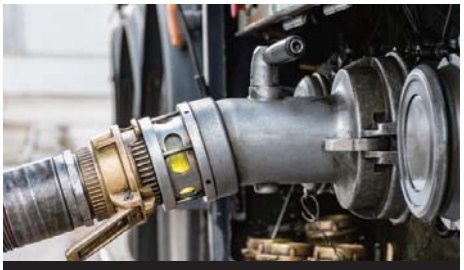
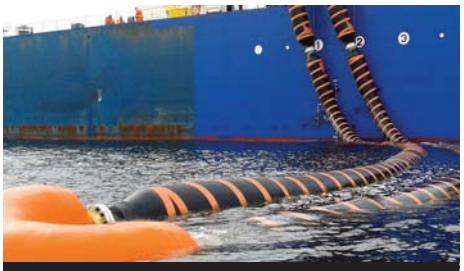
ThorburnFlex

Fracking



Rail & Truck Loading / Unloading



Off-Shore Transfer

OIL & GAS

TRANSFER HOSE ASSEMBLIES

Engineered Solutions For Pipe Motion

www.thorburnflex.com

ThorburnFlex

Thorburn Flex is an innovative manufacturer of specialized engineered flexible piping systems (i.e. custom hose assemblies and expansion joints). Since 1954, Thorburn's corporate mission evolution and business philosophy have been customer driven and targeted to select niche applications where Thorburn can achieve clear positions of sustainable technological and market share leadership. Thorburn is committed to a policy of continuous development and research to provide engineered solutions for pipe motion that set the industry standards for quality, safety, environmental protection, durability and value.

European Conformity	ISO 9001	B31.1, B31.3	ASME "NPT" Sec. III Class 1	ASME "U" Sec. VIII Div. 1	N285.0, B51 CGA CR96-001	97/23/EC Module H	UL 536

ISCIR Romania | CNCAN Romania | EN 13480-2002 | HAF 604 China | TSG China

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Edition11/28/2025

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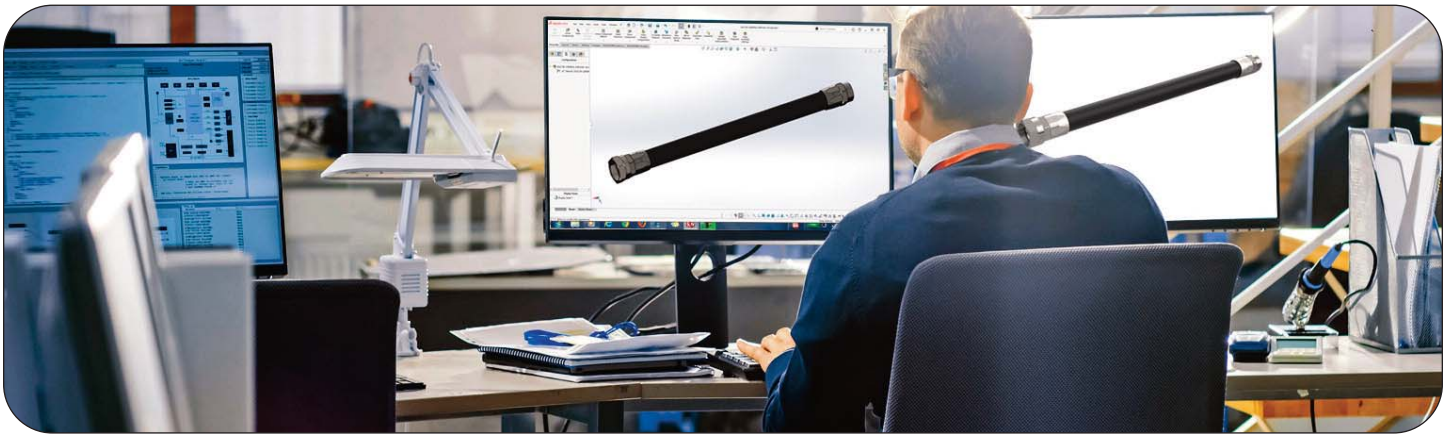


Thorburn's design team uses FEA & Solidworks to provide engineered pipe motion solutions

Engineering Capabilities & Experience

Thorburn's design engineering expertise is supported by advanced FEA software that offers powerful and complete solutions for both routine and sophisticated engineering problems. Thorburn's engineers can analyse and provide innovative solutions for pipe and duct motion problems including dynamic vibration, nonlinear static, linear static, thermal gradient through material wall thickness, acoustic impedance and fatigue using a common model data structure and integrated solver technology.

Design & Materials

- ASME Code Sections I, II, III, VIII, IX, B31.1 & B31.3
- ISO 10380 Corrugated Metal Hose & Hose Assemblies
- NACE MRO175-2009/ISO 15156-2009 compliance
- FEA - Finite Element Analysis

Welding and Fabrication Capabilities

- Arc, Pulse Arc, TIG, MIG, Core Wire
- Tube Welding, Track Welding, Automated Flame Cutting & Welding
- Rolls, Positioners, Turntables
- Automated Tube Welding 6mm (1/4") to 300mm (12")
- Lifting Capacity 22,000 lbs (10,000 kg)
- Crimping from 3 mm (1/8") to 600 mm (24")

NDT/NDE Programs & Design Verification Testing

- Weld X-Ray to 300KV-5MA / Welds Dye Penetrant to ASME Sec V
- Vacuum Testing 29.9" HG and Hydrostatic or Nitrogen Pressure Testing to 1,000 bar (15,000 psi)
- Impulse Testing to 680 bar (10,000 psi) at 204°C (400°F).
- Burst Testing up to 4,000 bar (60,000 psi)
- Pliability Fatigue & Deflection Testing ISO 10380:2012
- Seismic & Vibration Analysis in Acceptance with ASME Sec III
- Helium Mass Spectrometer Leak Testing

Fabrication Certification

- Welders and welding procedures: ASME Section VIII, IX, B31.1, B31.3, CSA B51 and Section III NPT (in progress)
- EN13480-2002: European Industrial Metallic Piping Standard & 97/23/EC (Pressure Equipment Directive)
- Canadian Gas Association (CGA) Certification: Standards CAN/CGA-8.1-M86, CGA96, UL96, UL536
- ISO 10380 Corrugated Metal Hose & Hose Assemblies
- Pressure Vessel Certification: CRN 0H0012. All Canadian Provinces & Territories
- Monel Chlorine Transfer: Chlorine Institute Spec. 135-3
- Hose Assemblies Degreased, Cleaned and Capped for Oxygen or Chlorine Service

Quality Assurance Certification & Compliance

- CSA N299.1, ISO 9001, ASME B31.1, B31.3 Section III, ASME Section VIII, Div 1 "U", CSA B51, NCA 4000 NQA-1, CSA N285.0, ASME NPT, AS 9100 (in progress), ISO IEC 17025

Hose Assembly Burst Testing (up to 4000 bar)

Petroleum Hose Manufacturing

DN 3 (1/8") to DN600 (24") Crimper, largest in the world - more than 3 million lbf (1.5 million kgf)

Fitting to End Joint CNC Manufacturing

Precision Machining

Fitting To End Joint Quality Inspection

Fitting To End Joint Crimping Process

Hose Assembly Impulse Testing (@ 150°C up to 1000 bar)

Hose Assembly Proof Testing up to 1000 bar

Typical Industrial Applications for Oil & Gas Hose Assemblies

LNG/LPG Transfer

Tank Truck Loading/Unloading Systems

Dewatering and Dredging

Fracking

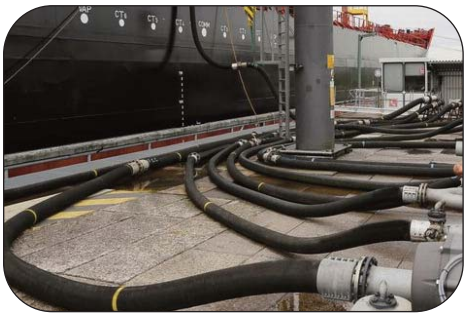
Aviation Fuelling

CALM/SPM Cargo Transfer

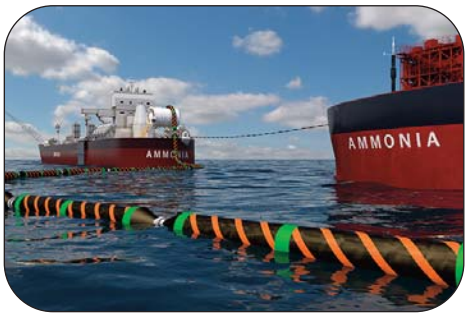
CBM/MBM Cargo Transfer

Ship to Ship

Submarine/Subsea



Ship to Shore



Tandem Cargo Offloading

Offshore Oil & Gas Operations

Oil & Gas - Upstream, Midstream, Downstream

Upstream

Upstream oil and gas refers to the exploration and production (E&P) sector, which involves finding crude oil and natural gas deposits and then extracting them from the ground. This includes all activities from geological surveys and seismic studies to drilling wells and bringing the raw materials to the surface.

Core activities of Upstream include:

Exploration: Finding potential reservoirs of oil and gas through methods like seismic surveys and geological studies.

Development: Preparing the site for extraction, which includes drilling wells and constructing necessary infrastructure.

Production: Extracting the crude oil and natural gas from the underground deposits and preparing them for transport.

Support services: This includes a wide range of services, such as rig operations, supply and service companies, and engineering firms.

Midstream

Midstream oil and gas refers to the part of the industry that processes, transports, and stores crude oil and natural gas between the upstream (extraction) and downstream (refining and marketing) phases. Key activities include moving products via pipelines, ships, and rail; processing natural gas and natural gas liquids (NGLs); and storing these products in terminals and other facilities until they are needed.

Core activities of Midstream include:

Transportation: Moving products from production areas to refineries and markets using pipelines, ships, railcars, and trucks.

Processing: Treating raw natural gas to separate it into marketable products, such as NGLs.

Storage: Storing crude oil, natural gas, and NGLs in terminals and other facilities.

Downstream

Downstream oil and gas refers to the refining, distribution, and retail of petroleum products, turning crude oil and natural gas into finished goods for consumers and industries. This includes oil refineries, petrochemical plants, natural gas distributors, and retail outlets like gas stations, which produce and sell products such as gasoline, diesel, LNG, Propane and jet fuel.

Core activities of Downstream include:

Refining: Crude oil is processed in refineries to separate and convert it into various products like gasoline, diesel, heating oil, and asphalt through processes like cracking and hydrotreating.

Petrochemicals: Crude oil and natural gas are used as raw materials to create a wide range of products, including plastics, synthetic rubber, fertilizers, pesticides, and pharmaceuticals.

Distribution and retail: This involves the marketing, wholesale, and retail sale of refined products to businesses and end-users through pipelines, distributors, and retail outlets like gas stations.

End products: The final products are those used daily, from fuels for vehicles and heating to everyday items like plastics and synthetic fabrics.

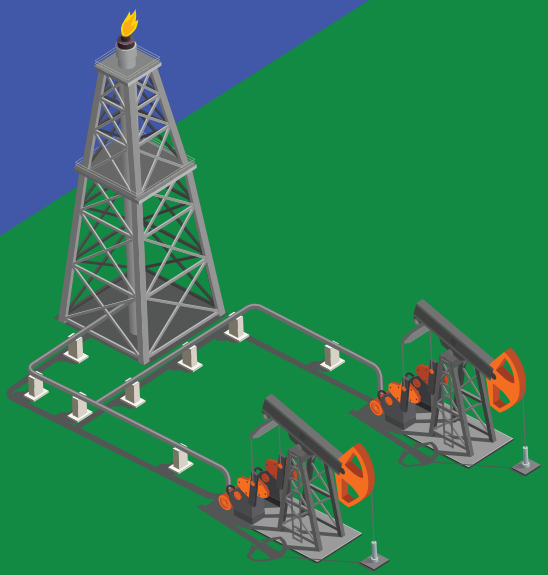
Oil & Gas Production Overview: Upstream - Midstream - Downstream

UPSTREAM

Exploration, drilling, and extraction of crude oil and natural gas

THORBURN HOSE ASSEMBLIES

- Fracking Hose
- Oilfield Spill Recovery Hoses
- Hydraulic Oil Return Line Hoses
- Drilling Hoses
- Mud Hoses

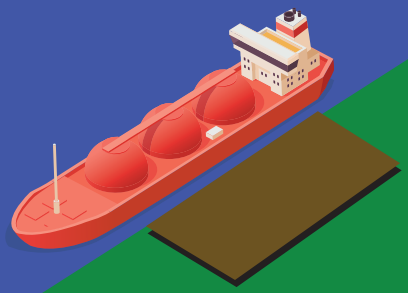


MIDSTREAM

Transportation, storage, and processing of raw materials and finished products

THORBURN HOSE ASSEMBLIES

- Discharge Hoses
- Layflat Hose
- Floating Hoses
- Composite Hoses
- Suction & Discharge Hoses
- Submarine/Subsea Hoses
- Ship to Ship/Ship to Shore Hoses
- Custom Flexpipe Hoses

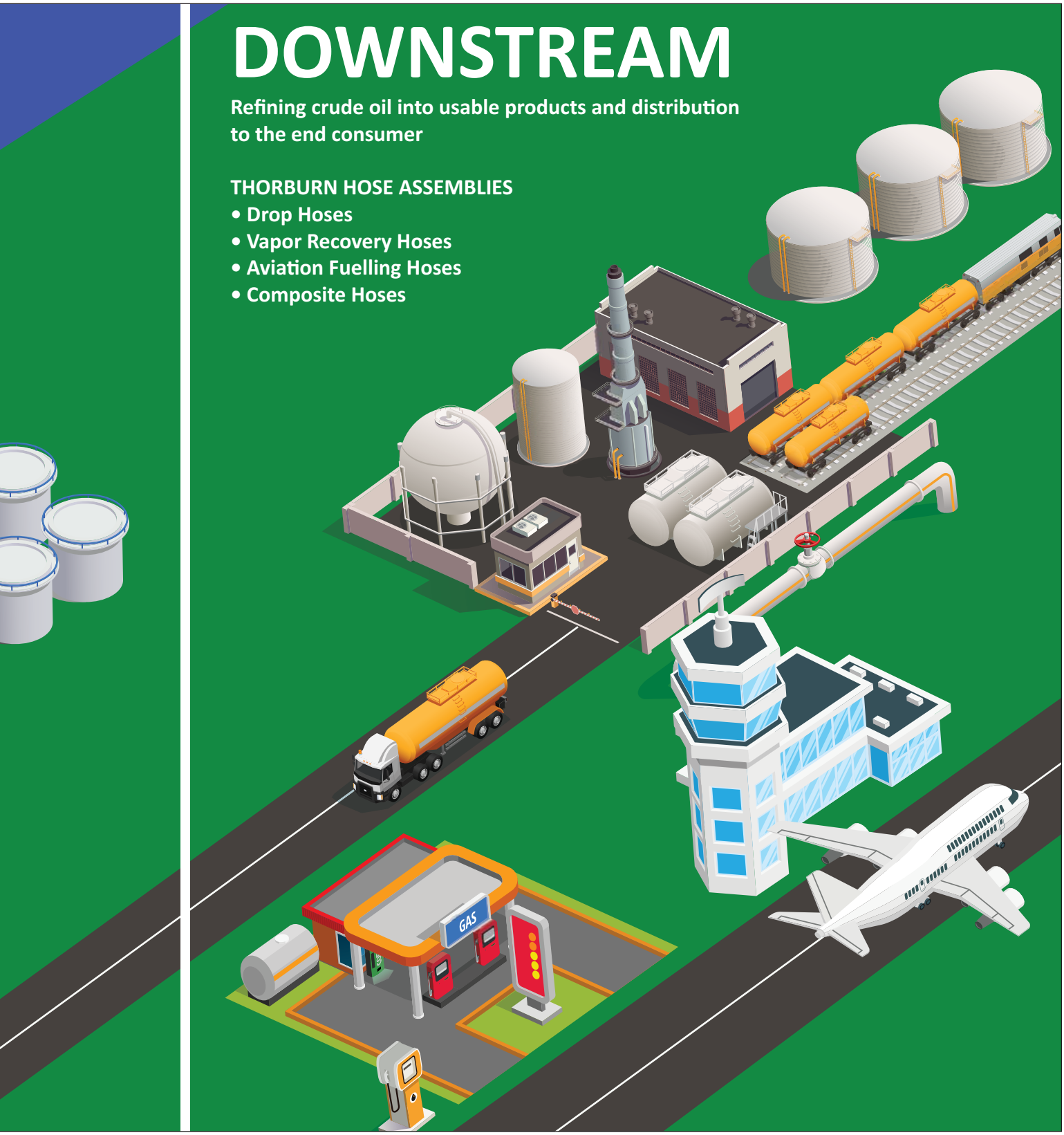


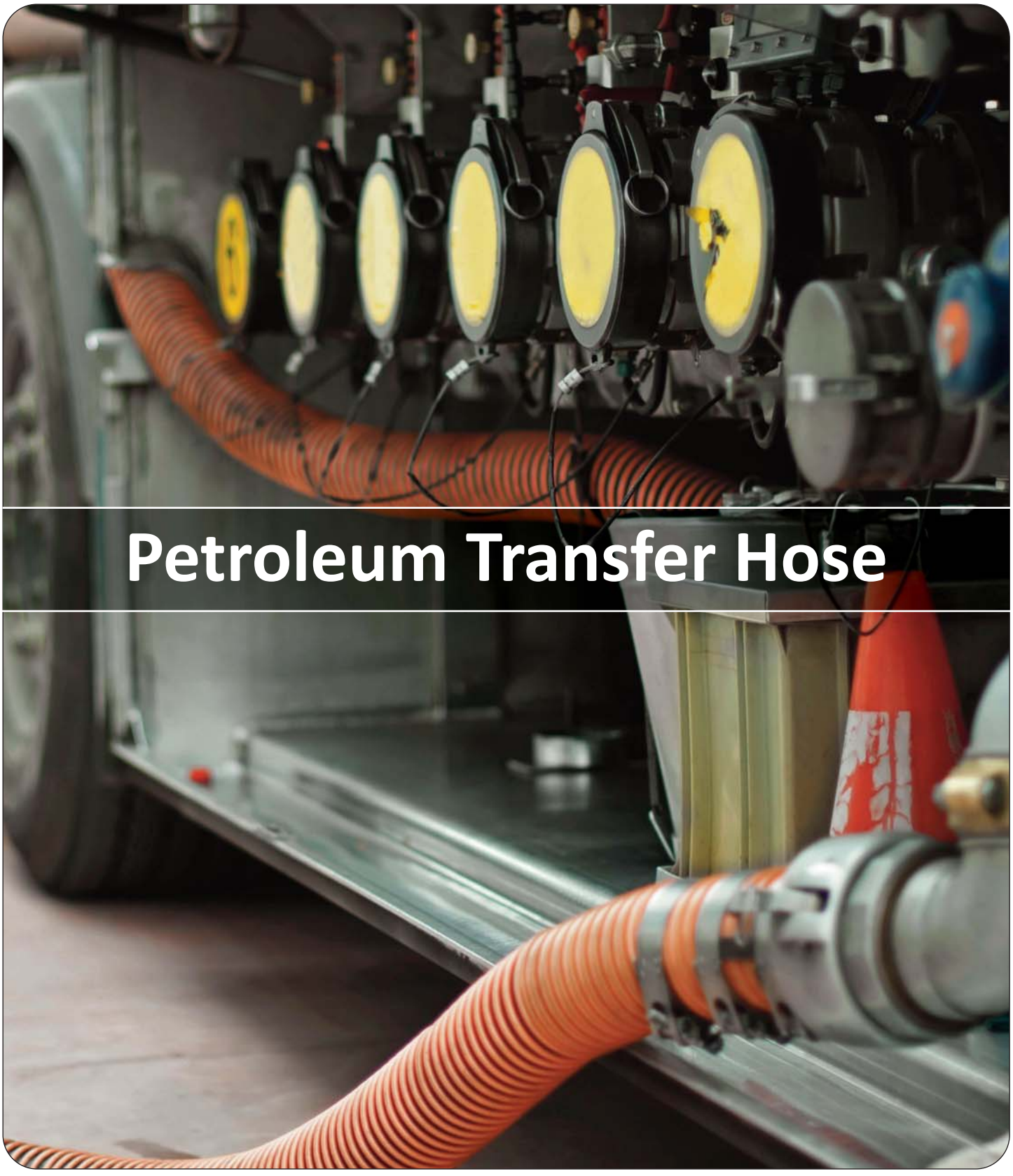
DOWNSTREAM

Refining crude oil into usable products and distribution to the end consumer

THORBURN HOSE ASSEMBLIES

- Drop Hoses
- Vapor Recovery Hoses
- Aviation Fuelling Hoses
- Composite Hoses





Petroleum Transfer Hose

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)52TP/(N)52TPV

Low Pressure Discharge Hose

Key Features

- Lightweight, flexible design for easy handling and maneuverability
- Excellent resistance to petroleum products, abrasion, and weathering
- Static wire for safe grounding in fuel transfer applications
- Optional FKM lining (52TPV) for maximum chemical and aromatic resistance
- Built to meet industry standards for fuel handling safety and performance

Thorburn Series (N)52TP(N)52TP/(N)52TP: is a lightweight, flexible hose designed for the safe discharge of petroleum-based products in low-pressure applications. It is suitable for refined fuels with aromatic content up to 55%. For applications involving aggressive fuels or high aromatic content, the Series (N)52TPV features a smooth FKM tube rated for up to 100% aromatics.

Applications

(N)52TP – Nitrile Tube

- Fuel oil and diesel discharge at terminals and depots
- Gasoline delivery from above-ground tanks
- Mobile fuel service trucks (construction, mining, agriculture)
- Low-pressure pump or gravity-fed fuel transfer
- Transfer of kerosene and light lubricating oils (up to 55% aromatics)

(N)52TPV – FKM Tube

- Premium gasoline and reformulated fuel transfer (up to 100% aromatics)
- Aviation fuel discharge (Jet A, Avgas)
- High-octane and blended gasoline transfer
- Petrochemical facilities and fuel blending terminals
- Extended-service applications with aggressive fuel exposure

Construction

Tube (N)52TP: Smooth seamless Nitrile (NBR)
Tube (N)52TPV: Smooth FKM for high-aromatic or aggressive fuels
Reinforcement: High-tensile synthetic fiber with static wire
Cover: Oil, ozone and weather-resistant Neoprene
Temperature Range: -40°F to +212°F (-40°C to +100°C)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Weight	
	mm	in	mm	in	bar	psi	kg/m	lb/ft
(N)52TP(V)12	20	3/4	31	1.2	10	150	0.6	0.4
(N)52TP(V)16	25	1	38	1.5	10	150	0.8	0.5
(N)52TP(V)20	32	1 1/4	43	1.7	10	150	0.9	0.6
(N)52TP(V)24	38	1 1/2	51	2.0	10	150	1.1	0.7
(N)52TP(V)32	50	2	64	2.5	10	150	1.4	1.0
(N)52TP(V)40	64	2 1/2	76	3.0	10	150	1.8	1.2
(N)52TP(V)48	76	3	89	3.5	10	150	2.2	1.5
(N)52TP(V)64	102	4	114	4.5	10	150	2.8	1.9
(N)52TP(V)96	152	6	168	6.6	10	150	5.1	3.4

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)552TP/(N)552TPV

High Pressure Discharge Hose

Key Features

- Designed for both suction and discharge applications
- Heavy duty, high pressure discharge service (300 psi - all sizes)
- 552TPV handles up to 100% aromatic content and ideal for more aggressive fuels
- Static wire for safe grounding in fuel transfer applications

Thorburn Series (N)552TP/(N)552TPV: is a high-pressure discharge hose engineered for demanding fuel transfer applications where enhanced strength, durability, and safety are required. Designed specifically for truck, tanker, and fueling operations, this hose features a premium nitrile (NBR) tube that is highly resistant to oil, gasoline, diesel, and other petroleum-based products with aromatic content up to 55%. For more aggressive fuels and higher aromatic content (up to 100%), the (N)552TPV version is constructed with a smooth FKM (Viton®) tube. A static grounding wire is embedded within the hose wall to safely dissipate static electricity during transfer. The rugged NBR/PVC blend cover offers superior resistance to weathering, abrasion, and oils—making this hose ideal for heavy-duty, high-pressure environments. The Thorburn Series (N)552TP / (N)552TPV is the preferred solution when higher pressure performance, enhanced durability, and safety are critical for petroleum product transfer operations.

Applications

- High-pressure fuel discharge from trucks and tankers
- Loading racks and terminals
- Fuel delivery systems for gasoline, diesel, biodiesel
- Industrial refueling stations
- Transfer of petroleum-based oils with moderate to high aromatic content

Construction

Tube (N)552TP: Smooth, seamless nitrile rubber (NBR), oil and fuel resistant
Tube (N)552TPV: Smooth FKM (Viton®) for enhanced chemical and aromatic resistance
Reinforcement: Two plies of high-tensile synthetic fibers with embedded static wire
Cover: Oil, abrasion, and weather-resistant NBR/PVC blend
Operating Temperature: –31°F to 212°F (–35°C to 100°C)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Weight	
	mm	in	mm	in	bar	psi	kg/m	lb/ft
(N)552TP(V)32	51	2	67	2.6	21	300	2.0	1.4
(N)552TP(V)40	64	2 1/2	80	3.1	21	300	2.3	1.6
(N)552TP(V)48	76	3	93	3.7	21	300	2.8	1.9
(N)552TP(V)64	102	4	117	4.6	21	300	3.8	2.6
(N)552TP(V)80	127	5	144	5.7	21	300	6.1	4.1

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)53TP/(N)53TPV

Heavy-Duty Suction & Discharge Drop Hose

Thorburn Series (N)53TP/(N)53TPV: are heavy-duty, highly flexible suction and discharge hoses engineered for demanding petroleum transfer applications—especially tank truck drop operations. Built with a dual helix wire for superior crush resistance and vacuum stability, this hose safely handles petroleum-based products with aromatic content up to 55%. For applications involving higher aromatic content or aggressive hydrocarbons, the (N)53TPV variant is equipped with a smooth FKM (Viton®) tube, rated for up to 100% aromatic content.

Key Features

- Lightweight, highly flexible hose designed for gravity drop and low pressure fuel delivery
- 53TPV handles aromatic content up to 100% and is ideal for more aggressive fuels
- Embedded static wire for added strength and safe dissipation of static electricity
- Corrugated cover is oil and abrasion resistant for enhanced flexibility and ease of handling

Applications

- Tank truck loading/unloading
- Petroleum terminal suction/drop operations
- Railcar and barge transfer
- Bulk fuel delivery systems
- Off-loading of diesel, gasoline, and aviation fuels

Construction

Tube (N)53TP: Seamless nitrile (NBR), oil-resistant
Tube (N)53TPV: Seamless FKM, premium chemical and aromatic resistance
Reinforcement: Two plies of high-tensile synthetic fabric with dual helix steel wire for full vacuum capability and crush resistance
Cover: Weather, abrasion, and oil-resistant NBR/PVC blend
Vacuum Rating: Full vacuum at 20°C (68°F) across all sizes
Operating Temperature: -31°F to 176°F (-35°C to 80°C)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)53TP(V)12	19	3/4	30	1.1	10	150	102	4.0	0.54	0.36
(N)53TP(V)16	25	1	35	1.4	10	150	152	6.0	0.73	0.49
(N)53TP(V)20	32	1 1/4	43	1.7	10	150	152	6.0	1.21	0.81
(N)53TP(V)24	38	1 1/2	51	2.0	10	150	165	6.5	1.35	0.91
(N)53TP(V)32	51	2	64	2.5	10	150	203	8.0	1.70	1.14
(N)53TP(V)40	64	2 1/2	78	3.1	10	150	305	12.0	2.62	1.76
(N)53TP(V)48	76	3	90	3.5	10	150	406	16.0	3.60	2.42
(N)53TP(V)64	102	4	117	4.6	10	150	457	18.0	4.00	2.69
(N)53TP(V)96	152	6	174	6.7	10	150	762	30.0	9.35	6.28

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)53TPX/(N)53TPXV

Arctic-Grade Low Temperature Suction & Discharge Drop Hose

Key Features

- Designed for extreme cold-weather applications down to -60°C (-76°F)
- Ultra-flexible construction remains pliable in sub-zero conditions
- Excellent chemical resistance to gasoline, ethanol, biodiesel, and fuel oils
- Static dissipating embedded wire for added safety in flammable environments
- Optional FKM liner (53TPXV) for 100% aromatic content and ideal for aggressive fuels

Thorburn Series (N)53TPX/(N)53TPXV: is a rugged, corrugated suction and discharge hose specially engineered for use in extreme cold-weather environments. Built for reliable operation in temperatures as low as -65°F (-54°C), this hose remains exceptionally flexible while maintaining full vacuum capability and excellent kink resistance. Designed for bulk transfer of petroleum products including gasoline, diesel, and other refined fuels - the hose handles aromatic contents up to 55% with the standard nitrile (NBR) tube, and up to 100% with the FKM (Viton®) tube option (53TPXV). Its blue chloroprene corrugated cover offers enhanced abrasion resistance and is specially formulated for durability in harsh climates, including snow, ice, and UV exposure. When low temperatures and harsh conditions demand more from your hose, the Thorburn Series (N)53TPX / 53TPXV delivers superior cold-weather performance, durability, and safety.

Applications

- Arctic and sub-zero fuel transfer operations
- Tank truck suction and discharge in cold climates
- Railcar, terminal, and barge fuel handling in winter environments
- Remote site refueling for mining, military, and energy sectors
- Emergency fuel supply operations in extreme conditions

Construction

Tube (N)53TPX: Smooth, seamless nitrile (NBR), fuel and oil-resistant
Tube (N)53TPXV: Smooth FKM for superior aromatic and chemical resistance
Reinforcement: Multiple plies of high-tensile synthetic fabric with dual helix wire for flexibility and full vacuum strength
Cover: Corrugated blue chloroprene (Type A) weather, abrasion, and ozone resistant
Vacuum Rating: Full vacuum @ 20°C (68°F) for all sizes
Operating Temperature: -65°F to 180°F (-54°C to 82°C)
Safety Factor: 3:1

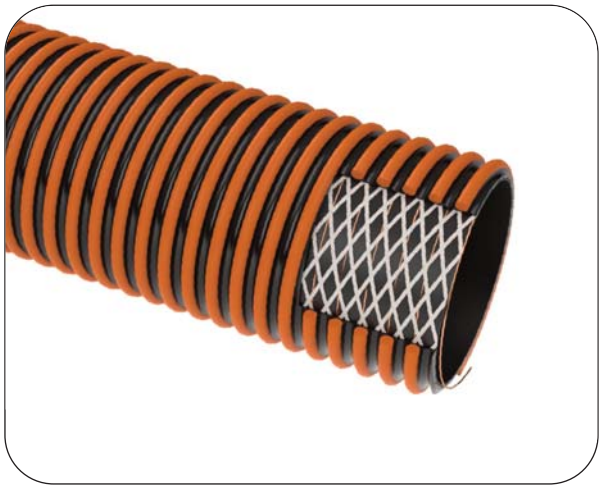
Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)53TPX(V)20	32	1 1/4	43	1.7	10	150	127	5.0	1.1	0.71
(N)53TPX(V)24	38	1 1/2	51	2.0	10	150	152	6.0	1.3	0.84
(N)53TPX(V)32	51	2	64	2.5	10	150	203	8.0	1.6	1.08
(N)53TPX(V)40	64	2 1/2	79	3.1	10	150	254	10.0	2.1	1.44
(N)53TPX(V)48	76	3	91	3.6	10	150	305	12.0	2.8	1.85
(N)53TPX(V)64	102	4	119	4.7	10	150	406	16.0	4.6	3.11

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)53TPS/(N)53TPW

Lightweight, Extra-Flexible Drop Hose for Suction & Delivery of Fuels



Key Features

- Corrugated PVC outer cover provides enhanced flexibility and ease of handling
- Ideal for gravity drop fuel delivery operations
- Clockwise external PVC helix improves durability when dragging over rough surfaces
- Extra lightweight construction is ideal for manual handling and quick deployment during fuel deliveries
- Designed for tank truck gravity drop and bulk transfer applications

Thorburn Series (N)53TPS/ (N)53TPW: are lightweight, extra-flexible suction and gravity-drop hoses designed for efficient fuel handling operations. Engineered for ease of use, these hoses are ideal for manual deployment, dragging, and quick connection in petroleum product transfer applications. A distinctive clockwise orange PVC helix reinforcement gives the hose excellent abrasion resistance and allows it to glide easily over rough surfaces—making it perfect for mobile and field-based fuel transfer. The (N)53TPW version includes an embedded static wire for safe grounding during hydrocarbon transfer. Designed to handle gasoline, diesel, lubricants, fuel slurries, and light petroleum-based products, both models offer full vacuum capability at room temperature and excellent flexibility across a wide temperature range. For flexible, easy-to-handle fuel transfer in everyday or mobile applications, Thorburn Series (N)53TPS / (N)53TPW offers lightweight performance without compromising strength or reliability.

Applications

- Gravity drop hose for tank truck and fuel delivery trucks
- Suction and discharge of gasoline, diesel, kerosene, and lubricants
- Grease and oil slurry handling
- Mobile refueling and transfer at construction, mining, or agricultural sites
- Ground support fuel operations

Construction

Tube: Smooth, seamless nitrile (NBR) – oil and fuel resistant
Reinforcement:
(N)53TPS: Single ply of high-tensile polyester fabric
(N)53TPW: Same as above, plus embedded static wire
Cover: Clockwise orange PVC helix for enhanced abrasion resistance and easy dragging
Vacuum Rating: Full vacuum @ 20°C (68°F) for all sizes
Operating Temperature: -10°F to 140°F (-23°C to 60°C)
Safety Factor: 3:1

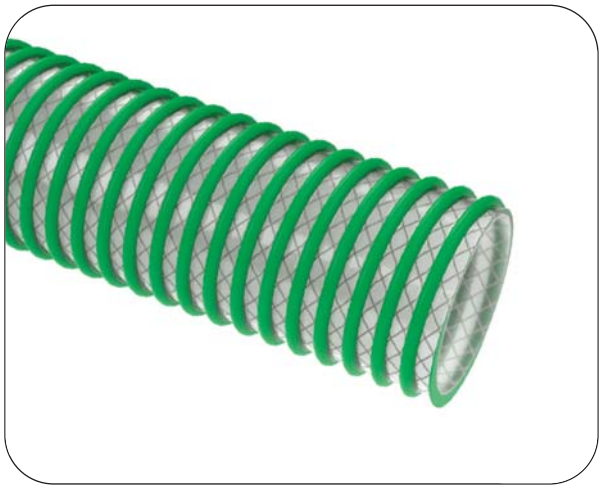
Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)53TPS32	51	2	68	2.7	5.0	70	127	5.0	1.7	1.1
(N)53TPS40	76	3	94	3.7	4.5	65	152	6.0	2.0	1.4
(N)53TPS64	102	4	122	4.8	4.5	65	203	8.0	3.2	2.2
(N)53TPW32	51	2	68	2.7	5.0	70	127	5.0	1.7	1.1
(N)53TPW40	76	3	94	3.7	4.5	65	152	6.0	2.0	1.4
(N)53TPW64	102	4	122	4.8	4.5	65	203	8.0	3.2	2.2

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)53TPP

Lightweight Polyurethane Drop Hose for Suction & Delivery of Gasoline and Alternative Fuels



Thorburn Series (N)53TPP: is a versatile, lightweight suction and delivery hose specifically engineered for clean transfer of gasoline and alternative fuels, including biodiesel, ethanol blends, kerosene, diesel, and ASTM fuel oils. Its clear polyurethane tube is static dissipating and delivers excellent chemical and abrasion resistance, while allowing visual inspection of media flow for safety and quality control. Designed for ease of handling in cold weather conditions down to –40°F (–40°C), the hose's corrugated polyurethane cover and clockwise PVC helix ensure superior flexibility and durability—especially when dragged over rough terrain in mobile fueling operations. Thorburn Series (N)53TPP is the smart choice for operators needing a clean, flexible, and cold-weather capable hose for safe handling of modern petroleum and renewable fuels.

Key Features

- Clear polyurethane tube provides excellent chemical resistance to gasoline, diesel, biodiesel, ethanol, and other fuel blends.
- Highly flexible in sub-zero temperatures (-40°F / -40°C), ideal for harsh climates.
- Built-in static wire and conductive materials provides for safe fuel transfer and grounding capability.
- Lower weight than rubber alternatives providing ease of handling and reducing operator fatigue.
- Corrugated polyurethane with clockwise PVC helix provides abrasion resistance and easy drag on rough surfaces.
- UV & weather resistant cover ensures long service life in outdoor conditions.

Applications

- Suction and discharge of gasoline and blended fuels
- Gravity drop and tank truck fuel delivery
- Biodiesel and ethanol transfer stations
- Fuel handling in remote or low-temperature environments
- Alternative fuel and clean energy distribution systems

Construction

Tube: Smooth, static-dissipating polyurethane – resistant to petroleum and alcohol-blended fuels
Reinforcement: High tensile polyester braid with integrated clockwise PVC helix
Cover: Corrugated polyurethane for abrasion, weather, and drag resistance
Vacuum Rating: Full vacuum @ 20°C (68°F) for all sizes
Operating Temperature: -40°F to 140°F (-40°C to 60°C)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)53TPP32	51	2	63	2.5	5.0	75	102	4.0	1.4	1.0
(N)53TPP40	76	3	96	3.8	4.5	65	152	6.0	2.5	1.7
(N)53TPP64	102	4	123	4.8	4.5	65	203	8.0	4.2	2.9

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)54TP

Lightweight, Flexible Vapor Recovery Hose

Key Features

- Lightweight and highly flexible for easy handling
- Corrugated cover and external helix allow smooth dragging on rough surfaces
- Built-in static wire for grounding in combustible vapor applications
- Maintains full vacuum across all sizes

Thorburn Series (N)54TP: is a high-performance, lightweight hose specifically engineered for gasoline vapor recovery applications. Its smooth nitrile rubber tube provides excellent resistance to gasoline vapors, while the corrugated PVC cover—reinforced with a rigid external PVC helix—offers outstanding flexibility and durability during use and transport. The static grounding wire ensures safe dissipation of electrostatic charge in volatile environments.

Applications

- Gasoline vapor recovery systems at terminals and service stations
- Stage I and Stage II vapor recovery during fuel delivery
- Refueling operations involving mobile tanks or fuel trucks
- Loading/unloading vapor return lines in petrochemical facilities

Construction

Tube: Smooth nitrile rubber – resistant to petroleum vapors
Reinforcement: Rigid PVC helix with integrated static grounding wire
Cover: Corrugated PVC with high abrasion resistance
Vacuum Rating: Full vacuum at 20°C (68°F)
Operating Temperature: -40°F to 140°F (-40°C to 60°C)
Safety Factor: 3:1

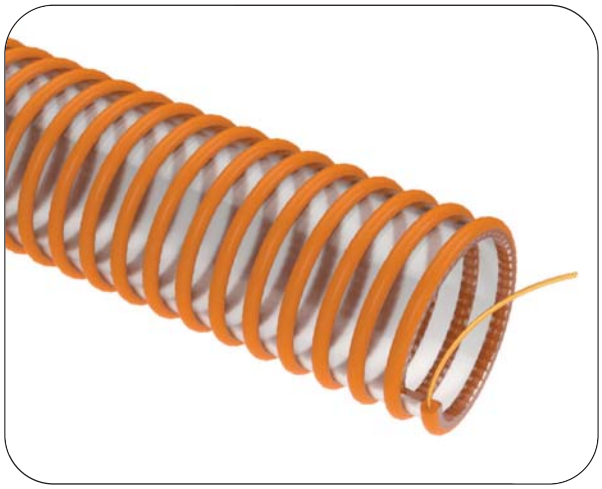
Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)54TP32	51	2	61	2.4	1.4	20	76	3.0	0.9	0.6
(N)54TP40	76	3	89	3.5	0.7	10	89	3.5	1.5	1.0
(N)54TP64	102	4	117	4.6	0.7	10	127	5.0	2.5	1.7

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)54TPP

Polyurethane Vapor Recovery Hose for Gasoline and Alternative Fuels



Thorburn Series (N)54TPP: is a lightweight, highly flexible vapor recovery hose engineered for use in tank truck and terminal operations handling gasoline, biodiesel, ethanol, and other alternative fuels. Its static-dissipating clear polyurethane tube, paired with an integrated static grounding wire, provides critical protection against static discharge in volatile environments. The corrugated polyurethane cover with an external clockwise PVC helix ensures long service life and smooth drag performance across rough surfaces.

Key Features

- Excellent flexibility and handling, even in cold conditions
- High resistance to gasoline, ethanol, biodiesel, and vapor-phase hydrocarbons
- Clear polyurethane tube allows visual inspection for wear or contamination
- Built-in static protection for maximum operational safety
- Easy dragging across uneven or abrasive surfaces

Applications

- Vapor recovery during fuel delivery or bulk fuel transfer
- Tank truck loading/unloading operations
- Stage I and Stage II vapor recovery systems
- Gasoline and alternative fuel vapor containment in distribution terminals

Construction

Tube: Smooth, clear static-dissipating polyurethane
Reinforcement: Rigid PVC helix with embedded static grounding wire
Cover: Corrugated polyurethane with excellent abrasion resistance
Vacuum Rating: Full vacuum at 20°C (68°F)
Operating Temperature: -40°F to 140°F (-40°C to 60°C)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)54TPP32	51	2	61	2.4	0.62	09	51	2.0	0.6	0.4
(N)54TPP40	76	3	94	3.6	0.55	08	76	3.0	1.0	0.7
(N)54TPP64	102	4	117	4.6	0.48	07	102	4.0	1.5	1.0

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)55TP/(N)55TPV

Heavy-Duty Petroleum Suction & Discharge Hose (for Aromatic Content up to 100%)

Thorburn Series (N)55TP: The Thorburn Series (N)55TP is a rugged, high-performance hose designed for the suction and delivery of petroleum products in demanding industrial and transportation environments. Engineered for tank truck, railcar, and in-plant transfer, it is also suitable for hydraulic suction and return lines. The standard Nitrile tube handles fuels with up to 55% aromatic content, while the (N)55TPV version features a premium FKM tube for compatibility with fuels and solvents up to 100% aromatic content. Unlike the lighter-duty Thorburn 53TP, which is ideal for gravity drop and general fuel transfer, the 55TP Series is built for heavy-duty suction and pressure service, with dual wire helix reinforcement and a robust nitrile/PVC cover for superior durability under harsh operating conditions.

Key Features

- Heavy-duty construction for high-pressure and full suction applications
- Available in two tube options for compatibility with a wide range of fuels
- Full vacuum capability across all sizes
- Reinforced for tough handling and routing under pressure
- Distinct upgrade over 53TP for more aggressive service conditions

Applications

- Tank truck and railcar loading/unloading
- Bulk fuel handling in terminals and refineries
- In-plant suction and discharge of crude oil, diesel, gasoline, and fuel oils
- Hydraulic oil suction and return lines
- Petrochemical transfer requiring higher aromatic resistance

Construction

Tube (N)55TP: Smooth, seamless nitrile – up to 55% aromatic content
Tube (N)55TPV: Smooth FKM – up to 100% aromatic content
Reinforcement: Dual wire helix with two plies of high-strength synthetic fabric
Cover: Nitrile/PVC blend – abrasion, oil, and weather resistant
Vacuum Rating: Full vacuum @ 20°C (68°F)
Operating Temperature: -25°F to 200°F (-32°C to 93°C).
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)55TP(V)16	25	1	37	1.5	21	300	89	3.5	0.8	0.5
(N)55TP(V)20	32	1 1/4	44	1.7	21	300	102	4.0	1.0	0.7
(N)55TP(V)24	38	1 1/2	51	2.0	21	300	127	5.0	1.4	0.9
(N)55TP(V)32	51	2	64	2.5	21	300	203	8.0	1.9	1.3
(N)55TP(V)40	64	2 1/2	79	3.1	21	300	254	10.0	2.5	1.7
(N)55TP(V)48	76	3	100	3.6	21	300	305	12.0	3.3	2.2
(N)55TP(V)64	102	4	121	4.8	21	300	432	17.0	4.3	2.9
(N)55TP(V)96	152	6	176	6.9	21	300	686	27.0	10.0	6.5
(N)55TP(V)128	203	8	228	9.0	21	300	1219	48.0	10.3	6.9

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Petroleum Transfer Hose Assemblies

Thorburn Series (N)555TP/(N)555TPV

High-Pressure Petroleum Suction & Discharge Hose (for Aromatic Content up to 100%)

Thorburn Series (N)555TP: is a premium-grade, high-pressure hose specifically engineered for the transfer of petroleum products in both gravity drop and pressurized systems. Built to exceed the durability and performance of the standard 55TP series, this hose is ideal for tank truck, bulk fuel delivery, and marine applications where static discharge, abrasion, and harsh environmental conditions pose operational risks. The dual copper grounding wire system, embedded within the hose body, ensures safe static dissipation when properly secured—making the 555TP series particularly suitable for high-flow, high-risk fuel transfer applications. For more aggressive media, the (N)555TPV variant features a smooth FKM (Viton®) tube, enabling compatibility with fuels up to 100% aromatic content. 555TP/555TPV is built for higher pressure, greater abrasion and environmental resistance, and enhanced static protection. It is the optimal choice when durability, safety, and compatibility with aromatic-rich fuels are paramount.

Key Features

- Built for high-pressure suction and discharge applications
- Superior to 55TP/55TPV in environmental resistance (ozone, seawater, abrasion)
- Embedded copper wires for static grounding – critical for safe fuel transfer
- Available in nitrile or FKM liner options for broad chemical compatibility
- Long-lasting performance in mobile, marine, or terminal use

Applications

- High-pressure fuel transfer in tank truck and fuel delivery systems
- Gravity drop hose for gasoline, diesel, biodiesel, and jet fuel
- Petroleum loading/unloading at terminals, barges, and railcars
- Marine fuel bunkering and ship-to-shore fuel transfer
- Static-sensitive environments requiring grounding capability

Construction

Tube (N)555TP: Smooth nitrile – up to 55% aromatic content
Tube (N)555TPV: Smooth FKM (Viton®) – up to 100% aromatic content
Reinforcement: Dual wire helix with two plies of high-tensile synthetic fabric
Conductivity: Dual copper static wires and integrated ground wire (must be properly grounded)
Cover: Abrasion-, ozone-, seawater-, and weather-resistant NBR/PVC blend
Vacuum Rating: Full vacuum @ 20°C (68°F)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)555TP(V)32	51	2	72	2.8	28	400	305	12	2.8	1.9
(N)555TP(V)48	76	3	99	3.9	28	400	508	20	4.4	3.0
(N)555TP(V)64	101	4	125	4.9	28	400	762	30	5.7	3.9

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Oilfield Clean-Up Hose Assemblies

Thorburn Series (N)55TPU

UHMW-PE Bio-Diesel & Ethanol Suction & Discharge Hose (for Aromatic Content up to 55%)

Thorburn Series (N)55TPU: is a heavy-duty, high-performance hose engineered for the transfer of biofuels, ethanol blends, and petroleum products with up to 55% aromatic content. Featuring a UHMW-PE (Ultra High Molecular Weight Polyethylene) tube, this hose offers exceptional resistance to aggressive alcohol-based fuels and oxygenated gasoline blends. Designed for full suction and high-pressure discharge service, the 55TPU is equipped with dual conductive copper wires and a grounding wire embedded within the hose wall—ensuring safe static dissipation in flammable environments. Its smooth CR (chloroprene rubber) cover resists abrasion, weathering, ozone, and heat, making it ideal for rigorous mobile or stationary fuel handling operations. The 55TPU is purpose-built for biofuels and ethanol-based fuels, offering enhanced chemical compatibility through its UHMW-PE lining. It is the ideal choice when handling alcohol-rich or oxygenated fuels, which can degrade standard nitrile or even FKM linings over time.

Key Features

- UHMW-PE tube provides superior resistance to ethanol and biodiesel blends
- Conductive construction ensures safe fuel handling in flammable vapor zones
- Full vacuum capability with excellent flexibility and durability
- Weather- and abrasion-resistant cover for demanding outdoor use
- Designed for long service life in high-circulation fuel transfer systems

Applications

- Suction and discharge of bio-diesel, ethanol, and oxygenated fuel blends
- Fuel transfer in tank trucks, railcars, marine terminals, and ethanol plants
- Bulk handling of petroleum products with moderate aromatic content
- Static-sensitive environments requiring effective grounding

Construction

Tube: Black UHMW-PE – resistant to alcohols, biofuels, and up to 55% aromatic hydrocarbons
Reinforcement: Dual wire helix with two plies of high-strength synthetic fabric
Conductivity: Dual copper wires plus embedded grounding wire for static dissipation
Cover: Smooth black chloroprene (CR) – abrasion, ozone, weather, and heat resistant
Vacuum Rating: Full vacuum @ 20°C (68°F)
Operating Temperature: -31°F to 176°F (-35°C to 80°C).
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)55TPU16	25	1	36	1.4	10	150	152	6.0	0.7	0.5
(N)55TPU20	32	1 1/4	43	1.7	10	150	178	7.0	0.9	0.6
(N)55TPU24	38	1 1/2	49	1.9	10	150	203	8.0	1.1	0.8
(N)55TPU32	51	2	63	2.5	10	150	305	12.0	1.7	1.2
(N)55TPU48	76	3	89	3.5	10	150	356	14.0	2.7	1.8

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Oil Transfer Hose Assemblies

Thorburn Series (N)555TPX

Lightweight, Flexible Oilfield Clean-Up & Spill Recovery Hose

Thorburn Series (N)555TPX: is a lightweight, highly flexible suction hose engineered specifically for oilfield clean-up, spill recovery, and environmental response applications. Constructed from a durable NBR/PVC blend, the hose offers excellent resistance to crude oil, diesel fuel, brine, and hydrocarbon-based slurries. Designed for easy handling in the field, even in sub-zero conditions, the 555TPX is the ideal choice for clean-up crews, mobile vacuum units, and emergency responders. Its clockwise external PVC helix provides enhanced durability and drag resistance across rough terrain, while also allowing for tight bends and compact storage. Thorburn Series 555TPX is built for field portability, quick deployment, and environmental clean-up. Its lightweight construction and extreme flexibility make it the preferred choice for mobile, cold-weather, and rapid-response operations, where ease of handling and temperature resilience are critical.

Key Features

- Ultra-lightweight and highly flexible – ideal for rapid deployment and retrieval
- Cold weather resistant – remains flexible down to -40°F
- Excellent resistance to crude oil, diesel, saltwater, and hydrocarbons
- External helix allows for easy dragging, tight bending, and kink resistance
- Easy to handle in mobile and remote operations

Applications

- Oilfield clean-up and spill recovery
- Waste crude oil and diesel fuel suction
- Salt water, brine, and tank bottom clean-up
- Environmental remediation and vacuum truck service
- Temporary bypass and drainage lines in mobile operations

Construction

Tube: Oil and fuel resistant NBR/PVC blend
Reinforcement: Clockwise rigid PVC helix for crush resistance and flexibility
Cover: Smooth NBR/PVC for abrasion, oil, and weather resistance
Vacuum Rating: Full vacuum @ 20°C (68°F)
Operating Temperature: -40°F to 140°F (-40°C to 60°C).
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)555TPX32	51	2.0	62	2.4	3.5	50	102	4.0	1.0	0.7
(N)555TPX48	75	3.0	89	3.5	3.0	45	152	6.0	1.6	1.1
(N)555TPX64	100	4.0	117	4.6	2.6	38	208	8.2	2.7	1.6

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Oilfield Clean-Up Hose Assemblies

Thorburn Series (N)TPR4/(N)TPR4LT

SAE 100R4 Hydraulic Oil Return Hose for Suction & Return Lines

Thorburn Series (N)TPR4/(N)TPR4LT: is a premium SAE 100R4 hose engineered for hydraulic oil return, suction, and low-pressure transfer lines in mobile and stationary equipment. Designed to handle both petroleum- and water-based hydraulic fluids, this hose features a seamless nitrile tube and high-tensile wire helix reinforcement to support full vacuum service and flexible routing in suction or return applications. For extreme cold weather conditions, the Series (N)TPR4LT offers the same high-performance construction with a specially formulated low-temperature nitrile blend in both tube and cover, providing exceptional flexibility down to -65°F (-54°C) and increased heat resistance up to 250°F (121°C). (N)TPR4 and (N)TPR4LT are purpose-built for hydraulic systems—specifically for suction and return lines under low pressure. Additionally, the LT variant offers superior cold-weather flexibility, making it the go-to solution for Arctic and sub-zero environments where standard fuel hoses would stiffen or crack.

Key Features

- Fully compliant with SAE 100R4 specifications
- Designed for full vacuum and flexible routing under suction
- Available in standard and Arctic-grade (LT) versions
- Excellent resistance to petroleum fluids, weathering, and abrasion
- Ideal for both fixed installations and mobile hydraulic systems
- Enhanced cold-weather flexibility unmatched by standard petroleum hoses

Applications

- Hydraulic oil suction and return lines
- Power steering and lubrication circuits
- Off-road and heavy-duty equipment
- Industrial and mobile machinery in cold climate zones
- Transmission and low-pressure petroleum transfer systems

Construction

Tube (N)TPR4: Smooth seamless nitrile for petroleum and water-based fluids
Tube (N)TPR4LT: Smooth low-temperature nitrile blend for Arctic conditions
Reinforcement: Wire helix embedded between high-strength textile cords
Cover (N)TPR4: Oil-, gasoline-, and abrasion-resistant synthetic rubber
Cover (N)TPR4LT: Low-temperature nitrile blend with enhanced cold weather flexibility
Vacuum Rating: Full vacuum @ 20°C (68°F)
Operating Temperature:
(N)TPR4: -40°F to 200°F (-40°C to 93°C)
(N)TPR4LT: -65°F to 250°F (-54°C to 121°C)
Safety Factor: 4:1

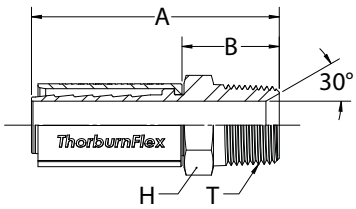
Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Bend Radius		Weight	
	mm	in	mm	in	bar	psi	mm	in	kg/m	lb/ft
(N)TPR4(TL)12	19	3/4	30.5	1.2	21	300	51	2.0	0.7	0.5
(N)TPR4(TL)16	25	1	38.1	1.5	17	250	64	2.5	0.9	0.6
(N)TPR4(TL)20	32	1 1/4	43.2	1.7	14	200	76	3.0	1.0	0.7
(N)TPR4(TL)24	38	1 1/2	50.8	2.0	10	150	102	4.0	1.2	0.8
(N)TPR4(TL)32	51	2	63.5	2.5	7	100	152	6.0	1.6	1.1
(N)TPR4(TL)40	64	2 1/2	76.2	3.0	7	100	152	6.0	2.4	1.6
(N)TPR4(TL)48	76	3	91.4	3.6	7	100	203	8.0	2.8	1.9

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Crimp End Fittings

Thorburn Crimp End Fittings

Series MP | Male Pipe NPT Rigid

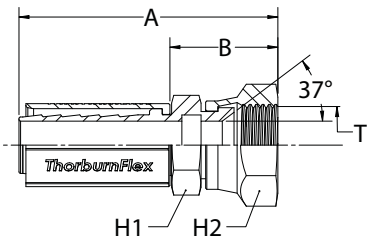


Part Number	Nominal Hose I.D.		Fitting Size		Thread Size	A		B - Cutoff Allowance		H Hex
	Inch	mm	Inch	mm		Inch	mm	Inch	mm	Inch
TR40-12-12MP	3/4	20	3/4	20	3/4-14	3.22	82	1.51	38	1.13
TR40-16-16MP	1	25	1	25	1-11 1/2	3.69	94	1.98	50	1.38
TR40-20-20MP	1 1/4	30	1 1/4	30	1 1/4-11 1/2	4.39	112	2.09	53	1.75
TR40-24-24MP	1 1/2	40	1 1/2	40	1 1/2-11 1/2	4.82	122	2.18	55	2.00
TR40-32-32MP	2	50	2	50	2-11 1/2	5.86	149	2.33	59	2.50
TR40-48-48MP	3	80	3	80	3-8	6.50	165	3.40	86	3.50

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69

Thorburn Crimp End Fittings

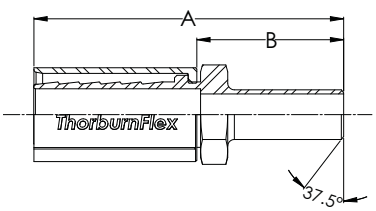
Series FJX | Female JIC 37° Swivel



Part Number	Nominal Hose I.D.		Fitting Size		Thread Size	A		B - Cutoff Allowance		H2 Hex	H1 Hex
	Inch	mm	Inch	mm		Inch	mm	Inch	mm	Inch	Inch
TR40-12-12FJX	3/4	20	3/4	20	1 1/16-12	3.39	86	1.68	43	1.00	1.25
TR40-16-16FJX	1	25	1	25	1 5/16-12	3.63	92	1.92	49	1.25	1.50
TR40-20-20FJX	1 1/4	30	1 1/4	30	1 5/8-12	4.58	116	2.28	58	2.00	2.00
TR40-24-24FJX	1 1/2	40	1 1/2	40	1 7/8-12	5.10	130	2.46	63	2.25	2.25
TR40-32-32FJX	2	50	2	50	2 1/2-12	6.45	164	2.92	74	2.50	2.88

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69

Series BWT | Butt Weld Tube

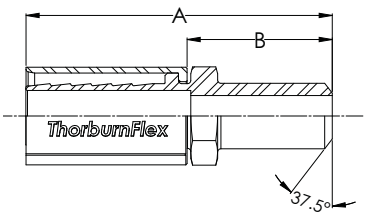


Part Number	Nominal Hose I.D.		Tube O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-12-12BWT	3/4	20	3/4	20	4.00	100	1.70	43
TR40-16-16BWT	1	25	1	25	4.25	108	1.70	43
TR40-24-24BWT	1 1/2	40	1 1/2	40	4.50	114	2.70	69
TR40-32-32BWT	2	50	2	50	5.00	127	3.50	89
TR40-48-48BWT	3	75	3	75	5.75	146	3.75	95
TR40-64-64BWT	4	100	4	100	6.00	152	4.00	100

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69

Thorburn Crimp End Fittings

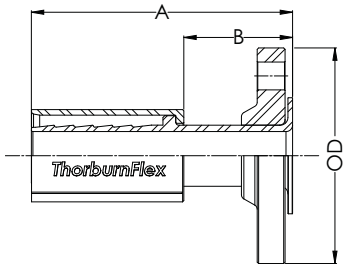
Series BWP | Butt Weld Pipe



Part Number	Nominal Hose I.D.		Pipe O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-12-12BWP	3/4	20	1.1	28	4.00	100	1.70	43
TR40-16-16BWP	1	25	1.3	33	4.25	108	1.70	43
TR40-24-24BWP	1 1/2	40	1.9	48	4.50	114	2.70	69
TR40-32-32BWP	2	50	2.4	61	5.00	127	3.50	89
TR40-48-48BWP	3	75	3.5	89	5.75	146	3.75	95
TR40-64-64BWP	4	100	4.5	114	6.00	152	4.00	100

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69

Series LF | Swivel Flange 150 lbs

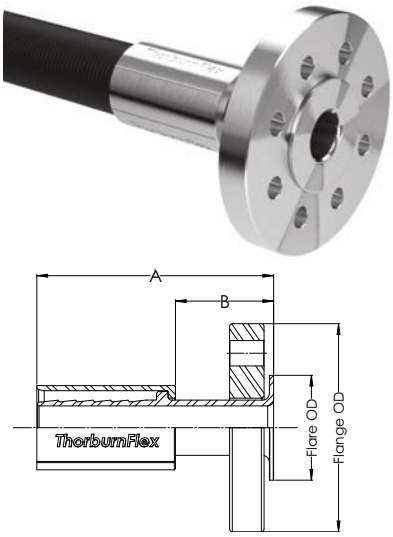


Part Number	Nominal Flange Size		A		B - Cutoff Allowance		Bolt Holes	Bolt Circle	Stub Flare O.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	#	Inch	Inch	mm	Inch	mm
TR40-12-12LF	3/4	20	3.1	79	1.50	38	4	2.75	1.69	42.9	2.75	70
TR40-16-16LF	1	25	3.4	86	1.65	42	4	2.13	2.00	50.8	3.13	79
TR40-20-20LF	1 1/4	30	3.9	99	1.68	43	4	3.50	2.50	63.5	4.63	118
TR40-24-24LF	1 1/2	40	4.0	102	1.85	47	4	3.98	2.87	73.0	5.00	127
TR40-32-32LF	2	50	5.7	145	2.70	69	4	4.75	3.63	92.1	6.00	152
TR40-48-48LF	3	75	6.0	152	2.90	74	4	6.00	5.00	127.0	7.50	191
TR40-64-64LF	4	100	7.0	178	3.50	89	8	7.50	6.19	157.2	9.00	229
TR40-96-96LF	6	150	9.0	229	4.00	102	8	9.50	8.50	215.9	11.0	279

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69

Thorburn Crimp End Fittings

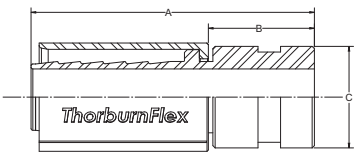
Series LFPN | Swivel Flange PN10/PN16



Part Number	Nominal Flange Size		A		B - Cutoff Allowance		Bolt Holes	Bolt Circle	Stub Flare O.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	#	Inch	Inch	mm	Inch	mm
TR40-12-12LFPN	3/4	20	3.1	79	1.50	38	4	2.95	2.28	58	4.13	105
TR40-16-16LFPN	1	25	3.4	86	1.65	42	4	3.35	2.68	68	4.53	115
TR40-20-20LFPN	1 1/4	30	3.9	99	1.68	43	4	3.94	3.07	78	5.51	140
TR40-24-24LFPN	1 1/2	40	4.0	102	1.85	47	4	4.33	3.46	88	5.91	150
TR40-32-32LFPN	2	50	5.7	145	2.70	69	4	4.92	4.02	102	6.50	165
TR40-48-48LFPN	3	75	6.0	152	2.90	74	8	6.30	5.43	138	7.87	200
TR40-64-64LFPN	4	100	7.0	178	3.50	89	8	7.09	6.22	158	8.66	220
TR40-96-96LFPN	6	150	9.0	229	4.00	102	8	9.45	8.35	212	11.22	285

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69
Note: Other flange drillings available upon request (ANSI 300lbs, PN10, PN16, PN25).

Series VC | Victaulic Couplings



Part Number	Nominal Hose I.D.		Fitting Size		A		B - Cutoff Allowance		C O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-12-12VC	3/4	20	3/4	20	4.75	121	3.00	75	1.26	32
TR40-16-16VC	1	25	1	25	5.25	133	3.50	89	1.63	41
TR40-24-24VC	1 1/2	40	1 1/2	40	6.75	171	4.00	100	2.14	54
TR40-32-32VC	2	50	2	50	8.03	204	4.50	114	2.64	67
TR40-48-48VC	3	75	3	75	8.75	222	5.25	133	3.70	94
TR40-64-64VC	4	100	4	100	9.00	229	5.50	140	4.71	120
TR40-96-96VC	6	150	6	150	11.00	279	6.7	170	7.09	180

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69

Thorburn Combination Hose Shank Couplings - Low Pressure

Thorburn combination hose shank couplings are designed for use on hose without enlargement of hose ends. Especially suitable for wire-woven hose to convey fuel or water fluids at low pressure by suction or discharge. Serrated shank attached to hose using positive sealing round wire clamps, single or double bolt clamps or flat bands. Not recommended for steam service. Not recommended for compressed air service for sizes 1 1/4" and above. **Other materials available upon request.**

Style 11IC | Male NPT

Note: Requires a clamp or ferrule to secure Thorburn Style 11IC fittings to a hose (See Pages 58 to 68)

Style11IC			NPT End Materials				Hose ID		Thread
Plated Steel	316SS	Aluminum	Brass	Hastelloy	Nylon	Poly propylene	in	mm	in
11IC12-CP	11IC12-S6	11IC12-AL	11IC12-BB		-	11IC12-PP	3/4	20	3/4-14
11IC16-CP	11IC16-S6	11IC16-AL	11IC16-BB		-	11IC16-PP	1	25	1-11 1/2
11IC20-CP	11IC20-S6	11IC20-AL	11IC20-BB		11IC20-NN	-	1 1/4	32	1 1/4-11 1/2
11IC24-CP	11IC24-S6	11IC24-AL	11IC24-BB		11IC24-NN	11IC24-PP	1 1/2	38	1 1/2-11 1/2
11IC32-CP	11IC32-S6	11IC32-AL	11IC32-BB		11IC32-NN	11IC32-PP	2	50	2-11 1/2
11IC40-CP	11IC40-S6	11IC40-AL	11IC40-BB		-	-	2 1/2	64	2-8
11IC48-CP	11IC48-S6	11IC48-AL	11IC48-BB		11IC48-NN	11IC48-PP	3	76	3-8
11IC64-CP	11IC64-S6	11IC64-AL	11IC64-BB		-	-	4	102	4-8
11IC80-CP	11IC80-S6	11IC80-AL	11IC80-BB		-	-	5	127	5-8
11IC96-CP	11IC96-S6	11IC96-AL	11IC96-BB		-	-	6	152	6-8
11IC128-CP	11IC128-S6	11IC128-AL	-		-	-	8	203	8-8
11IC160-CP	11IC160-S6	-	-		-	-	10	254	10-8
11IC192-CP	11IC192-S6	-	-		-	-	12	305	12-8

Style 11IFS | Stub End for Floating Flanges

USAGE

To put a floating flange on at least one end of a hose assembly so that torsional stress is relieved in the hose and for ease in connecting to another flanged outlet.

Style 11IFS		Hose ID	
Plated Steel	316SS	in	mm
11IFS12-CP	11IFS12-S6	3/4	20
11IFS16-CP	11IFS16-S6	1	25
11IFS20-CP	11IFS20-S6	1 1/4	32
11IFS24-CP	11IFS24-S6	1 1/2	38
11IFS32-CP	11IFS32-S6	2	50
11IFS40-CP	11IFS40-S6	2 1/2	64
11IFS48-CP	11IFS48-S6	3	76
11IFS64-CP	11IFS64-S6	4	102
11IFS80-CP	11IFS80-S6	5	127
11IFS96-CP	11IFS96-S6	6	152
11IFS128-CP	11IFS128-S6	8	203
11IFS160-CP	11IFS160-S6	10	254
11IFS192-CP	11IFS192-S6	12	305

Note: Requires a clamp or ferrule to secure Thorburn Style 11IFS fittings to a hose (See Pages 58 to 68)

Thorburn Combination Hose Shank Couplings - Low Pressure

Style 11IV | Victaulic Grooved End

Note: Requires a clamp or ferrule to secure Thorburn Style 11IV fittings to a hose (See Pages 58 to 68)

Style 11IV		Hose ID	
Plated Steel	316SS	in	mm
11IV12-CP	11IV12-S6	3/4	19
11IV16-CP	11IV16-S6	1	25
11IV20-CP	11IV20-S6	1 1/4	32
11IV24-CP	11IV24-S6	1 1/2	38
11IV32-CP	11IV32-S6	2	51
11IV40-CP	11IV40-S6	2 1/2	64
11IV48-CP	11IV48-S6	3	76
11IV64-CP	11IV64-S6	4	102
11IV80-CP	11IV80-S6	5	127
11IV96-CP	11IV96-S6	6	152
11IV128-CP	11IV128-S6	8	203
11IV160-CP	11IV160-S6	10	254
11IV192-CP	11IV192-S6	12	305

Style 11IW | Welded End

Note: Requires a clamp or ferrule to secure Thorburn Style 11IW fittings to a hose (See Pages 58 to 68)

Style 11IW		Hose ID	
Carbon Steel	316SS	in	mm
11IW12-CS	11IW12-S6	3/4	19
11IW16-CS	11IW16-S6	1	25
11IW20-CS	11IW20-S6	1 1/4	32
11IW24-CS	11IW24-S6	1 1/2	38
11IW32-CS	11IW32-S6	2	51
11IW40-CS	11IW40-S6	2 1/2	64
11IW48-CS	11IW48-S6	3	76
11IW64-CS	11IW64-S6	4	102
11IW80-CS	11IW80-S6	5	127
11IW96-CS	11IW96-S6	6	152
11IW128-CS	11IW128-S6	8	203
11IW160-CS	11IW160-S6	10	254
11IW192-CS	11IW192-S6	12	305

Style 25I | Hose Mender

Note: Requires a clamp or ferrule to secure Thorburn Style 25I fittings to a hose (See Pages 58 to 68)

Style 25I			Hose ID	
Plated Steel	316SS	Nylon	in	mm
25I12-CP	25I12-S6	25I12-NN	3/4	19
25I16-CP	25I16-S6	25I16-NN	1	25
25I20-CP	25I20-S6	25I20-NN	1 1/4	32
25I24-CP	25I24-S6	25I24-NN	1 1/2	38
25I32-CP	25I32-S6	25I32-NN	2	51
25I40-CP	25I40-S6	25I40-NN	2 1/2	64
25I48-CP	25I48-S6	25I48-NN	3	76
25I64-CP	25I64-S6	25I64-NN	4	102
25I80-CP	25I80-S6	25I80-NN	5	127
25I96-CP	25I96-S6	25I96-NN	6	152
25I128-CP	25I128-S6	25I128-NN	8	203
25I160-CP	25I160-S6	25I160-NN	10	254
25I192-CP	25I192-S6	25I192-NN	12	305

Thorburn Heavy Duty Ground Joint Couplings

Thorburn's Ground Joint Coupling System are all-purpose hose couplings widely used for air, water, fluid petroleum, chemicals and liquid petroleum gas and for high pressure fracking applications. These barbed hose fittings grip the inside of the hose to hold the fitting in place and are secured with an interlocking clamp to create a leak-resistant seal. The coarse threads make ground joint fittings easy to couple in the field, and the heavy wing nuts can be tightened using a hammer or mallet. Must be used with Thorburn high pressure interlocking clamps.

Features

Heavy-Duty Construction: Made from durable materials like plated ductile iron, carbon steel, and brass for resistance to harsh conditions.

Coarse Threads and Wing Nuts: The large threads and heavy-duty wing nuts are designed for easy coupling and tightening in the field, sometimes using a hammer or mallet.

Interlocking Design: The collars on the hose stems work with interlocking clamps and double spuds for secure hose assembly.

Style 17I | Hose Stem with Wing Nut & Female Spud

Thorburn Part #			Hose ID	
Malleable Iron	Brass	316SS	in	mm
17I12-MI	17IB12-BB	17IS612-S6	3/4	19
17I16-MI	17IB16-BB	17IS616-S6	1	25
17I20-MI	17IB20-BB	17IS620-S6	1 1/4	32
17I24-MI	17IB24-BB	17IS624-S6	1 1/2	38
17I32-MI	17IB32-BB	17IS632-S6	2	51
17I40-MI	-	-	2 1/2	64
17I48-MI	-	-	3	76
17I64-MI	-	-	4	102
17I80-MI	-	-	5	127
17I96-MI	-	-	6	152

Available in other sizes upon request. Minimum quantities apply.

Note: Includes Styles 181, 191 & 201. Requires a clamp or ferrule to secure Thorburn Style 17I fittings to a hose (See Pages 58 to 68)

Thorburn Heavy Duty Ground Joint Couplings

Style 25I | Hose Stem with Wing Nut & Male Spud

Note: Includes Styles 181, 191 & 211. Requires a clamp or ferrule to secure Thorburn Style 25I fittings to a hose (See Pages 58 to 68)

Thorburn Part #			Hose ID	
Malleable Iron	Brass	316SS	in	mm
25I12-MI	25I12-BB	25I12-S6	3/4	19
25I16-MI	25I16-BB	25I16-S6	1	25
25I20-MI	25I20-BB	25I20-S6	1 1/4	32
25I24-MI	25I24-BB	25I24-S6	1 1/2	38
25I32-MI	25I32-BB	25I32-S6	2	51
25I40-MI	-	-	2 1/2	64
25I48-MI	-	-	3	76
25I64-MI	-	-	4	102
25I80-MI	-	-	5	127
25I96-MI	-	-	6	152

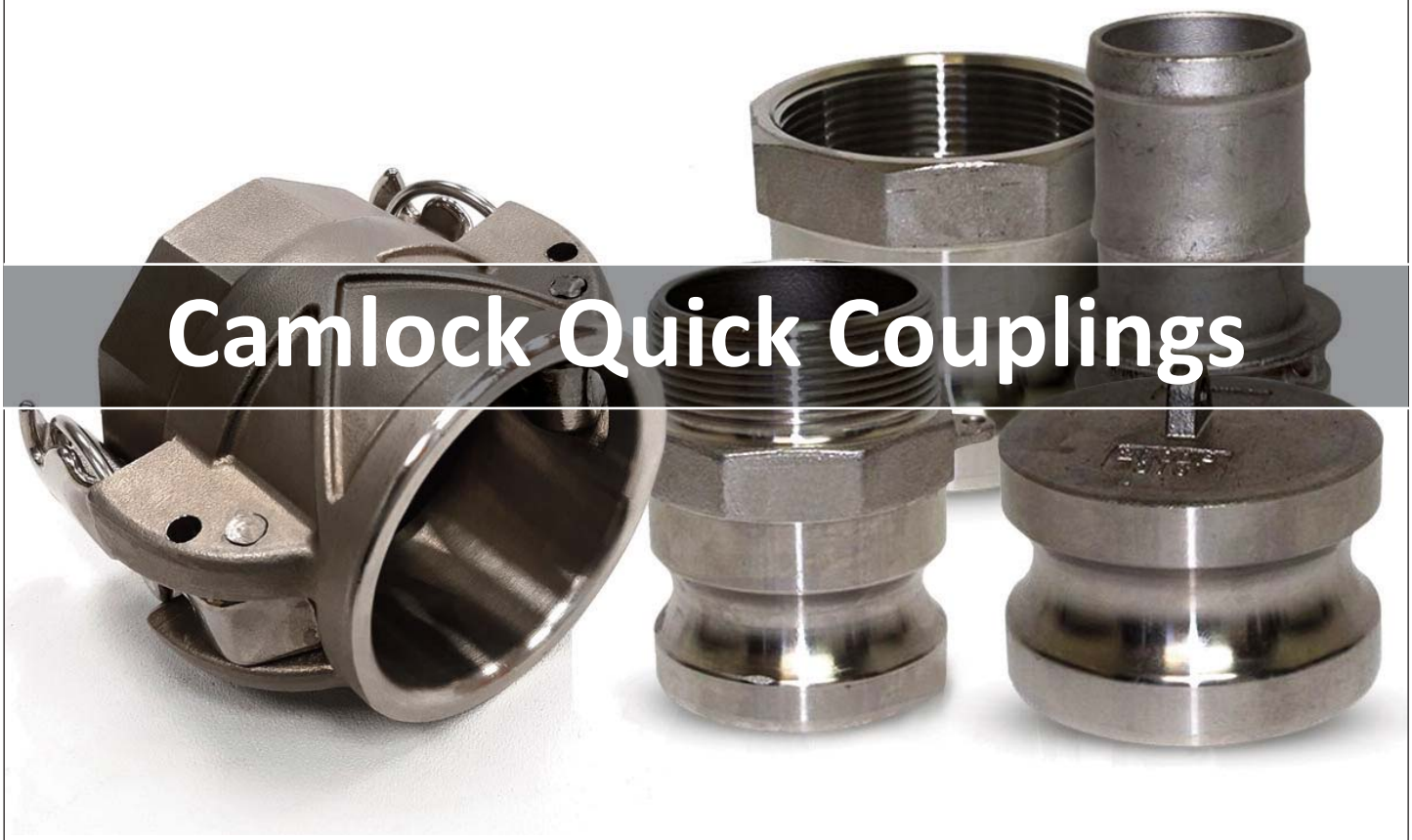
Available in other sizes upon request. Minimum quantities apply.

Style 24I | Hose Splice

Note: Used to join two hoses together. Requires a clamp or ferrule to secure Thorburn Style 24I fittings to a hose. (See Pages 58 to 68)

Thorburn Part #				Hose ID	
Malleable Iron	Brass	316SS	Plated Steel	in	mm
24I12-MI	24I12-BB	24I12-S6	24I12-CP	3/4	19
24I16-MI	24I16-BB	24I16-S6	24I16-CP	1	25
24I20-MI	24I20-BB	24I20-S6	24I20-CP	1 1/4	32
24I24-MI	24I24-BB	24I24-S6	24I24-CP	1 1/2	38
24I32-MI	24I32-BB	24I32-S6	24I32-CP	2	51
24I40-MI	24I40-BB	24I40-S6	24I40-CP	2 1/2	64
24I48-MI	24I48-BB	24I48-S6	24I48-CP	3	76
24I64-MI	24I64-BB	24I64-S6	24I64-CP	4	102
24I80-MI	24I80-BB	24I80-S6	24I80-CP	5	127
24I96-MI	24I96-BB	24I96-S6	24I96-CP	6	152

Camlock Quick Couplings



Thorburn Camlock Quick Couplings

What is a Thorburn Camlock Quick Coupling?

A Thorburn camlock coupling, also called a cam and groove coupling, is used to connect two hoses and / or pipes together in a variety of industries, so that a commodity from one can be transferred to the other. They're easy to use, requiring no tools to connect and disconnect the two halves of the couplings and they replace the traditional time-consuming methods of some other types of hose or pipe connections. This, together with their cost effectiveness makes them the most popular coupling in the world.

Typically, Thorburn camlocks are used in every industry, such as manufacturing, agriculture, oil, gas, chemical, pharmaceutical and within military applications. They are an extremely versatile product, and because there are no threads when connecting the coupling halves together, there are no issues with them becoming damaged or dirty. Therefore, Thorburn camlock couplings are very suitable for dirty environments. The system is especially well suited to a situation where frequent changes of hoses are required, such as for petroleum, and industrial chemical trucks.

How does a Thorburn camlock quick coupling work?

The assembly consists of a male groove adapter and a female coupler. To connect and disconnect:

1. Extend the handles on the coupler outwards and place the correct size male adapter into the female coupler.
2. Close both handles at the same time until the two halves are firmly fixed together.
3. Closing both handles at the same time ensures that the grooved adapter is pulled down consistently onto the seal making a leak proof assembly for the safe transfer of liquids
4. Reverse the process to disconnect the fitting first making sure that the hose assembly has been de-pressurized.

How to measure the dimension of camlocks?

Measuring a metallic camlock fitting is reasonably easy. For instance, if the hose tail, male or female thread is 2", then the camlock coupling would be known as a 2" (DN50) camlock coupling.

Polypropylene is slightly different. There is no international standard and different manufacturers have different head sizes. For Thorburn's ½" size, the body is actually ¾" but it's the thread (or hose tail) that is ½". There are also some anomalies in the 1 ¼" sized systems.

With Thorburn most cam couplings, measure the Outside Diameter (OD) of the adapter head or the Inside Diameter (ID) of the coupler. This will identify the fitting size, as depicted in the images bellow.

To what standard are camlocks manufactured?

The standard for cam & groove couplings is based on the US military specification Mil-C-27487 now superseded by A-A-59326D. The original specification was replaced by the new standard, but still guaranteed the interchangeability of couplings designed to the same specification. The Mil-C-27487 specified the casting methods, materials, dimensions, tolerances, pressure ratings, and inspection procedures.

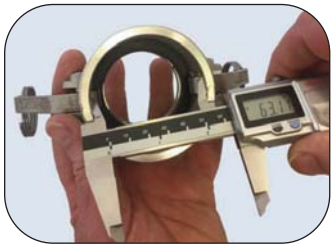
European standard

The European standard EN 14420-7 was approved by CEN in September 2004 and was applied to cam and groove couplings manufactured to the American military standard, as outlined above. This American standard does not apply to the hose connection side, but only to the coupling side.

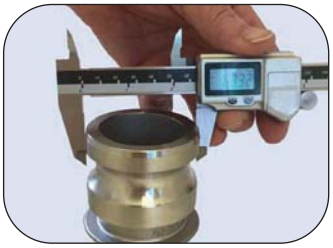
Camlock fittings produced to EN 14420-7 are interchangeable with those produced to the original MIL-C-27487 standard, but differ in terms of hose tail design, thread, and part number. A flat thread seal has been added to the female threaded parts and a smooth hose shank complying with EN 14420-7/DIN 2828 has been added for assembly with safety clamps complying with EN 14420-3/DIN 2817.

Are camlocks interchangeable?

Between manufacturers, cam and groove couplings are interchangeable with the exception of ½" (12.5mm), 5" and 8". The A-A-59326A Mil Specification does not apply to 5" and 8" cam and groove couplings due to the presence of two versions of cam and groove couplings in today's market.



Measuring ID of coupler



Measuring OD of adapter

How do I choose the right camlock coupling?

When specifying a fitting, there are seven fields of information required. The acronym for this is STAMPED, which stands for:

S = Size
T = Temperature
A = Application
M = Material (or media being used)
P = Pressure rating required
E = End fittings & connections (thread type)
D = Delivery (any extras, such as material certs)

Thorburn Camlock Gaskets

Thorburn's Camlock Gaskets fit in the grooves of the female camlock or cam and groove couplings. The pressure of the fitting pushes against the gasket to create a tight seal. Our gaskets are designed to provide a touch seal and can be used safely within the food, petrochemical, and pharmaceutical industries. With an elastomer core and FEP/PFA exterior, the seals are perfect for chemical resistance. Thorburn's encapsulated gaskets have a non-stick finish, allowing for easier insertion and leak-free service. Thorburn Standard gasket material is Buna Nitrile, EPDM, PTFE, FKM and PTFE FKM.

Features

- All wetted parts PTFE
- Suitable for most brands of Camlocks
- Easy to replace
- Various materials available
  (refer to chemical resistance charts, Page 193)

Buna Nitrile Type Gaskets

Part Number	Size		Material	Minimum Temperature		Maximum Temperature	
	in	mm	(Standard)	°F	°C	°F	°C
12TCFG-D	3/4	19	Nitrile Buna	-40	-40	93	34
16TCFG-D	1	25	Nitrile Buna	-40	-40	93	34
20TCFG-D	1 1/4	32	Nitrile Buna	-40	-40	93	34
24TCFG-D	1 1/2	38	Nitrile Buna	-40	-40	93	34
32TCFG-D	2	51	Nitrile Buna	-40	-40	93	34
40TCFG-D	2 1/2	64	Nitrile Buna	-40	-40	93	34
48TCFG-D	3	76	Nitrile Buna	-40	-40	93	34
64TCFG-D	4	102	Nitrile Buna	-40	-40	93	34
80TCFG-D	5	127	Nitrile Buna	-40	-40	93	34
96TCFG-D	6	152	Nitrile Buna	-40	-40	93	34

EPDM Type Gaskets

Part Number	Size		Material	Minimum Temperature		Maximum Temperature	
	in	mm		°F	°C	°F	°C
12TCFG-H	3/4	19	EPDM	-30	-34	149	65
16TCFG-H	1	25	EPDM	-30	-34	149	65
20TCFG-H	1 1/4	32	EPDM	-30	-34	149	65
24TCFG-H	1 1/2	38	EPDM	-30	-34	149	65
32TCFG-H	2	51	EPDM	-30	-34	149	65
40TCFG-H	2 1/2	64	EPDM	-30	-34	149	65
48TCFG-H	3	76	EPDM	-30	-34	149	65
64TCFG-H	4	102	EPDM	-30	-34	149	65
96TCFG-H	6	152	EPDM	-30	-34	149	65

FKM Type Gaskets

Part Number	Size		Material	Minimum Temperature		Maximum Temperature	
	in	mm		°F	°C	°F	°C
12TCFG-I	3/4	19	FKM	-40	-40	200	93
16TCFG-I	1	25	FKM	-40	-40	200	93
20TCFG-I	1 1/4	32	FKM	-40	-40	200	93
24TCFG-I	1 1/2	38	FKM	-40	-40	200	93
32TCFG-I	2	51	FKM	-40	-40	200	93
40TCFG-I	2 1/2	64	FKM	-40	-40	200	93
48TCFG-I	3	76	FKM	-40	-40	200	93
64TCFG-I	4	102	FKM	-40	-40	200	93
96TCFG-I	6	152	FKM	-40	-40	200	93

PTFE Envelope Type Gaskets

Part Number	Size		Material	Minimum Temperature		Maximum Temperature	
	in	mm		°F	°C	°F	°C
12TCFG-JD	3/4	19	PTFE Env.	-40	-40	93	34
16TCFG-JD	1	25	PTFE Env.	-40	-40	93	34
20TCFG-JD	1 1/4	32	PTFE Env.	-40	-40	93	34
24TCFG-JD	1 1/2	38	PTFE Env.	-40	-40	93	34
32TCFG-JD	2	51	PTFE Env.	-40	-40	93	34
40TCFG-JD	2 1/2	64	PTFE Env.	-40	-40	93	34
48TCFG-JD	3	76	PTFE Env.	-40	-40	93	34
64TCFG-JD	4	102	PTFE Env.	-40	-40	93	34
96TCFG-JD	6	152	PTFE Env.	-40	-40	93	34

PTFE-FKM Envelope Type Gaskets

Part Number	Size		Material	Minimum Temperature		Maximum Temperature	
	in	mm		°F	°C	°F	°C
12TCFG-JI	3/4	19	PTFE/FKM Env.	-40	-40	200	93
16TCFG-JI	1	25	PTFE/FKM Env.	-40	-40	200	93
20TCFG-JI	1 1/4	32	PTFE/FKM Env.	-40	-40	200	93
24TCFG-JI	1 1/2	38	PTFE/FKM Env.	-40	-40	200	93
32TCFG-JI	2	51	PTFE/FKM Env.	-40	-40	200	93
40TCFG-JI	2 1/2	64	PTFE/FKM Env.	-40	-40	200	93
48TCFG-JI	3	76	PTFE/FKM Env.	-40	-40	200	93
64TCFG-JI	4	102	PTFE/FKM Env.	-40	-40	200	93
96TCFG-JI	6	152	PTFE/FKM Env.	-40	-40	200	93

Thorburn Series 733-HD - High Pressure Camlock Couplings

Thorburn Series 733-HD camlock couplings are connected by opening the four coupler levers and inserting the male adapter into the coupler. Closing the four coupler levers by hand produces a uniform gasket compression without special tools. This feature provides for quick connection & disconnection of hose assemblies from pumps, tanks and other equipment. Thorburn Series 733-HD high pressure four lever camlock coupling system is designed for applications which require higher working pressures than Thorburn's 2 lever camlock coupling system. All 733 style couplings are supplied with Thorburn's Guard-Lok™ locking feature (standard). Conforms to DIN 2828 and A-A-59326 (MIL-C-27487) specifications to ensure interchangeability.

Thorburn's Guard-Lok™ Technology

Thorburn's Guard-Lok™ Technology

Prevents Accidental Opening During Operation

Thorburn's Camlock high pressure coupling series have a mechanism built into the levers which prevent accidental disconnection during operation. The coupling levers lock automatically into the coupler body, in the closed position and stay locked until opened manually. Ideal for applications where vibration is present, hose assemblies are dragged or the coupling could be accidentally opened resulting in disasterous spillage.

Guard-Lok™ Advantages

- Locks shut with one smooth motion
- Levers automatically lock to the body when closed
- Prevents accidental disconnection and loss of fluids during operation
- Effortless operation and simple to unlock
- Simple streamlined design does not require loose parts, clips or springs

Thorburn Series 733-HD - High Pressure Camlock Couplings

Design Specifications

Materials: Stainless Steel (SA351 CF8M/SA479 T316) - Carbon Steel and Brass (Available upon request)
Pressure: 1/2" ID to 1 1/4" ID - 400 psi (28 bar), 1 1/2" ID to 2 1/2" ID - 300 psi (21 bar), 3" ID - 275 psi (19 bar), 4" & 6" ID - 250 psi (17 bar) - 4:1 safety factor
Gasket: Buna-N (Standard). Also available in EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N, EPDM 121°C (250°F), FKM, PTFE (ER) 99°C (210°F)
Warning: Thorburn's Camlock Couplings are designed for liquid transfer only (not to be used for air, gas or steam transfer systems)

733C-HD

Hose Shank to Female Coupler

733D-HD

Female NPT Coupler Adapter

633A-HD

Female NPT to Male Adapter

633FSW-HD

Socket Weld to Male Adapter

633FBW-HD

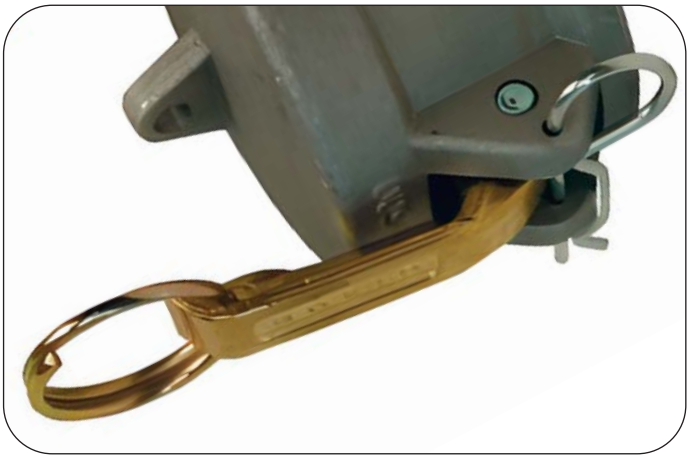
Butt Weld to Male Adapter

Thorburn Camlock Part #					Hose ID	
Female Hose Shank Coupler	Female Hose Shank Adapter	Female NPT Adapter	Adapter to Socket Weld	Adapter to Butt Weld	in	mm
733C-HD12-S6*	733D-HD12-S6	633A-HD12-S6	633FSW-HD12-S6	633FBW-HD12-S6	3/4	20
733C-HD16-S6*	733D-HD16-S6	633A-HD16-S6	633FSW-HD16-S6	633FBW-HD16-S6	1	25
733C-HD20-S6*	733D-HD20-S6	633A-HD20-S6	6633FSW-HD20-S6	633FBW-HD20-S6	1 1/4	32
733C-HD24-S6*	733D-HD24-S6	633A-HD24-S6	633FSW-HD24-S6	633FBW-HD24-S6	1 1/2	38
733C-HD32-S6*	733D-HD32-S6	633A-HD32-S6	633FSW-HD32-S6	633FBW-HD32-S6	2	50
733C-HD40-S6*	733D-HD40-S6	633A-HD40-S6	633FSW-HD40-S6	633FBW-HD40-S6	2 1/2	64
733C-HD48-S6*	733D-HD48-S6	633A-HD48-S6	633FSW-HD48-S6	633FBW-HD48-S6	3	76
733C-HD64-S6*	733D-HD64-S6	633A-HD64-S6	633FSW-HD64-S6	633FBW-HD64-S6	4	102
733C-HD96-S6*	733D-HD96-S6	633A-HD96-S6	633FSW-HD96-S6	633FBW-HD96-S6	6	152

***Note:** Requires a clamp or ferrule to secure Thorburn Style 733-HD fittings to a hose (See Pages 58 to 68)

Thorburn Camlock Quick Couplings

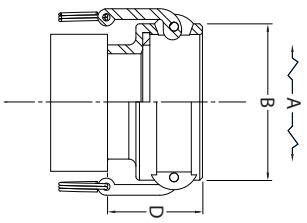
Thorburn Style 733 with Guard-Lok™
Thorburn's Camlock high pressure coupling series 733 have a mechanism built into the levers to prevent accidental disconnection during operation.



Thorburn Style 633 with Cotter Pin
Thorburn's Camlock series 633 couplings use a cotter pin in the levers to prevent accidental disconnection during operation.

Design Specifications

Materials: Stainless Steel (SA351 CF8M/SA479 T316) - Carbon Steel (Available upon request)
Pressure: 3" ID - 275 psi (19 bar), 4" & 6" ID - 250 psi (17 bar) 4 to 1 safety factor
Gasket: Buna-N (Standard). Also available in EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N, EPDM 121°C (250°F), FKM, PTFE (ER) 99°C (210°F)
Warning: Thorburn's Camlock Couplings are designed for liquid transfer only (not to be used for air, gas or steam transfer systems)



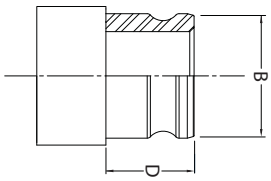
Female Camlock Coupler Hose End 733C/633C

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID)
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N, EPDM (250°F), FKM, PTFE (ER) (210°F)

Part Number	Adapter/Coupler Size		Hose Shank Size		(A) O.D. Extended Cam Arms		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733C(633C)-XX-Y-12	0.75	20	.75	20	4.51	115	2.11	54	2.4	61
(N)733C(633C)-XX-Y-16	1.0	25	1.0	25	5.10	130	2.44	62	2.8	71
(N)733C(633C)-XX-Y-20	1.25	32	1.25	32	6.86	174	3.26	83	3.14	80
(N)733C(633C)-XX-Y-24	1.5	38	1.5	38	7.16	182	3.56	90	3.35	85
(N)733C(633C)-XX-Y-32*	2.0	50	2.0	50	7.54	192	3.94	100	3.75	95
(N)733C(633C)-XX-Y-40	2.5	64	2.5	64	8.03	204	4.43	113	4.0	102
(N)733C(633C)-XX-Y-48*	3.0	76	3.0	76	9.56	243	5.46	139	4.3	109
(N)733C(633C)-XX-Y-64*	4.0	102	4.0	102	10.56	271	6.56	167	4.5	114
(N)733C(633C)-XX-Y-96*	6.0	152	6.0	152	16.26	413	10.16	258	6.0	152

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS) Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM). Requires a clamp or ferrule to secure Thorburn Style 633-C fittings to a hose (See Pages 58 to 68)

Thorburn Camlock Quick Couplings

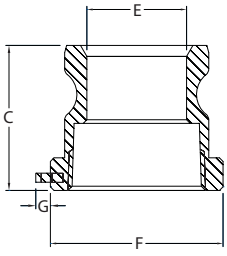


Male Camlock Hose End 633E

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID)

Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633E-XX-12	0.75	20	.75	20	1.26	32	2.6	67
(N)633E-XX-16	1.0	25	1.0	25	1.63	41	3.0	76
(N)633E-XX-20	1.25	32	1.25	32	2	51	3.5	89
(N)633E-XX-24	1.5	38	1.5	38	2.14	54	3.6	91
(N)633E-XX-32	2.0	50	2.0	50	2.64	67	4.0	102
(N)633E-XX-40	2.5	64	2.5	64	3.07	78	4.5	114
(N)633E-XX-48	3.0	76	3.0	76	3.70	94	4.75	121
(N)633E-XX-64	4.0	102	4.0	102	4.71	120	5.0	127
(N)633E-XX-96	6.0	152	6.0	152	7.10	180	6.7	170

Code: XX = S6 (316SS) **Note:** Requires a clamp or ferrule to secure Thorburn Style 633-E fittings to a hose (See Pages 58 to 68)



Female Camlock Adapter 633A

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Thread Size: Standard NPT Optional: Use Code ZZ & Specify (BSP, BSPT, DIN, JIS)

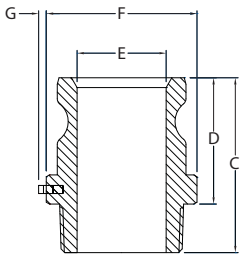
Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633A-XX-12	0.75	20	.75	20	1.62	41	.75	20
(N)633A-XX-16	1.0	25	1.0	25	1.91	49	.88	22
(N)633A-XX-20	1.25	32	1.25	32	2.16	55	1.04	26
(N)633A-XX-24	1.5	38	1.5	38	2.29	58	1.35	34
(N)633A-XX-32	2.0	50	2.0	50	2.54	65	1.72	44
(N)633A-XX-40	2.5	64	2.5	64	2.75	79	2.14	54
(N)633A-XX-48	3.0	76	3.0	76	2.84	72	2.8	71
(N)633A-XX-64	4.0	102	4.0	102	3.16	80	3.78	96
(N)633A-XX-96	6.0	152	6.0	152	3.35	85	5.90	150

Code: XX = S6 (316SS), AL (Aluminum)

Thorburn Camlock Quick Couplings

Male Camlock Adapter 633F

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Thread Size: Standard NPT Optional: Use Code ZZ & Specify (BSP, BSPT, DIN, JIS)

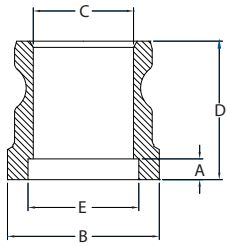


Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633F-XX-12	0.75	20	.75	20	2.47	63	1.67	42
(N)633F-XX-16	1.0	25	1.0	25	2.89	73	1.99	51
(N)633F-XX-20	1.25	32	1.25	32	3.23	82	2.23	57
(N)633F-XX-24	1.5	38	1.5	38	3.29	84	2.31	59
(N)633F-XX-32	2.0	50	2.0	50	3.57	91	2.57	65
(N)633F-XX-40	2.5	64	2.5	64	4.18	106	2.78	71
(N)633F-XX-48	3.0	76	3.0	76	4.37	111	2.87	73
(N)633F-XX-64	4.0	102	4.0	102	4.79	122	3.19	81
(N)633F-XX-96	6.0	152	6.0	152	5.20	132	3.40	86

Code: XX = S6 (316SS), AL (Aluminum)

Socket Weld Camlock Adapter 633ASW

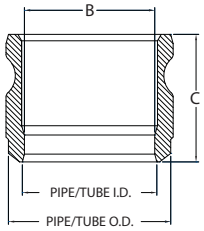
(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID)



Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633ASW-XX-12	0.75	20	.30	8	1.25	32	.75	20
(N)633ASW-XX-16	1.0	25	.30	8	1.45	37	.88	22
(N)633ASW-XX-20	1.25	32	.30	8	2.00	50	1.06	27
(N)633ASW-XX-24	1.5	38	.40	10	2.25	64	1.35	34
(N)633ASW-XX-32	2.0	50	.40	10	2.74	70	1.81	46
(N)633ASW-XX-40	2.5	64	.40	10	3.25	83	2.14	54
(N)633ASW-XX-48	3.0	76	.40	10	3.75	95	2.81	71
(N)633ASW-XX-64	4.0	102	.50	13	5.01	127	3.00	76
(N)633ASW-XX-96	6.0	152	.60	15	7.00	178	5.84	148

Code: XX = S6 (316SS), AL (Aluminum)

Thorburn Camlock Quick Couplings

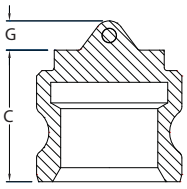


Butt Weld Camlock Adapter 633ABW

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID)

Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633ABW-XX-12	0.75	20	1.40	35	.75	19	2.6	67
(N)633ABW-XX-16	1.0	25	1.74	44	.88	22	3.0	76
(N)633ABW-XX-20	1.25	32	1.99	51	1.06	27	3.5	89
(N)633ABW-XX-24	1.5	38	2.06	52	1.25	32	3.6	91
(N)633ABW-XX-32	2.0	50	2.50	64	1.75	44	4.0	102
(N)633ABW-XX-40	2.5	64	2.44	62	2.14	54	4.5	114
(N)633ABW-XX-48	3.0	76	2.75	70	2.81	71	4.75	121
(N)633ABW-XX-64	4.0	102	2.88	73	3.75	95	5.0	127
(N)633ABW-XX-96	6.0	152	3.00	76	5.84	148	6.7	170

Code: XX = S6 (316SS)



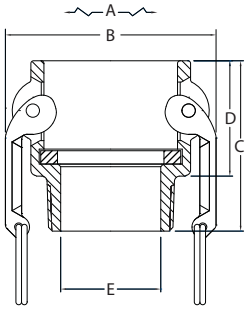
Camlock Plug Adapter 633DP

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only

Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633DP-XX-12	0.75	20	1.41	36	.59	15	.75	20
(N)633DP-XX-16	1.0	25	1.35	34	.96	24	.88	22
(N)633DP-XX-20	1.25	32	1.94	49	.62	16	1.04	26
(N)633DP-XX-24	1.5	38	2.06	52	.50	13	1.35	34
(N)633DP-XX-32	2.0	50	1.90	48	.70	18	1.72	44
(N)633DP-XX-40	2.5	64	2.44	62	.81	21	2.14	54
(N)633DP-XX-48	3.0	76	2.03	52	1.0	25	2.8	71
(N)633DP-XX-64	4.0	102	2.10	53	1.0	25	3.78	96
(N)633DP-XX-96	6.0	152	2.28	58	1.0	25	5.90	150

Code: XX = S6 (316SS), AL (Aluminum)

Thorburn Camlock Quick Couplings

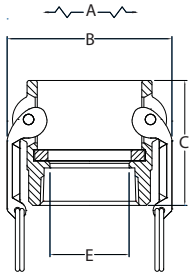


Male Camlock Adapter Coupler 733B/633B

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)
Thread Size: Standard NPT Optional: Use Code ZZ & Specify (BSP, BSPT, DIN, JIS)

Part Number	Adapter Size		Thread Size		(A) O.D. Extended Cam Arms		(B) Outside Diameter		(C) Overall Length		(D) Exposed Length		(E) Inside Diameter	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733B(633B)-XX-Y-12	0.75	20	.75	20	4.51	115	2.11	54	2.10	53	1.25	32	.78	20
(N)733B(633B)-XX-Y-16	1.0	25	1.0	25	5.10	130	2.44	62	2.50	64	1.56	40	.97	25
(N)733B(633B)-XX-Y-20	1.25	32	1.25	32	6.86	174	3.26	83	2.89	73	1.84	47	1.25	32
(N)733B(633B)-XX-Y-24	1.5	38	1.5	38	7.16	182	3.56	90	2.93	74	1.88	48	1.50	38
(N)733B(633B)-XX-Y-32	2.0	50	2.0	50	7.54	192	3.94	100	3.20	81	2.15	55	1.88	48
(N)733B(633B)-XX-Y-40	2.5	64	2.5	64	8.03	204	4.43	113	3.63	92	2.18	55	2.38	60
(N)733B(633B)-XX-Y-48	3.0	76	3.0	76	9.56	243	5.46	139	3.82	97	2.27	58	2.88	73
(N)733B(633B)-XX-Y-64	4.0	102	4.0	102	10.66	271	6.56	167	4.00	102	2.34	59	3.60	91
(N)733B(633B)-XX-Y-96	6.0	152	6.0	152	16.26	413	10.16	258	4.52	115	2.62	67	5.60	142

Note: When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)



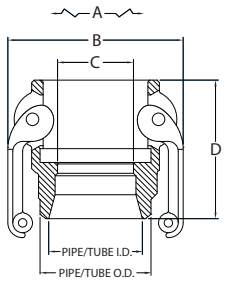
Female Camlock Adapter Coupler 733D/633D

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F))
Thread Size: Standard NPT Optional: Use Code ZZ & Specify (BSP, BSPT, DIN, JIS)

Part Number	Adapter Size		Thread Size		(A) O.D. Extended Cam Arms		(B) Outside Diameter		(C) Overall Length		(E) Inside Diameter	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733D(633D)-XX-Y-12	0.75	20	.75	20	4.51	115	2.11	54	2.10	53	.88	22
(N)733D(633D)-XX-Y-16	1.0	25	1.0	25	5.10	130	2.44	62	2.50	64	.97	25
(N)733D(633D)-XX-Y-20	1.25	32	1.25	32	6.86	174	3.26	83	2.70	69	1.25	32
(N)733D(633D)-XX-Y-24	1.5	38	1.5	38	7.16	182	3.56	90	2.80	71	1.50	38
(N)733D(633D)-XX-Y-32	2.0	50	2.0	50	7.54	192	3.94	100	3.10	79	1.88	48
(N)733D(633D)-XX-Y-40	2.5	64	2.5	64	8.03	204	4.43	113	3.40	86	2.38	60
(N)733D(633D)-XX-Y-48	3.0	76	3.0	76	9.56	243	5.46	139	3.50	89	2.88	73
(N)733D(633D)-XX-Y-64	4.0	102	4.0	102	10.66	271	6.56	167	3.90	99	3.60	91
(N)733D(633D)-XX-Y-96	6.0	152	6.0	152	16.26	413	10.16	258	4.40	112	5.50	140

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)

Thorburn Camlock Quick Couplings

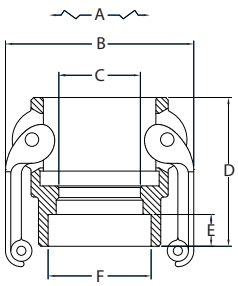


Butt Weld Camlock Adapter Coupler 733FBW/733FBW-HD/633FBW

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter Size		(A) O.D. Extended Cam Arms		(B) Outside Diameter		(C) Inside Diameter		(D) Overall Length	
	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733FBW(-HD)(633FBW)-XX-Y-12	0.75	20	4.51	115	2.11	54	.78	20	2.0	50
(N)733FBW(-HD)(633FBW)-XX-Y-16	1.0	25	5.10	130	2.44	62	.97	25	2.51	64
(N)733FBW(-HD)(633FBW)-XX-Y-20	1.25	32	6.86	174	3.26	83	1.25	32	2.89	73
(N)733FBW(-HD)(633FBW)-XX-Y-24	1.5	38	7.16	182	3.56	90	1.54	39	2.81	71
(N)733FBW(-HD)(633FBW)-XX-Y-32	2.0	50	7.54	192	3.94	100	1.88	48	3.20	81
(N)733FBW(-HD)(633FBW)-XX-Y-40	2.5	64	8.03	204	4.43	113	2.38	61	3.63	92
(N)733FBW(-HD)(633FBW)-XX-Y-48	3.0	76	9.56	243	5.46	139	2.88	73	3.82	97
(N)733FBW(-HD)(633FBW)-XX-Y-64	4.0	102	10.66	271	6.56	167	3.5	89	4.00	102
(N)733FBW(-HD)(633FBW)-XX-Y-96	6.0	152	16.26	413	10.16	258	5.5	140	4.54	115

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)



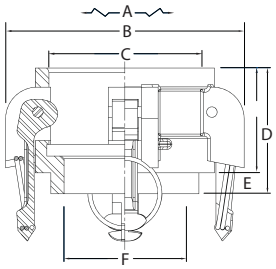
Socket Weld Camlock Adapter Coupler 733DSW/733DSW-HD/633DSW

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter Size		(A) O.D. Ext. Cam Arms		(B) Outside Diameter		(C) Inside Diameter		(D) Overall Length		(E) Socket Depth		(F) Socket Diameter Pipe		Tube	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733DSW(-HD)(633DSW)-XX-Y-12	0.75	20	4.51	115	2.11	54	.88	22	2.06	52	.50	13	1.10	28	.77	20
(N)733DSW(-HD)(633DSW)-XX-Y-16	1.0	25	5.10	130	2.44	62	.97	24	2.50	64	.50	13	1.36	35	1.02	26
(N)733DSW(-HD)(633DSW)-XX-Y-20	1.25	32	6.86	174	3.26	83	1.25	32	2.70	69	.50	13	1.71	43	1.27	32
(N)733DSW(-HD)(633DSW)-XX-Y-24	1.5	38	7.16	182	3.56	90	1.50	38	2.81	71	.50	13	1.95	49	1.52	39
(N)733DSW(-HD)(633DSW)-XX-Y-32	2.0	50	7.54	192	3.94	100	1.88	48	3.10	79	.70	18	2.44	62	2.02	51
(N)733DSW(-HD)(633DSW)-XX-Y-40	2.5	64	8.03	204	4.43	113	2.38	60	3.40	86	.70	18	2.94	75	3.02	77
(N)733DSW(-HD)(633DSW)-XX-Y-48	3.0	76	9.56	243	5.46	139	2.88	73	3.50	89	.70	18	3.57	91	4.03	102
(N)733DSW(-HD)(633DSW)-XX-Y-64	4.0	102	10.66	271	6.56	167	3.60	91	3.90	99	.70	18	4.58	116	5.03	128
(N)733DSW(-HD)(633DSW)-XX-Y-96	6.0	152	16.26	413	10.16	258	5.50	140	4.54	115	.90	23	6.72	171	6.03	153

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)

Thorburn Camlock Quick Couplings

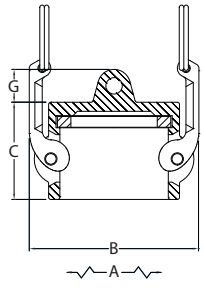


Socket Weld Heavy Duty Camlock Adapter Coupler 733DSW4-HD

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter Size		(A) O.D. Ext. Cam Arms		(B) Outside Diameter		(C) Inside Diameter		(D) Overall Length		(E) Socket Depth		(F) Socket Diameter Pipe			Tube
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733DSW4-HD-XX-Y-12	0.75	20	4.51	115	2.11	54	.88	22	2.06	52	.50	13	1.10	28	.77	20
(N)733DSW4-HD-XX-Y-16	1.0	25	5.10	130	2.44	62	.97	24	2.50	64	.50	13	1.36	35	1.02	26
(N)733DSW4-HD-XX-Y-20	1.25	32	6.86	174	3.26	83	1.25	32	2.70	69	.50	13	1.71	43	1.27	32
(N)733DSW4-HD-XX-Y-24	1.5	38	7.16	182	3.56	90	1.50	38	2.81	71	.50	13	1.95	49	1.52	39
(N)733DSW4-HD-XX-Y-32	2.0	50	7.54	192	3.94	100	1.88	48	3.10	79	.70	18	2.44	62	2.02	51
(N)733DSW4-HD-XX-Y-40	2.5	64	8.03	204	4.43	113	2.38	60	3.40	86	.70	18	2.94	75	3.02	77
(N)733DSW4-HD-XX-Y-48	3.0	76	9.56	243	5.46	139	2.88	73	3.50	89	.70	18	3.57	91	4.03	102
(N)733DSW4-HD-XX-Y-64	4.0	102	10.66	271	6.56	167	3.60	91	3.90	99	.70	18	4.58	116	5.03	128
(N)733DSW4-HD-XX-Y-96	6.0	152	16.26	413	10.16	258	5.50	140	4.54	115	.90	23	6.72	171	6.03	153

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)



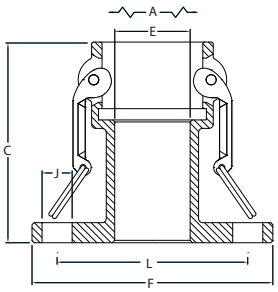
Camlock Dust Cap 733DC/633DC

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 150 psi (2.5" ID or less), 75 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter Size		(A) O.D. Ext. Cam Arms		(B) Outside Diameter		(C) Overall Length		(G) Chain Lug Extension	
	in	mm	in	mm	in	mm	in	mm	in	mm
(N)733DC(633DC)-XX-Y-12	0.75	20	4.51	115	2.11	54	1.35	34	.5	13
(N)733DC(633DC)-XX-Y-16	1.0	25	5.10	130	2.44	62	1.60	41	.62	16
(N)733DC(633DC)-XX-Y-20	1.25	32	6.86	174	3.26	83	1.89	48	.60	15
(N)733DC(633DC)-XX-Y-24	1.5	38	7.16	182	3.56	90	1.96	50	.86	22
(N)733DC(633DC)-XX-Y-32	2.0	50	7.54	192	3.94	100	2.25	57	.76	19
(N)733DC(633DC)-XX-Y-40	2.5	64	8.03	204	4.43	113	2.28	58	.90	23
(N)733DC(633DC)-XX-Y-48	3.0	76	9.56	243	5.46	139	2.27	58	1.03	26
(N)733DC(633DC)-XX-Y-64	4.0	102	10.66	271	6.56	167	2.34	59	.99	25
(N)733DC(633DC)-XX-Y-96	6.0	152	16.26	413	10.16	258	2.76	70	1.14	29

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)

Thorburn Camlock Quick Couplings

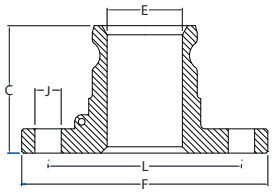


Camlock Flanged Adapter Coupler 633-PFC 150# PN10

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 150 psi (2.5" ID or less), 75 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter/ Flange Size		(A) O.D. Ext. Cam Arms		(C) Overall Length		(E) Inside Diameter.		(F) Outside Diameter		(J) Bolt Hole Diameter		(K) Number of Holes	(L) Bolt Circle Diameter	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	#	in	mm
(N)633-PFE-XX-Y-16	1.0	1	5.04	128	3.48	88	.69	18	4.25	108	.63	16	4	3.13	80
(N)633-PFE-XX-Y-24	1.5	2	7.16	182	5.25	133	1.15	34	5.0	127	.63	16	4	3.88	99
(N)633-PFE-XX-Y-32	2.0	3	7.54	192	5.82	148	1.63	41	6.0	152	.75	19	4	4.75	121
(N)633-PFE-XX-Y-40	2.5	4	8.03	204	5.09	129	2.38	60	7.0	178	.75	19	4	5.5	140
(N)633-PFE-XX-Y-48	3.0	5	9.56	243	5.82	148	2.90	74	7.5	191	.75	19	4	6.0	152
(N)633-PFE-XX-Y-64	4.0	6	10.66	271	5.39	137	3.60	91	9.0	229	.75	19	8	7.5	191
(N)633-PFE-XX-Y-96	6.0	7	16.76	426	7.75	197	5.60	142	11.0	279	.88	22	8	9.5	241

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)



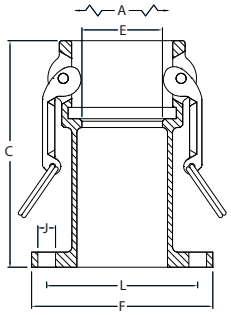
Camlock Flanged Adapter 633-PFE 150# PN10

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 150 psi (2.5" ID or less), 75 psi (3"- 6" ID)) - Stainless Steel Only

Part Number	Adapter/ Flange Size		(C) Overall Length		(E) Inside Diameter.		(F) Outside Diameter		(J) Bolt Hole Diameter		(K) Number of Holes	(L) Bolt Circle Diameter	
	in	mm	in	mm	in	mm	in	mm	in	mm	#	in	mm
(N)633-PFE-XX-16	1.0	25	2.32	59	.88	22	4.25	108	.63	16	4	3.13	80
(N)633-PFE-XX-24	1.5	38	3.56	90	1.34	34	5.0	127	.63	16	4	3.88	99
(N)633-PFE-XX-32	2.0	50	3.50	89	1.72	44	6.0	152	.75	19	4	4.75	121
(N)633-PFE-XX-40	2.5	64	3.63	92	2.14	54	7.0	178	.75	19	4	5.5	140
(N)633-PFE-XX-48	3.0	76	3.69	94	2.78	71	7.5	191	.75	19	4	6.0	152
(N)633-PFE-XX-64	4.0	102	4.0	102	3.78	96	9.0	229	.75	19	8	7.5	191
(N)633-PFE-XX-96	6.0	152	4.5	114	5.56	141	11.0	279	.88	22	8	9.5	241

Code: XX = S6 (316SS), AL (Aluminum)

Thorburn Camlock Quick Couplings

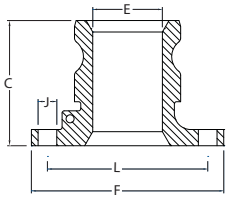


Camlock 633-TTC Tank & Truck Adapter Coupler

Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS)
Pressure: 150 psi (2.5" ID or less), 75 psi (3"- 6" ID) - Stainless Steel Only
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter/ Flange Size		(A) O.D. Ext. Cam Arms		(C) Overall Length		(E) Inside Diameter.		(F) Outside Diameter		(J) Bolt Hole Diameter		(K) Number of Holes	(L) Bolt Circle Diameter	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	#	in	mm
(N)633-TTC-XX-Y-32	2.0	50	7.54	192	5.63	143	2.0	51	4.5	114	.44	11	6	3.75	95
(N)633-TTC-XX-Y-48	3.0	76	9.56	243	5.66	144	2.9	74	5.63	143	.44	11	8	4.88	124
(N)633-TTC-XX-Y-64	4.0	102	10.66	271	5.68	144	3.6	91	6.63	158	.44	11	8	5.88	149
(N)633-TTC-XX-Y-96	6.0	152	16.26	413	7.25	184	5.6	142	8.88	226	.44	11	12	8.13	207

Note: * Sizes for 733C-HD Only. When ordering 633C, pressures are less than shown above | Part Number Material Codes: XX = S6 (316SS)
Part Number Gasket Codes: Y = D (Nitrile), H (EPDM), I (FKM), PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)



Camlock 633-TTE Tank & Truck Adapter

(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 150 psi (2.5" ID or less), 75 psi (3"- 6" ID)) - Stainless Steel Only

Part Number	Adapter/ Flange Size		(C) Overall Length		(E) Inside Diameter.		(F) Outside Diameter		(J) Bolt Hole Diameter		(K) Number of Holes	(L) Bolt Circle Diameter	
	in	mm	in	mm	in	mm	in	mm	in	mm	#	in	mm
(N)633-TTE-XX-32	2.0	50	2.93	74	1.63	41	4.5	114	.44	11	6	3.75	95
(N)633-TTE-XX-48	3.0	76	3.38	86	2.8	71	5.63	143	.44	11	8	4.88	124
(N)633-TTE-XX-64	4.0	102	3.35	85	3.78	96	6.63	168	.44	11	8	5.88	149
(N)633-TTE-XX-96	6.0	152	4.88	124	5.84	148	8.88	226	.44	11	12	8.13	207

Code: XX = S6 (316SS), AL (Aluminum)

Camlock Elbow Quick Couplings

Camlock 633-90CC 90º X 90º Coupler

Material: SA351 CF8M/SA479 T316 | **Code:** XX = S6 (316SS), AL = Aluminum
Pressure: 75 psi (2" ID), 50 psi (3"- 6" ID)
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter / Flange Size	
	in	mm
(N)633-90CC-XX-Y-32	2.0	50
(N)633-90CC-XX-Y-48	3.0	76
(N)633-90CC-XX-Y-64	4.0	102
(N)633-90CC-XX-Y-96	6.0	152

Part Number Material Codes: XX = S6 (316SS) **Part Number Gasket Codes**: Y = D (Nitrile), H (EPDM), I (FKM),
PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)

Camlock 633-90EC 90° Coupler X Male Adapter

Material: SA351 CF8M/SA479 T316 | **Code:** XX = S6 (316SS), AL = Aluminum
Pressure: 75 psi (2" ID), 50 psi (3"- 6" ID)
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter / Flange Size	
	in	mm
(N)633-90EC-XX-Y-32	2.0	50
(N)633-90EC-XX-Y-48	3.0	76
(N)633-90EC-XX-Y-64	4.0	102
(N)633-90EC-XX-Y-96	6.0	152

Part Number Material Codes: XX = S6 (316SS) **Part Number Gasket Codes**: Y = D (Nitrile), H (EPDM), I (FKM),
PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)

Camlock 633-90FPC 90° Coupler X Female NPT

Material: SA351 CF8M/SA479 T316 | **Code:** XX = S6 (316SS), AL = Aluminum
Pressure: 75 psi (2" ID), 50 psi (3"- 6" ID)
Gasket Material: Buna-N (Standard) Options: EPDM, FKM & PTFE Encapsulated Rubber (ER)
Temperature: Buna-N 100°C (210°F), EPDM, FKM, PTFE (ER) 120°C (250°F)

Part Number	Adapter/Flange Size	
	in	mm
(N)633-90FPC-XX-Y-32	2.0	50
(N)633-90FPC-XX-Y-48	3.0	76
(N)633-90FPC-XX-Y-64	4.0	102
(N)633-90FPC-XX-Y-96	6.0	152

Part Number Material Codes: XX = S6 (316SS) **Part Number Gasket Codes**: Y = D (Nitrile), H (EPDM), I (FKM),
PTFE Encapsulated Rubber Codes: JD (Nitrile), JH (EPDM), JI (FKM)

Thorburn Camlock Quick Couplings

Style TQ | Standard Safety Pin - Zinc Plated for 633 Style Couplers

Thorburn Part #
Zinc Plated
TQ36

Style TCH | Standard "S" Hook Security Chain For 633 Style Couplers

Thorburn Part #		Description
Brass	316SS	
TCHB-06	-	6 inch Brass "S" Hook Chain
TCHB-12	-	12 inch Brass "S" Hook Chain
-	TCHS6-06	6 inch 316 Stainless Steel "S" Hook Chain
-	TCHS6-12	12 inch 316 Stainless Steel "S" Hook Chain
-	TCHS6-24	24 inch 316 Stainless Steel "S" Hook Chain

Style TCHCS | Standard Sash Type Security Chain For 633 Style Couplers

Thorburn Part #	Description
Plated Steel	
TCHCS-12	12 inch Plated Steel Sash Type Chain

Bolt-On Clamp Couplings

EN 14420-5/DIN 2817
EN 14423/DIN 2826

Thorburn Series 70 Hose Couplings for Bolt-On Clamps

Thorburn Series 70 EN 14420-5 Hose Couplings and EN14420-4 Flanges are designed for use with Thorburn Style 70BSC EN14420-3/DIN 2817 Bolt-On Safety Clamps (Pg 54)

Thorburn Series 70 EN 14420-5 hose couplings are used to connect hoses with male or female BSP, BSPT or NPT threaded couplings. The coupling is designed to be used with Thorburn Style 70BSC Bolt-On Clamp (EN14420-3/DIN 2817). Hose, coupling, assembly method and seal must be chosen in relation with the desired application and temperature range. Thorburn EN 14420-5 hose couplings are not interchangeable with Thorburn EN 14423 hose couplings, due to differences in application and overall dimensions.

Application
To connect rubber and thermoplastic hoses.

Working Pressure
25 bar (363 psi)

Temperature Range:
-30°C (-22°F) up to 300°C (572°F)

Material:
Coupling: SS316 or Brass

Seal Material:
316SS Coupling: PTFE
Brass Coupling: Polyurethane (PU)

Style 71FBSPP | Female BSPP Fitting - Smooth Stem EN 14420-5/DIN 2817

Part Number		Nominal Hose I.D.		Thread
316SS	Brass	DN	in	Inch
71FBSPP12-S6	71FBSPP12-BB	20	3/4	3/4
71FBSPP16-S6	71FBSPP16-BB	25	1	1
71FBSPP20-S6	71FBSPP20-BB	32	1 1/4	1 1/4
71FBSPP24-S6	71FBSPP24-BB	40	1 1/2	1 1/2
71FBSPP32-S6	71FBSPP32-BB	50	2	2
71FBSPP40-S6	71FBSPP40-BB	65	2 1/2	2 1/2
71FBSPP48-S6	71FBSPP48-BB	80	3	3
71FBSPP64-S6	71FBSPP64-BB	100	4	4

To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Thorburn Series 70 Hose Couplings for Bolt-On Clamps

Style 72FBSPP | Female BSPP Fitting - Serrated Stem EN 14420-5/DIN 2817

Part Number		Nominal Hose I.D.		Thread
316SS	Brass	DN	in	Inch
72FBSPP12-S6	72FBSPP12-BB	20	3/4	3/4
72FBSPP16-S6	72FBSPP16-BB	25	1	1
72FBSPP20-S6	72FBSPP20-BB	32	1 1/4	1 1/4
72FBSPP24-S6	72FBSPP24-BB	40	1 1/2	1 1/2
72FBSPP32-S6	72FBSPP32-BB	50	2	2
72FBSPP40-S6	72FBSPP40-BB	65	2 1/2	2 1/2
72FBSPP48-S6	72FBSPP48-BB	80	3	3
72FBSPP64-S6	72FBSPP64-BB	100	4	4

To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Style 73MBSPT | Male BSPT Fitting - Smooth Stem EN 14420-5/DIN 2817

Part Number		Nominal Hose I.D.		Thread
316SS	Brass	DN	in	Inch
73MBSPT12-S6	73MBSPT12-BB	20	3/4	3/4
73MBSPT16-S6	73MBSPT16-BB	25	1	1
73MBSPT20-S6	73MBSPT20-BB	32	1 1/4	1 1/4
73MBSPT24-S6	73MBSPT24-BB	40	1 1/2	1 1/2
73MBSPT32-S6	73MBSPT32-BB	50	2	2
73MBSPT40-S6	73MBSPT40-BB	65	2 1/2	2 1/2
73MBSPT48-S6	73MBSPT48-BB	80	3	3
73MBSPT64-S6	73MBSPT64-BB	100	4	4

To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Style 74MBSPT | Male BSPT Fitting - Serrated Stem EN 14420-5/DIN 2817

Part Number		Nominal Hose I.D.		Thread
316SS	Brass	DN	in	Inch
74MBSPT12-S6	74MBSPT12-BB	20	3/4	3/4
74MBSPT16-S6	74MBSPT16-BB	25	1	1
74MBSPT20-S6	74MBSPT20-BB	32	1 1/4	1 1/4
74MBSPT24-S6	74MBSPT24-BB	40	1 1/2	1 1/2
74MBSPT32-S6	74MBSPT32-BB	50	2	2
74MBSPT40-S6	74MBSPT40-BB	65	2 1/2	2 1/2
74MBSPT48-S6	74MBSPT48-BB	80	3	3
74MBSPT64-S6	74MBSPT64-BB	100	4	4

To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Thorburn Series 70 Hose Couplings for Bolt-On Clamps

Style 75FLX | Fixed Flange - Smooth Stem EN 14420-4/DIN 2817

Part Number		Nominal Hose I.D.	
316SS	Brass	DN	in
75FLX16XX-S6	75FLX16XX-BB	25	1
75FLX20XX-S6	75FLX20XX-BB	32	1 1/4
75FLX24XX-S6	75FLX24XX-BB	40	1 1/2
75FLX32XX-S6	75FLX32XX-BB	50	2
75FLX40XX-S6	75FLX40XX-BB	65	2 1/2
75FLX48XX-S6	75FLX48XX-BB	80	3
75FLX64XX-S6	75FLX64XX-BB	100	4
75FLX16XX-S6	75FLX16XX-BB	125	5
75FLX96XX-S6	75FLX96XX-BB	150	6
75FLX128XX-S6	75FLX128XX-BB	200	8

XX = Specify Flange Type:
FL1 = CL150 ANSI, **FL2** = CL300 ANSI, **FL3** = PN10, **FL4** = PN16 **FL5** = PN25, **FL6** = PN40
To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Style 76FLX | Fixed Flange - Serrated Stem EN 14420-4/DIN 2817

Part Number		Nominal Hose I.D.	
316SS	Brass	DN	in
76FLX16XX-S6	76FLX16XX-BB	25	1
76FLX20XX-S6	76FLX20XX-BB	32	1 1/4
76FLX24XX-S6	76FLX24XX-BB	40	1 1/2
76FLX32XX-S6	76FLX32XX-BB	50	2
76FLX40XX-S6	76FLX40XX-BB	65	2 1/2
76FLX48XX-S6	76FLX48XX-BB	80	3
76FLX64XX-S6	76FLX64XX-BB	100	4
76FLX16XX-S6	76FLX16XX-BB	125	5
76FLX96XX-S6	76FLX96XX-BB	150	6
76FLX128XX-S6	76FLX128XX-BB	200	8

XX = Specify Flange Type:
FL1 = CL150 ANSI, **FL2** = CL300 ANSI, **FL3** = PN10, **FL4** = PN16 **FL5** = PN25, **FL6** = PN40
To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Thorburn Series 70 Hose Couplings for Bolt-On Clamps

Style 77FLXS | Swivel Flange - Smooth Stem EN 14420-4/DIN 2817

Part Number		Nominal Hose I.D.	
316SS	Brass	DN	in
77FLXS16XX-S6	77FLXS16XX-BB	25	1
77FLXS20XX-S6	77FLXS20XX-BB	32	1 1/4
77FLXS24XX-S6	77FLXS24XX-BB	40	1 1/2
77FLXS32XX-S6	77FLXS32XX-BB	50	2
77FLXS40XX-S6	77FLXS40XX-BB	65	2 1/2
77FLXS48XX-S6	77FLXS48XX-BB	80	3
77FLXS64XX-S6	77FLXS64XX-BB	100	4
77FLXS16XX-S6	77FLXS16XX-BB	125	5
77FLXS96XX-S6	77FLXS96XX-BB	150	6
77FLXS128XX-S6	77FLXS128XX-BB	200	8

XX = Specify Flange Type:
FL1 = CL150 ANSI, **FL2** = CL300 ANSI, **FL3** = PN10, **FL4** = PN16 **FL5** = PN25, **FL6** = PN40
To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Style 78FLXS | Swivel Flange - Serrated Stem EN 14420-4/DIN 2817

Part Number		Nominal Hose I.D.	
316SS	Brass	DN	in
78FLXS16XX-S6	78FLXS16XX-BB	25	1
78FLXS20XX-S6	78FLXS20XX-BB	32	1 1/4
78FLXS24XX-S6	78FLXS24XX-BB	40	1 1/2
78FLXS32XX-S6	78FLXS32XX-BB	50	2
78FLXS40XX-S6	78FLXS40XX-BB	65	2 1/2
78FLXS48XX-S6	78FLXS48XX-BB	80	3
78FLXS64XX-S6	78FLXS64XX-BB	100	4
78FLXS16XX-S6	78FLXS16XX-BB	125	5
78FLXS96XX-S6	78FLXS96XX-BB	150	6
78FLXS128XX-S6	78FLXS128XX-BB	200	8

XX = Specify Flange Type:
FL1 = CL150 ANSI, **FL2** = CL300 ANSI, **FL3** = PN10, **FL4** = PN16 **FL5** = PN25, **FL6** = PN40
To assemble the insert, use Thorburn Style 70BSC (EN 14420-3/DIN 2817) Bolt-On Safety Clamps

Thorburn Series 70BSC - Bolt-On Clamps

Standard Service EN 14420-3 / DIN 2817 Bolt-On Clamps

Thorburn Series 70BSC Bolt-On Clamps are constructed as a two piece shell type EN 14420-3/DIN 2817 clamp, and are specifically designed for use with EN 14420-5 hose couplings and EN 14420-4 flange hose couplings with smooth or serrated stems with a safety collar. Thorburn Bolt-On Clamps are designed with a rim on the inside, which fits over the hose tail collar when the bolts are tightened. When the safety clamps are assembled correctly, the coupling cannot be pulled out of the hose and will stay secure up to and including the burst pressure of the hose assembly. Thorburn Series 70BSC Bolt-On Clamps are commonly used in industries such as chemical processing, oil and gas, food and beverage, and pharmaceuticals and is suitable for connecting hoses or pipes carrying fluids such as water, chemicals, gases, and powders.

Style 70BSC | Bolt-On Clamp

Construction

Normative Regulation:
EN 14420-3/DIN 2817
Sizes: From DN 15 up to DN 250
Coupling Material:
Aluminum , Stainless Steel, Brass
Operating Temperature:
-20°C/-4 °F to + 65°C/149°F
Working Pressure:
-0.8 bar / -11 psi up to 25 bar/360 psi
Connection Mechanism:
Assembly into EN 14420-5 hose couplings (Pg 50-51) or
EN 14420-4 hose flange couplings (Pg 52-53)

Thorburn Part #			Hose OD		Bolt Thread
Aluminum	Brass	316SS	Min	Max	mm
70BSC22X24-AL	70BSC22X24-BB	70BSC22X24-S6	22	24	M6*20
70BSC30X33-AL	70BSC30X33-BB	70BSC30X33-S6	30	33	M6*20
70BSC28X30-AL	70BSC28X30-BB	70BSC28X30-S6	28	30	M6*20
70BSC34X36-AL	70BSC34X36-BB	70BSC34X36-S6	34	36	M6*20
70BSC36X39-AL	70BSC36X39-BB	70BSC36X39-S6	36	39	M6*20
70BSC40X43-AL	70BSC40X43-BB	70BSC40X43-S6	40	43	M6*20
70BSC41X44-AL	70BSC41X44-BB	70BSC41X44-S6	41	44	M6*20
70BSC43X46-AL	70BSC43X46-BB	70BSC43X46-S6	43	46	M6*20
70BSC47X50-AL	70BSC47X50-BB	70BSC47X50-S6	47	50	M6*20
70BSC50X52-AL	70BSC50X52-BB	70BSC50X52-S6	50	52	M6*20
70BSC53X56-AL	70BSC53X56-BB	70BSC53X56-S6	53	56	M6*20
70BSC57X60-AL	70BSC57X60-BB	70BSC57X60-S6	57	60	M6*20
70BSC58X61-AL	70BSC58X61-BB	70BSC58X61-S6	58	61	M6*20
70BSC59X62-AL	70BSC59X62-BB	70BSC59X62-S6	59	62	M8*25
70BSC60X64-AL	70BSC60X64-BB	70BSC60X64-S6	60	64	M8*25
70BSC61X65-AL	70BSC61X65-BB	70BSC61X65-S6	61	65	M8*25
70BSC63X67-AL	70BSC63X67-BB	70BSC63X67-S6	63	67	M8*25
70BSC69X71-AL	70BSC69X71-BB	70BSC69X71-S6	69	71	M8*25
70BSC74X77-AL	70BSC74X77-BB	70BSC74X77-S6	74	77	M8*25
70BSC84X87-AL	70BSC84X87-BB	70BSC84X87-S6	84	87	M8*25
70BSC87X90-AL	70BSC87X90-BB	70BSC87X90-S6	87	90	M8*25
70BSC89X92-AL	70BSC89X92-BB	70BSC89X92-S6	89	92	M8*25
70BSC89X93-AL	70BSC89X93-BB	70BSC89X93-S6	89	93	M8*25
70BSC94X97-AL	70BSC94X97-BB	70BSC94X97-S6	94	97	M8*25
70BSC114X119-AL	70BSC114X119-BB	70BSC114X119-S6	114	119	M10*40
70BSC118X122-AL	70BSC118X122-BB	70BSC118X122-S6	118	122	M10*40
70BSC122X126-AL	70BSC122X126-BB	70BSC122X126-S6	122	126	M10*40
70BSC143X148-AL	70BSC143X148-BB	70BSC143X148-S6	143	148	M10*40
70BSC168X174-AL	70BSC168X174-BB	70BSC168X174-S6	168	174	M12*50
70BSC174X180-AL	70BSC174X180-BB	70BSC174X180-S6	174	180	M12*50
70BSC187X193-AL	70BSC187X193-BB	70BSC187X193-S6	187	193	M12*51
70BSC222X229-AL	70BSC222X229-BB	70BSC222X229-S6	222	229	M12*60
70BSC274X278-AL	70BSC274X278-BB	70BSC274X278-S6	274	278	M12*60

Thorburn Series 80 Hose Couplings for Bolt-On Clamps

Thorburn Series 80 EN 14423 Hose Couplings are designed for use with Thorburn Style 80BSC EN14423/DIN 2826 Bolt-On Safety Clamps (Pg 57)

Thorburn EN 14423 hose couplings are used to connect hoses with male or female BSP, BSPT or NPT threaded couplings. The coupling is designed to be used with Thorburn Style 80BSC Bolt-On Clamp (EN14423 / DIN 2826) For steam service applications. The Hose, coupling, assembly method and seal must be chosen in relation with the desired application and temperature range. Thorburn EN 14423 hose couplings are not interchangeable with Thorburn EN 14420 couplings, due to differences in application and overall dimensions.

Application
To connect rubber and thermoplastic hoses.

Working Pressure
25 bar (363 psi)

Temperature Range:
-30°C (-22°F) up to 300°C (572°F)

Material:
Coupling: SS316 or Brass

Seal Material:
Brass Coupling: PU
316SS Coupling: PTFE

Style 81FBSPP | Female BSPP Fitting - EN 14423/DIN 2826

Part Number		Nominal Hose I.D.		Thread
316SS	Brass	DN	in	Inch
81FBSPP12-S6	81FBSPP12-BB	20	3/4	3/4
81FBSPP16-S6	81FBSPP16-BB	25	1	1
81FBSPP20-S6	81FBSPP20-BB	32	1 1/4	1 1/4
81FBSPP24-S6	81FBSPP24-BB	40	1 1/2	1 1/2
81FBSPP32-S6	81FBSPP32-BB	50	2	2

To assemble the insert, use Thorburn Style 80BSC (EN 14423/DIN 2826) Bolt-On Safety Clamps

Thorburn Series 80 Hose Couplings for Bolt-On Clamps

Style 82MBSPT | Male BSPT Fitting - EN 14423/DIN 2826

Part Number		Nominal Hose I.D.		Thread
316SS	Brass	DN	in	Inch
82FBSPP12-S6	82FBSPP12-BB	20	3/4	3/4
82FBSPP16-S6	82FBSPP16-BB	25	1	1
82FBSPP20-S6	82FBSPP20-BB	32	1 1/4	1 1/4
82FBSPP24-S6	82FBSPP24-BB	40	1 1/2	1 1/2
82FBSPP32-S6	82FBSPP32-BB	50	2	2

To assemble the insert, use Thorburn Style 80BSC (EN 14423/DIN 2826) Bolt-On Safety Clamps

Style 83FLX | Fixed Flange - EN 14423/DIN 2826

Part Number		Nominal Hose I.D.	
316SS	Brass	DN	in
83FLXS12XX-S6	83FLXS12XX-BB	20	3/4
83FLXS16XX-S6	83FLXS16XX-BB	25	1
83FLXS20XX-S6	83FLXS20XX-BB	32	1 1/4
83FLXS24XX-S6	83FLXS24XX-BB	40	1 1/2
83FLXS32XX-S6	83FLXS32XX-BB	50	2

XX = Specify Flange Type:
FL1 = CL150 ANSI, **FL2** = CL300 ANSI, **FL3** = PN10, **FL4** = PN16 **FL5** = PN25, **FL6** = PN40
To assemble the insert, use Thorburn Style 80BSC (EN 14423/DIN 2826) Bolt-On Safety Clamps

Style 84FLXS | Swivel Flange - EN 14423/DIN 2826

Part Number		Nominal Hose I.D.	
316SS	Brass	DN	in
84FLXS12XX-S6	84FLXS12XX-BB	20	3/4
84FLXS16XX-S6	84FLXS16XX-BB	25	1
84FLXS20XX-S6	84FLXS20XX-BB	32	1 1/4
84FLXS24XX-S6	84FLXS24XX-BB	40	1 1/2
84FLXS32XX-S6	84FLXS32XX-BB	50	2

XX = Specify Flange Type:
FL1 = CL150 ANSI, **FL2** = CL300 ANSI, **FL3** = PN10, **FL4** = PN16 **FL5** = PN25, **FL6** = PN40
To assemble the insert, use Thorburn Style 80BSC (EN 14423/DIN 2826) Bolt-On Safety Clamps

Thorburn Series 80BSC - Bolt-On Clamps

Steam Service EN 14423 / DIN 2826 Bolt-On Clamps
Thorburn Series 80BSC Bolt-On Clamps are constructed as a two piece shell type EN 14423/DIN 2826 clamp, and are specifically designed for use with EN 14423 hose couplings for steam service. Thorburn 80BSC Bolt-On Clamps have a rim on the inside, which fits the hose shank collar when the bolts are tightened stopping the coupling from being pulled out of the hose.

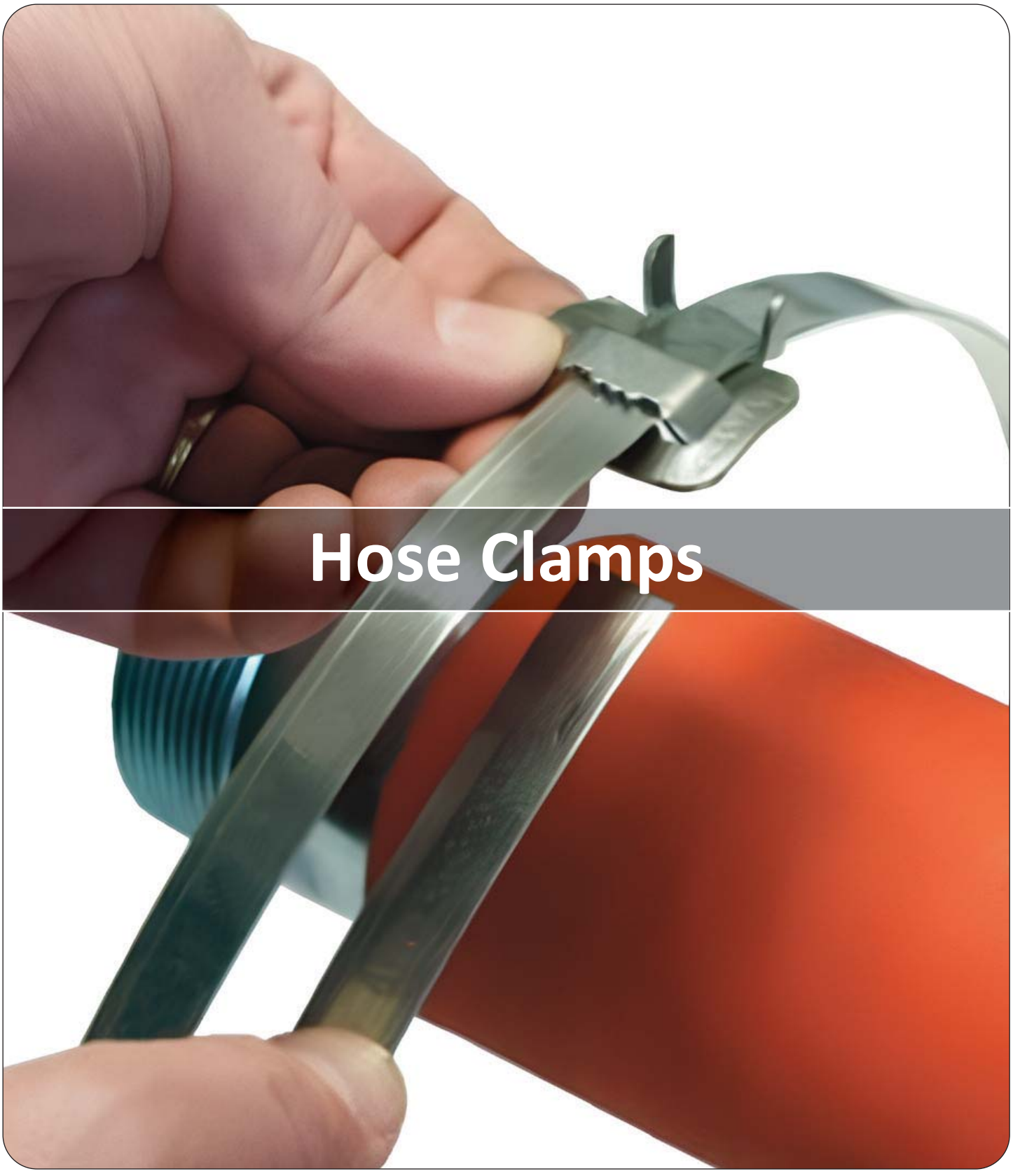
Application
- Steam and hot water use
- Food
- Pharmaceutical Industry
- Transport Industry

Style 80BSC | Bolt-On Safety Clamp

Thorburn Part #		Hose OD	
316SS	Brass	Min	Max
80BSC24X26-S6	80BSC24X26-BB	24	26
80BSC32X34-S6	80BSC32X34-BB	32	34
80BSC39X41-S6	80BSC39X41-BB	39	41
80BSC47X50-S6	80BSC47X50-BB	47	50
80BSC53X56-S6	80BSC53X56-BB	53	56
80BSC67X69-S6	80BSC67X69-BB	67	69

WARNING: Steam is dangerous. Never use quick-release couplings for steam applications. Extra care and attention should be taken when choosing the correct hose, fitting and clamping solution

Construction
Normative Regulation:
EN 14423 previous DIN 2826
Sizes: From DN 13 up to DN 50
Coupling Material: Stainless Steel, Brass
Operating Temperature:
Steam: 210°C (410°F)
Hot Water: 120°C (248°F)
Working Pressure:
18 bar (261 psi)
Connection Mechanism:
Assembly into EN 14423 hose couplings (Pg 55-56)



Hose Clamps

Thorburn Clamps

Style 65C | Preformed "Fast Lock" Clamps

Type "CK" clamp is a preformed clamp with a special buckle which permits this clamp to be tightened and locked with not only Thorburn's 68CF1 tool, but with other makes as well. **Materials:** Plated Steel and 316SS

Plated Steel	Stainless Steel	Size ID		Standard Pack
Part #	Part #	mm	in	QTY
65CK04-CP	65CKS604-S6	25	1	100
65CK05-CP	65CKS605-S6	32	1 1/4	100
65CK06-CP	65CKS606-S6	38	1 1/2	100
65CK07-CP	65CKS607-S6	45	1 3/4	100
65CK08-CP	65CKS608-S6	51	2	100
65CK09-CP	65CKS609-S6	57	2 1/4	100
65CK10-CP	65CKS610-S6	64	2 1/2	50
65CK11-CP	65CKS611-S6	70	2 3/4	50
65CK12-CP	65CKS612-S6	76	3	50
65CK14-CP	65CKS614-S6	89	3 1/2	50
65CK16-CP	65CKS616-S6	102	4	25
65CK18-CP	65CKS618-S6	114	4 1/2	25
65CK20-CP	65CKS620-S6	127	5	25
65CK24-CP	65CKS624-S6	152	6	25
65CK32-CP	65CKS632-S6	203	8	25

Style 66C | Field Installation Clamping - Bulk Strapping

Bulk strapping provides separate stainless steel or galvanized steel strapping in 4 widths and in 100 ft. rolls with clamp buckles of corresponding widths in 50 through 300 piece quantities and a special Jack-type clamping tool Thorburn number **68C2** for use on all widths with adjustable tensioning.

Part #	Width		Thickness		Material
	mm	in	mm	in	
66C06-S6	10	3/8	0.64	0.025	316SS
66C08-S6	12	1/2	0.76	0.030	316SS
66C10-S6	16	5/8	0.76	0.030	316SS
66C12-S6	20	3/4	0.76	0.030	316SS
66C06-S2	10	3/8	0.64	0.025	201SS
66C08-S2	12	1/2	0.76	0.030	201SS
66C10-S2	16	5/8	0.76	0.030	201SS
66C12-S2	20	3/4	0.76	0.030	201SS
66C06-CP	10	3/8	0.64	0.025	Galvanized
66C08-CP	12	1/2	0.76	0.030	Galvanized
66C10-CP	16	5/8	0.76	0.030	Galvanized
66C12-CP	20	3/4	0.76	0.030	Galvanized

Thorburn Clamps

Style 67C | Field Installation Clamping - Buckles

Provides separate stainless steel or galvanized steel strapping in 4 widths and in 100 ft. rolls with clamp buckles of corresponding widths in 50 through 300 piece quantities and a special Jack-type clamping tool Thorburn number 68C2 for use on all widths with adjustable tensioning.
Material: 316SS, 201SS, Galvanized

Part #	Width		Thickness		Material	Box
	mm	in	mm	in		QTY
67C06-S6	10	3/8	0.64	0.025	316SS	300
67C08-S6	12	1/2	0.76	0.030	316SS	150
67C10-S6	16	5/8	0.76	0.030	316SS	100
67C12-S6	20	3/4	0.76	0.030	316SS	75
67C06-S2	10	3/8	0.64	0.025	201SS	300
67C08-S2	12	1/2	0.76	0.030	201SS	150
67C10-S2	16	5/8	0.76	0.030	201SS	100
67C12-S2	20	3/4	0.76	0.030	201SS	75
67C06-CP	10	3/8	0.64	0.025	Galvanized	300
67C08-CP	12	1/2	0.76	0.030	Galvanized	150
67C10-CP	16	5/8	0.76	0.030	Galvanized	100
67C12-CP	20	3/4	0.76	0.030	Galvanized	75

Style 68C | Fast Lock Tools & Accessories

68CF1
(For 5/8" Fast-Lok Clamps)
68CF2
(For 3/4" Fast-Lok Clamps)

68CF550
Fast-Lok Strap Cutter

68C2
Clamp-It Buckle Clamping Tool

Thorburn Clamps

Style 71C | Stainless Bolt Clamp

APPLICATION

May be used on low or medium pressure hose with such couplings as long shank, short shank, combination nipples or scored nipples.

Material: 316SS

Stainless Steel	Size	Hose Diameter Range OD				Width	
		Minimum		Maximum			
	mm	mm	in	mm	in	mm	in
71C-32-S6	32-35	32	1.26	36	1.41	20	0.79
71C-36-S6	36-39	36	1.42	40	1.56	20	0.79
71C-40-S6	40-43	40	1.57	44	1.72	22	0.87
71C-44-S6	44-47	44	1.73	48	1.88	22	0.87
71C-48-S6	48-51	48	1.89	52	2.04	22	0.87
71C-52-S6	52-55	52	2.05	55	2.17	22	0.87
71C-56-S6	56-59	56	2.20	60	2.35	22	0.87
71C-60-S6	60-63	60	2.36	64	2.51	22	0.87
71C-64-S6	64-67	64	2.52	68	2.67	24	0.94
71C-68-S6	68-73	68	2.68	74	2.90	24	0.94
71C-74-S6	74-79	74	2.91	80	3.14	24	0.94
71C-80-S6	80-85	80	3.15	86	3.38	24	0.94
71C-86-S6	86-91	86	3.39	92	3.61	24	0.94
71C-92-S6	92-97	92	3.62	98	3.85	24	0.94
71C-98-S6	98-103	98	3.86	104	4.08	24	0.94
71C-104-S6	104-112	104	4.09	113	4.44	24	0.94
71C-113-S6	113-121	113	4.45	122	4.79	24	0.94
71C-122-S6	122-130	122	4.80	131	5.15	24	0.94
71C-131-S6	131-139	131	5.16	140	5.50	26	1.02
71C-140-S6	140-148	140	5.51	149	5.86	26	1.02
71C-149-S6	149-161	149	5.87	162	6.37	26	1.02
71C-162-S6	162-174	162	6.38	175	6.88	26	1.02

Style 72C | Stainless Constant Tension Clamp

APPLICATION

Provides excellent 360° seal and has a spring that automatically adjusts the clamp diameter to compensate for hose expansion and contraction.

Material: Stainless Steel

Stainless Steel 316SS	Size	Hose Diameter Range OD				Width	
		Minimum		Maximum			
	mm	mm	in	mm	in	mm	in
72C-65-S6	58-65	58	2.28	65	2.56	19	0.75
72C-68-S6	60-68	60	2.36	68	2.68	19	0.75
72C-75-S6	67-75	67	2.63	75	2.95	19	0.75
72C-81-S6	73-81	73	2.87	81	3.19	19	0.75
72C-87-S6	79-87	79	3.11	87	3.43	19	0.75
72C-100-S6	92-100	92	3.62	100	3.94	19	0.75
72C-113-S6	105-113	105	4.13	113	4.45	19	0.75
72C-119-S6	111-119	111	4.37	118	4.66	19	0.75
72C-125-S6	117-125	117	4.61	125	4.92	19	0.75
72C-138-S6	130-138	130	5.12	138	5.43	19	0.75
72C-151-S6	143-151	143	5.63	151	5.94	19	0.75
72C-167-S6	159-167	160	6.26	167	6.57	19	0.75

Thorburn Clamps

Style 777C | Perma-Clamp

FEATURES
- 100% stainless steel construction
- 3/4" wide band
- Double banded for durability
- Easily installed without removing hoses
- 2 ply band for even distribution of torque
- Full range of sizes– 1.5" to 10"
- Larger sizes available upon request
- Ideal for hoses, filter bags and marine engine installations

Material: Plated Steel

Plated Steel	Size	Hose Diameter Range OD				Width	
		Minimum		Maximum			
	mm	mm	in	mm	in	mm	in
777C-19-CP	17-19	17	0.67	19	0.75	26	1.02
777C-22-CP	20-22	20	0.79	22	0.87	26	1.02
777C-25-CP	23-25	23	0.87	25	0.98	26	1.02
777C-28-CP	26-28	26	1.02	28	1.10	26	1.02
777C-31-CP	29-31	29	1.14	31	1.22	26	1.02
777C-35-CP	32-35	32	1.26	35	1.38	26	1.02
777C-39-CP	36-39	36	1.42	39	1.54	26	1.02
777C-43-CP	40-43	40	1.57	43	1.69	22	0.87
777C-47-CP	44-47	44	1.73	47	1.85	22	0.87
777C-51-CP	48-51	48	1.89	51	2.01	22	0.87
777C-55-CP	52-55	52	2.05	55	2.17	22	0.87
777C-59-CP	56-59	56	2.20	59	2.32	22	0.87
777C-63-CP	60-63	60	2.36	63	2.48	22	0.87
777C-67-CP	64-67	64	2.52	67	2.64	24	0.94
777C-73-CP	68-73	68	2.68	73	2.87	24	0.94
777C-79-CP	74-79	74	2.91	79	3.11	24	0.94
777C-85-CP	80-85	80	3.15	85	3.35	24	0.94
777C-91-CP	86-91	86	3.39	91	3.58	24	0.94
777C-97-CP	92-97	92	3.62	97	3.62	24	0.94
777C-103-CP	98-103	98	3.86	103	4.06	24	0.94
777C-112-CP	104-112	104	4.09	112	4.41	24	0.94
777C-121-CP	113-121	113	4.45	121	4.76	24	0.94
777C-130-CP	122-130	122	4.80	130	5.12	24	0.94
777C-139-CP	131-139	131	5.16	139	5.47	26	1.02
777C-148-CP	140-148	140	5.51	148	5.83	26	1.02
777C-161-CP	149-161	149	5.87	161	6.34	26	1.02

Thorburn Spiral Clamps

Thorburn Spiral Clamps are used on convoluted hoses. To determine which type of spiral clamp is required you must examine the end of the hose to view the spiral helix reinforcement. If the helix spirals in a clockwise direction away from you, a clockwise spiral clamp is needed. If the helix spirals in a counterclockwise direction away from you, a counterclockwise spiral clamp is needed.

Style 770CX | Spiral Clamps - Clockwise Wound

Plated Steel	Size	Hose Diameter Range OD			
		Minimum		Maximum	
	in	mm	in	mm	in
770CX32-CP	2	58	2 - 18/64	64	2 - 32/64
770CX40-CP	2 1/2	69	2 - 46/64	79	3 - 8/64
770CX48-CP	3	76	3	89	3 - 32/64
770CX64-CP	4	102	4	114	4 - 32/64
770CX80-CP	5	129	5 - 6/64	140	5 - 32/64
770CX96-CP	6	159	6 - 16/64	178	7
770CX128-CP	8	216	8 - 32/64	235	9 - 16/64
770CX160-CP	10	270	10 - 40/64	286	11 - 16/64

Material: Plated carbon steel

Style 771CX | Spiral Clamps - Counter Clockwise Wound

Plated Steel	Size	Hose Diameter Range OD			
		Minimum		Maximum	
	in	mm	in	mm	in
771CX32-CP	2	58	2 - 18/64	64	2 - 32/64
771CX40-CP	2 1/2	69	2 - 46/64	79	3 - 8/64
771CX48-CP	3	76	3	89	3 - 32/64
771CX64-CP	4	102	4	114	4 - 32/64
771CX80-CP	5	129	5 - 6/64	140	5 - 32/64
771CX96-CP	6	159	6 - 16/64	178	7
771CX128-CP	8	216	8 - 32/64	235	9 - 16/64
771CX160-CP	10	270	10 - 40/64	286	11 - 16/64

Material: Plated carbon steel

Thorburn High Pressure Interlocking Clamps

APPLICATIONS: For use with interlocking type inserts or universal quick-acting couplings for heavy duty high pressure applications.
MATERIALS: Cast malleable iron, Brass, Stainless Steel

Style 71 | 2 Bolt Clamp

Part #			Hose ID	Hose Diameter Range OD			
				Minimum		Maximum	
Maleable Iron	Brass	316SS	in	mm	in	mm	in
71C219-MI	71C219-BB	71C219-S6	3/4	21	0.81	24	0.94
71C221-MI	71C221-BB	71C221-S6	3/4	33	1.31	38	1.50
71C224-MI	-	-	3/4	38	1.50	43	1.69

Style 72 | 4 Bolt Clamp

Part #			Hose ID	Hose Diameter Range OD			
				Minimum		Maximum	
Maleable Iron	Brass	316SS	in	mm	in	mm	in
72C417-MI	72C417-BB	72C417-S6	1	39	1.53	44	1.72
72C422-MI	72C422-BB	72C422-S6	1	43	1.69	47	1.84
72C428-MI	-	-	1	48	1.88	52	2.06
72C417-MI	72C417-BB	72C417-S6	1 1/4	52	2.06	57	2.25
72C422-MI	72C422-BB	72C422-S6	1 1/2	53	2.09	58	2.28
72C440-MI			1 1/2	57	2.25	62	2.44
72C447-MI	-	-	1 1/2	63	2.47	69	2.72
72C448-MI	72C448-BB	72C448-S6	2	64	2.50	71	2.78
72C456-MI	72C456-BB	72C456-S6	2	70	2.75	78	3.06
72C459-MI	-	-	2	78	3.09	87	3.44
72C464-MI	-	-	2 1/2	89	3.50	100	3.94
72C474-MI	-	-	3	97	3.81	106	4.19
72C478-MI	-	-	3	103	4.06	113	4.44

Style 73 | 6 Bolt Clamp

Part #			Hose ID	Hose Diameter Range OD			
				Minimum		Maximum	
Maleable Iron	Brass	316SS	in	mm	in	mm	in
73C668-MI	-	-	4	108	4.25	122	4.81
73C678-MI	-	-	4	124	4.88	135	5.31
73C696-MI	-	-	4	130	5.13	157	6.19
73C697-MI	-	-	6	175	6.88	183	7.19
73C700-MI	-	-	6	191	7.50	203	8.00

Crimp Ferrules

Crimp Ferrules

Thorburn permanent crimp sleeves are used in applications where a safe and reliable clamping method is preferred over band clamps or strapping. The sleeve provides a 360° uninterrupted compression around the hose and results in a durable attachment with no protrusions. The sleeves have smooth, beveled edges and are available in stainless steel or plated steel. Sleeves are chosen based on the length of the coupling barb and the actual hose outside diameter. As a general rule, the sleeve should be about 1/4" shorter than the hose barb.

Temperature Range: -54°C (-65°F) to 150°C (300°F)

Style TF | Crimp Ferrules (Notched) Plated Steel - Sold with assembly only

Plated Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TF-150-CP	25	1	38	1.50	58	2.29
TF-163-CP	25	1	41	1.63	58	2.29
TF-206-CP	38	1 1/2	52	2.06	60	2.36
TF-213-CP	38	1 1/2	54	2.13	60	2.36
TF-263-CP	52	2	67	2.63	71	2.79
TF-275-CP	52	2	70	2.75	71	2.79
TF-363-CP	75	3	92	3.63	100	3.94
TF-375-CP	75	3	95	3.75	100	3.94
TF-388-CP	75	3	99	3.88	100	3.94
TF-463-CP	100	4	118	4.63	106	4.19
TF-475-CP	100	4	121	4.75	106	4.19
TF-481-CP	100	4	122	4.81	106	4.19
TF-494-CP	100	4	125	4.94	106	4.19
TF-663-CP	150	6	168	6.63	144	5.67
TF-688-CP	150	6	175	6.88	144	5.67
TF-713-CP	150	6	181	7.13	144	5.67

Style TFS | Crimp Ferrules (Notched) 316 Stainless Steel - Sold with assembly only

Stainless Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TFS-206-S6	38	1 1/2	52	2.06	60	2.36
TFS-213-S6	38	1 1/2	54	2.13	60	2.36
TFS-263-S6	52	2	67	2.63	71	2.79
TFS-275-S6	52	2	70	2.75	71	2.79
TFS-363-S6	75	3	92	3.63	100	3.94
TFS-375-S6	75	3	95	3.75	100	3.94
TFS-463-S6	100	4	118	4.63	106	4.19
TFS-481-S6	100	4	122	4.81	106	4.19

Crimp Ferrules

Style TSS | Crimp Short Ferrules Plated Steel (No notch & no ring insert) - Sold with assembly only

Plated Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TSS-113-CP	20	3/4	29	1.13	30	1.19
TSS-138-CP	25	1	35	1.38	30	1.19
TSS-163-CP	25	1	41	1.63	30	1.19
TSS-175-CP	32	1 1/4	44	1.75	38	1.50
TSS-188-CP	32	1 1/4	48	1.88	38	1.50
TSS-200-CP	38	1 1/2	51	2.00	38	1.50
TSS-213-CP	51	2	54	2.13	51	2.00
TSS-263-CP	51	2	67	2.63	51	2.00
TSS-275-CP	52	2	70	2.75	51	2.00
TSS-363-CP	75	3	92	3.63	67	2.63
TSS-375-CP	75	3	95	3.75	67	2.63
TSS-388-CP	75	3	99	3.88	67	2.63
TSS-463-CP	100	4	118	4.63	87	3.44
TSS-475-CP	100	4	121	4.75	87	3.44
TSS-483-CP	100	4	123	4.83	87	3.44

Style TSSS | Crimp Short Ferrules 316 Stainless Steel (No notch & no ring insert) - Sold with assembly only

Plated Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TSSS-113-S6	20	3/4	29	1.13	30	1.19
TSSS-138-S6	25	1	35	1.38	30	1.19
TSSS-163-S6	25	1	41	1.63	30	1.19
TSSS-175-S6	32	1 1/4	44	1.75	38	1.50
TSSS-188-S6	32	1 1/4	48	1.88	38	1.50
TSSS-200-S6	38	1 1/2	51	2.00	38	1.50
TSSS-213-S6	51	2	54	2.13	51	2.00
TSSS-263-S6	51	2	67	2.63	51	2.00
TSSS-275-S6	52	2	70	2.75	51	2.00
TSSS-363-S6	75	3	92	3.63	67	2.63
TSSS-375-S6	75	3	95	3.75	67	2.63
TSSS-388-S6	75	3	99	3.88	67	2.63
TSSS-463-S6	100	4	118	4.63	87	3.44
TSSS-475-S6	100	4	121	4.75	87	3.44
TSSS-483-S6	100	4	123	4.83	87	3.44

Crimp Ferrules

Style TSL | Crimp Long Ferrules Plated Steel (No notch & no ring insert) - Sold with assembly only

Crimp Ferrule Sizes:
1/4" (6 mm), 3/8" (10 mm), 1/2" (12 mm), also available.

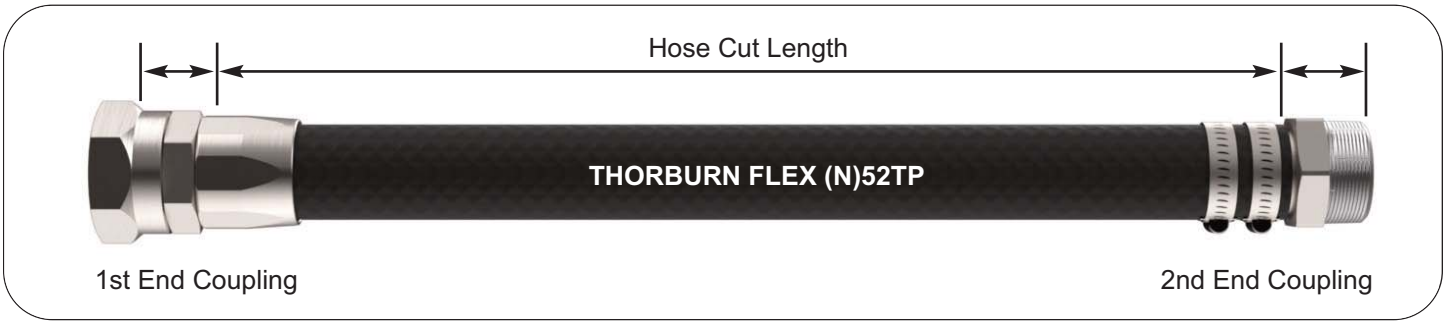
Plated Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TSL-113-CP	20	3/4	29	1.13	54	2.13
TSL-138-CP	20	3/4	35	1.38	54	2.13
TSL-150-CP	25	1	38	1.50	57	2.31
TSL-163-CP	25	1	41	1.63	57	2.31
TSL-175-CP	25	1	44	1.75	57	2.31
TSL-213-CP	38	1 1/2	54	2.13	60	2.38
TSL-263-CP	52	2	67	2.63	70	2.75
TSL-275-CP	52	2	70	2.75	70	2.75
TSL-288-CP	52	2	73	2.88	70	2.75
TSL-313-CP	65	2 1/2	80	3.13	80	3.13
TSL-338-CP	65	2 1/2	86	3.38	80	3.13
TSL-363-CP	75	3	92	3.63	100	3.94
TSL-369-CP	75	3	91	3.61	100	3.94
TSL-375-CP	75	3	95	3.75	100	3.94
TSL-388-CP	75	3	99	3.88	100	3.94
TSL-400-CP	75	3	102	4.00	100	3.94
TSL-438-CP	100	4	111	4.38	106	4.19
TSL-463-CP	100	4	118	4.63	106	4.19
TSL-475-CP	100	4	121	4.75	106	4.19
TSL-483-CP	100	4	123	4.83	106	4.19
TSL-494-CP	100	4	125	4.94	106	4.19
TSL-650-CP	150	6	165	6.50	144	5.67
TSL-675-CP	150	6	171	6.75	144	5.67
TSL-688-CP	150	6	175	6.88	144	5.67
TSL-713-CP	150	6	181	7.13	144	5.67
TSL-850-CP	200	8	216	8.50	165	6.50
TSL-900-CP	200	8	229	9.00	165	6.50
TSL-1075-CP	250	10	273	10.75	165	6.50
TSL-1100-CP	250	10	279	11.00	165	6.50
TSL-1125-CP	250	10	286	11.25	165	6.50
TSL-1300-CP	300	12	330	13.00	229	9.00
TSL-1325-CP	300	12	337	13.25	229	9.00
TSL-1350-CP	300	12	343	13.50	229	9.00
TSL-1375-CP	300	12	349	13.75	229	9.00

Style TSLS | Crimp Long Ferrules 316 Stainless Steel (No notch & no ring insert) - Sold with assembly only

Crimp Ferrule Sizes:
1/4" (6 mm), 3/8" (10 mm), 1/2" (12 mm), also available.

Stainless Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TSLS-138-S6	25	1	35	1.38	54	2.13
TSLS-150-S6	25	1	38	1.50	54	2.31
TSLS-163-S6	25	1	41	1.63	54	2.31
TSLS-175-S6	25	1	44	1.75	54	2.31
TSLS-188-S6	32	1 1/4	48	1.88	60	2.38
TSLS-213-S6	38	1 1/2	54	2.13	60	2.38
TSLS-225-S6	38	1 1/2	57	2.25	59	2.36
TSLS-263-S6	52	2	67	2.63	70	2.75
TSLS-275-S6	52	2	70	2.75	70	2.75
TSLS-313-S6	65	2 1/2	80	3.13	80	3.13
TSLS-369-S6	75	3	94	3.69	100	3.94
TSLS-375-S6	75	3	95	3.75	100	3.94
TSLS-388-S6	75	3	99	3.88	100	3.94
TSLS-483-S6	100	4	123	4.83	106	4.19
TSLS-494-S6	100	4	125	4.94	106	4.19

How To Order Thorburn Petroleum Hose Assemblies



Hose Type	Hose Size	1st End Coupling	1st End Material	1st End Clamp/Crimp & Material	2nd End Coupling	1st End Material	2nd End Clamp/Crimp & Material	OAL	Accessories
52TP	32	02	S6	CRS6	01	S6	CL2S6	120	

Hose Type

(N)52TP(V)	(11)
(N)552TP(V)	(12)
(N)53TP(V)	(13)
(N)53TPX(V)	(14)
(N)53TPS(W)	(15)
(N)53TPP	(16)
(N)54TP	(17)
(N)54TPP	(18)
(N)55TP(V)	(19)
(N)555TP(V)	(20)
(N)55TPU	(21)
(N)555TPX	(22)
(N)TPR4	(23)
(N)TPR4LT	(23)

Hose Size

06 = 3/8″
08 = 1/2″
12 = 3/4″
16 = 1″
20 = 1 1/4″
24 = 1 1/2″
32 = 2″
40 = 2 1/2″
48 = 3″
64 = 4″
96 = 6″

1st End Material / 2nd End Material

S6 - 316 Stainless Steel
S2 - 201 Stainless Steel
BB - Brass
CP - Plated Steel
HH - Hastelloy Insert & Hastelloy Ferrule
HS - Hastelloy Insert & 316SS Ferrule
II - Inconel 625 Insert & Inconel 625 Ferrule
IS - Inconel 625 Insert & 316SS Ferrule
SE - All 316SS & Encapsulated PTFE/PFA Insert - All wetted parts PTFE/PFA
SF - All 316SS & Flare Through PTFE/PFA Insert - All wetted parts PTFE/PFA
YY - Other (Specify)

OAL

Overall Length (Inches)
Tolerances on length: +\- 1%
For metric length, put mm after number

Accessories

Leave blank for none

Camlock Adapters - Refer to Codes Below

TQ | Safety Pin	(48)
TCH-X | "S" Hook Chain (X=Specify Material BB or S6)	(48)
TCHCS | Sash Type Chain	(48)

Thorburn Standard Crimp Hose Couplings
01-Series MP | Male Pipe NPT Rigid (25)
02-Series FJX | Female JIC 37° Swivel (26)
03-Series BWT | Butt Weld Tube (26)
04-Series BWP | Butt Weld Pipe (27)
05-Series LF | Swivel Flange 150 lbs (27)
06-Series LFPN | Swivel Flange PN10/PN16 (28)
07-Series VC | Victaulic Coupling (28)

Thorburn Combination Shank Couplings
08-Series 11IC | Male NPT (29)
09-Series 11IFS | Stub End for Floating Flange (29)
10-Series 11IV | Victaulic Groove (30)
11-Series 11IW | Welded End (30)
12-Series 25I | Hose Mender (30)

Thorburn Heavy Duty Ground Joint Couplings
13-Series 17I | Hose Stem with Wing Nut & Female Spud (31)
14-Series 17I | Hose Stem with Wing Nut & Male Spud (32)
15-Series 17I | Hose Splice (32)

Thorburn Series 733 Guard Lok™ Camlock Couplings
16-733C-HD-Female Hose Shank Coupler (37)
17-733D-HD-Female NPT Coupler (37)
18-Style 733-C | Female Camlock Coupler (38)

Thorburn Series 733 Camlock Adapters
19-Style 733-B | Male Camlock Adapter (42)
20-Style 733-D | Female Camlock Adapter (42)
21-Style 733FBW | Butt Weld Camlock Adapter (43)
22-Style 733FBW-HD | Butt Weld Camlock Adapter (43)
23-Style 733-DSW | Socket Weld Camlock Adapter (43)
24-Style 733-DSW-HD | Socket Weld Camlock Adapter (43)
25-Style 733-DSW4-HD |Socket Weld Camlock Adapter (44)
26-Style 733-DC | Camlock Dust Cap (44)

Thorburn Series 633 Pin Lock Camlocks
27-Style 633-C | Female Camlock Coupler (38)
28-Style 633-E | Male Camlock (39)

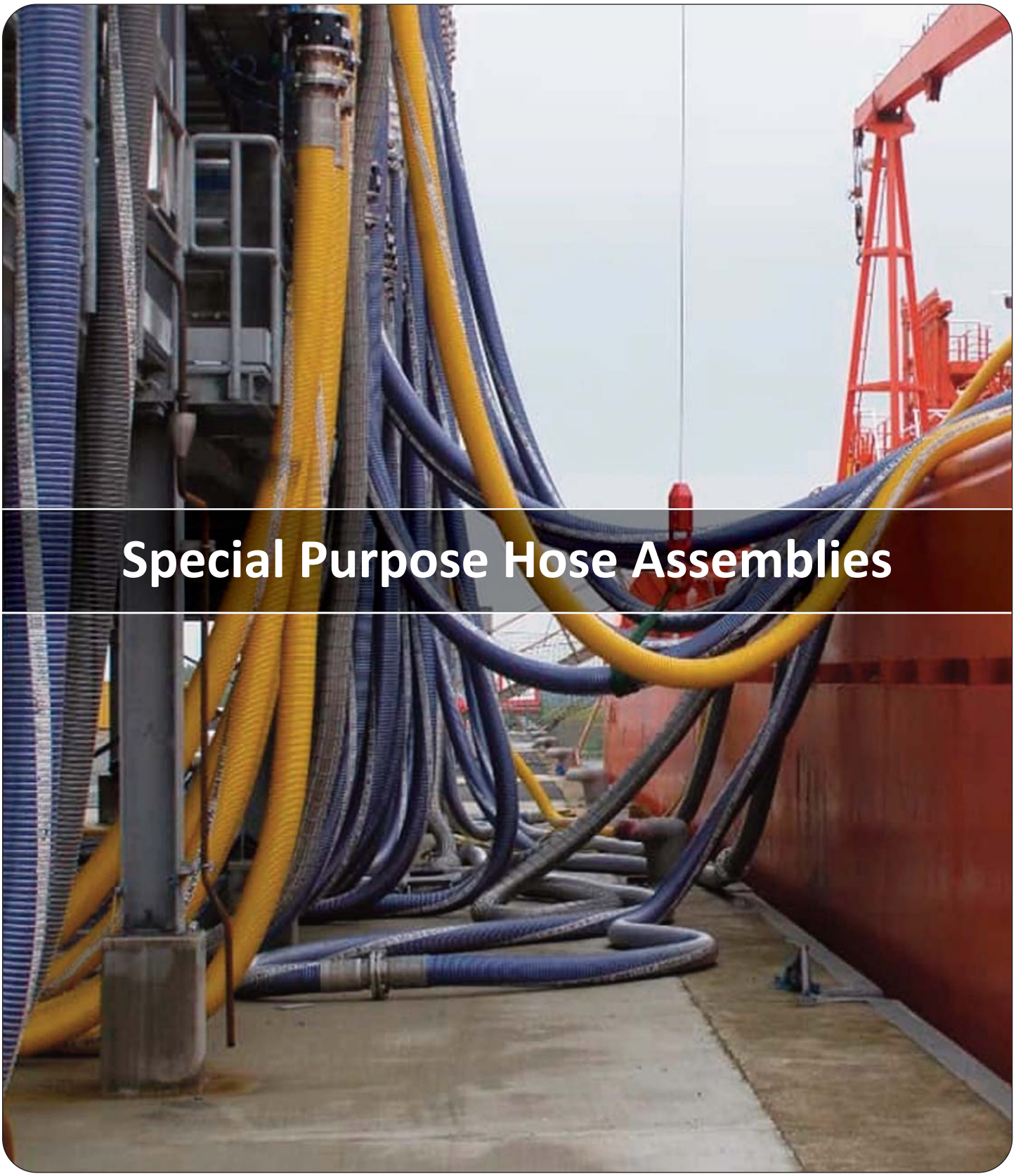
Thorburn Series 633 Pin Lock Camlock Adapters
29-633A-HD-Female NPT Adapter (37)
30-633FSW-HD-Adapter to Socket Weld (37)
31-633FBW-HD-Adapter to Butt Weld (37)
32-Style 633-A | Adapter Female NPT (39)
33-Style 633-F | Adapter Male NPT (40)
34-Style 633-ASW | Socket Weld Camlock Adapter (40)
35-Style 633-ABW | Butt Weld Camlock Adapter (41)
36-Style 633-DP | Camlock Plug Adapter (41)
37-Style 633-B | Male Camlock Adapter (42)
38-Style 633-D | Female Camlock Adapter (42)
39-Style 633FBW | Butt Weld Camlock Adapter (43)
40-Style 633-DSW | Socket Weld Camlock Adapter (43)
41-Style 633-DC | Camlock Dust Cap (44)
42-Style 633-PFC | Camlock Flanged Adapter 150# (45)
43-Style 633-PFC | Camlock Flanged Adapter PN10 (45)
44-Style 633-PFE | Camlock Flanged Adapter 150# (45)
45-Style 633-PFE | Camlock Flanged Adapter PN10 (45)
46-Style 633-TTC | Flanged Tank & Truck Adapter (46)
47-Style 633-TTE | Flanged Tank & Truck Adapter (46)
48-Style 633-90CC | 90° X 90° Coupler (47)
49-Style 633-90EC| Coupler X Male Adapter (47)
50-Style 633-90FPC | Coupler X Female NPT (47)

Thorburn Series 70 Hose Couplings for Bolt-On Safety Clamps
62-Style 71FBSPP | Female BSPP-Smooth Stem EN 14420-5/DIN 2817 (50)
63-Style 72FBSPP | Female BSPP-Serrated Stem EN 14420-5/DIN 2817 (51)
64-Style 73MBSPT | Male BSPT-Smooth Stem EN 14420-5/DIN 2817 (51)
65-Style 74MBSPT | Male BSPT-Serrated Stem EN 14420-5/DIN 2817 (51)
66-Style 75FLX | Fixed Flange-Smooth Stem EN 14420-4/DIN 2817 (52)
67-Style 76FLX | Fixed Flange-Serrated Stem EN 14420-4/DIN 2817 (52)
68-Style 77FLXS | Swivel Flange-Smooth Stem EN 14420-4/DIN 2817 (53)
69-Style 78FLXS | Swivel Flange-Serrated Stem EN 14420-4/DIN 2817 (53)

Thorburn Series 80 Hose Couplings for Bolt-On Safety Clamps
70-Style 81FBSPP | Female BSPP Fitting-EN 14423/DIN 2826 (55)
71-Style 82MBSPT | Male BSPT Fitting-EN 14423/DIN 2826 (56)
72-Style 83FLX | Fixed Flange-EN 14423/DIN 2826 (56)
73-Style 84FLXS | Swivel Flange-EN 14423/DIN 2826 (56)

Thorburn Clamps
CL = Clamps (58)
Quantity of Clamps (If **1** leave blank) **2, 3, 4** (Specify # after clamp code, before material code)

Crimp Ferrules (Notched)
CR = Crimp (65)



Special Purpose Hose Assemblies

THORFLEX Composite Hose Assemblies

Thorflex Series

Thorflex Series 58TCL/58TCH (SSP/SGP/PGP) composite hose assemblies are engineered for the safe and reliable transfer of a wide range of industrial petrochemicals. These hoses are constructed using six seamless polypropylene tubes that deliver superior chemical resistance while eliminating potential leak paths—without compromising flexibility, durability, or safety.

Thorflex Series 58TCL/58TCH (SST/SGT) variant hoses feature a PTFE (Polytetrafluoroethylene) inner liner, backed by multiple layers of solid polypropylene tubing and high-density polyethylene fabric reinforcement. This advanced construction provides outstanding resistance to highly aggressive chemicals and solvents, making it ideal for demanding transfer applications.

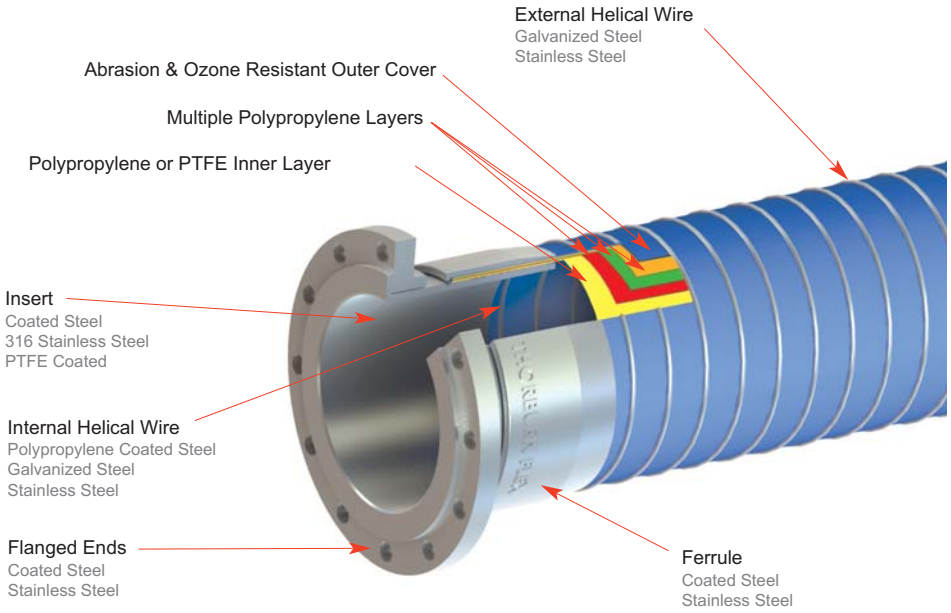
Features:

- Lightweight and exceptionally flexible for ease of handling
- Constructed to full vacuum rating
- Double end-to-end electrical continuity for static discharge protection
- Exceptional abrasion and drag resistance
- Reliable performance in extremely low temperatures
- Compliant with key industry standards:

- Canadian Coast Guard Specifications
- U.S. Coast Guard Regulations (33 CFR Sections 154.500 & 154.810)
- British Standard BS5842 (1980)

Typical Applications:

- Chemical processing facilities
- Petroleum and petrochemical refineries
- Bulk chemical haulers
- Marine loading and offloading terminals
- Tank truck and railcar loading systems
- Drum filling and emptying stations
- Acid and solvent transfer lines
- Portable chemical transfer units
- Environmental clean-up operations
- Barge and ship-to-shore operations
- LNG Loading/Unloading



THORFLEX Series 58TCL Composite Hose Assemblies

Polypropylene Hose | 250 PSI Design Pressure

Standard Chemicals

THORFLEX TYPE SSP (Red Cover)
S Stainless Steel (316) Internal Wire
S Stainless Steel (316) External Wire
P Polypropylene Tubes

THORFLEX TYPE SGP (Blue Cover)
S Stainless Steel (316) Internal Wire
G Galvanized External Wire
P Polypropylene Tubes

THORFLEX TYPE PGP (Blue Cover)
P Polypropylene Coated Galvanized Internal Wire
G Galvanized External Wire
P Polypropylene Tubes

Ideal Hose for Handling:

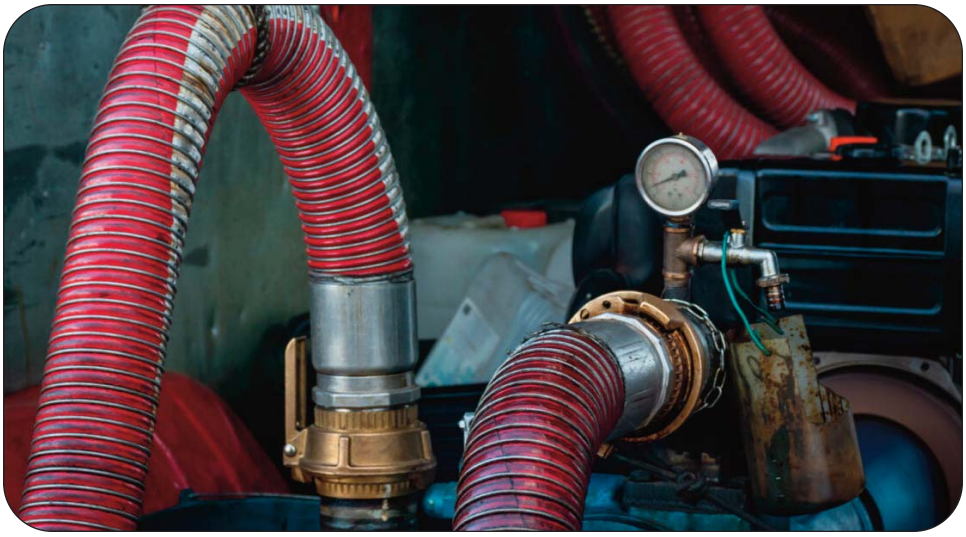
- Most corrosive acids and alkalis
- Aldehydes
- Amines
- Aliphatic
- Aromatic fuels
- Chlorinated hydrocarbons
- Alcohols
- Esters
- Ketones
- Lacquers
- Sulphuric Acid

Temperature: -60°F to 212°F (-51°C to 100°C) depending on media
Safety Factor: 4:1
Couplings: Flanges, Victaulic Groove, NPT/BSP Threaded, Butt Weld, Camlock
CRN: Available for all Canadian Provinces

Thorburn Part #	Hose I.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
58TCLXXX-16	25	1	17	250	69	1000	150	6	1.1	0.77
58TCLXXX-24	40	1.5	17	250	69	1000	150	6	1.5	1.01
58TCLXXX-32	50	2	17	250	69	1000	175	7	1.8	1.24
58TCLXXX-40	65	2.5	17	250	69	1000	175	7	2.8	1.85
58TCLXXX-48	80	3	17	250	69	1000	300	12	4.2	2.79
58TCLXXX-64	100	4	17	250	69	1000	350	14	4.8	3.23
58TCLXXX-96	150	6	14	200	55	800	525	21	10.6	7.12
58TCLXXX-128	200	8	14	200	55	800	700	28	15.2	10.21
58TCLXXX-160	250	10	14	200	55	800	900	36	20.0	13.45
58TCLXXX-192	300	12	14	200	55	800	1100	44	24.0	16.10

THORFLEX Series 58TCH Composite Hose Assemblies

PTFE Lined Hose | Up To 250 PSI Design Pressure



Aggressive Chemicals

THORFLEX TYPE SST (Red Cover)
S Stainless Steel (316) Internal Wire
S Stainless Steel (316) External Wire
T PTFE Liner

THORFLEX TYPE SGT (Red Cover)
S Stainless Steel (316) Internal Wire
G Galvanized External Wire
T PTFE Liner

Ideal Hose for Handling:

- Butyl chloride
- Chlorosulphonic acid
- Oleum
- Pentachloroethane
- Fuel & Solvents
- Hot Oil
- Molten Sulphur

Temperature: -60°F to 212°F
(-51°C to 100°C) depending on media
Safety Factor: 4:1
Couplings: Flanges, Victaulic Groove, NPT/BSP Threaded, Butt Weld, Camlock
CRN: Available for all Canadian Provinces

Thorburn Part #	Hose I.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
58TCHXXXX-16	25	1	17	250	69	1000	200	8	1.3	0.90
58TCHXXXX-24	40	1.5	17	250	69	1000	200	8	1.8	1.20
58TCHXXXX-32	50	2	17	250	69	1000	225	9	2.2	1.50
58TCHXXXX-40	65	2.5	17	250	69	1000	225	9	3.3	2.20
58TCHXXXX-48	80	3	17	250	69	1000	350	14	4.3	2.90
58TCHXXXX-64	100	4	17	250	69	1000	400	16	5.4	3.65
58TCHXXXX-96	150	6	14	200	55	800	575	23	12.6	8.50
58TCHXXXX-128	200	8	14	200	55	800	800	32	20.1	13.50
58TCHXXXX-160	250	10	14	200	55	800	1000	40	26.5	17.80
58TCHXXXX-192	300	12	14	200	55	800	1200	48	31.8	21.35

THORFLEX Composite Hose End Fittings

Fixed Flange - ANSI, PN

Swivel Flange - ANSI, PN

Sanitary Flange

Victaulic Groove End

Male Threaded NPT

Male Camlock Type E

Female Type C Camlock

Butt Weld End

How to Order THORFLEX Composite Hose Assemblies

Hose Type	Hose Size	1st End	1st End Crimp Material	2nd End	2nd End Crimp Material	OAL	Accessories
58TCHSSP	64	03	CRS6	03	CRS6	120	

Hose Type	Hose Size	1st End Crimp Material / 2nd End Crimp Material	OAL	Accessories
58TCLSSP 58TCLSGP 58TCLPGP 58TCLSST 58TCLSGT 58TCHSSP 58TCHSGP 58TCHPGP 58TCHSST 58TCHSGT	16 = 1” 24 = 1.5” 32 = 2” 40 = 2.5” 48 = 3” 64 = 4” 96 = 6” 128 = 8” 160 = 10” 192 = 12”	CRS6 = 316SS CRCS = Plated Steel	Overall Length (Inches) Add suffix mm for millimeters	Leave blank for none Camlock Adapters - Refer to Codes Below (Pg 45) TQ | Safety Pin TCH-X | “S” Hook Chain (X=Specify Material BB or S6) TCHCS | Sash Type Chain

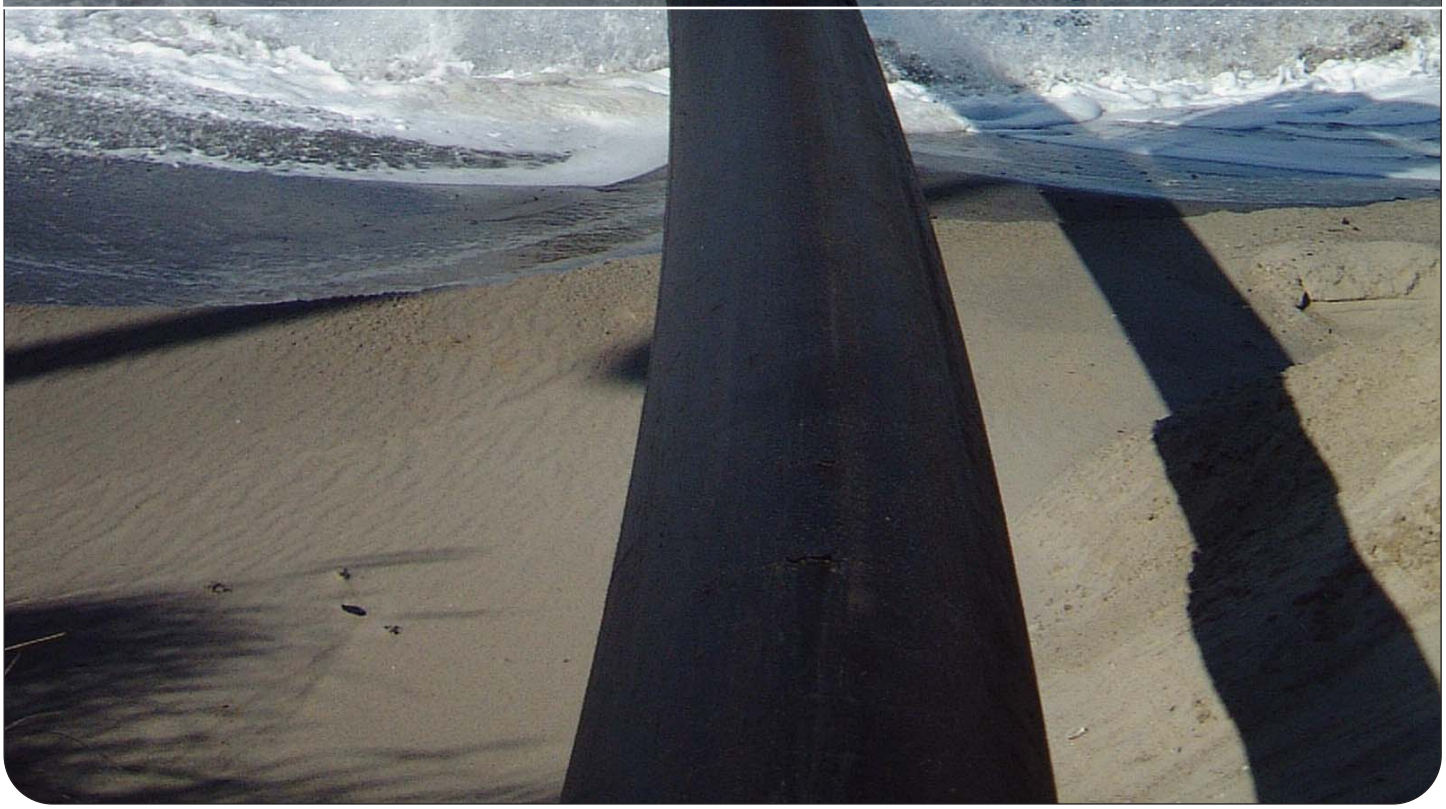
End Fitting Special Notes:
a. For wetted parts coated with PTFE, add “P” after the end fitting code.
b. If fitting end code is not shown above, please insert XX for first end and YY for second end and specify type and material.

Wetted Parts:
A = Wetted parts Carbon Steel non-wetted Carbon Steel
B = Wetted parts Stainless Steel non-wetted Carbon Steel
C = Wetted parts Stainless Steel non-wetted Stainless Steel
D = Wetted parts Aluminum non-wetted Stainless Steel

End Fitting Codes

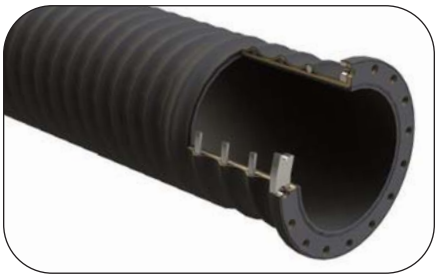
01 - Fixed Flange ANSI 150-A (wetted parts Carbon Steel non-wetted Carbon Steel)
02 - Fixed Flange ANSI 150-B (wetted parts Stainless Steel non-wetted Carbon Steel)
03 - Fixed Flange ANSI 150-C (wetted parts Stainless Steel non-wetted Stainless Steel)
04 - Fixed Flange ANSI 300-A
05 - Fixed Flange ANSI 300-B
06 - Fixed Flange ANSI 300-C
07 - Fixed Flange PN10-A
08 - Fixed Flange PN10-B
09 - Fixed Flange PN10-C
10 - Fixed Flange PN16-A
11 - Fixed Flange PN16-B
12 - Fixed Flange PN16-C
13 - Fixed Flange PN25-A
14 - Fixed Flange PN25-B
15 - Fixed Flange PN25-C
16 - Fixed Flange PN40-A
17 - Fixed Flange PN40-B
18 - Fixed Flange PN40-C
19 - Swivel Flange ANSI 150-A
20 - Swivel Flange ANSI 150-B
21 - Swivel Flange ANSI 150-C
22 - Swivel Flange ANSI 300-A
23 - Swivel Flange ANSI 300-B
24 - Swivel Flange ANSI 300-C
25 - Swivel Flange PN10-A
26 - Swivel Flange PN10-B
27 - Swivel Flange PN10-C
28 - Swivel Flange PN16-A
29 - Swivel Flange PN16-B
30 - Swivel Flange PN16-C
31 - Swivel Flange PN25-A
32 - Swivel Flange PN25-B
33 - Swivel Flange PN25-C
34 - Swivel Flange PN40-A
35 - Swivel Flange PN40-B
36 - Swivel Flange PN40-C
37 - Male NPT-A
38 - Male NPT-B
39 - Male NPT-C
40 - Female Type C Camlock-A
41 - Female Type C Camlock-B
42 - Female Type C Camlock-C
43 - Female Type C Camlock-D
44 - Male Type C Camlock-A
45 - Male Type C Camlock-B
46 - Male Type C Camlock-C
47 - Male Type C Camlock-D
48 - Victaulic Groove - A
49 - Victaulic Groove - B
50 - Victaulic Groove - C
51 - Sanitary Flange - A
52 - Sanitary Flange - B
53 - Sanitary Flange - C
54 - Butt Weld - A
55 - Butt Weld - B
56 - Butt Weld - C

60TMH/61TMH Flex-Pipe



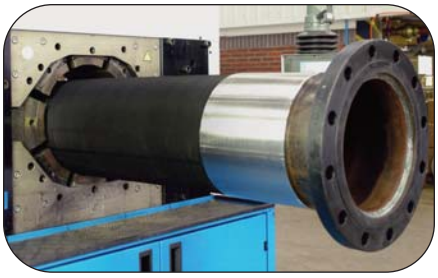
Thorburn Series (N)60TMH/61TMH

Custom Engineered Suction & Discharge Flexpipe



60TMHSC smooth tube & corrugated cover for smooth flow and an MBR as low as 4X ID depending on pressure

60TMHCC corrugated tube & corrugated cover with integral annular rings to reduce the MBR as low as 2X ID depending on pressure



Available with factory assembled permanently attached crimped ends

Sizes: 12 mm to 1200 mm I.D. | Pressure Range: Full Vacuum to 70 bar (1000 psi)
Thorburn Series 60TMH and 61TMH Flexpipe assemblies are custom-built multi-purpose hoses designed to replace rigid metal piping where flexibility, durability, and performance are critical. These flexible connectors are engineered to absorb vibration, noise, thermal movement, misalignment, and lateral deflection in demanding industrial environments. Ideal for systems requiring resistance to corrosion, electrolysis, abrasion, or water hammer, Thorburn Flexpipe solutions ensure long-term reliability under high mechanical and thermal stress.

Construction

Tube: Available in a range of elastomeric compounds to match media and operating conditions. Smooth or corrugated interior and wall thickness are specified based on pressure, flexibility, and chemical compatibility. *Please call Thorburn for details.*

Reinforcement: Multi-layered, cross-woven high-tensile calendared fabric.
60TMH: Reinforced with heavy-duty helix wire or annular rings to maintain structural integrity across pressure ranges, from full vacuum to 70 bar. Engineered to maintain rigidity over long runs or achieve tight bend radii (as low as 2× I.D.).

61TMH: Collapsible discharge design with the same high-strength construction for flexible deployment and efficient storage.

Cover: Various elastomeric compounds available with smooth or corrugated finishes to suit environmental conditions, abrasion, and handling requirements.

Sizes: 1/2" (12mm) to 48" (1200mm) I.D. up to 100ft (30m) long.
Longer lengths available on special order only.

Engineering Notes:
1. All assemblies are custom-designed based on application requirements—media, pressure, and bend radius.
2. Standard minimum bend radius is approximately 6× the hose I.D.
3. Corrugated construction enhances flexibility at lower pressures.
4. Smooth configurations with annular rings optimize performance at high pressures.
5. Bending resistance increases with internal pressure—consult Thorburn Engineering for optimal design.
6. Optional arches can be incorporated to accommodate axial movement.
7. Special end connections and configurations available upon request.

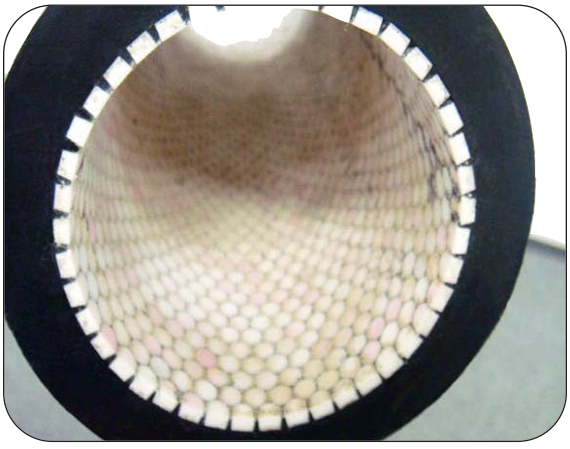
Engineered to Perform, built to Last!
Contact Thorburn for application-specific recommendations and engineered hose system solutions.

Thorburn Series (N)60TMH/61TMH

Ceramic Lined Custom Multi-Purpose Suction & Discharge Hose

Ceramic lined for extreme abrasion

Thorburn Series 60TMH/61TMH ceramic lined custom hose assemblies are engineered for the most demanding abrasion and high-temperature applications. Custom-built in a wide range of sizes and available in continuous lengths up to 15 meters, these hoses feature an advanced ceramic lining that provides exceptional resistance to wear, impact, and heat — ideal for the transfer of highly abrasive materials such as alumina and zirconia. The ceramic lining is vulcanized into the hose body using a high-temperature inorganic adhesive, enabling reliable operation at temperatures up to 350°C (lining only). A proprietary convex/concave ceramic bead design allows the hose to maintain an impressive 6:1 bend radius without sacrificing structural integrity or flexibility. Thorburn's 60TMH/61TMH ceramic lined hose system is the optimal solution where flexibility, durability, and extreme wear resistance are critical.



Thorburn 60TMH rubber hose lined with ceramic balls composed of a minimum of 96% silica

Features

Extreme Wear Resistance: Vulcanized ceramic ball lining offers superior abrasion and impact resistance, significantly extending service life in aggressive material handling environments.

High-Temperature Capability: Ceramic lining withstands continuous temperatures up to 350°C, making it ideal for hot material transfer.

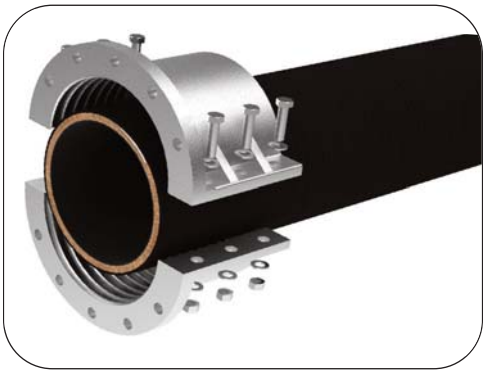
Flexible Yet Tough: Unique bead configuration delivers a flexible hose design without compromising on durability or internal protection.

Full Ceramic Protection: All wetted surfaces are ceramic lined to prevent erosion and chemical degradation at the point of flow.

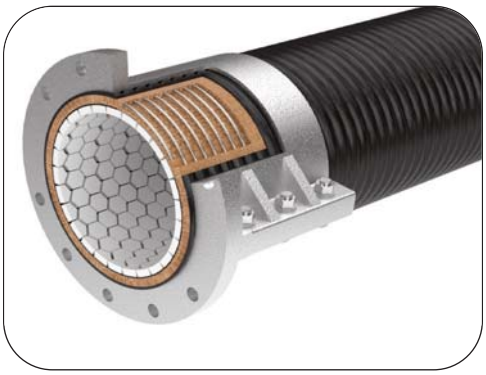
Rugged Outer Cover: Available in smooth or corrugated elastomeric construction with abrasion- and UV-resistant properties, supported by high-tensile fabric and steel wire helix reinforcement.

Minimum bend radius of 6 X ID: To get into very tight location
Safety Factor: is four times the working pressure designed for ASME B31.1 and B31.3

Field Attachable Fitting-to-End Joints for 60TMHSC/60TMHCC Hoses



Thorburn FAS150 Smooth Cover Coupling



Thorburn FAC150 Corrugated Cover Coupling

Thorburn offers a unique field-attachable solution. Hoses are supplied in bulk lengths and can be easily cut and assembled on-site using Thorburn's reusable aluminum split cast couplings — a no-weld, bolt-on solution that simplifies installation and reduces downtime.

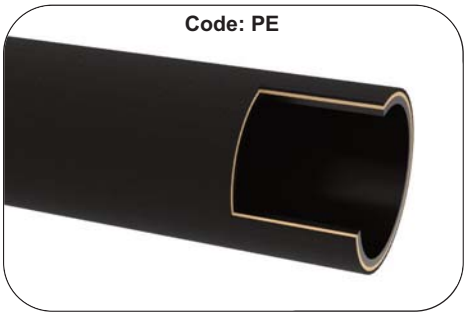
No Process Contact: Couplings are isolated from internal flow, extending fitting life and enabling safe reuse.
On-Site Assembly: Cut-to-length design supports fast field installation without special tools.
Inventory Efficiency: Stock bulk hose lengths and reusable fittings instead of pre-fabricated assemblies — reducing lead times and storage costs.
Versatile Connections: Accommodates a wide range of flange specifications.

Temperature Range: -40°C to +100°C (hose body), up to 350°C (ceramic lining only)
Reinforcement: High-tensile fabric with steel wire helix

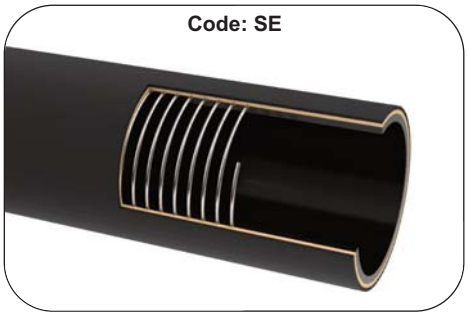
Applications

- Mineral processing plants
- Sand and gravel industries
- Cement and coal industries
- Petrochemical plants
- Ship to Ship Transfer
- Ship to Shore Transfer

Thorburn (N)60TMH/61TMH Integrated Ends

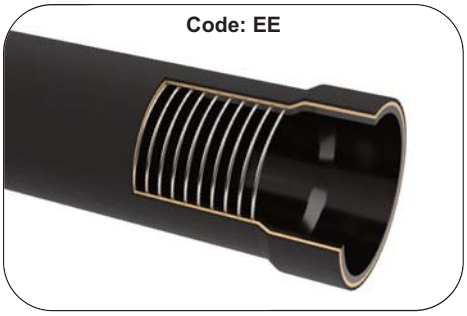


Plain End

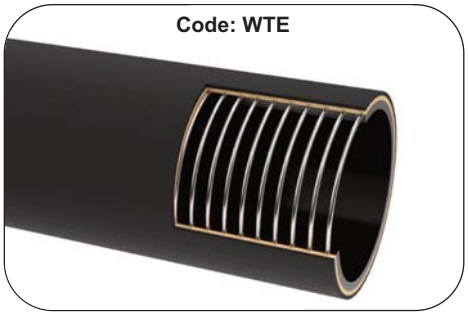


Soft End

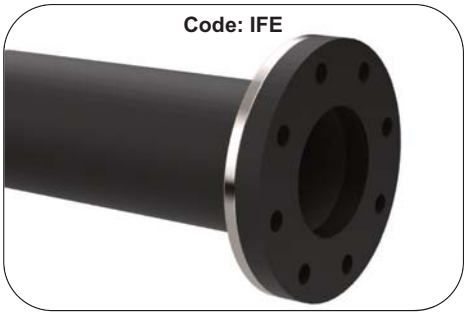
Rubber & Duck Flanges



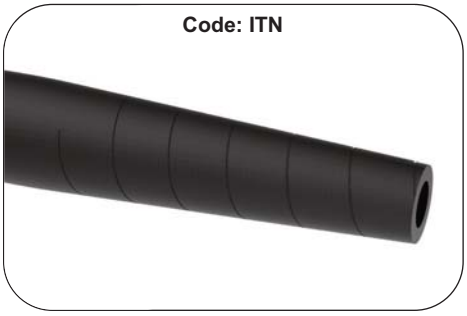
Enlarged End



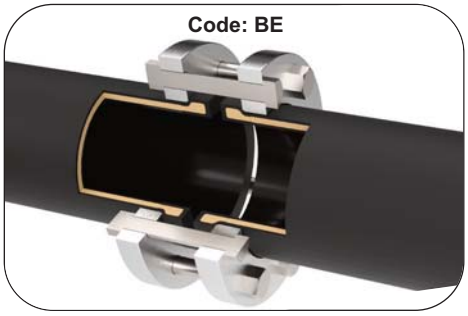
Wire To End



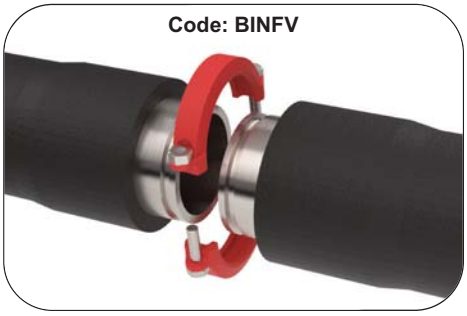
Integral Flange End



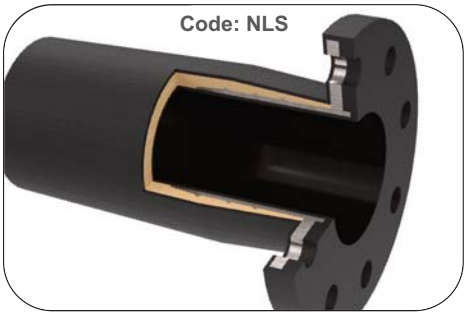
Integral Tapered Nozzle Ends



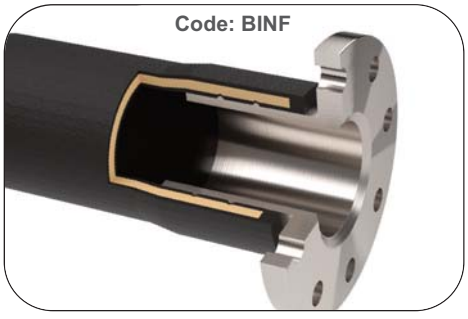
Beaded Ends With Split Flanges



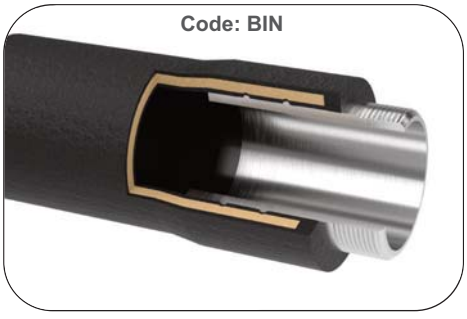
Built-In Victaulic Nipple



Built-In Nipple Rubber Lined Flanged 150lbs & 300lbs



Built-In Nipple Flanged 150lbs & 300lbs



Built-In Nipple Threaded

Thorburn (N)60TMH/61TMH Standard Crimp End Fittings

Fixed Flange - ANSI, PN

Swivel Flange - ANSI, PN

Male NPT/BSPT

Female NPT

Female Cam Coupling Type C

Male Cam Adapter Type E

Victaulic Groved

Butt Weld End

Sanitary Flange

Thorburn Series (N)60TMH/61TMH Ordering Codes

Hose Models

(N)60TMH - Smooth tube & smooth cover Suction & Discharge Hose
(N)60TMHSC - Smooth tube & corrugated cover Suction & Discharge Hose
(N)60TMHCC - Corrugated tube & corrugated cover Suction & Discharge Hose
(N)61TMH - Discharge Hose

Tube & Cover Compounds

Our Flexpipe hoses are manufactured to the latest RMA standards.

Code A Black natural rubber up to 180°F (82°C).
Code B Pure gum up to 180°F (82°C).
Code C* Neoprene up to 212°F (100°C) - **CF** = FDA Compliant - White Neoprene
Code D* Nitrile up to 225°F (107°C) - **DF** = FDA Compliant & **ND** = NSF-61 Compliant - White Nitrile
Code E H_3 (Butyl) up to 300°F (148°C).
Code F Hypalon up to 250°F (121°C).
Code H* EPDM up to 300°F (148°C) - **HF** = FDA Compliant & **NH** = NSF-61 Compliant - White EPDM
Code I FKM up to 350°F (176°C).
Code J PTFE Lined up to 400°F (204°C).
Code K PFA Lined up to 400°F (204°C).
Code L Silicone up to 500°F (260°C).
Code M HNBR up to 300°F (148°C).
Code N** Nitrile NSF-61 Compliant tube (Only for potable water service).
Code O Ceramic Lined up to 400°F (204°C).
Code U UHMW up to 180°F (82°C).
Code X Specify.

*Thorburn offers FDA compliant white Neoprene, white Nitrile and white EPDM. Add suffix "F" after Tube code.
**Thorburn offers NSF-61 Compliant tube for white nitrile & white EPDM. Add suffix "N" before tube code.

Tube & Cover Thickness

Code 01 1/16" (1.5mm)
Code 02 1/8" (3mm)
Code 04 1/4" (6mm)
Code 06 3/8" (10mm)
Code 08 1/2" (13mm)

Note: PTFE lining is typically less than 1/8" (3mm)

End Materials

Code CS Carbon steel
Code S4 304 Stainless steel
Code S6 316 Stainless steel
Code AL Aluminum (Field Attachable Fittings Only)
Code X Specify

Working Pressure Codes

Code 25 25 psi (2 bar)
Code 75 75 psi (5 bar)
Code 100 100 psi (7 bar)
Code 150 150 psi (10 bar)
Code 250 250 psi (17 bar)
Code 500 500 psi (34 bar)
Code 1000 1000 psi (69 bar)

Note: Minimum burst pressure is 4X working pressure

Flexpipe Integrated Ends

Code PE - Plain End
Code SE - Soft End
Code RDF - Rubber Duck Flange with Split Rings
Code EE - Enlarged End
Code WTE - Wire To End
Code IFE - Integral Flange End
Code ITN - Integral Rubber Tapered Nozzle End
Code BE - Beaded Ends with Split Flange
Code BINFV*** - Built In Victaulic Nipple
Code NLS150 - Built In Nipple Rubber Lined Flange 150lb
Code NLS300 - Built In Nipple Rubber Lined Flange 300lb
Code BINF150*** - Built In Nipple with Flange 150lbs drill size
Code BINF300*** - Built In Nipple with Flange 300lbs drill size
*** Built In Nipple Threaded

Flexpipe Crimped Ends

Code 01 - Female NPT
Code 02 - Male NPT
Code 03 - Fixed Flange 150 Lb. RF
Code 04 - Fixed Flange 300 LB. RF
Code 05 - Fixed Flange PN10
Code 06 - Fixed Flange PN16
Code 07 - Fixed Flange PN25
Code 08 - Fixed Flange PN40
Code 09 - Swivel Flange 150 Lb. RF
Code 10 - Swivel Flange 300 LB. RF
Code 11 - Swivel Flange PN10
Code 12 - Swivel Flange PN16
Code 13 - Swivel Flange PN25
Code 14 - Swivel Flange PN40
Code 15 - Female Cam Coupler
Code 16 - Male Cam Adapter
Code 17 - Butt Weld End
Code 18 - Victaulic Groved
Code 19 - Sanitary Flange

Field Attachable Fitting-to-End Joints

Code FAS150 - Smooth Cover Split Cast 150lbs
Code FAS300 - Smooth Cover Split Cast 300lbs
Code FAC150 - Corrugated Cover Split Cast 150lbs
Code FAC300 - Corrugated Cover Split Cast 300lbs

Crimp / Clamp

CRS6 - Crimp 316SS
CRCS - Crimp Plated Steel
CLS6 - Clamp 316SS
CLCS - Clamp Plated Steel
Integrated or Field Attachable - Leave Blank

How To Order Thorburn Series (N)60TMH/61TMH Integrated & Crimp End Hose Assemblies

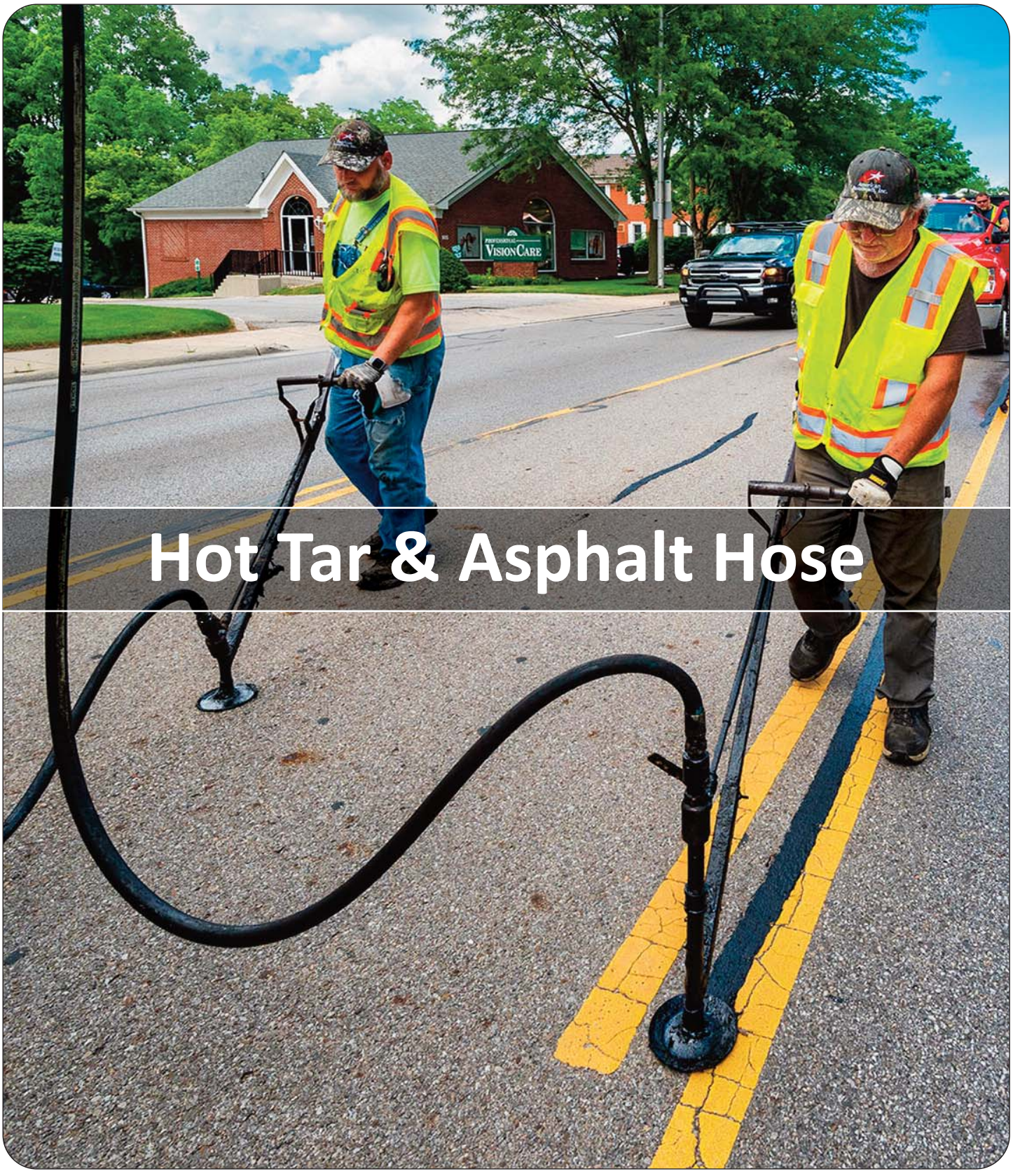
Hose Type	Hose Size	Cover & Tube Compound	Cover & Tube Thickness	1st End	1st End Material	Crimp/ Clamp	2nd End	2nd End Material	Crimp/ Clamp	Working Pressure	OAL
(N)60TMH	48	H	04	10	S6	CRS6	10	S6	CRS6	150	120

(N)60TMH
(N)60TMHSC
(N)60TMHCC
(N)61TMH

08 = 1/2"	(DN15)	64 = 4"	(DN100)
12 = 3/4"	(DN20)	80 = 5"	(DN125)
16 = 1"	(DN25)	96 = 6"	(DN150)
32 = 2"	(DN50)	128 = 8"	(DN200)
40 = 2 1/2"	(DN65)	160 = 10"	(DN250)
48 = 3"	(DN80)	192 = 12"	(DN300)

Note: Insert Suffix "X" at the end of the part number to specify special construction options such as, corrugated tube, corrugated cover & annular rings to meet specific design requirements.

Overall Length (Inches) Add suffix mm for millimeters



Hot Tar & Asphalt Hose

Thorburn Series (N)557TP Hot Tar & Asphalt Hose

Thorburn Series (N)557TP: is a heavy-duty transfer hose specifically engineered for tar, asphalt, hot oil, waxes, and high-temperature petroleum-based products. Built with synthetic fiberglass tire-cord reinforcement and an embedded steel wire helix, it delivers excellent pressure retention and vacuum stability under continuous service temperatures up to 180 °C (356 °F). This hose combines exceptional heat, oil, and weather resistance with full vacuum capability, making it ideal for use in refineries, road-construction depots, and hot-oil circulation systems.

Features:

- Abrasion and heat-resistant tube & cover for long service life
- Anti-static, oil-resistant outer cover prevents static build-up
- Full vacuum rated for suction & discharge service
- Ozone and weather-resistant construction for outdoor use
- No crimp sleeves or ferrules required for assembly

Applications:

- Hot tar and asphalt transfer lines
- Hot-oil and wax-transfer systems
- Road tanker loading/unloading operations
- Industrial heating-fluid circulation

Construction:

Tube: Black, smooth synthetic rubber blend; oil, abrasion, and heat resistant
Reinforcement: High-tensile fiberglass calendared fabric with embedded steel wire helix
Cover: Black, smooth synthetic rubber blend; oil, abrasion, and heat resistant
Temperature Range: -30°C (-22°F) to 180°C (356°F)
Vacuum: Full
Safety Factor: 4:1

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
557TP16	25	1	48	1 3/4	14	200	102	4	2.01	1.34
557TP20	32	1 1/4	55	2	14	200	127	5	2.45	1.63
557TP24	38	1 1/2	61	2 1/2	14	200	152	6	2.70	1.80
557TP32	52	2	75	3	14	200	203	8	3.74	2.49
557TP40	63	2 1/2	88	3 1/2	14	200	254	10	4.49	2.99
557TP48	75	3	100	4	14	200	305	12	5.24	3.49
557TP64	100	4	127	5	10	150	406	16	8.88	4.92

Thorburn Series (N)557TP End Fittings and Clamps

Male Nipple

Female Cam Coupling Type C

Male Cam Adapter Type E

Interlocking Ground Joint

Swivel Flanges ANSI 150, 300, 600
PN 6,10, 16, 25, 40, 50, 64, 80
Series 70 & 80 Bolt-On

Fixed Flanges ANSI 150, 300, 600
PN 6,10, 16, 25, 40, 50, 64, 80
Series 70 & 80 Bolt-On

How To Order Thorburn Series (N)557TP Hose Assemblies

Hose Type	Hose Size	1st End	1st End Material	2nd End	2nd End Material	Crimp Material/ Clamp Material & QTY	OAL
(N)557TP	48	2	S6	3	S6	CLS62	120

Hose Size
16 = 1
20 = 1 1/4
24 = 1 1/2
32 = 2”
40 = 2 1/2
48 = 3”
64 = 4”

1st End Material / 2nd End Material
S6 = 316SS
CS = Plated Steel
YY = Specify

OAL
Overall Length (Inches)
For metric lengths use (mm) at end of the part #

1st End / 2nd End

1 = Combination Nipple Male NPT
2 = Combination Nipple Male BSP
3 = Combination Nipple Male BSPT
4 = Female Camlock Type C
5 = Male Camlock Type E
6 = Interlocking Ground Joint
7 = Threaded Hex Male NPT
8 = Threaded Hex Male BSPP
9 = Threaded Hex Male BSPT
10 = Threaded Hex Male NPT Union
11 = Threaded Hex Male BSPP Union
12 = Threaded Hex Male BSPT Union
13 = Threaded Hex Female NPT
14 = Threaded Hex Female BSPP
15 = Threaded Hex Female BSPT
16 = Threaded Hex Female NPT Union
17 = Threaded Hex Female BSPP Union
18 = Threaded Hex Female BSPT Union
19 = API 6A Type B Threaded Flange
20 = API 6A Type B Weld Neck Flange
21 = Fixed Flange ANSI B16.5 Class 150
22 = Fixed Flange ANSI B16.5 Class 300
23 = Fixed Flange ANSI B16.5 Class 600
24 = Fixed Flange PN 6
25 = Fixed Flange PN 10
26 = Fixed Flange PN 16
27 = Fixed Flange PN 25
28 = Fixed Flange PN 40
29 = Fixed Flange PN 50
30 = Fixed Flange PN 64
31 = Fixed Flange PN 80
32 = Swivel Flange ANSI B16.5 Class 150*
33 = Swivel Flange ANSI B16.5 Class 300*
34 = Swivel Flange PN 6*
35 = Swivel Flange PN 10*
36 = Swivel Flange PN 16*
37 = Swivel Flange PN 25*
38 = Female BSPP Series 70 71FBSPP
39 = Female BSPP Series 70 72FBSPP
40 = Male BSPT Series 70 73MBSPT
41 = Male BSPT Series 70 74MBSPT
42 = Fixed Flange Series 70 75FLX
43 = Fixed Flange Series 70 76FLX
44 = Swivel Flange Series 70 77FLXS*
45 = Swivel Flange Series 70 78FLXS*
46 = Female BSPP Series 80 81FBSPP
47 = Male BSPT Series 80 82MBSPT
48 = Fixed Flange Series 80 83FLX
49 = Swivel Flange Series 80 84FLXS*
XXX = Specify

*Material Codes for Swivel Flanges Only
S6S6 = 316SS Stub Insert & 316SS Flange
S6CS = 316SS Stub Insert & Carbon Steel Flange
CSCS = Carbon Steel Stub Insert & Carbon Steel Flange

Crimp Material/ Clamp Material & QTY

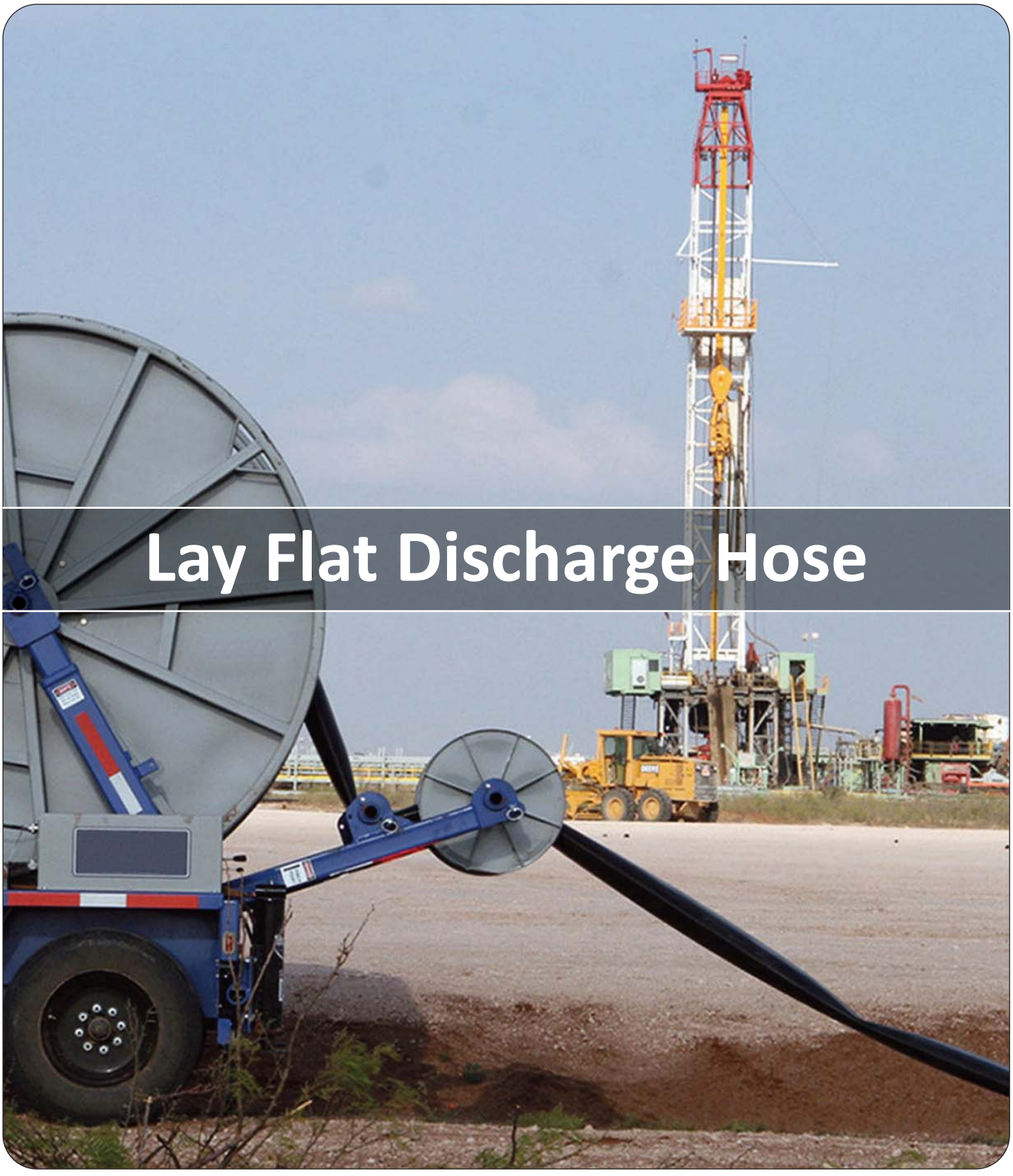
Crimp Ferrules
CR = Crimp
Materials
S6 = 316SS **CS** = Plated Steel

Clamps
CL = Clamps
Materials
S6 = 316SS **CS** = Plated Steel
Quantity of Clamps
(If **1** leave blank) **2, 3, 4**
(Specify # after clamp code)

Bolt-On Clamps
CL70 = 70BSC
Materials
S6 = 316SS **BB** = Brass
AL = Aluminum

CL80 = 80BSC
Materials
S6 = 316SS **BB** = Brass

Interlocking Clamps
71 = 2 Bolt **72** = 4 Bolt
73 = 6 Bolt
Materials
S6 = 316SS **BB** = Brass
MI = Maleable Iron



Lay Flat Discharge Hose

Thorburn TPU High Pressure Lay Flat Discharge Hose Assemblies

Thorburn's TPU lay flat hose assemblies provide flexibility and mobility to streamline efficient use of transferring large volume of liquids. Lay flat hoses can be easily transported by light weight vehicles to remote areas or places with limited infrastructure and can be deployed in harsh environments such as rocky mountain sides, oil spills and deep wells. Lay flat hose assemblies are ideal for rapid large volume dewatering due to less pressure drop over large distances reducing the need for connections. After use, lay flat hoses can be easily dismantled, cleaned, reeled up and relocated to a new site with minimal manual labor.

Features

- Minimal pressure loss & low friction
- Excellent abrasion and chemical resistance
- Transfers large volume of liquid
- Continuous operation at high pressures
- Terrain friendly, follows ground contours
- Easy access to remote areas
- Canadian CRN available upon request (N)

Thorburn Series (N)22TWHD TPU High Pressure Lay Flat Hose

High Pressure TPU Layflat Discharge Hose

Thorburn Series (N)22TWHD: Is designed to provide flexibility and mobility to streamline efficient use of transferring large volume of liquids. Lay flat hose assemblies are ideal for rapid large volume dewatering due to less pressure drop over large distances reducing the need for connections. After use, lay flat hoses can be easily dismantled, cleaned, reeled up and relocated to a new site with minimal manual labor.

Applications: Used for hydraulic fracture water transfer, to replace damaged hydrant lines, or to replace a broken water main, emergency rescue and disaster relief, remote water supply for municipal fire fighting, industrial sewage discharge and river dredging.

Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Design Pressure		Minimum Burst Pressure		Weight	
	mm	in	bar	PSI	bar	PSI	kg/m	lb/ft
(N)22TWHD16	25	1	17	250	52	750	0.20	0.13
(N)22TWHD32	50	2	17	250	52	750	0.29	0.19
(N)22TWHD48	75	3	17	250	52	750	0.45	0.30
(N)22TWHD64	100	4	17	250	52	750	1.0	0.67
(N)22TWHD80	130	5	17	250	52	750	1.2	0.81
(N)22TWHD96	150	6	17	250	52	750	2.0	1.34
(N)22TWHD128	200	8	17	250	52	750	3.0	2.02
(N)22TWHD160	250	10	17	250	52	750	6.0	4.03
(N)22TWHD192	300	12	14	200	41	600	6.2	4.17

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 Safety Factor required.

Construction
Tube: Smooth **T**PU (Thermoplastic polyurethane)
Reinforcement: High tensile calendered polyester
Cover: Smooth polyurethane
Cover Color: Black (Standard), Green (G), Blue (B), Yellow (Y), Brown (BR)
Operating Temperature:
-50°C (-58°F) to 80°C (176°F)
Maximum Continuous Length: 200 m (656 ft)
Typical Couplings:
Crimp Style Couplings (Standard)
Clamp Style Victaulic Couplings
(See Page 86)

Thorburn Series (N)22TWHP TPU High Pressure Lay Flat Hose

Very High Pressure TPU Discharge Layflat Hose

Thorburn Series (N)22TWHD: Is designed to operate at higher pressures than Thorburn's (N)22TWHP. Built to provide flexibility and mobility to streamline efficient use of transferring large volume of liquids. Lay flat hose assemblies are ideal for rapid large volume dewatering due to less pressure drop over large distances reducing the need for connections. After use, lay flat hoses can be easily dismantled, cleaned, reeled up and relocated to a new site with minimal manual labor.

Applications: Long distance fracking water transfer, industrial dewatering, discharge pumping, water irrigation, manure slurry pumping, wastewater delivery.

Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Design Pressure		Minimum Burst Pressure		Weight	
	mm	in	mm	in	bar	PSI	kg/m	lb/ft
(N)22TWHP64	102	4	29	420	87	1260	1.8	1.21
(N)22TWHP96	152	6	29	420	87	1260	4.0	2.69
(N)22TWHP128	203	8	21	300	62	900	4.2	2.82

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 Safety Factor required.

Construction
Tube: Smooth **T**PU (Thermoplastic polyurethane)
Reinforcement: High tensile calendered polyester
Cover: Smooth polyurethane
Cover Color: Black
Operating Temperature:
-50°C (-58°F) to 80°C (176°F)
Maximum Continuous Length: 200 m (656 ft)
Typical Couplings:
Crimp Style Couplings (Standard)
Clamp Style Victaulic Couplings
(See Page 86)

Thorburn TPU High Pressure Lay Flat Hose Standard Couplings

Victaulic Groove Style Hose Couplings

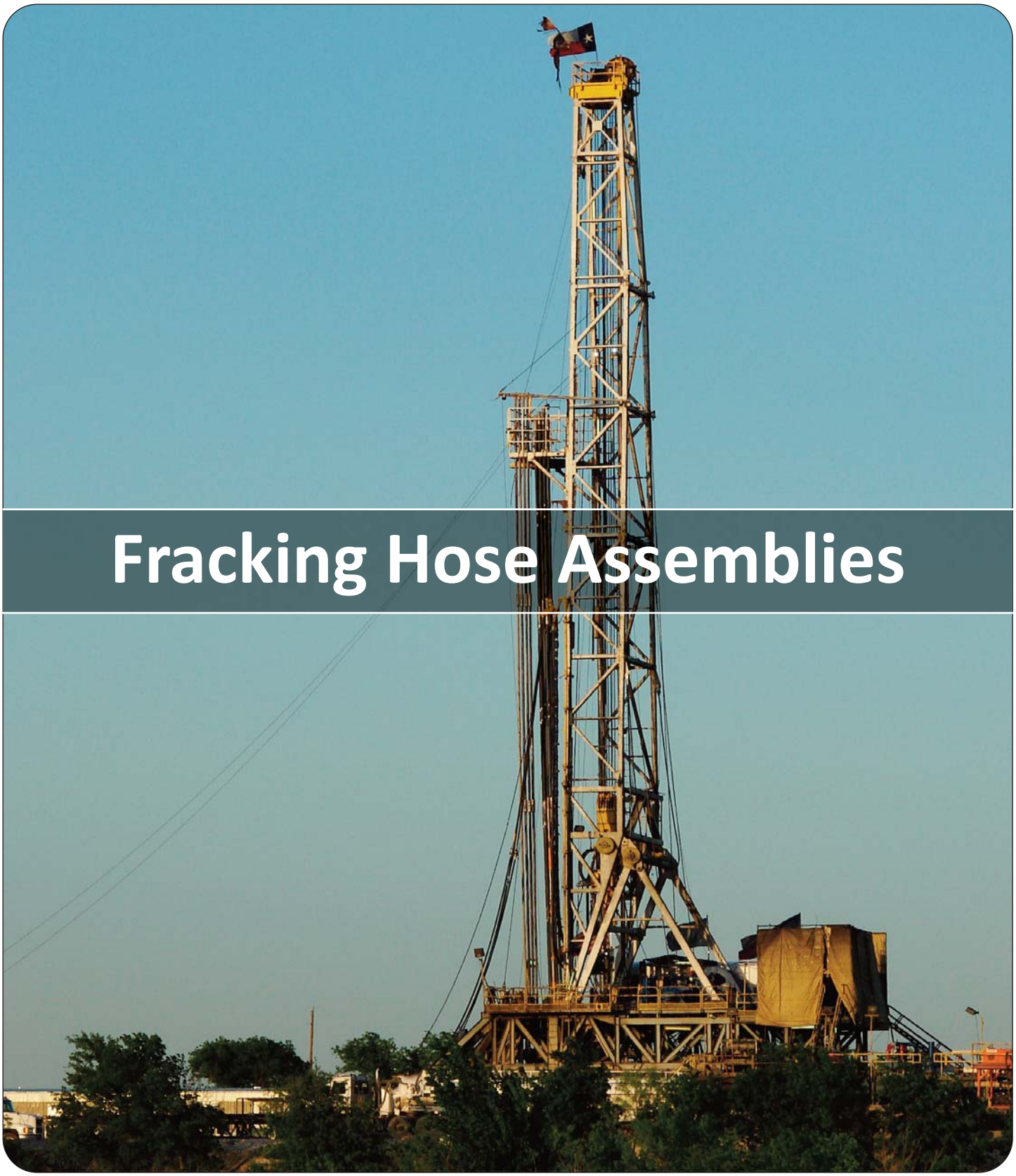
- Crimp Style (Standard)**(Code 01)**
- Clamp Style **(Code 02)**
- 316SS or aluminum material
- Full Bore design to minimize friction loss and increase flow
- Hard-coat anodized clamp for abrasion resistance
- Sizes: DN 25 (1”) to DN 300 (12”)
- Temperature: -50°C to 80°C (-58°F to 176°F)

Code 01
Crimp Style Victaulic Couplings (Standard)

Code 02
Clamp Style Victaulic Couplings

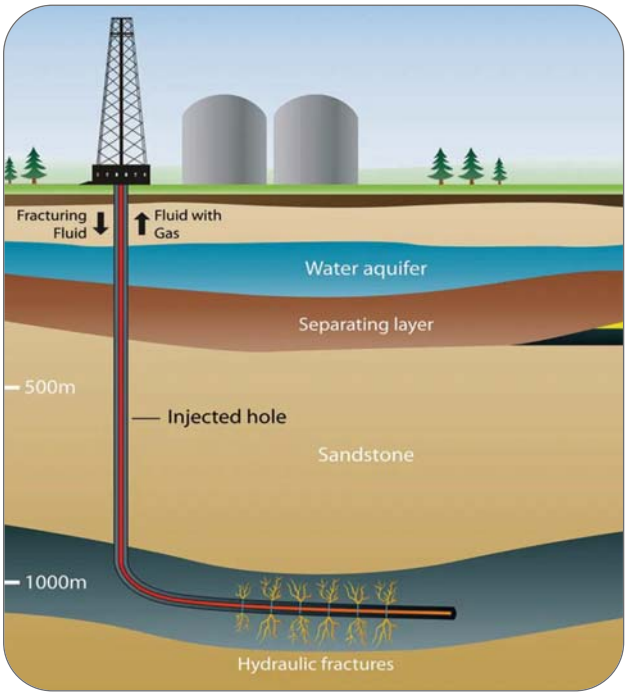
How To Order Thorburn High Pressure Layflat Hose Assemblies

Model	Size	1st End Coupling	2nd End Coupling	1st End Fitting Material	2nd End Fitting Material	Hose Length (in)
22TWHD	**64**	**02**	**02**	**S6**	**S6**	**600**
(N)22TWHD (N)22TWHP	**16 =** 1” **32 =** 2” **48 =** 3” **64 =** 4” **80 =** 5” **96 =** 6” **128 =** 8” **160 =** 10” **192 =** 12”	**01** = Victaulic Style (Crimp) **02** = Victaulic Style (Clamp) **XX** = Specify		**S6** = 316SS **AL** = Aluminum (Anodized)		For metric lengths use (mm) at end of the part #



Fracking Hose Assemblies

Thorburn Series TPX Fracking Hose



Fracking hoses connected to tank manifold

Thorburn Series TPX Fracking Hose Assemblies are engineered for the demanding conditions of modern hydraulic fracturing ("fracking") operations. Designed to safely and efficiently transfer a wide range of fracking fluids, these hoses play a critical role in maintaining reliable site performance, minimizing downtime, and ensuring environmental protection. Fracking (short for hydraulic fracturing) is the process of injecting a high-pressure mixture of water, sand (proppant), and chemical additives deep into shale formations to release trapped oil and natural gas.

The process involves several key stages:
Drilling: Vertical and horizontal wells are drilled into the shale rock formation.
Fluid Injection: High-pressure fluid is pumped into the wellbore to create fractures in the rock.
Fracturing: Sand particles hold these fractures open, forming channels for hydrocarbon flow.
Extraction: Oil and gas move through the open fractures to the surface for collection and processing.

As part of this process, Thorburn's Fracking Hoses are used throughout the well site for the transfer of water, oil, hydrochloric acid, brine, slurries, and other process fluids. Built to withstand harsh environments and variable fluid compositions, Thorburn hoses provide exceptional pressure capability, flexibility, and chemical resistance, making them a dependable choice for continuous, high-demand field operations.

Benefits:

High Working Pressure: Handles pressures up to 64 bar (1000 psi)
Lightweight & Flexible: Easier handling, faster deployment, and improved operator safety
Multi-Fluid Compatibility: Suitable for oil, water, chemical, and acid service
Field Durability: Designed for rugged, high-cycle use in extreme operating conditions
Custom Configurations: Available in multiple diameters, end fittings, and lengths to meet specific site requirements

Applications:

Ideal for the transfer of:
- Petroleum-based fluids
- Non-potable and salt water
- Brine and mild chemicals
- Slurries and sludge

Thorburn Fracking Hose

Thorburn Series (N)52TPX Low Pressure 150 PSI (10 BAR) Fracking Hose

Specifications:

Temperature Range: -40°C (-40°F) to 70°C (158°F)
Safety Factor: 4:1 for all sizes
CRN: Available for all sizes (upon request)

Construction:

Tube: Synthetic and natural rubber blend
Reinforcement: 4 braids of high tensile fabric with single wire helix
Cover: SBR Blend. Optional UHMWP wear cover (add suffix "U" to part #)

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
52TPX32(U)	51	2	62	2.4	10	150	200	7.9	1.7	1.1
52TPX48(U)	76	3	94	3.7	10	150	340	13.4	2.8	1.9
52TPX64(U)	102	4	122	4.8	10	150	450	17.2	3.8	2.6
52TPX96(U)	152	6	178	7.0	10	150	700	27.6	7.2	4.8

U = Optional UHMWP wear cover

Thorburn Series (N)552TPX Low Pressure 400 PSI (28 BAR) Fracking Hose

Specifications:

Temperature Range: -40°C (-40°F) to 93°C (200°F)
Safety Factor: 4:1 for all sizes
CRN: Available for all sizes (upon request)

Construction:

Tube: Nitrile blend
Reinforcement: 2 braids of high tensile plated steel
Cover: Black Nitrile/PVC blend oil, ozone & UV resistant.
Optional UHMWP wear cover (add suffix "U" to part #)

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
52TPX48(U)	76	3	94	3.7	28	400	950	38	4.32	2.9
52TPX64(U)	102	4	122	4.8	28	400	1050	42	5.92	4.0
52TPX96(U)	152	6	178	7.0	28	400	1300	51	9.12	6.1

U = Optional UHMWP wear cover

Thorburn Fracking Hose

Thorburn Series (N)62TPX Medium Pressure 500 PSI (34 BAR) Fracking Hose

Specifications:

Temperature Range: -40°C (-40°F) to 82°C (180°F)
Safety Factor: 4:1 for all sizes
CRN: Available for all sizes (upon request)

Construction:

Tube: Synthetic rubber blend
Reinforcement: Multiple braids of high tensile fabric with single wire helix
Cover: Black abrasion & UV resistant rubber.
Optional UHMWP wear cover (add suffix "U" to part #)

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
52TPX48(U)	51	2	66	2.6	34	500	500	19.7	4.0	2.7
52TPX48(U)	76	3	98	3.9	34	500	650	25.6	6.8	4.6
52TPX64(U)	102	4	129	5.1	34	500	800	31.5	9.1	6.1

U = Optional UHMWP wear cover

Thorburn Series (N)662TPX High Pressure 1000 PSI (69 BAR) Fracking Hose

Specifications:

Temperature Range: -40°C (-40°F) to 93°C (200°F)
Safety Factor: 4:1 for all sizes
CRN: Available for all sizes (upon request)

Construction:

Tube: Nitrile blend
Reinforcement: 4 spiral braids of high tensile plated steel
Cover: Black Nitrile/PVC blend oil, ozone & UV resistant.
Optional UHMWP wear cover (add suffix "U" to part #)

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
662TPX48(U)	80	3	117	4.6	69	1000	1100	43	15	10.1
662TPX64(U)	100	4	142	5.6	69	1000	1200	47	18	11.8
662TPX96(U)	150	6	192	7.6	69	1000	1500	59	25	16.8

U = Optional UHMWP wear cover

Thorburn Fracking Hose Standard End Fittings

Combination Nipple

Female Cam Coupling Type C

Male Cam Adapter Type E

Interlocking Ground Joint (Male/Female)

API 6A Type 6B Flange

Fixed Flanges ANSI 150, 300, 600
PN 6,10, 16, 25, 40, 50, 64, 80
Series 70 & 80 Bolt-On

Swivel Flanges ANSI 150, 300, 600
PN 6,10, 16, 25, 40, 50, 64, 80
Series 70 & 80 Bolt-On

Hex Connector (Male/Female)
NPT, BSPT, BSPP
Series 70 & 80 Bolt-On

Victaulic Groved

Thorburn Fracking Hose

How To Order Thorburn Series (N)52TP Hose Assemblies

Hose Type	Hose Size	Tube	Cover	1st End	1st End Material	2nd End	2nd End Material	Crimp Material/ Clamp Material & QTY	OAL
(N)52TPX	48	U	U	2	S6	3	S6	CLS62	120

52TPX
552TPX
62TPX
662TPX

32 = 2”
48 = 3”
64 = 4”
96 = 6”

Blank = Nitrile/PVC Blend
U = UHMW

S6 = 316SS
CS = Plated Steel
YY = Specify

Overall Length (Inches)
For metric lengths use (mm) at end of the part #

Crimp Ferrules
CR = Crimp

Materials
S6 = 316SS
CS = Plated Steel

Clamps
CL = Clamps
Materials
S6 = 316SS
CS = Plated Steel
Quantity of Clamps
(If **1** leave blank) **2, 3, 4**
(Specify # after clamp code)

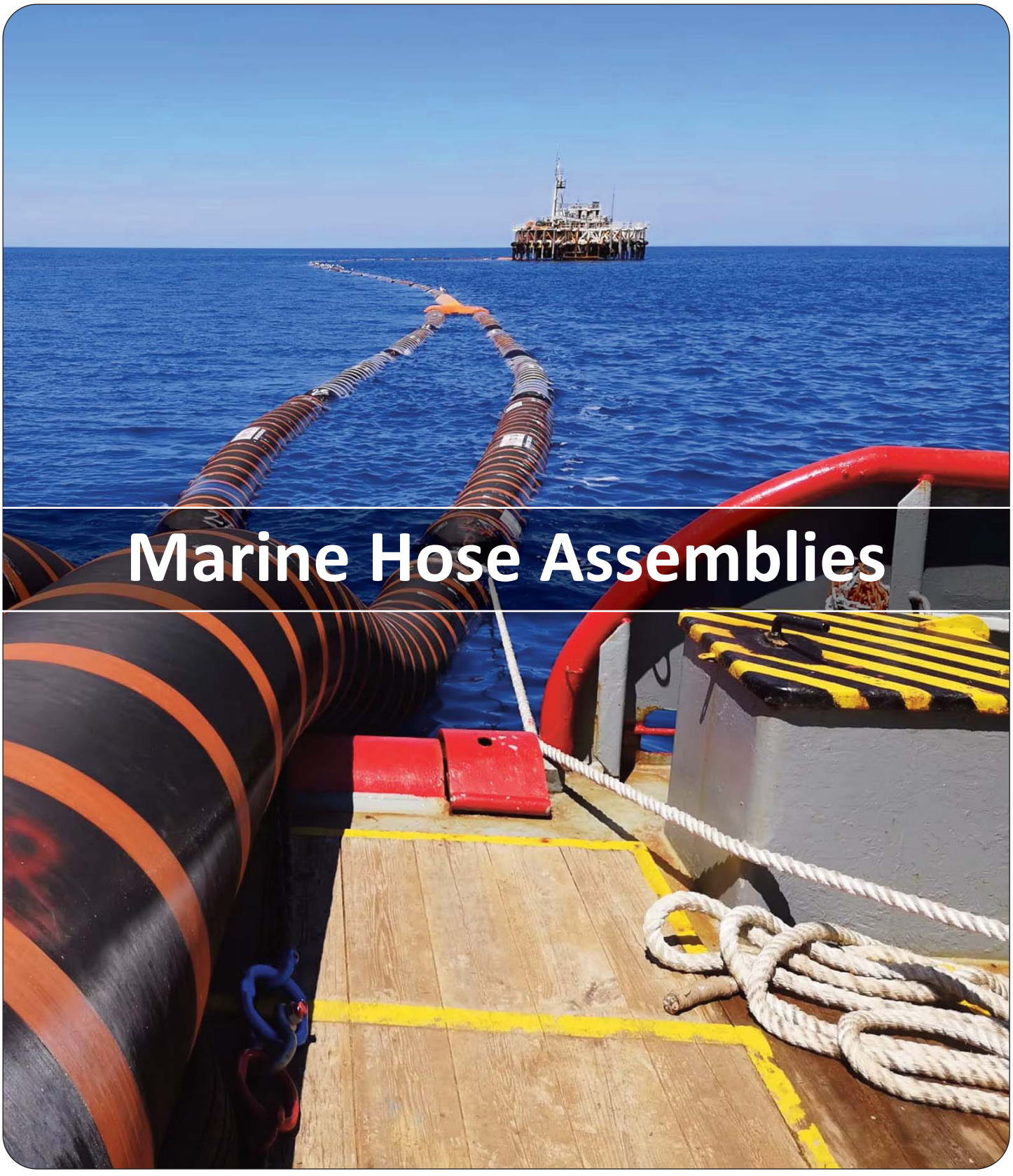
Bolt-On Clamps
CL70 = 70BSC
Materials
S6 = 316SS
AL = Aluminum
BB = Brass

CL80 = 80BSC
Materials
S6 = 316SS
BB = Brass

Interlocking Clamps
71 = 2 Bolt
72 = 4 Bolt
73 = 6 Bolt
Materials
S6 = 316SS
MI = Maleable Iron
BB = Brass

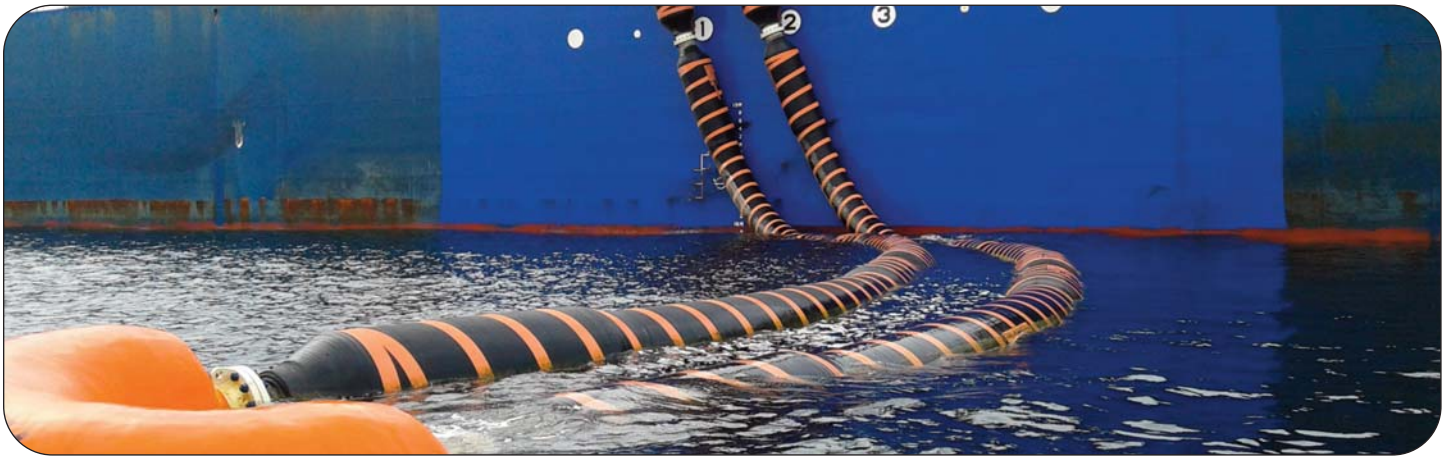
1 = Combination Nipple Male NPT
2 = Combination Nipple Male BSP
3 = Combination Nipple Male BSPT
4 = Female Camlock Type C
5 = Male Camlock Type E
6 = Interlocking Ground Joint
7 = Threaded Hex Male NPT
8 = Threaded Hex Male BSPP
9 = Threaded Hex Male BSPT
10 = Threaded Hex Male NPT Union
11 = Threaded Hex Male BSPP Union
12 = Threaded Hex Male BSPT Union
13 = Threaded Hex Female NPT
14 = Threaded Hex Female BSPP
15 = Threaded Hex Female BSPT
16 = Threaded Hex Female NPT Union
17 = Threaded Hex Female BSPP Union
18 = Threaded Hex Female BSPT Union
19 = API 6A Type B Threaded Flange
20 = API 6A Type B Weld Neck Flange
21 = Fixed Flange ANSI B16.5 Class 150
22 = Fixed Flange ANSI B16.5 Class 300
23 = Fixed Flange ANSI B16.5 Class 600
24 = Fixed Flange PN 6
25 = Fixed Flange PN 10
26 = Fixed Flange PN 16
27 = Fixed Flange PN 25
28 = Fixed Flange PN 40
29 = Fixed Flange PN 50
30 = Fixed Flange PN 64
31 = Fixed Flange PN 80
32 = Swivel Flange ANSI B16.5 Class 150*
33 = Swivel Flange ANSI B16.5 Class 300*
34 = Swivel Flange PN 6*
35 = Swivel Flange PN 10*
36 = Swivel Flange PN 16*
37 = Swivel Flange PN 25*
38 = Female BSPP Series 70 71FBSPP
39 = Female BSPP Series 70 72FBSPP
40 = Male BSPT Series 70 73MBSPT
41 = Male BSPT Series 70 74MBSPT
42 = Fixed Flange Series 70 75FLX
43 = Fixed Flange Series 70 76FLX
44 = Swivel Flange Series 70 77FLXS*
45 = Swivel Flange Series 70 78FLXS*
46 = Female BSPP Series 80 81FBSPP
47 = Male BSPT Series 80 82MBSPT
48 = Fixed Flange Series 80 83FLX
49 = Swivel Flange Series 80 84FLXS*
XXX = Specify

*Material Codes for Swivel Flanges Only
S6S6 = 316SS Stub Insert & 316SS Flange
S6CS = 316SS Stub Insert & Carbon Steel Flange
CSCS = Carbon Steel Stub Insert & Carbon Steel Flange



Marine Hose Assemblies

Thorburn Series FL1 Floating Hose



Thorburn Series FL1 Floating Hoses are engineered for reliable offshore transfer of crude oil, petroleum products, and other bulk liquids. Designed in accordance with OCIMF (Oil Companies International Marine Forum) guidelines, the FL1 Series provides a robust, buoyant, and flexible solution for Ship-to-Ship (STS), Ship-to-Shore (STS), and Single Point Mooring (SPM) operations. Constructed with a multi-carcass design reinforced with high-tensile steel wire, these hoses combine strength, flexibility, and safety for demanding marine environments. Integrated foam-filled floatation collars maintain positive buoyancy and high visibility, ensuring ease of handling and safe operation even in rough sea conditions. The oil- and abrasion-resistant outer cover protects against harsh environmental exposure, while precision-engineered end fittings provide secure, leak-free connections to tankers, buoys, and onshore terminals.

Features

OCIMF-Compliant Design: Meets international standards for offshore loading and discharge systems.
Multi-Carcass Reinforcement: Multiple carcass layers with steel wire helix for superior pressure containment and collapse resistance.
Durable Outer Cover: Highly resistant to oil, abrasion, UV, and seawater.
Buoyant Construction: Foam-filled floatation collars ensure the hose remains afloat and visible at all times.
Leak-Free Connections: Precision-machined end fittings for secure integration with manifold and buoy systems.
Operational Safety: Designed to maintain integrity under dynamic wave, current, and mooring conditions

CALM/SPM Buoy System

Applications

- CALM / SPM Cargo Transfer Systems
- Tandem Cargo Offloading Systems
- Ship-to-Ship & Ship-to-Shore Transfer
- Marine and Industrial Liquid Handling

Tandem Cargo Offloading - Mooring System

Hose Specifications:

Carcass: Single or Double
Reinforcement: Polyester or steel wire cord
Working Pressure: 15 bar (218 psi), 19 bar (276 psi), 21 bar (305 psi)
Temperature Range: -40°C (-40°F) to +82°C (180°F)
Inner Diameter: 6" to 24" (customizable)
Safety Factor: 5:1 for all sizes
Electrically (as requested): Continuous / Discontinuous

Thorburn Series FL1 Floating Hose

Thorburn Series FL1-1 First Off Buoy Hose

Thorburn Series FL1-1 First Off Buoy Hose is designed with one end reinforced and the other end floating used in connecting the single point mooring Buoy system or CALM (Catenary Anchor Leg Mooring) Buoy system to transport crude oil and petroleum between FPSO and tanker. The purpose of the reinforced end is to move the bending movement towards the more flexible mid-section of the hose.

Ordering: See Page 103

Thorburn Series FL1-2 Mainline Hose

Thorburn Series FL1-2 Mainline Hose is specifically designed for the transfer of crude oil and petroleum between loading and unloading vessels at offshore mooring systems. The construction of the hose is uniform along the hose length and is the typical hose within a floating hose string.

Ordering: See Page 103

Thorburn Series FL1-3 Tapered/Reducer Hose

Thorburn Series FL1-3 Tapered/Reducer Hose is specifically designed to achieve a reliable connection of mainline hoses with large diameters and rubber oil hose with small diameters. Typical reductions are 24/20”, 20/16”, 16/12”

Ordering: See Page 103

Thorburn Series FL1-4 Tail Hose

Thorburn Series FL1-4 Tail Hose is a full floating hose designed to connect with tanker rail hoses used for transporting crude oil and petroleum. The hose construction is optimized for strength, flexibility and weight.

Ordering: See Page 103

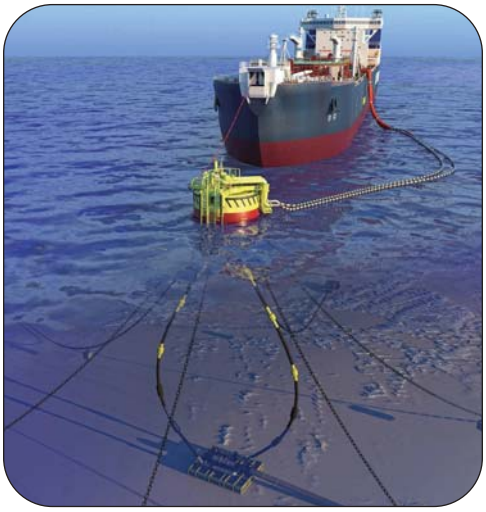
Thorburn Series FL1-5 Tanker Rail Hose

Thorburn Series FL1-5 Tanker Rail Hose is installed on the ship side and is designed to connect with pipeline end manifolds (PLEMs) of a floating production storage offloading FPSO unit. The barbell shaped buoyancy jackets provide increased flexibility in the mid-section.

Ordering: See Page 103

Thorburn Series SS1 Submarine/Subsea Hose

CBM/MBM Cargo Transfer System with Submarine Hoses



CALM/SPM Cargo Transfer System with Subsea Hoses

Single carcass hose with float collars attached (Code FC)

Thorburn Series SS1 Submarine (Subsea) Hoses are engineered for the underwater transfer of crude oil, refined fuels, and gases between subsea installations, production platforms, and tankers. Built to perform under extreme oceanic conditions, these hoses combine superior flexibility, high pressure capability, and environmental protection for safe, continuous offshore operations.

Each SS1 hose features a multi-layered construction with an oil-resistant inner lining, reinforced by high-tensile steel or fabric layers to resist external pressure and bending fatigue. Optional double-carcass designs incorporate an independent secondary containment layer, providing an additional safeguard against leaks and environmental pollution in case of primary carcass failure.

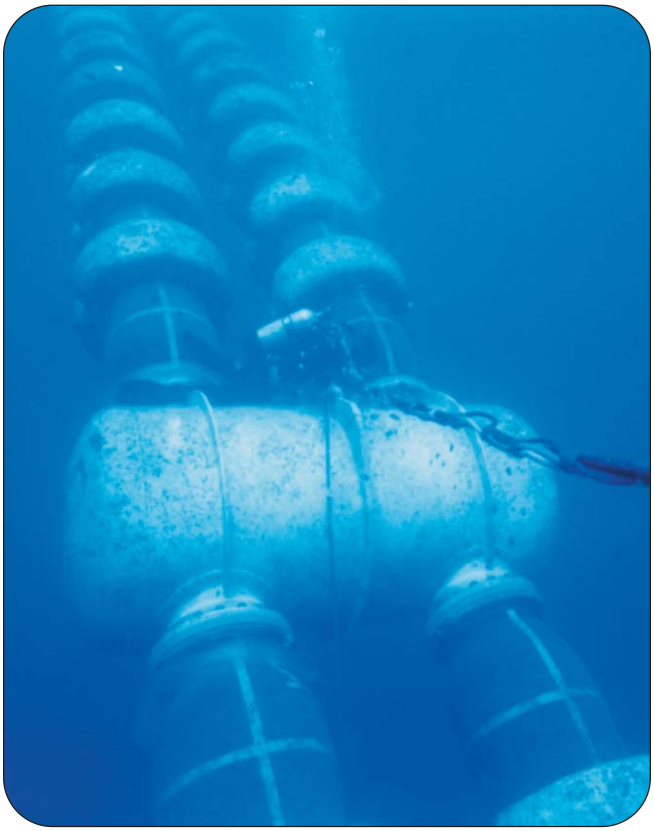
Features:

Heavy-Duty Multi-Carcass Construction: Inner oil-resistant tube with multiple reinforcement layers for maximum strength and flexibility.
Double-Carcass Safety Design (Optional): Secondary containment hose prevents leakage and protects the marine environment.
High Pressure & Fatigue Resistance: Engineered to withstand dynamic subsea loading, bending, and crushing forces.
Corrosion & Abrasion Resistant: For long service life in harsh subsea conditions.
Float Collar Options: Available with integrated buoyancy collars to maintain mid-water positioning and reduce seabed wear.
Emergency Disconnection Protection: Compatible with marine breakaway couplings to prevent spills during over-tension events

Hose Specifications:

Carcass: Single or Double
Reinforcement: Polyester or steel wire cord
Working Pressure: 15 bar (218 psi), 19 bar (276 psi), 21 bar (305 psi)
Temperature Range: -40°C (-40°F) to +82°C (180°F)
Inner Diameter: 6" to 24" (customizable)
Safety Factor: 5:1 for all sizes
Electrically (as requested): Continuous / Discontinuous

Thorburn Series SS1 Submarine/Subsea Hose



Applications:

CBM/MBM Cargo Transfer Systems: A Conventional Buoy Mooring system (CBM or MBM) is used in relatively shallow water close to shore. The cargo loading/offloading negatively buoyant submarine hose string are connected to the subsea pipelines PLEM (Pipeline End Manifold) and left resting on the seabed between operations.

CALM/SPM Cargo Transfer Systems: In CALM/ SPM cargo transfer systems the buoy is connected to the PLEM (Pipeline End Manifold) by flexible subsea hoses. The configurations can take the form of a Chinese lantern, Lazy-S, Lazy Wave, or Steep-S depending on depth, sea state, buoy motions, and other factors. Marine breakaway couplings enable for emergency pipeline disconnection to prevent hose breakage and associated oil spills.

Offshore Oil & Gas Operations: Ideal for loading and unloading crude oil, refined products, or process fluids between FPSOs, FSOs, and subsea infrastructure.

Emergency Transfer Systems: Suitable for critical applications requiring redundant hose systems and fast-acting safety couplings.

Thorburn Series SS1-1 First Off PLEM/Buoy Submarine Hose

Thorburn Series FL1-1 First Off PLEM/Buoy Hose is designed with one end reinforced (has white band) for use at locations where the hose strings are attached to rigid manifolds. The reinforced end is designed to direct the bending movement towards the more flexible mid-section of the hose.

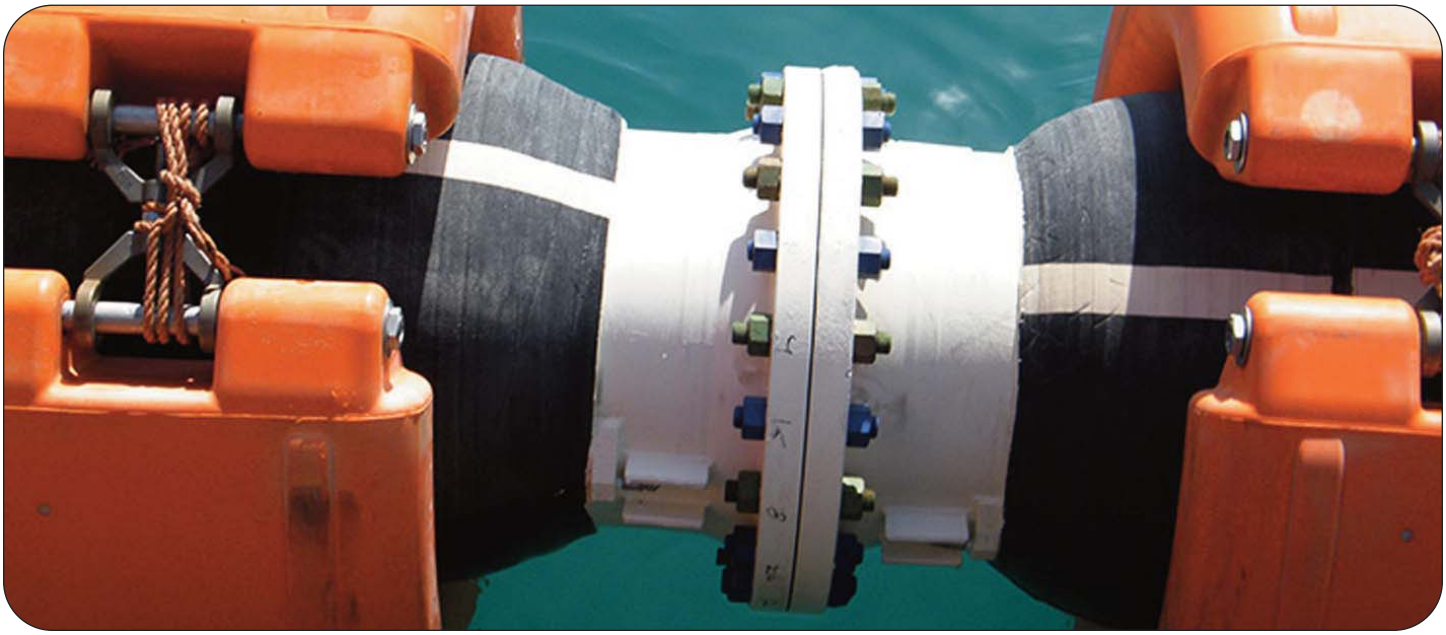
Ordering: See Page 103

Thorburn Series SS1-1C First Off PLEM/Buoy Subsea Hose with Location Collars

Thorburn Series SS1-1C First Off PLEM/Buoy Hose has floating collars put on the unreinforced part of the submarine hose body which simplifies float installation in dynamic marine settings and ensures consistent positioning during subsea oil and gas transfer.

Ordering: See Page 103

Thorburn Series SS1 Submarine/Subsea Hose



Thorburn Series SS1-2 Mainline Submarine Hose

Thorburn Series SS1-2 Mainline Hose construction is uniform along the hose length and is the typical hose within a hose string.

Ordering: See Page 103

Thorburn Series SS1-2C Mainline Subsea Hose with 7 Location Collars

Thorburn Series SS1-2C Mainline Hose construction is uniform along the hose length and is the typical hose within a hose string. Hose comes with 7 collars, which simplifies float installation in dynamic marine settings and ensures consistent positioning during subsea oil and gas transfer

Ordering: See Page 103

Thorburn Series SS1-3 Reducer Submarine Hose

Thorburn Series SS1-3 Tapered/Reducer Hose is specifically designed to achieve a reliable connection of mainline hoses with large diameters and rubber oil hose with small diameters. Typical reductions are 24/20”, 20/16”, 16/12”

Ordering: See Page 103

Thorburn Series SS1 Submarine/Subsea Hose

Thorburn Series SS1-4 Tail Submarine Hose

Thorburn Series SS1-4 Tail Hose is designed to connect with tanker rail hoses used for transporting crude oil and petroleum. The hose construction is optimized for strength, flexibility and weight.

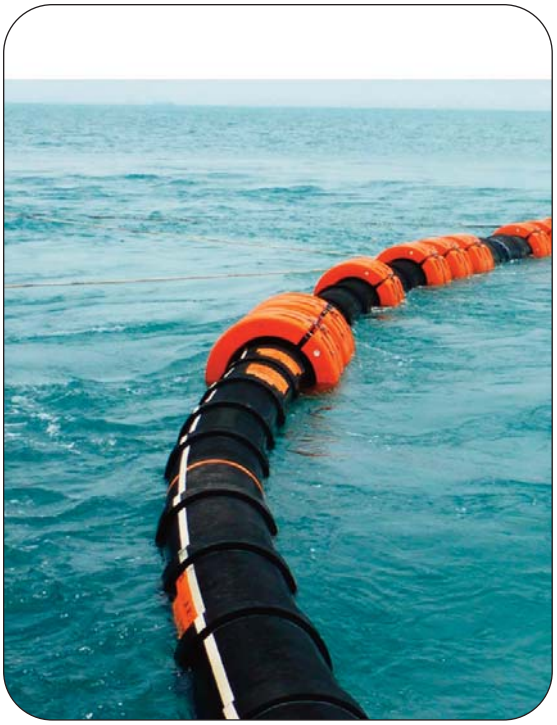
Ordering: See Page 103

Thorburn Series SS1-5 Tanker Rail Submarine Hose

Thorburn Series SS1-5 Tanker Rail Hose is installed on the ship side and is designed to connect with pipeline end manifolds

Ordering: See Page 103

Thorburn Subsea Location Collars



Subsea Hose with integrated location collars and floating collars attached

Thorburn Subsea Location Collars are engineered buoyancy and positioning devices designed to maintain the stability, alignment, and depth of subsea hose strings in offshore loading and discharge systems. Integrated directly onto submarine hoses, these collars provide precise buoyancy control and positional stability within Single Buoy Mooring (SBM) and Submarine Hose String configurations. Constructed from high-strength, closed-cell buoyant materials encased in a robust polyurethane or composite shell, Thorburn SS1 Collars are built to endure extreme marine environments, including high pressure, turbulence, and impact loading.

Benefits

Accurate Hose Positioning: Maintains proper hose alignment and spacing
Optimized Buoyancy Control: Provides reliable lift and depth management
Enhanced System Stability: Reduces dynamic movement and hose strain
Rugged Marine Construction: Corrosion-resistant & impact-tolerant
Easy Integration: Designed for quick installation and secure attachment to Thorburn SS1 subsea hose assemblies.
Low Maintenance: Closed-cell construction prevents water ingress

Applications

- Single Buoy Mooring (SBM) Systems
- Submarine Hose Strings
- Offshore Production and Storage Facilities
- Dynamic Marine Environments

Thorburn Series 60TMH-NLS Ship-to-Ship/Ship-to-Shore Hose

Thorburn Series 60TMH-NLS Ship-to-Ship and Ship-to-Shore Transfer Hoses are engineered for the safe and efficient handling of petroleum products and a wide range of liquid chemicals. Designed for both suction and discharge operations, these heavy-duty hoses deliver exceptional flexibility, strength, and chemical resistance for demanding marine transfer applications.Each hose is built with a nitrile or high-grade synthetic rubber inner tube reinforced with multiple high-tensile textile cords and an embedded steel wire helix to provide superior vacuum resistance and pressure capability. The oil-, ozone-, and abrasion-resistant outer cover ensures durability in harsh marine environments, while integrated permanent couplings—such as flanges or nipples—guarantee secure and leak-free connections during transfer operations.

Features:

Dual-Purpose Design: Suitable for both suction and discharge service.
High Chemical Resistance: Handles petroleum products with aromatic content up to 100%.
Robust Reinforcement: Multi-layer textile cords and steel wire helix provide strength, flexibility, and crush resistance.
Weather & Oil Resistant Cover: Engineered to withstand sunlight, salt spray, oil, and abrasion.
Permanent Couplings: Built-in, factory-installed fittings ensure secure and long-lasting connections.
Temperature Range: Designed to operate reliably under varied temperature and pressure conditions typical of marine fuel transfer.

Applications:

- Ship-to-Shore Transfer
- Ship-to-Ship Transfer
- Bunkering Operations
- Terminal Loading/Unloading

Thorburn Series 60TMH-NLS Ship-to-Ship/Ship-to-Shore Hose

Thorburn Series (N)60TMH-NLS 150 PSI (10 BAR) Hose

Construction:
Tube: Nitrile blend with an aromatic content up to 50%, UHMW, FKM, PTFE up to 100%
Reinforcement: Multiple plies of high tensile polyester cord with embedded steel wire helix
Cover: Neoprene Blend (Type C)
Temperature Range: -20°C (-4°F) to 82°C (180°F)
Maximum Length: Up to 60 meters
Safety Factor: 4:1 for all sizes

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
60TMH-NLS-150-32	51	2	79	3.1	10	150	474	18.7	3.9	2.6
60TMH-NLS-150-48	76	3	105	4.1	10	150	625	24.6	5.8	3.9
60TMH-NLS-150-64	102	4	132	5.2	10	150	795	31.2	8.1	5.4
60TMH-NLS-150-96	152	6	184	7.2	10	150	1097	43.2	14.9	10.0
60TMH-NLS-150-128	203	8	241	9.4	10	150	1433	56.4	23.1	15.5
60TMH-NLS-150-160	254	10	295	11.6	10	150	1768	69.6	30.2	20.3
60TMH-NLS-150-192	305	12	348	13.7	10	150	2088	82.2	39.1	26.3
60TMH-NLS-150-256	406	16	440	17.3	10	150	2637	103.8	76.8	51.6

Other sizes available on special order up to 24" (DN600)

Thorburn Series (N)60TMH-NLS 225 PSI (15 BAR) Hose

Construction:
Tube: Nitrile blend with an aromatic content up to 50%, UHMW, FKM, PTFE up to 100%
Reinforcement: Multiple plies of high tensile steel wire helix
Cover: Neoprene Blend (Type C)
Temperature Range: -20°C (-4°F) to 82°C (180°F)
Maximum Length: Up to 60 meters
Safety Factor: 4:1 for all sizes

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
60TMH-NLS-225-48	76	3	116	4.6	15	225	696	27.4	6.0	4.0
60TMH-NLS-225-64	102	4	144	5.7	15	225	864	34.0	8.7	5.8
60TMH-NLS-225-96	152	6	201	7.9	15	225	1206	47.5	14.6	9.8
60TMH-NLS-225-128	203	8	261	10.3	15	225	1566	61.7	23.6	15.9
60TMH-NLS-225-160	254	10	312	12.3	15	225	1872	73.7	28.5	19.2
60TMH-NLS-225-192	305	12	358	14.1	15	225	2148	84.6	30.1	20.2

Other sizes available on special order up to 24" (DN600)

Thorburn Series 60TMH-NLS Ship-to-Ship/Ship-to-Shore Hose

Thorburn Series (N)60TMH-NLS 300 PSI (21 BAR) Hose

Construction:

Tube: Nitrile blend with an aromatic content up to 50%, UHMW, FKM, PTFE up to 100%
Reinforcement: Multiple plies of high tensile wire cord
Cover: Neoprene Blend (Type C)
Temperature Range: -20°C (-4°F) to 82°C (180°F)
Maximum Length: Up to 60 meters
Safety Factor: 4:1 for all sizes

Thorburn Part Number	Nominal Hose ID		Nominal Hose OD		Working Pressure		MBR		Weight	
	(mm)	(in)	(mm)	(in)	(bar)	(psi)	(mm)	(in)	(kg/m)	(lbs/ft)
60TMH-NLS-300-64	102	4	140	5.5	21	300	840	33.1	22.3	15
60TMH-NLS-300-96	152	6	198	7.8	21	300	1188	46.8	35.7	24
60TMH-NLS-300-128	203	8	262	10.3	21	300	1572	61.9	44.6	30
60TMH-NLS-300-160	254	10	310	12.2	21	300	1860	73.2	53.5	36
60TMH-NLS-300-192	305	12	361	14.2	21	300	2166	85.3	58.0	39

Other sizes available on special order up to 24" (DN600)

Thorburn Marine Hose End Fittings

Fixed Flange - ANSI, PN

Swivel Flange - ANSI, PN

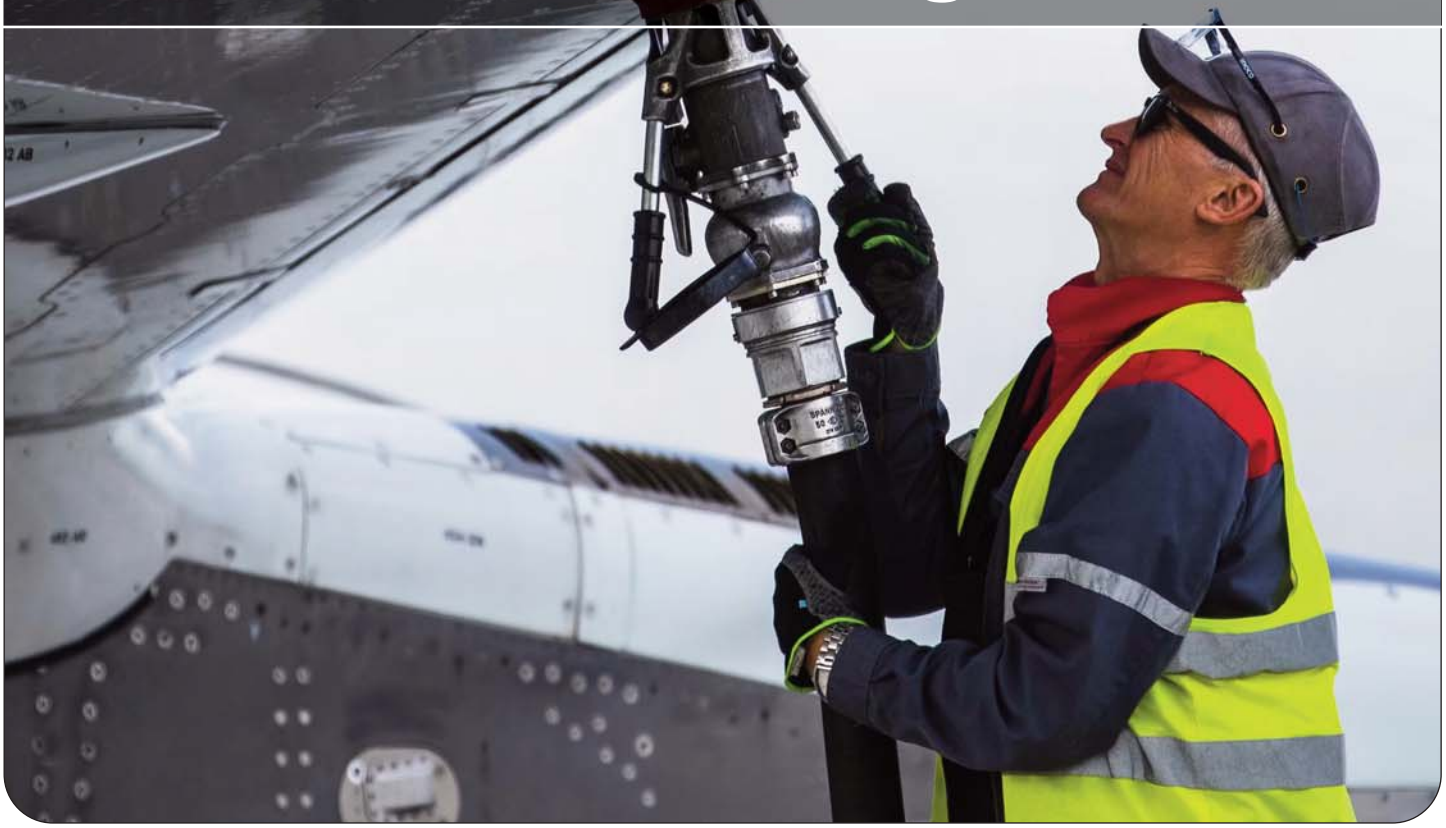
Victaulic Grooved

How To Order Thorburn Marine Hose Assemblies

Hose Model	Size	Tube Material	Cover Material	1st End	1st End Material	2nd End	2nd End Material	End Fitting Type	OAL	Option
(N)FL1-2	**96**	**D**	**C**	**02**	**S6**	**02**	**S6**	**B1**	**300**	**FC8**
(N)FL1-1 **(N)FL1-2** **(N)FL1-3** **(N)FL1-4** **(N)FL1-5** **(N)SS1-1** **(N)SS1-1C** **(N)SS1-2** **(N)SS1-2C** **(N)SS1-3** **(N)SS1-4** **(N)SS1-5** **(N)60TMH-NLS-150** **(N)60TMH-NLS-225** **(N)60TMH-NLS-300**	**64** = 4” **96** = 6” **128** = 8” **160** = 10” **192** = 12”	**C** = Neoprene Blend **D** = Nitrile Blend **I** = FKM **J** = PTFE **M** = HNBR **U** = UHMW	**C** = Neoprene Blend **I** = FKM **M** = HNBR	**01** = Fixed Flange ANSI 150 **02** = Fixed Flange ANSI 300 **03** = Fixed Flange PN 10 **04** = Fixed Flange PN 16 **05** = Fixed Flange PN 25 **06** = Fixed Flange PN 40 **07** = Swivel Flange ANSI 150 **08** = Swivel Flange ANSI 300 **09** = Swivel Flange PN 10 **10** = Swivel Flange PN 16 **11** = Swivel Flange PN 25 **12** = Swivel Flange PN 40 **13** = Victaulic Grooved	**S6** = 316SS **S4** = 304SS **CS** = Plated Steel		**S6** = 316SS **S4** = 304SS **CS** = Plated Steel	**B1** = Built-In **CR** = Crimped	Overall Length (Inches) For metric lengths use Millimeters (mm) or Meters (m) at end of the part #	**FC** = Float Collar **QTY** = # of Float Collars None = Leave Blank

Subsea Float Collars (Code FC)

Aviation Fuelling Hose



Thorburn Aviation Fuelling Hose Assemblies

Thorburn Series (N)5556TPX

Aviation Fueling & De-Fueling Hose

Thorburn Series (N)5556TPX: is a premium-grade hose specifically engineered for the safe transfer of aviation fuels during fueling and defueling operations. Designed for both commercial and private aircraft, this hose is suitable for handling Jet A, Jet A-1, JP-8, and high-aromatic aviation gasoline (Avgas). Its static-dissipating construction and multi-layered reinforcement provide safe, durable, and flexible performance in ground refueling environments

Key Features

- Compatible with all common grades of aviation fuel, including jet fuels and aromatic aviation gasoline
- Static-dissipative construction reduces risk of spark and explosion
- Reinforced with multiple spiral layers of synthetic fabric for strength and flexibility
- Designed for smooth operation and long service life in both fueling and defueling applications
- Wide temperature operating range for varied climate conditions

Applications

- Refueling and defueling of commercial, military, and private aircraft
- Fixed-base operator (FBO) fueling operations
- Mobile aircraft fueling trucks and hydrant systems
- Ground fueling systems at airports and helipads

Construction

Tube: Black synthetic rubber blend , resistant to jet fuel and aromatic hydrocarbons
Reinforcement: Multiple spiral layers of high-strength synthetic fabric
Cover: Black, static-dissipating synthetic rubber, abrasion and weather resistant
Operating Temperature: -67°F to +176°F (-55°C to +80°C)
Safety Factor: 3:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Weight	
	mm	in	mm	in	bar	psi	kg/m	lb/ft
(N)5556TPX16	25	1	40	1.6	21	300	0.9	0.6
(N)5556TPX20	32	1 1/4	48	1.9	21	300	1.3	0.8
(N)5556TPX24	38	1 1/2	54	2.1	21	300	1.4	1.0
(N)5556TPX32	51	2	69	2.7	21	300	2.1	1.4
(N)5556TPX40	64	2 1/2	82	3.2	21	300	2.6	1.7
(N)5556TPX48	76	3	94	3.7	21	300	3.0	2.0
(N)5556TPX64	102	4	122	4.8	21	300	4.3	2.9

N is used in the part number only when a Canadian CRN is required, when a code requirement must be met or material traceability is required. 4:1 safety factor required.

Thorburn Aviation Fuelling Hose End Fittings

5556TPX-MP | Male NPT Solid Crimp

Thorburn Part #	Hose ID		Thread Size (NPT)
	mm	in	in
556TPX-16-16-MP	25	1	1 - 11 1/2
556TPX-20-20-MP	32	1 1/4	1 1/4 - 11 1/2
556TPX-24-24-MP	38	1 1/2	1 1/2 - 11 1/2
556TPX-32-32-MP	51	2	2 - 11 1/2
556TPX-40-40-MP	64	2 1/2	2 1/2 - 8
556TPX-48-48-MP	76	3	3 - 8
556TPX-64-64-MP	102	4	4 - 8

5556TPX-MPX | Male NPT Live Swivel Crimp

Thorburn Part #	Hose ID		Thread Size (NPT)
	mm	in	in
556TPX-16-16-MPX	25	1	1 - 11 1/2
556TPX-20-20-MPX	32	1 1/4	1 1/4 - 11 1/2
556TPX-24-24-MPX	38	1 1/2	1 1/2 - 11 1/2
556TPX-32-32-MPX	51	2	2 - 11 1/2
556TPX-40-40-MPX	64	2 1/2	2 1/2 - 8
556TPX-48-48-MPX	76	3	3 - 8
556TPX-64-64-MPX	102	4	4 - 8

5556TPX-RMPX | Male NPT Field Attachable Live Swivel Crimp

Thorburn Part #	Hose ID		Thread Size (NPT)
	mm	in	in
556TPRX-16-16-MPX	25	1	1 - 11 1/2
556TPRX-20-20-MPX	32	1 1/4	1 1/4 - 11 1/2
556TPRX-24-24-MPX	38	1 1/2	1 1/2 - 11 1/2
556TPRX-32-32-MPX	51	2	2 - 11 1/2
556TPRX-40-40-MPX	64	2 1/2	2 1/2 - 8
556TPRX-48-48-MPX	76	3	3 - 8
556TPRX-64-64-MPX	102	4	4 - 8

Thorburn Aviation Fuelling Hose Nozzles

A | Over Wing Fuel Nozzle
Body: Cast aluminum
Main Stem: Stainless steel
Stem Seal: Buna-N O-Ring
Disc: Viton® (FKM)
Sizes: 1 1/2”

B | Over Wing AVGAS Fuel Nozzle
Body: Cast aluminum
Main Stem: Stainless steel
Stem Seal: Buna-N O-Ring
Disc: Viton® (FKM)
Sizes: 1”, 1 1/4”, 1 1/2”

C | Over Wing Jet Fuel Nozzle
Body: Cast aluminum
Main Stem: Stainless steel
Stem Seal: Buna-N O-Ring
Disc: Viton® (FKM)
Sizes: 1 1/2”

D | Under Wing Jet Fuel

Features

- Easier Swivelling under all conditions. Swivel independent of quick disconnect
- Connects to 3-lig international standard aircraft adapter
- Utilizes same accessories as 64200 and 64348 model nozzles
- Positive internal mechanical interlock - nozzle cannot be opened until connected to aircraft; cannot be removed from aircraft in open position
- Replaceable knob on operation lever; eliminates razor-sharp abrasion on lever
- Lightweight and most rugged of any Eaton nozzle
- Two threaded ports in nozzle body for accessories such as vacuum breaker, pressure gauge, and or sampling port

How To Order Thorburn Aviation Fuelling Hose Assemblies

Model	Size	1st End Coupling	2nd End Coupling	1st End Material	2nd End Material	Crimp/Clamp	Fuel Nozzle
(N)5556TPX	12	02	02	S6	S6	CRS6	C
	16 = 1” **20 =** 1 1/4” **24 =** 1 1/2” **32 =** 2” **40 =** 2 1/2” **48 =** 3” **64 =** 4”	**01** = Male NPT Solid **02** = Male NPT Live Swivel **03** = Field Attachable Male NPT Live Swivel		**S6** = 316SS **AL** = Aluminum (Anodized)		**Crimp Ferrules** **CR** = Crimp **Clamps** **CL** = Clamps **Quantity of Clamps** (If **1** leave blank) **2, 3, 4** (Specify # after clamp code) **Materials** **S6** = 316SS **CS** = Plated Steel	See fuel hose nozzle codes above

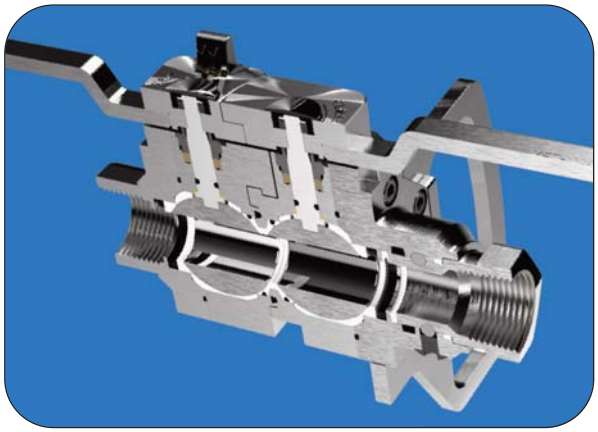
Special Purpose Couplings

(N)T92H Series - Dry Break High Pressure Quick Coupling

Prevents Resin Valve Blockage & Disconnection Spillage

Thorburn's (N)T92H is a major advancement in quick coupling technology achieving unrestricted full flow during operation and drip free double shut-off drybreak disconnection. The (N)T92H environmentally focused quick coupling system is specifically designed to prevent chemical spills, reduce vapor emissions of volatile organic compounds (VOCs) and enhance operator safety. Its full flow smooth bore design means better flow even for highly viscous fluids.

The (N)T92H coupling system consists of a female end having a concave ball valve and a male end having a convex ball valve that are precision machined to eliminate any spaces between the ball valves. A quarter turn of the ball valve securely seals the process fluids within the line. The (N)T92H coupling can even provide a seal when solids are suspended in the media such as radioactive D_20 resins in PHWR nuclear power stations. Thorburn's (N)T92H has a built-in swivel end that eases alignment regardless of pipe or hose orientation and has a unique locking mechanism that prevents accidental spillage. It is ideally suited for tank truck and tank car transfer systems where environmental compliance is not an option and operator safety is a company culture.



Unrestricted full flow reduces pressure drop during operation

Features

- **Zero spillage** during disconnection eliminates hazardous chemical waste pollution even when solids are suspended in the media.
- **Unrestricted high flow** during operation reduces pressure drops.
- **Eliminates chemical waste** incineration and disposal costs.
- **Reduces liability exposure**, loss time and worker compensation claims.
- **Built in swivel** eases alignment regardless of hose orientation.
- **Protects the installation assets** from hazardous waste product.
- **Prevents radio active D_2O resin blockage** between the valves in a PHWR nuclear power station.

Advantages

- Easy push & turn connection
- The valves cannot be opened when coupling is disconnected
- The coupling cannot be disconnected when the valves are open
- Reliable dry break with poppet valves

Applications

- Transfer of LIN/LOX/LAR, CO_2, Nitrous Oxide & LNG
- Loading/unloading of tank trucks, rail tankers
- Container discharge
- Fuel bunkering
- Vapor recovery lines

(N)T92H For Cryogenic Unloading

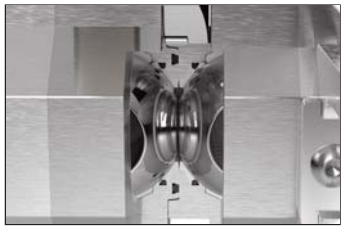
Thorburn's (N)T92H series is the worlds first dry break full flow coupling used for liquid cryogenic loading/unloading service. A sensational innovation over the poppet style cryogenic coupling which has inherent spillage when disconnected. The (N)T92H coupling has an easy turn action to connect and start the product flow. The full unrestricted flow will dramatically increase loading and unloading productivity of cryogenic liquids. The dry break technology will protect the environment and the operator's safety.

Thorburn's NT92H dry break couplings ideal for cryogenic LNG tank truck loading/unloading. Available with tank truck & railcar flanges

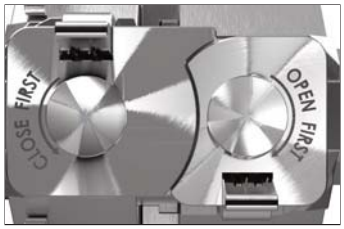
(N)T92H Built In Safety Features

Thorburn Flex (N)T92H is a dry break, zero leak, quick coupling, with mating convex and concave ball valves on each side of the coupling. The (N)T92H unique design features provide up to five levels of independent safety mechanisms to prevent spills and accidental release of dangerous contaminants in the environment. The safety features are based on a combination of locking mechanisms that prevent wrong operation of the coupling by allowing only the preset sequential operation.

- **Ball Valve Zero Gap System** (Convex (male end) & Concave (female end)) prevents hazardous chemical loss during disconnection.
- **Valve Handle Locking System** locks the handle in the off position to safeguard against accidental opening when disconnected.
- **Safety Locking Mechanism** incorporates a Valve Handle Safety Locking Pin to prevent accidental openings.
- **The Locking Pin** is guided by the Valve Handle on the male end coupler.



Ball Valve "Zero Gap" System



Valve Handle Locking System

Safety Locking Mechanism

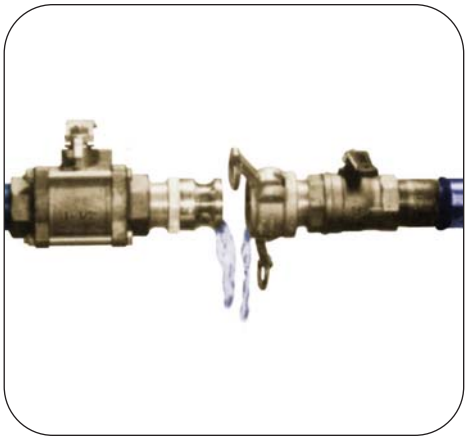
Locking Pin

(N)T92H Performance Characteristics

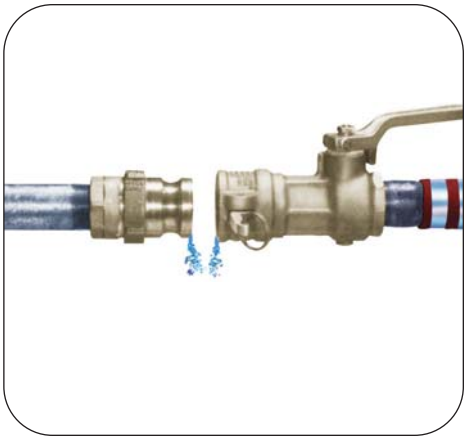
Adapter/Coupler Size		End Size		Spillage	Maximum Emissions	Flow Rate		Max. Working Pressure (min. 4-1 Safety)		Weight				Temperature			
										Male		Female		Min		Max	
in	mm	in	DIN	cc	ppm	GPM	l/min	psi	bar	lb	kg	lb	kg	ºF	ºC	ºF	ºC
1	25	3/4,1	20, 25	< 0.1	< 25	60	227	3000	207	4.02	1.82	4.23	1.92	-459	-273	400	204
2	50	1 1/2, 2	40, 50	< 0.2	< 25	180	681	1800	124	17.45	7.92	17.44	7.91	-459	-273	400	204
3	80	3	80	< 1	< 25	350	1325	1000	69	33.70	15.2	30.65	13.9	-459	-273	400	204

Problematic Quick Disconnect Coupling Technologies

Cam & Groove Type = Spillage

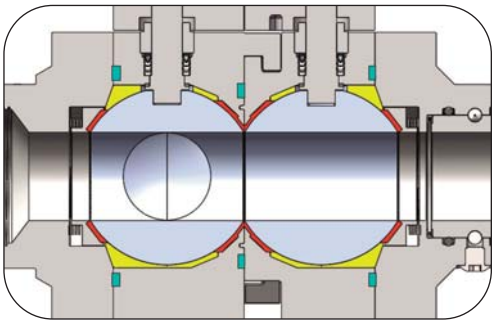


Ordinary Ball Valves Added = Spillage

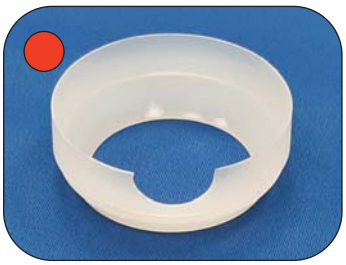


Traditional Poppet Valves = Spillage

(N)T92H Sealing Technology

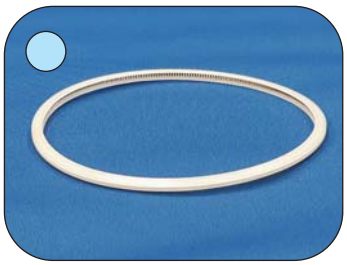


Cavity Filler - Prevents flow accumulation between ball valve and coupling body. Reduces spillage when disconnecting and prevents solids from being trapped between the rotating ball valves.
Ball Valve Seal - Flexible arch shaped ball valve seal provides constant sealing pressure and compensates for machining tolerances.
Spring Enhanced O-Ring Seal - Puts constant pressure around the stem and eliminates leaks through the valve handle stem.

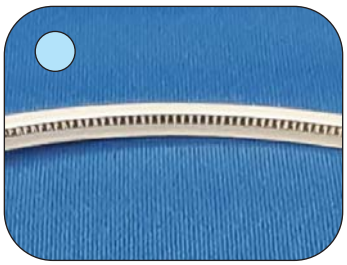


Cavity Filler

Ball Valve Seal



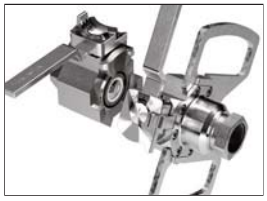
Spring Enhanced O-ring Seal



Detail of The Spring in the O-ring Seal

(N)T92H Easy to Operate Dry Break Solution

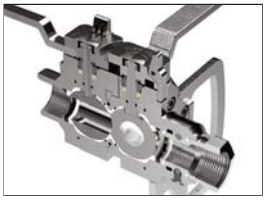
The (N)T92H coupling has an easy turn action to connect and start the product flow. The valves will not open until both coupling halves are connected properly. The coupling halves are first aligned and then connected with a push, followed by a quarter turn. There are no threads to damage by over tightening and no failure prone cam and groove latch connections to secure. The coupling halves are independent “shut off” ball valves that are controlled manually by rotating the valve handles in a specific sequence.



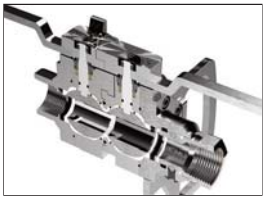
Align coupling halves

Push together & turn 90º

Coupling connected & locked



Open male end valve



Open female end valve

The (N)T92H can only be disconnected when both the valves are shut off in sequence; female end valve first and then male end valve second. This ensures zero spillage and protects against accidental disconnection.

How To Order (N)T92H Series Dry Break High Pressure Quick Couplings

Model	Valve Size	Type	Body Material (Wetted Parts)	End Size	1st End	2nd End	Seal	Options
(N)T92H	16	0	S6	32	1	1	J	DC
	16 = 1”(DN 25) **32** = 2”(DN 50) **48** = 3”(DN 80)	C = Coupler (Socket) N = Plug (Nipple)	**S6**=SA 479 type 316SS, EN1.4404 **S5**=SA 564 type 630 EN1.4548 **H16=Hastelloy** SB574 type C276 EN2.4819	**12** = 3/4” (DN 20) **16** = 1” (DN 25) **24** = 1 1/2” (DN 40) **32** = 2” (DN 50) **48** = 3” (DN 80)	**1**=FNPT **2**=FBSP **3**=O-Seal **4**=SCH 40 Butt Weld **5**=SCH 80 Butt Weld **6**=ANSI 150# Flange **7**=ANSI 300# Flange **8**=ANSI 600# Flange **9**=PN10 Flange **10**=PN16 Flange **11**=PN25 Flange **12**=PN40 Flange	**13**=Sanitary Flange **14**=Tank Truck Flange **XX**=Specify **YY**=Specify	**U**=UMHW **J**=PTFE **JX**=Reinforced PTFE **PK**=PEEK	**H** = Handle **DC** = Dust Cap **XX** = Specify

(N)UO Series - O-Seal™ Never Leak Pipe Unions

Thorburn O-Seal™ assembled female threaded union with handle bar lug nuts

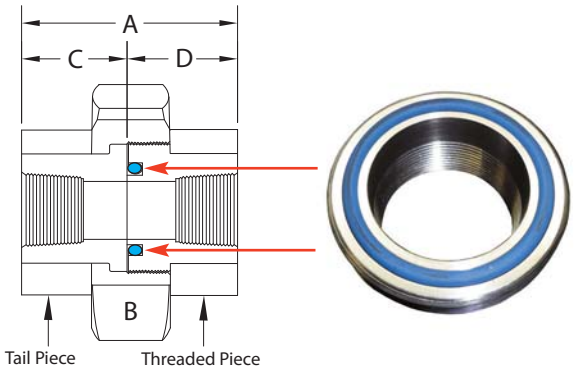
Thorburn O-Seal™ Unions are engineered for critical piping applications where leak-tight performance is non-negotiable. When traditional metal-to-metal seat unions corrode or fail under pressure, O-Seal™ technology provides a permanent solution. The elastomeric O-Ring seal eliminates leakage — even after years of service or repeated assembly and disassembly. Unlike conventional metal-to-metal unions that corrode during storage or outdoor exposure — leading to costly leaks during commissioning — Thorburn's O-Seal™ technology guarantees a positive seal every time, delivering lasting performance and peace of mind for contractors, EPCs, and plant operators alike. Designed and manufactured in full compliance with ANSI B31.1 "Power Piping", ANSI B16.11, MSS SP83,,ASMW b31.3 and the ASME Boiler & Pressure Vessel Code, Thorburn O-Seal™ Unions meet the most demanding industrial and utility standards.

Applications

- Power generation and process piping systems
- Oxygen, nitrogen, and inert-gas service
- High-pressure hydraulic and pneumatic lines
- Chemical and petrochemical process connections
- Commissioning and maintenance operations requiring quick, leak-free make and break

Technical Data

- Materials: SA105 Carbon Steel, SA182 Type 316. Option SA350LF2, Hastelloy, Inconel
- ASME B31.1, B31.3 & ANSI B16.11 forged steel fittings



Nominal Size		A Overall Length		B Hex		C Tail Piece		F Thread Piece	
(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
1/8	3	1.660	42	1 3/8	35	0.785	20	0.875	22
1/4	6	1.660	42	1 3/8	35	0.785	20	0.875	22
3/8	10	1.800	46	1 1/2	38	0.875	22	0.935	24
1/2	12.7	2.035	52	1 7/8	48	0.935	24	1.100	28
3/4	19	2.148	55	2 1/8	54	1.023	26	1.125	32
1	25	2.570	65	2 1/2	64	1.258	32	1.312	33
1 1/4	32	2.822	72	3	80	1.385	35	1.437	37
1 1/2	38	3.072	78	3 3/8	86	1.510	38	1.562	40
2	50	3.259	83	3 7/8	98	1.572	40	1.687	43
2 1/2	64	3.635	92	4 7/8	124	1.760	45	1.875	48
3	80	4.135	105	5 1/2	140	2.010	51	2.125	54

Note: millimeters have been rounded

(N)UO Series - O-Seal™ Never Leak Pipe Unions

Features

Never Leak Design: Seal is made on the O-Ring, not on corrodible metal faces
Zero Maintenance: No re-torquing or gasket replacement required
Vibration-Resistant: Will not loosen, even under extreme vibration
Unlimited Reuse: Break and remake without seal degradation
Fast Assembly: Flat-face slip design with hammer-lug nut for rapid connection
High Pressure Ratings: Available in 3000 psi, 6000 psi, and 9000 psi
Reliable Hand-Tight Seal: Withstands up to 200 bar without tools

Won't vibrate loose even under extreme vibration or pressure surges

How to Order (N)UO Series Pipe Unions

UNION TYPE	TAIL PIECE CODES	THREAD PIECE CODES	SIZE CODES	CLASS CODES	O-RING CODES*	BODY MATERIAL CODES	OPTIONS*
(N)UO	FP	FP	02 (1/8)	1 = 3000 lbs	D = BUNA N**	CS = A105**	O = ORIFICE
	MP	MP	04 (1/4)	2 = 6000 lbs	J = PTFE	S4 = 304SS**	D = DIELECTRIC INSULATED
	SP	SP	06 (3/8)		H = EPDM	S6 = 316SS**	H = HANDLE BAR LUG NUT
	ST	ST	08 (1/2)		I = FLUOROCARBON (VITON)*	H = HASTELLOY	
	BW	BW	12 (3/4)			I = INCONEL	
CODE DESCRIPTIONS			16 (1)			M = MONEL	
Union Type Code (N)UO=O-Seal Union		**End Type Codes** FP=FNPT Pipe MP=MNPT Pipe SP=Socket Weld Pipe ST=Socket Weld Tube BW=Butt Weld Pipe	20 (1 1/4)				
			24 (1 1/2)				
			32 (2)		* Only Applicable to O-Seal Unions	** Standard Material	* Only Applicable to O-Seal Unions
			40 (2 1/2)				
			48 (3)				

Notes: Prefix (N) is used for code compliance. When Nuclear Class 2, 3 or 4 is required insert NC2 for Class 2 NC3 for Class 3 & NC4 for Class 4 at the end of the part number. Nuclear Class 6 leave blank.

Model	Tail Piece	Thread Piece	Size	Class	O-Ring Material	Union Material	Option
UO	FP	FP	16	1	H	S6	D
UO = O-Seal Union	**FP** = Female FNPT	**FP** = Female FNPT	**16** = 1 inch	**1** = 3000 lbs	**H** = EPDM	**S6** = 316SS	**D** = Dielectric Insulation

MT3TL Series - Met-O-Seal

Tanker Truck/Car Loading Quick Coupling

Thorburn's Met-O-Seal Series MT3TL is a precision-engineered quick coupling specifically designed for tanker truck and railcar loading or unloading of liquids and gases, including cryogenic fluids such as liquid nitrogen (LN_2), liquid oxygen (LOX), and liquid hydrogen (LH_2). Unlike Thorburn's O-Seal™ Union, which employs an elastomeric O-ring as its primary seal for flat-face sealing in power and process piping, the Met-O-Seal™ primary seal is an all metal wedge seal and also includes an additional backup seal for added sealing safety. This allows reliable, leak-tight performance across extreme temperature ranges from ambient to cryogenic. The Met-O-Seal™ Quick Coupling combines precision-machined sealing surfaces with thermal flexibility, ensuring dependable, leak-tight performance where traditional couplings or elastomer-sealed unions cannot perform. Its proven reliability in cryogenic and high-purity gas service makes it the preferred choice for operators demanding maximum safety, speed, and service life.

| Thorburn Met-O-Seal with looped handles |

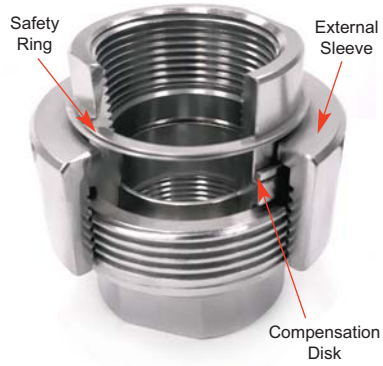
Part Number	Nominal Size		Working Pressure		Minimum Length	
	in	mm	psi	bar	in	mm
MT3TL16XYM	1	25	2400	165	3.00	80
MT3TL24XYM	1 1/2	38	2200	152	3.75	95
MT3TL32XYM	2	50	2000	138	4.00	102
MT3TL48XYM	3	80	1200	83	5.50	140
MT3TL64XYM	4	100	750	52	5.50	140

Applications

- Cryogenic transfer systems (LN_2, LOX, LH_2)
- Industrial and specialty gas loading operations
- Tanker truck and railcar loading/unloading stations
- Chemical and petrochemical bulk transfer
- Any operation requiring quick, safe, and repeated connection/ disconnection under pressure

Technical Data

- Leak rates (when connected) <1 x 10-9 std. cc. He/S.
- Full Vacuum to 345 Bar (5000 psi), Cryogenics to 260°C (500°F)
- Backup seal temperature rating:
  PTFE -273°C (-459°F) to 260°C (500°F) **Code: J**
  HNBR -40°C (-40°F) to 150°C (300°F) **Code: N**
  FKM -40°C (-40°F) to 175°C (350°F) **Code: I**
- Designed and tested to ASME B31.1 & B31.3
- All stainless steel are nitrated to reduce galling



How To Order MT3TL Series Met-O-Seal Couplings

Model	Size ID	Left End	Right End	End Material	Backup Seal Material	External Sleeve Material	Option
MT3TL	32	1	4	C	N	S6	LH
	Hose size in 1/16 of an inch Examples: **04** = 1/4 **06** = 3/8 **08** = 1/2 **12** = 3/4 **64** = 4 etc.	**1** = Female Thread (NPT) **2** = Male Thread (NPT) **3** = Butt Weld **4** = Socket Weld Female		**C** = Carbon Steel (SA105) **C1** = Carbon Steel (SA350-LF2) **AL** = Aluminum **S4** = 304SS **S6**= 316SS **I12** = Alloy 825 **H16** = Hastelloy C276 **XX** = Specify	**J** = PTFE **N** = HNBR **I** = FKM	**AL** = Aluminum **S6** = 316SS **C** = SA105 **C1** = SA350-LF2	**LH** = Loop handle sleeve (handle material is same as external sleeve material)

MTS4 Series - Met-O-Seal

Quick Couplings Cryogenic Liquids & Elusive Gases

Thorburn's Met-O-Seal Series MTS4 is a thermally active quick coupling system designed to deliver leak-proof make-and-break connections, engineered for extremes, from cryogenic liquids such as LN_2, LOX, LH_2 to high-temperature steam or vacuum systems. The MTS4 employs a unique ferrule seal made from dissimilar metals with different thermal-expansion and hardness characteristics than the coupling ends. As temperature changes, the seal dynamically strengthens, providing positive sealing integrity across wide thermal ranges providing a superior alternative from conventional unions. In addition to compared to O-Seal™ and Met-O seal Unions O- which uses an elastomeric O-ring Thorburn's MTS4, in contrast, uses a metallic, thermally responsive ferrule seal, enabling reliable performance where rubber or polymer seals would fail due to temperature excursions above 260 deg. C. The MTS4 Series Met-O-Seal™ represents the highest level of Thorburn's sealing technology, combining precision machining, thermal reactivity, and metal-to-metal resilience. Where the O-Seal™ provides dependable elastomeric sealing and the MT3TL offers mobility and ease of handling, the MTS4 stands as the ultimate solution for extreme-temperature, high-purity, and vacuum-tight applications.

Thorburn Number	Nominal Size		Working Pressure		Minimum Length	
	in	mm	psi	bar	in	mm
MTS416XYM	1/4	6	5000	345	2.5	63.5
MTS424XYM	3/8	10	5000	345	2.5	63.5
MTS432XYM	1/2	12.7	4800	330	2.5	63.5
MTS448XYM	3/4	19	4600	317	2.75	70
MTS464XYM	1	25	4000	276	2.75	70
MTS464XYM	1 1/2	38	3800	262	3.5	90
MTS464XYM	2	50	3600	248	4.5	114
MTS464XYM	3	80	3200	221	5.5	140
MTS464XYM	4	100	3000	207	5.5	140

Applications

Nuclear Generating Stations:

- Core feeder piping freeze systems: (LN_2 used to freeze water during inspection)
- Ion exchangers: replaces conventional flanges for tool-free operation
- High-temperature/pressure steam piping: up to 427 deg C/345 Bar (800 °F / 5000 psi)

High-Vacuum Systems: Composite building autoclaves, thermal cycling test setups

Cryogenic & Elusive Gas Service: LN_2, LOX, LH_2, He, H_2, and other low molecular-weight gases

Technical

- Leak rates (when connected) <1 x 10-9 std. cc. He/S.
- Full vacuum to 5,000 psi, Cryogenics to 1500°F
- Backup seal temperature rating:
  PTFE -273°C (-459°F) to 204°C (400°F) **Code: J**
  HNBR -40°C (-40°F) to 150°C (300°F) **Code: N**
  FKM -40°C (-40°F) to 175°C (350°F) **Code: I**
- Designed and tested to ASME B31.1 & B31.3
- All stainless steel are nitrated to reduce galling
- Light torque when hand tightening to rated pressures

How To Order MTS4 Series Met-O-Seal Couplings

Model	Size ID	Left End	Right End	End Material	Backup Seal Material	External Sleeve Material	Option
MTS4	16	1	4	S6	J	S6	LH
	Hose size in 1/16 of an inch Examples: **04** = 1/4 **06** = 3/8 **08** = 1/2 **12** = 3/4 **64** = 4 etc.	**1** = Female Thread (NPT) **2** = Male Thread (NPT) **3** = Butt Weld **4** = Socket Weld Female		**C** = Carbon Steel (SA105) **C1** = Carbon Steel (SA350-LF2) **AL** = Aluminum **S4** = 304SS **S6**= 316SS **I12** = Alloy 825 **H16** = Hastelloy C276 **XX** = Specify	**J** = PTFE **N** = HNBR **I** = FKM	**AL** = Aluminum **S6** = 316SS	**LH** = Loop handle sleeve (handle material is same as external sleeve material)

Thorburn Series (N)BC - Big Cam™ Camlock Flanged Couplings

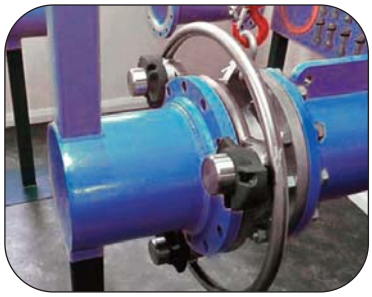
"Make leakproof flange connections in seconds!"

Thorburn's Big Cam™ is used anywhere there is a need to rapidly connect and disconnect piping or hose. Impossible to loosen while pressure is in the line. Couplings are hydrostatically tested and leakproof at 450 psi (31 bar). ANSI B16.5 Class 150 flanges are standard.

Features & Benefits

- Tough, long lasting and vibration proof
- Designed for industrial & marine service
- Recessed O-Ring replaces conventional flange gaskets providing a positive leak proof seal
- Compatible with all international flange standards, ANSI 150, 300, 600, B.S. Table E DIN PN10, 16, 25, 40, JIS, etc.
- Available in sizes from 3" to 28"

Traditional flanged bolted connection



Thorburn Big Cam™ quick flanged connection

Thorburn Part Number	Nominal Pipe Size	Flange OD 150lbs ANSI	Flange Thickness	Seal ID	Number of Cams	Min. Locking Range	Max. Locking Range	Number of Studs	Stud Dimensions	Weight
	in	in	in	in	#	in	in	#	in	lbs
(N)BC48*XY	3	7 1/2	15/16	4	2	5/8	1 1/8	4	5/8 X 2 5/8	20
(N)BC64*XY	4	9	15/16	4	2	5/8	1 1/8	4	5/8 X 2 5/8	42
(N)BC80*XY	5	10	15/16	6 5/16	2	11/16	1 3/16	8	3/4 X 2 3/4	45
(N)BC96*XY	6	11	1	7 5/16	2	3/4	1 1/4	8	3/4 X 2 3/4	48
(N)BC128*XY	8	13 1/2	1 1/8	9 1/16	3	7/8	1 3/8	8	3/4 X 2 3/4	74
(N)BC160*XY	10	16	1 3/16	11 9/16	3	15/16	1 7/16	12	7/8 X 3 1/4	86
(N)BC192*XY	12	19	1 1/4	13 3/8	4	1	1 1/2	12	7/8 X 3 1/4	122
(N)BC224*XY	14	21	1 3/8	15	4	1 1/8	1 5/8	12	1 X 3 3/4	150
(N)BC256*XY	16	23 1/2	1 7/8	16 15/16	5	1 3/16	1 11/16	16	1 X 4 1/4	186
(N)BC320*XY	20	27 1/2	1 11/16	21 1/2	6	1 7/16	1 15/16	20	1 1/8 X 4 3/4	252
(N)BC384*XY	24	32	1 15/16	25 1/2	7	1 11/16	2 3/16	20	1 1/4 X 5 1/2	303

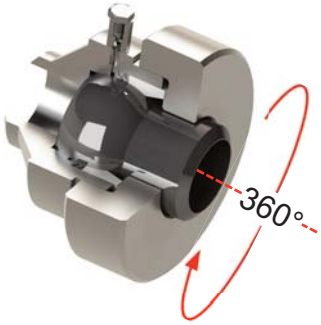
Notes: Prefix (N) is used for code compliance. When Nuclear Class 2, 3 or 4 is required insert NC2 for Class 2, NC3 for Class 3 & NC4 for Class 4 at the end of the part number. Class 6 use prefix (N) only

How To Order Thorburn Series (N)BC - Big Cam Couplings

Model	Size ID	Flange Type	Flange Material	Gasket Material
(N)BC	48	1	S6	D
	Hose size in 1/16 of an inch	**1** = ANSI 150# (Standard) **2** = ANSI 300# **3** = PN10 **4** = PN16 **5** = PN25 **6** = PN40	**A** = Aluminum **CS** = Plated Steel **S6** = 316SS	**D** = Buna N **H** = EPDM **I** = FKM **J** = PTFE **N** = Neoprene

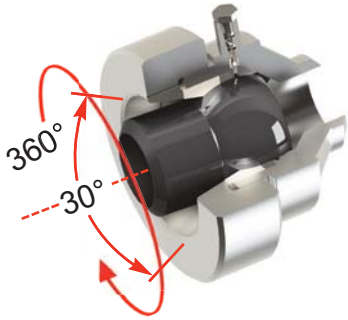
Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

Thorburn's Ball Joint Swivel Pipe Connector is a high pressure joint that compensates for movement of piping spools and equipment while maintaining sealing integrity and relieving piping stresses. It is designed with a high temperature, high pressure Graphoil™ seal that is easily serviced through a field service injection port in the connector casing. It suitable for both dynamic and static industrial applications such as steam, petrochemical and marine service. Thorburn's Model BJUS provides oscillating by-directional movement through to 360° continuous rotation while Model BJFS provides an additional flexible gimbal pivot movement of a maximum of 30°.



Model BJUS

- Provides oscillating by-directional movement through to 360° Continuous rotation
- Specifically designed for applications where restricted movement is required



Model BJFS

- Provides oscillating by-directional movement through to 360° Continuous rotation and a 30° angular pivot
- Reduces piping stress where thermal expansion and mechanical movement are present in the piping system

Features

- 360° continuous rotation and up to 30° axial pivot
- Adds flexibility to piping spools
- Compensates for thermal expansion, misalignment, and shifting equipment
- Field injection port for inline service maintenance
- Compact design pre-assembled with butt weld and flanged ends
- Reliable high-temperature, high-pressure Graphoil™ seals

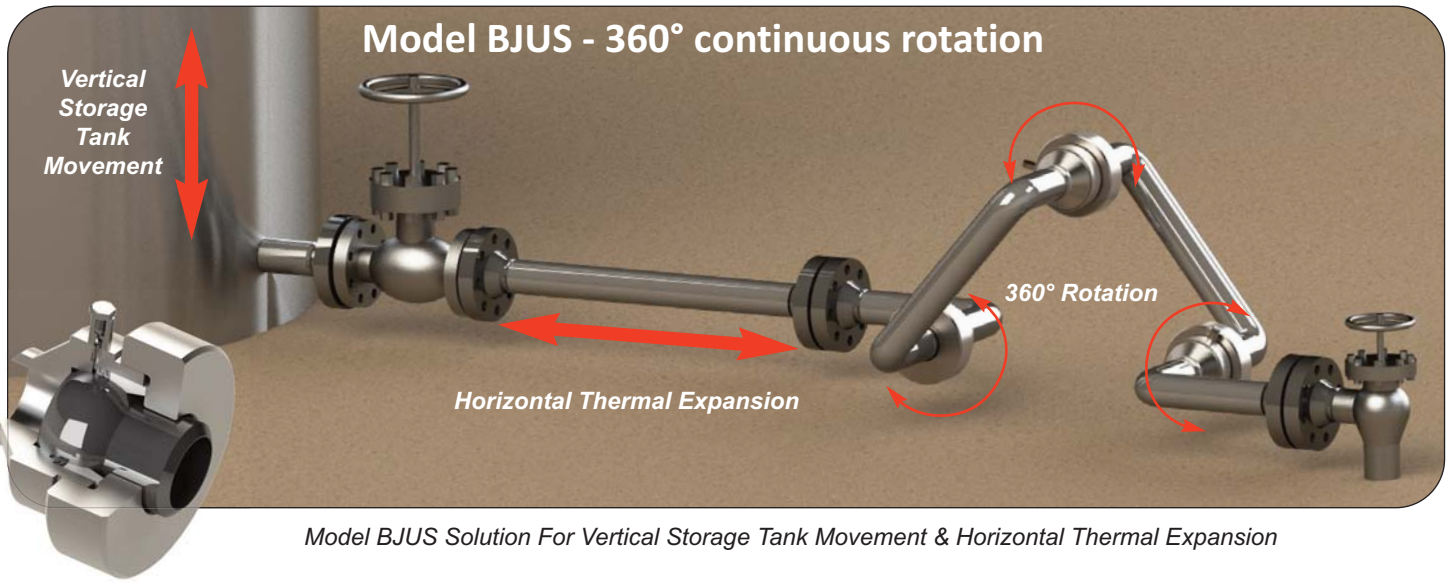
Specifications

Sizes: 1 in to 24 in (Din 25 to Din 600)
Pressure Ratings: Up To ASME Class 2500
Test Pressure: 1.5 X design pressure
Temperature Range: Up to 1000°F (538°C)
Materials: SA105N, SA479/182 Type 316SS, SA276 Type 2205 (Super Duplex SS)

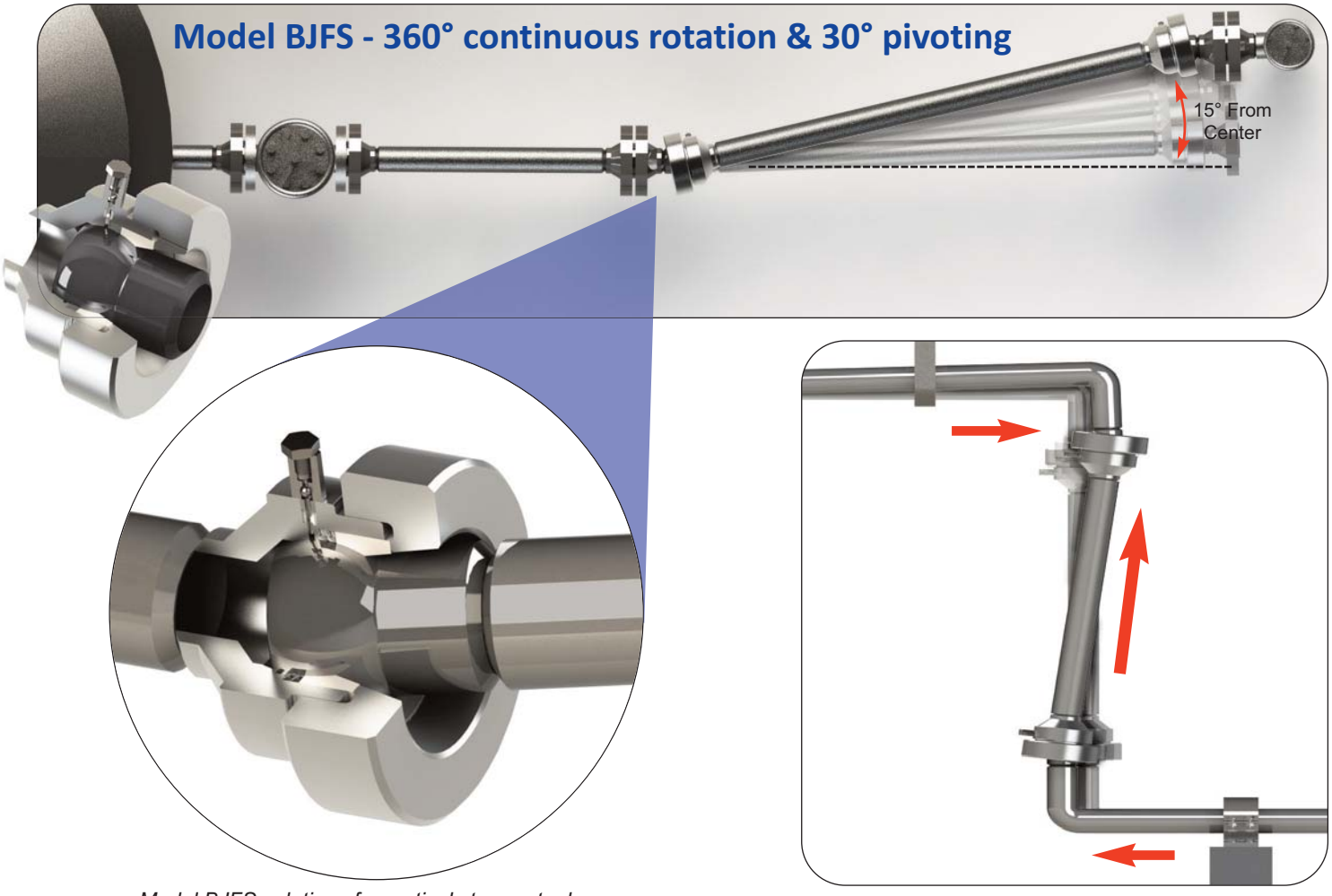
Design Codes

- ASME B31.1, B31.3
- ASTM F1298 (Flexible Expansion Type Ball Joints For Marine Applications)
- API 6FA (Fire Test Valves)
- ISO 9001:2015

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors



Model BJUS Solution For Vertical Storage Tank Movement & Horizontal Thermal Expansion



Model BJFS solutions for vertical storage tank movement & accommodating misalignment

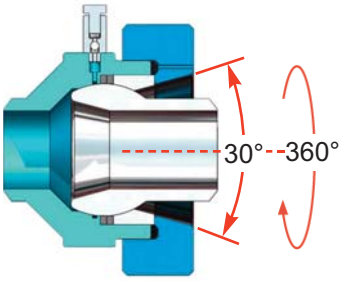
Model BJFS horizontal & vertical thermal expansion

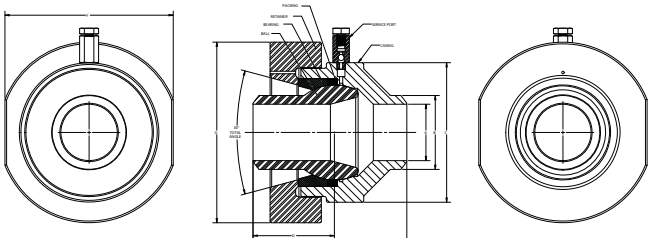
ThorburnFlex

Engineered Solutions For Pipe Motion

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

BJUS Ball Joint Swivel

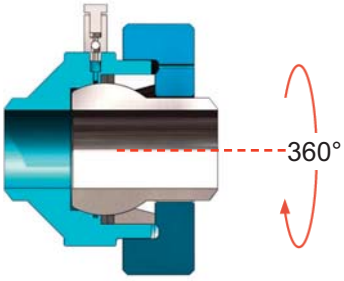


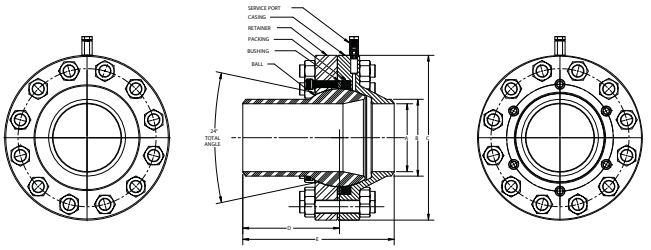


Nominal Pipe Size inches (DN)	Pressure Class**	PN Pressure Class** (bar)	Approximate Connector Dimensions - inches (mm)						Approximate Weight**** lbs (kg)
			B	C	D	E	F	G	
1.5 (40)	150 to 1500	20 to 260	1.900 (48)	5.90 (150)	3.63 (92)	6.81 (173)	6.00 (152)	7.00 (178)	30 (14)
2.0 (50)	150 to 1500	20 to 260	2.375 (60)	5.90 (150)	3.63 (92)	6.81 (173)	6.00 (152)	7.00 (178)	28 (13)
2.5 (65)	150 to 1500	20 to 260	2.875 (73)	7.20 (183)	5.00 (127)	9.56 (243)	8.25 (210)	9.00 (229)	75 (34)
3.0 (80)	150 to 1500	20 to 260	3.500 (89)	7.20 (183)	5.00 (127)	9.56 (243)	8.25 (210)	9.00 (229)	70 (32)
4.0 (100)	150 to 1500	20 to 260	4.500 (114)	8.44 (214)	5.00 (127)	9.56 (243)	10.25 (260)	11.00 (279)	105 (48)
5.0 (125)	150 to 1500	20 to 260	5.563 (141)	10.90 (277)	5.72 (145)	10.88 (276)	12.00 (305)	12.75 (324)	150 (68)
6.0 (150)	150 to 1500	20 to 260	6.625 (168)	10.90 (277)	5.72 (145)	10.88 (276)	12.00 (305)	12.75 (324)	150 (68)
8.0 (200)	150 to 900	20 to 150	8.625 (219)	14.50 (368)	6.50 (165)	12.00 (305)	15.98 (406)	16.50 (419)	245 (111)

* Custom schedules, weights, higher pressure ratings and wall thicknesses available upon request. ** Pipe wall thickness may reduce the pressure rating in some cases.
*** A dimension will depend on pressure class. **** Weights may change depending upon pressure class

BJFS Ball Joint Swivel





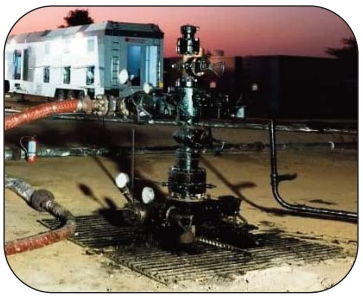
Nominal Pipe Size inches (DN)	Pressure Class** (psi)	PN Pressure Class** (bar)	Approximate Connector Dimensions - inches (mm)				Approximate Weight**** lbs (kg)
			B	C	D	E	
8 (200)	1500	260	8.625 (219)	18.75 (476)	10.86 (276)	17.00 (432)	800 (363)
10 (250)	150 to 300	20 to 50	10.75 (273)	19.50 (495)	8.30 (211)	16.50 (419)	455 (206)
	600	110	10.75 (273)	20.25 (514)	8.30 (211)	17.00 (432)	680 (308)
12 (300)	150 to 300	20 to 50	12.75 (324)	23.75 (603)	9.63 (245)	20.25 (514)	775 (352)
	600	110	12.75 (324)	24.00 (610)	9.63 (245)	20.25 (514)	956 (434)
14 (350)	150 to 300	20 to 50	14.00 (356)	26.00 (660)	9.00 (229)	20.50 (521)	1065 (483)
	600	110	14.00 (356)	26.00 (660)	9.00 (229)	20.50 (521)	1282 (582)
16 (400)	150 to 300	20 to 50	16.00 (406)	29.25 (749)	10.00 (254)	23.00 (584)	1609 (730)
	600	110	16.00 (406)	29.25 (749)	10.00 (254)	23.00 (584)	1947 (883)
18 (450)	150 to 300	20 to 50	18.00 (457)	33.00 (838)	11.00 (279)	25.00 (635)	1901 (862)
	600	110	18.00 (457)	33.00 (838)	11.00 (279)	25.00 (635)	2811 (1275)
20 (500)	150 to 300	20 to 50	20.00 (508)	35.75 (908)	12.00 (305)	27.00 (686)	2674 (1213)
	600	110	20.00 (508)	35.75 (908)	12.00 (305)	27.00 (686)	3538 (1605)
24 (600)	150 to 300	20 to 50	24.00 (610)	41.25 (1048)	14.00 (356)	31.00 (787)	4766 (2162)
	600	110	24.00 (610)	41.25 (1048)	14.00 (356)	31.00 (787)	6198 (2811)

* Custom schedules, weights, higher pressure ratings and wall thicknesses available upon request. ** Pipe wall thickness may reduce the pressure rating in some cases.
*** A dimension will depend on pressure class. **** Weights may change depending upon pressure class

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

Typical Applications

Oil Wellhead



Steam Injection Wellhead

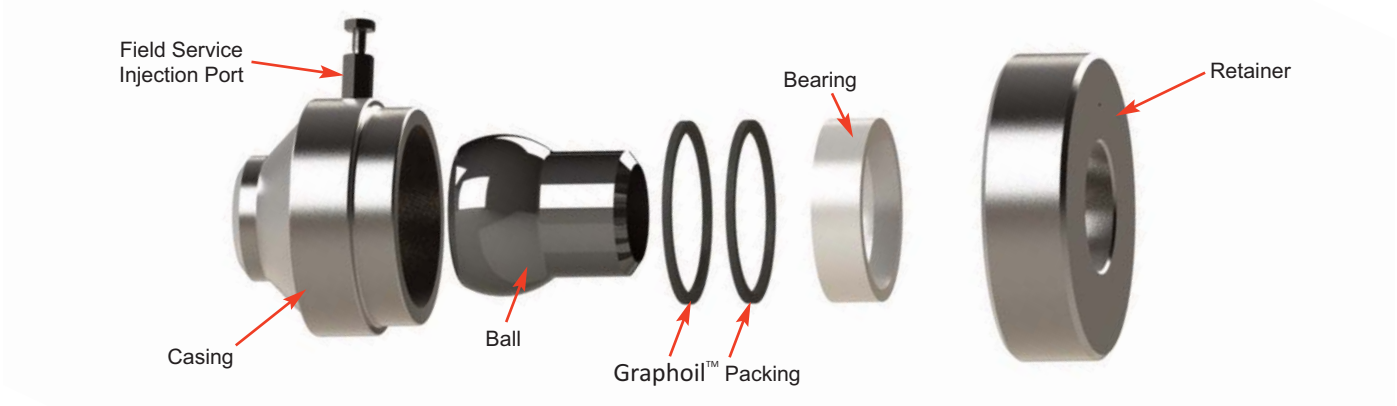
Sub Sea Oil Well Christmas Tree

Tank Settlement

Solar Energy

Barge Tide Water Movement

Ball Joint Swivel Components



Thorburn Series BJUS/BJFS Accessories

Alignment Connectors

- Available in single or double ball joint configurations to accommodate any amount of misalignment
- No limitations on end connection size or type
- Available in flange x flange or flange x buttweld configurations

Expansion Arms

- Geometry optimized to suit pipe movements and space constraints, and to reduce piping stresses
- Fabricated in accordance with material and NDE requirements
- Shipped tested and ready for installation on site

How to Order Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

Model	Size	Pressure Rating	Ends	End Material	Specify
BJFS	**64**	**4**	**BW**	**S6**	**-**

Model

BJUS
BJFS

High temperature Graphoil™ seal packing is standard

Size

24 = 1 1/2" (DN40)
32 = 2" (DN50)
40 = 2 1/2" (DN65)
48 = 3" (DN80)
64 = 4" (DN100)
80 = 5" (DN125)
96 = 6" (DN150)
128 = 8" (DN200)
160 = 10" (DN250)
192 = 12" (DN300)
224 = 14" (DN350)
256 = 16" (DN400)
288 = 18" (DN450)
320 = 20" (DN500)
384 = 24" (DN600)

Pressure Rating

Code	ASME B16.5	ISO 7005	
	Class	PSI	BAR*
1	150	290	20
2	300	750	50
3	400	1000	68
4	600	1500	110
5	900	2250	150
6	1500	3750	260
7	2500	6250	420

* Conforms to Pressure Nominal (PN) ISO 7005
Pressure rating at temperatures: -28°C to 38°C (-20°F to 100°F)

Ends

BW = Buttweld
SW = Socketweld
FL1 = ANSI CL 150
FL2 = ANSI CL 300
FL3 = ANSI CL 400
FL4 = ANSI CL 600
FL5 = ANSI CL 900
FL6 = ANSI CL 1500
FL7 = ANSI CL 2500
FL8 = PN10
FL9 = PN16
FL10 = PN20
FL11 = PN50
FL12 = PN68
FL13 = PN110
FL14 = PN150
FL15 = PN260
FL16 = PN420

End Material

Carbon Steel
CS = SA105
CSN = SA105N

Stainless Steel
S6 = SA182 316SS

Duplex (2205)
DX = SA276

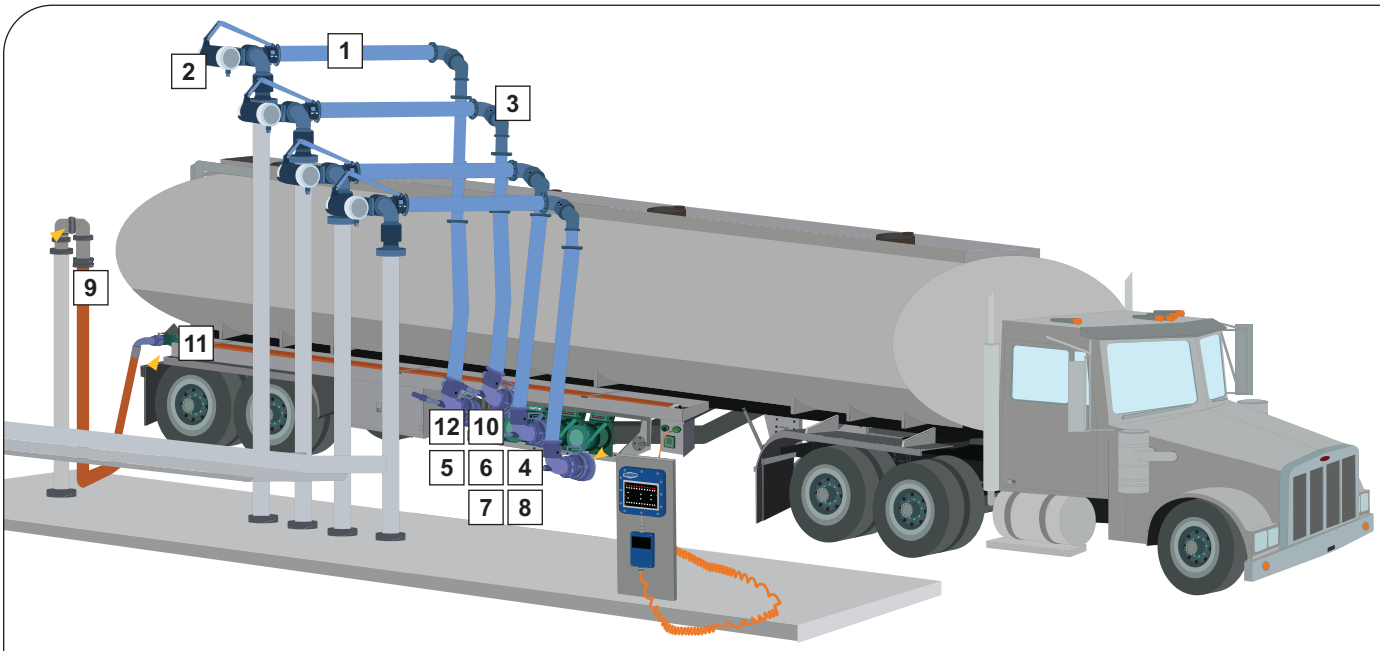
Super Duplex (2507)
DXS = SA479

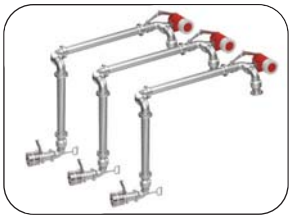
Specify

X = Specify Non Standard notes. If none, leave blank

Thorburn Loading/Unloading Products

Thorburn Terminal Tank Truck Bottom Loading Products





1 - Loading Arms
(Pages 165 - 177)

2 - Base Swivels & Counterbalance
(Pages 162 - 163)

3 - Swivels
(Pages 160 - 161)

4 - Loading Arm Swivels
(Page 164)

5 - TTMA Flange Adapters
(Page 131)

6 - TTMA Flange Extensions
(Page 131)

7 - Flange Spacers
(Page 132)

8 - Flange Gaskets
(Page 132)

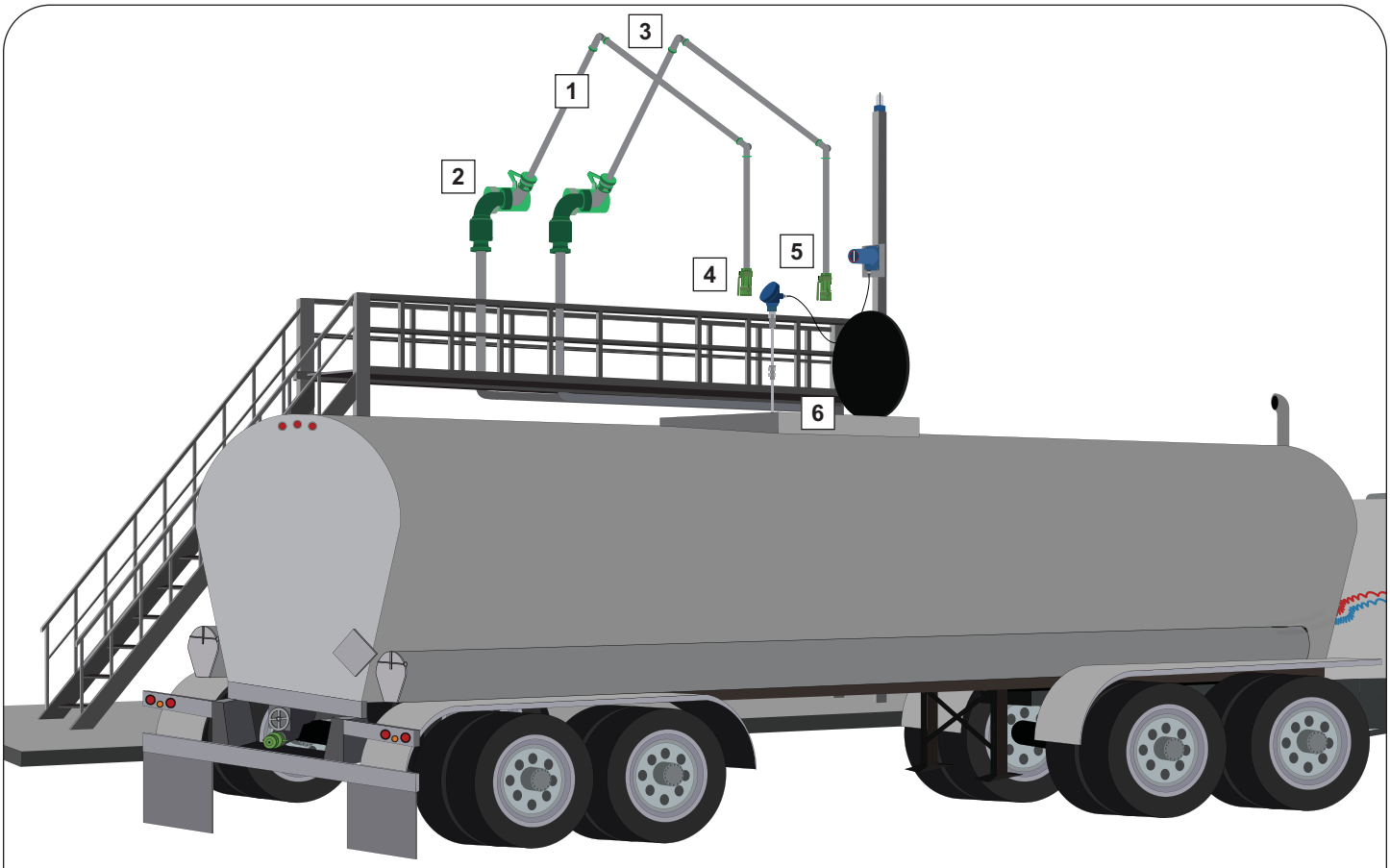
9 - Safety Breakaway Couplings
(Pages 137 - 142)

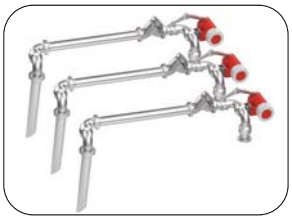
10 - API Couplers
(Page 153 - 155)

11 - Vapor Recovery Couplers
(Page 129 - 130)

12 - Thor-Site Flow Indicators
(Page 156)

Thorburn Terminal Tank Truck/Railcar Top Loading Products





1 - Top Loading Arms
(Pages 165 - 177)

2 - Base Swivels & Counterbalance
(Pages 162 - 163)

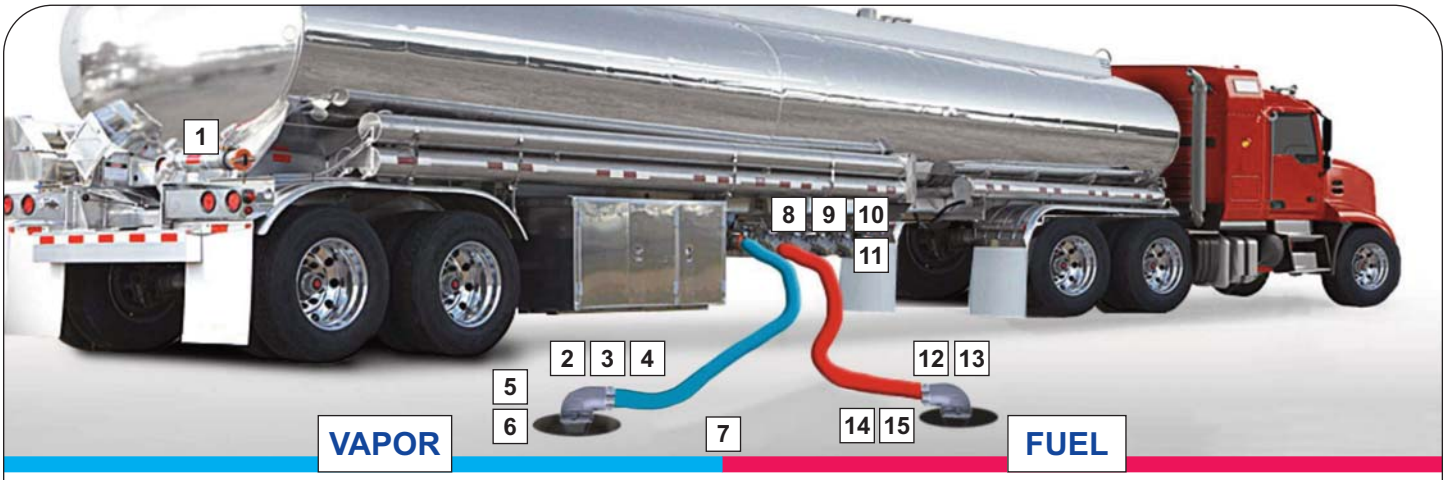
3 - Swivels
(Pages 160 - 161)

4 - Flanged Breakaway Couplings
(Pages 137 - 142)

5 - Drybreak Disconnects
(Pages 143 - 147)

6 - Drybreak Adapters
(Page 146)

Thorburn Tank Truck Loading/Unloading Products



1 - Vapor Recovery Valve
(Page 130)

2 - Vapor Adapters
(Page 152)

8 - API Valves
(Page 154)

9 - Drop Adapters
(Page 155)

3 - Vapor Elbows
(Page 150)

4 - Vapor Recovery Couplings
(Page 129)

10 - Dry Disconnect Couplings
(Pages 133 - 136)

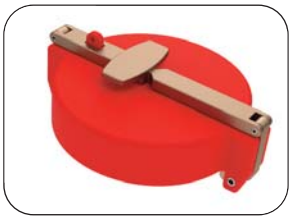
11 - TTMA Flanges, Adapters, Gaskets
(Pages 131 - 132)

5 - Dust Caps
(Page 46)

7 - Single Point Vapor/Drop
Co-Axial Elbow (Page 149)

12 - Hose Couplings
(Pages 35 - 50)

13 - Drop Elbows
(Page 151)



6 - Vapor Caps
(Page 130)

14 - Top Seal Adapter
(Page 152)

15 - Locking Fill Caps
(Page 152)

Thorburn Series THVA Vapor Recovery Couplings & Adapters

THVA-4040CS

THVA-4040CS-45

THVA-4040CS-S45

Model THVA-4040CS-4MNTP

Thorburn Series THVA Vapor Recovery Couplings are specialized fittings used primarily in the fuel industry to capture hazardous hydrocarbon and volatile organic compound (VOC) vapors during the transfer of petroleum products, such as during tanker loading and unloading. They are designed to prevent these harmful emissions from escaping into the atmosphere, which ensures regulatory compliance and provides economic benefits by recovering valuable product.

Application:

Filling Stations: Both Phase I (tanker to underground tank transfer) and Phase II (vehicle refueling) systems utilize these components to control emissions.

Oil and Gas Production Facilities: VRUs in the oil and gas industry use these to capture methane and other valuable hydrocarbons from storage tanks and other vented sources.

Fuel Tankers: They are used on tank trucks for efficient loading and unloading operations

Materials:

body: Aluminum
Seals: Nitrile Rubber, FKM
Pins & Finger Rings: Stainless steel

Features:

- Floating bridge poppet design allows optimal flow
- Machined hose shank ensures easier insertion into hose and better sealing
- Durable, easy to couple stainless cam arms
- Big wings ensure contact with tanker air interlock button, helping prevent drive-offs
- Poppet seal can be changed without removing the coupler from the hose
- Can be secured to hose with traditional band clamps or built in crimp collar
- Includes Floating Bridge Poppet and Probe
- 4" MNPT version allows for either cam and groove or threaded flange option

Specifications:

- Biofuel vapor compatible, up to E100 (100% Ethanol) and B20 (20% bio diesel)
- Vapor compatibility: gasoline and diesel, up to E100 & B20 biofuels

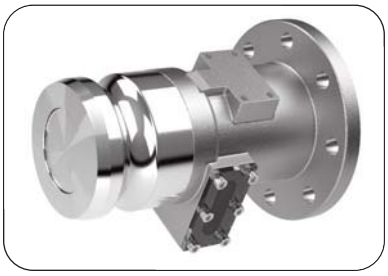
Part Number	Description
THVA-4040CS	4” Coupler X 4” Hose Stem
THVA-4030CS-45	4” Coupler X 3” 45° Hose Stem
THVA-4040CS-45	4” Coupler X 4” 45° Hose Stem
THVA-4040CS-S45	4” Coupler X 4” 45° Hose Stem Swivel
THVA-4040CS-4MNTP	4” Coupler X 4” MNPT Connection
THVA-4030CS-SH	4” Coupler X 3” Hose Stem

Thorburn Series THVV Vapor Recovery Valve Adapters

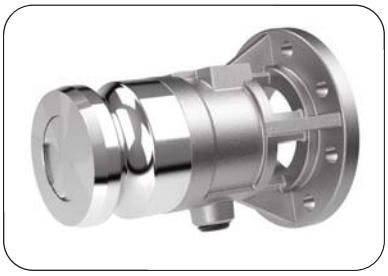
Model THVV-3100

Model THVV-4000

Model THVV-4100



Model THVV-4100F



Model THVV-4100F-SFI

Thorburn Series THVV vapor recovery valve adapters allows entry of displaced gasoline fumes from the underground tank to the 4” vapor piping system on the road tanker.

Application: Manufactured to connect to vapor hose couplings. Locking vapor caps (Model THVV-LVC) are available.

Materials:
body: Aluminum
Seals: Buna N
Sight Glass: Acrylic

Features:
- Rugged cast aluminum construction
- Variety of tank connections to suit any application, including 4" TTMA flange, 3" and 4" female NPT and 4" female NPS
- TH4000 features bulb design allows for maximum vapor flow, (2) large acrylic sight glasses, and drain plug
- Available with or without poppets; poppeted versions prevent vapor from escaping from the tanker
- Easy seal replacement while still on the tanker

Specifications:
- Biofuel vapor compatible, up to E100 (100% Ethanol) and B20 (20% bio diesel)
- Vapor compatibility: gasoline and diesel, up to E100 & B20 biofuels

Part Number	Size in	Description	Tanker Connection	Inlet Poppet Valve	Sight Glass
THVV-3100	4	Vapor valve, low profile design	3" female NPT	Yes	No
THVV-3100NP				No	No
THVV-4100			4" female NPT	Yes	No
THVV-4100NP				No	No
THVV-4100S			4" female NPS	Yes	No
THVV-4100NPS				No	No
THVV-4100F			4" TTMA flange	Yes	Yes
THVV-4100FNG				Yes	No
THVV-4100F-SFI				Yes	Yes
THVV-4100F-NGNP				No	No
THVV-4000		vapor valve, bulb design	4" TTMA flange	Yes	Yes

Locking Cap - Model THVV-LVC

Thorburn Series THFA64AL TTMA Tank Truck Flange Adapters

Thorburn Series THFA64AL TTMA Flange Adapters provide a simple way to convert threaded components to standard TTMA flange configurations. Made from one-piece cast aluminum and flange connections are designed to fit with the TTMA flange pattern.

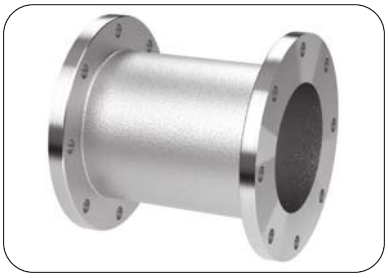
Features

- Easily converts threaded components to a standard TTMA flange configuration
- Solid cast lightweight aluminum design is more durable than welded fabrications
- Design improves flow through adapter
- Compact size reduces the overall space needed to install

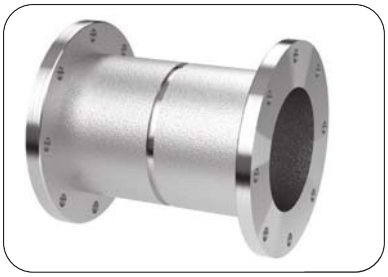
Part Number	Description
THFA64AL-4MT	4” TTMA Flange X 4” Male NPT, 2 1/2” OAL
THFA64AL-4MTHC	4” TTMA Flange X 4” Male NPT, 2 1/2” OAL Hard Coated
THFA64AL-4MTE	4” TTMA Flange X 4” Male NPT, 5 1/2” OAL
THFA64AL-4FT	4” TTMA Flange X 4” Female NPT, 2 1/2” OAL

Nominal Size	Flange OD	Flange Thickness	Bolt Circle Diameter	Number of Bolts	Bolt Hole Diameter	Diameter of Bolts Used
(in)	(in)	(in)	(in)	(#)	(in)	(in)
4	6 5/8	3/8	5 7/8	8	7/16	3/8

Thorburn Series THETF464AL TTMA Tank Truck Flange Extensions



THETF464AL (Standard)



THETF464AL-GR (Grooved)

Thorburn Series THETF464AL TTMA flange extensions add space, (6 inches) to allow for proper clearance and connection of an API (American Petroleum Institute) coupler to a loading arm on a tank truck. These extensions help in preventing damage to the equipment during the loading/unloading process. Color Coding Available. Contact Thorburn

Features

- A groove provides a specified parting point in case of excessive stress, which can help prevent extensive damage to the loading arm
- Includes a 1/2-inch female NPT port, for additional connections or instrumentation

Part Number	Size (in)	Description
THETF464AL	4	TTMA Flange Extension
THETF464AL-GR	4	TTMA Flange Extension with Grove
THETF464AL-FP50	4	TTMA Flange Extension with 1/2” Female NPT Port

Thorburn Series THFS64AL TTMA Flange Spacers with 1/2” Port

Thorburn Series THFS64AL TTMA flange spacer is a specific type of industrial fitting used to provide space or clearance in connections that adhere to the Tank Truck Manufacturer's Association (TTMA) standards. The main function is to add space between components, such as a loading arm and a tank truck, to ensure proper clearance and connection. They can also be used as a specified "parting point" to prevent damage to the loading arm in case of excessive stress.

Features

- Made from solid cast aluminum to be lightweight yet durable
- Includes a 1/2-inch female NPT port, for additional connections or instrumentation

Part Number	Size (in)	Description
THFS64AL-FP50	4	TTMA Flange Spacer with 1/2” Female NPT Port

Thorburn Series 48TTRFG/48TTSFG TTMA Flange Gaskets

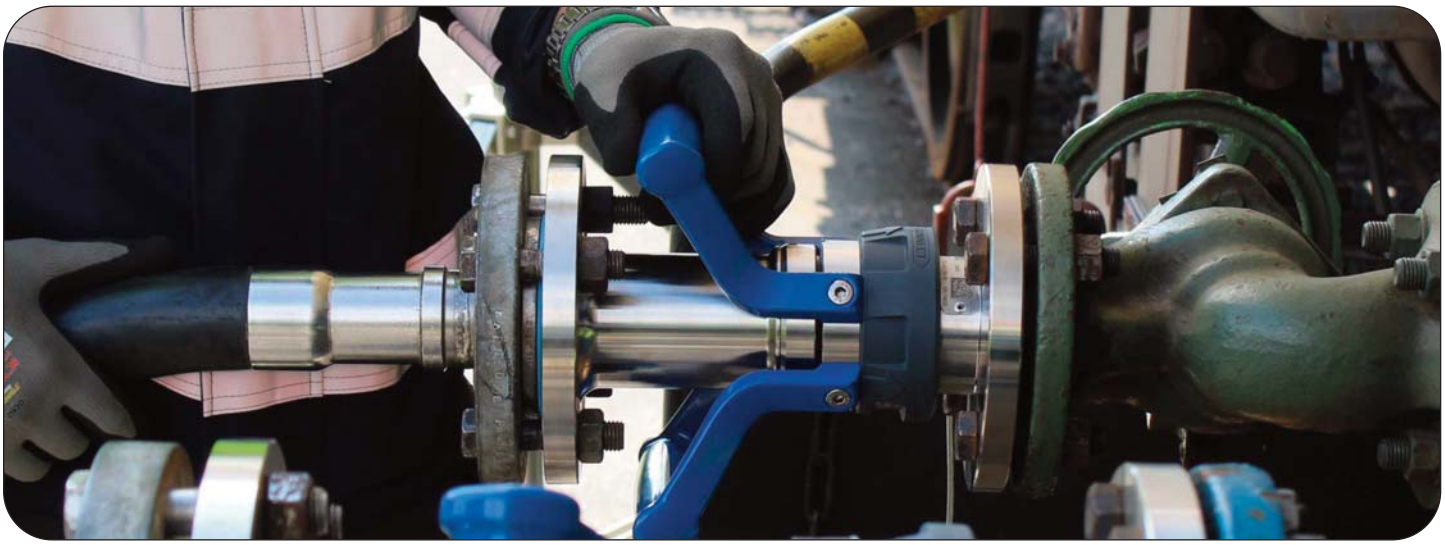
Thorburn Series 48TTRFG/48TTSFG TTMA flange gaskets are mechanical seals used to create a leak-tight connection between two bolted TTMA (Truck Trailer Manufacturers Association) standard flange faces, commonly found in tank truck and railcar operations involving liquid transfers.

Features

- Manufactured to seal with flanges produced to the 3” or 4” TTMA flange pattern
- Available in Round (48TTRFG) or Square (48TTSFG) Designs

Part Number	Size	Description	OD	ID	Thickness	Bolt Circle
	(in)		(in)	(in)	(in)	(in)
Round Gaskets						
48TTRFG-D	3	Round TTMA - Cork/BUNA	5 5/8	3 1/2	1/8	4 7/8
48TTRFG-J	3	Round PTFE Envelope	5 5/8	3 1/2	1/16	4 7/8
48TTRFG-NL	3	Round Nylon	5 5/8	3 1/2	1/8	4 7/8
64TTRFG-D	4	Round TTMA - Cork/BUNA	6 5/8	4 9/16	1/8	5 7/8
64TTRFG-J	4	Round PTFE Envelope	6 5/8	4 9/16	1/16	5 7/8
64TTRFG-NL	4	Round Nylon	6 5/8	4 9/16	1/8	5 7/8
Square Gaskets						
48TTSFG-D	3	Square TTMA - Cork/BUNA	4 1/2	3 3/8	1/8	-
48TTSFG-NL	3	Square Nylon	4 1/2	3 3/8	1/16	-
48TTSFG-H	3	Square White EPDM	4 1/2	3 3/8	1/8	-

Thorburn Series 63 DDC Dry Disconnect Couplings



Thorburn Series 63 DDC Dry Disconnect Couplings and NV-DC Non-Valved Quick Disconnect Couplings provide a secure, leak-free solution for the transfer of liquids, gases, and chemicals across a wide range of industrial environments.Using the standardized STANAG bayonet interface, Thorburn couplings deliver fast, high-flow connection and disconnection without product loss — protecting both personnel and the environment.Where conventional couplings rely on complex multi-part valving that increases restriction and wear, Thorburn's streamlined disc-valve design provides superior flow performance and reliable sealing through thousands of connection cycles, even under demanding pressure and temperature conditions. Thorburn's Series 63 DDC represents the next generation of dry disconnect technology — combining precision machining, robust safety design, and ease of operation into a single, proven interface.The result: faster turnaround, cleaner transfer, and long-term reliability without the maintenance sensitivities or pressure losses often associated with other quick-connect systems

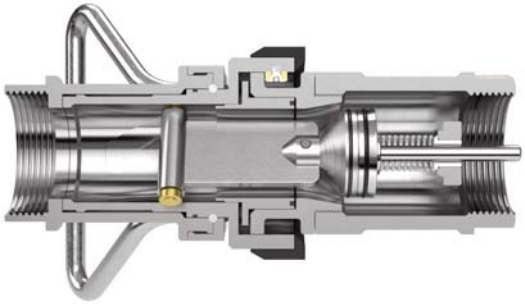
Features

No-Spill Operation: Automatic shut-off valves prevent leakage during connection and disconnection
High Flow Efficiency: Disc-valve geometry provides full-bore flow with minimal pressure drop
Full-Flow Non-Valved Option: Available for unrestricted transfer or venting applications
Quick Bayonet Coupling: Standardized STANAG interface ensures compatibility and easy operation
Integrated Swivel Design: Reduces hose torsion and operator fatigue
Exceptional Strength & Safety: Riveted piston pin and PTFE-embedded stainless shaft prevent seizure under extreme load
Weather-Resistant Construction: Protective ring made from electrically conductive, UV-stable rubber compound
Durable Composite Protection: PE-HD 300 dust plugs resist impact, corrosion, and temperature extremes
Threaded or Flanged Ends: Available for both hose-end and tank-unit configurations
Five-to-One Safety Factor: Rated up to 25 bar working pressure

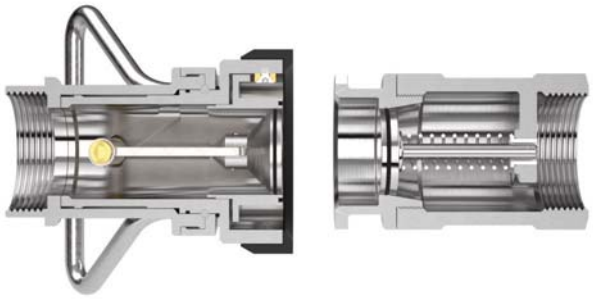
Applications

- Industrial process and transfer systems
- Road & rail tankers
- IBC containers and bulk storage facilities
- Pharmaceutical and petrochemical plants
- Marine and offshore fluid transfer
- Chemical, adhesive, detergent, and agricultural
- Industries handling acids, solvents, or hydrocarbons

Thorburn Series 63 DDC Dry Disconnect Couplings



Push and turn to connect



Turn and pull to disconnect - no spillage

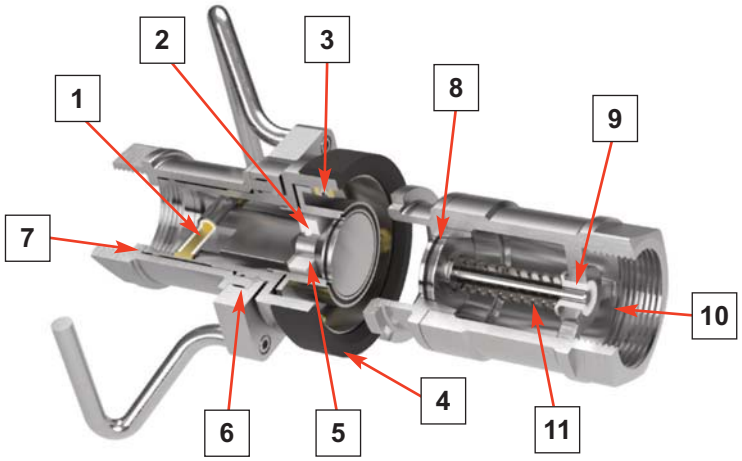
Construction

Sizes: 1" (DN25) to 8" (DN200)
Material: Aluminum, Brass, 316SS, Hastelloy, Titanium, PVDF, PEEK
Seals: FKM, NBR, EPDM
Working Pressure: up to 25 Bars (five times safety factor).
Threaded Connections: BSP, NPT
Flange Connections: ANSI, PN, TTMA

How Thorburn Series 63 DDC Dry Disconnect Couplings Works

Coupler End

1 - Hastelloy (C-276) shaft journal embedded in PTFE eliminates seizures
2 - PTFE bearing between piston shaft and piston guide eliminates seizure
3 - Hastelloy (C-276) rollers on stainless steel shaft to eliminate seizure potential
4 - Weather resistant, electrically conductive protective bumper ring
5 - Riveted piston pin to minimize risk of failure under high pressure conditions
6 - Stainless steel ball bearings
7 - Female thread NPT/BSP



Full flow non-valved option available

Adapter End

8 - Conical valve seat to eliminate the risk of piston blow-out in the event of extreme pressure
9 - PTFE bearing between piston shaft and piston guide eliminates seizure
10 - Female thread NPT/BSP
11 - Internal components made of Hastelloy (C-276) and 316SS

Thorburn Series 63 DDC Dry Disconnect Couplings

Series 63 DDC Dry Disconnect Coupler Types

Female thread (NPT/BSP) 3/4” to 1”

Female thread (NPT/BSP) 1 1/2”

Female thread (NPT/BSP) 2”

Female thread (NPT/BSP) 3”

Female thread (NPT/BSP) 4”

Female thread (NPT/BSP) 6” to 8”

Flange (ANSI, PN) 2”

Flange (ANSI, PN) 3” to 8”

Flange (TTMA) 4”

Series 63 DDC Dry Disconnect Adapter Types

Female thread (NPT/BSP) 3/4” to 6”

Flange (ANSI, PN) 2” to 8”

Flange (TTMA) 4”

Thorburn Series 63 DDC Dry Disconnect Couplings

Series 63 DDC Dry Disconnect Coupling Specifications

Nominal Size		Body Size	Thread Connection	Flange Connection	Flow Rate (63DDC)
inch	DN	mm	inch	inch	L/Minute
1	25	56	3/4” Thread (BSP/NPT) 1” Thread (BSP/NPT)		250
2	50	70	1 1/2” Thread (BSP/NPT) 2” Thread (BSP/NPT)	2” Flange (ANSI, PN)	900
2 1/2	65	105	2 1/2” Thread (BSP/NPT) 3” Thread (BSP/NPT)	3” Flange (ANSI, PN)	2,100
3	80	119	3” Thread (BSP/NPT)	3” Flange (ANSI, PN)	2,800
4	100	164	4” Thread (BSP/NPT)	4” Flange (ANSI, PN, TTMA)	7,000
6	150	238	6” Thread (BSP/NPT)	6” Flange (ANSI, PN)	14,000
8	200	272	8” Thread (BSP/NPT)	8” Flange (ANSI, PN)	23,000

How To Order Thorburn Series 63 DDC & 63 NV-DC

Model	Size	Type	Coupler/Adapter	Body Material	Seal	Options
63DDC	**32**	**C**	**3**	**S6**	**H**	**DPS6**
63DDC = Dry Disconnect Coupling **63NV-DC** = Non-Valved Disconnect Coupling	**16** = 1” (DN 25) **32** = 2” (DN 50) **40** = 2.5” (DN 65) **48** = 3” (DN 80) **64** = 4” (DN 100) **96** = 6” (DN 150) **128** = 8” (DN 200)	**C** = Coupler **A** = Adapter	**1** = Female NPT **2** = Female BSP **3** = Flange ANSI 150 **4** = Flange ANSI 300 **5** = Flange TTMA **6** = Flange PN10 **7** = Flange PN16 **8** = Flange PN25 **9** = Flange PN40	**Standard** **S6** = 316SS **AL** = Aluminum **Available** (On special order) **H** = Hastelloy C-276 **BR** = Brass **TI** = Titanium **X** = Specify	**H** = EPDM **I** = FKM **N** = NBR **KY** = PVDF **PK** = PEEK **XX** = Specify	**DC** = Dust Cap **DP** = Dust Plug None = Leave Blank **Materials** **S6** = 316SS **AL** = Aluminum **P** = Plastic **XY** = Specify

Thorburn Series TB Breakaway Couplings

Features

- Automatic shut-off: Internal valves close immediately upon separation to prevent spills.
- Calibrated break pins: Precisely engineered to release at a predetermined load for reliable activation.
- Three-bolt safety design: Ensures controlled, predictable performance under axial tension and real-world stresses.
- **Rugged construction:** Built from corrosion resistant materials for long service life in harsh industrial and marine environments.
- **Quick reassembly:** Designed for fast reset and return to service, minimizing downtime.

Thorburn Series TB Breakaway Couplings

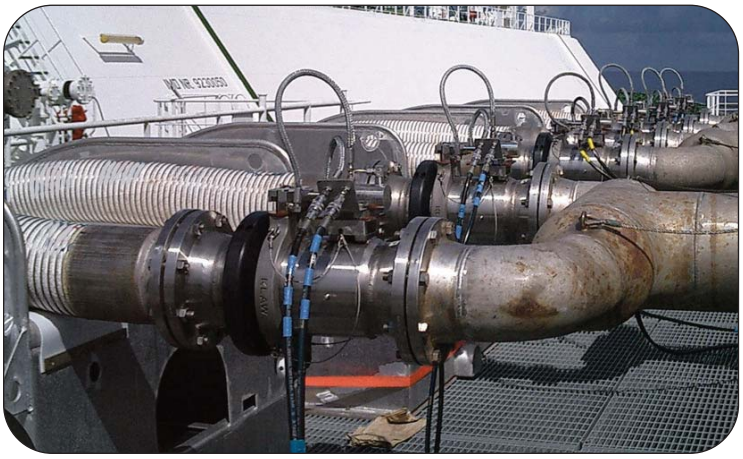
Thorburn Series TB Breakaway Couplings are engineered safety devices designed to prevent product spillage, equipment damage, and environmental hazards during accidental drive-away or pull-away incidents. Using a precision break-pin mechanism, the coupling separates cleanly at a pre-set force, instantly sealing both ends to stop flow and minimize product loss.

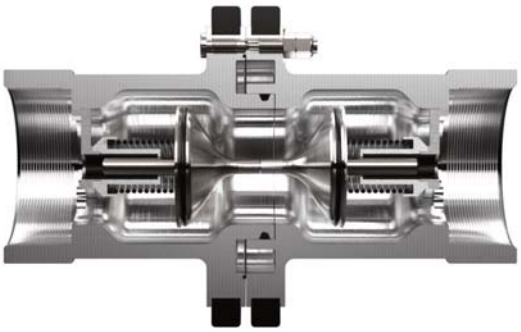
At the heart of each coupling is Thorburn's precision-calibrated triple-pin break system. Three external break bolts—each with a defined shear point—respond instantly to tensile overload. When the separation force threshold is reached, the coupling disengages cleanly and dual internal valves automatically seal both ends, ensuring immediate containment of the media. This rugged, field-proven design provides reliable protection without external actuation devices, minimizing downtime and maintenance while maximizing safety.

Benefits

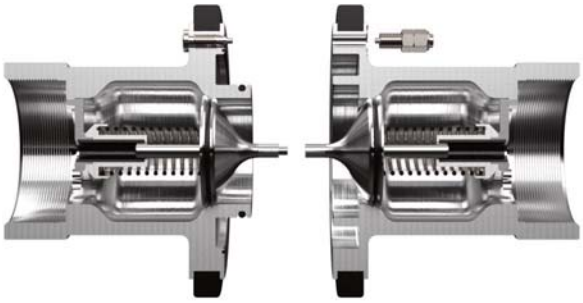
- Protects personnel, equipment, and the environment from accidental spills.
- Prevents costly downtime and product loss.
- Enhances operational safety and reliability across land, sea, and cryogenic applications.

How Thorburn Series TB Breakaway Couplings Work





Before Emergency Disconnect
The safety break-away valve consists of two halves, each with a valve that has a o-ring seal.



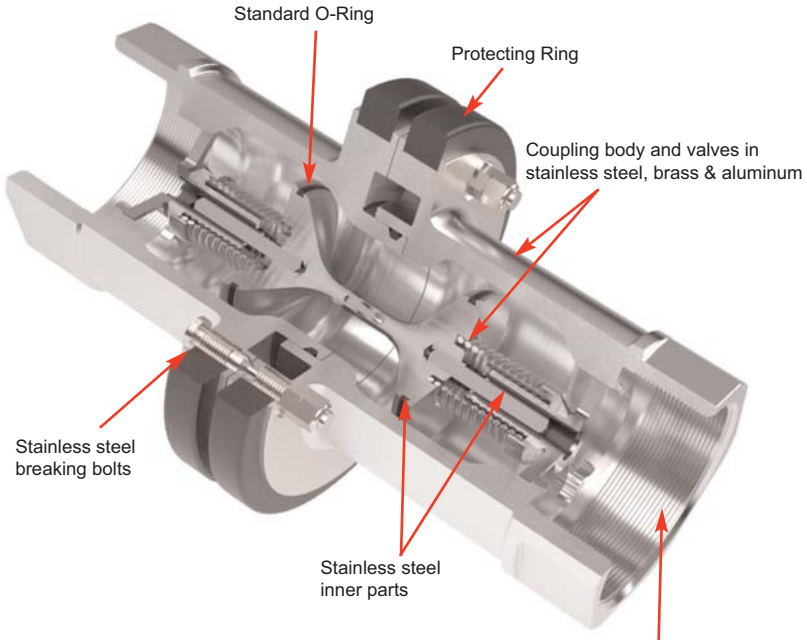
After Emergency Disconnect
When separated, it allows the valves to close. The two valves closes rapidly, minimizing exposure to personnel and the environment.

Specialized Designs for Every Application

TBI Industrial Series: For fixed installations where one side of the coupling is anchored such as loading arms, tank trucks, or pipelines.

TBC Cryogenic Series: Optimized for extreme low-temperature service handling LNG, liquid gases, and other cryogenic media.

TBM Marine Series: Designed for marine transfer operations; releases only under straight-line tension, ideal for ship-to-ship or ship-to-shore hoses.



Applications

Industrial
Loading and unloading of cryogenic tankers, railcars, storage vessels, cryogenic storage terminals, refueling stations, and industrial gas plants

Chemicals & Hydrocarbons
Aromatics, ethylenes, propylenes, VCM, alcohols, acids, diesel, Jet A1

Liquefied Gases
liquid nitrogen, liquid oxygen, LPG, butane, propane, CO_2, DME, LNG, refrigerants

Marine & Offshore
Ship-to-shore, ship-to-ship, rig transfer systems, marine bunkering, vapor recovery, container discharge, offshore & onshore cryogenic distribution systems

Thorburn Series TB Breakaway Couplings

Construction

Sizes: 1" (DN25) to 6” (DN150)
Working Pressure:
MWP 25 bar 1”-4” Couplings,
MWP 16 bar 6” Coupling
Working Temperature:
Protection Ring: Polyurethane (PU)
Material: 316SS, Aluminum, Brass
Seals: FKM / EPDM / FFKM / NBR
Connections: NPT/BSP Threads,
Flange (ANSI, PN), Victaulic

Thorburn Series TBI Industrial Breakaway Couplings

Thorburn Series TBI Industrial Breakaway Couplings are designed to protect loading arms, hose assemblies, and transfer systems from damage caused by accidental drive-away or pull-away incidents. Installed where one side is fixed, they instantly shut off flow to prevent spillage, equipment damage, and environmental hazards.

Features

Automatic Shut-Off: Internal valves close instantly on both sides when the coupling separates, preventing product loss.
Calibrated Break-Load Design: Precision break point ensures reliable activation at a predetermined force.
No External Power Needed: Fully mechanical operation for maximum reliability and simplicity.
High Flow / Low Pressure Drop: Optimized flow path ensures transfer efficiency without restricting throughput.
Easy Reset: Can be quickly reassembled on-site by a single operator using basic tools.
Durable Construction: Engineered for long service life under demanding industrial conditions.

Benefits

- Prevents costly downtime, cleanup, and product loss.
- Protects equipment, personnel, and the environment.
- Reduces maintenance time and ensures rapid return to service.
- Enhances operational safety and reliability at loading and unloading stations.

Construction

Sizes: 1" (DN25) to 6” (DN150)
Working pressure:
MWP 25 bar- 1”-4” couplings,
MWP 16 bar- 6” coupling
Working Temperature:
Material: 316SS, Aluminum
Seals: FKM / EPDM / FFKM / NBR
Connections: NPT/BSP Threads,
Flange (ANSI, PN), Victaulic

Thorburn Series TBM Marine Breakaway Couplings

Thorburn Series TBM Marine Breakaway Couplings are engineered to protect marine transfer systems from product spills, equipment damage, and environmental hazards caused by accidental pull-away incidents. Specifically designed to release only under straight-line tension, they are installed between two hose strings for ship-to-ship and ship-to-offshore platform fluid transfer operations.

Features

Inline Release Design: Activates only under axial tension, preventing accidental separation from torsional or bending forces.
Automatic Shut-Off: Dual valves instantly close upon separation, eliminating product loss and contamination.
Rugged Marine Construction: Stainless steel break bolts and corrosion-resistant materials ensure long life in harsh saltwater conditions.
High Flow / Low Pressure Drop: Maintains maximum transfer efficiency with minimal restriction.
Easy On-Site Reset: Simple reassembly by one operator using basic tools.

Benefits

- Prevents costly spills and downtime during marine transfer operations.
- Protects vessels, loading systems, and the environment from contamination.
- Provides reliable, maintenance-friendly safety performance in offshore and marine conditions.

Thorburn Series TB Breakaway Couplings

Construction

Sizes: 1" (DN25) to 6” (DN150)
Working pressure:
MWP 25 bar 1”-4” couplings,
MWP 16 bar 6” coupling
Working Temperature: -200°C to +65°C
Material: 316SS
Seals: PTFE
Connections: NPT/BSP Threads,
Flange (ANSI, PN)

Thorburn Series TBC Cryogenic Breakaway Couplings

Thorburn Series TBC Cryogenic Breakaway Couplings are precision-engineered to prevent accidental product release and equipment damage during drive-away or pull-away incidents. These couplings are specifically developed for cryogenic transfer systems where low temperatures and high product value demand the highest levels of safety and reliability. Thorburn Series TBC Breakaway Couplings deliver proven safety performance and reliability in the most demanding cryogenic applications, ensuring continuity of operations while safeguarding personnel, equipment, and product integrity

Features

Automatic Shut-Off Mechanism: Dual internal valves instantly close on both sides when separation occurs, minimizing product loss.
Precision Break Pin Design: Calibrated breaking pins ensure reliable activation at a predetermined tensile load, preventing premature release.
Low Pressure Drop: Engineered flow path minimizes restriction, maintaining transfer efficiency.
Cryogenic Compatibility: Constructed from materials rated for extreme low-temperature service, ensuring durability and seal integrity.

Benefits

- Protects operators, equipment, and the environment from hazardous leaks.
- Seals both ends instantly to retain valuable cryogenic media.
- Quick reassembly and reset capability minimize operational interruptions.

Construction

Sizes: 1" (DN25) to 6” (DN150)
Working pressure:
MWP 25 bar 1”-4” couplings,
MWP 16 bar- 6” coupling
Working Temperature: -200°C to +65°C
Material: 316 Stainless Steel
Seals: PTFE seals
Connections: NPT/BSP Threads,
Flange (ANSI, PN)

Thorburn Series TBCC Cryogenic Breakaway Couplings (Cable Release)

Thorburn Series TBCC Cryogenic Breakaway Couplings provide reliable protection against product spillage and equipment damage during accidental pull-away events in cryogenic transfer systems. Featuring a collar-type cable release mechanism, these couplings are designed for installation between a fixed point and a hose string. When tension is applied to the cable, the coupling releases cleanly at a predetermined break load, automatically sealing both ends to stop product flow. Engineered for cryogenic service down to –200 °C, the TBCC ensures safe, trouble-free operation in demanding low-temperature conditions, minimizing risk to operators and transfer systems.

Features

Cable-activated release: ensures controlled separation and safe shut-off
Automatic dual-valve closure: instantly seals both sides upon release
Cryogenic-rated materials: reliable performance down to -200 °C
No external power required: purely mechanical and maintenance-friendly
Compact design: easy installation and quick reset for continued service

Benefits

- Prevents costly product loss and equipment damage
- Enhances operator safety and environmental protection
- Reduces downtime with quick, on-site reset capability
- Provides dependable performance for critical cryogenic transfer operations

Thorburn Series TB Typical Breakaway Coupling Ends

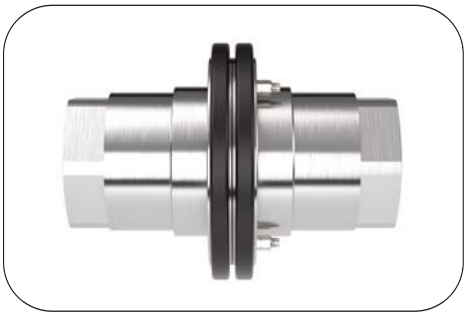
Male NPT/BSP

Female NPT/BSP

Flange - ANSI, PN

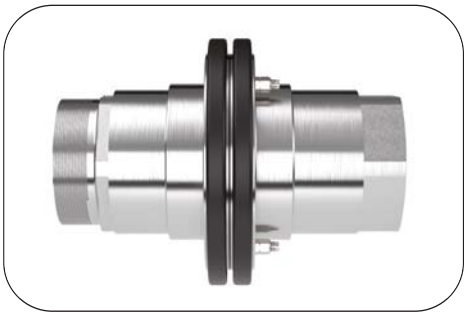
Victaulic

Typical End Type Combinations



Female thread / Female thread (NPT/BSP)

Male thread / Male thread (NPT/BSP)



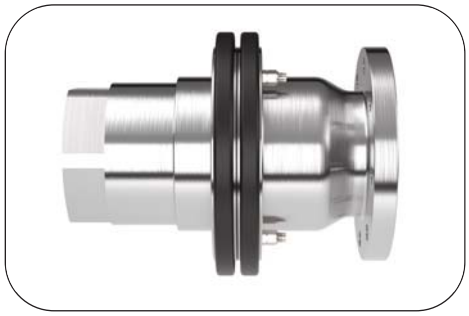
Female thread / Male thread (NPT/BSP)

Victaulic / Victaulic

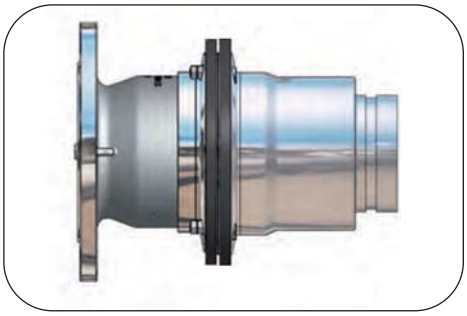
Female thread (NPT/BSP) / Victaulic

Male thread (NPT/BSP) / Victaulic

Flange / Flange



Flange / Female or Male (NPT/BSP)



Flange / Victaulic

Thorburn Series TB Technical Data

Nominal Hose I.D.		Breaking Force	Connection	Weight	
Inch	DN	kN	Inch	kg	lb
1	25	5	1” Thread (BSP/NPT)	2	4.4
			1” Flange	3	6.6
2	50	13	2” Thread (BSP/NPT)	3	6.6
			2” Flange	7	15
2.5	65	22	2.5” Thread (BSP/NPT)	7	15
			2.5” Flange	13	28.6
3	80	33	3” Thread (BSP/NPT)	9	19.8
			3” Flange	15	33
4	100	52	4” Thread (BSP/NPT)	16	35
			4” Flange	21	46
5	150	81	5” Thread (BSP/NPT)	32	70.5
			5” Victaulic	31	68
6	200	92	6” Thread (BSP/NPT)	47	103.6
			6” Flange	58	127.9

How To Order Series (N)TB Break Away Couplings

Model	Size	1st Half	2nd Half	Body Material (Wetted Parts)	Seal
(N)TBI	**16**	**4**	**5**	**S6**	**H**
(N)TBI = Industrial **(N)TBC** = Cryogenic **(N)TBCC** = Cryogenic (Cable Release) **(N)TBM** = Marine	**16** = 1” (DN 25) **32** = 2” (DN 50) **40** = 2.5” (DN 65) **48** = 3” (DN 80) **64** = 4” (DN 100) **80** = 5” (DN 125) **96** = 6” (DN 150)	**1** = Male Thread NPT **2** = Male Thread BSP **3** = Female Thread NPT **4** = Female Thread BSP **5** = Victaulic **6** = Flange ANSI 150 **7** = Flange ANSI 300 **8** = Flange PN10 **9** = Flange PN16 **10** = Flange PN25 **11** = Flange PN40		**S6** = 316SS **AL** = Aluminum **BB** = Brass	**J** = PTFE **I** = FKM **H** = EPDM **JX** = FFKM **N** = NBR

Thorburn Thorvolok Dry Break Quick Couplings

Dry Break Poppet Type Quick Disconnect Coupling System

Thorburn Thorvolok™ Series represents the next generation of dry-break coupling technology, engineered for maximum safety, spill prevention, and operational reliability in critical transfer applications. Designed to automatically shut off in the event of accidental disconnection, Thorvolok couplings prevent loss of product and protect both personnel and the environment. Ideal for use at liquid transfer points, such as, tank and truck connections, vapor-recovery systems, and the transfer of petroleum, solvents, and corrosive or caustic media, the Thorvolok system combines exceptional sealing integrity with minimal pressure drop and long-term durability.

Dry-Disconnect In Two Designs

Thorburn Model TVD17: Provides automatic closure on both the coupler and the adaptor, ensuring a total shut-off in either direction. This model remains the preferred choice for loading operations, blending manifolds, and closed-loop systems, where product integrity and zero emissions are essential

Thorburn Model TVD12: incorporates a precision flat-face interface that eliminates cavities where residual liquid can collect. This design reduces fluid loss upon disconnection by up to 85%, making it ideal for high-purity, corrosive, or hazardous-media transfer where cleanliness and environmental control are paramount.

Features

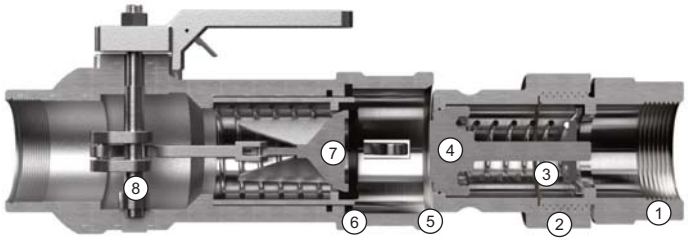
Exceptional Spill Protection: Engineered to reduce hazards and operator exposure during coupling or uncoupling of hazardous materials.
True Closed-Loop Loading: Prevents escape of both liquids and vapors, keeping hazardous media completely contained within the process line.
Positive Cam-Locking System: Robust locking arms secure automatically with an audible click, ensuring a leak-free connection. Disconnection requires only a controlled release pull—safe, fast, and ergonomic.
Precision Thorvolok Valve Mechanism: When uncoupled, both the coupler and adaptor remain tightly sealed by independent, spring-loaded poppet valves. When coupled and the operating lever engaged, the poppets align and open simultaneously, delivering unrestricted flow and maintaining full system pressure integrity.
Easy, Tool-Free Operation: Connection and disconnection are achieved simply by opening or closing the cam arms. The mechanically linked lever system provides smooth, single-motion control without twisting or external tools.

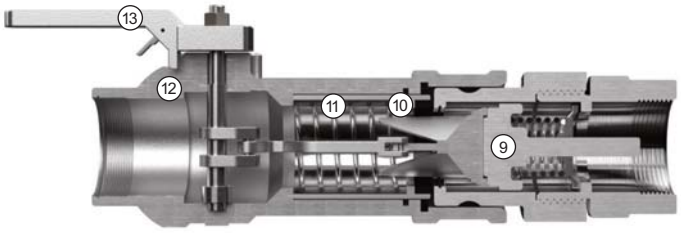
Thorburn Thorvolok Dry Break Quick Couplings

Thorburn Thorvolok Design Principle

Uncoupled with valve closed: When the dry-disconnect adaptor is separated from the coupler, its own spring-loaded poppet assembly holds the poppet disc firmly in the closed position. The coupler poppet disc is also held in the closed position.

Coupled with valve open: With the coupler and adaptor coupled together and the Open/Close level actuated, the coupler poppet mates with the adaptor poppet, then pushes it to full open position, allowing flow through.

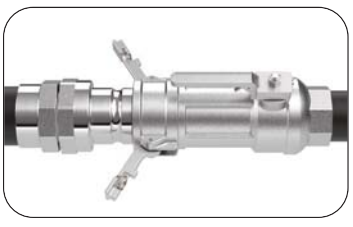




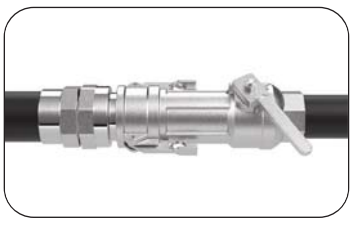
1 - Pipe End	4 - Poppet Sub-Assembly Disk	7 - Poppet	10 - Seal Cylinder	13 - Lever
2 - Adapter	5 - Body	8 - Stem Sub-Assembly	11 - Spring	
3 - Spring	6 - Cam Arm	9 - Center Guided Poppet	12 - Body	

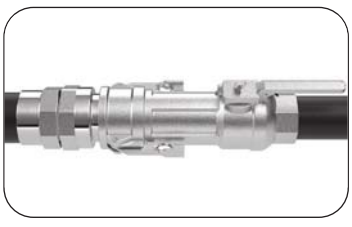
How to Operate Thorburn Thorvolok

Thorburn Thorvolok couplings connect and disconnect by simply closing and opening two cam arms which lock into the machined groove around the circumference of the mating adaptor. The adaptor contains a spring-loaded poppet assembly that is actuated by the handle-action on the coupler.


Coupler in any position


Cam arms lock coupler & adapter together


Locking handle opens valve


Handle locks and full flow begins

Thorburn Thorvolok Dry Break Quick Couplings

Thorvolok Series TVD17

Female NPT to Female Coupler - Double Shut-Off

Part Number	Nominal Size		
	in	mm	DN
TVD17-24	1 1/2	38	40
TVD17-32	2	51	50
TVD17-48	3	76	80

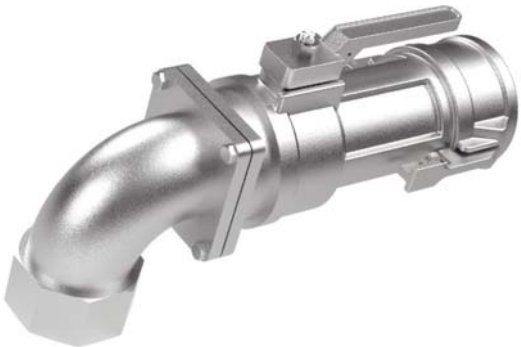
Thorvolok Series TVDFC

Female NPT to Female Coupler - Flat Face

Part Number	Nominal Size		
	in	mm	DN
TVDFC-24	1 1/2	38	40
TVDFC-32	2	51	50
TVDFC-48	3	76	80

Thorvolok Series TVD19

Female NPT Elbow to Female Coupler - Double Shut-Off



Part Number	Nominal Size		
	in	mm	DN
TVD19-24	1 1/2	38	40
TVD19-32	2	51	50
TVD19-48	3	76	80

Thorburn Thorvolok Dry Break Quick Adapters

Thorvolok Series TVDFA

Female NPT to Female Coupler - Flat Face

Part Number	Nominal Size		
	in	mm	DN
TVDFA-24	1 1/2	38	40
TVDFA-32	2	51	50
TVDFA-48	3	76	80

Thorvolok Series TVS14

Male Adapter to Female NPT - Vapor Recovery Single Shut-Off

Part Number	Nominal Size		
	in	mm	DN
TVS14-24	1 1/2	38	40
TVS14-32	2	51	50
TVS14-48	3	76	80

Thorvolok Series TVD15

Male Adapter to 2 inch Flange - Shut-Off

Part Number	Nominal Size		
	in	mm	DN
TVD15-24	1 1/2	38	40
TVD15-32	2	51	50
TVD15-48	3	76	80

Thorvolok Series TVD16

Male Adapter to Female NPT - Shut-Off

Part Number	Nominal Size		
	in	mm	DN
TVD16-24	1 1/2	38	40
TVD16-32	2	51	50
TVD16-48	3	76	80

Thorburn Thorvolok Dry Break Quick Adapters

Thorvolok Series TVP

Dry Disconnect Plug

Part Number	Nominal Size		
	in	mm	DN
TVP-24	1 1/2	38	40
TVP-32	2	51	50
TVP-48	3	76	80

Thorvolok Series TVC

Dry Disconnect Cap

Part Number	Nominal Size		
	in	mm	DN
TVC-24	1 1/2	38	40
TVC-32	2	51	50
TVC-48	3	76	80

How To Order Thorvolok Dry Break Couplings

Model	Size ID	End Material	Seal Material	Adapter	Adapter Material	Option
TVD17	**32**	**AL**	**H**	**TVDFA**	**AL**	**TVPS6**
TVD17 **TVDFC** **TVD19**	**24** = 1 1/2 **32** = 2 **48** = 3	**AL** = Aluminum **S6**= 316SS	**B** = BUNA N **I** = FKM **H** = EPDM **J** = PTFE	**TVDFA** **TVS14** **TVD15** **TVD16**	**AL** = Aluminum **S6**= 316SS	**TA** = Tank Truck Flange Adapter **JA** = Jump Size Female NPT Adapter **TVP** = Dry Disconnect Plug **TVC** = Dry Disconnect Cap None = Leave Blank **Materials** **S6** = 316SS **AL** = Aluminum **P** = Plastic **XY** = Specify

Thorburn Thor-Tite Elbow Couplings

Thorburn Thor-Tite™ Elbow Couplings are precision-engineered fitting system designed for fuel distribution and bulk transfer systems, providing a secure, leak-free connection between a tanker's drop hose and an underground storage tank fill collar. Each elbow is built to ensure smooth product flow while preventing hose damage, kinking, or premature wear during loading operations.

Thor-Tite™ elbows are constructed for long service life, minimal maintenance, and superior operator safety. They feature a positive locking mechanism that maintains a tight seal during filling and unloading operations, even under pressure or vibration. The robust swivel design and ergonomic geometry make hose alignment fast, safe, and effortless

Tightfill Elbows with Locking Handles: Incorporate an automatic self-locking mechanism that provides a secure, repeatable seal at every connection. Ergonomically designed handles ensure smooth operation and easy coupling or release, even with gloved hands or under adverse conditions.

Single Point (Coaxial) Drop Elbows: A compact, dual-function design allowing simultaneous vapor recovery and fuel delivery through one elbow. The upper connection serves as the fuel delivery inlet, while the lower connection handles vapor return, simplifying the setup and minimizing potential leak paths.

Dual Point Drop Elbows: Used in systems where liquid and vapor lines are handled separately. These elbows provide safe and efficient management of both product delivery and vapor recovery, making them ideal for installations requiring strict environmental compliance.

Benefits

Secure, Leak-Free Performance: Precision sealing surfaces and robust locking mechanisms ensure total containment during transfer.

Ergonomic Design: Smooth swivel and balanced handle geometry reduce operator strain and improve efficiency.

Hose Protection: Angled flow path minimizes stress & prevents kinking of the tanker drop hose.

Corrosion-Resistant Construction: Manufactured using premium materials for long service life in demanding fuel environments.

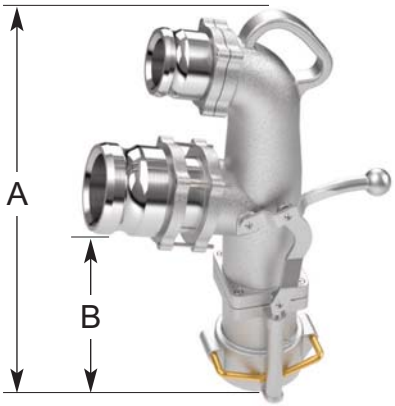
Interchangeable Configurations: Available in multiple connection types and flow geometries to suit terminal, retail, and mobile refueling systems

Thorburn Thor-Tite Series TSPCE Single Point Coaxial Elbow

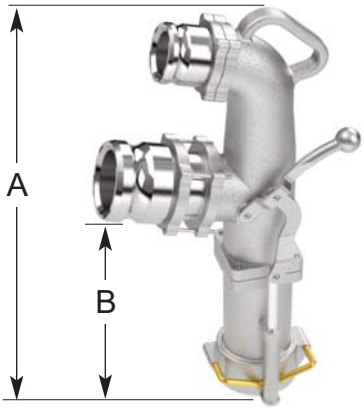
Thorburn Thor-Tite™ Series TSPCE Single-Point (Coaxial) Elbow is designed to simplify fuel loading operations by combining fuel delivery and vapor recovery through a single, compact elbow assembly. Engineered for seamless connection to underground tank fill collars, the TSPCE ensures a secure, leak-free transfer while maintaining full vapor-return integrity. The upper connection serves as the fuel delivery inlet, while the lower connection manages vapor recovery, allowing both functions to occur simultaneously through one elbow. A 4" liquid inlet adapter and 3" vapor outlet adapter interface with standard 4" fuel hoses and 3" vapor hoses for easy compatibility across loading systems. A 360° cylindrical acrylic sight glass provides complete visibility of product flow from all angles, enhancing operator confidence and safety during loading.

Features

- Cast from high-strength aluminum for maximum corrosion resistance, reduced weight, and long service life.
- Bolt-on inlet adapters can be replaced easily—eliminating the risk of galling and thread wear.
- Ball-handle lever allows positive engagement of bronze locking arms, securing the elbow to the underground adapter.
- Specialized sealing system ensures a tight connection and prevents any product crossover into the vapor line.
- Available in standard or tall heights to accommodate shallow or deep fill box installations.



TSPCE-6400



TSPCE-6400X

Construction

Body: Aluminum
Handle: Aluminum
Inlet/Outlet Connection: Aluminum
Hardware: 316SS
Gasket: NBR
Flat/Waved Washer: 316SS
Sight Glass: PMMA

How to Order Thorburn Thor-Tite Series TSPCE

Thorburn Part #	Description	A Overall Height	B Ground Clearance	Fuel Compatibility
TSPCE-6430	Standard height elbow with 3" adapter fuel inlet, 3" adapter vapor outlet	23 3/4	11 3/4	Gasoline and Diesel up to E100 & B20 Biofuels
TSPCE-6430F	Standard height elbow with 3" coupler fuel inlet, 3" adapter vapor outlet			
TSPCE-6400	Standard height elbow with 4" adapter fuel inlet, 3" adapter vapor outlet			
TSPCE-6400F	Standard height elbow with 4" coupler fuel inlet, 3" adapter vapor outlet			
TSPCE-6400FNPT	Standard height elbow with 4" coupler fuel inlet, 3" male NPT vapor outlet			
TSPCE-6430X	Tall height elbow with 3" adapter fuel inlet, 3" adapter vapor outlet	26 3/4	14 3/4	
TSPCE-6430XF	Tall height elbow with 3" coupler fuel inlet, 3" adapter vapor outlet			
TSPCE-6400X	Tall height elbow with 4" adapter fuel inlet, 3" adapter vapor outlet			
TSPCE-6400XF	Tall height elbow with 4" coupler fuel inlet, 3" adapter vapor outlet			
TSPCE-6400XFNPT	Tall height elbow with 4" coupler fuel inlet, 3" male NPT vapor outlet			

Thorburn Thor-Tite Series TDPVE Dual Point Vapor Elbow

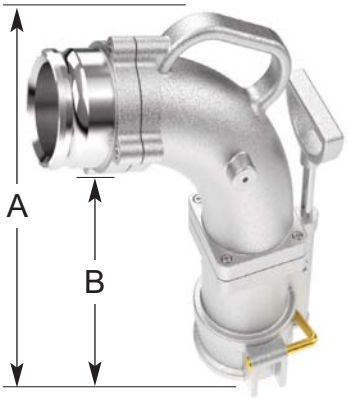
Thorburn Thor-Tite™ Series TDPVE Dual-Point Vapor Elbow is designed for dual-point vapor recovery systems, providing a secure and efficient connection between the vapor return line and the underground tank vapor adapter. The elbow incorporates a precision center probe that automatically opens the poppet valve of the underground adapter upon connection, creating a clear, unrestricted vapor path. Its lever-actuated locking system engages the stainless-steel locking arms simultaneously, producing uniform compression for a safe and vapor-tight seal. A 360° sight glass window offers complete visual confirmation of product or vapor movement, enhancing operator safety and confidence during operation.

Features

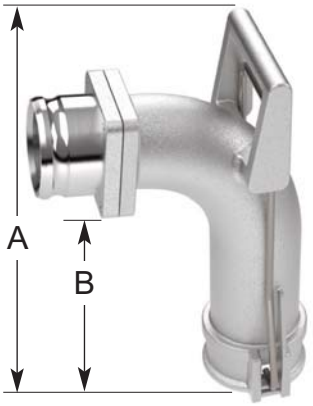
- Modular, corrosion-resistant housing designed for strength, durability, and long service life.
- Quick, single-motion coupling reduces the chance of misalignment.
- Stainless steel locking arms with precise and even seal compression
- Inlet probes are standard, and are available with or without outlet poppet valves

Construction

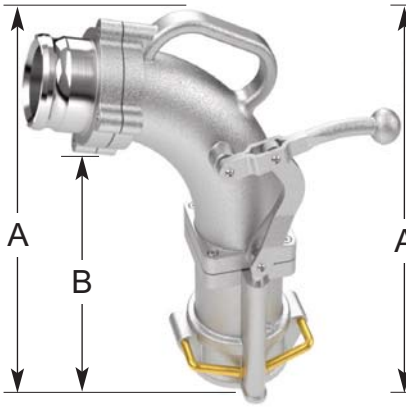
Body: Aluminum
Handle: Aluminum
Inlet/Outlet Connection: Aluminum
Hardware: 316SS
Seals: BUNA N



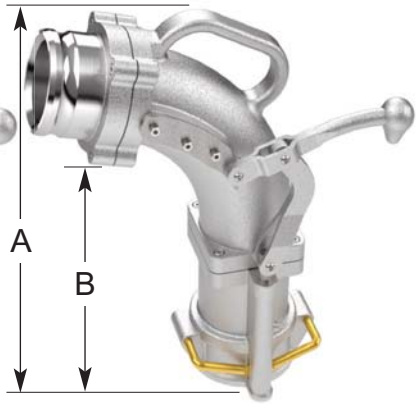
TDPVE-6000



TDPVE-6100



TDPVE-6200



TDPVE-6500A

How to Order Thorburn Thor-Tite Series TDPVE

Thorburn Part #	Description	Outlet Poppet Valve	A Overall Height	B Ground Clearance	Vapor Compatibility
TDPVE-6000NP	D-handle, 3” adapter outlet	No	17 1/4”	10 3/4”	Gasoline and Diesel up to E85 & B20 Biofuels
TDPVE-6100NP	Push-on style, 3” adapter outlet	No	18 3/4”	12 1/2”	
TDPVE-6200NPBU	Ball lever handle, without adapter outlet	No	17 1/4”	10 3/4”	
TDPVE-6200	Ball lever handle, 3” adapter outlet	Yes	17 1/4”	10 3/4”	
TDPVE-6200NP	Ball lever handle, 3” adapter outlet	No	17 1/4”	10 3/4”	
TDPVE-6200PNP	Ball lever handle, 3” adapter outlet with height extension	No	20 1/4”	13 3/4”	
TDPVE-6200ANP	Ball lever handle, 4” adapter outlet	No	17 1/4”	10 3/4”	
TDPVE-6200NPB	Ball lever handle, 3” coupler outlet	No	17 1/4”	10 3/4”	
TDPVE-6200NPBP	Ball lever handle, 3” coupler outlet with height extension	No	20 1/4”	13 3/4”	
TDPVE-6200NPDP	Ball lever handle, 4” coupler outlet with height extension	No	20 1/4”	13 3/4”	
TDPVE-6500	Heavy duty ball lever handle, 3” adapter outlet	Yes	17 1/4”	11 1/4”	
TDPVE-6500NP	Heavy duty ball lever handle, 3” adapter outlet	No	17 1/4”	11 1/4”	
TDPVE-6500LPNP	Heavy duty ball lever locking handle, 3” adapter outlet	No	20 1/4”	13 3/4”	

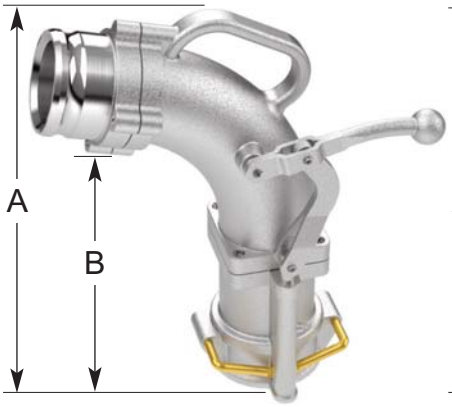
* Requires liquid sealant to seal elbow body

Thorburn Thor-Tite Series TDPLE Dual Point Lever Elbow

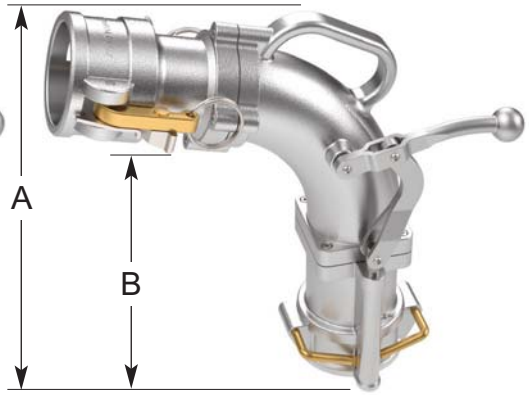
Thorburn Thor-Tite™ Series TDPLE Dual-Point Lever Elbow provides a reliable, ergonomic solution for connecting 4" fuel delivery hoses to underground tank fill collars in dual-point fuel transfer systems. Designed to eliminate hose kinking and reduce operator strain, the TDPLE ensures safe, efficient, and leak-free fuel delivery during every loading operation. The elbow features a 4" inlet coupler with self-locking brass handles on one end and a precision-machined outlet that mates securely to underground tank adapters on the other. When paired with a Thorburn TDPVE Vapor Elbow, the system enables simultaneous liquid transfer and vapor recovery, maintaining environmental integrity and operator safety.

Features

- Heavy-duty bolt-on arm attachment plate enhances structural rigidity and extends service life
- Dual hinge points provide superior load distribution, increasing locking-arm strength and durability
- Built-in heavy-duty locking mechanism prevents accidental disconnection while the elbow is under load or pressure.
- Smooth, balanced lever operation minimizes effort and can be mounted on either side for operator convenience



TDPLE-6200A



TDPLE-6200D

Construction

Body: Aluminum
Handle: Aluminum
Inlet/Outlet Connection: Aluminum
Hardware: 316SS
Gasket: NBR
Flat/Waved Washer: 316SS
Sight Glass: PMMA

How to Order Thorburn Thor-Tite Series TDPLE

Thorburn Part #	Description	A Overall Height	B Ground Clearance	Vapor Compatibility
TDPLE-6200	Standard height elbow only, without inlet connection	17 3/4"	10 7/8"	Gasoline and Diesel up to E100 & B20 Biofuels
TDPLE-6200C	Standard height elbow with 3" adapter inlet			
TDPLE-6200A	Standard height elbow with 4" adapter inlet			
TDPLE-6200B	Standard height elbow with 3" coupler inlet			
TDPLE-6200D	Standard height elbow with 4" coupler inlet			
TDPLE-6200T	Elbow with anti-spill sleeve with inlet connection			
TDPLE-6200AT	Elbow with 4" adapter inlet and anti-spill sleeve			
TDPLE-6200X	Tall height elbow only, without inlet connection	21"	13 3/4"	
TDPLE-6200XC	Tall height elbow with 3" adapter inlet			
TDPLE-6200XA	Tall height elbow with 4" adapter inlet			
TDPLE-6200XB	Tall height elbow with 3" coupler inlet			
TDPLE-6200XD	Tall height elbow with 4" coupler inlet			
TDPLE-6200XT	Tall elbow with anti-spill sleeve with inlet connection			
TDPLE-6200XAT	Tall elbow with 4" adapter inlet and anti-spill sleeve			

Thorburn Thor-Tite Drop Adapters

3”- 633CFR48-AL / 4”- 633CFR64-AL

Female Camlock Coupler - Flange

3”- 633EF48-AL / 4”- 633EF64-AL

Male Adapter - Flange

3”- 633EFP48-AL / 4”- 633EFP64-AL

Female NPT - Male Adapter

3”- 633EFH48-AL / 4”- 633EFH64-AL

Female NPSH - Male Adapter

3”- 633LC48-AL / 4”- 633LC64-AL

Locking Cap

3”- 633CFO48-AL / 4”- 633CFO64-AL

Female Camlock Coupler - Flange

3”- 633EFSQ48-AL / 4”- 633EFSQ64-AL

Male Adapter - Flange

3”- 633FPFSQ48-AL / 4”- 633FPFSQ64-AL

Female NPT - Flange

3”- 633MPFSQ48-AL / 4”- 633MPFSQ64-AL

Male NPT - Flange

Thorburn Thor-Tite Vapor Adapters

4”- THSA64-4051

Top Seal Adapter

4”- THVA64-4086

Vapor Adapter

4”- THSS64-4051

Side Seal Tank Adapter

Thorburn Series TJ942 Tank Truck API Valves

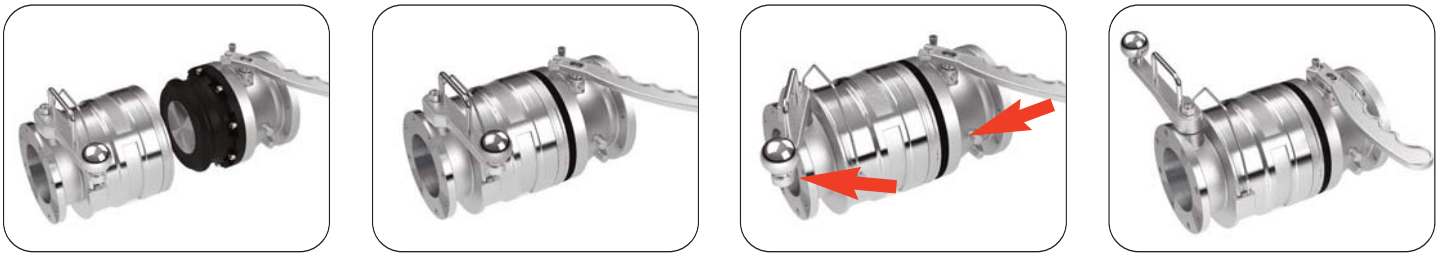
Thorburn Series TJ942 API Valve is the industry standard for bottom loading and unloading of fuel tankers, providing a secure, high-flow connection between the tanker and the loading terminal. Designed and manufactured to API RP-1004 specifications, the TJ942 delivers exceptional reliability, operator safety, and long service life. Mounted directly to the tanker, the valve serves as the primary interface with the terminal's API coupler, ensuring fast, spill-free transfer. Its interlock mechanism prevents operation unless fully connected, and the coupler cannot be released while the valve is open—eliminating accidental disconnection and product loss. Constructed from lightweight, high-strength aluminum, the TJ942 features an ergonomic 62° curved handle for smooth operation and a unique fluid-flow sight level for visual monitoring. Maintenance is simple—all seals (poppet, nose, and side) can be replaced without removing the valve from the tanker.

Features

- Conforms to API RP-1004 standard
- Interlock safety prevents mis-operation
- re-buildable in place—no valve removal required
- Ergonomic 62° short-stroke handle for easy actuation
- Fluid sight indicator for visual confirmation of flow
- Biofuel compatible up to E100 and B100
- **Max working pressure:** 75 PSI
- **Sight glass temperature limit:** 140 °F (60 °C)
- **Size:** 4" standard; flanged tank-truck inlet
- **Seals:** FKM standard; optional elastomers available

Application

Ideal for bottom loading of fuel tankers in terminals, depots, and refinery operations where safety, reliability, and transfer efficiency are critical. Bottom loading offers faster fill rates, reduced vapor emissions, and improved operator safety by allowing all connections to be made from ground level



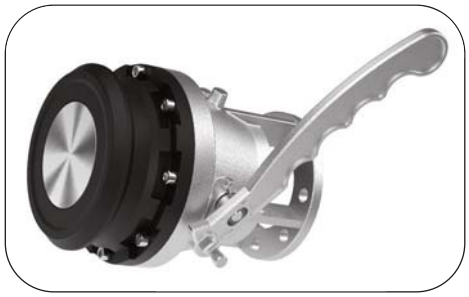
Connecting API coupling - a coupler (hose unit) with an adaptor (tank unit).

Thorburn Series TJ942 Tank Truck API Valves

Thorburn Series TJ942-API Coupler is the standard for the industry. A true work horse with a solid reputation built on years of service. It is an API style dry-break coupler built to conform with API RP- 1004. It is available in a 4" size only. Thorburn's TJ942 is designed with an interlock so that the coupler cannot be opened unless it is properly connected to an API style adapter. Once coupled, it cannot be uncoupled while the valve is open. Constructed of aluminum, this durable coupler has a 4" tank truck flanged inlet.

Thorburn's API coupler has a special seal design that allows the poppet, nose and side seals to be replaced without disassembling the coupler or removing it from the loading arm. Standard seals are FKM Orings. Other elastomers available.

Model TJ942-1
Valve - Fixed handle & sight glass



Model TJ942-2
Valve - Fixed handle inline full body sight glass

Model TJ942-3
Valve - No handle with sight glass

Thorburn Part #	Description	Temperature Range	Application	Fuel Compatibility
TJ942-1-NG	Fixed handle with FKM seals (no sight glass)	-40°C to 60°C (-40°F to 140°F)	Loading/ Unloading	Gasoline & Diesel E100 / B100 Biofuels
TJ942-1-NGC	Canadian API with FKM seals (no sight glass)			
TJ942-1	Fixed handle, FKM seals and sight glass			Gasoline & Diesel E20 / B100 Biofuels
TJ942-1-P	Fixed handle, FKM seals and sight glass, drilled/tapped boss			
TJ942-1-C	Canadian API with FKM seals and sight glass			
TJ942-1-SNG	Fixed handle, FKM seals and stainless steel spring (no sight glass)	-40°C to 93°C (-40°F to 200°F)		Crude Oil, Gasoline & Diesel E20 / B100 Biofuels
TJ942-1-TNG	Fixed handle with PTFE seals (no sight glass)			B100 Biodiesel
TJ942-1-NGV	Fixed handle with FKM seals (no sight glass)			Gasoline & Diesel B100 Biodiesel
TJ942-2	Fixed handle, FKM seals and inline full body sight glass	-40°C to 60°C (-40°F to 140°F)		Gasoline & Diesel E100 / B100 Biofuels
TJ942-2-P	Fixed handle, FKM seals and inline full body sight glass, drilled/tapped			
TJ942-3-LNG	FKM seals (no sight glass)	-40°C to 93°C (-40°F to 200°F)	Loading Only	
TJ942-3-SNG	FKM seals (no sight glass) with stainless spring			Crude Oil, Gasoline & Diesel E20 / B100 Biofuels
TJ942-3	FKM seals and sight glass	-40°C to 60°C (-40°F to 140°F)		Gasoline & Diesel E20 / B100 Biofuels

Thorburn Series 633ADA API Drop Adapters

Adapter - API to 4” drop adapter

Adapter - API to 4” drop adapter, flat gasket one piece design, with inline sight glass

Adapter - API to 4” drop adapter nitrile seal, two piece design with sight glass

Adapter - API to 4” drop coupler with nitrile gasket

Adapter - API to 4” coupler with nitrile gasket, two piece design & sight glass

4” API Dust Cap - Aluminum with flat nitrile gasket and nylon release lever

4” API Dust Cap - Aluminum with O-ring seal & brass cam arms

4” API Dust Cap - Nylon with flat nitrile seal & plated steel padlock roller lever

4” API Dust Cap - Aluminum with O-ring seal & brass locking cam arms

How To Order Series TJ942 Tank Truck API Valves & Adapters

Model	Size ID	Type	Body Material	Options
633ADA	64	2	AL	DC2
	64 = 4	**1** = API to 4” drop adapter **2** = API to 4” drop adapter, flat gasket one piece design, with inline sight glass **3** = API to 4” drop adapter nitrile seal, two piece design with sight glass **4** = API to 4” drop coupler with nitrile gasket **5** = API to 4” coupler with nitrile gasket, two piece design & sight glass	**AL** = Aluminum **XX** = Specify	None = Leave Blank **DC1** **DC2** **DC3** **DC4**

(N)TS25 Series - Thor-Sight™ Flow Indicator

Thor-Sight™ A Better Sealing Method

Thorburn's Thor-Sight™ offers two types of seals between the body and the outside diameter of the glass lens. For lower temperature applications an elastomer radial seal is used where as in higher temperatures a PTFE lip seal is used. Both seals house stainless steel spring that maintains a constant expanding force within the seal to form a longer lasting, more secure seal

Thor-Sight™ Applications

POWER PLANTS Motor flow of critical fluids, such as lubricants pumped to turbines in hydro-electric generators and water cooling lines

ELIMINATING STEAM BETWEEN LINE EROSION Wet steam combined with fly ash and dirt form a high velocity abrasive compound. Thor-Sight™ can show when filters begin to fail, when traps become clogged or worse, the abrasive steam will pass through the sight flow indicator.

MONITORING CLOGGED FILTERS Sight flow indicators are usually installed before and after a filter trap to monitor the filtration efficiency

MONITORING PROGRESS AND PURGE The bidirectional flapper shows flow direction.

There are four critical ways to view the media to increase productivity and reduce process maintenance costs...

ITEM	(N)TS25
Max. Pressure @ Temperature	250 PSI @ 175ºF / 1.7 MPa @ 79ºC
Max. Temperature @ Pressure	150 PSI @ 500ºF / 1.0 MPa @ 260ºC
Glass	Tempered Borosilicate
Seals	Viton A*
Indicator Material	Ryton**

* Other seals available upon request | ** PTFE is available upon request

Thor-Sight™ Indicator Options

Propeller The best way to show flow of opaque liquids. Ideal for observations at a distance. Flow from right to left is standard. Specify if left to right flow is needed. **(Code-1)**

Bi-Directional Flapper points in either direction to show you at a glance which way the liquid is flowing. **(Code-2)**

Drip Tube Ideal for gravity, extremely low or intermittent flow. Keeps product from dripping on the glass. Assures constant see-through. For vertical lines. **(Code-3)**

Bi-Directional Plain When the color and clarity of your liquid are of prime importance. **(Code-4)**

How To Order Thor-Sight™ Model (N)TS25

Model	Material	Size ID	End	End	Indicator	Seal
(N)TS25	S6	32	T	MJ	2	B
	S6 = 316SS* X = Other (Specify)	Hose size in 1/16 of an inch Examples: 04=1/4 32=2 06=3/8 48=3 08=1/2 64=4 12=3/4 96=6 16=1 128=8 20=1 1/2 160=10 24=1 1/2 192=12	F = Flanged ANSI Class 150 T = Female NPT B = Butt Weld S = Socket Weld MJ = Male JIC MP = Male NPT FJX = Female JIC Swivel XX = End 1 Specify YY = End 2 Specify		1 = Propeller 2 = Flapper 3 = Drip Tube 4 = Plain	B = Buna N I = Viton C = Neoprene H = EPDM J = PTFE X = Other (Specify)

Notes: Prefix (N) is used for code compliance. When Nuclear Class 2, 3 or 4 is required insert NC2 for Class 2 NC3 for Class 3 & NC4 for Class 4 at the end of the part number. Nuclear Class 6 leave blank.

Thorburn Series SJ Low Pressure Swivel Joints

Thorburn's SJ Series Ball Bearing Live Swivel

Thorburn's 316SS single fabricated "SJ" Series live swivel joint with 90° elbow flanges

Thorburn SJ Series Swivel Joints provide smooth, unrestricted movement for loading and unloading of liquids, gases, or dry bulk materials under both pressure and vacuum conditions. Designed to replace cumbersome flexible hoses or to enhance their performance, these precision-engineered joints allow rigid metal piping to be used safely and efficiently for transferring caustic, corrosive, or hazardous products. When flexible hoses are required, Thorburn swivels, mounted at the hose ends or integrated into hose guides eliminate kinking, twisting, and operator strain. They also prevent accidental impact damage to tanks, trucks, and equipment, while ensuring smooth flow and extended hose life. Engineered for broad industrial service and ideal for both rigid piping systems and articulated hose arms.

Full 360° rotation: Permits unrestricted movement of piping or hose assemblies under load
Leak-tight seal integrity: Precision-machined raceways and balanced bearing design maintain sealing under pressure or vacuum
Reduced Hose Wear: eliminates torsional stress, extending hose life and minimizing downtime
Adaptable Configurations: Available in multiple end styles, bearing designs, and rotation angles
Material & Seal Versatility: Offered in five metals and five seal materials for compatibility with nearly any fluid or gas
Cast & Fabricated Constructions: Engineered to cover a wide range of pressures, temperatures, and corrosion environments
Compact, Maintenance-Friendly Design: Simple disassembly for seal replacement and cleaning

Maximum Rated Pressure 2 inch (DIN50) SJ Swivel Joint

Cast Bronze	100 psi
Cast Aluminum	100 psi
Cast Stainless Steel	500 psi
Cast Ductile Iron	300 psi
Fabricated Steel	500 psi
Fabricated Stainless Steel	500 psi

Buna-N seals are standard with all of the above swivel joints, but each is available with seals made of Neoprene, Teflon, EPT or Viton-A, depending on the pressures and temperatures of your operation.

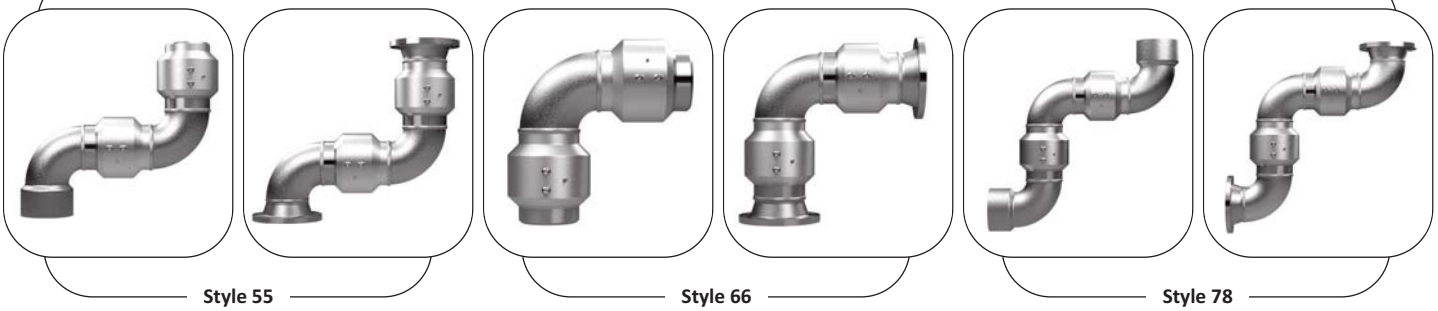
Contact Thorburn Flex with application details for specific Temperature / Pressure suitability

Thorburn Series SJ Low Pressure Swivel Joints

1 Plane of Rotation

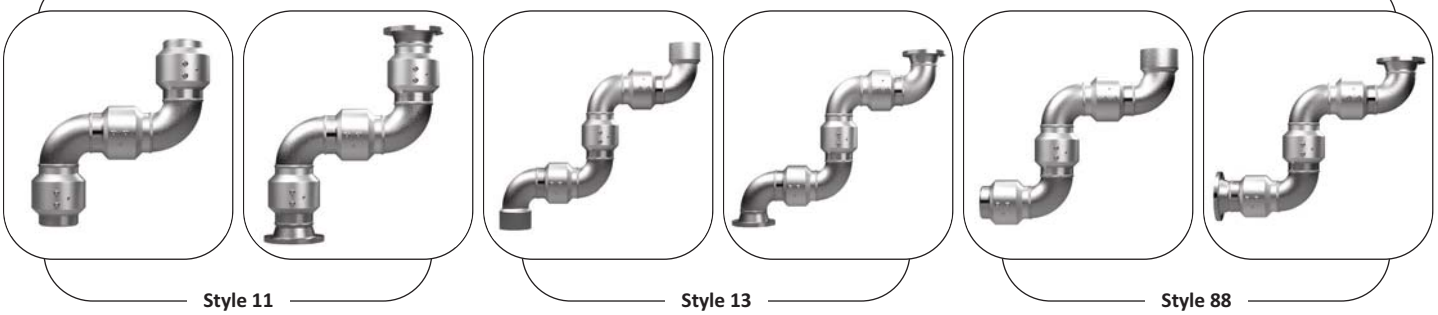
Style 22 — Style 33 — Style 34

2 Planes of Rotation



Style 55 — Style 66 — Style 78

3 Planes of Rotation



Style 11 — Style 13 — Style 88

How to Order Thorburn Series SJ Swivel Joints

Model	Size	Material	Style	1st End	2nd End	Seal
SJ	48	2	11	F1	T1	B

Size — Hose size in 1/16 of an inch
Examples:
01 = 1/16
02 = 1/8
04 = 1/4
06 = 3/8
08 = 1/2
12 = 3/4
48 = 3... etc.

Material
1 = Bronze
2 = Aluminum
3 = Fab. Steel
4 = Cast Stainless Steel
5 = Fab. SS304
6 = Fab. SS316

Style

11	55
13	66
22	78
33	88
34	SP**

1st End / 2nd End
F1 = Flanged ANSI Class 150
F2 = Flanged ANSI Class 300
T1 = Female NPT
B1 = Butt Weld
SW= Socket Weld
XX = Special (Specify)

Seal
B = Buna N
I = FKM
C = Neoprene
H = EPDM
J = PTFE
X = Other (Specify)

Some materials may not be available for certain sizes. Contact Thorburn.
** For materials other than listed, insert Code X and specify.*
*** SP = Special.*

Thorburn Series BLS Bottom Loading Swing Joint

Thorburn Series BLS Bottom Loading Accessories are designed to enhance the performance and flexibility of bottom loading arms and hose loading systems. Built for smooth operation, minimal pressure loss, and long service life, these swing joints provide precise alignment and reliable rotation during coupling and product transfer operations.

Model BLS-1 Single Outboard Swing Joint

Thorburn BLS-1 is a long-radius single swing joint engineered specifically for hose loader assemblies. It provides full 360° horizontal rotation, ensuring smooth, unrestricted hose movement and easy alignment during bottom loading operations. Constructed from lightweight yet durable cast aluminum, the BLS-1 offers a low-pressure-drop design for efficient flow and reduced turbulence. It incorporates the same proven sealing technology used in Thorburn's fabricated swivel joints, with seals available in FKM (Viton®), NBR (Buna-N), or PTFE. The BLS-1 is supplied with a 4" tank-truck flange for direct connection to Thorburn's TJ942 API Coupler, providing a fully integrated loading solution.

Model BLS-2 Double Outboard Swing Joint

Thorburn BLS-2 is a dual-axis swing joint designed for "A"-frame style bottom loading arms. It provides full 360° rotation on both horizontal and vertical planes, enabling effortless hose positioning and precise coupling alignment. Available in 2" through 6" sizes, the BLS-2 is constructed from high-strength cast aluminum and fitted with Quad-Ring seals available in Viton® or Buna-N, ensuring leak-free performance under demanding conditions.

How To Order Thorburn Series BLS

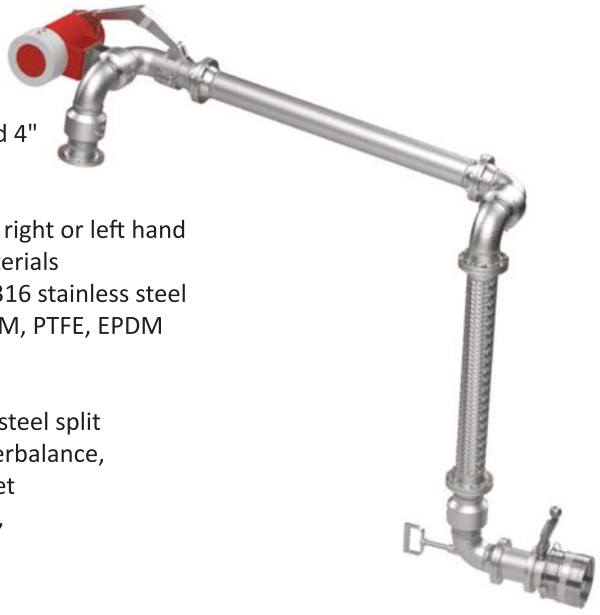
Model	Size Code	Seal Material
BLS-1	**32**	**J**
BLS-1 **BLS-2**	**32** = 2 (50 DN) **48** = 3 (80 DN) **64** = 4 (100 DN) **96** = 6 (150 DN)	**B** = BUNA N **I** = FKM **J** = PTFE

Thorburn Series TBSCB Base Swivels with Counter Balance

Left Hand Style

Right Hand Style

Thorburn Series TBSCB Base Swivels with a Counterbalance are mechanisms that use a weight distribution system (counterbalance) in conjunction with a swivel joint to manage loads, allow for easy movement, and maintain stability. Used In loading arm systems for transferring fuel and other media, these systems feature a base swivel, a connecting arm, a counterbalance, and a spring. The counterbalance helps manage the weight of the arm and attached piping/hoses for safe and ergonomic operation.



Sizes

- Carbon steel V-ring: 3”, 4”
- Carbon steel split flange: 2", 3”, and 4”
- 316 stainless steel split flange: 2", 3”, and 4"

Features

- Torsion spring counterbalance offered in right or left hand
- Connecting arm and clamp included Materials
- Base swivel materials: carbon steel and 316 stainless steel
- Available seals include: nitrile rubber, FKM, PTFE, EPDM

Specifications

- Standard configurations include carbon steel split flange base swivel, torsion spring counterbalance, 150# flange inlet, and TTMA flange outlet
- Connection options include: 150# flange, 300# flange, and TTMA flange
- Other options available upon request

Thorburn Series TBSCB Base Swivels with Counter Balance

Upfeed - Right Hand

Upfeed - Left Hand

Downfeed - Right Hand

Downfeed - Left Hand

Horizontal Upfeed - Right Hand

Horizontal Upfeed - Left Hand

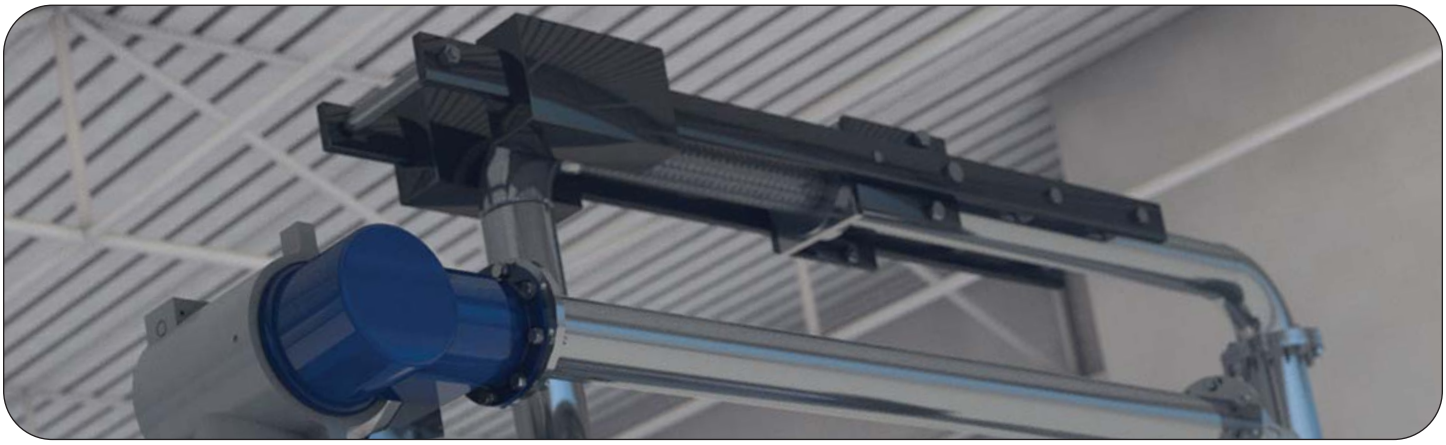
Horizontal Downfeed - Right Hand

Horizontal Downfeed - Left Hand

How To Order Series TBSCB Base Swivels with Counter Balance

Model	Size ID	Size ID	Type	Body Material	Seals
TBSCB	64	B	2	S6	H
	32 = 2 **48** = 3 **64** = 4	**A** = V-Ring **B** = Split Flange	**1** = Upfeed - Right Hand **2** = Upfeed - Left Hand **3** = Downfeed - Right Hand **4** = Downfeed - Left Hand **5** = Horizontal Upfeed - Right Hand **6** = Horizontal Upfeed - Left Hand **7** = Horizontal Downfeed - Right Hand **8** = Horizontal Downfeed - Left Hand	**S6** = 316SS **CS** = Plated Steel	**I** = FKM **D** = Nitrile **J** = PTFE **H** = EPDM

Thorburn Series CW Counterweight Base Assembly



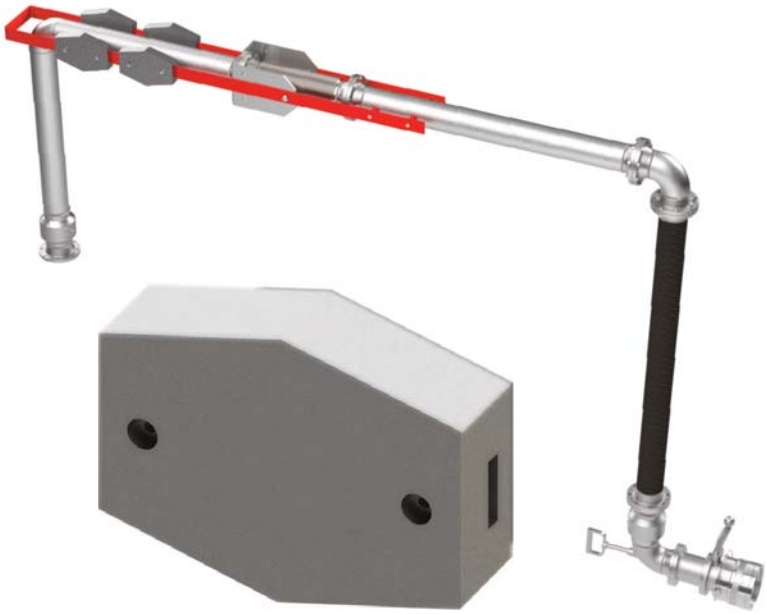
Thorburn Series CW counterweight Base Assembly offers a proven and reliable method for supporting the weight of a loading arm. It uses a lever-and-fulcrum design with heavy metal weights that counteract the arm's weight, ensuring smooth and controlled operation. Depending on the arm's reach and overall load, the system utilizes either two or four weights, and the balancing force can be precisely adjusted by sliding the weights along a rail. Designed to store fully extended in a horizontal position when not in use, this counterweight system is ideal for tight spaces, locations handling multiple products, or installations where arm crossover may be required.

Applications

- Bottom loading bulk liquids and other loading products
- Suitable for fuel loading racks and other loading products requiring multiple arms to crossover

Features

- No springs
- Split flange base swivel
- 2 or 4 adjustable counterweights
- Easy adjustment, operation, and maintenance



How To Order Thorburn Series THLV / TALV Loading Valves

Model	Quantity of Weights	DWG - Custom Application
CW	4	#

2 = 2 Weights
4 = 4 Weights

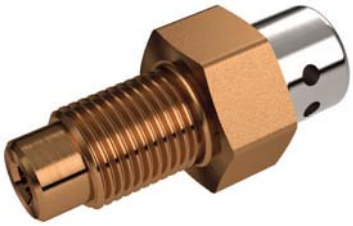
Thorburn Loading Valves

Thorburn Series THLV Horizontal Loading Valves

Thorburn Series THLV Horizontal Loading Valves have earned a long-standing reputation for reliability and quality across the petroleum industry, supported by more than five decades of proven performance in demanding operating environments. Minimize Line Shock – A variable closure rate allows the operator to precisely adjust how quickly the valve closes, reducing the risk of hydraulic shock in the loading system. Easy Maintenance – A unique stuffing box design enables quick, straightforward disassembly, helping reduce maintenance time and downtime. No Air Traps – The internal flow path is designed to prevent air pockets from forming, minimizing the chance of unintended product release after the valve is closed. Superior Shaft Sealing – Dual O-rings provide redundant sealing in critical areas, enhancing leak protection and long-term reliability. Valves are available in 3-inch and 4-inch sizes, constructed from durable aluminum, and equipped with TTMA flanged connections for compatibility with standard industry systems.

Thorburn Series TALV Angle Loading Valves

Thorburn Series TALV Angle Loading Valves, constructed from cast aluminum, is designed to hold fluid in the line all the way to the end of the loading arm. Its aluminum body is fitted with stainless steel internal trim, providing durability and compatibility with a wide range of fluids. The valve incorporates a deadman safety feature, requiring the operator to manually hold the handle in the open position during loading; the valve automatically closes when released. Standard end connections include a female pipe thread inlet and a TTMA flange outlet, ensuring compatibility with industry-standard loading systems. The valve is available in 3-inch and 4-inch sizes to accommodate various flow requirements.



Thorburn Series TVRV Vacuum Relief Valve

Thorburn Series TVRV Vacuum Relief Valves, installed on the loading valve of a loading arm, is a compact safety device designed to protect the arm, hose, and product line from vacuum-related damage during shutdown or draining. When the operator releases the loading valve handle and the system closes, trapped product in the arm or hose can create a vacuum condition. This valve automatically opens to admit air, preventing the arm from collapsing the hose, or drawing contaminants back into the system. Features a 3/8" NPT thread and a design pressure of 10 Bar G, making it suitable for a wide range of industrial loading operations. Its robust construction ensures reliability, extended service life, and enhanced operational safety during fluid transfer. Made of 316SS

How To Order Thorburn Loading Valves

Model	Size	Coupling Material	Seal Material	Options
THLV	**32**	**32**	**H**	**H**
THLV = Horizontal Loading Valve **TALV** = Angle Loading Valve	**48** = 3 (80 DN) **64** = 4 (100 DN)	**AL** = Aluminum **XX** = Other (Specify)	**B** = BUNA N **I** = FKM **H** = EPDM	**TVRV** = Vacuum Relief Valve **None** = Leave Blank

Thorburn Loading Systems

Thorburn Loading Systems - Overview

System Design - Line Sizing

As a general rule for safe and efficient fluid transfer, line velocity should not exceed 15–20 ft/sec (4.6–6.1 m/sec). Keeping velocity within this range helps limit turbulence, reduce static charge generation, and prevent excessive pressure loss across the system. It also minimizes wear on hoses, pipes, swivel joints, and other loading components. Velocities above this threshold can lead to increased friction losses, unstable flow characteristics, and accelerated equipment fatigue. The accompanying chart provides recommended flow rates for various line sizes to help ensure proper system design and optimal loading performance.

Line Size	Maximum Flow Rate by Line Velocity	
	15 ft. per second	20 ft. per second
2	150 GPM (568 LPM)	150 GPM (568 LPM)
3	350 GPM (1,325 LPM)	350 GPM (1,325 LPM)
4	600 GPM (2,271 LPM)	600 GPM (2,271 LPM)
6	1,350 GPM (5,110 LPM)	1,350 GPM (5,110 LPM)

Plant Piping Orientations

Several configurations are available to accommodate a wide range of plant piping layouts. Depending on the location of the supply line, space constraints, elevation changes, and the orientation of loading equipment, piping can be routed from above, below, or horizontally to the loading island. Each orientation supports different operational needs—for example, overhead piping may reduce ground-level congestion, while below-grade or horizontal approaches can simplify maintenance access and minimize structural requirements. Selecting the proper orientation ensures smooth product flow, reduces installation complexity, and helps optimize overall loading-system performance.

Added Weight

Any change in weight—either added or removed—will affect the balance and counterbalancing requirements of a loading arm. For proper operation, stroke adjustment, and long-term mechanical stability, it is important to specify all components or materials that will be installed on the arm. Common additions include insulation jackets, inboard or outboard valves, vapor-recovery lines, instrumentation, or any product that may remain trapped within the arm after shutdown. Providing accurate weight information allows the manufacturer to correctly size springs, counterweights, and swivels, ensuring safe, smooth, and reliable arm movement in service.

Thorburn Loading Systems - Overview

Materials

Materials and seal components must be compatible with the product being handled, as well as its temperature, viscosity, and chemical characteristics during operation. Proper material selection helps prevent corrosion, swelling, embrittlement, and premature seal failure. In most installations, the loading arm materials are matched to the plant piping specifications to ensure uniform performance, and maintain compliance with facility standards. Common material options include...

Metals (standard): Plated Steel, 316 Stainless Steel, Aluminum
Seals (standard): FKM, Buna-N, PTFE, EPDM and Neoprene
Piping: Schedule 10, 40, 80, seamless or welded. All flanged

Valves

Valves are a frequently specified option for loading arms, and various types are available to meet specific operational needs. When requesting a valve, be sure to specify both the type required (e.g., ball, butterfly, plug, dry-disconnect, or loading valve) and its desired location on the arm. This ensures proper integration, safe operation, and efficient flow control.

Steam Jacketing

Loading arms can be designed to include either partial or full steam jacketing, allowing effective temperature control for products that must be kept warm during transfer.

High-Level Shut-Off

Multiple shut-off options are available to help prevent overfill conditions and ensure safe, controlled loading operations.

Grounding

Proper grounding is essential when loading volatile products to prevent static buildup and reduce ignition risk. Several grounding options are available to ensure the system is safely and reliably grounded during operation.

Counterbalance

All materials and seals used in the counterbalance system must be compatible with the application. A properly balanced loading arm enables operators to move the arm into and out of the loading position smoothly, safely, and with minimal effort. **(See Page 160)**

Terminal Connections

Guard Lock Camlock Couplings
(See Page 36)

Thorvolok Dry Break Couplings
(See Pages 141 - 145)

TJ942 API Couplings
(See Page 152)

Breakaway Couplings
(See Pages 135 - 140)

(N)T92 Dry Break Couplings
(See Pages 112 - 114)

Thorburn Bottom Loading Systems

Thorburn Model BLS - Bottom Loading System

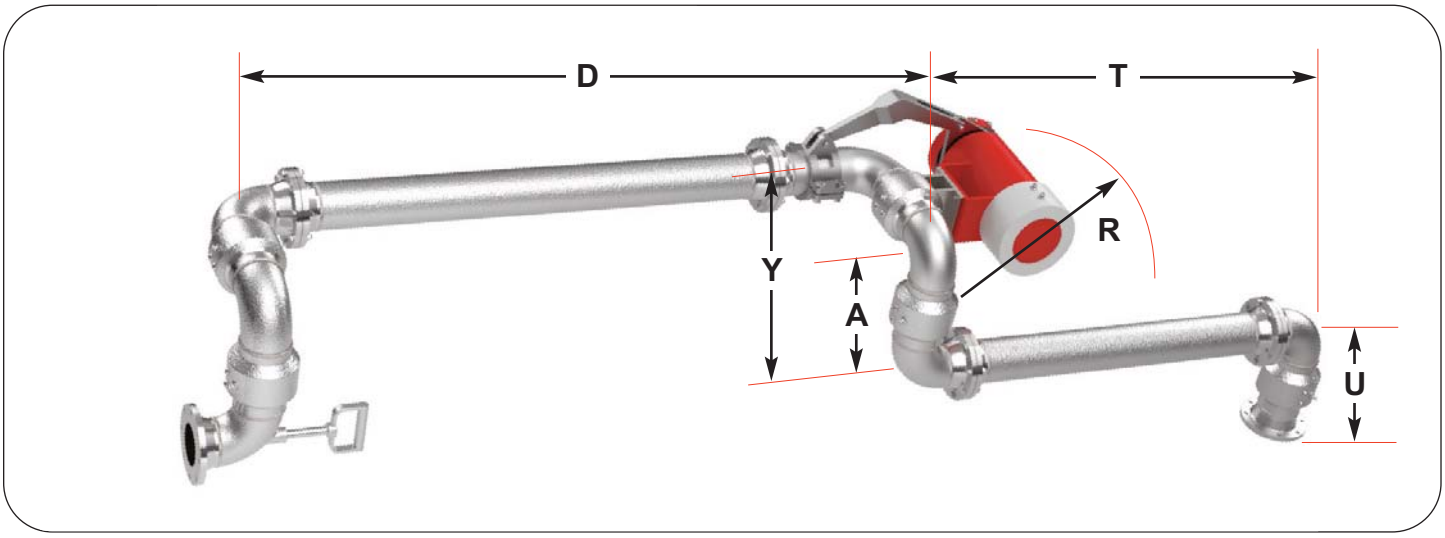
The Thorburn BLS Bottom Loading System provides a highly efficient and safe solution for loading multi-compartment tank trucks in high-throughput terminal environments. Engineered for ground-level operation, the system eliminates the need for elevated platforms, ladders, and overhead loading racks, significantly reducing fall hazards and minimizing manual handling requirements. Operators connect hoses or loading arms directly to standardized API bottom-loading adapters, allowing faster setup, improved ergonomics, and consistent alignment with terminal safety procedures.

By supporting the simultaneous filling of two or more compartments, the Thorburn BLS system dramatically increases total loading throughput. Product enters each compartment at controlled velocities and pressures—maintained through calibrated valves, flow meters, and pump settings—to prevent static buildup, minimize turbulence, and protect product quality. Automated or semi-automated control sequences can be integrated to regulate loading rates, prevent overfill, and ensure proper compartment selection. The system's closed-loop vapor-recovery design captures displaced vapors from each compartment and routes them to a vapor-processing or containment system. This not only reduces fugitive emissions and odor release but also helps terminals comply with stringent environmental regulations such as EPA and regional air-quality standards.

Benefits

High Productivity: Rapid turnaround & simultaneous compartment loading
Operator Safety: All operations performed from ground level & no climbing required
Environmental Protection: Closed-loop system minimizes vapor release and product loss
Low Maintenance: No overhead rack components & minimal moving parts
Proven Savings: Faster loading, reduced spillage, and lower emissions
Envelope & Handling Range: Standard arm lengths accommodate most vehicle configurations; extended reach options are available to cover the farthest compartment without vehicle re-positioning.

Thorburn Unsupported Boom Type Bottom Loader



Thorburn Series BLS-U Unsupported Boom Type Bottom Loader

The Thorburn BLS-U is built for operations that require maximum flexibility, long reach, and easy under-vehicle access. With at least five planes of rotation, the arm moves naturally into tight or offset positions, making it ideal for railcars, tank trucks, ISO tanks, and aviation re-fuelers where alignment is rarely perfect. As the vehicle rises or settles during loading, the outboard swivel automatically follows the motion, maintaining a secure, low-effort connection. Choose Thorburn 's Series BLS-U when you require smooth movement, superior tracking, and reliable sealing under real-world operating conditions. The Series BLS-U gives operators greater working freedom, minimizes strain, and reduces the risk of connection errors—making it the preferred solution when flexibility, reach, and ease of handling directly impact productivity and safety.

Features

- Low-profile design
- Long-reach articulation
- Minimum five planes of rotation
- Compact "scissor-back" storage
- Torsion-spring balanced
- Dual-plane outboard swivel
- 2", 3", 4", 6" sizes
- CS, 316SS, Aluminum, or specialty alloys
- Flanged, threaded, or fully welded builds

Benefits

- Effortless, precise maneuvering
- Safe, unobstructed storage
- Fast, reliable under-vehicle connection
- Automatically compensates for vehicle height or position changes
- Optimizes space and reduces operator strain

Materials:

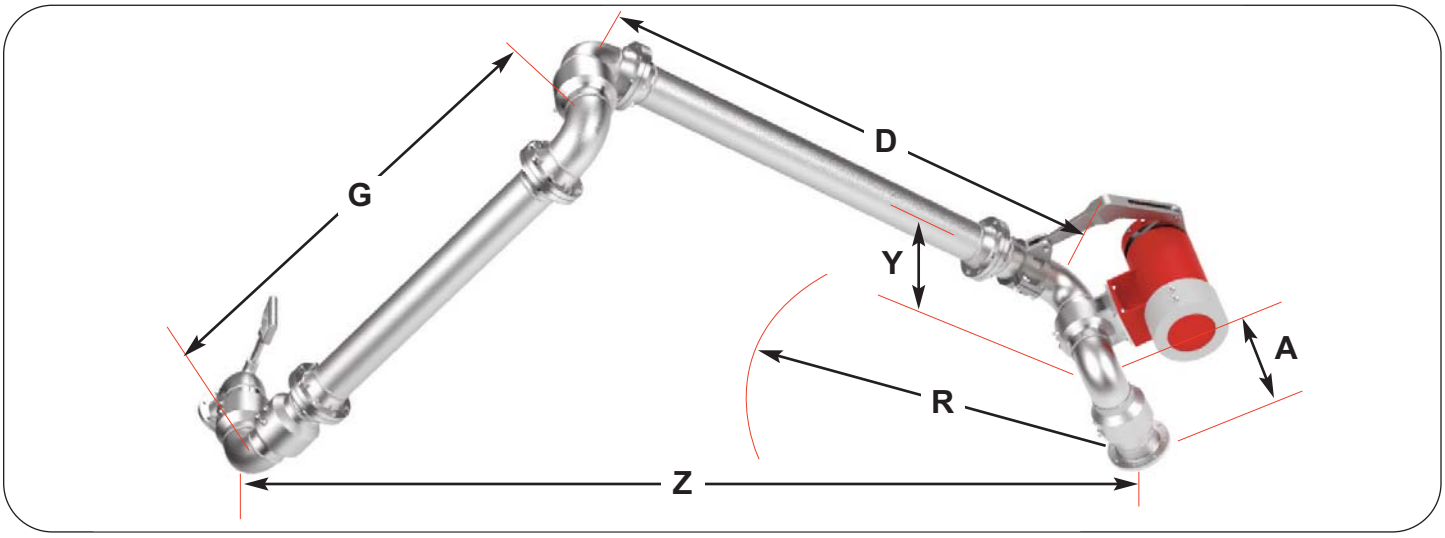
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series BLS-U Dimensions*

Thorburn Part #	SIZE		A		D		T		U		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
BLS-U-32	2	51	8 1/8	206	66	1676	42	1067	8 5/8	219	17	432	8 1/8	206
BLS-U-48	3	76	10 3/4	273	66	1676	42	1067	10 1/2	267	18 1/2	470	10 3/4	273
BLS-U-64	4	102	12 3/4	324	66	1676	42	1067	11 3/4	298	20	508	12 3/4	324
BLS-U-96	6	152	21 1/2	546	66	1676	42	1067	19	483	24 3/4	629	18 1/2	470

* Custom Sizes also available - Contact Thorburn

Thorburn A-Frame Bottom Loader



Thorburn Series BLS-AFP A Frame Bottom Loader

Thorburn's BLS-AFP A-Frame loading arm is a proven, versatile configuration engineered for smooth, controlled movement, long reach, and excellent operator handling. Its balanced geometry allows the arm to track vehicle elevation changes effortlessly while maintaining a stable, predictable connection. When not in use, the A-Frame stores in a clean, near-vertical position, allowing multiple arms to be spaced tightly together without obstructing traffic or loading operations. Thorburn's BLS-AFP A-Frame loading arm This configuration is commonly used for tank-truck bottom loading, but its inherent stability also makes it suitable for top-loading or unloading where a steady, repeatable positioning is required. The design supports dry-disconnects, unions, tight-fill connections, and other specialty fittings. With 300-lb flanges and seamless welded piping, the A-Frame is well suited for LPG service such as propane or butane. Thorburn's A-Frame Stands Apart for precision balance, smooth operation, and long-term reliability—ensuring operators work faster, safer, and with less strain. Its compact storage profile and predictable movement pattern make it the preferred solution for facilities requiring efficiency, repeatability, and organized loading-rack layouts.

Features

- Low mounting height for operator convenience
- 2", 3", and 4" sizes
- Flanged, threaded, or fully welded construction
- Heavy-duty 300-lb flanges for LPG applications
- CS, 316SS, Aluminum, or specialty alloys
- Flanged, threaded, or fully welded builds

Benefits

- Stores safely away from vehicle traffic
- Allows tight spacing for multiple product arms
- Moves smoothly while compensating for vehicle elevation changes
- Supports crossover for multi-compartment truck loading

Materials:

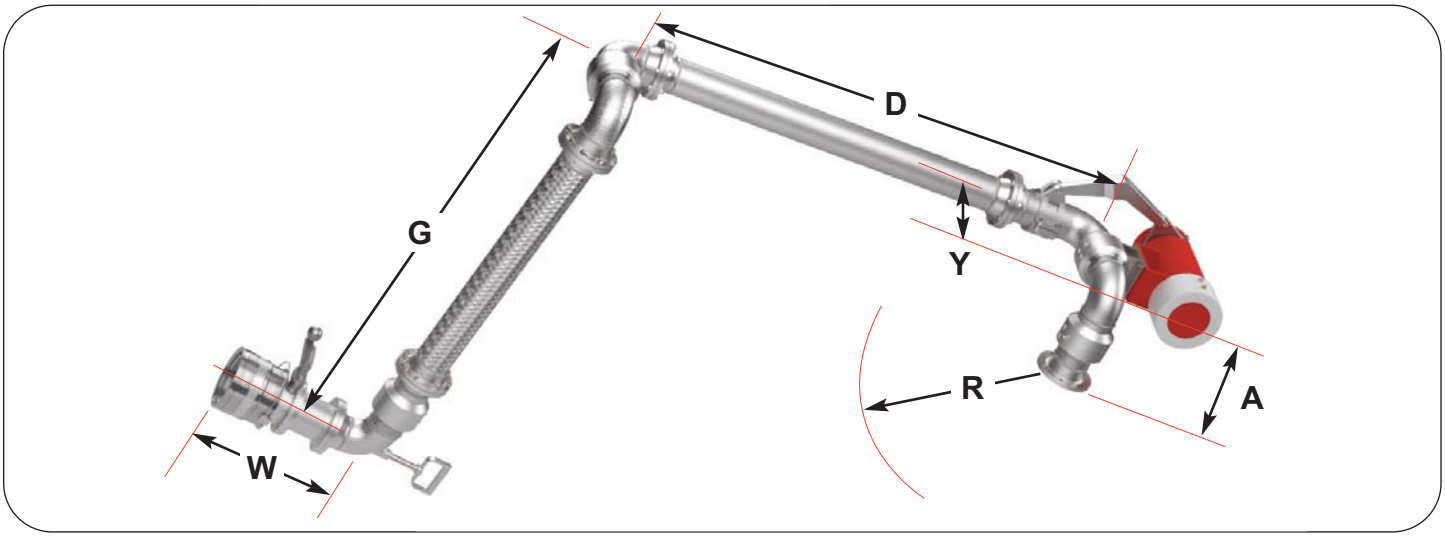
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series BLS-AFP Dimensions*

Thorburn Part #	SIZE		A		D		G		Z		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
BLS-AFP-32	2	51	8 5/8	219	60	1524	60	1524	90	2286	17	432	8 1/8	206
BLS-AFP-48	3	76	10 1/2	267	60	1524	60	1524	90	2286	18 1/2	470	10 3/4	273
BLS-AFP-64	4	102	11 3/4	298	60	1524	60	1524	90	2286	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn A-Frame Hose Bottom Loader



Thorburn Series BLS-AFH A Frame Hose Bottom Loader
Thorburn's BLS-AFH provides the proven geometry of Thorburn's A-Frame loading arm while using a flexible hose on the secondary arm for greater maneuverability. This design reduces the required mounting height and makes it ideal where vehicle heights vary or space is limited. The arm stores vertically, allowing loading from either side of the island and easy integration with multiple closely spaced arms. Thorburn's BLS-AFH can also be used as a vapor-return arm in fuel terminals. Recommended drop-hose length: 60 in (1524 mm).

Features
- Low riser mounting height
- Sizes: 2", 3", 4"
- Flanged, threaded, or all-welded construction

Hoses (X): (Place at the end of the part number)
R = Rubber Hose
C = Composite Hose
M = Metal Hose

Benefits
- Can function as a vapor-recovery arm
- Stores cleanly away from vehicles
- Allows tight spacing and crossover with other arms
- Flexible, operator-friendly movement

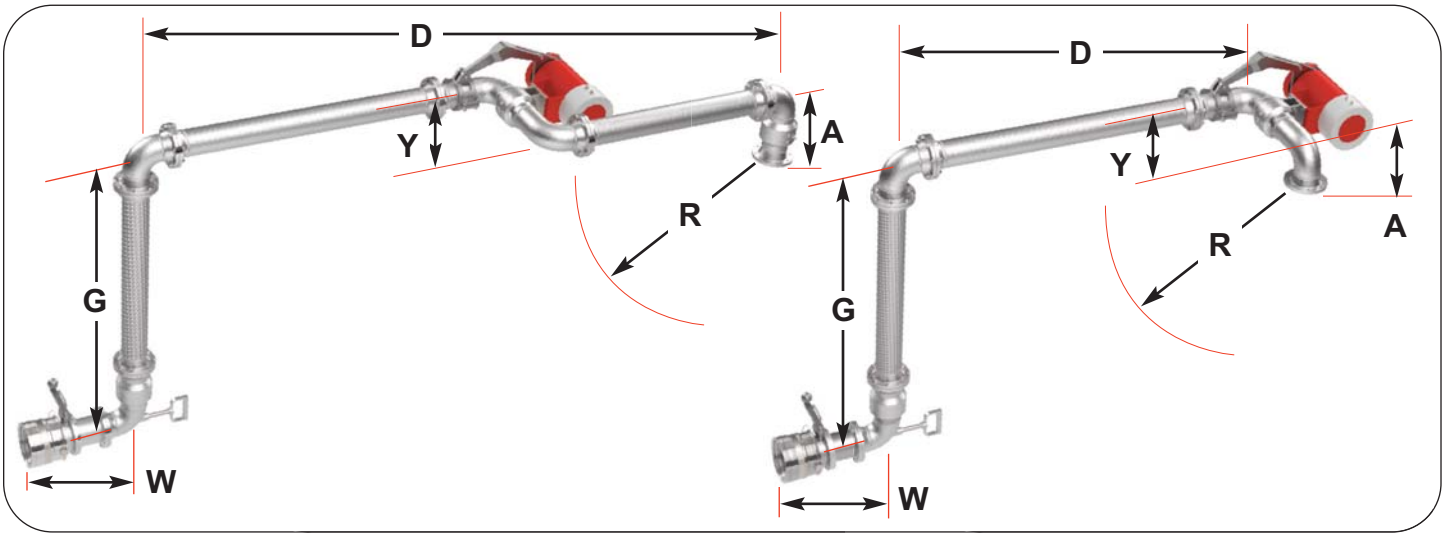
Materials:
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series BLS-AFH Dimensions*

Thorburn Part #	SIZE		A		D		G		W		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
BLS-AFH-32 (X)	2	51	8 5/8	219	60	1524	72	1829	15	381	17	432	8 1/8	206
BLS-AFH-48 (X)	3	76	10 1/2	267	60	1524	72	1829	21	533	18 1/2	470	10 3/4	273
BLS-AFH-64 (X)	4	102	11 3/4	298	60	1524	72	1829	21	533	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn Spring Balanced Hose Bottom Loader



Thorburn Series BLS-SBS (Short Range)**/BLS-SBL** (Long Range)
Thorburn's spring-balanced hose loaders use a precision torsion-spring mechanism to provide smooth, controlled movement without the bulk of external counterweights. Thorburn spring -balanced hose loaders store horizontally and require only light vertical adjustment to connect to the truck adaptor, making them ideal for compact loading islands and high-cycle operations. Where some spring-balanced systems feel stiff or sensitive to wear, Thorburn uses over-engineered bearing surfaces, heavy-duty pivots, and balanced geometry to deliver long service life and low operator fatigue. Use Thorburn Spring-Balanced Hose Bottom Loader when you need simple, low-profile operation, horizontal storage, and quick alignment with the truck adaptor. It's ideal for tight riser areas, short loading islands, or installations where operators prefer minimal vertical movement.

Features
- Low riser mounting height
- Sizes: 2", 3", 4"
- Flanged, threaded, or all-welded construction

Benefits
- Easy to handle
- Simple spring adjustment
- Compact storage
- API-compliant coverage

Hoses (X): (Place at the end of the part number)
R = Rubber Hose
C = Composite Hose
M = Metal Hose

Materials:
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series BLS-SBS Dimensions*

Thorburn Part #	SIZE		A		D		G		W		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
BLS-SBS-32 (X)	2	51	8 5/8	219	52	1321	104	2642	15	381	17	432	8 1/8	206
BLS-SBS-48 (X)	3	76	10 1/2	267	52	1321	104	2642	21	533	18 1/2	470	10 3/4	273
BLS-SBS-64 (X)	4	102	11 3/4	298	52	1321	104	2642	21	533	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn Series BLS-SBL Dimensions*

Thorburn Part #	SIZE		A		D		G		W		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
BLS-SBL-48 (X)	3	76	10 1/2	267	114	2896	104	2642	21	533	20 1/2	521
BLS-SBL-64 (X)	4	102	18 1/8	460	114	2896	104	2642	21	533	20 1/2	521

* Custom Sizes also available - Contact Thorburn

Thorburn Top Loading Systems

Thorburn Model TLS - Top Loading Systems

Top loading of railcars and tank trucks continues to serve as an efficient, cost-effective, and widely adaptable method for transferring liquid products in a broad range of industrial applications—including petroleum distribution, chemical processing, and specialty liquids handling. An effective top-loading system must offer sufficient horizontal reach to access every compartment on a vehicle without requiring re-spotting, which minimizes loading time and reduces wear on spotting equipment. Equally important is providing ample vertical travel and properly sized drop-pipe lengths so operators can safely service vehicles with significantly different hatch heights, from low-profile tank trucks to taller railcars.

A well-engineered top-loading arm accomplishes these functions through a combination of optimized swivel geometry, boom or arm articulation, telescoping or adjustable drop tubes, and optional counterbalance mechanisms. Modern top-loading systems can also be configured to support tight-fill, closed-loop, or vapor-recovery operations. When equipped with properly designed vapor cones, sealing heads, dry-disconnect fittings, and engineered venting components, these systems help facilities meet environmental regulations, reduce fugitive emissions, and protect operator safety—while maintaining high throughput and reliable long-term performance.

Benefits

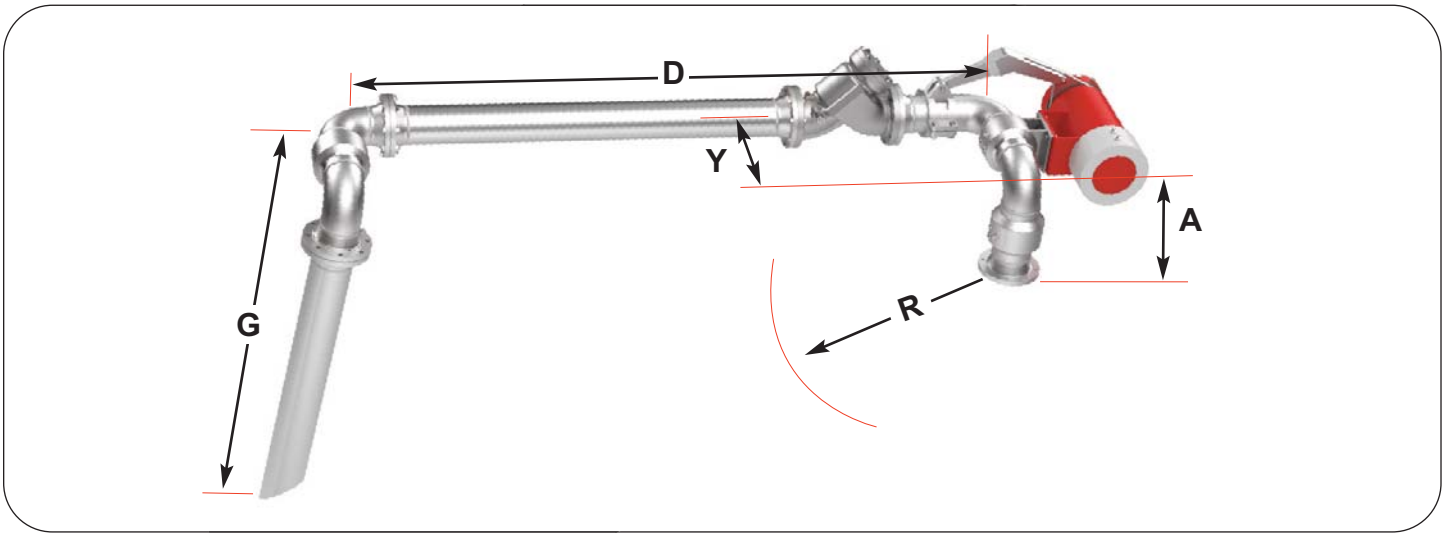
Simple installation: Fewer components and lower initial cost
Flexible configurations: Custom arm geometries for top or side access hatches
Proven reliability: Long service life with minimal maintenance

Line Size & Line Velocity

Standard Line Sizes: 2", 3" and 4" (larger diameters available on request)
Recommended Line Velocity: Not to exceed 15 ft/s at 1500 cP viscosity

Note: Top loading can result in higher vapor loss—typically two to three times greater than bottom loading. For facilities subject to strict emissions control, Thorburn's bottom loading systems offer superior containment and compliance.

Thorburn Single Arm Fixed Reach Top Loader



Thorburn Series TLS-SAP - Single Fixed Top Loader

The TLS-SAP is a precision-engineered top loader designed for facilities where railcars or tank trucks can be accurately spotted. Commonly used for railcar loading through open domes, it also performs exceptionally well in tank-truck top-loading applications with fixed vehicle positioning. Its compact single-arm design features three planes of swivel rotation for smooth, predictable movement. Two inlet swivels provide vertical and lateral adjustment, while a third swivel keeps the drop pipe vertical for clean, controlled entry into the hatch. Valves may be mounted inboard or outboard, with outboard placement reducing dripping when handling viscous or high-value products. The loader can be upgraded for tight-fill, closed-system, or vapor-recovery service by adding additional swivels and/or a drop hose with the appropriate outboard coupling.

Features

- Three-plane swivel system for controlled, low-effort movement
- Precision Thorburn swivel joints
- Flanged, threaded, or all-welded construction
- Optional swivels & drop-hose assemblies for closed-system loading

Benefits

- Reliable, simple design for fixed-reach top loading
- Low-resistance operation reduces operator effort
- Tolerates moderate mis-spotting when used with wide hatch openings
- Adaptable for closed-system and vapor-recovery service
- Flexible valve positioning to minimize product drips
- Engineered to Thorburn's high industrial and nuclear-grade performance standards

Materials:

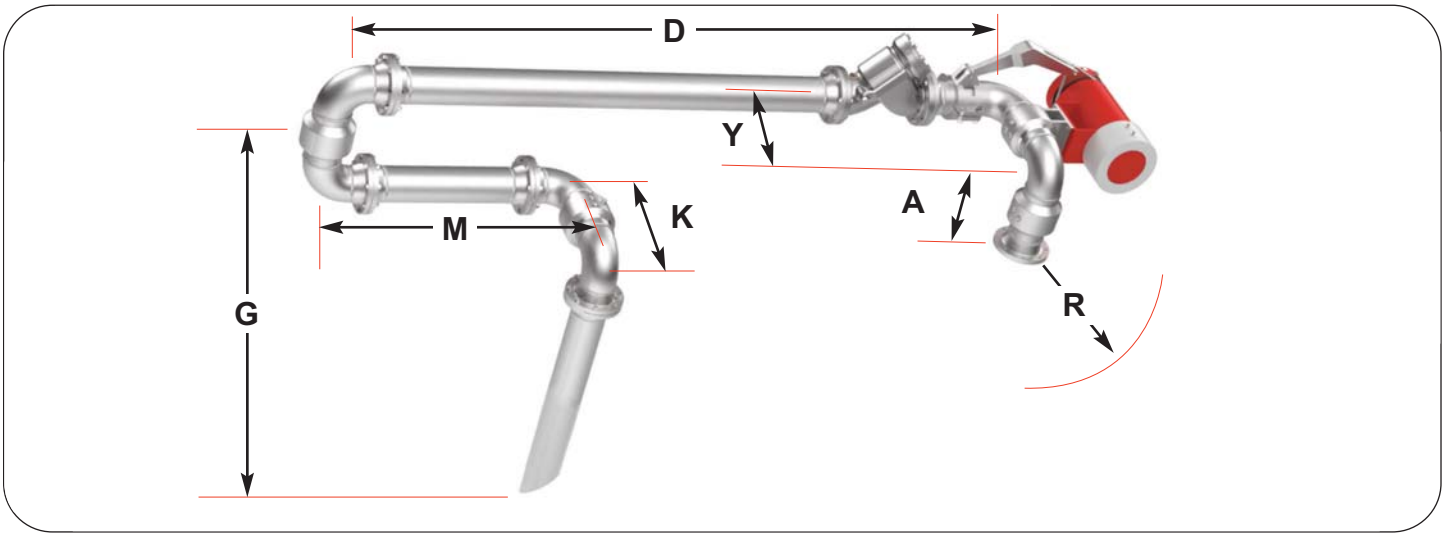
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series TLS-SAP Dimensions*

Thorburn Part #	SIZE		A		D		G		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-SAP-32	2	51	8 5/8	219	120	3048	48	1219	17	432	8 1/8	206
TLS-SAP-48	3	76	10 1/2	267	120	3048	48	1219	18 1/2	470	10 3/4	273
TLS-SAP-64	4	102	11 3/4	298	120	3048	48	1219	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn Scissor Type Arm Top Loader



Thorburn Series TLS-SA - Scissor Top Loader

The Thorburn Scissor-Type Arm is built for high-flow, heavy-duty top-loading applications where durability, flexibility, and wide operating range are essential. Frequently used for tank-truck top loading, this arm also performs exceptionally well in railcar operations, particularly where cars are routinely mis-spotted or vary in position. Unlike fixed-reach single-arm loaders, the scissor arm uses a two-arm, folding configuration. The secondary arm rotates a full 360° horizontally, offering a spotting tolerance up to twice its own length. This makes it ideal for busy loading racks where vehicles cannot always be aligned precisely. The scissor design delivers greater outreach, smoother maneuverability, and higher product throughput than traditional single-arm units. For safety and ergonomics, the scissor arm is generally not recommended in 6" size when built entirely from steel or stainless steel, as the outboard components become too heavy for manual operation. The TLS-SA can be configured for tight-fill, closed-system, or vapor-recovery loading by adding additional swivel planes and/or a drop hose with the appropriate coupling or union.

Features

- Two-arm scissor configuration with 360° horizontal rotation
- Wide spotting tolerance—up to twice the arm length
- Smooth, low-resistance operation using precision swivels
- Choice of flanged, threaded, or all-welded construction
- Optional swivels and drop-hose assemblies for closed-system or tight-fill loading

Benefits

- Excellent for variable spot truck and railcar loading
- Handles high flow rates and demanding operating cycles
- Large horizontal reach improves safety & operator convenience
- Adaptable for vapor-recovery, closed-system, or tight-fill service
- Designed for rugged industrial environments requiring long service life
- Engineered to Thorburn's industrial and nuclear-grade quality standards

Materials:

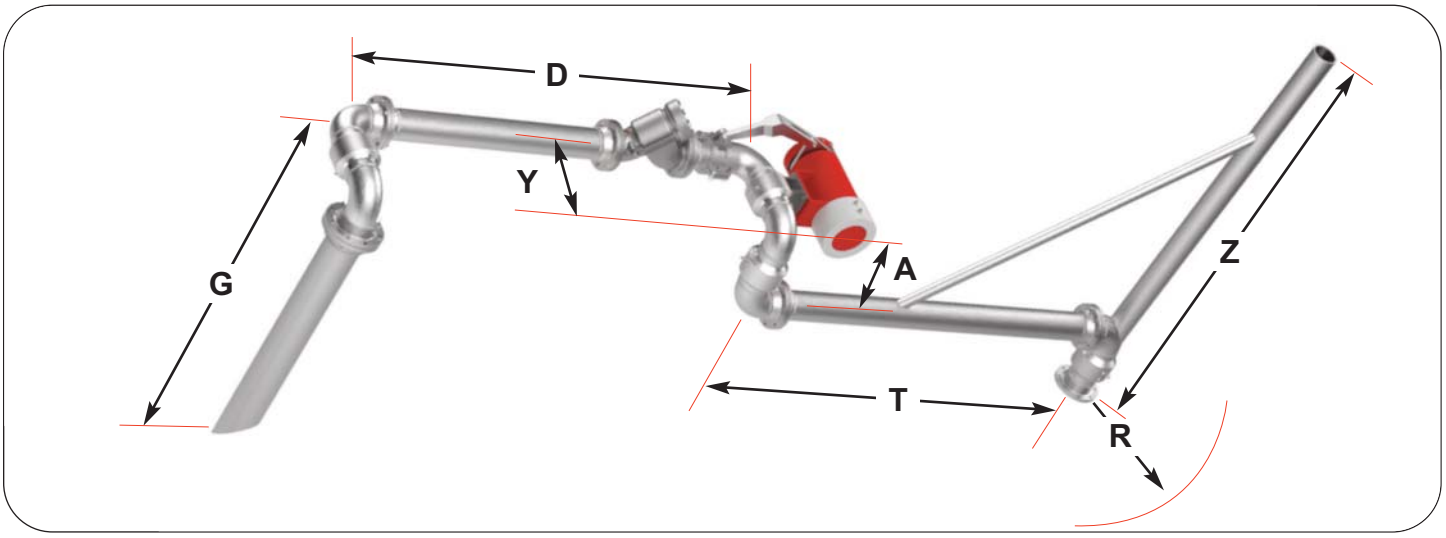
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series TLS-SA Dimensions*

Thorburn Part #	SIZE		A		D		G		K		M		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-SA-32	2	51	8 5/8	219	84	2134	48	1219	8 1/8	206	24	610	17	432	8 1/8	206
TLS-SA-48	3	76	10 1/2	267	84	2134	48	1219	10 3/4	273	24	610	18 1/2	470	10 3/4	273
TLS-SA-64	4	102	11 3/4	298	84	2134	48	1219	12 3/4	324	24	610	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn Supported Boom Arm Top Loader



Thorburn Series TLS-SBA - A Frame Bottom Loader

The TLS-SBA Supported Boom Arm is designed for long-reach, heavy-duty top loading where maximum flexibility and low maintenance are critical. Because the boom supports the weight of the arm and product line, loads are not transferred to the swivels, resulting in smoother operation and significantly reduced wear. A single loading arm is mounted on a swiveling boom supported by a pillow block or flange bearing, giving it a very wide operating range—ideal for facilities where railcars or tank trucks are often mis-spotted or positioned at varying distances. Both the boom and the arm fold back tightly against the rack, keeping the drive-through lane completely clear when not in use. Thorburn's TLS-SBA is commonly used for open-dome railcar and tank-truck loading, and can be adapted for closed-system, vapor-recovery, or tight-fill applications. Since the boom carries the load, heavier valves—such as dry disconnects, loading valves, ball valves, or butterfly valves—can be installed without affecting handling

Features

- Boom-supported design extends swivel life
- Folds back for compact, no-obstruction storage
- Flanged, threaded, or all-welded construction
- Optional swivels and drop-hose assemblies for closed systems

Benefits

- Long reach with excellent flexibility
- Ideal for inconsistent vehicle alignment
- Supports heavy valve options
- Durable, low-maintenance performance

Materials:

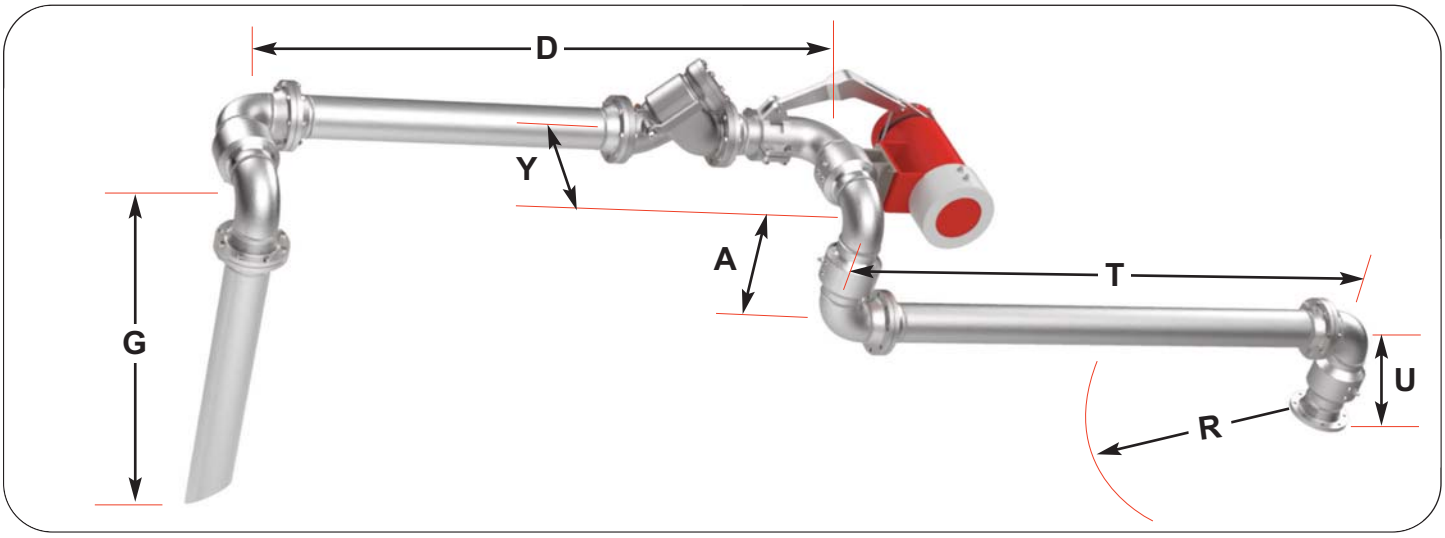
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series TLS-SBA Dimensions*

Thorburn Part #	SIZE		A		D		G		T		Z		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-SBA-32	2	51	14 1/4	362	78	1981	48	1219	78	1981	84	2134	17	432	8 1/8	206
TLS-SBA-48	3	76	17 3/4	451	78	1981	48	1219	78	1981	84	2134	18 1/2	470	10 3/4	273
TLS-SBA-64	4	102	20 3/4	527	78	1981	48	1219	78	1981	84	2134	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn Unsupported Boom Arm Top Loader



Thorburn Series TLS-UBA - A Frame Bottom Loader

The Thorburn Unsupported Boom Arm is designed for wide-reach, heavy-duty top loading in facilities where a structural support column or overhead beam is not available. This makes it an ideal choice for many railcar loading sites, where installing a supported boom is not feasible. This versatile design provides excellent variable reach and compensates well for mis-spotted railcars and tank trucks. The arm folds neatly back against the rack for compact, unobstructed storage. While its maximum reach is slightly less than that of a supported boom, the TLS-UBA still delivers significant horizontal coverage, and its range can be expanded by using a larger base joint or a heavy-duty split-flange swivel at the inlet. The unsupported boom arm can also be configured for tight-fill, closed-system, or vapor-recovery loading, and accommodates a wide range of valves without compromising performance.

Features

- Long-reach boom design without external support structure
- Wide operating envelope for mis-spotted vehicles
- Choice of flanged, threaded, or all-welded construction
- Optional heavy-duty base joints or split-flange swivels for extended reach
- Compatible with tight-fill & closed-system drop-hose assemblies

Benefits

- Excellent variable reach where supports are unavailable
- Compensates for railcar or truck mis-spotting
- Compact fold-back storage keeps lanes clear
- Optional valving allows product to remain in the line
- Engineered for Thorburn's industrial & nuclear-grade service life

Materials:

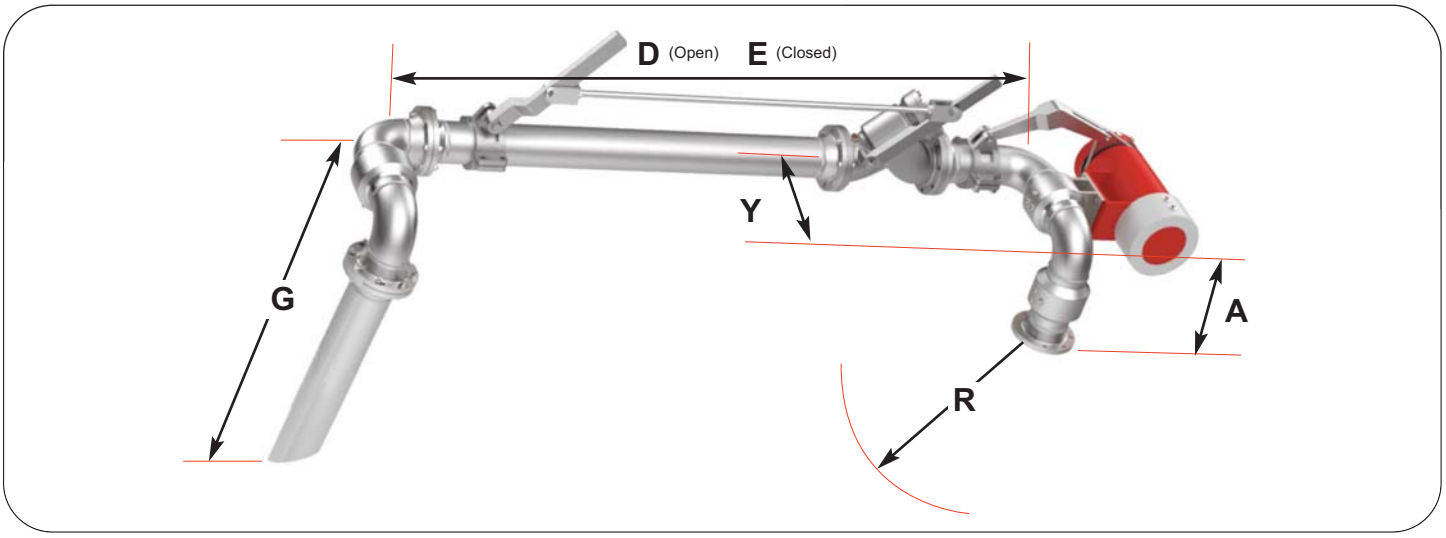
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series TLS-UBA Dimensions*

Thorburn Part #	SIZE		A		D		G		T		U		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-UBA-32	2	51	8 5/8	219	78	1981	48	1219	48	1219	8 5/8	219	17	432	8 1/8	206
TLS-UBA-48	3	76	10 1/2	267	78	1981	48	1219	48	1219	10 1/2	267	18 1/2	470	10 3/4	273
TLS-UBA-64	4	102	12 3/4	324	78	1981	48	1219	48	1219	11 3/4	298	20	508	12 3/4	324

* Custom Sizes also available - Contact Thorburn

Thorburn Slide Sleeve Arm Top Loader



Thorburn Series TLS-SSA - Slide Sleeve Top Loader

The Thorburn Slide Sleeve Arm uses a telescoping sleeve assembly that extends and retracts smoothly to match changes in distance between the loading rack and the vehicle. This design is widely used in small bulk plants, fuel depots, and petroleum terminals for top loading gasoline, diesel, heating oil, and similar refined products. Known for its rugged simplicity and low ownership cost, the slide-sleeve arm provides dependable performance in medium-duty service. Operators can position the drop tube accurately with minimal effort, making it an ideal choice for busy facilities with varied vehicle types or mixed fleet operations. The TLS-SSA is recommended for flow rates up to 15 ft/sec (4.5 m/sec); higher velocities may cause the inner sleeve to extend beyond the desired loading point. Both torsion-spring and counterweighted versions are available to suit different handling preferences and installation requirements.

Features

- Telescoping primary arm for smooth extension & retraction
- **Typically supplied with:** 2" female threaded inlet, or 3" & 4" 150-lb ASME flanged inlets
- Available in torsion-spring balanced or counterweighted configurations

Benefits

- Ideal for terminals with varying vehicle types
- Accurate, low-effort drop-tube positioning
- Proven, dependable, cost-efficient design
- Medium-duty performance for refined petroleum products
- Compatible with deadman-type loading valve

Materials:

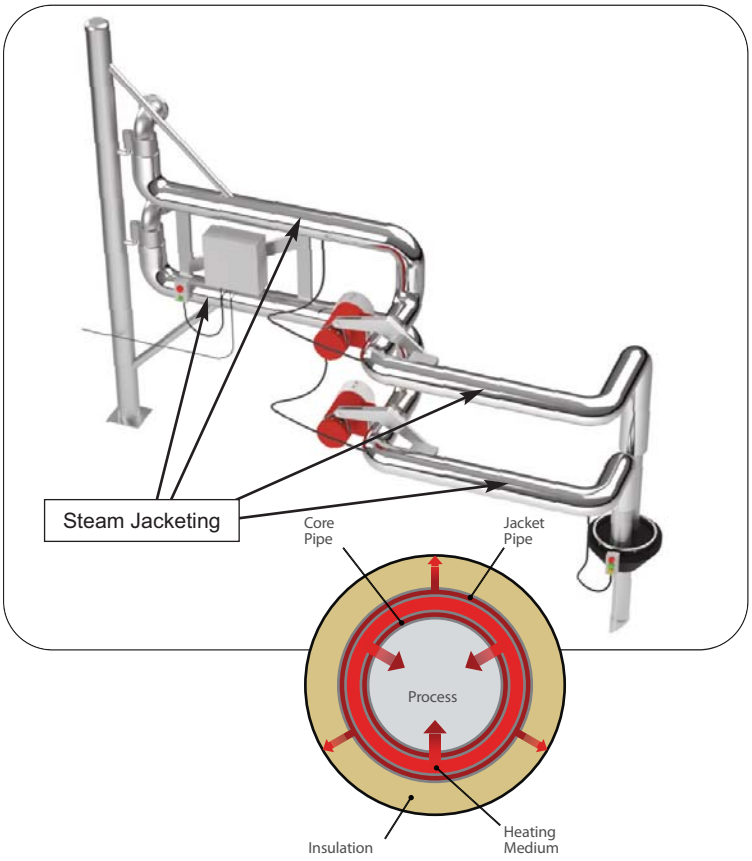
CS = Plated Steel
S6 = 316 Stainless Steel
AL = Aluminum

Thorburn Series TLS-SSA Dimensions*

Thorburn Part #	SIZE		A		D		E		G		R		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-SSA-32	2	51	5 5/8	143	126	3200	78	1981	48	1219	15 1/4	387	6 1/8	156
TLS-SSA-48	3	76	6 7/8	175	131	3327	83	2108	48	1219	16	406	7 5/8	194
TLS-SSA-64	4	102	8 1/8	206	135	3429	87	2210	48	1219	17 3/4	451	9 1/4	235

* Custom Sizes also available - Contact Thorburn

Thorburn Steam Jacketed Loading Arms



A steam-jacketed loading arm is a specialized heated transfer arm used for loading and unloading products that must remain at elevated temperatures to stay pumpable, such as asphalt, bitumen, sulfur, heavy crude, tars, waxes, resins, and other high-viscosity or temperature-sensitive materials. The arm is built with a pipe-in-a-pipe configuration, where the inner pipe carries the product and the outer pipe, or jacket, circulates steam or another heating medium. This continuous heating maintains a uniform temperature across the entire arm, preventing cold spots, solidification, or viscosity spikes that could restrict flow.

Steam-jacketed arms often include insulated sections, engineered swivel joints designed for heated service, and expansion allowances to accommodate thermal movement. By providing controlled heating throughout the transfer path, these arms improve flow efficiency, reduce the risk of plugging, support safer operation, and ensure the product remains within required process specifications from storage to transport.

Features

Double-Pipe Construction: The inner pipe transports the product, and the outer jacket is filled with steam or another heating medium.

Temperature Control: The steam in the jacket heats the inner pipe, keeping the product in a liquid state and ensuring it flows easily.

Materials: Steam jacketed arms are constructed from plated steel or 316SS

Design: Designed as a top or bottom loading arm, depending on the application.

Sizes: 2”, 3”, 4”, 6”

Applications

Steam-jacketed loading arms are used for handling products that are difficult to manage at ambient temperatures, such as:

- Asphalt
- Molten Sulfur
- Waxes
- Resins

Thorburn Custom Pipe Insulation Jackets

Thorburn supplies custom insulation packages engineered to fit each loading arm and its individual components, including swivel joints, valves, counterbalance sections, and piping. Every insulation panel is precision-cut and secured with high-temperature fasteners to ensure a tight, durable fit that maintains thermal efficiency during operation. Unlike field-applied insulation, which is often difficult to remove, easily damaged, and inconsistent in quality, Thorburn's removable and reusable insulation system allows operators to access any part of the arm quickly for scheduled maintenance, troubleshooting, or component replacement. This greatly reduces downtime, improves serviceability, and ensures the arm maintains proper operating temperature for products requiring heat retention. The modular design also improves safety by reducing the risk of exposed hot surfaces and supports long-term performance by protecting critical equipment from heat loss and environmental exposure.

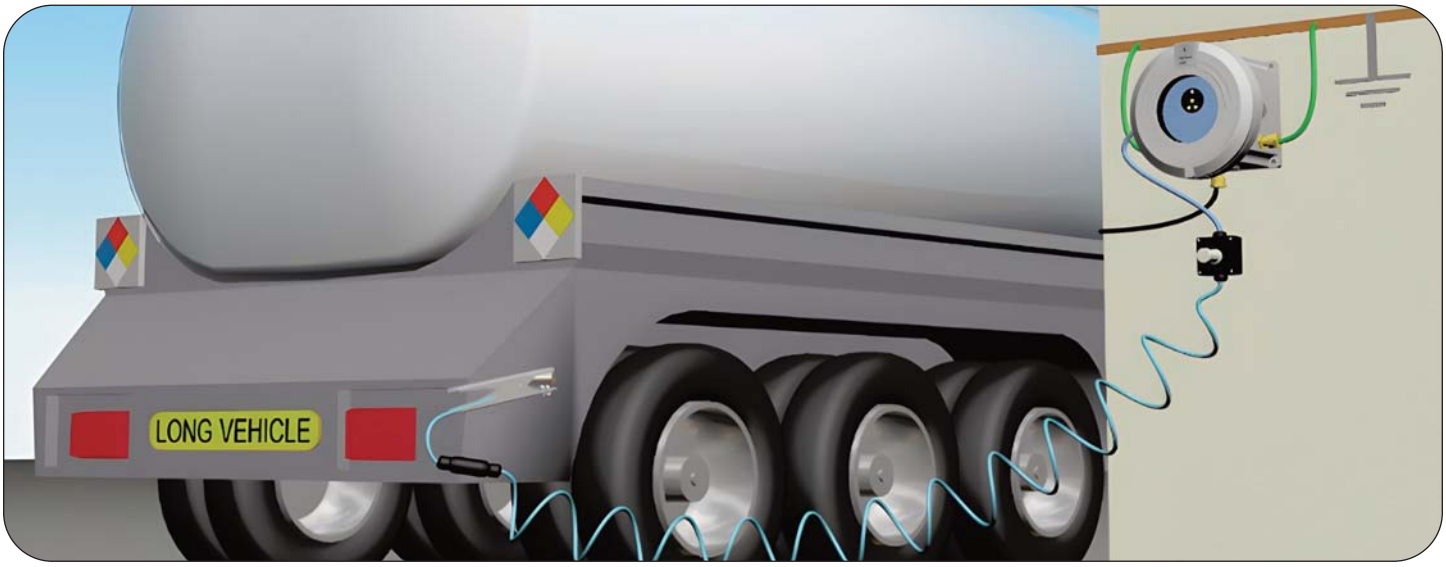
Removable & Reusable: Each component of the loading arm is individually jacketed, allowing the insulation to be removed easily for routine service and maintenance. Field-applied insulation is usually difficult and time-consuming.
Improved Safety: Thorburn Insulation Packages provide complete thermal protection and reduce burn hazards.
Superior Heat Retention: The 2" thick, low-density fiberglass insulation delivers excellent heat retention, helping maintain stable product temperature during operation.
Durable Construction: An outer layer of PTFE-impregnated fiberglass cloth protects the insulation from harsh environmental conditions, ensuring long service life in demanding loading areas.

Construction

- **Inner Jacketing:** 17 oz./sq. yd. PTFE Impregnated Fiberglass Cloth
- **Outer Jacketing:** 17 oz./sq. yd. PTFE Impregnated Fiberglass Cloth
- **Insulation:** 2" THK, low-density Fiberglass
- **Thread:** PTFE-Coated Fiberglass Thread
- **Attachments:** PTFE Cloth Belts with stainless steel double-D rings; drawstring flaps with Nomex Cord

Refer to Thorburn's Brochure: ThermaCover™ Removable Insulation Jackets

Thorburn Series TSG Static Grounding System



Thorburn Series TSG Static Grounding System provides assured, positive verification of static grounding for a wide range of industrial equipment, helping prevent ignition risks when handling flammable or combustible products. Designed for versatility across plant operations, it reliably earths drums, IBCs, containers, rail tankers, and other conductive equipment where static charge buildup is a hazard.The system is ideal for grounding railcars, drums, IBCs, and large storage containers, ensuring each unit is safely bonded before product transfer begins. A built-in safety interlock automatically shuts down operations if either the equipment connection or earth path becomes faulty, immediately halting static generation and protecting personnel and assets.Bright, traffic-light-style GO/NO-GO LED indicators provide instant visual confirmation of grounding status, making it easy for operators to verify safe conditions at a glance. The system complies with international safety standards, confirming a secure, low-resistance dissipation path of 10 ohms or less between the equipment and the designated earthing point.A heavy-duty stainless steel grounding clamp ensures a strong, reliable connection to all common tankers, drums, and conductive plant items, providing long-lasting performance even in harsh industrial environments.

Features

- Explosion-proof enclosure is strong, durable, and lightweight
- LED indicators are visible through a window in the enclosure lid
- Three green LEDs pulse during product transfer to show a positive ground connection
- Pulsing LEDs confirm the system is continuously monitoring the ground condition
- Patented Tri-Mode Technology ensures permissive mode is only enabled when all grounding safety parameters are met
- Prevents activation if connected to tanker parts not electrically bonded to the container
- Prevents operation when a low-resistance connection to true earth is not detected

Specifications

Ingress Protection: IP 66 / NEMA 4X, 7 & 9.
Operating Temperature Range: -13°F to +131°F
Certification: IP66, NEMA 4X, 7 & 9 ingress protection rating
Clamp Material: Stainless steel heavy-duty 2 core clamp with tungsten steel tips
Power Supply:
Selectable 110/120V or 220/240V AC, 50-60 Hz.
Includes: Clamp stowage box and common graphical instruction wall board

How to Order Thorburn Loading Arm Systems

Thorburn Bottom Loading Arm Systems

Arm Type	Pipe Size & Material	Pipe Schedule	Base Assembly & Material	Swing Joint** & Material	Seal Material	Riser Connection & Material	End Connection & Material	Options
BLS-U	64AL	80S	DRS6	BLS-1AL	H	AN300AL	08AL	D
1	2	3	5	6	7	8	9	10

Thorburn Top Loading Arm Systems

Arm Type	Pipe Size & Material	Pipe Schedule	Valve* & Material	Base Assembly & Material	Seal Material	Riser Connection & Material	End Connection & Material	Options
TLS-SAP	64AL	80S	THLVAL	DRS6	H	AN300AL	08AL	D
1	2	3	4	5	7	8	9	10

1 - Loading Arms
Thorburn Bottom Loading Arms
BLS-U = Unsupported Boom Type Arm Bottom Loader (166)
BLS-AFP = A-Frame Arm Bottom Loader (167)

BLS-AFH(X) = A-Frame Hose Arm Bottom Loader (168)
BLS-SBS(X) = Spring Balanced Hose Bottom Loader - Short (169)
BLS-SBL(X) = Spring Balanced Hose Bottom Loader - Long (169)
(X) = Hose Type -
Add Code: **R** (Rubber), **C** (Composite), **M** (Metal)

Thorburn Top Loading Arms
TLS-SAP = Single Arm Fixed Reach Top Loader (171)
TLS-SA = Scissor Type Arm Top Loader (172)
TLS-SBA = Supported Boom Arm Top Loader (173)
TLS-UBA = Unsupported Boom Arm Top Loader (174)
TLS-SSA = Slide Sleeve Arm Top Loader (175)

2 - Pipe Sizes
32 = 2 inches
48 = 3 inches
64 = 4 inches
96 = 6 inches

3 - Pipe Schedule
10S = Schedule 10 Seamless **10W** = Schedule 10 Welded
40S = Schedule 10 Seamless **40W** = Schedule 10 Welded
80S = Schedule 10 Seamless **80W** = Schedule 10 Welded

4 - *Thorburn Loading Valves (For Top Loading Arms Only)
THLV = Horizontal Loading Valve (160)
TALV = Angle Loading Valve (160)

Pipe & Connector Material
CS = Plated Steel **S6** = 316 Stainless Steel **AL**= Aluminum

5 - Base Assembly
Counterweight Base Assembly
CW2= Counter Weight + QTY (2 weights) (165)
CW4= Counter Weight + QTY (4 weights) (165)

Counterbalance Spring Base Assembly
UR = Upfeed - Right Hand (158)
UL = Upfeed - Left Hand (158)
DR = Downfeed - Right Hand (158)
DL = Downfeed - Left Hand (158)
HUR = Horizontal Upfeed - Right Hand (158)
HUL = Horizontal Upfeed - Left Hand (158)
HDR = Horizontal Downfeed - Right Hand (158)
HDL = Horizontal Downfeed - Left Hand (158)

6 - **Swing Joint (For Bottom Loading Arm System Only)
BLS-1 = Single Outboard Swing (157)
BLS-2 = Double Outboard Swing (157)

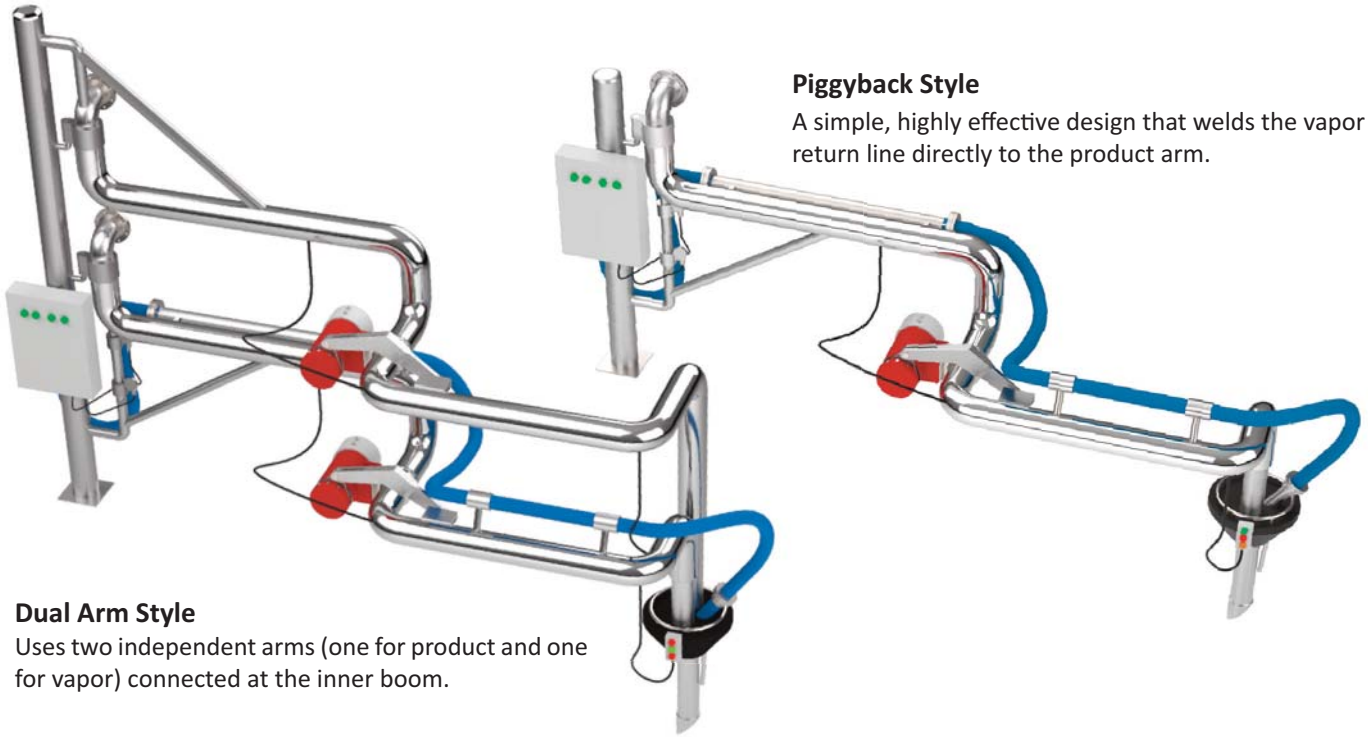
7 - Seal Material
I = FKM **D** = Nitrile
J = PTFE **H** = EPDM

8 - Riser Connections
AN100 = ANSI 150# Flange
AN300 = ANSI 300# Flange

9 - Thorburn End Connections
01 = TBI Breakaway Couplings - ANSI 150 (137)
02 = TBI Breakaway Couplings - ANSI 300 (137)
03 = Thorvolok TVD17
FNPT to Female Coupler - Double Shut-Off (143)
04 = -Thorvolok TVDFC
FNPT to Female Coupler - Flat Face (143)
05 = Thorvolok TVD19
FNPT Elbow to Female Coupler - Double Shut-Off (143)
06 = API Valve - Model TJ942-1 (152)
07 = API Valve - Model TJ942-2 (152)
08 = API Valve - Model TJ942-3 (152)
09 = Guard-Lok Cam Couplings (36)
10 = (N)T92H Dry Break Couplings (112)

10 - Options
A = Series (N)TS25 Thor-Site (154)
B = Steam Jacketed Loading Arms (177)
C = Pipe Insulation Jackets (177)
D = Series STG Static Grounding System (178)
E = Series TVRV Vacuum Relief Valve (161)
(For loading valves only)

Thorburn Top Loading Vapor Recovery Systems



Piggyback Style
A simple, highly effective design that welds the vapor return line directly to the product arm.

Dual Arm Style
Uses two independent arms (one for product and one for vapor) connected at the inner boom.

Vapor Recovery Loading Arms

Thorburn Top Loading Vapor Recovery Systems capture and contain displaced vapors during loading to maintain compliance, improve safety, and reduce emissions. They integrate seamlessly with Thorburn's loading arms to create a closed loop solution for railcars and tank trucks. Each vapor recovery arm uses a dedicated return line and engineered components such as swivel joints, vapor hoods, or sealing cones to form a secure interface at the hatch. Key design considerations include vapor volume, line sizing, material compatibility, pressure drop, and seal integrity. Because facility requirements differ, Thorburn builds every system to precise customer specifications for optimal performance.

Thorburn Series TLP-ALCU Air Logic Control Unit

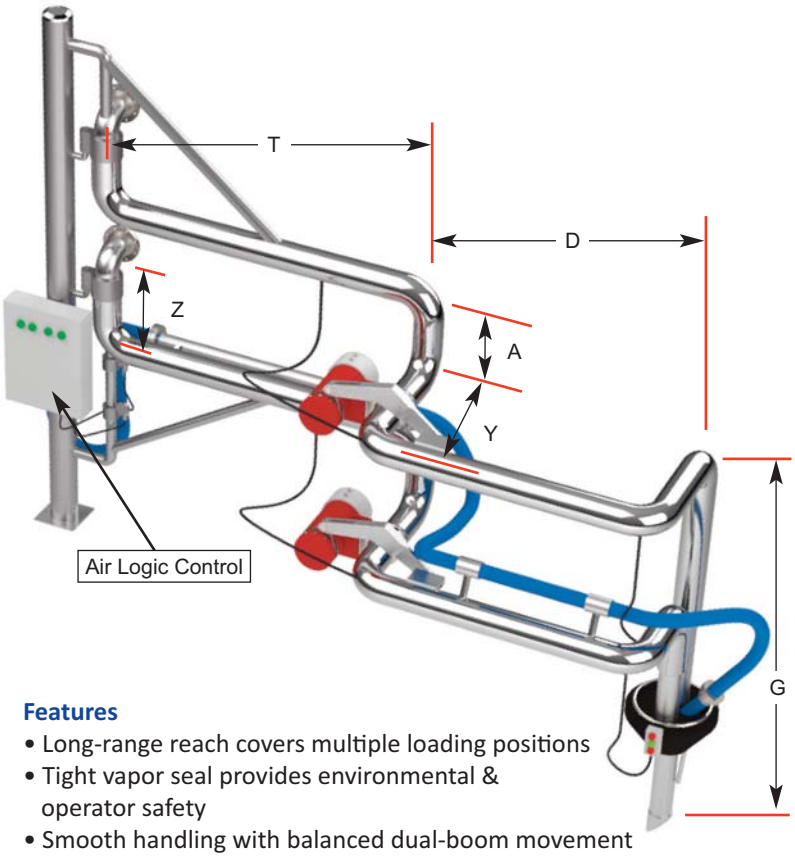
Vapor-recovery loading arms rely on precise sequencing to prevent emissions and ensure safe operation. The air-logic control unit manages this process by verifying that the vapor cone is fully sealed before allowing liquid flow, and it immediately closes the product valve in the event of a lost seal, overfill alarm, pressure loss, or deadman release. This coordinated control maintains proper synchronization between the product arm and the vapor arm, ensuring reliable and compliant loading performance.

Features

- Controls Product Flow (Pneumatic Valve Actuation)
- Interlocks Product & vapor Recovery
- Operates the Pneumatic Cylinder
- Integrates with a deadman handle or button
- Provides Fail-Safe Operation
- Supports Overfill Protection

Thorburn Top Loading Vapor Recovery Systems

Thorburn Series TLP-VRD Top Loading Vapor Recovery "Dual" System



Thorburn TLP-VRD is engineered for safe, controlled loading of aggressive and toxic media while fully containing displaced vapors. Its dual-boom rigid vapor-recovery design delivers product through the lower boom and simultaneously captures vapors through the upper boom. A secure vapor-recovery cone seals the manhole to prevent emissions and allows recovery of valuable vaporized product.

Both booms operate as a single, balanced unit with Multiple-duty swivels for smooth movement in all planes. Vertical motion is powered by a pneumatic lift cylinder with push-button controls at both the upper and lower stations. Product flow is managed by a pneumatic ball valve operated from the same control points, giving the operator precise and safe handling. Because the vapor cone covers the fluid level, the VRDA includes an overfill sensor that automatically signals the valve to close or "bump" the flow, preventing spills and ensuring safe, efficient loading.

Features

- Long-range reach covers multiple loading positions
- Tight vapor seal provides environmental & operator safety
- Smooth handling with balanced dual-boom movement
- Pneumatic valve improves precision & reduces operator effort
- Overfill sensor prevents spills & maintains operational uptime

Applications

- Hydrocarbon and chemical terminals
- Rail and truck loading racks
- Loading of toxic, corrosive, or aggressive media
- Facilities needing extended reach
- Tight vapor containment
- Multi-compartment loading

Advantages

- Rigid dual-boom design for maximum vapor containment
- Stronger, longer-lasting swivels for demanding chemical and hydrocarbon service
- Sealed vapor cone for superior emission control
- Simple push-button pneumatic controls for lifting and flow
- Integrated overfill protection supplied as standard

Specifications

Design Pressure: 10.0 Bar G
Test Pressure: 15.0 Bar G
Design Temperature: -15°C / +65°C
Arm Material: Plated Steel, Aluminum, 316SS
Seal Material: PTFE
Flow Rate: 3"– 75 mc/h Max | 4"– 125mc/h Max

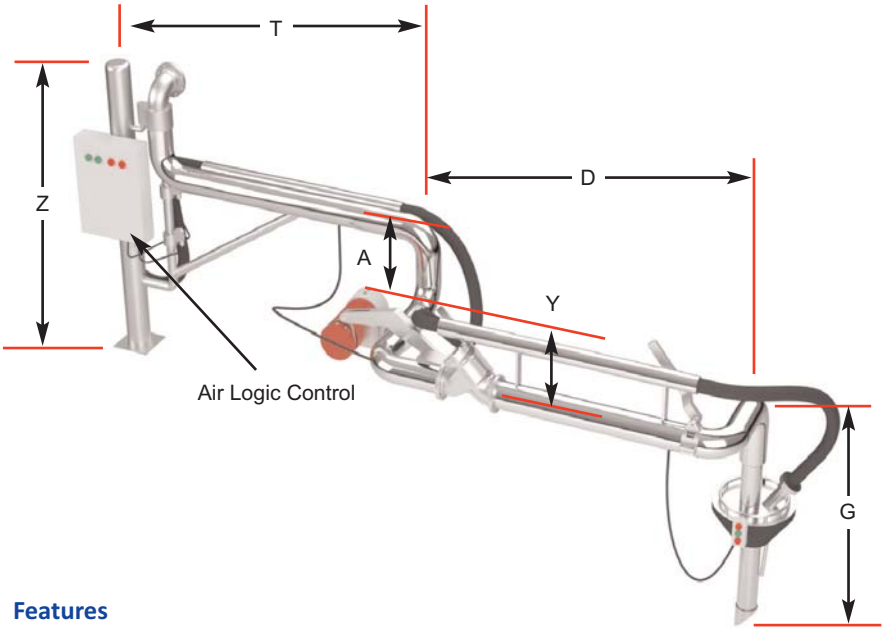
Thorburn Series TLS-VRD Dimensions*

Thorburn Part #		SIZE		A		D		G		T		Z		Y	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-SBA-48	Loading Arm	3	76	12.2	309	63	1600	63	1600	55	1400	11.9	303	12.2	309
	Vapor Arm	2	51	11.2	285	63	1600	-	-	55	1400	10.7	273	11.2	285
TLS-SBA-64	Loading Arm	4	102	14.7	373	63	1600	63	1600	55	1400	13.7	348	14.7	373
	Vapor Arm	3	76	12.2	309	63	1600	-	-	55	1400	11.9	303	12.2	309

* Custom Sizes also available - Contact Thorburn

Thorburn Top Loading Vapor Recovery Systems

Thorburn Series TLP-VRP Top Loading Vapor Recovery "Piggyback" System



Thorburn TLS-VRP is a long-reach top loading arm designed for safe, efficient loading of trucks and railcars while fully containing hazardous vapors. Its extended horizontal boom gives wide vertical and horizontal coverage, allowing multi-compartment loading without moving the vehicle.

A piggyback vapor line with a precision sealing cone captures displaced vapors at the hatch, reducing emissions and recovering valuable product. Three heavy-duty swivels, a spring-balance cylinder, pneumatic valve, vacuum breaker, and automatic overfill sensor come standard for smooth handling and reliable, low-maintenance operation.

Features
- Longer reach and larger working envelopes
- Tighter vapor sealing with positive-contact cone
- Heavy-duty swivels built for high-cycle service
- Simple, robust balance system
- Full alloy options & standard integrated safety controls

Advantages
- Product and vapor lines move together as a single unit
- Compact, easy-to-handle configuration
- Can also be used for unloading by using the vapor line to pressurize railcars or trucks with deep pipes

Applications
- Hydrocarbon and chemical terminals
- Rail and truck loading racks
- Facilities needing extended reach
- Tight vapor containment,
- Multi-compartment loading

Specifications
Design Pressure: 10.0 Bar G
Test Pressure: 15.0 Bar G
Design Temperature: -15°C / +65°C
Arm Material: Plated Steel, Aluminum, 316SS
Seal Material: VITON, Nitrile, Special FKM **
Flow Rate: 3"– 75 mc/h Max | 4"– 125mc/h Max

Thorburn Series TLS-VRP Dimensions*

Thorburn Part #	SIZE		A		D		G		T		Z		Y	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TLS-VRP-48	3	76	14.6	372	78	1981	63	1600	78	1981	40	1000	14.6	372
TLS-VRP-64	4	102	17.9	455	78	1981	63	1600	78	1981	40	1000	17.9	455

* Custom Sizes also available - Contact Thorburn | ** Suitable for BIO-Products

Thorburn Top Loading Vapor Recovery Systems

Thorburn Series TLP-VC Vapor Cones & Series TLP-VP Vapor Plates

Thorburn Vapor Cones & Vapor Plates help control atmospheric emissions during loading, and Thorburn offers both in customizable configurations to match each facility and loading arm. When integrated with a vapor recovery system, these devices capture displaced product vapors, improving terminal profitability, reducing environmental impact, and enhancing operator safety. Vapor cones accommodate variable manhole sizes from 10 to 24 inches, while vapor plates are suited for consistent manhole diameters and seal directly on the dome. Both options can include elastomer seals for improved containment and may be equipped with locking devices for secure positioning. They are available in stainless steel or aluminum and can be fitted with accessories such as overfill protection devices, perforated drop tubes, sampling hatches, and acrylic sight windows.

Features & Benefits

- Does not require pneumatics to operate
- Available with or without elastomer seals
- Customizable design
- Reduces atmospheric emissions and environmental impact
- Effective where sealing surfaces are inconsistent
- Fits variable manhole sizes from 10 to 24 inches
- Provides operator safety during loading operations
- **Materials:** Aluminum, 316SS

How to Order Thorburn Top Loading Vapor Recovery Systems

Model	Pipe Size & Material	Pipe Schedule	Valve* & Material	Base Assembly & Material	Seal Material	Riser Connection & Material	Options
TLS-VRPR	64AL	80S	THLVAL	DRS6	H	AN300AL	ACD
1	2	3	4	5	6	7	8

1 -Vapor Recovery Model
TLS-VRD = Dual vapor recovery system (181)
TLS-VRP(X) = Piggyback vapor recovery system (182)
(X) = Hose Type -
Add Code: **R** (Rubber), **C** (Composite), **M** (Metal)

2 - Pipe Size
48 = 3 inches
64 = 4 inches

3 - Pipe Schedule
10S = Schedule 10 Seamless **10W** = Schedule 10 Welded
40S = Schedule 10 Seamless **40W** = Schedule 10 Welded
80S = Schedule 10 Seamless **80W** = Schedule 10 Welded

4 - *Thorburn Loading Valves (For Top Loading Arms Only)
THLV = Horizontal Loading Valve (160)
TALV = Angle Loading Valve (160)

Pipe & Connector Material
CS = Plated Steel **S6** = 316 Stainless Steel **AL**= Aluminum

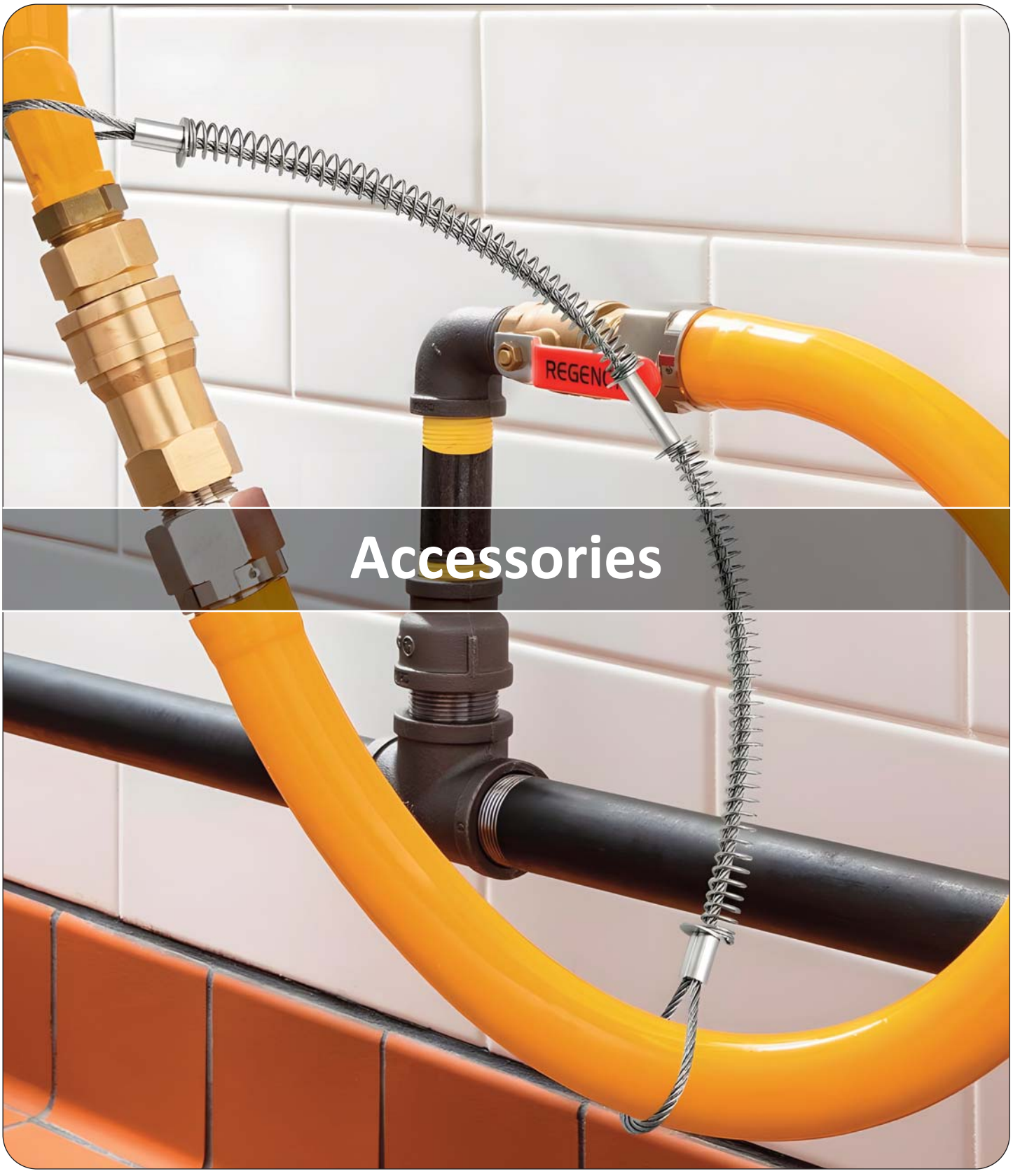
5 - Base Assembly
Counterweight Base Assembly
CW2= Counter Weight + QTY (2 weights) (165)
CW4= Counter Weight + QTY (4 weights) (165)

Counterbalance Spring Base Assembly
UR = Upfeed - Right Hand (158)
UL = Upfeed - Left Hand (158)
DR = Downfeed - Right Hand (158)
DL = Downfeed - Left Hand (158)
HUR = Horizontal Upfeed - Right Hand (158)
HUL = Horizontal Upfeed - Left Hand (158)
HDR = Horizontal Downfeed - Right Hand (158)
HDL = Horizontal Downfeed - Left Hand (158)

6 - Seal Material
I = FKM **D** = Nitrile
J = PTFE **H** = EPDM

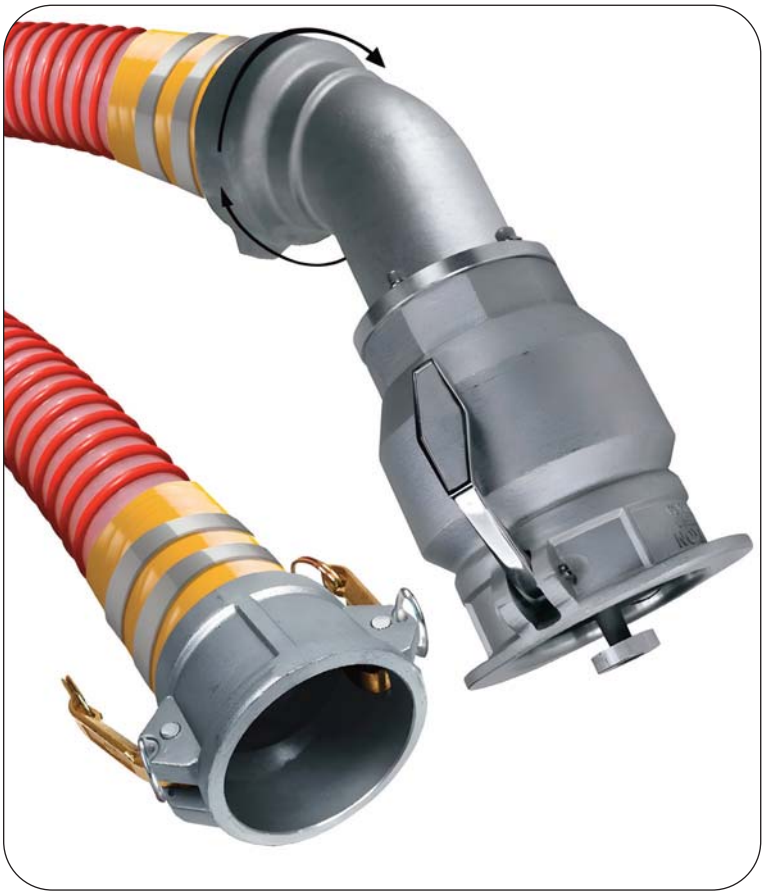
7 - Riser Connections
AN100 = ANSI 150# Flange
AN300 = ANSI 300# Flange

8 - Options
A = Series TLP-VC Vapor Cone (183)
B = Series TLP-VP Vapor Plate (183)
C = Series TLP-ALCU Air Logic Control Unit (180)
D = Series TVRV Vacuum Relief Valve (161)
(For loading valves only)



Accessories

Thorburn Banding Sleeves

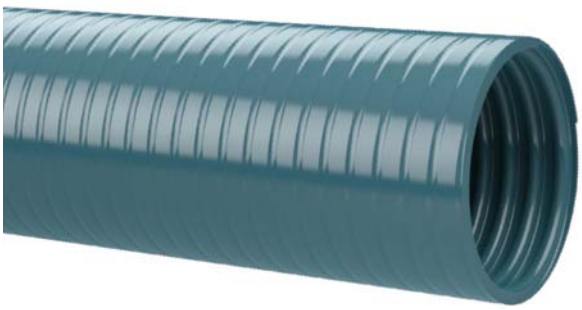


Thorburn Series TBSL PVC Banding Sleeves

Thorburn Banding Sleeves fill the voids between the PVC rod spirals of thorburn drop and transfer hoses, enabling the clamps to apply an even pressure for superior coupling holding power. In addition, Thorburn Banding Sleeves are cut into approximately 12-inch lengths and to help prevent kinking behind the fitting.

Construction:

Gray, non-food grade flexible PVC.

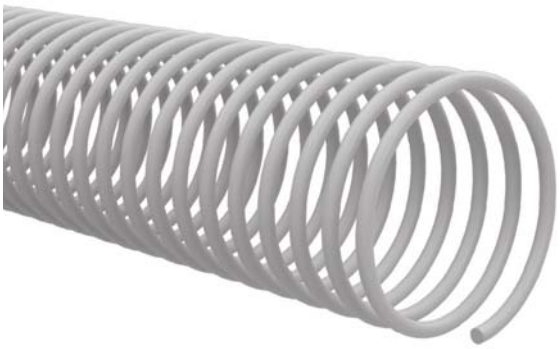


Thorburn Part #	Sleeve ID	Fits Hose ID	Weight
	in	in	lbs
TBSL-32	2.02	2	1.83
TBSL-48	3.03	3	3.06
TBSL-64	4.04	4	4.29

Thorburn PVC Banding Coils

Thorburn PVC Banding Coils are designed to fit and fill the area between the helix providing a smooth service for installation of tension bands and prevent over-flexing at couplings, particularly when attaching couplings to the hose ends. The banding coil is threaded (Clockwise or Counter Clockwise) onto the hose helix before the coupling is installed. Clamps are then applied over the coil and helix. In addition to providing a smooth surface, the coil can also add rigidity to the hose, especially at the coupling, which helps prevent excessive flexing and potential damage to the hose or coupling.

Thorburn Series TBCC Counter Clockwise Banding Coils



Thorburn Part # Clear Color	Weight	Thorburn Part # White Color	Weight	Fits Hose ID
	lbs		lbs	in
TBCC-24-CL	0.20	-	-	1 1/2
TBCC-32-CL	0.30	TBCC-32-WT	0.25	2
TBCC-48-CL	0.60	TBCC-48-WT	0.45	3
TBCC-64-CL	0.90	-	-	4
TBCC-80-CL	1.10	-	-	5
TBCC-96-CL	1.30	-	-	6
TBCC-128-CL	1.40	-	-	8

Colors: Clear - For hoses with a high profile counterclockwise helix
White - For hoses with a low profile counterclockwise helix

Thorburn Series TBCW Clockwise Banding Coils

Thorburn Part # Grey Color	Weight	Thorburn Part # Yellow Color	Weight	Fits Hose ID
	lbs		lbs	in
TBCW-32-GR	0.30	TBCW-32-YL	0.25	2
TBCW-48-GR	0.60	TBCW-48-YL	0.45	3
TBCW-64-GR	0.90	TBCW-64-YL	0.75	4

Colors: Grey - For hoses with a high profile clockwise helix
Yellow - For vapor recovery hoses

Thorburn Hose Assembly Whip Checks

Thorburn Series TWA hose to hose (spring loop on both ends) Whip Checks

Thorburn Series TWA hose to hose whip check

Warning: Replace and discard if a blowout event occurs. Always install fully extended with no slack, with the cable centered on the hose connection when possible.

Thorburn Whip Checks are designed to give protection from hose whipping if a hose disconnects under high pressure. Thorburn Whip Checks are an easy to use safety product to prevent injury and are highly resistant to rust and corrosion. Thorburn Whip Checks do not require any tools to install having spring-loaded loops in the cable ends to easily pass over the couplings, for a firm grip on the hose. Highly recommended for high pressure applications.

Features:

- Sizes for a range from 1/2" through 10" hose diameters
- 200 PSI air service rating
- 5X safety ratio (1000 PSI burst)
- Galvanized Steel or 304 Stainless Steel
- Available as hose-to-hose or hose-to-tool styles

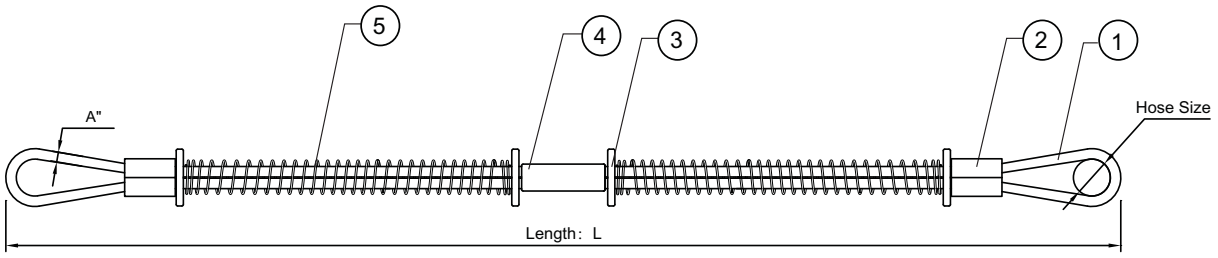
Thorburn's Series TWSR is designed for one side of the whip check to loop over a pneumatic tool such as the neck of a jackhammer and the other spring end to loop around the hose.

Thorburn Hose Assembly Whip Check Specifications

Thorburn Series TWB/TWA Hose To Hose Whip Check

Thorburn Part Number		Hose Size	Length (L)		Cable OD (A)		Approximate Break Strength	Weight
SS304	Galvanized	in	in	mm	in	mm	KN	kg/pc
TWB1-S4	TWB1-CP	1/2" - 1 1/4"	20.25	514.3	1/8"	3.0	6.5	0.11
TWA2-S4	TWA2-CP	1 1/2" - 3"	38	965.2	1/4"	6.0	27.5	0.45
TWA4-S4	TWA4-CP	4"	44	1117.6	3/8"	9.5	38.2	1.15
TWA6-S4	TWA6-CP	6"	43.5	1100	3/8"	9.5	85.5	1.20
TWA8-S4	TWA8-CP	8"	55	1400	9/16"	14.0	150	2.86

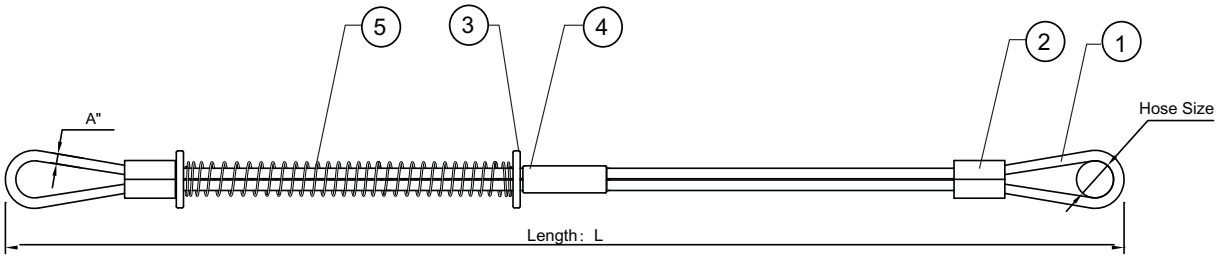
1. Wire Rope
2. Slider
3. Flat Washer
4. Ferrules
5. Spring



Thorburn Series TWSR Hose To Tool Whip Check

Thorburn Part Number		Hose Size	Length (L)		Cable OD (A)		Approximate Break Strength	Weight
SS304	Galvanized	in	in	mm	in	mm	KN	kg/pc
TWSR1-S4	TWSR1-CP	1/2" - 1 1/4"	20.25	514.3	1/8"	3.0	6.5	0.07
TWSR2-S4	TWSR2-CP	1 1/2" - 3"	38	965.2	1/4"	6.0	27.5	0.37
TWSR4-S4	TWSR4-CP	4"	44	1117.6	3/8"	9.5	37.2	1.00
TWSR6-S4	TWSR6-CP	6"	43.5	1100	3/8"	9.5	85.5	1.05
TWSR8-S4	TWSR8-CP	8"	55	1400	9/16"	14.0	150	2.68

1. Wire Rope
2. Slider
3. Flat Washer
4. Ferrules
5. Spring



Thorburn Series TWS Hose Assembly Whip Socks

Thorburn's Whip Sock high pressure hose restraints are designed to significantly reduce the risk of injury caused by a high pressure hose blow-out failure. The magnitude of force caused by a large-diameter pressurized hose can cause fatal injury and be difficult to quickly restrain. Thorburn Whip Socks also provide a grip on a hose over the larger area so to securing the hose and prevent it from whipping if a high-pressure accident causes the hose to release from its place. The double leg loop ends will also prevent the hose from side to side whipping under pressure. Whip Socks are Ideal for use in hydraulic systems or to restrain high pressure hoses dispensing water, air, sand, steam, concrete and slurry. Thorburn Whip Sock systems are capable of significantly higher pressure ratings than the standard Whip Check or nylon hose safety restraints and can also be connected directly to one another without a clamp where two hoses are being joined. Each restraint features thimble eyes that are used as shackle points when fitted over the hose.

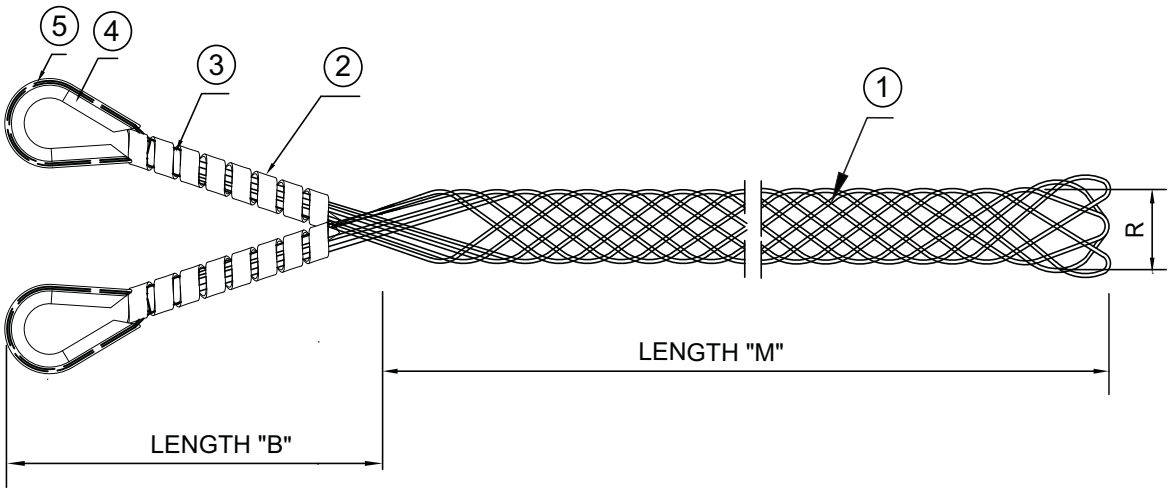
Features:

- Sizes for a range from 1/2" through 6" hose diameters
- Keeps personnel and equipment safe
- Minimizes the high-pressure hose whipping
- Protects hoses from abrasion and wear
- 15" long leads for easier and more flexible installation
- Galvanized or 304 stainless steel

Thorburn Series TWS Hose Assembly Whip Sock Specifications

Thorburn Part Number		Hose Size	Dimension (B)		Dimension (R)				Dimension (M)		Approx. Break Strength
					Min		Max				
SS304	Galvanized Steel	in	in	mm	in	mm	in	mm	in	mm	KN
TWS08-S4	TWS08-CP	1/2”	5.9	150	0.75	19	1.10	28	19.69	500	38
TWS12-S4	TWS12-CP	3/4”	7.1	180	1.10	28	1.57	40	23.62	600	57
TWS16-S4	TWS16-CP	1”	7.1	180	1.57	40	1.97	50	31.50	800	57
TWS24-S4	TWS24-CP	1 1/2”	9.8	250	1.97	50	2.36	60	35.43	900	100
TWS32-S4	TWS32-CP	2”	10.0	254	2.36	60	2.76	70	35.43	900	100
TWS40-S4	TWS40-CP	2 1/2”	10.6	270	2.76	70	3.35	85	39.37	1000	100
TWS48-S4	TWS48-CP	3”	15.0	381	3.35	85	3.94	100	39.37	1000	158
TWS56-S4	TWS56-CP	3 1/2”	16.5	420	3.94	100	4.72	120	47.24	1200	158
TWS64-S4	TWS64-CP	4”	23.6	600	4.72	120	5.91	150	55.12	1400	195
TWS96-S4	TWS96-CP	6”	23.6	600	5.91	150	7.48	190	63.00	1600	195
TWS128-S4	TWS128-CP	8”	23.6	600	7.51	191	8.66	220	63.00	1600	195

1. Wire Mesh Assembly
2. Shoulder Protector
3. Aluminum Sleeve
4. Capel
5. Wire Rope



Warning: When installing a Whip Stop Safety Restraint, ensure proper fit by verifying if he diamond-pattern of the braiding is equally proportioned. If the diamonds are longer than they are wide, then the restraint is too big and the hose is at risk of slipping. After installing on the hose, pull on the loop ends to ensure there is no movement or rotation of the hose. Inspect Whip Sock restraints regularly, and replace if there is any sign of rust or broken cable strands.

Thorburn Series TSHP Hose Support Saddles

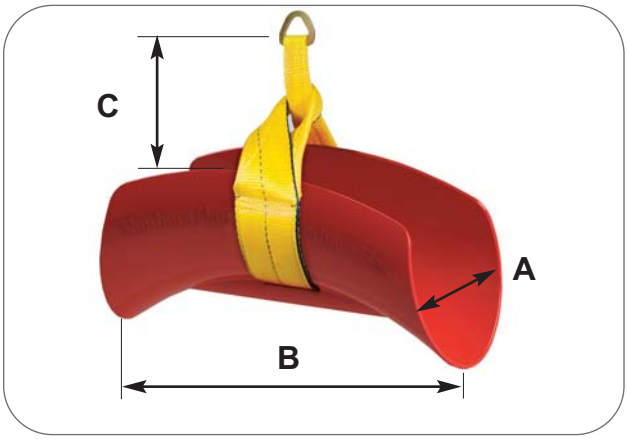
Thorburn Series TSHP™ "Hose Support Saddles" protects the hose assembly from surpassing its minimum bend radius when being lifted, moved or supported. Thorburn Series TSHP™ "Hose Support Saddles" are designed to protect the hose assembly from kinking when suspended in a temporary or permanent position. Even wide body slings cannot effectively protect the hose from exceeding its bend radius.

Construction

Saddle Material: Abrasion resistant polyurethane
Maximum Temperature: 93°C (200°F)
Safety Factor over rated capacity: 5:1
Sling Material: UV resistant high tensile polyester

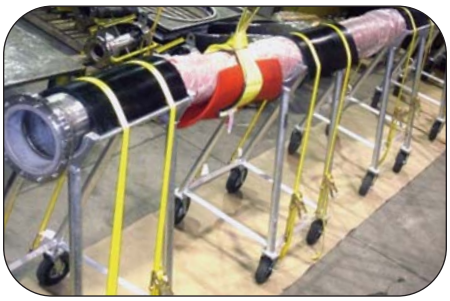
Applications

- Petrochemical industry truck loading/unloading stations
- Oil & gas drilling installations
- Ship to shore loading/unloading stations
- Aircraft refueling depots
- Industrial and nuclear power plant installations that require temporary or permanent re-routing of piping during maintenance and emergency service.



Part Number	Nominal Hose I.D.		(A) Max. Hose O.D.	(B) Saddle Length	Sling Rated Capacity	(C) Sling Length
	inch	DN	mm	mm	kg	mm
THSP-16	1.00	25	25	406	612	203
THSP-20	1.25	32	57	445	612	140
THSP-24	1.50	38	64	495	612	165
THSP-32	2.00	50	80	510	612	184
THSP-48	3.00	80	105	550	907	203
THSP-64	4.00	100	130	570	907	203
THSP-96	6.00	150	205	646	3629	572
THSP-128	8.00	200	250	775	5443	457
THSP-160	10.0	250	360	1035	6803	489
THSP-192	12.0	300	500	1035	6803	591

Thorburn Series TH-20/TH-40 ThorCart Hose Taxi



Thorburn ThorCart TH-20

Thorburn ThorCart Hose Taxis provide safe on-site transportation of long hose assemblies to installation or storage areas. They are available in two main models: the TH-20 (Light Duty) for composite hose assemblies and the TH-40 (Heavy Duty) for large-diameter material-handling hoses. Each ThorCart is custom designed to fit site requirements and prevent abrasion damage caused by dragging hoses on the ground. The system also reduces risks of mishandling, such as over-bending or kinking during transport. The TH-40 features a low center of gravity for stability and can be used in tandem via a hitch system to carry longer hoses. All models are built to handle uneven surfaces and include straps for securing hoses. Standard 360° pivot wheels allow smooth movement in any direction.

Ordering Codes: TH-20 (Light Duty Hose Taxi) | **TH-40** (Heavy Duty Hose Taxi)

Thorburn Series TDHR Marine Hose Reels

Shore-to-Ship Petroleum Transfer

Thorburn Series TDHR Marine Hose Reels are purpose engineered to provide safe, controlled, and reliable handling of large diameter hose assemblies in demanding marine environments. Designed for smooth, controlled operation, Series TDHR reels maintain proper hose alignment and bending radius, reducing mechanical stress, abrasion, and fatigue during repeated handling cycles. Thorburn Series TDHR Marine Hose Reels prevent hose kinking, over-bending, and impact damage while significantly extending the hose service life, improving operational safety, and reducing downtime during offloading, loading, and transfer operations. Engineered for continuous duty in harsh marine conditions, Thorburn's TDHR hose reel play a critical role in protecting high-value hose assemblies in storage, handling efficiency, and ensuring safe fluid transfer throughout Floating production storage and offloading (FPSO) operations.

Reeling System for FPSO

STS Bunkering

Thorburn Series TDHR Marine Hose Reels are engineered with high-torque electric, hydraulic or electro-hydraulic power drives matched to Thorburn marine hose diameter, weight, bend radius and storage length. Designed for smooth controlled deployment and retrieval of large diameter marine hose assemblies (6" to 12"), with variable speed operation, fail-safe braking, emergency stop, and torque limiting protection to ensure safe handling under full load. Thorburn Series TDHR Marine Hose Reel power and control systems are supplied in marine-rated enclosures and delivered fully powered, assembled and ready for immediate installation and service.

Features

- Powered hose deployment & retrieval (Forward & reverse variable speed control with smooth acceleration and deceleration)
- High-Torque power drives (Electric, Hydraulic, Electro-Hydraulic)
- Marine rated, heavy-duty, corrosion-resistant construction with protection enclosures
- Fail-Safe braking system secures the drum during power loss
- Emergency stop with local and remote activation options
- Torque limiters and pressure relief valves protect hoses and components from overload
- Manual override / hand pump (hydraulic systems) for controlled operation during power failure
- Spooling guidance systems ensures even hose layering and prevents cross-winding

Thorburn Series TDHR Marine Hose Reels

LNG Bunkering

LNG Transfer

Benefits

- Safer, controlled hose handling under full load
- Reduces hose wear, shock loads, twisting & longer hose life
- Lower risk of leaks, spills, or costly downtime
- Faster, more efficient fluid transfer
- Improved operational reliability
- Rapid installation and commissioning
- Supplied fully powered, assembled, ready to install and use
- 75% savings in operational costs

Applications

- Petroleum & Chemical loading/unloading
- Shore-to-ship and STS bunkering
- Ballast water operations and firewater deployment
- LNG/cryogenic transfer
- Floating production, storage and offloading (FPSO)

Thorburn Series TDHR Specifications

Hose Sizes: 4”, 6”, 8”, 10”, 12”
Drives: Electric **(E)**, Hydraulic **(H)**, Electro-Hydraulic **(EH)**
Typical Power: 5 - 30kW (7 - 40 HP)
Control: Variable speed, Forward / Reverse
Reel Materials: Plated Steel (Standard), 316SS
Safety: Failsafe Brake, Torque Limiting
Hose Assemblies: 60TMH-NLS, Thorflex, FL1, SS1
End Fittings: Fixed Flange, Swivel Flange, Victaulic Grove
Hose Length: Up to 60m

Final motor sizing: is confirmed by Thorburn’s engineering based on first-layer load, drum diameter, required line speed, and site conditions.

Thorburn Hose Reels: are designed and sold with Thorburn Marine Hose Assemblies attached. Refer to Thorburn Thorflex Series Composite Hose Assemblies (Pages 71 - 75), 60TMH-NLS Ship-to-Ship/Ship-to-Shore Hose Assemblies (Pages 103 - 105), FL1 Floating Hose Assemblies (Pages 97 - 98), SS1 Submarine Hose Assemblies (Pages 99 - 102).

How To Order Thorburn Series TDHR Marine Hose Reels

Reel Model	Hose Model	Hose Size	Pressure	Drive	1st End & Material	2nd End & Material	End Fitting Type	OAL	Reel Material	End Option
TDHR	60TMH-NLS	160	2	E	01S6	07S6	CR	40m	CS	BC
	60TMH-NLS (104) 58TC (71) FL1 (97) SS1 (99)	**64** = 4” **96** = 6” **128** = 8” **160** = 10” **192** = 12”	**1** = 150 PSI (10 bar) **2** = 200 PSI (14 bar) **3** = 225 PSI (16 bar) **4** = 250 PSI (17 bar) **5** = 300 PSI (21 bar)	**E** = Electric **H** = Hydraulic **EH** = Electric/ Hydraulic **End Material** **S6** = 316SS **S4** = 304SS **CS** = Plated Steel **XX** = Specify	**01** = Fixed Flange ANSI 150 **02** = Fixed Flange ANSI 300 **03** = Fixed Flange PN 10 **04** = Fixed Flange PN 16 **05** = Fixed Flange PN 25 **06** = Fixed Flange PN 40 **07** = Swivel Flange ANSI 150 **08** = Swivel Flange ANSI 300 **09** = Swivel Flange PN 10 **10** = Swivel Flange PN 16 **11** = Swivel Flange PN 25 **12** = Swivel Flange PN 40 **13** = Victaulic Grooved		**B1** = Built-In **CR** = Crimped	**Overall Length** Use Feet (ft) or Meters (m) after number	**S6** = 316SS **CS** = Plated Steel	**BC** = Big Cam Couplings (Pg 119) **None** = Leave Blank

Note: For detailed hose assembly information, please see Thorburn’s Thorflex Composite Hose Assemblies (Pages 71 - 75) and Thorburn’s Marine Hose Assemblies (Pages 96 - 106). Add the hose assembly part number below the hose reel part number when ordering Thorburn hose reels.

Technical Data

Chemical Resistance Guide

Interpretation of Chemical Resistance

The Chemical Resistance Chart that follows is a general guide only. Since many factors can affect the chemical resistance of a given product, you should test under your own conditions.

Chemical resistance is a measure of:
Permeation: the process by which a chemical agent migrates through a material at the molecular level
Penetration: the bulk flow of a chemical agent through porous materials, closures, seams, or imperfections in a material
Degradation: a damaging change in one or more physical property of a material after it's been exposed to a chemical agent

Elastomeric Chemical Resistance

Variables that affect the resistance of a compound to a chemical attack are:
Temperature of the Media Transmitted: Ratings given are based at 70°F (21°C). Higher temperatures increase the affect of chemicals on compounds. The amount of increase depends upon the polymer and the chemical. A compound quite suitable at room temperature might fail very quickly at higher temperatures. It is not recommended to operate outside hose temperature limits.

Service Conditions: A rubber compound usually swells when exposed to a chemical. Within a given percent of swell, a hose tube may function well if the hose is in a static condition, but may fail quickly if the hose is subject to flexing.

The Grade or Blend of the Rubber Compound: Basic polymers are sometimes mixed or blended to enhance a particular property for a specific service and the reaction to a particular chemical may therefore be somewhat different. When in doubt, a sample of the compound should always be tested with the particular chemical it is going to handle.

Thermoplastic Chemical Resistance

Thermoplastics have outstanding resistance to a wide range of chemical reagents. The chemical resistance of plastic piping is basically a function of the thermoplastic material and the compounding components. In general, the less compounding components used the better the chemical resistance. Thermoplastic pipes with significant filler percentages may be susceptible to chemical attack where an unfilled material may be affected to a lesser degree or not at all. Thermoplastic hose and tubing achieve their optimum physical properties at room temperature 68°F (20°C). As Thermoplastic materials are exposed to increased ambient temperatures, they soften and their physical properties change. It is advised to test the product in a controlled environment and consider all operating conditions prior to use. Types of thermoplastic material are: **PVC** (Polyvinyl Chloride) , **TPR** (Thermoplastic Rubber), **TPE** (Thermoplastic Elastomer), **TPU** (Thermoplastic Polyurethane), **UHMW** (Ultra High Molecular Weight Polyethylene).

Coupling Material Chemical Resistance

The tables provide an initial guide to the selection of materials and are intended to facilitate understanding of the different types of corrosion damage that can arise due to poor material selection. The chemical resistance of a material does not necessarily indicate the suitability of a fitting in a given application due to variables such as improper clamp and coupling application, special hose construction and gasket material. Ratings given are based at 70°F (21°C). Chemical compatibility varies greatly with temperature.

Material Compatibility Key

(**A**) Excellent
(**B**) Good
(**C**) Fair (Conditional)
(**D**) Unsatisfactory
(**E**) Contact Thorburn
(**Y**) Acceptable (Coupling Material Only)
(**-**) No Information

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Acetal	C	C	B	D	C	C	B	D	A	A	-
Acetaldehyde	C	D	A	D	C	C	A	D	A	A	-
Acetamide	C	C	A	B	B	B	A	B	A	A	-
Acetate Solvents	C	D	C	D	D	D	C	D	A	A	-
Acetic Acid (10%)	B	B	B	B	C	C	B	C	A	A	B
Acetic Acid (30%)	D	D	B	D	C	B	A	C	A	A	
Acetic Acid (50%)	D	D	B	C	C	D	A	D	A	A	
Acetic Acid (Glacial)	D	D	B	D	C	D	B	D	A	A	C
Acetic Anhydride	D	D	B	D	D	D	B	D	A	A	-
Acetic Ester (Ethyl Acetate)	D	D	B	D	D	D	B	D	A	A	-
Acetic Ether (Ethyl Acetate)	D	D	B	D	D	C	B	D	A	A	-
Acetic Oxide (Acetic Anhydride)	D	D	B	D	D	D	B	D	A	A	-
Acetone	B	C	A	D	C	C	A	D	A	A	D
Acetophenone	C	D	A	D	D	D	A	D	A	A	-
Acetyl Acetone	B	D	B	D	D	D	B	D	A	A	-
Acetyl Chloride	D	D	C	D	D	D	C	B	B	A	-
Acetylene	D	D	A	A	B	B	B	A	A	A	C
Acrylonitrile	C	D	D	D	C	C	D	D	A	A	-
Air	A	A	A	A	A	A	A	A	A	A	A
Alcohols Aliphatic	A	B	A	A	A	A	A	C	A	A	-
Alcohols, Aromatic	C	D	D	C	C	D	D	A	A	A	-
Alk-Tri (Trichlorethylene)	D	D	D	D	D	D	D	A	A	A	-
Allyl Alcohol	A	B	A	A	A	A	A	B	A	A	-
Allyl Bromide	D	D	D	D	D	D	D	B	B	A	-
Allyl Chloride	D	D	D	D	D	D	D	B	B	A	-
Alum (Aluminum Potassium Sulfate)	A	A	A	A	A	A	A	A	A	A	-
Aluminum Acetate	C	C	A	C	C	B	A	A	A	A	-
Aluminum Chloride	A	A	A	A	A	A	A	A	A	A	A
Aluminum Fluoride	A	A	A	A	A	A	A	A	A	A	B
Aluminum Hydroxide	A	A	A	A	A	A	A	A	A	A	-
Aluminum Nitrate	A	A	A	A	A	A	A	A	A	A	-
Aluminum Phosphate	A	A	A	A	A	A	A	A	A	A	-
Aluminum Sulfate	A	A	A	A	A	A	A	A	A	A	A
Ammonia Anhydrous	A	C	A	A	A	B	A	D	A	A	-
Ammonia Gas (150°F)	Anhydrous Ammonia Hose Only										
Ammonia in Water	B	B	B	B	B	B	A	B	A	A	A
Ammonia Liquid	B	B	A	A	A	A	A	A	A	A	-
Ammonia, Gas (Cold)	Anhydrous Ammonia Hose Only										
Ammonium Carbonate	A	A	A	C	A	A	A	A	A	A	-
Ammonium Chloride	A	A	A	A	A	A	A	A	A	A	C
Ammonium Hydroxide	B	B	B	B	A	B	B	A	A	A	C
Ammonium Metaphosphate	A	A	A	A	A	A	A	A	A	A	-
Ammonium Nitrate	B	A	A	A	A	A	A	A	A	A	-
Ammonium Nitrite	A	A	A	A	A	A	A	A	A	A	A
Ammonium Persulfate	A	D	A	D	A	A	A	A	A	A	-
Ammonium Phosphate	A	A	A	A	A	A	A	A	A	A	A
Ammonium Sulfate	A	A	A	A	A	A	A	A	A	A	A
Ammonium Sulfide	A	A	A	A	A	A	A	A	A	A	-
Ammonium Sulfite	A	A	A	A	A	A	A	A	A	A	-
Ammonium Thiocyanate	A	A	A	A	A	A	A	A	A	A	-
Ammonium Thiosulfate	A	A	A	A	A	A	A	A	A	A	-
Amyl Acetate	C	D	B	D	D	D	B	D	A	A	D
Amyl Acetone	D	D	B	D	D	D	B	D	A	A	-
Amyl Alcohol	A	A	A	A	A	A	A	A	A	A	D

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Amyl Borate	D	D	D	A	A	C	D	A	A	A	
Amyl Chloride	D	D	D	D	D	D	D	A	A	A	
Amyl Chloronaphthalene	D	D	D	D	D	D	D	A	A	A	
Amyl Naphthalene	D	D	D	D	D	D	D	A	A	A	
Amyl Oleate	D	D	B	D	D	D	B	C	A	A	
Amyl Phenol	D	D	D	D	D	D	D	A	A	A	
Amylamine	See Ammonia										
Anethole	D	D	D	D	D	D	D	B	B	A	
Aniline	D	D	B	D	C	C	D	B	A	A	D
Aniline Dyes	B	B	B	C	B	B	B	B	A	A	D
Aniline Hydrochloride	B	C	B	B	D	D	B	B	A	A	
Animal Fats	D	D	B	A	B	B	B	A	A	A	
Animal Grease	D	D	D	B	B	D	C	A	A	A	
Animal Oils	D	D	B	A	D	D	C	A	A	A	
Ansul Ether	D	D	C	C	D	D	C	D	A	A	
Antifreeze (Ethylene Glycol)	A	A	A	A	A	A	A	A	A	A	
Antimony Pentachloride	D	D	C	D	D	D	C	A	B	A	
Antimony Trichloride	D	D	A	B	B	B	B	A	A	A	
Aqua Regia	D	D	D	D	D	C	C	B	D	A	
Aromatic Hydrocarbons	D	D	D	C	D	D	D	A	A	A	
Arquad	A	A	A	A	A	A	A	A	A	A	
Arsenic Acid	A	A	A	A	A	A	A	A	A	A	
Arsenic Chloride	D	D	B	D	B	D	B	D	D	A	
Arsenic Trichloride	D	D	B	D	B	D	B	D	D	A	
Asphalt	D	D	D	A	B	D	D	A	B	A	-
Astm #1 Oil	D	D	D	A	A	B	D	A	A	A	-
Astm #2 Oil	D	D	D	A	B	C	D	A	A	A	-
Astm #3 Oil	D	D	D	A	B	C	D	A	A	A	-
Aviation Gasoline	D	D	D	A	C	D	D	A	A	A	-
Barium Carbonate	A	A	A	A	A	A	A	A	A	A	-
Barium Chloride	A	A	A	A	A	A	A	A	A	A	A
Barium Hydroxide	A	A	A	A	A	A	A	A	A	A	A
Barium Sulfate	A	A	A	A	A	A	A	A	A	A	-
Barium Sulfide	A	A	A	A	A	A	A	A	A	A	A
Beer	F.D.A. Tube Required										
Beet Sugar Liquors	A	A	A	A	A	A	A	A	A	A	A
Benzaldehyde	D	D	B	D	D	D	B	D	A	A	-
Benzene (Benzol)	D	D	D	C	C	D	D	A	A	A	D
Benzene Sulfonic Acid	D	D	D	B	A	A	C	A	A	A	-
Benzine Solvent (Ligroin)	D	D	D	A	A	C	D	A	A	A	-
Benzoic Acid	D	D	B	D	B	B	B	A	A	A	-
Benzoic Aldehyde	D	D	D	D	D	D	D	D	A	A	-
Benzotrichloride	D	D	D	D	D	D	D	B	B	A	-
Benzoyl Chloride	D	D	D	D	D	D	D	B	B	A	-
Benzyl Acetate	D	D	B	D	D	B	B	D	A	A	-
Benzyl Alcohol	B	B	B	D	B	B	B	A	A	A	-
Benzyl Chloride	D	D	C	D	D	D	D	A	A	A	-
Bichromate of Soda (Sodium Dichromate)	D	D	A	D	B	B	C	A	A	B	-
Bichromate of Soda (Sodium Bichromate)	D	D	A	D	B	B	C	A	A	A	-
Black Sulfate Liquor	B	B	A	B	A	B	A	A	A	A	A
Blast Furnace Gas	D	D	C	C	B	B	C	A	A	B	A
Bleach Solutions	D	D	B	D	D	C	B	B	B	A	-
Borax	B	B	A	B	A	A	A	A	A	A	B
Bordeaux Mixture	B	B	A	A	A	A	A	A	A	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Brandy	F.D.A. Tube Required										
Brine	A	A	A	A	A	A	A	A	A	A	-
Bromine	D	D	D	D	D	C	D	C	D	A	D
Bromine Water	D	D	B	C	B	A	B	A	A	A	-
Bromobenzene	D	D	D	D	D	D	D	B	C	A	-
Bunker Oil	D	D	D	A	B	D	D	A	A	A	-
Butane	Use Butane-Propane Hose Only										
Butanol (Butyl Alcohol)	A	A	A	A	A	A	A	A	A	A	C
Butter (Non-F.D.A.)	C	C	B	A	A	A	B	A	A	A	-
Butyl Acetate	D	D	B	D	D	D	C	D	A	A	D
Butyl Acrylate	D	D	D	D	D	D	D	D	B	A	-
Butyl Benzene	D	D	D	D	D	D	D	A	A	A	-
Butyl Bromide	D	D	D	D	D	D	D	B	B	A	-
Butyl Butyrate	D	D	C	D	D	D	B	C	B	A	-
Butyl Carbitol	D	D	A	B	B	B	A	A	A	A	-
Butyl Cellosolve	D	D	A	B	B	B	A	D	A	A	-
Butyl Chloride	D	D	C	D	D	D	D	A	B	A	-
Butyl Ether	D	D	C	B	B	B	C	D	A	A	-
Butyl Ethyl Acetaldehyde	D	D	C	D	D	D	D	D	A	A	-
Butyl Ethyl Ether	D	D	C	D	D	B	C	C	A	A	-
Butyl Oleate	D	D	B	D	D	D	B	A	A	A	-
Butyl Phthalate	D	D	C	D	D	D	C	C	A	A	-
Butyl Stearate	D	D	C	B	D	D	C	A	A	A	-
Butylamine	See Ammonia										
Butyric Acid	C	D	C	C	C	B	C	C	A	A	-
Butyric Anhydride	C	D	C	C	C	B	C	C	A	A	-
Butyuraldehyde	C	D	C	C	D	B	C	C	A	A	-
Calcium Acetate	C	D	D	D	D	D	D	D	A	A	-
Calcium Bisulfate	C	D	A	D	D	D	A	D	A	A	C
Calcium Bisulfite	A	A	A	A	A	A	A	A	A	A	-
Calcium Carbonate	A	A	A	A	A	A	A	A	A	A	-
Calcium Chloride	A	A	A	A	A	A	A	A	A	A	A
Calcium Hydroxide	A	A	A	A	A	A	A	A	A	A	A
Calcium Hypochlorite	A	B	A	B	A	B	A	C	A	A	C
Calcium Nitrate	D	D	B	D	D	C	B	A	B	A	-
Calcium Sulfate	A	A	A	A	A	A	A	A	A	A	-
Calcium Sulfide	A	A	A	A	A	A	A	A	A	A	-
Calcium Sulfite	A	A	A	A	A	A	A	A	A	A	-
Caliche Liquor (Crude Sodium Nitrate)	A	A	A	A	A	A	A	A	A	A	B
Cane Sugar Liquors (Non F.D.A.)	A	A	A	A	A	A	A	A	A	A	A
Carbitol	D	D	A	D	A	B	B	B	A	A	-
Carbitol Acetate	D	D	A	D	A	B	B	B	A	A	-
Carbolic Acid (Phenol)	D	D	B	D	D	D	B	D	A	A	D
Carbon Bisulfide	D	D	B	C	C	C	B	A	A	A	-
Carbon Dioxide	See Carbon Disulfide										
Carbon Disulfide	A	A	A	A	A	A	A	A	A	A	D
Carbon Monoxide	D	D	D	D	D	D	D	A	A	A	A
Carbon Tetrachloride	A	A	A	A	A	A	A	A	A	A	D
Carbon Tetrafluoride	D	D	D	C	D	D	D	A	C	A	-
Carbonic Acid	D	D	D	C	D	D	D	A	C	A	-
Castor Oil	A	A	A	A	A	A	A	A	A	A	A
Caustic Potash (Potassium Hydroxide)	C	D	B	A	B	C	B	A	A	A	-
Caustic Soda (Sodium Hydroxide)	A	B	A	A	B	A	A	C	A	A	-

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Cellosolve	D	D	B	B	A	B	B	C	A	A	-
Cellulose Acetate	C	D	B	D	C	C	B	D	B	A	D
Cellulube	C	D	B	D	D	D	A	C	A	A	-
China Wood Oil (Tung Oil)	D	D	B	A	B	B	B	A	A	A	D
Chlorinated Hydrocarbons	D	D	D	D	D	D	D	A	B	A	-
Chlorine Dioxide	D	D	D	D	D	C	D	A	B	A	-
Chlorine Gas (Dry)	C	C	C	C	D	B	C	B	B	A	D
Chlorine Water Solutions	C	D	C	D	D	B	C	A	A	A	-
Chloroacetic Acid	B	D	C	D	D	D	C	C	A	A	-
Chloroacetone	D	D	B	D	D	D	C	D	A	A	-
Chlorobenzene	D	D	D	D	D	D	D	A	B	A	-
Chlorobutadiene	D	D	D	D	D	D	D	A	B	A	-
Chlorobutane	D	D	D	D	D	D	D	A	B	A	-
Chloroform	D	D	D	D	D	D	D	A	B	A	-
Chloropentane	D	D	D	D	C	D	D	A	A	A	-
Chlorophenol	D	D	D	D	D	D	D	B	B	A	-
Chloropropanone	D	D	C	D	D	D	C	D	A	A	-
Chlorosulfonic Acid	D	D	D	D	D	C	D	D	B	A	D
Chlorothene (Trichloroethane)	D	D	D	D	D	D	D	A	B	A	-
Chlorotoluene	D	D	D	D	D	D	D	A	B	A	-
Chromic Acid	D	D	D	D	D	A	C	C	A	A	C
Citric Acid	A	A	A	B	B	A	A	A	A	A	A
Coal Oil	D	D	D	A	B	D	D	A	A	A	-
Coal Tar	D	D	D	A	B	B	B	A	A	A	-
Coal Tar Naptha	D	D	D	C	C	D	D	A	A	A	-
Cobalt Chloride	A	A	A	A	A	A	A	A	A	A	-
Coconut Oil	D	D	B	A	B	B	A	A	A	A	-
Cod Liver Oil	D	D	A	A	B	B	A	A	A	A	-
Coke Oven Gas	D	D	C	D	D	B	D	A	A	A	-
Copper Arsenate	A	A	A	A	A	A	A	A	A	A	-
Copper Chloride	A	A	A	A	A	A	A	A	A	A	A
Copper Cyanide	A	A	A	A	A	A	A	A	A	A	-
Copper Nitrate	A	A	A	A	A	A	A	A	A	A	-
Copper Nitrite	A	A	A	A	A	A	A	A	A	A	-
Copper Sulfate	C	A	A	A	A	A	A	A	A	A	A
Copper Sulfide	C	A	A	A	A	A	A	A	A	A	-
Corn Oil	D	D	B	A	B	B	B	A	A	A	A
Cottonseed Oil	D	D	A	A	B	A	A	A	A	A	A
Creosols	D	D	D	C	C	C	D	A	A	A	-
Creosote (Coal Tar)	D	D	D	B	C	C	D	A	A	A	C
Creosote (Wood)	D	D	D	B	C	C	D	A	A	A	D
Cresylic Acid	D	D	D	C	C	C	D	A	A	A	-
Crude Oil	D	D	D	C	C	C	D	A	A	A	-
Cumene	D	D	D	A	B	D	D	A	A	A	-
Cupric Carbonate	D	D	D	C	C	D	D	A	A	A	-
Cupric Chloride	C	C	A	B	B	B	A	A	A	A	-
Cupric Nitrate	C	C	A	A	B	A	A	A	A	A	-
Cupric Nitrite	C	C	A	A	B	A	A	A	A	A	-
Cupric Sulfate	C	C	A	A	B	A	A	A	A	A	-
Cyclohexane	C	B	A	A	B	B	A	A	A	A	-
Cyclohexanol	D	D	D	D	D	D	D	C	A	A	-
Cyclohexanone	D	D	D	B	D	D	D	A	A	A	-
Cyclopentane	D	D	D	B	B	D	D	B	A	A	-
D.M.P. (Dimethyl Phenols)	B	D	D	D	D	D	D	D	C	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
DDT in Kerosene	D	D	D	C	D	D	D	A	A	A	-
Decaline (Deklin)	D	D	D	A	B	C	D	A	A	A	-
Decane	D	D	D	D	D	D	D	A	A	A	-
Detergent Solutions	D	D	D	D	D	D	D	A	A	A	-
Diacetone Alcohol	B	B	A	A	A	A	A	A	A	A	-
Diamylamine	See Ammonia										
Dibenzyl Ether	D	D	D	D	D	D	D	C	A	A	-
Dibenzyl Sebacate	D	D	D	D	D	D	D	C	A	A	-
Dibromobenzene	C	D	B	D	D	C	B	B	A	A	-
Dibutyl Sebacate	D	D	B	D	D	D	B	D	B	A	-
Dibutylamine	See Ammonia										
Dibutylether	B	C	C	B	A	C	B	D	A	A	-
Dibutylphthalate	D	D	B	D	D	D	A	D	A	A	-
Dicalcium Phosphate	A	A	A	A	A	A	A	A	A	A	-
Dichloroacetic Acid	D	D	C	D	D	D	C	C	A	A	-
Dichlorobutane	D	D	D	D	D	D	D	A	A	A	-
Dichlorodifluoromethane (Freon 12)	D	D	D	B	D	D	D	B	A	A	-
Dichloroethane	D	D	D	D	D	D	D	A	A	A	-
Dichloroethyl Ether	D	D	D	D	D	D	D	C	A	A	-
Dichloroethylene	D	D	D	D	D	D	D	A	A	A	D
Dichlorohexane	D	D	D	D	D	D	D	A	A	A	-
Dichloroisopropyl Ether	D	D	C	D	D	D	C	C	A	A	-
Dichloromethane	D	D	D	D	D	D	D	A	A	A	-
Dichloropentane	D	D	D	D	D	D	D	A	A	A	-
Dicyclohexylamine	See Ammonia										
Dieldrin in Xylene	D	D	D	D	D	D	D	A	A	A	-
Dieldrin in Xylene and Water Spray	D	D	D	B	B	D	D	A	A	A	-
Diesel Oil	D	D	D	A	B	C	D	A	A	A	D
Diethanolamine	See Ammonia										
Diethyl Benzene	D	D	D	D	D	D	D	A	A	A	-
Diethyl Ether	D	D	D	B	C	C	C	D	A	A	-
Diethyl Oxalate	A	A	A	D	D	D	A	C	A	A	-
Diethyl Phthalate	D	D	A	D	D	D	B	C	A	A	-
Diethyl Sebacate	D	D	A	D	D	D	B	C	A	A	-
Diethyl Sulfate	D	D	B	D	D	D	B	D	A	A	-
Diethyl Triamine	B	C	A	B	B	C	B	C	A	A	-
Diethylamine	See Ammonia										
Diethylene Dioxide	D	D	B	D	D	D	B	D	A	A	-
Diethylenetriamine	See Ammonia										
Dihydroxyethyl Amine	See Ammonia										
Dihydroxyethyl Ether	A	A	A	A	B	A	B	A	A	A	-
Diisobutyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Diisobutylene	D	D	D	A	B	D	D	A	A	A	-
Diisodecyl Adipate	D	D	A	D	D	C	A	C	A	A	-
Diisodecyl Phthalate	D	D	A	D	D	C	A	C	A	A	-
Diisooctyl Adipate	D	D	A	D	D	C	A	C	A	A	-
Diisooctyl Phthalate	B	C	A	B	B	C	A	C	A	A	-
Diisopropanol Amine	D	D	D	C	D	D	D	A	A	A	-
Diisopropyl Benzene	D	D	D	B	C	D	D	B	A	A	-
Diisopropyl Ether	D	D	A	D	D	D	A	D	A	A	-
Diisopropyl Ketone	D	D	D	D	D	D	D	C	A	A	-
Dilauryl Ether	D	D	D	D	D	D	D	A	A	A	-
Dimethyl Benzene	B	C	A	D	C	C	A	D	A	A	-
Dimethyl Ketone (Acetone)	D	D	A	D	D	D	B	C	A	A	-

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Dimethyl Phthalate	D	D	A	D	D	D	B	C	A	A	-
Dimethyl Sulfate	D	D	D	D	D	D	D	D	A	A	-
Dimethyl Sulfide	D	D	D	D	D	D	D	C	B	A	-
Dimethylamine	See Ammonia										
Dimethylaniline	D	D	D	D	D	D	D	D	B	A	-
Dimethylformamide (DMF)	C	C	C	D	C	C	C	D	A	A	-
Dinitrobenzene	D	D	C	D	C	D	C	A	A	A	-
Dinitrotoluene	D	D	D	D	D	D	D	C	A	A	-
Dioctyl Adipate (DOA)	D	D	B	D	D	D	B	C	A	A	-
Dioctyl Phthalate (DOP)	D	D	B	D	D	D	B	A	A	A	D
Dioctyl Sebacate (DOS)	D	D	B	D	D	D	B	B	A	A	-
Dioctylamine	See Ammonia										
Dioxane	D	D	B	D	D	D	B	D	A	A	-
Dioxolane	D	D	C	D	D	D	B	C	A	A	-
Dipentene (Limonene)	D	D	D	C	D	D	D	A	A	A	-
Diphenyl (Biphenyl)	D	D	D	D	D	D	D	A	A	A	-
Diphenyl Oxide (Phenylether)	D	D	D	D	D	C	D	A	A	A	-
Dipropyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Dipropylamine	See Ammonia										
Dipropylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Disodium Phosphate	A	A	A	A	A	A	A	A	A	A	-
Divinyl Benzene	D	D	D	D	D	D	D	D	A	A	-
Dodecyl Benzene	D	D	D	D	D	D	D	A	A	A	-
Dodecyl Toluene	D	D	D	D	D	D	D	A	A	A	-
Dow-Per (Perchloroethylene)	D	D	D	C	D	D	D	A	A	A	-
Dowfume W 40, 100%	D	D	D	D	C	C	C	C	B	A	-
Dowtherm Oil, A & E	D	D	D	D	D	C	D	A	A	A	-
Dowtherm S.R.-1	A	A	A	A	A	A	A	A	A	A	-
Dry Cleaning Fluids	D	D	D	C	D	D	D	A	B	A	-
Epichlorohydrin	D	D	B	D	D	C	B	D	B	A	-
Ethanol (Ethyl Alcohol)	A	A	A	A	A	A	A	A	A	A	-
Ethanolamine	See Ammonia										
Ethers	D	D	C	D	D	C	D	C	A	A	D
Ethyl Acetate	D	D	B	D	D	D	B	D	A	A	B
Ethyl Acetoacetate	D	D	B	D	D	D	B	D	A	A	-
Ethyl Acrylate	D	D	C	D	D	D	D	D	B	A	-
Ethyl Benzene	D	D	D	C	D	D	D	A	B	A	-
Ethyl Benzoate	D	D	B	B	C	C	B	C	A	A	-
Ethyl Butyl Alcohol	A	A	A	A	A	A	A	A	A	A	-
Ethyl Butyl Amine	See Ammonia										
Ethyl Butyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Ethyl Cellulose	B	B	B	B	B	B	B	D	A	A	C
Ethyl Chloride	C	C	D	C	C	D	D	A	A	A	C
Ethyl Dichloride	D	D	D	D	D	D	D	B	B	A	-
Ethyl Ether	D	D	D	C	D	D	D	D	A	A	-
Ethyl Formate	D	D	B	D	D	D	C	D	A	A	-
Ethyl Hexanol	A	A	A	A	A	A	A	B	A	A	-
Ethyl Methyl Ketone	C	D	B	D	D	D	B	D	A	A	-
Ethyl Oxalate	A	A	A	D	D	D	B	C	A	A	-
Ethyl Phthalate	D	D	A	D	D	D	B	C	A	A	-
Ethyl Propyl Ether	D	D	D	C	D	D	D	C	A	A	-
Ethyl Propyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Ethyl Silicate	C	C	A	A	A	A	A	A	A	A	-
Ethyl Sulfate	D	D	B	D	D	D	B	D	A	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Ethylene	D	D	D	A	B	C	D	A	A	A	-
Ethylene Bromide	D	D	D	C	D	D	D	A	B	A	-
Ethylene Chloride	D	D	D	C	D	D	D	A	B	A	-
Ethylene Diamine	See Ammonia										
Ethylene Dibromide	D	D	D	C	D	D	D	B	B	A	-
Ethylene Dichloride	D	D	D	C	D	D	D	B	B	A	-
Ethylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Ethylene Oxide	D	D	C	D	D	D	C	D	C	A	-
Ethylene Trichloride (Trichloroethylene)	D	D	D	C	D	D	D	A	B	A	-
EX TRI (Trichlorethylene)	D	D	D	C	D	D	D	A	B	A	-
Fatty Acids	D	D	D	B	B	B	C	A	A	A	-
Ferric Bromide	A	A	A	A	A	A	A	A	A	A	-
Ferric Chloride	A	A	A	A	A	A	A	A	A	A	A
Ferric Nitrate	A	A	A	A	A	A	A	A	A	A	-
Ferric Sulfate	A	A	A	A	A	A	A	A	A	A	B
Ferrous Acetate	D	D	A	D	D	D	B	D	A	A	-
Ferrous Ammonium Sulfate	A	A	A	A	A	A	A	A	A	A	-
Ferrous Chloride	A	A	A	A	A	A	A	A	A	A	-
Ferrous Hydroxide	B	C	A	B	A	B	A	C	A	A	-
Ferrous Sulfate	A	A	A	A	A	A	A	A	A	A	-
Fish Oil	D	D	A	A	A	A	A	A	A	A	-
Fluorine	D	D	D	D	D	D	D	D	D	A	-
Fluoroboric Acid	A	C	A	A	B	A	A	C	A	A	-
Fluosilicic Acid	B	B	A	B	B	A	B	A	A	A	-
Formaldehyde (Formalin)	C	C	A	B	B	B	B	A	A	A	B
Formamide	A	A	A	A	A	A	A	D	A	A	-
Formic Acid	B	B	A	C	C	C	C	D	B	A	C
Freon 11	D	D	D	A	B	A	D	A	A	A	-
Freon 12	D	D	D	B	C	D	C	B	B	A	-
Freon 13	A	A	A	A	A	A	A	A	A	A	-
Freon 13B1	A	A	A	A	A	A	A	A	A	A	-
Freon 21	D	D	D	D	B	D	D	D	A	A	-
Freon 22	D	D	A	D	A	D	A	D	A	A	-
Freon 31	B	B	A	D	A	B	A	D	A	A	-
Freon 32	A	A	A	A	A	A	A	D	A	A	-
Freon 112	D	D	D	B	B	B	D	A	A	A	-
Freon 113	C	B	D	A	A	A	D	B	A	A	-
Freon 114	A	A	A	A	A	A	A	B	A	A	-
Freon 114B2	D	C	D	B	A	A	D	B	A	A	-
Freon 115	A	A	A	A	A	A	A	B	A	A	-
Freon 142B	A	A	A	A	A	A	A	D	A	A	-
Freon 152A	A	A	A	A	A	C	A	D	A	A	-
Freon 218	A	A	A	A	A	A	A	A	A	A	-
Freon 502	A	A	A	B	A	A	A	B	A	A	-
Freon BF	D	D	D	B	B	B	D	A	A	A	-
Freon C316	A	A	A	A	A	A	A	A	A	A	-
Freon C318	A	A	A	A	A	A	A	A	A	A	-
Freon MF	D	B	D	A	C	B	D	A	A	A	-
Freon T-P35	A	A	A	A	A	A	A	A	A	A	-
Freon T-WD 602	C	B	A	A	B	B	B	A	A	A	-
Freon TA	A	A	A	A	A	A	A	C	A	A	-
Freon TC	D	B	A	A	A	A	B	A	A	A	-
Freon TF	C	B	A	A	A	A	A	A	A	A	-
Freon TMC	B	C	B	B	B	B	B	A	A	A	-

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Fuel Oil	D	D	D	A	B	C	D	A	A	A	D
Fuel, ASTM - A	D	D	D	A	A	C	D	A	A	A	-
Fuel, ASTM - B	D	D	D	A	B	C	D	A	A	A	-
Fuel, ASTM - C	D	D	D	B	C	D	D	A	B	A	-
Fumaric Acid	A	A	D	A	B	B	D	A	A	A	-
Furan	D	D	C	D	D	D	C	D	A	A	-
Furfural	D	D	B	D	C	B	B	D	A	A	D
Furfuryl Alcohol	D	D	C	D	C	C	C	D	A	A	-
Gallic Acid	A	A	B	B	B	B	B	B	A	A	-
Gasoline (Hi-Test)	D	D	D	A	B	D	D	A	A	A	D
Gasoline (Lead Free)	D	D	D	B	B	D	D	A	A	A	D
Gasoline (Regular)	D	D	D	A	A	C	D	A	A	A	D
Gelatin	A	A	A	A	A	A	A	A	A	A	A
Gluconic Acid	D	D	C	C	C	B	C	A	A	A	-
Glucose	A	A	A	A	A	A	A	A	A	A	A
Glue	A	A	A	A	A	A	A	A	A	A	A
Glycerine (Glycerol)	A	A	A	A	A	A	A	A	A	A	A
Glycols	A	A	A	A	A	A	A	A	A	A	-
Grease	D	D	D	A	B	C	D	A	A	A	-
Green Sulfate Liquor	A	A	A	A	B	A	A	B	A	A	A
Halowax Oil	D	D	D	D	D	D	D	A	A	A	-
Heptachlor (in Petroleum Solvents)	D	D	D	B	B	D	D	A	A	A	-
Heptachlor (in Petroleum Solvents, Water Spray)	D	D	D	B	B	D	D	A	A	A	-
Heptanal (Heptaldehyde)	D	D	D	D	D	D	B	D	A	A	-
Heptane Carboxylic Acid	D	D	C	C	B	B	C	A	A	A	-
Heptane	D	D	D	A	A	B	D	A	A	A	-
Hexaldehyde (n-Hexaldehyde)	D	D	B	D	B	C	B	D	A	A	-
Hexane	D	D	D	A	A	C	D	A	A	A	-
Hexanol (Hexyl Alcohol)	A	A	A	A	A	A	A	A	A	A	-
Hexene	D	D	D	B	B	C	D	A	A	A	-
Hexyl Methyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Hexylamine	See Ammonia										
Hexylene	D	D	D	A	B	D	C	A	B	A	-
Hexylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Hi-Tri (Trichloroethylene)	D	D	D	C	D	D	D	A	B	A	-
Hydraulic Fluid (Petroleum)	D	D	D	A	B	B	D	A	A	A	C
Hydraulic Fluid (Phosphate Ester Base)	D	D	A	D	D	D	A	D	A	A	D
Hydraulic Fluid (Poly Alkylene Glycol Base)	B	B	A	A	A	A	A	A	A	A	D
Hydrobromic Acid	A	D	A	D	C	A	B	A	A	A	D
Hydrochloric Acid, 5%	A	B	A	C	C	A	B	A	A	A	D
Hydrochloric Acid, 15%	A	D	B	D	D	A	C	A	A	A	D
Hydrochloric Acid, 37%	B	D	C	D	D	B	C	C	A	A	D
Hydrocyanic Acid	B	C	A	B	C	A	B	B	A	A	B
Hydrofluoric Acid	B	D	B	D	C	A	B	B	A	A	D
Hydrofluosilicic Acid	A	D	A	D	C	A	B	B	A	A	-
Hydrogen Gas	B	B	A	A	A	A	B	A	A	A	C
Hydrogen Peroxide, 3%	A	B	A	B	C	A	B	A	A	A	A
Hydrogen Peroxide, 10%	D	D	C	D	C	C	C	A	A	A	A
Hydrogen Peroxide, 30%	D	D	D	D	D	D	C	A	A	A	A
Hydrogen Peroxide, 90%	D	D	D	D	D	D	C	B	B	A	A
Hydrogen Sulfide	D	D	A	D	A	B	A	A	A	A	D
Hydroquinone	B	B	B	D	D	C	B	D	A	A	-
Hypochlorous Acid	B	B	B	D	B	A	B	A	A	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Ink Oil (Linseed Oil Base)	D	D	B	B	B	B	B	A	A	-	-
Insulating Oil	D	D	D	A	B	D	D	A	A	-	-
Iodine	D	D	D	D	D	C	D	C	A	A	-
Iron Acetate	D	D	A	D	D	D	B	D	A	A	-
Iron Hydroxide	C	C	A	B	A	B	B	C	A	A	-
Iron Salts	A	A	A	A	A	A	A	A	A	A	-
Iron Sulfate	A	A	A	A	A	A	A	A	A	A	-
Iron Sulfide	A	A	A	A	A	A	A	A	A	A	-
Isoamyl Acetate	D	D	A	D	D	D	B	D	A	A	-
Isoamyl Alcohol	A	A	A	A	A	A	A	A	A	A	-
Isoamyl Bromide	D	D	D	D	D	D	D	B	B	A	-
Isoamyl Butyrate	D	D	C	D	D	D	C	D	B	A	-
Isoamyl Chloride	D	D	C	D	D	D	D	B	B	A	-
Isoamyl Ether	D	D	D	D	D	D	D	D	A	A	-
Isoamyl Phthalate	D	D	A	D	D	D	B	C	A	A	-
Isobutane	D	D	D	A	A	D	D	A	A	A	-
Isobutanol (Isobutyl Alcohol)	A	A	A	A	A	A	A	A	A	A	A
Isobutyl Acetate	D	D	A	D	D	D	B	D	A	A	-
Isobutyl Aldehyde	C	D	B	D	D	D	B	D	A	A	-
Isobutyl Amine	B	C	B	D	D	C	B	D	A	A	-
Isobutyl Bromide	D	D	D	D	D	D	D	B	B	-	-
Isobutyl Carbinol	A	A	A	A	B	A	A	B	A	A	-
Isobutyl Chloride	D	D	D	D	D	D	D	B	B	A	-
Isobutyl Ether	D	D	D	D	D	D	D	D	A	A	-
Isobutylene	D	D	D	C	C	D	D	A	A	A	-
Isoctane	D	D	D	A	A	B	D	A	A	A	D
Isocyanates	C	D	B	D	D	C	B	C	B	-	-
Isopentane	D	D	D	A	A	D	D	A	B	A	-
Isopropyl Acetate	D	D	A	D	D	C	B	D	A	A	-
Isopropyl Alcohol (Iso-propanol)	A	A	A	A	A	A	B	B	B	A	A
Isopropyl Amine	B	D	B	C	A	C	B	D	A	A	-
Isopropyl Benzene	D	D	D	D	D	D	D	A	A	A	-
Isopropyl Chloride	D	D	D	D	D	D	D	B	B	A	-
Isopropyl Ether	D	D	D	C	D	C	D	D	A	A	-
Isopropyl Toluene	D	D	D	D	D	D	D	A	A	A	-
Jet Fuels (JP1-JP6)	D	D	D	A	B	C	D	A	A	A	-
Ketones	B	B	B	D	D	D	B	D	A	A	-
Kerosene	D	D	D	A	B	C	D	A	A	A	D
Lacquer Solvents	D	D	D	D	D	D	D	D	A	A	D
Lacquers	D	D	D	D	D	D	D	D	A	A	D
Lactic Acid	B	B	B	A	A	A	B	A	A	A	A
Lard	D	D	D	A	B	D	C	A	A	A	-
Lauryl Alcohol	A	A	A	A	A	A	A	B	A	A	-
Lead Acetate	D	D	A	C	C	D	B	C	A	A	-
Lead Nitrate	A	A	A	A	A	A	A	A	A	A	-
Lead Sulfamate	B	B	A	B	A	B	A	A	A	A	-
Lead Sulfate	A	A	A	A	A	A	A	A	A	A	-
Ligroin	D	D	D	A	A	D	D	A	A	A	-
Lime Water	D	D	A	C	A	A	A	A	A	A	-
Lindol (Tricresyl Phosphate)	D	D	A	D	D	D	A	A	A	A	-
Linseed Oil	D	D	A	A	B	B	B	A	A	A	A
Liquid Petroleum Gas	D	D	D	A	B	D	D	A	A	A	-
Liquid Soap	A	A	A	A	A	A	A	A	A	A	-
Lubricating Oils	D	D	D	A	B	C	D	A	A	A	C

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Lye (Sodium Hydroxide)	A	B	A	B	A	A	A	D	A	A	-
Magnesium Acetate	D	D	A	D	D	D	B	D	A	A	-
Magnesium Carbonate	A	A	A	A	A	A	A	A	A	A	-
Magnesium Chloride	A	A	A	A	A	A	A	A	A	A	A
Magnesium Hydrate	A	B	A	B	A	B	A	B	A	A	-
Magnesium Hydroxide	A	A	A	A	A	A	B	A	A	A	B
Magnesium Nitrate	A	A	A	A	A	A	A	A	A	A	-
Magnesium Sulfate	A	A	A	A	A	A	A	A	A	A	A
Malathion 50 (in Aromatic Solvents)	D	D	D	C	C	D	D	A	A	A	-
Malathion 50 (in Aromatic Solvents Water Spray)	D	D	D	A	A	D	D	A	A	A	-
Maleic Acid	D	D	C	D	C	D	C	A	B	A	-
Maleic Anhydride	D	D	C	D	C	D	C	A	A	A	-
Malic Acid	A	B	D	B	C	B	D	A	A	A	-
Manganese Sulfate	A	A	A	A	A	A	A	A	A	A	-
Manganese Sulfide	C	A	A	A	B	A	B	A	A	A	-
Manganese Sulfite	C	A	A	A	B	A	B	A	A	A	-
Mercuric Chloride	B	B	B	C	C	B	C	A	A	A	A
Mercury	B	B	A	A	B	A	A	A	A	A	-
Methacrylic Acid	B	D	D	B	D	B	C	B	A	A	-
Methane	D	D	D	A	B	B	D	A	A	A	-
Methyl Acetate	C	D	B	D	D	D	B	D	A	A	-
Methyl Acrylate	C	D	B	D	C	D	B	D	A	A	-
Methyl Alcohol (Methanol)	A	A	A	A	A	A	A	C	A	A	A
Methyl Benzene (Toluene)	D	D	D	D	D	D	D	D	D	A	-
Methyl Bromide	D	D	B	B	D	D	B	A	A	A	-
Methyl Butyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Methyl Cellosolve	D	D	B	C	B	C	B	D	A	A	-
Methyl Chloride	D	D	B	C	B	C	B	D	A	A	D
Methyl Cyclohexane	D	D	D	C	D	D	C	B	C	A	-
Methyl Ethyl Ketone (MEK)	B	D	B	D	D	D	B	D	A	A	D
Methyl Formate	C	C	B	D	B	C	B	C	B	A	-
Methyl Hexanol	A	A	A	A	A	A	A	B	A	A	-
Methyl Hexyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Methyl Isobutyl Carbinol	B	C	A	B	B	B	A	B	A	A	-
Methyl Isobutyl Ketone (MIBK)	D	D	B	D	D	D	B	D	A	A	-
Methyl Isopropyl Ketone	D	D	B	D	D	D	B	D	A	A	-
Methyl Methacrylate	D	D	D	D	D	B	D	D	B	A	-
Methyl Propyl Ether	D	D	D	D	D	D	D	D	A	A	-
Methyl Propyl Ketone	D	D	B	D	D	D	B	D	A	A	C
Methyl Salicylate	D	D	B	D	D	D	B	C	B	A	-
Methylene Bromide	D	D	D	D	D	D	D	B	B	A	-
Methylene Chloride	D	D	D	D	D	D	D	B	A	A	-
Mineral Oil	D	D	D	A	B	B	D	A	A	A	A
Mineral Spirits	D	D	D	A	B	D	D	A	A	A	-
Monochloro difluoromethane (Freon 22)	D	D	A	D	A	D	A	D	A	A	-
Monochlorobenzene	D	D	D	D	D	D	D	A	A	A	-
Monoethanolamine	See Ammonia										
Monomethylether	B	B	A	A	A	C	A	C	A	A	-
Monovinyl Acetate	D	D	B	D	D	C	C	A	A	A	-
Motor Oil	D	D	D	A	A	D	D	A	A	A	-
Muriatic Acid	See Hcl 37%										
Naphtha	D	D	D	A	B	D	D	A	A	A	-
Napthalene	D	D	D	D	D	D	D	A	B	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Napthenic Acid	D	D	C	D	D	D	D	A	B	A	-
Natural Gas Contact Titan Tech	See Ammonia										
Neatsfoot Oil	D	D	B	A	B	B	B	A	A	A	-
Neu-Tri (Trichloroethylene)	D	D	D	C	D	D	D	A	B	A	-
Nickel Acetate	D	D	A	D	D	D	B	D	A	A	-
Nickel Chloride	A	A	A	A	A	A	A	A	A	A	A
Nickel Nitrate	A	A	A	A	A	A	A	A	A	A	-
Nickel Plating Solution	A	D	B	B	C	B	B	A	A	A	-
Nickel Sulfate	A	A	A	A	A	A	A	A	A	A	A
Niter Cake	A	A	A	A	A	A	A	A	A	A	-
Nitric Acid, 10%	D	D	B	D	C	B	B	A	A	A	C
Nitric Acid, 20%	D	D	B	D	D	B	C	A	A	A	C
Nitric Acid, 30%	D	D	B	D	D	C	C	A	B	A	C
Nitric Acid, 30-70%	D	D	C	D	D	D	D	C	C	A	D
Nitric Acid, Red Fuming	D	D	D	D	D	D	D	D	D	A	-
Nitrobenzene	D	D	D	D	D	D	D	B	A	A	C
Nitrogen Gas	A	A	A	A	A	A	A	A	A	A	-
Nitrogen Tetroxide	D	D	D	D	D	D	D	D	D	A	-
Nitromethane	B	B	B	D	C	C	B	D	A	A	-
Nitropropane	C	C	A	D	C	C	B	D	A	A	-
Nitrous Oxide	A	A	A	A	A	A	A	A	A	A	-
Octadecanoic Acid	D	D	B	A	B	D	C	C	A	A	-
Octane	D	D	D	A	B	D	D	A	B	A	-
Octanol (Octyl Alcohol)	B	B	B	B	A	B	B	A	A	A	-
Octyl Acetate	D	D	A	D	D	D	B	D	A	A	-
Octyl Amine	See Ammonia										
Octyl Carbinol	A	A	A	A	A	A	A	B	A	A	-
Octylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Oil, Astm #1	D	D	D	A	A	B	D	A	A	A	-
Oil, Astm #2	D	D	D	A	A	C	D	A	A	A	-
Oil, Astm #3	D	D	D	A	B	C	D	A	A	A	-
Oil, Petroleum	D	D	D	A	A	C	D	A	A	A	-
Oleic Acid	D	D	B	B	C	C	B	C	A	A	D
Oleum (Fuming Sulfuric Acid)	D	D	D	D	D	D	D	D	D	A	-
Olive Oil (Non F.D.A.)	D	D	B	A	B	B	B	A	A	A	-
Orthodichlorobenzene	D	D	D	D	D	D	D	A	B	A	-
Oxalic Acid	C	C	A	B	C	B	A	C	A	A	B
Oxygen, Cold	B	B	A	B	B	B	B	A	A	A	D
Oxygen, Hot	D	D	D	D	D	D	D	B	A	A	-
Ozone	D	C	B	D	B	A	A	A	A	A	-
P-Cymene	D	D	D	C	D	D	D	A	A	A	-
P-Dichlorobenzene	D	D	D	D	D	D	D	A	A	A	-
Paint Thinner (Duco)	D	D	D	D	D	D	D	C	A	A	-
Palm Oil	D	D	A	A	B	B	B	A	A	A	-
Palmitic Acid	D	D	B	A	B	B	B	A	B	A	D
Papermaker's Alum	A	A	A	A	A	A	A	A	A	A	-
Paradichlorobenzene	D	D	D	D	D	D	D	A	B	A	-
Paraffin	D	D	D	A	A	D	D	A	D	A	-
Paraformaldehyde	D	D	B	B	B	B	B	C	A	A	-
Peanut Oil	D	D	C	A	B	B	D	A	B	A	-
Pentane	D	D	A	A	B	D	A	A	B	A	-
Perchloric Acid	B	B	B	D	A	A	B	A	A	A	-
Perchloroethylene	D	D	D	C	D	D	D	A	B	A	C
Petrolatum	D	D	D	A	A	C	D	A	A	A	-

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Petroleum Ether (Naphtha)	D	D	D	A	A	D	D	A	A	A	-
Petroleum Oils	D	D	D	A	A	C	D	A	A	A	D
Petroleum, Crude	D	D	D	A	A	C	D	A	A	A	D
Phenol	C	C	B	D	C	C	C	A	A	A	-
Phenol Sulfonic Acid	D	D	C	D	C	D	C	A	B	A	-
Phenyl Chloride	D	D	D	D	D	D	D	A	A	A	-
Phenylhydrazine	C	D	B	D	D	C	C	A	A	A	-
Phorone	D	D	A	D	D	D	B	C	A	A	-
Phosphate Esters	D	D	A	D	D	D	A	C	A	A	-
Phosphoric Acid, 10%	A	A	A	A	A	A	A	A	A	A	C
Phosphoric Acid: 10-85%	C	C	A	C	B	A	A	A	A	A	C
Phosphorous Trichloride	D	D	A	D	D	D	A	A	A	A	-
Pickling Solution	C	C	C	C	C	C	C	B	A	A	-
Picric Acid, Molten	C	C	C	C	C	B	C	C	D	A	D
Picric Acid, Water Solution	A	C	A	B	B	A	B	C	A	A	-
Pine Oil	D	D	D	C	C	D	D	B	A	A	-
Pinene	D	D	D	A	D	D	D	A	A	A	-
Piperidine	D	D	D	D	D	D	D	D	B	A	-
Pitch	D	D	D	B	B	C	D	C	A	A	-
Plating Solution, Chrome	D	D	A	B	B	C	A	A	A	A	-
Plating Solutions, Others	A	A	A	B	B	C	A	B	A	A	-
Polyethylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Polypropylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Polyvinyl Acetate Emulsion (PVA)	C	C	A	C	B	B	A	C	A	A	-
Potassium Bicarbonate	A	A	A	A	A	A	A	A	A	A	-
Potassium Bisulfate	A	A	A	A	A	A	A	A	A	A	-
Potassium Bisulfite	A	A	A	A	A	A	A	A	A	A	-
Potassium Carbonate	A	A	A	A	A	A	A	A	A	A	-
Potassium Chloride	A	A	A	A	A	A	A	A	A	A	-
Potassium Chromate	D	D	A	D	C	C	B	A	B	A	-
Potassium Cyanide	A	A	A	A	A	A	A	A	A	A	A
Potassium Dichromate	D	D	A	D	B	C	B	A	A	A	-
Potassium Hydrate	A	B	A	B	B	B	A	C	A	A	-
Potassium Hydroxide	A	A	A	A	B	A	A	D	A	A	C
Potassium Nitrate	A	A	A	A	A	A	A	A	A	A	-
Potassium Permanganate	D	D	A	D	D	D	A	A	A	A	-
Potassium Silicate	A	A	A	A	A	A	A	A	A	A	-
Potassium Sulfate	A	A	A	A	A	A	A	A	A	A	A
Potassium Sulfide	A	A	A	A	A	A	A	A	A	A	-
Potassium Sulfite	A	A	A	A	A	A	A	A	A	A	-
Producer Gas	D	D	D	A	B	B	D	A	A	A	-
Propane Gas	Use Butane Propane Hose Only										
Propanediol	A	A	A	A	B	A	A	A	A	A	-
Propyl Acetate	D	D	B	D	D	D	B	D	A	A	-
Propyl Alcohol (Propanol)	A	A	A	A	A	A	A	A	A	A	-
Propyl Aldehyde	C	D	B	D	D	D	B	D	A	A	-
Propyl Chloride	D	D	C	D	C	D	C	B	B	A	-
Propylene Diamine	See Ammonia										
Propylene Dichloride	D	D	D	D	D	D	D	B	B	A	-
Propylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Pydraul Hydraulic Fluids	D	D	B	D	D	D	B	A	B	A	-
Pyranol	D	D	D	C	D	D	D	A	A	A	-
Pyridine	D	D	B	D	D	D	B	D	A	A	-
Pyroligneous Acid	C	C	B	C	B	B	B	A	A	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Pyrrole	C	B	B	D	D	D	C	C	A	A	-
Rape Seed Oi	D	D	A	B	B	B	B	A	B	A	-
Red Oil (Crude Oleic Acid)	D	D	B	B	B	B	B	A	A	A	-
Richfield A Weed Killer,100%	D	D	D	D	D	D	D	C	B	A	-
Richfield B Weed Killer, 33%	D	D	B	B	B	C	D	C	B	A	-
Rosin Oil	D	D	D	A	A	B	D	A	A	A	-
Rotenone and Water	A	A	A	A	A	A	A	A	A	A	-
Rum	F.D.A. Tube Required										
Sal Ammoniac (Ammonium Chloride)	A	A	A	A	A	A	A	A	A	A	-
Salicylic Acid	A	B	A	D	D	A	A	A	A	A	-
Salt Water (Sea Water)	A	A	A	A	A	A	A	A	A	A	-
Sewage	C	C	C	A	B	A	B	A	A	A	B
Silicate Esters	D	D	D	B	A	A	D	A	A	A	-
Silicate of Soda (Sodium Silicate)	A	A	A	A	A	A	A	A	A	A	-
Silicone Greases	A	A	A	A	A	A	A	A	A	A	-
Silicone Oils	A	A	A	A	A	A	A	A	A	A	-
Silver Nitrate	A	A	A	A	A	A	A	A	A	A	-
Skelly Solvent	D	D	D	A	B	C	D	A	A	A	-
Skydrol Hydraulic Fluids	D	D	A	D	D	D	A	D	A	A	-
Soap Solutions	A	A	A	A	A	A	A	A	A	A	A
Soda Ash (Sodium Carbonate)	A	A	A	A	A	A	A	A	A	A	A
Soda Niter (Sodium Nitrate)	A	A	A	A	A	A	A	A	A	A	-
Soda, Caustic (Sodium Hydroxide)	A	B	A	B	A	A	A	D	A	A	-
Soda, Lime	A	B	A	B	B	B	A	C	A	A	-
Sodium Acetate	D	A	D	D	D	B	D	A	A	A	-
Sodium Aluminate	A	A	A	A	A	A	A	A	A	A	-
Sodium Bicarbonate	A	A	A	A	A	A	A	A	A	A	A
Sodium Bisulfate	A	A	A	A	A	A	A	A	A	A	A
Sodium Bisulfite	A	A	A	A	A	A	A	A	A	A	-
Sodium Borate	A	A	A	A	A	A	A	A	A	A	-
Sodium Carbonate	A	A	A	A	A	A	A	A	A	A	-
Sodium Chloride	A	A	A	A	A	A	A	A	A	A	A
Sodium Chromate	D	D	A	D	C	C	B	C	B	A	-
Sodium Cyanide	A	A	A	A	A	A	A	A	A	A	A
Sodium Dichromate	D	D	A	D	C	C	B	C	A	A	-
Sodium Fluoride	A	A	A	A	A	A	A	A	A	A	-
Sodium Hydroxide	A	B	A	B	A	A	A	D	A	A	A
Sodium Hypochlorite	C	D	B	D	D	C	B	A	B	A	B
Sodium Metaphosphate	A	A	A	A	B	B	A	A	A	A	A
Sodium Nitrate	A	A	A	A	A	A	A	A	A	A	D
Sodium Nitrite	A	A	A	A	A	A	A	A	A	A	-
Sodium Perborate	C	D	A	D	D	D	B	A	A	A	B
Sodium Peroxide	B	B	A	B	B	B	A	A	B	A	C
Sodium Phosphate	A	A	A	A	A	A	A	A	A	A	D
Sodium Silicate	A	A	A	A	A	A	A	A	A	A	A
Sodium Sulfate	A	A	A	A	A	A	A	A	A	A	A
Sodium Sulfide	A	A	A	A	A	A	A	A	A	A	A
Sodium Sulfite	A	A	A	A	A	A	A	A	A	A	-
Sodium Thiosulfate	A	A	A	A	A	A	A	A	A	A	-
Soybean Oil	D	D	B	B	B	B	B	A	A	A	A
Stannic Chloride	A	A	B	A	A	A	A	A	A	A	B
Stannic Sulfide	A	A	A	A	A	A	A	A	A	A	-
Stannous Chloride	A	A	A	A	A	A	A	A	A	A	B
Stannous Sulfide	A	A	A	A	A	A	A	A	A	A	-

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Steam, over 300°F	Steam Hose Only										
Steam, under 300°F	Steam Hose Only										
Stearic Acid	D	D	B	A	B	B	C	A	A	B	A
Stoddard's Solvent	D	D	D	A	C	D	D	A	A	B	-
Styrene	D	D	D	D	D	D	D	B	A	B	-
Sugar Sols. (Sucrose, Non F.D.A.)	A	A	A	A	A	A	A	A	A	A	-
Sulfamic Acid	C	C	A	B	B	B	A	A	A	A	-
Sulfite Liquors	B	B	A	B	B	A	B	A	A	A	-
Sulfonic Acid	D	D	D	D	C	C	D	D	B	C	-
Sulfur (Molten)	D	D	B	C	C	C	C	A	D	D	B
Sulfur Chloride	D	D	D	D	D	B	D	A	B	C	C
Sulfur Dioxide	C	C	B	D	B	B	C	A	A	B	B
Sulfur Hexafluoride	A	A	A	A	A	A	A	A	A	A	-
Sulfur Trioxide	D	D	B	D	D	D	C	A	B	B	-
Sulfuric Acid, 25%	D	D	D	D	B	A	A	A	A	A	D
Sulfuric Acid, 25-50%	B	D	A	D	C	B	B	A	A	A	D
Sulfuric Acid, Fuming	D	D	D	D	D	D	D	D	D	D	D
Sulfurous Acid	B	C	B	C	B	A	B	A	A	A	D
Tall Oil	D	D	D	C	D	D	D	A	A	B	-
Tallow	D	D	D	A	A	D	D	A	A	B	-
Tannic Acid	A	B	A	C	B	B	A	A	A	A	B
Tar	D	D	D	B	B	D	D	A	D	A	B
Tartaric Acid	A	A	A	A	B	A	A	A	A	A	A
Terpineol	D	D	C	D	D	D	C	A	B	A	-
Tertiary Butyl Alcohol	A	A	A	A	A	A	A	A	A	A	-
Tetrachlorobenzene	D	D	D	D	D	D	D	B	B	A	-
Tetrachloroethane	D	D	D	D	D	D	D	A	B	A	-
Tetrachloroethylene	D	D	D	D	D	D	D	A	B	A	-
Tetrachloromethane	D	D	D	C	D	D	D	A	B	A	-
Tetrachloronapthalene	D	D	D	D	D	D	D	A	B	A	-
Tetraethyl Lead	D	D	D	B	C	D	D	A	A	A	-
Tetraethylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Tetrahydrofuran (THF)	D	D	D	D	D	D	D	D	A	A	-
Thionyl Chloride	D	D	D	D	D	D	D	B	A	A	-
Tin Chloride	A	A	A	A	A	A	A	A	A	A	-
Tin Tetrachloride	A	A	A	A	A	A	A	A	A	A	-
Titanium Tetrachloride	D	D	D	B	C	C	C	A	A	A	-
Toluene (Toluol)	D	D	D	D	D	D	D	A	A	A	D
Toluene Diisocyanate (TDI)	C	C	A	C	D	D	A	B	A	A	-
Toxaphene	D	D	D	B	B	D	D	A	A	A	-
Transformer Oils (Chlorinated Phenyl Base Askerels)	D	D	D	D	D	D	A	A	B	A	-
Transformer Oils (Petroleum Base)	D	D	D	A	B	B	D	A	A	A	-
Transmission Fluids-A	D	D	D	B	C	D	D	A	A	A	-
Transmission Fluids-B	D	D	D	C	D	D	D	A	A	A	-
Tributyl Amine	See Ammonia										
Tributyl Phosphate	D	D	B	D	D	D	B	B	A	A	-
Tricetin	A	B	A	B	B	B	A	D	A	A	-
Trichlorobenzene	D	D	D	D	D	D	D	B	B	A	-
Trichloroethane	D	D	D	D	D	D	D	A	A	A	-
Trichloroethylene	D	D	D	C	D	D	D	A	B	A	D
Trichloropropane	D	D	D	D	D	D	D	A	A	A	-
Tricresyl Phosphate (TCP)	D	D	A	D	D	D	B	B	A	A	-
Triethanolamine (TEA)	See Ammonia										

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Elastomeric Chemical Resistance

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Trichloroethylene	D	D	D	C	D	D	D	A	B	A	-
Trichloropropane	D	D	D	D	D	D	D	A	A	A	-
Tricresyl Phosphate (TCP)	D	D	A	D	D	D	B	B	A	A	-
Triethanolamine (TEA)	See Ammonia										
Triethylamine	See Ammonia										
Triethylene Glycol	A	A	A	A	A	A	A	A	A	A	-
Trinitrotoluene (TNT)	D	D	D	D	B	B	D	B	D	A	-
Triphenyl Phosphate	D	D	A	D	C	C	B	C	A	A	-
Trisodium Phosphate	A	A	A	A	A	A	A	A	A	A	-
Tung Oil	D	D	C	A	B	B	D	A	A	A	-
Turbine Oil	D	D	D	B	B	B	D	A	A	A	-
Turpentine	D	D	D	B	B	D	D	A	A	A	D
2,4D With 10% Fuel Oil	D	D	D	A	A	D	D	A	A	A	-
Ucon Hydrolube Oils	D	D	A	A	B	D	A	A	A	A	-
Undecanol	A	A	A	A	A	A	A	B	A	A	-
Unsymmetrical Dimethyl											
Hydrazine (UDMH)	D	D	A	D	D	A	A	D	A	A	-
Uran	B	C	B	B	B	A	B	C	A	A	-
Urea	See Ammonia										
V.M.& P. Naptha	D	D	D	A	A	D	D	A	A	A	-
Varnish	D	D	D	B	B	C	D	A	A	A	-
Vegetable Oils	D	D	A	A	B	B	A	A	A	A	-
Versilube	A	A	A	A	A	A	A	A	A	A	-

Material (All ratings are based on 70°F)	Natural Rubber	SBR	Butyl	Nitrile	Neoprene	Hypalon	EPDM	Viton	XLPE	PTFE/TFE/FEP	Silicone
Vinegar	A	C	A	C	A	A	B	B	A	A	A
Vinyl Acetate	D	D	A	D	D	C	C	D	B	A	D
Vinyl Benzene	D	D	D	D	D	D	D	A	B	A	-
Vinyl Chloride (Monomer)	C	D	D	D	D	D	D	A	A	A	-
Vinyl Ether	D	D	D	D	D	C	C	D	A	A	-
Vinyl Toluene	D	D	D	D	D	D	D	A	B	A	-
Vinyl Trichloride	D	D	D	D	D	D	D	A	A	A	-
Water Spray	D	D	D	B	B	D	D	A	A	A	-
Water, Fresh (Non F.D.A.)	A	A	A	A	A	A	A	A	A	A	A
Water, Salt	A	A	A	B	A	A	A	A	A	A	-
Whiskey, Wines											
White Liquor	D	A	B	A	A	A	C	A	A	A	-
White Oil	D	D	D	A	B	D	D	A	A	A	-
Wood Alcohol (Methanol)	A	A	A	A	A	A	A	D	A	A	-
Xylene (Xy101)	D	D	D	D	D	D	D	A	A	A	D
Xylidine	D	D	D	D	D	D	D	C	B	A	-
Zeolites	A	A	A	A	A	A	A	A	A	A	-
Zinc Acetate	C	D	A	C	C	C	B	D	A	A	-
Zinc Carbonate	A	A	A	A	A	A	A	A	A	A	-
Zinc Chloride	A	A	A	A	A	A	B	A	A	A	A
Zinc Chromate	A	C	A	A	A	C	A	A	B	A	-
Zinc Sulfate	A	A	A	A	A	A	A	A	A	A	A

Elastomeric Temperature and Shelf Life

Elastomers & Fluoroplastics	Min. Material Temperature	Continuous Material Temperature	Intermittent Operating Temperature / Accumulative Time (hrs)**	Shelf Life (yrs)	Resistant To	Generally Attacked By
Chloroprene (CR)	-40°C (-40°F)	107°C (225°F)	121°C (250°F) / 168	36	Moderate Acids & Chemicals, Ozone, Oils, Fats & many Solvents	Oxidizing Acids, Esters & Ketones, Aromatic Chlorinated & Nitro Hydrocarbons
Chlorosulfinated Polyethylene (CSM)	-40°C (-40°F)	121°C (250°F)	177°C (350°F) / 70	60	Strong Acids, Freons, Hydroxides, Ozone, Alcohols, Alkalines & Hydrochlorite Solutions	Ketones, Esters, Some Chlorinated Oxidizing Acids, Chlorinated Nitro & Aromatic Hydrocarbons
Ethylene Propylene Diene Monomer (EPDM)	-54°C (-65°F)	149°C (300°F)***	163°C (325°F) / 300 177°C (350°F) / 200 177°C (350°F) / 150 191°C (375°F) / 70	60	Vegetable & Animal Fats, Oils, Ozone, Ketones, Alcohols, Many Strong & Oxidizing Chemicals	Mineral Oils, Solvents & Aromatic Hydrocarbons
Chlorobutyl (CIIR)	-40°C (-40°F)	149°C (300°F)	177°C (350°F) / 150	32	Vegetable & Animal Oils, Fats, Greases, Air, Gas, Water & Many Oxidizing Chemicals	Oils, Solvents & Aromatic Hydrocarbons
Fluoroelastomer (FKM)	-34°C (-30°F)	204°C (400°F)	288°C (550°F) / 240 316°C (600°F) / 48 343°C (650°F) / 16 371°C (700°F) / 4* 399°C (750°F) / 2*	49	All Aromatic Aliphatic & Halogentated Hydrocarbons, Vegetable & Animal Oils, Many Acids	Ketones, Esters & Nitro Containing Compounds
Silicone (SL)	-51°C (-60°F)	249°C (480°F)	315°C (600°F) /168	60	Oxidizing Chemicals, Ozone, Concentrated Sodium Hydroxide	Many Solvents, Oils, Concentrated Acids, Sulfurs
Polytetra Fluoroethylene (PTFE)	-79°C (-110°F)	315°C (600°F)	371°C (700°F) / 75	Unlimited	Most Known Fluid Chemicals	Molten Alkali Metals, Fluorine & Related Compounds
Nitrile-Buna Rubber (NBR)	-40°C (-40°F)	107°C (225°F)	121°C (250°F) / 168	15	Most Hydrocarbons, Fats, Oils, Greases, Hydraulic Fluids, Chemicals & Solvents	Ozone, Ketones, Esters, Aldehydes, Nitro & Chlorinated Hydrocarbons, Polar Solvents MEK.
Hydrogenated Nitrile Butadiene Rubber (HNBR)	-54°C (-65°F)	149°C (300°F)	163°C (325°F) / 300	36	Mineral Oil Based Hydraulic Fluids, Animal & Vegetable Fats, Diesel Fuel, Ozone, Sour Gas, Dilute Acids	Aromatic Oils, Polar Solvents, Some Oxygenated Solvents & Aromatic Hydrocarbons

*Fluoroelastomers when reinforced with non-reactive materials have an intermittent temperature capacity of 4 hours at 371°C (700°F) and 2 hours at 399°C (750°F) | ** Excursions at high temperature will have a detrimental effect on useful life of the product | *** Using a Peroxide cure, continuous material temperature is 165°C (329°F)

Elastomeric Comparitive Properties

ANSI/ASTM D1418-77	NR/IR	AU/EU	CR	NBR	CIIR	CSM	EPDM	FKM	AFMU	SI
Elastomer	Gum/Natural	Urethane	Neoprene	Nitrile/Buna-N	Chlorobutyl	Hypalon®	EPDM/EPT	Viton®/Fluorel®	PTFE	Silicone
ASTM D-2000, SAE J-200	AA	BG	BC-BE	BF-BG-BK-CH	AA-BA	CE	BA-CA-DA	HK	-	FC-FE-GE
MIlitary: MIL STD 417	RN	SB	SC	SB	RS	SC	RS	-	-	TA
Chemical Name Definition	Polyisoprene	Polyester/ Polyether Urethane	Poly-Chloroprene	Butadiene Acrylic-Nitrile	Chloro-Isobutylene Isoprene	Chloro-Sulfonated Polyethylene	Ethylene Propylene Polymer	Fluoronated Hydrocarbon	Tetrafluoro-Ethylene Resin	Poly-Siloxane
Abrasion	A	A	A	B	B	A	A	B	B	D
Absorption, Water	A	B	B	B	A	A	A	A	-	A
Acid-Concentrated	B	D	B	B	B	A	A	A	A	C
Acid-Diluted	B	C	A	B	A	A	A	A	A	A
Adhesion To Fabrics	A	A	A	B	B	B	B	A	B	A
Adhesion To Metals	A	A	A	A	B	A	A	B	B	A
Chemicals	B	C	B	B	A	A	A	A	A	A
Cold	A	A	B	B	B	B	A	B	A	A
Dielectric Strength	A	A	B	D	A	A	A	B	-	B
Dynamic Properties	A	A	C	A	C	C	A	A	-	D
Electrical Insulation	A	C	B	D	B	B	A	B	-	A
Flame	D	C	B	D	D	B	D	A	A	B
Heat	B	B	A	B	A	A	A	A	A	A
Heat Aging	C	B	B	B	A	A	A	A	A	A
Hydrocarbons-Aliphatic	D	A	B	A	D	B	D	A	A	D
Hydrocarbons-Aromatic	D	B	C	B	D	C	D	A	A	D
Hydrocarbons-Oxygenated	B	D	D	D	B	D	A	D	A	C
Impermeability	D	D	D	D	D	D	D	D	-	D
Oil-Animal & Vegetable	D	A	B	A	A	B	B	A	A	A
Oil & Gasoline	D	A	B	A	D	B	D	A	A	C
Oxydation	B	A	A	B	A	A	A	A	A	A
Ozone	C	A	A	C	A	A	A	A	A	A
Radiation	A	A	A	A	B	A	A	A	B	A
Rebound-Cold	A	B	A	B	D	B	A	B	-	A
Rebound-Hot	A	B	A	B	A	B	A	B	-	A
Set-Compression	B	C	B	B	C	C	B	B	-	C
Solvents, Lacquer	D	D	D	C	B	D	D	D	A	D
Steam	C	D	C	B	B	C	A	B	-	C
Sunlight Aging	D	B	A	D	A	A	A	A	A	A
Swelling In Oil	D	A	B	A	D	A	D	A	-	C
Tear	A	A	B	C	B	C	B	C	-	D
Tensile Strength	A	A	B	A	B	C	A	A	-	D
Water	B	D	C	B	B	C	A	B	A	C
Weather	C	A	A	C	A	A	A	A	A	A
Generally Resistant To:	Water, air and average concentration acids, bases, alcohols, salts, ketones, best abrasion resistance	moderate chemicals, oils, fats, greases and many hydrocarbons	moderate acids and chemicals, ozone, oils, fats ans many solvents. Oily abrasive applications	Most hydrocarbons, fats, oils, greases, hydraulic fluids, chemicals and solvents	animal and vegetable oils, fats, greases, air, gas, water, many oxidizing chemicals and ozone	strong acids, and bases, freons, hydroxides, ozone, alcohols, etching, alkaline and hypochlorite solutions	Vegetable and animal fats, oils, ozone, many strong and oxidizing chemicals, keytones and alcohols	All aromatic aliphatic and halogenated hydrocarbons, many acids. animal and vegetable oils	Most known fluid chemicals	Moderate or oxidizing chemicals, ozone, concentrated sodium hydroxide
Generally Affected Or Attacked By:	Not for ozone, strong acids, bases, oils, solvents, most hydrocarbons	Not for concentrated acids, ketones, esters, chloronated and nitro hydrocarbons	Not for oxidizing acids, esters and ketones, aromatic, chloronated and nitro hydrocarbons	Not for ozone, ketones, esters, aldehydes, nito and chloronated hydrocarbons, polar solvents, MEK	Not for oils, solvents, aromatic hydrocarbons	Not for ketones, esters, certain chloronated oxidizing acids, chloronated, nitro andaromatic hydrocarbons	Not for mineral oils, solvents, aromatic hydrocarbons	Not for ketones, esters, and nitro containing compunds	Not for molten alkali metals, fluorine and related compounds	Not for many-solvents, oils, concentrated acids, sulfurs

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatifactory, **(-)** = No Data Available

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Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Acetaldehyde	D	D	D	D	D	D	D	D	B
Acetaldehyde (40%)	D	D	D	D	D	D	D	D	B
Acetate Solvents, crude	D	D	C	D	C	D	C	D	-
Acetate Solvents, pure	D	D	C	D	C	D	C	D	-
Acetate Solvents, pure	A	B	A	B	C	D	D	D	-
Acetic Acid (20-30%)	A	B	A	B	C	D	D	D	B
Acetic Acid (80%)	B	B	A	B	D	D	D	D	B
Acetic Acid Vapors	A	B	A	B	C	C	D	D	-
Acetic Acid Glacial	B	C	B	C	D	D	D	D	-
Acetic Anhydride	D	D	-	-	-	-	D	D	B
Acetone	B	C	A	A	C	D	C	D	A
Acetylene	A	A	-	-	-	-	A	A	A
Acrylonitrite	A	B	-	-	-	-	-	-	-
Adipic Acid	B	C	-	-	-	-	D	D	-
Allyl Alcohol (96%)	D	D	-	-	-	-	D	D	A
Allyl Chloride	C	C	-	-	-	-	D	D	B
Alum	A	A	A	A	A	A	A	A	A
Aluminum Acetate	B	C	-	-	-	-	-	-	A
Aluminum Alkyl	D	D	-	-	-	-	-	-	-
Aluminum Chloride	A	A	A	A	A	A	C	C	A
Aluminum Flouride	A	A	A	A	A	A	A	A	A
Aluminum Hydroxide	A	-	A	A	B	B	B	C	A
Aluminum Nitrate	A	B	-	-	-	-	A	A	A
Aluminum Oxychloride	A	A	-	-	-	-	-	-	-
Aluminum Phosphate Solution	D	D	-	-	-	-	-	-	-
Aluminum Salts	A	A	-	-	-	-	-	-	-
Aluminum Sulphate	A	A	A	A	A	A	A	A	A
Aminoethanol	B	-	-	-	-	-	-	-	-
Ammonia - aqueous	A	-	A	-	C	-	C	D	-
Ammonia - dry gas	C	D	B	-	C	-	C	D	-
Ammonia - liquid	D	D	C	-	C	-	C	D	-
Ammoniated Latex	A	C	-	-	-	-	-	-	-
Ammonium Acetate	A	A	-	-	-	-	-	-	-
Ammonium Bicarbonate	A	A	-	-	-	-	-	-	-
Ammonium Carbonate	A	A	-	-	-	-	A	A	-
Ammonium Chloride Solution	A	A	-	-	-	-	B	C	A
Ammonium Flouride (25%)	D	D	-	-	-	-	C	D	-
Ammonium Hydroxide (30% NH)	A	A	-	-	-	-	B	B	A
Ammonium Metaphosphate	A	A	-	-	-	-	B	B	-
Ammonium Persulfate	A	A	-	-	-	-	B	B	-
Ammonium Nitrate	A	A	-	-	-	-	-	-	A
Ammonium Phosphate Solutions	A	A	-	-	-	-	A	A	A
Ammonium Sulfate	A	A	A	A	A	A	A	A	A
Ammonium Sulfide	A	A	A	A	B	B	B	B	-
Ammonium Thiocyanate	D	D	-	-	-	-	-	-	-
Amyl Acetate	A	B	A	B	D	D	D	D	A
Amyl Alcohol	D	D	D	D	D	D	-	-	A
Amyl Chloride	B	C	A	B	-	-	D	D	A
Aniline	D	D	-	-	-	-	D	D	A
Aniline Chlorohydrate	D	D	-	-	-	-	D	D	-
Aniline Hydrochloride	A	-	-	-	-	-	-	-	-
Animal Gelatin	A	A	A	A	-	-	-	-	-
Animal Oils	D	D	-	-	-	-	-	-	-
Ant Oil	A	A	-	-	-	-	-	-	-
Anthraquinone	A	A	-	-	-	-	-	-	-

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Anthraquinonesufonic Acid	A	A	-	-	-	-	D	D	-
Antifreeze	A	A	-	-	-	-	-	-	-
Antimony Chloride	A	-	-	-	-	-	-	-	-
Antimony Salts	A	-	-	-	-	-	-	-	-
Antimony Trichloride	A	A	-	-	-	-	A	A	-
Apple Sauce/Juice	A	A	-	-	-	-	-	-	-
Aqua Ammonia	D	D	-	-	-	-	-	-	-
Aqua Regia	C	D	B	C	-	-	D	D	D
Argon, Compressed	D	D	-	-	-	-	-	-	A
Aromatic Hydrocarbons	C	C	A	A	-	-	-	-	-
Arsenic Acid 80%	A	B	A	A	D	D	D	D	-
Arsenic Trichloride	A	A	-	-	-	-	A	A	-
Arsenic Trioxide	A	-	-	-	-	-	-	-	-
Arylsulfonic Acid	C	D	-	-	-	-	D	D	-
Askarel (Transformer Oil)	D	D	-	-	-	-	-	-	-
Asphalt	D	D	-	-	-	-	-	-	D
ASTM Fuel Oil # 1	A	A	A	A	B	B	A	A	A
ASTM Oil # 2	D	D	-	-	-	-	-	-	A
ASTM Fuel Oil # 3	B	C	A	A	B	B	A	A	A
ASTM Fuel A	B	B	A	A	B	B	A	A	B
ASTM Fuel B	D	D	A	A	B	C	B	C	B
ASTM Fuel C	D	D	-	-	-	-	B	C	B
Baby Food	A	A	-	-	-	-	-	-	-
Baltic (Types 100, 150, 200, 300, 500)	B	-	-	-	-	-	-	-	-
Barium Carbonate	A	A	A	A	A	A	A	A	-
Barium Chloride	A	A	A	A	A	A	A	A	A
Barium Hydroxide	A	A	-	-	-	-	B	C	A
Barium Sulfate	A	A	A	A	A	A	A	A	-
Barium Sulfide	A	A	A	A	A	A	A	A	A
Barley	A	D	-	-	-	-	-	-	-
Basic Copper Arsenate	A	-	-	-	-	-	-	-	-
Beer	A	A	-	-	-	-	-	-	A
Beet Sugar - liquor	A	A	-	-	-	-	-	-	B
Bellows 80-20 Hydraulic Oil	B	-	-	-	-	-	-	-	-
Benzaldehyde	D	D	-	-	-	-	-	-	-
Benzene	D	D	-	-	-	-	-	-	B
Benzidine	D	D	-	-	-	-	-	-	-
Benzoic Acid	B	C	A	B	D	D	D	D	-
Benzoic Aldehyde	D	D	-	-	-	-	-	-	-
Benzol	D	D	B	C	C	D	C	D	B
Benzotrichloride	D	D	-	-	-	-	-	-	B
Benzyl Alcohol	A	-	-	-	-	-	-	-	A
Benzyl Chloride	D	D	-	-	-	-	-	-	A
Berries	A	A	-	-	-	-	-	-	-
Bismuth Carbonate	A	A	-	-	-	-	A	A	-
Black Liquor	A	A	A	A	-	-	-	-	-
Blast Furnace Gas	D	D	-	-	-	-	-	-	-
Bleach (12.5% Active CL)	B	C	A	B	C	D	C	D	A
Borax	A	B	A	A	-	-	A	A	A
Bordeaux Mixture	A	A	A	A	-	-	-	-	-
Boric Acid	A	A	A	A	-	-	D	D	A
Boric Oxide	A	-	-	-	-	-	-	-	-
Boron Triflouride	A	A	-	-	-	-	A	A	-
Brake Fluid (Petroleum Base)	B	-	-	-	-	-	-	-	-
Brake Fluid (Synthetic Base)	B	-	-	-	-	-	-	-	-

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Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Brine	A	A	A	A	C	D	B	C	A
Bromic Acid	A	B	A	B	C	D	D	D	-
Bromine - Liquid	D	D	C	D	D	D	D	D	-
Bromine - Water	D	D	C	D	D	D	D	D	-
Bromobenzene	D	D	-	-	-	-	-	-	C
Bromochloromethane	D	D	-	-	-	-	-	-	-
Bromotoluene	D	D	-	-	-	-	-	-	-
Bunker Oil	D	D	-	-	-	-	-	-	-
Butadiene	C	D	-	-	-	-	-	-	-
Butane	A	A	A	A	A	A	A	A	A
Butanol - Primary	D	D	-	-	-	-	C	D	A
Butanol - Secondary	D	D	-	-	-	-	C	D	A
Butter	B	C	-	-	-	-	-	-	-
Butyl Acetate	A	-	-	-	-	-	-	-	A
Butyl Alcohol	A	B	A	B	A	B	C	D	A
Butyl Cellosolve	D	D	C	D	-	-	-	-	A
Butyl Mercaptan	D	D	-	-	-	-	-	-	-
Butyl Phenol	C	D	B	C	-	-	-	-	-
Butyl Stearate	A	-	-	-	-	-	-	-	A
Butylene	A	B	A	A	A	A	A	A	-
Butyric Acid 20%	C	D	B	C	C	D	C	D	A
Butynedial	D	D	-	-	-	-	D	D	-
Cake Alum Solution	A	-	-	-	-	-	-	-	-
Calcium Arsenate	A	-	-	-	-	-	-	-	-
Calcium Bisulfate	A	A	A	A	A	A	-	-	-
Calcium Bisulfide	B	-	-	-	-	-	-	-	-
Calcium Bisulfite	A	A	-	-	-	-	A	A	-
Calcium Carbonate	A	A	A	A	A	A	A	A	-
CalciumChlorate	A	A	A	A	B	C	B	C	-
Clacium Chloride	A	A	A	A	C	D	C	D	A
Calcium Hydrosulfide	B	-	-	-	-	-	-	-	-
Calcium Hydroxide	A	A	A	A	B	C	B	C	A
Clacium Hypochlorite	A	A	A	A	D	D	D	D	C
Calcium Metasilicate	A	-	-	-	-	-	-	-	-
Calcium Nitrate	A	A	A	A	A	A	A	A	A
Calcium Silicate	A	-	-	-	-	-	-	-	-
Calcium Sulfate	A	A	A	A	A	A	A	A	-
Calcium Sulfide	B	-	-	-	-	-	-	-	A
Cane Sugar Liquors	-	-	-	-	-	-	-	-	-
Carbolic Acid	D	D	-	-	-	-	-	-	A
Carbon Bisulfide	A	A	-	-	-	-	-	-	-
Carbon Dioxide	A	A	-	-	-	-	-	-	A
Carbon Disulfide	D	D	-	-	-	-	-	-	A
Carbon Monoxide	A	A	A	A	A	A	A	A	A
Carbon Tetrachloride	D	D	B	C	C	D	C	D	B
Carbolic Acid	D	D	-	-	-	-	-	-	-
Carbonic Acid	A	A	A	A	D	D	D	D	-
Carrots	A	A	A	A	D	D	-	-	-
Casein	A	B	-	-	-	-	A	A	-
Castor Oil	A	A	A	A	A	A	A	A	A
Catsup	A	B	-	-	-	-	-	-	-
Caustic Potash	A	A	A	A	C	D	C	D	-
Caustic Soda	A	A	A	A	C	D	C	D	-
Cellosolve	C	D	B	C	B	C	B	C	A
Cellulose Acetate	A	-	-	-	-	-	-	-	-

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Cellulose Buty	A	-	-	-	-	-	-	-	-
Cheese	A	B	-	-	-	-	-	-	-
Cherries	A	A	-	-	-	-	-	-	-
China-Wood Oil	B	-	-	-	-	-	-	-	-
Chlorodane	B	-	-	-	-	-	-	-	-
Chloroacetic Acid	A	D	-	-	-	-	D	D	A
Chloral Hydrate	A	A	-	-	-	-	B	C	-
Chloric Acid 20%	A	A	-	-	-	-	D	D	-
Chlorinated Hydrocarbons	A	A	-	-	-	-	D	D	-
Chlorinated Solvents	D	D	-	-	-	-	-	-	-
Chlorine Gas - dry	A	A	A	A	D	D	D	D	-
Chlorine Gas - moist	C	D	B	C	C	D	D	D	-
Chlorine Trifluoride	D	D	-	-	-	-	-	-	-
Chloroacetyl Chloride	A	-	-	-	-	-	-	-	-
Chlorobenzene	D	D	-	-	-	-	-	-	-
Chlorobromomethane	D	D	-	-	-	-	-	-	-
Chloroethane	D	D	-	-	-	-	-	-	-
Chloroform	D	D	-	-	-	-	-	-	A
Chloropentane	D	D	-	-	-	-	-	-	A
Chloropicrin Mixture	D	D	-	-	-	-	-	-	-
Chlorotoluene	D	D	-	-	-	-	-	-	B
Chlorox	A	-	-	-	-	-	-	-	B
Chlorsulfonic Acid	C	D	-	-	-	-	D	D	D
Chocolate	B	C	-	-	-	-	-	-	-
Chocolate Syrup	A	-	-	-	-	-	-	-	-
Chromic Chloride	A	-	-	-	-	-	-	-	-
Chrome Alum	A	A	A	A	A	A	A	A	-
Chromic Acid 25%	B	C	A	B	D	D	D	D	A
Chromic Acid 50%	B	C	A	B	D	D	D	D	A
Chromium Trioxide	D	D	-	-	-	-	-	-	-
Cider	B	-	-	-	-	-	-	-	-
Citgo FR Fuels	B	-	-	-	-	-	-	-	-
Coal Gas	A	-	-	-	-	-	-	-	-
Coal Tar	D	D	C	C	-	-	D	D	A
Coconut Oil	C	D	A	A	A	A	A	A	A
Cola Beverage	A	A	-	-	-	-	-	-	-
Copper Chloride	A	B	A	A	A	A	A	A	A
Copper Cyanide	A	A	-	-	-	-	-	-	A
Copper Flouride 2%	A	A	-	-	-	-	A	A	-
Copper Nitrate	A	B	A	A	A	A	A	A	-
Copper Sulphate	A	B	-	-	-	-	A	A	A
Core Oils	A	A	-	-	-	-	A	A	-
Corn Oils	A	B	-	-	-	-	-	-	A
Cottonseed Oil	B	C	-	-	-	-	A	A	A
Creosole	D	D	C	D	C	D	-	-	A
Creosote	D	D	C	D	-	-	-	-	A
Cresylic Acid 50%	D	D	-	-	-	-	D	D	A
Crude Oil Sour	A	A	A	A	A	A	A	A	A
Crude Oil Sweet	A	A	A	A	A	A	A	A	A
Crude Wax	A	-	-	-	-	-	-	-	-
Cupric Chloride	A	-	-	-	-	-	-	-	-
Cupric Cyanide	A	-	-	-	-	-	-	-	-
Cupric Nitrate	A	-	-	-	-	-	-	-	A
Cupric Sulfate	A	-	-	-	-	-	-	-	A
Cyanide, Copper	A	-	-	-	-	-	-	-	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Cyanide, Silver	A	-	-	-	-	-	-	-	-
Cyanide Sodium	A	-	-	-	-	-	-	-	-
Cyclohexane	D	D	-	-	-	-	-	-	A
Cyclohexanol	D	D	-	-	-	-	C	D	A
Cyclohexanone	D	D	-	-	-	-	D	D	-
Cymene	D	D	-	-	-	-	-	-	-
Decanol	D	D	-	-	-	-	-	-	-
Deicing Fluid	A	A	-	-	-	-	-	-	-
Demineralized Water	A	A	A	A	C	D	B	D	-
Denatured Alcohol	A	-	-	-	-	-	-	-	-
Detergents, synthetic	A	B	A	A	-	-	-	-	-
Developers, photographic	A	A	A	A	-	-	-	-	-
Dextrin	A	-	-	-	-	-	-	-	-
Dextron	B	-	-	-	-	-	-	-	-
Dextrose	A	B	A	A	A	A	A	A	-
Diacetone	D	D	-	-	-	-	-	-	-
Diacetone Alcohol	D	D	-	-	-	-	-	-	A
Diammonium Phosphate	A	-	-	-	-	-	-	-	-
Diazinon	B	-	-	-	-	-	-	-	-
Diazo Salts	A	A	-	-	-	-	-	-	-
Dibutyl Phthalate	A	-	-	-	-	-	-	-	A
Dibutylamine	D	D	-	-	-	-	-	-	A
Dichlorobenzene	D	D	-	-	-	-	-	-	A
Dichlorobenzyl Chloride	D	D	-	-	-	-	-	-	-
Dichloroethane	D	D	-	-	-	-	-	-	-
Dichloroethylene	D	D	-	-	-	-	-	-	-
Dichloromethane	D	D	-	-	-	-	-	-	-
Diesel Oils	C	D	A	B	-	-	-	-	A
Diethanolamine	B	-	-	-	-	-	-	-	A
Diethyl Ether	B	-	-	-	-	-	-	-	-
Diethyl Ketone	D	D	-	-	-	-	-	-	-
Diethyl Oxalate	D	D	-	-	-	-	-	-	-
Diethylene Dioxide	B	-	-	-	-	-	-	-	-
Diethylene Ether	D	D	-	-	-	-	-	-	-
Diethylene Glycol	A	-	-	-	-	-	-	-	A
Diglycolic Acid	A	B	-	-	-	-	-	-	-
Dihydroxyethyl Ether	A	-	-	-	-	-	-	-	-
Dimethylamine	D	D	-	-	-	-	D	D	A
Dimethylbenzene	D	D	-	-	-	-	-	-	-
Dimethylcarbonal	B	-	-	-	-	-	-	-	A
Dimethylketone	D	D	-	-	-	-	-	-	A
Dioctyl Phthalate	D	D	-	-	-	-	-	-	A
Dioctyl Phosphite	D	D	-	-	-	-	-	-	A
Dioxane	D	D	-	-	-	-	-	-	A
Disodium Phosphate	A	A	A	A	A	A	A	A	A
Distilled Water	A	A	A	A	C	D	B	D	-
DMB (Dimethylbenzene)	D	D	-	-	-	-	-	-	-
Duro Oils	B	-	-	-	-	-	-	-	-
EDB (Ethylene Dibromide)	D	D	-	-	-	-	-	-	-
Eggs	A	A	-	-	-	-	-	-	-
Emulsions, photographic	A	A	-	-	-	-	-	-	-
Enamels	B	-	-	-	-	-	-	-	-
Essential Oils	B	-	-	-	-	-	-	-	-
Ethanolamine	B	-	-	-	-	-	-	-	A
Ethers	D	D	-	-	-	-	B	C	-

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Ethyl Acetate	D	D	-	-	-	-	-	-	A
Ethyl Acrylate	D	D	-	-	-	-	-	-	A
Ethyl Alcohol	B	C	-	-	-	-	-	-	A
Ethyl Alcohol 50-98%	C	D	-	-	-	-	-	-	A
Ethyl Bromide	D	D	-	-	-	-	-	-	-
Ethyl Chloride	D	D	D	D	D	D	D	D	B
Ethyl Ether	D	D	-	-	-	-	B	C	A
Ethyl Ether Acetate	A	-	-	-	-	-	-	-	-
Ethyl Mercaptan	D	D	-	-	-	-	-	-	-
Ethyl Methyl Ketone	D	D	-	-	-	-	-	-	-
Ethylbutanol	A	-	-	-	-	-	-	-	-
Ethylbutyl Alcohol	A	-	-	-	-	-	-	-	-
Ethylene Bromide	A	D	A	C	D	D	D	D	-
Ethylene Chlorohydrin	D	D	-	-	-	-	-	-	-
Ethylene Dibromide	D	D	-	-	-	-	-	-	B
Ethylene Dichloride	D	D	-	-	-	-	D	D	B
Ethylene Glycol	A	A	A	A	B	C	B	C	A
Ethylene Oxide	D	D	-	-	-	-	D	D	-
Ethylhexanol	A	-	-	-	-	-	-	-	-
Ethylhexyl Acrylate	D	D	-	-	-	-	-	-	-
Ethylhexyl Alcohol	A	-	-	-	-	-	-	-	-
Fatty Acid	B	-	-	-	-	-	-	-	A
Fatty Alcohol, Blend	A	-	-	-	-	-	-	-	-
Ferric Chloride	A	A	A	A	B	C	B	C	A
Ferric Nitrate	A	A	A	A	A	A	A	A	A
Ferric Sulphate	A	A	A	A	A	A	A	A	A
Ferrous Chloride	A	A	-	-	-	-	A	A	A
Ferrous Nitrate	B	-	-	-	-	-	-	-	-
Ferrous Sulfate Solution	A	-	-	-	-	-	-	-	A
Fertilizer	B	-	-	-	-	-	-	-	-
Figs	A	A	-	-	-	-	-	-	-
Fish Solubles	A	A	-	-	-	-	-	-	-
Fixing Solutions, photographic	A	B	-	-	-	-	-	-	-
Flour	A	D	-	-	-	-	-	-	-
Flourobic Acid	A	A	A	A	A	A	-	-	C
Fluorine	D	D	-	-	-	-	D	D	D
Fluosilic Acid	D	D	-	-	-	-	-	-	C
Foric Acid	A	C	-	-	-	-	D	D	-
Formaldehyde Solution (to 50%)	A	-	-	-	-	-	-	-	A
Formalin	A	-	-	-	-	-	-	-	-
Formic Acid 3%	A	B	-	-	-	-	-	-	A
Formic Acid 10%	A	B	-	-	-	-	D	D	A
Formic Acid 25%	A	B	-	-	-	-	D	D	A
Formic Acid 50%	C	D	-	-	-	-	D	D	A
Freon-12	A	B	A	A	A	A	A	A	-
Fructose	A	A	A	A	A	A	A	A	-
Fruit Pulps and Juices	A	A	-	-	-	-	A	A	-
Fuel Oil	B	C	A	A	A	B	A	A	A
Fumaric Acid	D	D	-	-	-	-	-	-	-
Furan	D	D	-	-	-	-	-	-	-
Furfural	D	D	-	-	-	-	D	D	A
Furfuryl Alcohol	A	C	-	-	-	-	-	-	A
Fusel Oil	A	-	-	-	-	-	-	-	-
Gallic Acid Solution	D	D	-	-	-	-	-	-	A
Gasohol	D	D	-	-	-	-	-	-	-

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Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Gas - cook oven	B	B	A	B	B	B	B	B	
Gas - natural (dry)	A	A	A	A	A	A	A	A	
Gas - natural (wet)	A	A	A	A	A	A	A	A	
Gasoline	D	D	-	-	-	-	-	-	A
Gasoline - refined	C	D	A	A	B	C	-	-	
Gasoline, Unleaded	D	D	-	-	-	-	-	-	
Gasoline, White	D	D	-	-	-	-	-	-	
Gelatin	A	A	A	A	A	A	A	A	
Gin	A	B	-	-	-	-	-	-	
Ginger Ale	A	A	-	-	-	-	-	-	
Glacial Acetic Acid	D	D	-	-	-	-	-	-	
Glucose	A	A	A	A	A	A	A	A	A
Glue	A	-	-	-	-	-	-	-	
Glycerine	A	A	A	A	A	A	-	-	
Glycerol	A	A	-	-	-	-	-	-	
Glycol	A	A	A	A	B	B	A	A	A
Glycolic Acid 30%	A	A	-	-	-	-	D	D	
Grape Juice	A	A	-	-	-	-	-	-	
Grapefruit Juice	A	A	-	-	-	-	-	-	
Grease	A	-	-	-	-	-	-	-	A
Green Liquor (paper)	A	A	-	-	-	-	-	-	A
Heptachlor	D	D	-	-	-	-	-	-	
Heptane	C	D	A	B	A	-	A	-	A
Heptanol	A	-	-	-	-	-	-	-	A
Hexane	C	D	-	-	-	-	-	-	B
Honey	A	A	-	-	-	-	-	-	
HPO (Sodium Thiosulfate)	A	-	-	-	-	-	-	-	
Hydraulic Fluid	A	-	-	-	-	-	-	-	A
Hydraulic Fluid HF-18, HF-20	B	-	-	-	-	-	-	-	
Hydrazine	D	D	-	-	-	-	-	-	
Hydro-Drive Oil (houghton)	B	-	-	-	-	-	-	-	
Hydrobromic Acid	D	D	-	-	-	-	-	-	B
Hydrochloric Acid 10%	A	A	A	A	D	D	D	D	A
Hydrochloric Acid 48%	C	D	-	-	-	-	D	D	A
Hydrocyanic Acid	D	D	-	-	-	-	-	-	A
Hydroflouric Acid 4%	B	C	-	-	-	-	D	D	A
Hydroflouric Acid 10%	C	C	-	-	-	-	D	D	A
Hydroflouric Acid 48%	C	D	-	-	-	-	D	D	A
Hydroflouric Acid 60%	C	D	-	-	-	-	D	D	A
Hydrofluosilicic Acid	D	D	-	-	-	-	D	D	B
Hydrogen	A	B	A	A	A	A	A	A	A
Hydrogen Bromide (Dry) (liquid)	-	-	-	-	-	-	D	D	
Hydrogen Cyanide	A	A	-	-	-	-	D	D	
Hydrogen Peroxide	D	D	-	-	-	-	-	-	A
Hydrogen Peroxide 12%	A	B	A	A	B	C	-	-	A
Hydrogen Peroxide 50%	A	C	A	B	C	D	B	C	A
Hydrogen Peroxide 90%	D	D	C	D	D	D	D	D	A
Hydrogen Phosphide	A	C	-	-	-	-	-	-	
Hydrogen Sulfide - Aqueous Sol.	A	A	-	-	-	-	-	-	A
Hydrogen Sulfide - Dry	A	A	-	-	-	-	-	-	
Hydrolube (water glycol)	A	A	-	-	-	-	-	-	
Hydrolubric Oil	B	-	-	-	-	-	-	-	
Hydroquinone Solution	B	-	-	-	-	-	-	-	
Hydroxylamine Sulfate	A	A	-	-	-	-	-	-	
Hypochlorous Acid	A	A	-	-	-	-	C	D	

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Iodine	D	D	-	-	-	-	-	-	B
Iron Acetete Liquor	A	-	-	-	-	-	-	-	
Iron Salts	A	-	-	-	-	-	-	-	
Iron Sulfate Solution	A	-	-	-	-	-	-	-	
Isobutanol	B	-	-	-	-	-	-	-	
Isobutyl Alcohol	B	-	-	-	-	-	-	-	
Isooctane	D	D	-	-	-	-	-	-	A
Isopropanol	B	-	-	-	-	-	-	-	
Isopropyl Acetate	D	D	-	-	-	-	-	-	A
Isopropyl Alcohol	A	B	A	A	C	D	-	-	A
Isopropyl Ether	D	D	-	-	-	-	-	-	A
JP 3, 4, 5	D	D	B	C	C	C	B	C	
Jelly	A	A	-	-	-	-	-	-	
Jet Fuel - All Types	D	D	-	-	-	-	-	-	A
Karo Syrup	A	A	-	-	-	-	-	-	
Kerosene	D	D	A	A	A	A	A	B	A
Ketones	D	D	-	-	-	-	-	-	A
Kraft Liquor (paper)	A	A	-	-	-	-	-	-	
Lacquer Thinner	C	D	B	B	C	C	B	-	B
Lactic Acid 28%	A	A	-	-	-	-	D	D	
Lard	B	C	-	-	-	-	-	-	B
Lard Oil	A	B	-	-	-	-	A	B	
Latex Paint	A	-	-	-	-	-	-	-	
Lauric Acid	A	A	A	A	C	D	C	D	
Lauryl Chlorite	A	A	-	-	-	-	A	B	
Lauryly Sulfate	A	A	-	-	-	-	-	-	
Lead Acetate	A	A	A	A	A	A	A	A	A
Lead Nitrate Solution	A	-	-	-	-	-	-	-	
Lead, Tetraethyl	A	-	-	-	-	-	-	-	
Lemon Juice	A	B	-	-	-	-	-	-	
Ligroin	D	D	-	-	-	-	-	-	
Lime. Chloronated	B	-	-	-	-	-	-	-	
Lime, sulfur	A	A	-	-	-	-	-	-	A
Linoleic Acid	A	-	-	-	-	-	-	-	
Linseed Oil	A	A	A	A	A	A	A	A	A
Liquid Soap	B	-	-	-	-	-	-	-	
Liquors	A	B	-	-	-	-	-	-	
Lubricating Oils	D	D	A	A	A	A	A	A	
Machine Oil under 135°F	B	-	-	-	-	-	-	-	
Magnesium Carbonate	A	A	A	A	A	A	A	A	
Magnesium Hydroxide	A	A	A	A	C	D	B	C	A
Magnesium Nitrate	A	A	-	-	-	-	A	A	
Magnesium Sulfate Solution	A	-	-	-	-	-	-	-	A
Malathion	A	-	-	-	-	-	-	-	
Maleic Acid Solution	D	D	-	-	-	-	-	-	A
Manganese Salts	A	-	-	-	-	-	-	-	
Manganese Sulfate Solution	A	-	-	-	-	-	-	-	
Mayonnaise	A	A	-	-	-	-	-	-	
MBK (Methyl Butyl Ketone)	D	D	-	-	-	-	-	-	
MEA (Ethanolamine)	B	-	-	-	-	-	-	-	
MEK (Ethyl Methyl Ketone)	D	D	-	-	-	-	-	-	
Mercuric Chloride	B	B	A	A	B	C	B	C	
Mercuric Chloride Solution	B	-	-	-	-	-	-	-	
Mercuric Cyanide	B	B	-	-	-	-	-	-	
Mercuric Nitrate	B	B	-	-	-	-	B	B	

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Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Mercury	B	B	-	-	-	-	-	-	A
Mesitylene	D	D	-	-	-	-	-	-	-
Mesityl Oxide	D	D	-	-	-	-	-	-	A
Mesitylene	D	D	-	-	-	-	-	-	-
Methanol	D	D	D	D	D	D	D	D	-
Methyl Acetate	D	D	-	-	-	-	-	-	A
Methyl Acetone	A	-	-	-	-	-	-	-	A
Methyl Alcohol	C	D	B	C	C	D	D	D	A
Methyl Bromide	D	D	-	-	-	-	-	-	B
Methyl Butanathiol	D	D	-	-	-	-	-	-	-
Methyl Butanol	A	-	-	-	-	-	-	-	-
Methyl Chloride	D	D	-	-	-	-	D	D	-
Methyl Chloroform	D	D	-	-	-	-	-	-	-
Methyl Cyanide	A	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	D	D	B	C	C	D	-	-	A
Methy Isobutenyl Ketone	D	D	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	D	D	-	-	-	-	-	-	-
Methyl Isopropyl Ketone	D	D	-	-	-	-	-	-	-
Methyl Methacrylate	A	-	-	-	-	-	-	-	B
Methyl Methacrylate Monomer	D	D	-	-	-	-	-	-	-
Methyl Propyl Ketone	D	D	-	-	-	-	-	-	-
Methyl Slaicylate	A	-	-	-	-	-	-	-	-
Methyl Sulfate	A	-	-	-	-	-	-	-	-
Methylamine	D	D	-	-	-	-	-	-	-
Methylaniline	D	D	-	-	-	-	-	-	-
Methylene Bromide	D	D	-	-	-	-	-	-	-
Methylene Chloride	D	D	-	-	-	-	-	-	B
Methylene Dichloride	D	D	-	-	-	-	-	-	-
Milk	A	A	-	-	-	-	A	A	-
Mineral Oils	A	B	A	A	A	A	A	A	A
Molasses	A	A	A	A	A	A	A	A	-
Monochlorobenzene	D	D	-	-	-	-	-	-	B
Monomethylamine	D	D	-	-	-	-	-	-	-
Monosodium Phosphate	A	-	-	-	-	-	-	-	-
Motor Oil	C	-	-	-	-	-	-	-	-
Muriatic Acid	D	D	-	-	-	-	-	-	A
N-Octane	D	D	-	-	-	-	-	-	-
Naphthenic Acid	A	-	-	-	-	-	-	-	-
Naptha	D	D	A	A	-	-	-	-	A
Napthalene	C	D	A	A	-	-	-	-	A
Nickel Chloride Solution	A	A	-	-	-	-	A	A	A
Nickel Nitrate Solution	B	-	-	-	-	-	A	A	A
Nickel Plating Solution	D	D	-	-	-	-	-	-	-
Nickel Salts	B	-	-	-	-	-	-	-	-
Nickel Sulfate Solution	A	-	-	-	-	-	-	-	A
Nicotine	A	A	-	-	-	-	A	A	-
Nicotine Acids	A	B	A	A	C	D	C	D	-
Nicotine Salts	A	-	-	-	-	-	-	-	-
Niter Cake	A	-	-	-	-	-	-	-	-
Nitric Acid 10%	A	B	-	A	D	D	D	D	A
Nitric Acid 40%	B	C	A	A	D	D	D	D	A
Nitric Acid 60%	C	D	B	C	D	D	D	D	A
Nitric Acid 68%	C	D	B	C	D	D	D	D	A
Nitric Acid 70%	D	D	C	C	D	D	D	D	A
Nitrobenzene	D	D	-	-	-	-	D	D	A

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Nitrogen	A	-	-	-	-	-	-	-	A
Nitrogen Oxide	D	D	-	-	-	-	-	-	A
Nitromethane	D	D	-	-	-	-	-	-	-
Nitrous Acid (up to 10%)	A	-	-	-	-	-	-	-	-
Nitrous Oxide	A	A	-	-	-	-	A	A	-
Oats	A	D	-	-	-	-	-	-	-
Octadecanoic Acid	A	-	-	-	-	-	-	-	-
Octanol	B	-	-	-	-	-	-	-	A
Octyl Alcohol	B	-	-	-	-	-	-	-	A
Oil of Turpentine	A	-	-	-	-	-	-	-	-
Oils, Animal	B	-	-	-	-	-	-	-	-
Oils, Mineral	D	D	-	-	-	-	-	-	-
Oils, Petroleum	A	B	A	A	A	A	A	A	A
Oleic Acid	B	C	A	A	D	D	D	D	A
Oleum	D	D	D	D	D	D	D	D	D
Olive Oil	B	B	-	-	-	-	-	-	B
Ortho-Dichlorobenzene	D	D	-	-	-	-	-	-	-
Ortho-xylene	D	D	-	-	-	-	-	-	-
Oxalic Acid	D	D	-	-	-	-	-	-	A
Oxygen	A	A	-	-	-	-	A	A	-
Ozone	C	D	-	-	-	-	-	-	C
Paint	A	-	-	-	-	-	-	-	-
Para formaldehyde	A	B	-	-	-	-	-	-	-
Paraffin	A	B	-	-	-	-	-	-	A
Palmitic Acid 10%	A	B	-	-	-	-	D	D	A
Palmitic Acid 70%	C	D	-	-	-	-	D	D	A
Peaches	A	A	-	-	-	-	-	-	-
Peanut Butter	A	B	-	-	-	-	-	-	-
Peanut Oil	B	-	-	-	-	-	-	-	-
Peas	A	A	-	-	-	-	-	-	-
Pentachlorophenol in Oil	D	D	-	-	-	-	-	-	-
Pentane	C	D	-	-	-	-	-	-	B
Pentanone	D	D	-	-	-	-	-	-	-
Pentasol	B	-	-	-	-	-	-	-	-
Perchloric acid	D	D	-	-	-	-	-	-	-
Perchloroethylene	D	D	-	-	-	-	-	-	-
Petrol	D	D	-	-	-	-	-	-	-
Petroleum Ether	C	C	A	A	-	-	-	-	-
Petroleum Naptha	D	D	-	-	-	-	-	-	-
Petroleum Oils (Refined)	A	-	-	-	-	-	-	-	-
Petroleum Oils (Sour)	B	-	-	-	-	-	-	-	-
Phenol	D	D	-	-	-	-	-	-	A
Phenol Acid	D	D	-	-	-	-	-	-	-
Phenyl Chloride	D	D	-	-	-	-	-	-	-
Phenolhydrazine	D	D	-	-	-	-	-	-	-
Phenolhydrazine Hydrochloride	C	D	-	-	-	-	-	-	-
Phosgene (gas)	A	B	-	-	-	-	-	-	-
Phosgene (liquid)	D	D	-	-	-	-	-	-	-
Phosphorous (yellow)	B	C	-	-	-	-	-	-	-
Phosphorous Pentoxide	D	D	-	-	-	-	-	-	-
Phosphorous Trichloride	A	A	-	-	-	-	A	A	-
Phosphorous Trichloride	A	A	-	-	-	-	A	A	-
Photographic Chemicals	A	A	-	-	-	-	A	B	-
Photographic Fixing Solutions	A	-	-	-	-	-	-	-	-
Picric Acid	D	D	D	D	D	D	D	D	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		PTU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Pinene	D	D	-	-	-	-	-	-	A
Pitch	B	C	A	A	-	-	-	-	
Plating Solutions	A	B	-	-	-	-	A	A	
Polyethylene Glycol	B	-	-	-	-	-	-	-	
Potash	A	-	-	-	-	-	-	-	A
Potassium Acetate	A	-	-	-	-	-	-	-	
Potassium Acid Sulfate	A	A	-	-	-	-	A	A	
Potassium Antimonate	A	A	-	-	-	-	A	A	
Potassium Bicarbonate	A	A	A	A	A	A	A	A	
Potassium Bichromate	A	A	-	-	-	-	A	A	
Potassium Bisulfate	A	-	-	-	-	-	-	-	A
Potassium Bisulfite	A	A	-	-	-	-	A	A	A
Potassium Borate 1%	A	A	-	-	-	-	A	A	
Potassium Bisulfate	A	-	-	-	-	-	-	-	
Potassium Bromate 10%	A	A	A	A	A	A	A	A	
Potassium Bromide	A	A	A	A	A	A	A	A	
Potassium Carbonate	A	-	-	-	-	-	-	-	A
Potassium Chlorate	A	-	-	-	-	-	-	-	
Potassium Chloride	A	A	A	A	A	B	A	B	A
Potassium Chromate	A	-	-	-	-	-	B	B	B
Potassium Cuprocyanide	A	-	-	-	-	-	-	-	
Potassium Cyanide	A	A	A	A	A	A	A	A	A
Potassium Dichromate	A	A	-	-	-	-	B	B	B
Potassium Ferrocyanide	A	A	-	-	-	-	A	A	
Poassium Fluoride	A	A	A	A	A	B	-	-	
Potassium Hydrate	B	-	-	-	-	-	-	-	
Potassium Hydroxide	A	A	-	-	-	-	-	-	B
Potassium Hypochlorite	B	C	-	-	-	-	D	D	
Potassium Iodide	A	-	-	-	-	-	-	-	
Potassium Nitrate	A	A	A	A	A	A	A	A	A
Potassium Perborate	A	A	A	A	A	A	A	A	
Potassium Perchlorite	A	A	-	-	-	-	B	C	
Potassium Permanganate	D	D	-	-	-	-	-	-	A
Potassium Persulfate	A	-	-	-	-	-	-	-	
Potassium Sulfate	A	-	-	-	-	-	-	-	A
Potassium Sulfide	A	A	A	A	A	A	A	A	A
Potassium Sulfite	B	-	-	-	-	-	-	-	
Potassium Thiosulfate	A	-	-	-	-	-	-	-	
Potatoes	A	A	-	-	-	-	-	-	
Propane	A	A	A	A	A	A	A	A	
Propargyl Alcohol	A	A	-	-	-	-	-	-	
Propyl Alcohol	A	B	A	A	B	C	B	C	A
Propylene Dichloride	D	D	-	-	-	-	D	D	
Propylene Glycol	A	-	-	-	-	-	D	D	A
Prune Juice	A	A	-	-	-	-	-	-	
Puropale RX Oils	B	-	-	-	-	-	-	-	
Pyrene	D	D	-	-	-	-	-	-	
Pyrethrum	B	-	-	-	-	-	-	-	
Pyridine	D	D	-	-	-	-	-	-	
Pyrogard C, D	B	-	-	-	-	-	-	-	
Red Oil	B	-	-	-	-	-	-	-	
Regal Oils R&O	B	-	-	-	-	-	-	-	
Richfield A Weed Killer	A	B	-	-	-	-	-	-	
Rubilene Oils	B	-	-	-	-	-	-	-	
Salicylic Acid	A	-	-	-	-	-	-	-	

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Salt Water	A	A	A	A	B	C	B	D	A
Sauerkraut	B	-	-	-	-	-	-	-	
Selenic Acid	A	B	-	-	-	-	D	D	
Sewage	B	-	-	-	-	-	-	-	A
Shortening	B	C	-	-	-	-	-	-	
Silicic Acid	A	A	-	-	-	-	D	D	
Silicone Greases	B	-	-	-	-	-	-	-	
Silicone Oils	B	-	-	-	-	-	-	-	A
Silver Cyanide	A	A	-	-	-	-	A	A	
Silver Nitrate	A	A	A	A	A	A	-	-	A
Silver Plating Solution	A	B	A	A	A	A	A	A	
Skydrol 500A & 7000	D	D	-	-	-	-	-	-	
Soap	A	A	A	A	B	C	B	D	
Soda Ash	A	-	-	-	-	-	-	-	A
Soda Water	A	A	-	-	-	-	-	-	
Sodium Acetate	A	A	-	-	-	-	A	A	A
Sodium Aluminate Solution	B	-	-	-	-	-	-	-	A
Sodium Arsenite	A	A	-	-	-	-	A	A	
Sodium Benzoate	A	B	A	A	A	A	A	A	
Sodium Bicarbonate	A	A	A	A	A	A	A	A	A
Sodium Bichromate Solution	B	-	-	-	-	-	-	-	
Sodium Bisulfite	A	-	-	-	-	-	-	-	A
Sodium Borate	A	-	-	-	-	-	-	-	A
Sodium Bromide	A	A	A	A	A	B	A	B	
Sodium Carbonate (soda ash)	A	A	A	A	A	A	A	A	A
Sodium Chlorate	B	C	A	B	C	C	B	B	
Sodium Chloride	A	A	A	A	A	B	A	B	A
Sodium Chlorite Solution	B	-	-	-	-	-	-	-	
Sodium Chromate	B	-	-	-	-	-	-	-	
Sodium Cyanide	A	A	A	A	A	A	A	A	A
Sodium Dichromate	A	B	A	B	A	B	A	B	A
Sodium Ferricyanide	A	A	-	-	-	-	A	A	
Sodium Ferrocyanide	A	A	-	-	-	-	A	A	
Sodium Fluoride (70%)	A	A	-	-	-	-	A	B	
Sodium Hydrate	B	-	-	-	-	-	-	-	
Sodium Hydrochlorite	B	-	-	-	-	-	-	-	
Sodium Hydrosulfide	A	-	-	-	-	-	-	-	
Sodium Hydrosulfite	B	-	-	-	-	-	-	-	
Sodium Hydroxide 10%	A	A	A	A	C	D	C	D	A
Sodium Hydroxide 35%	A	B	A	A	D	D	D	D	A
Sodium Hydroxide 50%	A	C	A	B	-	-	-	-	A
Sodium Hypochlorite (20%)	A	A	-	-	-	-	D	D	A
Sodium Hyposulfate	A	-	-	-	-	-	-	-	
Sodium Metaphosphate	A	-	-	-	-	-	-	-	A
Sodium Nitrate	A	A	-	-	-	-	A	A	A
Sodium Nitrite	A	A	-	-	-	-	A	A	
Sodium Peroxide	A	-	-	-	-	-	-	-	A
Sodium Phosphate	A	-	-	-	-	-	-	-	A
Sodium Phosphate Acid	B	B	A	B	D	D	-	-	
Sodium Silicate	A	-	-	-	-	-	-	-	A
Sodium Sulfate	A	-	-	-	-	-	-	-	A
Sodium Sulfhydrate	B	-	-	-	-	-	-	-	
Sodium Sulfide	A	A	-	-	-	-	A	A	
Sodium Sulfite	A	A	-	-	-	-	A	A	A
Sodium Sulphrydate	B	-	-	-	-	-	-	-	

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Thermoplastic Chemical Resistance

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Sodium Thiosulfat	A	A	-	-	-	-	A	B	A
Solnus Oils	A	-	-	-	-	-	-	-	-
Sour Crude Oil	D	D	-	-	-	-	-	-	-
Soya Beans	A	D	-	-	-	-	-	-	-
Soya Oil	A	C	-	-	-	-	-	-	-
Soybean Oil	A	A	-	-	-	-	-	-	A
Spent Acid	D	D	-	-	-	-	-	-	-
Spinach	A	A	-	-	-	-	-	-	-
Squash	A	A	-	-	-	-	-	-	-
Stannic Chloride	B	-	-	-	-	-	-	-	A
Stannis Chloride	A	A	A	A	A	B	A	B	-
Starch	A	-	-	-	-	-	-	-	-
Starch Gum	A	-	-	-	-	-	-	-	-
Stearic Acid	A	-	-	-	-	-	-	-	A
Stoddard Solvent	B	-	-	-	-	-	-	-	-
Straight Synthetic Oils	B	-	-	-	-	-	-	-	-
Styrene	D	D	-	-	-	-	-	-	B
Sugar - all forms	A	A	-	-	-	-	-	-	-
Sulfamic Acid	D	D	-	-	-	-	-	-	-
Sulfate Liquors under 150°F	A	-	-	-	-	-	-	-	-
Sulfur	B	B	-	-	-	-	-	-	A
Sulfur Chloride	B	-	-	-	-	-	-	-	A
Sulfur Dioxide (dry)	A	-	-	-	-	-	-	-	B
Sulfur Dioxide (liquid)	D	D	-	-	-	-	-	-	B
Sulfur Hexafluoride (Gas)	B	-	-	-	-	-	-	-	-
Sulfur Trioxide	A	-	-	-	-	-	-	-	D
Sulfuric Acid 10%	A	B	A	A	C	D	C	D	A
Sulfuric Acid 70%	A	B	A	A	D	D	D	D	A
Sulfuric Acid 95%	C	C	A	B	D	D	D	D	A
Sulfurous Acid	B	C	A	B	D	D	D	D	A
Sulfur Dioxide Gas - dry	A	A	-	-	-	-	-	-	B
Sulfur Dioxide Gas - wet	D	D	-	-	-	-	-	-	B
Sulfur Dioxide - Liquid	C	D	-	-	-	-	-	-	B
Sun R&O Oils	B	-	-	-	-	-	-	-	-
Suntac HP Oils	B	-	-	-	-	-	-	-	-
Suntac WR Oils	B	-	-	-	-	-	-	-	-
Sunvis Oils 700, 800, 900	B	-	-	-	-	-	-	-	-
Synthetic Oil (Citgo)	B	-	-	-	-	-	-	-	-
Tall Oil	D	D	-	-	-	-	-	-	A
Tallow	B	-	-	-	-	-	-	-	A
Tannic Acid	A	A	A	A	C	D	C	D	A
Tanning Liquors	A	A	-	-	-	-	-	-	-
Tar Oil	B	-	-	-	-	-	-	-	-
Tartaric Acid	A	B	A	A	B	C	C	D	-
TEA (Triethanolamine)	B	C	-	-	-	-	-	-	-
Tellus Oils	B	-	-	-	-	-	-	-	-
Tenol Oils	B	-	-	-	-	-	-	-	-
Terpineol	B	-	-	-	-	-	-	-	-
Tetrachloroethane	D	D	-	-	-	-	-	-	-
Tetraethyl Lead	C	D	-	-	-	-	-	-	-
Tetrahydrofuran	D	D	-	-	-	-	-	-	-
Tetrahydroxydicyclopentadiene	D	D	-	-	-	-	-	-	-
THF (Tetrahydrofuran)	D	D	-	-	-	-	-	-	-
Thionyl Chloride	D	D	-	-	-	-	D	D	-
Tin Chloride	A	A	A	A	A	A	-	-	-

Material	Hose Construction								
	PVC		TPR		TPE		TPU		UHMW
	68°F	104°F	68°F	104°F	68°F	104°F	68°F	104°F	
Titanium Tetrachloride	A	D	-	-	-	-	C	D	B
Toluene	D	D	B	B	C	D	-	-	A
Toluol	D	D	-	-	-	-	-	-	-
Tomatoes	A	A	-	-	-	-	-	-	-
Tributyl Phosphate	D	D	-	-	-	-	-	-	A
Trichloroethylene	D	D	-	-	-	-	C	D	B
Trichloroethane	D	D	-	-	-	-	-	-	-
Tricresyl Phosphate	D	D	-	-	-	-	D	D	A
Triethanolamine	C	D	-	-	-	-	-	-	A
Triethylamine	B	C	-	-	-	-	-	-	A
Trihydroxybenzoic Acid	D	D	-	-	-	-	-	-	-
Trimethylbenzene	D	D	-	-	-	-	-	-	-
Trimethyl Propane	C	D	-	-	-	-	-	-	-
Trinitrophenol	A	-	-	-	-	-	-	-	-
Trisodium Phosphate	A	A	A	A	A	A	A	A	-
Tung Oil	B	-	-	-	-	-	-	-	A
Turpentine	C	D	A	A	B	C	A	B	-
Ucon Hydrolube 150CP, 200CP	B	-	-	-	-	-	-	-	-
Ucon Hydrolube 275CP,300CP, 550CP	B	-	-	-	-	-	-	-	-
Ucon M1	B	-	-	-	-	-	-	-	-
Union Hydraulic Tractor Fluid	B	-	-	-	-	-	-	-	-
Urea	A	B	A	A	A	A	A	A	A
Urine	A	A	A	A	A	A	A	A	-
Varnish	D	D	A	A	A	B	A	B	-
Vegetable Oils	B	C	-	-	-	-	-	-	A
Versilube F-50, F-44	B	-	-	-	-	-	-	-	-
Vinegar	A	B	-	-	-	-	B	C	D
Vinyl Acetate	D	D	-	-	-	-	D	D	A
Vinyl Chloride	D	D	-	-	-	-	-	-	A
Vinyl Trichloride	D	D	-	-	-	-	-	-	A
Vitrea Oils	B	-	-	-	-	-	-	-	-
Vodka	A	B	-	-	-	-	-	-	-
Water Acid - mine water	A	A	A	A	C	D	B	D	-
Water in Oil Emulsions	A	-	-	-	-	-	-	-	-
Water - distilled	A	A	A	A	C	D	B	D	A
Water - fresh	A	A	A	A	C	D	B	D	-
Water - salt	A	A	A	A	C	D	B	D	-
Whiskey	A	B	-	-	-	-	-	-	D
White Gasoline	A	A	A	A	A	B	A	B	-
White Liquor (paper)	A	A	-	-	-	-	-	-	-
Wines	A	B	-	-	-	-	-	-	D
Wood Oil	A	-	-	-	-	-	-	-	A
Xenon	-	-	-	-	-	-	-	-	-
Xylene	D	D	A	A	B	C	B	C	A
Xylol	D	D	A	A	B	C	B	C	A
Yeast	A	B	-	-	-	-	-	-	-
Yogurt	A	B	-	-	-	-	-	-	-
Zeric	B	-	-	-	-	-	-	-	-
Zinc Acetate	A	-	-	-	-	-	-	-	-
Zinc Chloride Solutions	A	-	-	-	-	-	-	-	A
Zinc Chromate	A	A	A	A	A	A	A	A	-
Zinc Cyanide	A	A	A	A	A	A	A	A	-
Zinc Hydrate	A	-	-	-	-	-	-	-	-
Zinc Nitrate	A	A	A	A	A	-	A	A	-
Zinc Sulfate	A	A	A	A	A	A	A	A	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **(-)** = No Data Available

Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Absorption Oil	-	A	-	-	-	-	-
Acetal	-	A	-	-	-	-	-
Acetaldehyde	A	A	A	A	A	-	A
Acetamide	A	D	-	B	-	-	-
Acetate Solvents (Crude)	A	D	B	A	A	Y	D
Acetate Solvents (Pure)	A	A	D	A	A	Y	D
Acetic Acid (80%)	C	D	D	A	A	D	D
Acetic Acid (50%)	B	D	D	B	A	D	D
Acetic Acid (20%	B	D	D	B	A	D	D
Acetic Acid (10%)	B	D	D	A	A	D	D
Acetic Anhydride	B	D	B	B	B	D	D
Acetic Ether	A	A	A	A	A	-	B
Acetic Oxide	B	D	D	B	B	-	D
Acetone	A	B	B	A	A	Y	D
Acetophenone	-	-	-	-	-	-	B
Acetylene	A	D	B	A	A	D	D
Acetyl Oxide	B	D	D	B	B	-	D
Acetylene Dichloride	-	-	-	-	-	-	D
Aeroshell 7A, 17 Grease	A	-	A	A	A	-	-
Air 212°F	A	A	A	A	A	-	-
Air, Ambient	A	A	A	A	A	-	A
Aircraft Hydraulic Oil AA	A	A	A	A	A	-	-
Alachlor (Lasso)	-	-	-	A	A	-	-
Alcohol - Amyl	B	B	B	B	B	A	D
Alcohol - Benzy	B	B	B	A	A	Y	D
Alcohol - Butyl	A	B	B	A	A	D	D
Alcohol - Diacetone	A	A	B	B	B	D	D
Alcohol - Ethyl	A	B	B	B	B	D	D
Alcohol - Hexyl	E	E	E	E	E	D	D
Alcohol - Isobutyl	E	E	E	E	E	D	D
Alcohol - Isopropyl	B	B	B	B	B	D	D
Alcohol - Methyl	B	B	B	B	B	D	D
Alcohol - Octyl	E	E	E	E	E	Y	D
Alcohol - Propy	B	B	B	A	A	D	D
Alkyaryl Sulfonate	-	-	A	A	-	-	-
Allomalaic Acid Solution	-	-	A	A	-	-	-
Allyl Chloride	-	-	A	A	-	-	-
Aluminum Acetate	-	D	-	A	A	-	-
Aluminum Bromide	-	D	D	B	B	-	-
Aluminum Chloride	D	D	D	D	D	Y	Y
Aluminum Fluoride	B	E	D	D	B	D	Y
Aluminum Nitrate	C	D	D	B	B	Y	Y
Aluminum Potassium Sulfate	B	B	D	D	B	D	Y
Aluminum Salts	B	-	-	B	B	-	A
Aluminum Sulfate	D	D	D	E	B	Y	Y
Amines (Mixed)	D	D	-	A	-	-	-
Aminoethanol	-	A	A	A	A	-	-
Ammonia Anhydrous	A	D	A	B	A	Y	D
Ammonia Gas	D	D	A	A	A	Y	D
Ammonia Nitrate	E	E	E	E	E	D	E
Ammonium Acetate	-	D	-	A	A	-	A
Ammonium Bifluoride	E	D	D	E	E	D	Y
Ammonium Carbonate	B	D	B	B	B	Y	Y

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Ammonium Casenate	E	E	E	E	E	Y	E
Ammonium Chloride	D	D	D	D	D	Y	Y
Ammonium Hydroxide	B	D	A	B	B	Y	Y
Ammonium Metaphosphate	D	-	A	A	A	-	A
Ammonium Nitrate	B	D	D	E	E	Y	Y
Ammonium Nitrite	-	-	-	A	A	-	A
Ammonium Persulfate	-	D	-	A	A	-	D
Ammonium Phosphate	D	D	D	A	B	Y	Y
Ammonium Sulfate	D	D	D	D	B	Y	Y
Ammonium Sulfide	D	D	A	A	A	-	A
Ammonium Thiocyanate	-	-	A	A	A	-	A
Amyl Acetate	D	A	D	A	A	-	D
Amyl Alcohol	A	A	A	A	-	-	
Amyl Chloride	-	-	-	A	A	-	D
Amy Chloronapthalene	-	-	-	A	A	-	-
Amyl Napthalene	-	-	-	A	A	-	-
Amyl Phenol	-	-	-	A	A	-	-
Anethole	B	D	B	A	A	-	A
Aniline	E	D	D	A	A	D	D
Aniline Hydrochloride	-	D	-	D	D	-	B
Aniline Oil	B	D	B	A	A	-	A
Animal Fat (Lard)	A	D	A	A	A	-	-
Animal Gelatin	-	-	-	A	A	-	-
Animal Oils	A	-	A	A	A	-	-
Ant Oil	A	A	B	A	A	-	B
Antifreeze	A	A	A	A	A	-	A
Aqua Ammonia	-	D	B	A	A	-	A
Aqua Regia	-	-	-	D	D	-	D
Aromatic Hydrocarbons	B	B	A	A	A	-	-
Arsenic Acid	B	-	B	-	A	-	B
Askarel (Transformer Oil)	-	A	A	A	A	-	B
Asphalt	E	E	B	E	B	D	D
Asphalt (Cut Back)	-	A	A	A	A	-	-
ASTM Oil No. 1	A	A	A	A	A	-	B
ASTM Oil No. 2	A	A	A	A	A	-	D
ASTM Oil No. 3	A	A	A	A	A	-	D
ASTM Reference Fuel A	A	A	A	A	A	-	D
ASTM Reference Fuel B	A	A	A	A	A	-	D
ASTM Reference Fuel C	A	A	A	A	A	-	D
Baltic Types (100, 150, 200, 300, 500)	-	-	-	-	-	-	B
Banvel	-	-	-	-	A	-	-
Bardol B	-	-	A	A	A	-	-
Barite	-	B	A	A	A	-	-
Barium Carbonate	D	B	B	B	B	Y	Y
Barium Chloride	E	B	E	D	E	Y	Y
Barium Hydroxide	D	B	B	B	B	Y	Y
Barium Sulfate	B	B	D	B	B	Y	Y
Barium Sulfide	D	D	B	B	B	Y	Y
Beer	A	B	B	A	A	Y	Y
Beet Sugar Liquors	D	-	D	D	D	-	D
Bellows 80-20 Hydraulic Oil	-	-	-	-	-	-	D
Benzaldehyde	B	B	D	B	B	D	D
Benzene, Benzol	A	B	B	B	B	Y	D

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **E** = Contact Thorburn, **Y** = Acceptable, (**-**) = No Data Available

Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Benzenesulfonic Acid	D	-	D	-	B	-	A
Benzine	A	B	B	B	B	Y	D
Benzoic Acid	B	B	D	B	B	D	D
Benzoic Aldehyde	-	-	A	-	A	-	A
Benzol	A	A	A	A	A	-	D
Benzyl Alcohol (Photo Inhibited)	-	-	A	A	A	-	A
Benzyl Benzoate	-	-	A	A	A	-	-
Bismuth Carbonate	-	-	A	A	A	-	A
Bitumastic	-	A	A	A	A	-	-
Black Liquor	-	-	A	A	A	-	A
Black Sulfate	-	-	A	A	A	-	A
Blast Furnace Gas	-	A	A	A	A	-	-
Bleach (12.5% Active Chlorine)	D	E	D	E	D	D	Y
Borax	D	B	B	A	A	D	Y
Bordeaux Mixture	-	-	-	A	A	-	-
Boric Acid	A	D	D	E	E	X	Y
Brake Fluid (Peteroleum Based)	-	A	A	A	A	-	D
Brake Fluid (Synthetic Based)	-	A	A	A	A	-	-
Brine Acid	A	D	D	E	E	D	Y
Bromic Acid	D	D	E	E	E	D	Y
Bromine	-	A	A	A	A	-	D
Bromine Liquid	B	E	E	D	D	D	D
Bromochloromethane	-	A	A	A	A	-	D
Bunker Oil	A	A	A	A	A	-	-
Butadiene, Butylene	B	B	B	B	B	D	D
Butanal	-	A	-	-	-	-	-
Butane	B	B	A	B	B	D	D
Butter Oil (Use FDA Hose)	A	A	A	A	A	-	-
Butyl Acetate	A	B	B	B	B	Y	D
Butyl Alcohol	A	A	A	A	A	-	A
Butyl Carbitol	A	A	A	A	A	-	-
Butyl Ether	A	A	A	A	A	-	-
Butyl Mercaptan	-	-	-	A	A	-	-
Butyl Stearate	A	A	A	A	A	-	-
Butylamine	A	A	A	A	A	-	D
Butyric Acid	B	B	D	B	B	Y	Y
Cake Alum	D	D	D	D	B	-	A
Calcine Liquor	B	-	A	A	A	-	-
Calcium Acetate	A	A	A	A	A	-	-
Calcium Bisulfate	D	E	D	D	B	D	Y
Calcium Bisulfide	E	E	E	E	B	Y	Y
Calcium Bisulfite	D	D	D	E	B	D	Y
Calcium Bromide	D	B	D	D	D	D	D
Calcium Carbonate	D	B	B	A	B	Y	Y
Calcium Chlorate	-	-	-	B	A	-	A
Calcium Chloride	E	B	B	E	E	Y	Y
Calcium Hydrogen Sulfite	-	-	-	A	A	-	A
Calcium Hydrosulfide	-	D	-	B	A	-	A
Calcium Hydroxide	D	B	B	B	B	Y	Y
Calcium Hypochlorite	D	D	D	D	B	D	Y
Calcium Metasilicate	A	A	A	A	A	-	A
Calcium Nitrate Solutions	A	A	A	A	A	-	A
Calcium Oxide	-	-	-	-	B	-	-

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Calcium Silicate	A	A	A	A	A	-	-
Calcium Sulfate	-	A	A	A	A	-	A
Calcium Sulfide	B	-	A	A	A	-	-
Caliche Liquors	B	-	A	A	A	-	-
Cane Sugar Liquors	A	B	A	A	A	-	A
Carbolic Acid	B	D	D	A	A	-	-
Carbolic Acid (Phenol)	B	D	D	A	A	-	-
Carbolic Acid (Phenol, 82-95% in Creosols)	B	D	D	A	A	-	-
Carbon Bisulfide	A	D	B	B	B	Y	D
Carbon Dioxide - Dry	A	A	B	B	B	Y	Y
Carbon Dioxide - Wet	A	D	C	B	B	D	Y
Carbon Disulfide	A	D	B	B	B	Y	D
Carbon Monoxide	A	A	B	A	A	Y	Y
Carbon Tetrachloride	D	E	B	A	E	Y	D
Carbonic Acid	A	B	B	B	B	D	Y
Castor Oil	B	B	B	B	B	D	Y
Caustic Potash	D	E	D	E	B	Y	Y
Caustic Soda (see Sodium Hydroxide)	D	B	B	E	E	D	Y
Cellosolves	B	B	B	B	B	D	Y
Cellosolve Acetate	-	-	A	A	A	-	A
Cellosolve Butyl	-	-	A	A	A	-	A
China Wood Oil	A	A	A	A	A	-	-
Chlorine - Liquid	E	E	B	E	C	D	D
Chlorine - Water	-	-	-	D	D	-	A
Chloroacetic Acid Solution	-	B	D	D	D	-	A
Chlorobenzene	A	A	A	A	A	-	D
Chlorobromomethane	-	A	A	A	A	-	D
Chloroform	E	E	D	E	E	D	D
Chloropentane	-	-	-	A	A	-	D
Chloropropylene Oxide	-	-	A	-	-	-	A
Chlorosulfonic Acid	E	D	B	D	D	D	D
Chlorothene	-	A	-	A	A	-	-
Chlorotoluene	A	A	A	A	A	-	-
Clorox (5.5% bleach)	D	E	D	E	B	D	E
Chromic Acid (50%)	B	D	D	C	E	D	D
Chromium Trioxide	D	D	D	D	B	-	A
Citric Acid	C	D	D	C	E	D	D
Coal Tar	A	A	A	A	A	-	-
Cobalt Nickel Plating Solution	-	-	-	-	B	-	-
Cocoa Butter	-	-	A	A	A	-	-
Cod Liver Oil	A	A	A	A	A	-	-
Coke Oven Gas	B	C	B	B	B	D	D
Copper Arsenate	-	-	A	A	A	-	-
Copper Chloride	D	D	D	D	D	Y	Y
Copper Cyanide	D	D	E	B	B	D	E
Copper Nitrate	-	D	D	A	A	-	A
Copper Sulfate	D	D	D	E	B	Y	Y
Corn Oil	A	A	A	A	A	-	D
Corn Syrup	A	-	A	A	A	-	-
Cottonseed Oil	A	A	A	A	A	-	A
Creosote	A	D	B	A	A	-	B
Cresol	A	-	B	A	A	-	B
Crotonic Acid	-	-	A	D	-	-	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **E** = Contact Thorburn, **Y** = Acceptable, **(-)** = No Data Available

Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Crude Oil	A	A	A	A	A	-	A
Crude Wax	-	A	A	A	A	-	A
Cryolite	-	A	A	A	A	-	D
Crysylic Acid	B	B	B	B	B	D	D
Cupric Arsenate	-	-	A	A	A	-	-
Cupric Nitrate	-	D	D	A	A	-	A
Cutting Oil (Mineral Oil Base)	-	A	A	A	A	-	D
Cutting Oil, Sulfur Base	-	A	A	A	A	-	A
Cutting Oil, Water Soluble	-	A	A	A	A	-	A
Cyanide, Copper	-	D	-	A	A	-	A
Cyanide, Mercuric	D	-	-	-	-	-	A
Cyanide, Silver	D	D	B	A	A	-	A
Cyanide, Sodium	D	D	B	A	A	-	-
Cyclohexane	B	B	B	B	B	Y	D
Cyclohexanol	-	-	-	-	-	-	A
Cyclohexanone	B	-	-	A	A	-	D
Cymene	A	A	A	A	A	-	-
Decalin	-	A	-	-	-	-	A
Deicing Fluid	A	A	B	A	A	-	A
Denatured Alcohol	A	A	A	A	A	-	-
Detergents	B	B	B	A	B	Y	Y
Developing Solutions	-	-	-	A	A	-	-
Dextrin	-	-	-	A	A	-	-
Dextrose	B	E	E	E	E	Y	Y
Dextrose							
Diacetone	-	A	A	A	A	-	A
Diacetone Alcohol	A	A	A	A	A	-	A
Diammonium Phosphate	D	-	D	B	A	-	A
Diazinon	-	-	-	-	-	-	B
Dibenzyl Ether	A	A	A	A	A	-	-
Dibutyl Phthalate	A	A	A	A	A	-	B
Dibutylsebacate	-	A	-	-	-	-	-
Dichlorobenzene (ortho)	-	A	-	A	A	-	-
Dichlorobenzene (para)	-	A	-	A	A	-	-
Dichloroethylene	-	-	-	-	-	-	D
Dichloromethane	-	A	A	A	A	-	-
Diesel Fuels	A	A	B	A	A	Y	D
Diethanolamine	A	D	A	A	A	-	-
Diethanolamine (20%)	A	D	A	A	A	-	-
Diethyl Ether	A	A	B	A	A	-	A
Diethyl Phthalate	-	A	-	A	A	-	-
Diethyl Sebacate	-	A	-	A	A	-	-
Diethylamine	B	E	D	B	B	D	Y
Diethylene Dioxide	A	A	A	A	A	-	A
Diethylene ether	A	A	A	A	A	-	A
Diethylene Glyco	A	A	A	A	A	-	A
Dihydroxyethyl Ether	A	A	A	A	A	-	A
Diisobutyl Ketone	-	A	A	A	A	-	A
Diisobutylene	-	A	-	A	A	-	-
Diisopropyl Ketone	-	A	-	A	A	-	-
Diisopropylidene Acetone	-	A	A	A	A	-	-
Dimethyl Aniline	-	A	-	-	-	-	-
Dimethyl Ether	A	A	A	A	A	-	-

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Dimethyl Formamide	-	-	A	A	A	-	A
Dimethyl Phthalate	-	A	-	-	-	-	-
Dimethylcarbinol	A	B	A	A	A	-	A
Dimethylformamide	-	-	A	A	A	-	A
Dimethylketone	A	A	A	A	A	-	B
Dioctyl Phthalate	A	A	A	A	A	-	D
Dioxane	A	A	A	A	A	-	A
Dioxolane	A	A	A	A	A	-	-
Dipentene	A	A	A	A	A	-	-
Dirco Oils	A	A	A	A	A	-	-
Disodium Phosphate	E	E	A	E	A	Y	Y
DMF (Dimethylfomamide)	-	-	A	A	A	-	A
Dowtherm A	A	A	A	A	A	-	-
Dowtherm SR-1	A	A	B	A	A	-	A
Duro Oils	A	A	A	A	A	-	-
Ehylene Chloride	E	E	B	E	E	Y	D
Ehylene Dichloride	E	B	B	B	B	Y	D
Ehylene Glycol	A	B	B	B	B	Y	D
Ehylene Oxide	A	D	B	B	B	D	D
Enamels	-	A	-	-	-	-	-
Epichlrohydrin	-	-	A	-	-	-	A
Essential Oils	A	A	A	A	A	-	-
Ethano	A	B	A	A	A	-	A
Ethanolamine	-	A	A	A	A	-	-
Ethers	B	B	B	A	A	Y	D
Ethers	A	A	A	A	A	-	B
Ethyl Acetate	E	E	B	B	B	Y	D
Ethyl Acetoacetate	A	A	A	A	A	-	D
Ethyl Alcohol	A	B	A	A	A	-	A
Ethyl Bromide	-	A	-	A	A	-	-
Ethyl Butyrate	A	-	-	A	A	-	-
Ethyl Chloride	E	E	B	E	A	Y	D
Ethyl Ether	A	A	B	A	A	-	A
Ethyl Mercaptan	-	-	B	-	-	-	-
Ethyl Pentachlorobenzene	-	A	B	A	A	-	-
Ethyl Phthalate	-	A	-	A	A	-	-
Ethyl Silicate	A	A	A	A	A	-	-
Ethylamine	-	A	-	A	A	-	-
Ethylbenzene	-	A	A	A	A	-	-
Ethylcellulose	-	A	A	A	A	-	-
Fatty Acids	A	C	D	E	A	Y	Y
Ferric Chloride	D	D	D	D	D	D	Y
Ferric Hydroxide	E	E	E	A	A	Y	E
Ferric Nitrate (10 - 50%)	D	D	D	B	B	D	Y
Ferric Sulfate	D	D	D	E	E	D	Y
Ferrous Chloride	D	D	E	D	D	D	Y
Ferrous Nitrate	-	-	-	A	A	-	A
Ferrous Sulfate	B	B	D	B	E	D	Y
Fertilizer	A	A	A	A	A	-	A
Fire-Resistant Hydra-Fluid	A	A	A	A	A	-	-
Fixing Solution (Photo)	-	-	-	A	A	-	A
Fluboric Acid	D	E	A	E	E	D	Y
Fluosilicic Acid	A	-	-	-	-	-	A

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **E** = Contact Thorburn, **Y** = Acceptable, **(-)** = No Data Available

Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
E Formaldehyde (50%)	E	B	D	A	A	D	Y
Formic Acid (Anhydrous)	A	D	D	E	E	D	Y
Freon 11	B	B	D	B	B	D	D
Freon 12	B	B	D	B	B	D	D
Freon 22	B	B	D	B	B	D	D
Fruit Juices	B	B	D	B	B	Y	Y
Fuel Oil	B	B	B	B	B	Y	D
Fumaric Acid	-	-	-	A	A	-	-
Furan	A	A	A	A	A	-	-
Furfural	B	B	B	B	B	Y	D
Furfuran	A	A	A	A	A	-	-
Fusel Oil	A	A	A	A	A	-	-
Fyrguard 150, 200	A	A	A	A	A	-	-
Fyrquel (15R&O, 220R&O, 550R&O)	A	-	A	-	-	-	-
Fyrquel (90, 150, 220, 300, 550, 1000)	A	-	A	-	-	-	-
Gallic Acid	-	-	D	A	A	-	A
Gasohol	A	A	B	A	A	-	D
Gasoline - Refined	B	B	B	B	B	Y	D
Gasoline - Sour	D	B	B	B	B	Y	D
Gasoline (Oxygenated- Blended with MTBE)	A	A	B	A	A	-	D
Gelatin	B	B	D	B	B	Y	Y
Glucose	A	A	A	A	A	-	-
Glue	B	B	B	E	B	E	Y
Glycerine	A	A	B	A	A	Y	Y
Glycerol	A	A	B	A	A	-	-
Glycols	B	B	B	B	B	Y	Y
Grease	A	A	A	A	A	-	-
Grease, Silicone Base	A	A	A	A	A	-	-
Green Liquor	E	E	B	E	E	E	Y
Green Sulfate Liquor	-	-	A	A	A	-	-
Heptane	B	B	B	B	B	Y	D
Hexaldehyde	E	E	E	E	E	-	-
Hexane	B	B	B	A	A	Y	D
Hexanol	A	B	A	A	A	-	-
Hexene	-	A	A	A	A	-	-
Hexyl Alcohol	A	B	A	A	A	-	-
Hexylene	-	A	A	A	A	-	-
Houghto-Safe (1055, 1110, 1115, 1120, 1130)	A	A	A	A	A	-	-
Houghto-Safe (271, 416, 520, & 616, 620)	A	A	A	A	A	-	-
Houghto-Safe (5048)	A	A	A	A	A	-	-
Houghto-Safe (625, 640 & 525 under 100°F)	A	A	A	A	A	-	-
HPO (Sodium Thiosulfate)	B	D	D	A	A	-	-
Hy-Chock Oil	-	-	A	A	A	-	-
Hydrafluid 760	A	A	A	A	A	-	-
Hydrafluid (AZR&O, A, B, AA, C)	A	-	A	A	A	-	-
Hydrasol A	A	-	A	A	A	-	-
Hydraulic Fluid (Phosphate Ester Base)	-	-	A	A	A	-	-
Hydraulic Fluid (Polyalphaolifin)	A	A	A	A	A	-	-
Hydraulic Fluid (Std. Petroleum Oils)	A	A	A	A	A	-	-
Hydraulic Fluid (Water Glycol Based)	A	A	A	A	A	-	-
Hydraulic Fluid (HF-18, HF-20)	A	A	A	A	A	-	-
Hydraulic Fluid (HF-31)	A	A	A	A	A	-	-
Hydrobromic Acid (20%)	D	D	D	D	D	D	Y

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Hydrobromic Acid (50%)	D	D	D	D	D	D	Y
Hydrochloric Acid (20%)	D	D	D	D	D	D	Y
Hydrochloric Acid (38%)	D	D	D	D	D	D	Y
Hydrocyanic Acid	B	D	B	B	B	D	Y
Hydrofluosilicic Acid (10 -50%)	D	B	D	D	B	D	E
Hydrogen Chloride (Dry Gas)	D	B	B	E	E	D	Y
Hydrogen Fluoride	-	-	A	A	A	-	-
Hydrogen Gas	A	A	E	A	A	D	Y
Hydrogen Peroxide (50%)	E	D	D	E	E	D	Y
Hydrogen Peroxide (35% or less)	A	D	D	B	A	-	-
Hydrogen Peroxide (50% or less)	A	D	D	B	A	-	-
Hydrogen Peroxide (70% or less)	A	D	D	B	A	-	-
Hydrogen Peroxide (90% or less)	A	D	D	B	A	-	-
Hydrogen Sulfide	E	E	E	D	B	D	Y
Hydroquinine	-	-	-	A	A	-	-
Hydroquinine Solution	-	-	-	A	A	-	-
Hypo Chlorous Acid	D	D	D	D	D	D	D
Ink (Printers)	-	B	B	B	A	-	-
Ink Oil	-	A	A	A	A	-	-
Insulating Oil	-	A	A	A	A	-	-
Iodine	A	D	D	D	D	D	Y
Iron Acetate Liquor	-	-	A	A	A	-	A
Iron Sulfate Solution	D	D	D	A	A	-	A
Isobutanol	A	B	A	A	A	-	-
Isobutyl Alcohol	A	B	A	A	A	-	-
Isocyanate	-	-	A	A	A	-	-
Isooctane	B	A	A	A	A	-	-
Isoproponal	A	B	A	A	A	-	A
Isopropyl Acetate	A	A	A	A	A	-	-
Isopropyl Alcohol	A	B	A	A	A	-	A
Isopropyl Ether	E	B	E	A	B	Y	D
Isopropyltoluene	A	A	A	A	A	-	-
Jet Fuel (JP4, JP5)	B	A	B	B	B	D	D
Karo Syrup	-	-	-	A	A	-	-
Kerosene	B	B	B	B	B	D	D
Ketchup	-	-	-	A	A	-	-
Ketones	B	B	B	B	B	Y	D
Lacquer (Alcohol or Acetate as Solvent)	A	A	D	D	A	-	-
Lacquer (Toluene or Xylene as Solvent)	A	A	D	D	A	-	-
Lactic Acid (25%)	C	B	D	E	E	Y	Y
Lactic Acid (80%)	B	B	D	E	E	Y	Y
Lactol	-	A	A	A	A	-	-
Lard Oil	B	E	C	B	B	Y	Y
Lasso	-	-	-	A	A	-	-
Latex Paint	A	A	A	A	A	-	-
Lead Acetate	D	D	D	B	B	D	Y
Lead Chloride	D	E	E	B	B	D	E
Lead Nitrate Solution	-	-	A	A	A	-	-
Lead Sulfate	D	E	D	B	B	D	E
Lecithin	-	-	-	A	A	-	-
Ligroin	-	-	B	A	A	-	-
Lime	-	-	-	-	B	-	-
Lime (Chlorinated - normal 35-37% Chlorine)	-	-	-	-	B	-	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **E** = Contact Thorburn, **Y** = Acceptable, **(-)** = No Data Available

Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Lime Sulfur Solution	D	D	B	A	A	-	-
Lime Sulphur	D	D	D	B	B	D	Y
Lime (Chlorinated)	-	-	D	B	A	-	-
Limonene	A	A	A	A	A	-	-
Lindane	-	-	-	A	A	-	-
Linseed Oil	B	B	B	B	B	Y	Y
Liquid Soap	A	A	A	A	A	-	-
Lonoleic Acid	B	D	D	B	B	D	Y
Lubricants (oil)	B	A	B	B	B	Y	D
Machine Oil (Under 135°F)	A	A	A	A	A	-	-
Magnesium Chloride	D	D	E	E	E	D	Y
Magnesium Hydroxide	B	B	B	A	A	D	Y
Magnesium Nitrate	B	B	B	B	B	D	Y
Magnesium Oxide	E	E	E	E	E	D	E
Magnesium Sulfate	B	E	E	B	B	D	Y
Magnesium Carbonate	B	E	E	B	B	D	Y
Malathion	-	A	A	A	A	-	-
Maleic Acid	E	B	D	E	B	D	Y
Maxmul	-	-	A	-	A	-	-
MBK (Methyl Butyl Ketone)	A	A	A	A	A	-	-
Mecurious Nitrate Solution	D	-	A	A	A	-	-
MEK (Ethyl Methyl Ketone)	A	A	A	A	A	-	-
Mercuric Chloride	D	D	D	D	E	D	Y
Mercuric Cyanide	D	D	D	B	B	D	Y
Mercury	D	D	B	A	A	Y	Y
Mesityl Oxide	A	A	A	A	A	-	-
Metallic Soaps	A	A	A	A	A	-	-
Methane	A	A	B	A	A	Y	D
Methanol	B	B	B	B	B	Y	Y
Methoxychlor Solution	-	-	A	A	A	-	-
Methyamine	-	-	A	A	A	-	-
Methyl Acetate	A	A	A	A	A	-	-
Methyl Acrylate	A	A	A	A	A	-	-
Methyl Alcohol	A	A	A	A	A	-	-
Methyl Bromide	D	E	B	B	B	D	D
Methyl Butyl Ketone	A	A	A	A	A	-	-
Methyl Cyanide	-	-	A	A	A	-	-
Methyl Ethyl Ketone	B	B	B	B	B	Y	D
Methyl Formate	A	A	A	A	A	-	-
Methyl Isobutyl Ketone	B	B	B	B	B	Y	D
Methyl Metha crylate	B	E	D	B	B	D	Y
Methyl Nutanathiol	-	-	-	A	A	-	-
Methyl Phenol	A	-	B	A	A	-	B
Methyl Salicylate	A	A	A	A	A	-	-
Methylene Chloride	E	B	B	E	E	Y	D
Methylene Dichloride	D	A	A	A	A		
Milk	A	D	C	A	A	Y	Y
Mineral oil	B	A	B	A	B	Y	Y
Mobile Therm 603	A	A	A	A	A	-	-
Molasses	B	D	B	A	A	-	-
Monochloroacetic Acid Solution	-	B	D	D	D	-	-
Monochlorobenzene	-	A	A	A	A	-	-
Monoethanolamine	-	A	A	A	A	-	-

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Monomethylamine	-	-	A	A	A	-	-
Monosodium Phosphate	D	D	A	A	A	-	-
Motor Oil	A	A	A	A	A	-	-
Mould Oil	-	-	A	A	A	-	-
Mouth Wash	A	A	A	A	A	-	-
Muriatic Acid	D	E	E	D	D	D	Y
Mustard	-	-	D	A	A	-	-
Naptha	-	A	B	A	A	-	-
Napthalene	B	B	B	A	A	Y	Y
Napthalene	B	B	B	B	B	Y	D
Neutral Oil	-	A	A	A	A	-	-
Nickel Acetate	A	A	A	A	A	-	-
Nickel Chloride	D	D	D	E	E	D	Y
Nickel Nitrate	D	-	-	-	B	-	-
Nickel Plating Solution	-	-	-	A	A	-	-
Nickel Sulfate	D	D	E	B	B	D	Y
Nicotine Salts	-	-	A	D	B	-	-
Niter Cake	D	D	D	A	A	-	-
Nitogen, Liquid	A	A	A	A	A	-	-
Nitric Acid (100%)	A	D	D	B	E	D	D
Nitric Acid (30%)	D	D	D	A	E	D	D
Nitric Acid (50%)	D	D	D	B	E	D	D
Nitrobenzene	A	B	B	B	B	Y	Y
Nitroethane	-	A	-	A	A	-	-
Nitrogen Gas	A	A	A	A	A	-	-
Nitrogen Oxide	-	D	A	A	A	-	-
Nitromethane	-	A	-	A	A	-	-
Nitropropane	-	A	-	A	A	-	-
Nitrosyl Chloride	-	-	-	A	A	-	-
Nitrous Acid (Up to 10%)	D	D	D	A	A	-	-
Nitrous Oxide	-	D	A	A	A	-	-
Octadecanoic Acid	D	D	D	B	A	-	-
Octanol	A	B	A	A	A	-	-
Octyl Alcohol	A	B	A	A	A	-	-
Oil - Castor	B	B	B	B	B	Y	Y
Oil - Coconut	B	E	C	B	B	Y	Y
Oil - Corn	B	B	B	E	B	Y	Y
Oil - Cotton Seed	B	B	B	B	B	Y	Y
Oil - Fuel	B	B	B	B	B	Y	D
Oil - Linseed	B	B	B	B	B	Y	Y
Oil - Mineral	B	A	B	A	B	Y	Y
Oil - Silicon	B	A	B	B	B	Y	Y
Oil - Vegetable	B	B	B	A	A	Y	D
Oils, Animal	A	A	A	A	A	-	-
Oleic Acid	B	C	B	E	A	Y	D
Oleum	B	D	B	B	B	D	D
Olive Oil	A	B	B	A	A	-	A
Ortho-Dichlorobenzene	-	A	-	A	A	-	-
Oxalic Acid	B	E	D	D	D	D	Y
Oxygen	B	B	B	B	B	D	D
Ozone	A	A	A	A	A	-	A
Paint (inorganic)	A	A	-	A	A	-	-
Palm Oil	A	A	A	A	A	-	-

Rating Codes: **A** = Excellent, **B** = Good, **C** = Fair Conditional, **D** = Unsatisfactory, **E** = Contact Thorburn, **Y** = Acceptable, **(-)** = No Data Available

Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Palmitic Acid	B	C	C	B	B	D	Y
Paraffin	B	B	B	B	B	Y	Y
Paraformaldehyde	A	-	-	A	A	-	-
Peanut Oil	A	A	A	A	A	-	A
Pentasol	A	A	A	A	A	-	-
Perchloric Acid	-	-	C	B	A	-	A
Perchloroethylene	B	B	B	E	E	D	D
Petrolatum	B	E	C	B	B	Y	E
Petroleum Ether	-	A	B	A	A	-	-
Phenol (Carbonic Acid)	A	A	C	E	A	D	D
Phenyl Chloride	A	A	A	A	A	-	D
Phorone	-	A	A	A	A-	-	-
Phosphoric Acid (25-50%)	D	D	D	E	E	D	Y
Phosphoric Acid (50-85%)	D	D	D	E	E	D	Y
Photographic Solutions	E	E	D	A	A	D	D
Phthalic Anhydride	E	B	B	A	A	D	D
Picric Acid	A	D	D	B	B	D	E
Plating Solutions - Brass	E	E	E	E	B	D	Y
Plating Solutions - Cadmium	E	B	E	E	B	D	Y
Plating Solutions - Chrome (40%)	D	E	D	B	B	D	Y
Plating Solutions - Copper Cyanide	E	E	E	E	E	D	Y
Plating Solutions - Gold	E	E	E	E	A	D	Y
Plating Solutions - Iron	E	E	E	E	E	D	Y
Plating Solutions - Lead	E	E	E	A	A	D	Y
Plating Solutions - Nickel	E	E	E	A	A	D	Y
Plating Solutions - Silver	E	E	E	A	A	D	Y
Plating Solutions - Tin	E	E	E	E	C	D	Y
Plating Solutions - Zinc	E	E	E	E	E	D	Y
Potash	-	D	B	A	A	-	A
Potassium Acetate	D	D	B	E	E	Y	Y
Potassium Bicarbonate (30%)	D	B	B	A	A	Y	Y
Potassium Carbonate (50%)	D	B	B	A	A	Y	Y
Potassium Chlorate (30%)	B	D	B	B	A	D	Y
Potassium Chloride (30%)	D	D	B	E	E	Y	Y
Potassium Chromate (30%)	B	B	E	B	B	D	Y
Potassium Cyanide (30%)	D	D	B	B	B	D	Y
Potassium Dichromate (30%)	A	B	B	A	A	D	Y
Potassium Hydroxide (90%)	D	D	E	D	E	D	Y
Potassium Nitrate (80%)	A	B	B	B	B	D	Y
Potassium Permanganate (20%)	B	B	B	B	B	D	Y
Potassium Sulfate (10%)	A	B	B	A	A	Y	Y
Propane	A	A	B	B	B	D	D
Propionic Acid	-	-	A	A	-	-	-
Propylene Glycol	B	B	B	B	B	Y	Y
Propylene Oxide (90%)	E	E	E	A	A	D	D
Purina insecticide	A	B	A	A	A	-	-
Puropale RX Oils	A	A	A	A	A	-	-
Pydraul (10E, 29E-LT, 30E, 60, 65E, 115SE)	A	A	A	A	A	-	-
Pyrene	D	B	D	B	B	Y	D
Pyridine	B	B	B	B	B	-	D
Pyrogallic Acid	B	B	B	B	B	D	D
Pyroguard (160, 230, 630)	-	-	A	A	A	-	-
Pyroguard (51, 53, 55)	-	-	A	A	A	-	-

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Pyroguard C, D	A	A	A	A	A	-	-
Quenching Oil	A	-	-	A	A	-	-
Quintolubric 822	A	A	A	A	A	-	-
Ramrod (Ag Spray)	A	A	A	A	A	-	-
Rando Oils	A	A	A	A	A	-	-
Rapeseed Oil	A	A	A	A	A	-	-
Red Oil (MIL-5606)	A	B	B	B	A	-	A
Refined Wax (Petroleum)	-	A	A	A	A	-	-
Regal Oils R&O	A	A	A	A	A	-	-
Salicyclic Acid	B	-	-	A	A	-	-
Salt Water	-	B	B	A	A	-	-
Sewage	B	A	D	A	A	-	-
Silicone Greases	-	A	A	A	A	-	-
Silicone Oils	-	A	A	A	A	-	-
Silver Nitrate	D	D	D	B	A	D	Y
Skydrol (500A & 7000)	A	-	A	A	A	-	-
Soap Solutions	B	B	B	B	B	Y	Y
Soda Ash	D	B	A	A	A	-	A
Sodium Acetate	A	B	D	B	B	Y	Y
Sodium Bicarbonate (20%)	B	B	C	A	A	Y	Y
Sodium Bisulfate	D	E	B	E	E	Y	Y
Sodium Bisulfite	D	B	D	E	E	Y	Y
Sodium Borate	B	B	C	B	B	Y	Y
Sodium Carbonate	D	B	B	E	B	Y	Y
Sodium Chlorate (50%)	B	B	D	B	B	D	Y
Sodium Chloride	D	D	B	B	A	-	-
Sodium Chromate	D	D	B	A	A	-	-
Sodium Cyanide	D	D	B	E	E	Y	Y
Sodium Dichromate	B	D	B	B	B	D	Y
Sodium Fluoride (70%)	-	-	-	-	B	-	-
Sodium Hydrochloride (30%)	D	B	B	E	E	D	Y
Sodium Hydroxide (30%)	D	B	B	A	A	D	Y
Sodium Hydroxide (50%)	D	D	C	A	E	D	Y
Sodium Hydroxide (70%)	D	D	C	B	B	D	Y
Sodium Hydroxide (40%)	D	D	B	A	A	-	-
Sodium Hypochlorite	D	D	D	E	E	D	Y
Sodium Metaphosphate	D	D	D	B	B	D	D
Sodium Nitrate (40%)	A	B	B	A	A	Y	Y
Sodium Perborate (10%)	B	D	B	B	B	D	Y
Sodium Perborate (10%)	B	D	B	B	B	D	Y
Sodium Peroxide (10%)	B	D	B	B	B	D	Y
Sodium Phosphate	D	D	-	A	A	-	-
Sodium Silicate	A	B	B	B	B	Y	Y
Sodium Sulfate	E	B	B	E	A	Y	Y
Sodium Sulfide (50%)	D	D	B	E	B	D	Y
Sodium Thiosulphate	B	D	D	B	B	Y	Y
Solnus Oils	A	A	A	A	A	-	-
Soybean Oil	-	-	A	A	A	-	-
Spent Acid	-	-	-	A	A	-	-
Stannic Chloride	D	D	D	D	D	D	Y
Stannous Chloride	D	D	D	D	E	D	D
Starch Gum	-	-	-	A	A	-	A
Stauffer Jet 1	A	A	A	A	A	-	-

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Coupling Material Chemical Resistance

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Stauffer Jet 2	A	A	A	A	A	-	-
Steam	E	E	E	E	E	D	E
Stearic Acid	B	C	C	B	A	Y	Y
Stoddard's Solvent	B	B	B	B	B	D	Y
STPP (Sodium Tripolyphosphate)	D	D	-	A	A	-	-
Styrene	D	B	B	D	B	-	-
Sucrose Solutions	-	-	A	A	A	-	-
Sugar Liquors (Beet)	A	B	B	A	A	Y	Y
Sugar Liquors (Cane)	A	B	B	B	B	Y	Y
Sulfate Liquors	B	D	C	E	B	D	Y
Sulfite Liquors	D	D	D	B	B	D	D
Sulfur Chloride	D	E	D	E	E	D	D
Sulfur Dioxide (Dry)	B	B	A	E	B	D	Y
Sulfur Trioxide	B	B	B	E	B	D	D
Sulfuric Acid (100%)	D	D	B	E	E	D	D
Sulfuric Acid (to 10%)	D	B	D	D	D	D	Y
Sulfurous Acid	B	B	D	D	E	D	Y
Sun R&O Oils	A	-	A	A	A	-	-
Suntac HP Oils	A	-	A	A	A	-	-
Suntac WR Oils	A	-	A	-	A	-	-
Sunvis Oils (700, 800, 900)	-	-	A	A	A	-	-
Synthetic Oil (Citgo)	-	-	A	A	A	-	-
Syrup	-	-	A	A	A	-	-
Tall Oil	-	-	-	D	B	-	-
Tall Oil (Under 150°F)	-	-	-	D	B	-	-
Tallow	A	B	B	B	B	-	-
Tannic Acid	D	E	D	B	B	D	Y
Tanning Liiquors	A	E	E	A	A	D	Y
Tar (Under 100°F)	A	B	A	A	A	-	-
Tartaric Acid	E	E	E	A	A	Y	Y
Tellus Oils	A	A	A	A	A	-	-
Tenol Oils	-	-	A	A	A	-	-
Tergitol	-	B	B	A	A	-	-
Tetrahydrofuran	D	C	A	-	B	Y	D
Tetrahydrofuran (THF)	-	-	B	-	-	-	D
Theobromo Oil	-	-	A	A	A	-	-
Titanium Tetrachloride	D	D	B	E	B	D	D
Toluene	A	A	A	A	A	Y	D
Toluene Diisocyanate	-	-	A	A	A	-	-
Tomato Juice	B	E	C	B	B	D	Y
Transformer Oil (Askarel Types)	-	A	A	A	A	-	B
Transformer Oil (Petroleum Types)	A	A	A	A	A	-	-
Transmission Fluid	-	A	A	A	A	-	-
Tributoxyethyl Phosphate	D	-	A	-	-	-	-
Tributyl Phosphate	D	-	A	-	-	-	-
Trichloroethylene	A	E	B	E	E	Y	D
Trichloroethylene	D	A	D	-	A	-	-
Tricresyl Phosphate	D	-	A	-	B	-	-
Triethanolamine	B	D	B	B	B	Y	D
Triethylamine	E	E	E	B	B	Y	D
Trihydroxybenzoic Acid	-	-	D	A	A	-	A
Trinitriphenol	D	D	D	A	A	-	-
Trisodium Phosphate	D	B	B	A	A	Y	Y

Material (All ratings are based on 70°F)	Aluminum	Brass	Carbon Steel	304SS	316SS	Nylon	Poly-Propylene
Tung Oil	A	A	A	A	A	-	-
Turpentine	B	D	B	A	A	D	D
Ucon (Hydrolube Types 150CP, 200CP)	A	A	A	A	A	-	-
Ucon (M1)	A	A	A	A	A	-	-
Union Hydraulic Tractor Fluid	A	A	A	A	A	-	-
Urea (50%)	B	E	B	B	B	Y	Y
Urine	E	E	B	A	A	D	Y
Varnish	-	B	B	A	A	-	-
Vegetable Oils	A	-	A	A	A	-	-
Versilube (F-50, F-44)	A	A	A	A	A	-	-
Vinegar	B	D	B	B	B	D	Y
Vinyl Acetate	A	B	-	A	B	-	-
Vinyl Chloride	A	D	B	A	A	-	-
Vitrea Oils	-	-	A	A	A	-	-
VM&P Naptha	B	A	A	A	A	-	-
Water (Distilled)	D	B	D	B	B	Y	Y
Water (Sea)	B	B	D	B	B	Y	Y
Water Acid (Mine)	D	D	D	E	E	D	Y
Whiskey	D	B	B	A	A	D	Y
White Liquor	B	E	D	B	B	D	Y
Wine	D	B	D	A	A	D	Y
Xylene	B	B	B	B	B	Y	D
Zeric	-	-	-	A	A	-	-
Zinc Chloride	D	D	D	D	B	Y	Y
Zinc Nitrate	E	E	E	B	B	D	Y
Zinc Sulfate (50%)	D	B	D	A	A	D	Y

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Temperature Conversion Chart

Celsius	Fahrenheit
-400	-688
-300	-508
-250	-418
-200	-328
-150	-238
-100	-148
-95	-139
-90	-130
-85	-121
-80	-112
-75	-103
-70	-94
-65	-85
-60	-76
-55	-67
-50	-58
-49	-56
-48	-54
-47	-53
-46	-51
-45	-49
-44	-47
-43	-45
-42	-43
-41	-42
-40	-40
-39	-38
-38	-36
-37	-35
-36	-33
-35	-31
-34	-29
-33	-27
-32	-26
-31	-24
-30	-22
-29	-20
-28	-18
-27	-17
-26	-15
-25	-13
-24	-11
-23	-9

Celsius	Fahrenheit
-22	-8
-21	-6
-20	-4
-19	-2
-18	-0.4
-17	1
-16	3
-15	5
-14	7
-13	9
-12	10
-11	12
-10	14
-9	16
-8	18
-7	19
-6	21
-5	23
-4	25
-3	27
-2	28
-1	30
0	32
1	34
2	36
3	37
4	39
5	41
6	43
7	45
8	46
9	48
10	50
11	52
12	54
13	55
14	57
15	59
16	61
17	63
18	64
19	66
20	68

Celsius	Fahrenheit
21	70
22	72
23	73
24	75
25	77
26	79
27	81
28	82
29	84
30	86
31	88
32	90
33	91
34	93
35	95
36	97
37	99
38	100
39	102
40	104
41	106
42	108
43	109
44	111
45	113
46	115
47	117
48	118
49	120
50	122
75	167
100	212
150	302
200	392
250	482
300	572
400	752
500	932
600	1112
700	1292
800	1472
900	1652
1000	1832

Celsius to Fahrenheit (°C X (9/5))+32 = °F | Fahrenheit to Celsius: ((°F-32) X (5/9)) = °C

Pressure Conversion Chart

psi	in/H2O	in/Hg	mm/H2O	mm/Hg	kg/cm2	bar	mbar	Pa	mPa	kPa
1.0	27.71	2.036	703.1	51.75	0.0703	0.0689	68.95	6895	0.006895	6.895
1.2	33.22	2.443	843.7	62.06	0.0844	0.0827	82.74	8274	0.008274	8.274
1.4	38.75	2.850	684.3	72.40	0.0984	0.0965	96.52	9652	0.009652	9.652
1.6	44.29	3.258	1125	82.74	0.1125	0.1103	110.0	11030	0.001103	11.03
1.8	49.82	3.665	1266	93.09	0.1266	0.1241	124.1	12410	0.001241	12.41
2.0	55.36	4.072	1406	103.4	0.1406	0.1379	137.9	13790	0.001379	13.79
2.2	60.90	4.479	1547	113.8	0.1547	0.1517	151.7	15170	0.001517	15.17
2.4	66.43	4.886	1687	124.1	0.1687	0.1655	165.5	16550	0.001655	16.55
2.6	71.97	5.294	1828	134.5	0.1828	0.1793	179.3	17930	0.001793	17.93
2.8	77.51	5.701	1969	144.8	0.1968	0.1930	193.0	19300	0.001930	19.30
3.0	83.04	6.108	2109	155.1	0.2109	0.2068	203.8	20680	0.002068	20.68
3.2	88.58	6.515	2250	165.5	0.2250	0.2206	220.6	22060	0.002206	22.06
3.4	94.11	6.922	2390	175.8	0.2390	0.2344	234.4	23440	0.002344	23.44
3.6	99.65	7.330	2531	186.2	0.2531	0.2482	248.2	24820	0.002482	24.82
3.8	105.2	7.737	2672	196.5	0.2672	0.2620	262.0	26200	0.002620	26.20
4.0	110.7	8.144	2812	206.9	0.2812	0.2758	275.8	27580	0.002758	27.58
4.2	116.3	8.551	2953	217.2	0.2953	0.2896	289.6	28960	0.002896	28.96
4.4	121.8	8.958	3094	227.5	0.3094	0.3034	303.4	30338	0.003034	30.34
4.6	127.3	9.366	3234	237.9	0.3234	0.3172	317.2	31720	0.003172	31.72
4.8	132.9	9.773	3375	248.2	0.3375	0.3310	331.0	33100	0.003310	33.10
5.0	138.4	10.18	3515	258.6	0.3515	0.3447	344.7	34470	0.003447	34.47
5.2	143.9	10.59	3656	268.9	0.3656	0.3585	358.5	35850	0.003585	35.85
5.4	149.5	10.99	3797	279.3	0.3797	0.3723	372.3	37230	0.003723	37.23
5.6	155.0	11.40	3973	289.6	0.3937	0.3861	386.1	38610	0.003861	38.61
5.8	160.5	11.81	4078	299.9	0.4078	0.3999	399.9	39990	0.003999	39.99
6.0	166.1	12.22	4218	310.3	0.4218	0.4137	413.7	41370	0.004137	41.37
6.2	171.6	12.62	4359	320.6	0.4359	0.4275	427.5	42750	0.004275	42.75
6.4	177.2	13.03	4500	331.0	0.4500	0.4413	441.3	44130	0.004413	44.13
6.6	182.7	13.44	4640	341.3	0.4640	0.4550	455.0	45500	0.004550	45.50
6.8	188.2	13.84	4781	351.7	0.4781	0.4688	468.8	46880	0.004688	46.88
7.0	193.8	14.25	4922	362.0	0.4921	0.4826	482.6	48260	0.004826	48.26
7.2	199.3	14.66	5062	372.3	0.5062	0.4964	496.4	49640	0.004964	49.64
7.4	204.8	15.07	5203	382.7	0.5203	0.5102	510.2	51020	0.005102	51.02
7.6	210.4	15.47	5343	393.0	0.5343	0.5240	524.0	52400	0.005240	52.40
7.8	215.9	15.88	5484	403.4	0.5484	0.5378	537.8	53780	0.005378	53.78
8.0	221.4	16.29	5625	413.7	0.5625	0.5516	551.6	55160	0.005516	55.16
8.2	227.0	16.70	5765	424.1	0.5765	0.5654	565.4	56540	0.005654	56.54
8.4	232.5	17.10	5906	434.4	0.5906	0.5792	579.2	57920	0.005792	57.92
8.6	238.0	17.51	6047	444.7	0.6046	0.5929	592.9	59290	0.005929	59.29
8.8	243.6	17.92	6187	455.1	0.6187	0.6067	606.7	60670	0.006067	60.67
9.0	249.1	18.32	6328	465.4	0.6328	0.6205	620.5	62050	0.006205	62.05
10.0	276.8	20.36	7031	517.1	0.7031	0.6895	689.5	68950	0.006895	68.95
11.0	304.5	22.40	7734	568.9	0.7734	0.7584	758.4	75840	0.008274	82.74
12.0	332.2	24.43	8437	620.6	0.8437	0.8274	827.4	82740	0.008274	82.74
13.0	359.8	26.47	9140	672.3	0.9140	0.8963	896.3	89630	0.008963	89.63
14.0	387.5	28.50	9843	724.0	0.9843	0.9652	965.2	96520	0.009652	96.52
15.0	415.2	30.54	10550	775.7	1.0550	1.0340	1034.0	103400	0.010340	103.40
16.0	442.9	32.58	11250	827.4	1.1250	1.1030	1103.0	110300	0.011030	110.30
17.0	470.6	34.61	11950	879.1	1.1950	1.1720	1172.0	117200	0.011720	117.20
18.0	498.2	36.65	12660	930.6	1.2650	1.2410	1241.0	124100	0.012410	124.10
19.0	525.9	36.68	13360	982.6	1.3360	1.3100	1310.0	131000	0.013100	131.00
20.0	553.6	40.72	14060	1034.0	1.4060	1.3790	1379.0	137900	0.013790	137.90
21.0	581.3	42.76	14770	1086.0	1.4760	1.4480	1448.0	144800	0.014480	144.80
22.0	609.0	44.79	15470	1138.0	1.5470	1.5170	1517.0	151700	0.015170	151.70
23.0	636.7	46.83	16170	1189.0	1.6170	1.5860	1586.0	158600	0.015860	158.60
24.0	664.3	48.86	16870	1241.0	1.6870	1.6550	1655.0	165500	0.016550	165.50
25.0	692.0	50.90	17580	1293.0	1.7580	1.7240	1724.0	172400	0.017240	172.40

Pressure Conversion Calculations

From	To	Multiply By	Example
atm (Atmosphere)	bar	1.01325	1.1 atm x 1.01325 = 1.115 bar
	MPa	0.10132	1.1 atm x 0.10132 = 0.111 MPa
	PSI	14.696	1.1 atm x 14.696 = 16.166 PSI
bar	atm	0.98692	10 bar x 0.98692 = 9.8692 atm
	MPa	0.1	10 bar x 0.1 = 1.0 MPa
	PSI	14.504	10 bar x 14.504 = 145 PSI
MPa (Megapascal)	atm	9.8692	10 MPa x 9.8692 = 98.692 atm
	bar	10	10 MPa x 10 = 100 bar
	PSI	145.0	10 MPa x 145.0 = 1450 PSI
PSI (Pounds / Square Inch)	atm	0.068	100 PSI x 0.068 = 6.80 atm
	bar	0.0689	100 PSI x 0.0689 = 6.89 bar
	MPa	0.00689	100 PSI x 0.00689 = 0.689 MPa

Flow Conversion Calculations

From	To	Multiply By	Example
CFM (Cubic Feet / Minute)	l/min	28.32	100 CFM x 28.32 = 2832 l/min
	l/s	0.472	100 CFM x 0.472 = 47.2 l/s
	m^3/h	1.699	100 CFM x 1.699 = 169.9 m^3/h
l/min (Liter / MInute)	CFM	0.0353	100 l/min x 0.0353 = 3.5 CFM
	l/s	0.0167	100 l/min x 0.0167 = 1.7 l/s
	m^3/h	0.06	100 l/min x 0.06 = 6 m^3/h
l/s (Liter / Second)	CFM	2.119	10 l/s x 2.119 = 21.2 CFM
	l/min	60	10 l/s x 60 = 600 l/min
	m^3/h	3.6	10 l/s x 3.6 = 36 m^3/h
m^3/h (Cubic Meter / Hour)	CFM	0.5885	10 m^3/h x 0.5885 = 5.885 CFM
	l/min	16.667	10 m^3/h x 16.667 = 166.7 l/min
	l/s	0.2777	10 m^3/h x 0.2777 = 2.777 l/s
GPM us (Gallon / Minute)	l/min	3.7854	10 GPM us x 3.7854 = 37.85 l/min
GPM uk (Gallon / Minute)	l/min	4.5461	10 GPM uk x 4.5461 = 45.46 l/min

Force Conversion Calculations

From	To	Multiply By	Example
lbf (Pound Force)	kp	0.454	10 lbf x 0.454 = 4.54 kp
	N	4.448	10 lbf x 4.448 = 44.48 N
kp (Kilogram Force)	lbf	2.205	10kp x 2.205 = 22.05 lbf
	N	9.806	10 kp x 9.806 = 98.06 N
N (Newton)	lbf	0.2248	10 N x 0.2248 = 2.25 lbf
	kp	0.1020	10 n x 0.1020 = 1.02 kp

Volume Conversion Calculations

From	To	Multiply By	Example
ft^3 (Cubic Foot)	gl UK	6.228	10 ft^3 x 6.228 = 62.28 gl UK
	gl US	7.48	10 ft^3 x 7.48 = 74.8 gl US
	l	28.32	10 ft^3 x 28.32 = 283.2 l
	m^3	0.0283	10 ft^3 x 0.0283 = 0.283 m^3
gl UK (Gallon UK)	ft^3	0.1605	10 gl UK x 0.1605 = 1.605 ft^3
	gl US	1.2009	10 gl UK x 1.2009 = 12.009 gl US
	l	4.546	10 gl UK x 4.546 = 45.46 l
	m^3	0.0045	10 gl UK x 0.0045 = 0.045 m^3
gl US (Gallon US)	ft^3	0.1336	10 gl US x 0.1336 = 1.336 ft^3
	gl UK	0.8326	10 gl US x 0.8326 = 8.326 gl UK
	l	3.785	10 gl US x 3.785 = 37.85 l
	m^3	0.0037	10 gl US x 0.0037 = 0.037 m^3
l (Liter)	ft^3	0.0353	100 l x 0.0353 = 3.53 ft^3
	gl UK	0.220	100 l x 0.220 = 22.0 gl UK
	gl US	0.264	100 l x 0.264 = 26.4 gl US
	m^3	0.001	100 l x 0.001 = 0.1 m^3
m^3 (Cubic meter)	ft^3	35.3	10 m^3 x 35.3 = 353 ft^3
	gl UK	219.96	10 m^3 x 219.96 = 2199.6 gl UK
	gl US	264.17	10 m^3 x 264.17 = 2641 gl US
	l	1000	10 m^3 x 1000 = 10,000 l

Mass Conversion Calculations

From	To	Multiply By	Example
g (Gram)	kg	0.001	10 g x 0.001 = 0.01 kg
	lb	0.0022	10 g x 0.0022 = 0.022 lb
	oz	0.0352	10 g x 0.0352 = 0.352 oz
kg (Kilogram)	g	1000	10 kg x 1000 = 10,000 g
	lb	2.205	10 kg x 2.205 = 22.05 lb
	oz	35.273	10 kg x 35.273 = 352.73 oz
lb (Pound)	g	453.9	10 lb x 453.9 = 4535 g
	kg	0.4539	10 lb x 0.4539 = 4.535 kg
	oz	16	10 lb x 16 = 160 oz
oz (Ounce)	g	28.349	10 oz x 28.349 = 283.49 g
	kg	0.0283	10 oz x 0.0283 = 0.283 kg
	lb	0.0625	10 oz x 0.0625 = 0.625 lb

Length Conversion Calculations

From	To	Multiply By	Example
ft (Foot)	in	12	10 ft x 12
	m	0.3048	10 ft x 0.3048
	mm	304.8	10 ft x 304.8
in (Inch)	ft	0.0833	10 in x 0.0833
	m	0.0254	10 in x 0.0254
	mm	25.4	10 in x 25.4
m (Meter)	ft	3.28083	10 m x 3.28083
	in	39.3699	10 m x 39.3699
	mm	1000	10 m x 1000
mm (Millimeter)	ft	0.00328	10 mm x 0.00328
	in	0.0393	10 mm x 0.0393
	m	0.001	10 mm x 0.001

Weight Per Length Conversion Calculations

From	To	Multiply By	Example
lb/ft (Pounds per foot)	kg/m	1.48816	10 lb/ft x 1.48816 = 14.8816 kg/m
kg/m (Kilograms per meter)	lb/ft	0.67197	10 kg/m x 0.67197 = 6.7197 lb/ft

Temperature Conversion Calculations

From	To	Conversion	Example
°C (Celsius)	°F	°F = (°C × (9/5)) + 32	(10°C × (9/5)) + 32 = 50ºF
	K	K = °C + 273.15	10°C + 273.15 = 283.15 K
	°R	°R = (°C × (9/5)) + 491.67	(10°C × (9/5)) + 491.67 = 509.67°R
°F (Fahrenheit)	°C	°C = (°F − 32) × (5/9)	(10°F − 32) × (5/9) = -12.22°C
	K	K = (°F + 459.67) × (5/9)	(10°F + 459.67) × (5/9) = 260.93 K
	°R	°R = °F + 459.67	10°F + 459.67 = 469.67°R
°K (Kelvin)	°C	°C = K - 273.15	10K - 273.15 = -263.15°C
	°F	°F = (K × (9/5)) - 459.67	(10K × (9/5)) - 459.67 = -441.67°F
	°R	°R = K × (9/5)	10K × (9/5) = 18°R
°R (Rankine)	°C	°C = (°R - 491.67) × (5/9)	(10°R - 491.67) × (5/9) = -267.59°C
	°F	°F = °R - 459.67	10°R - 459.67 = -449.67°F
	K	K = °R × (5/9)	10°R × (5/9) = 5.6 K

Velocity of Fluid Flow Through Hose

V	GPM	d	Calculation
Velocity	Gallons per Minute	Inside Diameter of Hose	$V = 0.408 \times GPM / d^2$

Flow of Water Through 100 ft Length Hose

Straight Smooth Bore (US Gallons per Minute)

PSI @ Hose Inlet	Hose ID											
	1/2	5/8	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8
20	4	8	12	26	47	76	161	290	468	997	2895	6169
30	5	9	15	32	58	94	200	360	582	1240	3603	7679
40	6	11	18	38	68	110	234	421	680	1449	4209	8970
50	7	12	20	43	77	124	264	475	767	1635	4748	10118
60	8	14	22	47	85	137	291	524	846	1804	5239	11165
75	9	15	25	53	95	154	329	591	955	2035	5910	12595
100	10	18	29	62	112	180	384	690	1115	2377	6904	14712
125	11	20	33	70	126	203	433	779	1258	2681	7788	15595
150	12	22	36	77	139	224	478	859	1388	2958	8593	18313
200	15	26	42	90	162	262	558	1004	1621	3455	10038	21390

Minimum Bend Radius

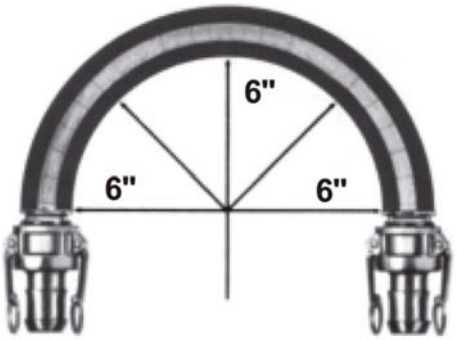
The Bend Radius is the radius to which the hose can be bent in service without damage or shortening its life. Textile reinforced hoses have a tendency to kink as the bend radius is reduced. A helical wire is used when a hose must withstand severe bends without flattening or kinking. The minimum bend radius of a Thorburn hose is established at 72°F. Temperature changes, either lower or higher, will effect the minimum bend radius. Caution should be taken to assure proper hose selection for the actual application temperature of both the material handled and the ambient temperature surrounding the application. During storage of hose, ambient temperature should also be considered to prevent hose damage. When possible, minimum bending radius of the hose should be as large as possible to avoid damage to the hose and early hose failure.

Bend Radius Calculations

General Formula to Determine the Bend Length:

$$\frac{\text{Angle of bend}}{360^\circ} \times 2\pi r = \text{minimum length of hose to make bend}$$

π = 3.14
r = given radius of hose



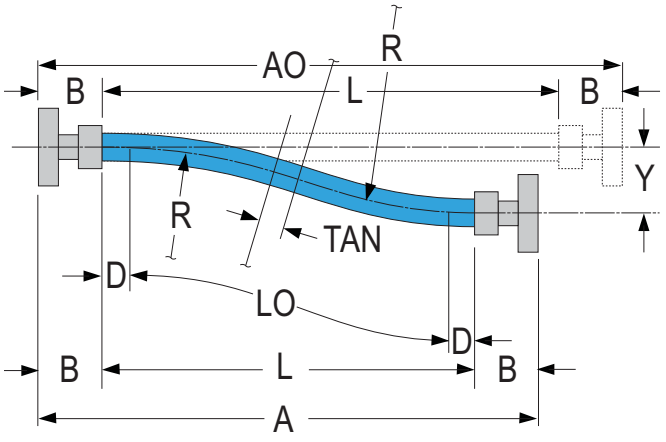
Example: to make a 180° bend with Thorburn hose which has a 2" I.D.
Given r = 6 "

$$\frac{180^\circ}{360^\circ} [2 \times 3.14 \times 6] = .5 \times 2 \times 3.14 \times 6 = 18.84"$$

Remember that the bend should take place over the entire minimum length and not a portion of it.

NOTE: This formula does not mean 18.84" will be long enough to meet application need. It only means that if the 180° bend takes place in less than 18.84" the flow of fluid or material could be restricted or the hose could be damaged.

Hose Assembly Offset



Offset Installation

Hose is installed S-shaped to accommodate offset (Y) between two mating flanges or connecting ends of the piping. To be used for static offset installation not for dynamic movement due to piping thermal expansion or vibration, maximum offset (Y) to be 50% of hose minimum static bend radius (Rs):
Y=0.5*Rs

A0 = Face to Face dimension for straight (as built) hose assembly
A = Face to Face for installation
B = Length of end connector
D = Outside diameter of the hose
L = Total live length of the hose
L0 = Minimum live length for offset installation
R = Bend radius of the offset installation (R>=Rs)
Rs = Minimum static bend radius for hose
Y = Lateral offset of the installation

A= L + 2*B
L = L0 + 2*D
L0 = 2*Rs*acos ((Rs-Y)/2*Rs)
See table below for sample calculated value of L0

Min. Bend Radius (in)	Y= Offset Installation (in)															
	1/8	1/4	3/8	1/2	3/4	1	1 1/2	2	3	4	5	6	8	10	20	30
	LO= Calculated Minimum Length for Offset Bending (in)															
2	1.00	1.42	1.75	2.02	2.49	2.89	3.58									
4	1.42	2.01	2.46	2.84	3.49	4.04	4.98	5.78								
6	1.73	2.45	3.01	3.48	4.27	4.93	6.06	7.03	8.67							
8	2.00	2.83	3.47	4.01	4.92	5.69	6.98	8.09	9.96	11.56						
10	2.24	3.17	3.88	4.48	5.49	6.35	7.80	9.02	11.10	12.87	14.45					
12	2.45	3.47	4.25	4.91	6.02	6.95	8.53	9.87	12.13	14.06	15.77	17.35				
14	2.65	3.74	4.59	5.30	6.50	7.51	9.21	10.65	13.08	15.15	16.99	18.67				
16	2.83	4.00	4.90	5.66	6.94	8.02	9.84	11.37	13.97	16.17	18.13	19.92	23.13			
18	3.00	4.25	5.20	6.01	7.36	8.51	10.43	12.06	14.80	17.13	19.20	21.08	24.47			
20	3.16	4.47	5.48	6.33	7.76	8.96	10.99	12.70	15.59	18.04	20.21	22.19	25.74	28.91		
25	3.54	5.00	6.13	7.08	8.07	10.02	12.28	14.19	17.41	21.14	22.55	24.75	28.68	32.18		
30	3.87	5.48	6.71	7.75	9.50	10.97	13.44	15.54	19.05	22.03	24.67	27.06	31.34	35.14		
35	4.18	5.92	7.25	8.37	10.26	11.85	14.52	16.77	20.57	23.78	26.62	29.19	33.79	37.88	54.26	
40	4.47	6.33	7.75	8.95	10.96	12.66	15.52	17.93	21.98	25.40	28.43	31.18	36.08	40.43	57.82	
45	4.74	6.71	8.22	9.49	11.63	13.43	16.45	19.01	23.30	26.93	30.14	33.05	38.23	42.83	61.17	
50	5.00	7.07	8.66	10.00	12.26	14.15	17.34	20.03	24.56	28.38	31.76	34.82	40.27	45.10	64.35	79.54
60	5.48	7.75	9.49	10.96	13.42	15.50	18.99	21.94	26.89	31.07	34.76	38.11	44.06	49.34	70.28	86.73
70	5.92	8.37	10.25	11.84	14.50	16.74	20.51	23.69	29.03	33.55	37.53	41.14	47.56	53.24	75.75	93.37
80	6.32	8.95	10.96	12.65	15.50	17.90	21.93	25.32	31.03	35.85	40.10	43.96	50.81	56.87	80.86	99.58
90	6.71	9.49	11.62	13.42	16.44	18.98	23.25	26.86	32.91	38.02	42.53	46.61	53.87	60.28	85.66	105.42
100	7.07	10.00	12.25	14.15	17.33	20.01	24.51	28.31	34.68	40.07	44.82	49.11	56.76	63.51	90.21	110.96
110	7.42	10.49	12.85	14.84	18.17	20.98	25.71	29.69	36.37	42.02	46.99	51.50	59.51	66.59	94.53	115.24
120	7.75	10.96	13.42	15.49	18.98	21.92	26.85	31.01	37.99	43.88	49.08	53.78	62.14	69.52	98.67	121.29

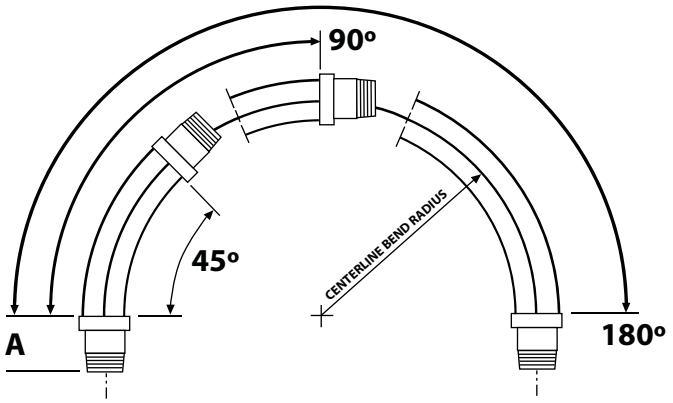
Note: Applicable for static bend only

Hose Assembly Minimum Length

Calculating Minimum Lengths for 45°, 90°, and 180° Bends of Thorburn Hose Assemblies

Determine the centerline bend radius required for your application. Under the column headed "Centerline bend radius in inches", find your radius and read horizontally to the desired degree of bend (45°, 90° or 180°). The number in that column will be the minimum live length required to make that degree of bend, along the desired centerline radius.

Note: Add fitting length dimension "A", plus the minimum live length to calculate OAL.

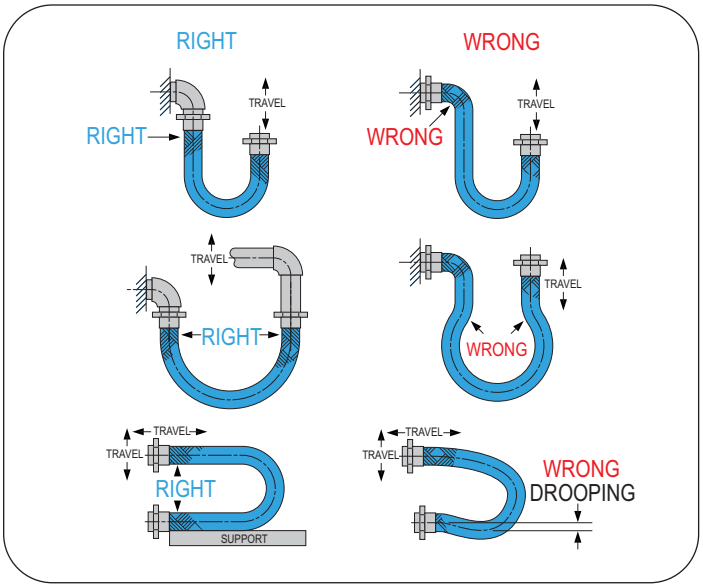


Centerline Bend Radius (in)	Minimum Live Length (in)		
	45°	90°	180°
1	1	2	4
2	2	3 1/2	7
3	2 1/2	5	10
4	3 1/2	6 1/2	13
5	4	8	16
6	5	10	20
7	5 1/2	11	22
8	6 1/2	13	26
9	7 1/2	14 1/2	29
10	8	16	32
11	9	18	36
12	10	19 1/2	39
13	10 1/2	21	42
14	11 1/2	22 1/2	45
15	12	24	48
16	13	26	52
17	13 1/2	27	54
18	14 1/2	29	58
19	15 1/2	30 1/2	61
20	16	32	64
21	17	33 1/2	67
22	17 1/2	35	70
23	18 1/2	36 1/2	73
24	19	38	76
25	20	40	80

Centerline Bend Radius (in)	Minimum Live Length (in)		
	45°	90°	180°
26	21	42	83
27	21 1/2	43	86
28	22 1/2	44 1/2	89
29	23	46	92
30	24	48	95
31	24 1/2	49	98
32	25 1/2	51	101
34	27	54	108
36	28 1/2	57	114
38	30	60	120
40	32	63	126
45	36	72	144
50	40	80	160
55	45	90	180
60	49	97	194
65	53	105	210
70	56	112	224
80	65	130	260
90	73	145	290
100	80	160	320
120	95	190	380
140	112	225	450
160	128	255	510
180	148	285	570
200	160	320	640

Installing Thorburn Hose Assemblies

Thorburn flexible hose assemblies are manufactured to the highest quality levels to assure maximum service life. The following precautions should be adhered to when installing a flexible hose assembly.

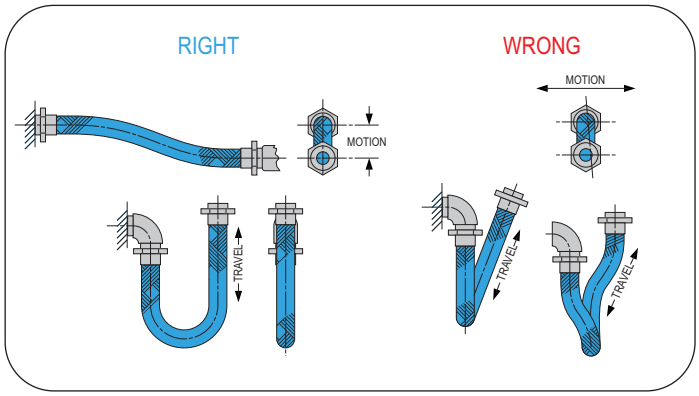


Avoid Overbending

Overbending a Thorburn hose can result in premature failure. This often occurs at the end connections and may be avoided by installing an elbow or interlock guard.

Avoid Improper Handling

Thorburn hoses can be damaged by dragging or when subjected to external abrasive or corrosive conditions. Avoid installings hose in areas where they may be subjected to corrosive sprays, spills, etc.



Avoid Torque

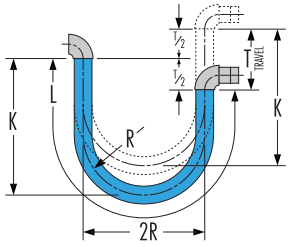
Torquing or twisting a Thorburn hose reduces service life substantially. When installing a hose, it is important that all movement originates in the same plane as the center line. Another precaution against torque is the use of a floating flange or union on one end of the assembly.

Calculations for minimum live length excluding end fittings

Thorburn flexible hose assemblies are usually flexed in accordance with one or a combination of the modes of motion shown below. To obtain maximum reliability it is essential to calculate the length of an assembly that will not be flexed beyond the minimum bend radius. The following formulas give a guide in determining the length of tube required. They are based on standard applications using our current product range. Variations should be discussed with Thorburn's technical department.

L = Minimum Live Length excluding end fitting
R = Minimum Bend Radius
T = Total Travel
K = Loop Length
π = 3.142

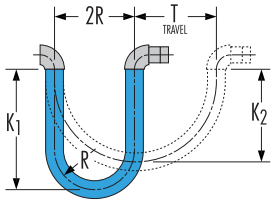
Class "A" Traveling Loops
For Maximum Vertical Travel



$L=4R+\frac{T}{2}$

$K=1.43R+\frac{T}{2}$

Class "B" Traveling Loops
For Short Horizontal Travel

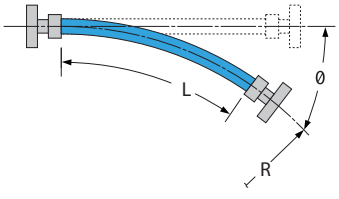


$L=4R+1.57T$

$K_1=1.43R+0.785T$

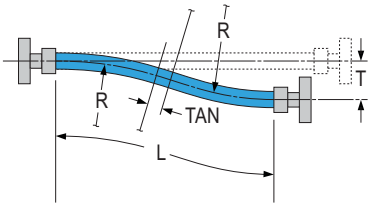
$K_2=1.43R=0.5T$

Angular Motion



$L=\frac{\pi R Ø}{180}+25$

Offset Motion



$L=\sqrt{20RT}$

Pipe Anchoring Guide

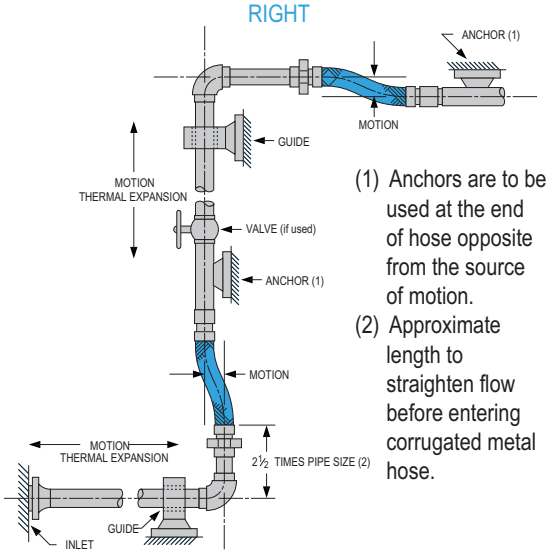
A piping system which utilizes Thorburn flexible hose assemblies to absorb pipe movement must be properly anchored and guided to assure correct functioning and maximum service life of the hose. The basic principles to be observed are:

1) The direction of pipe motion must be perpendicular to the center line (axis) of the hose.

2) The pipe must be anchored at each change of direction where a flexible hose is employed to prevent torsional stress.

Typical examples of RIGHT and WRONG guiding are shown below.

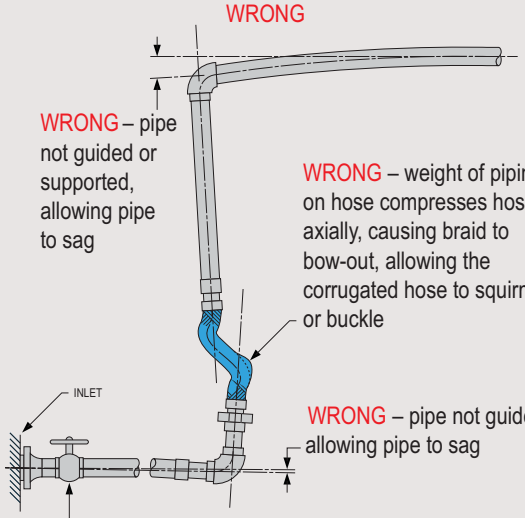
RIGHT



(1) Anchors are to be used at the end of hose opposite from the source of motion.

(2) Approximate length to straighten flow before entering corrugated metal hose.

WRONG



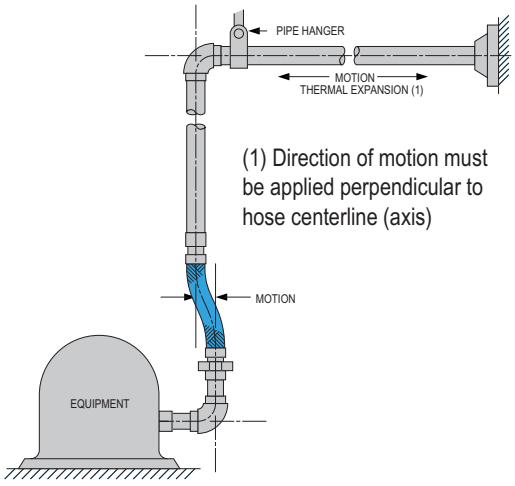
WRONG – pipe not guided or supported, allowing pipe to sag

WRONG – weight of piping on hose compresses hose axially, causing braid to bow-out, allowing the corrugated hose to squirm or buckle

WRONG – pipe not guided, allowing pipe to sag

WRONG – if valve between equipment and hose is quick-acting type

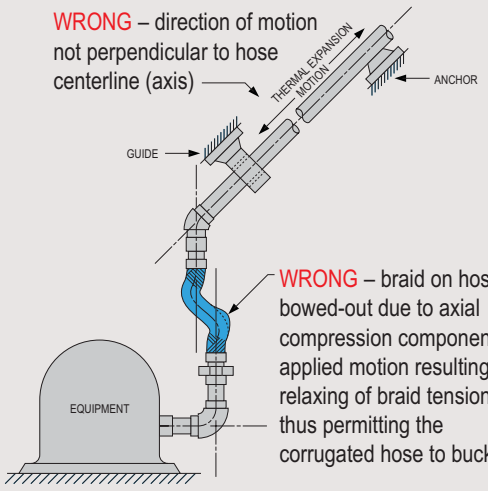
RIGHT



(1) Direction of motion must be applied perpendicular to hose centerline (axis)

WRONG

WRONG – direction of motion not perpendicular to hose centerline (axis)



WRONG – braid on hose bowed-out due to axial compression component of applied motion resulting in relaxing of braid tension, thus permitting the corrugated hose to buckle.

General Maintenance, Testing and Inspection of Hose

Special Procedure

Hose assemblies shall be inspected and tested immediately after the hose is subjected to abnormal abuse such as, severe end pull, flattening or crushing or sharp kinking. As you inspect a hose assembly, remember that mose hose failures occur between the coupling and the first three feet along the hose length. Pay close attention to this area. Any hose that has been recoupled shall be proof-tested and inspected before being placed in service.

Hydrostatic Pressure Test

For large bore hose being used in dock service, an inspection card which describes the hose manufacturer, date received, purchase order number and date of installation should be maintained for each hose. The inspection card should be used to record the test results and condition of the hose. Thorburn recommends that new hose assemblies be hydrostatically tested before being placed in service. Hydrostatic testing should be done at periodic intervals to determine if a hose is suitable for continued service. The hydrostatic test and examination shall be conducted in the following manner. Hose to be pressure tested must be restrained by placing steel rods or straps close to each end and at approximate 10 foot (3m) intervals along its length to keep the hose from “whipping” if failure occurs; the steel rods or straps may be anchored firmly to the test structure but in such a manner that they do not contact the hose which must be free to move.

• Hose shall lie in a straight and horizontal position supported on rollers to permit easy movement when under the test pressure.

• Water should be used as the test liquid. Never pressure test with solvents, corrosive liquids, or with compressed gases.

• Fill the hose with water with the outlet end raised and the outlet valve open to insure the complete removal of air. When all the air has been exposed, close the outlet valve and lower
the raised end.

• For new hose, raise the pressure to 1 1/2 times the rated working pressure of the hose and hold for 5 minutes. During this hold period, the hose shall be examined for leaks at the couplings, fitting slippage, or for any indication of weakness in the hose structure.

• For used hose, test with a pressure of 1 1/2 times the rated working pressure of the hose and examine as above.

• Completely relieve test pressure from the system prior to releasing hose from test equipment.

• Thoroughly drain the water from the hose after completion of the hydrostatic test.

Electrical Continuity

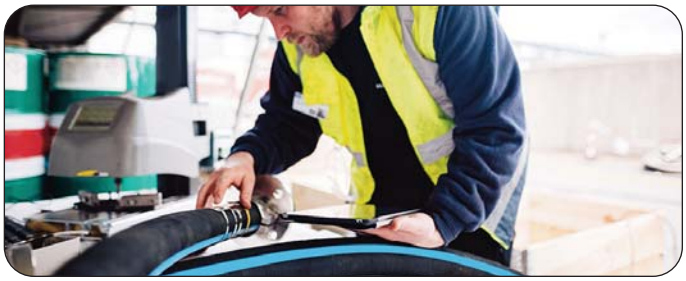
When required by the user, electrical continuity between the fittings shall be tested using an ohm meter. The hose must be clean and dry for this test.

Hose Assemblies

Hose has a limited life based on the severity and type of chemical contact, environment or exposure to heat and petroleum products. Thorburn recommends the following maintenance procedure to determine when hose should be replaced.

Visual Inspection of Hose

Any cuts, gouges or tears in the cover which do not expose the reinforcement should be repaired before the hose is returned to service. If the reinforcement is exposed, retire the hose from service. Covers may show surface cracking or crazing due to prolonged exposure to sunlight, ozone, or high temperature during soak tank cleaning., Such deterioration, which does not expose reinforcing material, is not cause for retirement. Look for any indication of kinking or broken reinforcement as evidenced by any permanent distortion, longitudinal ridges, or bulges. According to RMA IP-11-7 Chemical Hose Bulletin, crushed or kinked spots where the hose O.D. is reduced by 20% or more of the normal O.D. indicate the hose probably has internal damage. The hose assembly must be removed from service to ensure the safety of people in the work area. Hose containing crushed or kinked spots where the outside diameter is reduced less than 20% may be used if the hose passes the hydrostatic test.



Visual Inspection of Couplings

All metals are subject to attack by various chemicals. Check with Thorburn to make sure that suitable end fittings, appropriate to both the hose and the chemical being handled, are being used. Exposed surfaces of couplings, flanges and nipples shall be examined for cracks or excessive corrosion. Either condition shall cause the hose to be retired from service. Any evidence of coupling or nipple slippage on the hose is cause for removing the hose from service. The Rubber Manufacturers Association has published a series of technical bulletins which detail maintenance, testing and inspection recommendations.

Hose Assembly Maintenance and Storage

Because the life expectancy of the hose is limited, the user must be alert to signs of impending failure, particularly when the conditions of service include high working pressures and/or the conveyance or containment of hazardous materials. The periodic inspection and testing procedures described here provide a schedule of specific measures which constitute a minimum level of user action to detect signs indicating hose deterioration or loss of performance before conditions leading to malfunction or failure are reached.

General instructions are also described for the proper storage of hose to minimize deterioration from exposure to elements or environments which are known to be harmful to rubber products. Proper storage conditions can enhance and extend substantially the ultimate life of hose products.

Safety Warning: Failure to follow properly the manufacturer's recommended procedures for the care, maintenance and storage of a particular hose might result in its failure to perform in the manner intended and might result in possible damage to property and serious bodily injury.

General Care and Maintenance of Hose Assemblies

Hose should not be subjected to any form of abuse in service. It should be handled with reasonable care. Hose should not be dragged over sharp or abrasive surfaces unless specifically designed for such service. Care should be taken to protect hose from severe end loads for which the hose or hose assembly were not designed.

Hose should be used at or below its rated working pressure; any changes in pressure should be made gradually so as to not subject the hose to excessive surge pressures. Hose should not be kinked or be run over by equipment. In handling large size hose, dollies should be used whenever possible; slings or handling rigs, properly placed, should be used to support heavy hose in oil suction and discharge service.

General Test and Inspection Procedures

An inspection and hydrostatic test should be made at periodic intervals to determine if a hose is suitable for continued service. A visual inspection of the hose should be made for loose covers, kinks, bulges, or soft spots which might indicate broken or displaced reinforcement. The couplings or fittings should be closely examined and, if there is any sign of movement of the hose from the couplings, the hose should be removed from service. The periodic inspection of the hose should include a hydrostatic test for one minute at 150% of the recommended working pressure of the hose.

An exception to this would be woven jacketed fire hose.* During the hydrostatic test, the hose should be straight, not coiled or in a kinked position. Water is the usual test medium, and following the test , the hose should be flushed with alcohol to remove traces of moisture. A regular schedule should be followed and inspection records maintained.

*Woven jacketed fire hose should be tested in accordance with the service test provisions contained in the current edition of National Fire Protection Association Bulletin No. 1962— Standard for the Care, Use and Service Testing of Fire Hose, Chapter 5.

Hose Assembly Maintenance and Storage

• Air or any other compressible gas must never be used as the test medium because of the explosive action of the hose should a failure occur. Such a failure might result in possible damage to property and serious bodily injury.

• Air should be removed from the hose by bleeding it through an outlet valve while the hose is being filled with the test medium.

• Hose to be pressure tested must be restrained by placing steel rods or straps close to each end and at approximate 10 foot (3m) intervals along its length to keep the hose from "whipping" if failure occurs; the steel rods or straps are to be anchored firmly to the test structure but in such a manner that they do not contact the hose which must be free to move.

• The outlet end of hose is to be bulwarked so that a blown-out fitting will be stopped.

• Provisions must be made to protect testing personnel from the forces of the pressure media if a failure occurs.

• Testing personnel must never stand in front of in back of the ends of the hose being pressure tested.

• If liquids such as gasoline, oil, solvent, or other hazardous fluids are used as the test fluid, precautions must be taken to protect against fire or other damage should a hose fail and the test liquid be sprayed over the surrounding area.

Safety Warning: Before conducting any pressure test on hose, provision should be made to ensure the safety of the personnel performing the tests and to prevent any possible damage to property. Only trained personnel using proper tools and procedures should conduct any pressure tests.

Storage

Rubber hose products in storage can be affected adversely by temperature, humidity, ozone, sunlight, oils, solvents, corrosive liquids and fumes, insects, rodents and radioactive materials. The appropriate method for storing hose depends to a great extent on its size (diameter and length), the quantity to be stored, and the way in which it is packaged. Hose should not be piled or stacked to such an extent that the weight of the stack creates distortions on the lengths stored at the bottom. Since hose products vary considerably in size, weight and length, it is not practical to establish definite recommendations on this point. Hose having a very light wall will not support as much load as could a hose having a heavier wall or hose having a wire reinforcement. Hose which is shipped in coils or bales should be stored so that the coils are in a horizontal plane.

Storage As Stock

Whenever possible rubber hose products should be stored in their original shipping containers, especially when such containers are wooden crates or cardboard cartons which provide some protection against the deteriorating effects of oils, solvents and corrosive liquids; shipping containers also afford some protection against ozone and sunlight. Certain rodents and insects will damage rubber hose products, and adequate protection from them should be provided. Cotton jacketed hose should be protected against fungal growths if the hose is to be stored for prolonged periods in humidity conditions in excess of 70%. The ideal temperature for the storage of rubber hose products ranges from 50°F to 70°F (10°C - 21°C) with a maximum limit of 100°F (38°C.). If stored below 32°F (0°C), some rubber products become stiff and would require warming before being placed in service. Rubber products should not be stored near sources of heat , such as radiators, base heaters, etc. Nor should they be stored under conditions of high or low humidity.

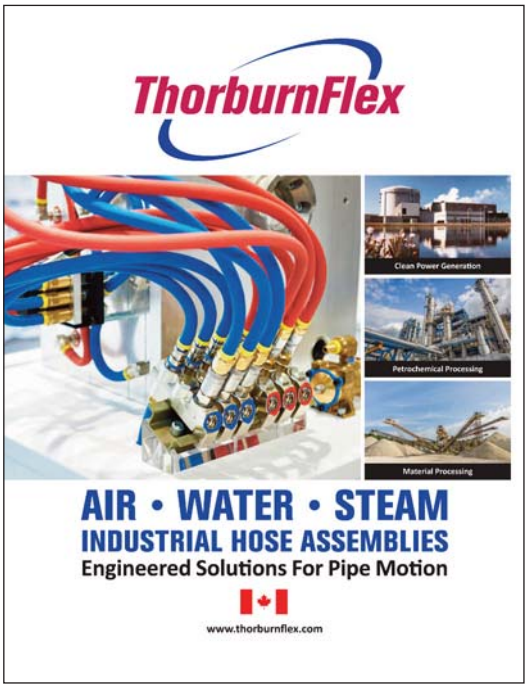
To avoid the effects of high ozone concentration, rubber hose products should not be stored near electrical equipment that may generate ozone or be stored for any lengthy period in geographical areas of known high ozone concentration. Exposure to direct or reflected sunlight — even through windows— should also be avoided. Uncovered hose should not be stored under fluorescent or mercury lamps which generate light waves harmful to rubber. Storage areas should be relatively cool and dark, and free of dampness and mildew. Items should be stored on a first-in first-out basis, since even under the best of conditions, an unusually long shelf life could deteriorate certain rubber products.

Storage After Use

After use of a hose assembly, wash thoroughly in cold water to remove any residue. Store the hose on a hose rack with good ventilation away from sunlight in a cool, dry location (Low humidity, 50-70°F). The ends of the hose assemblies should be capped.

Storage Life

It is necessary to perform a complete inspection of a hose assembly before using if it has been stored for a prolonged period as per ISO 8331. To avoid long term storage of hoses, it is recommended to use a scheduled rotation program and keep hose storage to a minimum. The maximum storage life for a hose assembly is two years.



Industrial Assemblies Catalog

Air - Water - Steam

Thorburn Flex supplies a complete range of elastomeric hose assemblies for Air, Water, and Steam (AWS) applications, in sizes from 3 mm to over 600 mm. Engineered for reliability in demanding environments—from construction, food processing, and marine, to steel mills, mining, and pulp and paper—our AWS hoses cover everything from basic utility service to high-performance applications like hydro-demolition, potable water transfer, industrial firefighting, and superheated steam. The catalogue includes a wide selection of end connections, including threaded, flanged, and quick-acting fittings, ensuring the right solution for every need.

Applicable Standards:

- ASTM D380 / D412 / D2240 – Physical properties of rubber hoses
- ISO 1403 / 6134 / 4649 – Steam and air hose performance
- EN 12115 / EN ISO 8330 – Hose assemblies for chemical and industrial use
- FDA CFR 21 (food-grade options) – For potable water and food applications
- NFPA 1961 – Fire hose construction (where applicable)

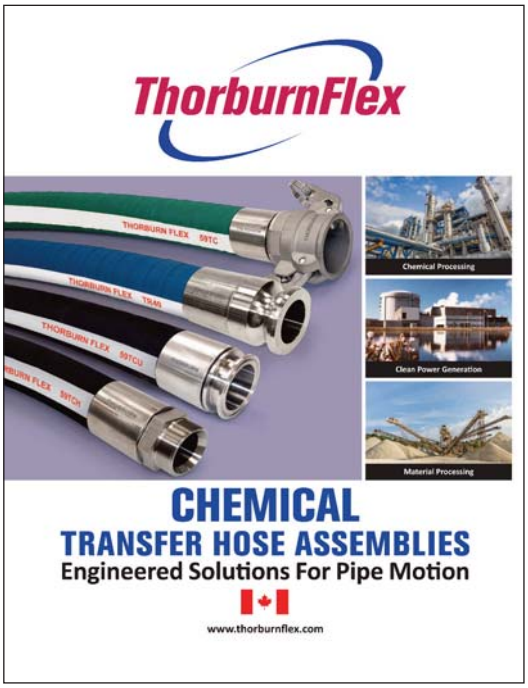
Applications

Clean Power Generation

LNG Transfer

Petro-Chemical Processing

Pulp & Paper Processing



Chemical Hose Assemblies Catalog

Thorburn's premium rubber chemical suction and discharge hose assemblies are purpose-built for full vacuum and high-pressure transfer service for the most demanding chemical, petrochemical, and industrial environments. Lightweight yet exceptionally durable and flexible, each hose assembly features advanced liner technologies — UHMWPE, XLPE, PTFE, FEP, EPDM, CSM, and FKM — delivering outstanding resistance to hundreds of aggressive chemicals and solvents, including acids, alkalis, aromatic and chlorinated hydrocarbons. Our chemical hose assemblies are equipped with Thorburn's proprietary Thor-Crimp™ 360° crimped fitting system for a secure, leak-free connection.

Applicable Standards:

- ASME B31.1, B31.3
- EN 12115
- BS 5842
- CSA B51
- ISO 10380
- ASTM D380
- NAHAD 400/2020
- CRN Registered (upon request)

Applications

Mining, Quarries & Dewatering

Material Processing

Chemical Processing

Clean Power Generation

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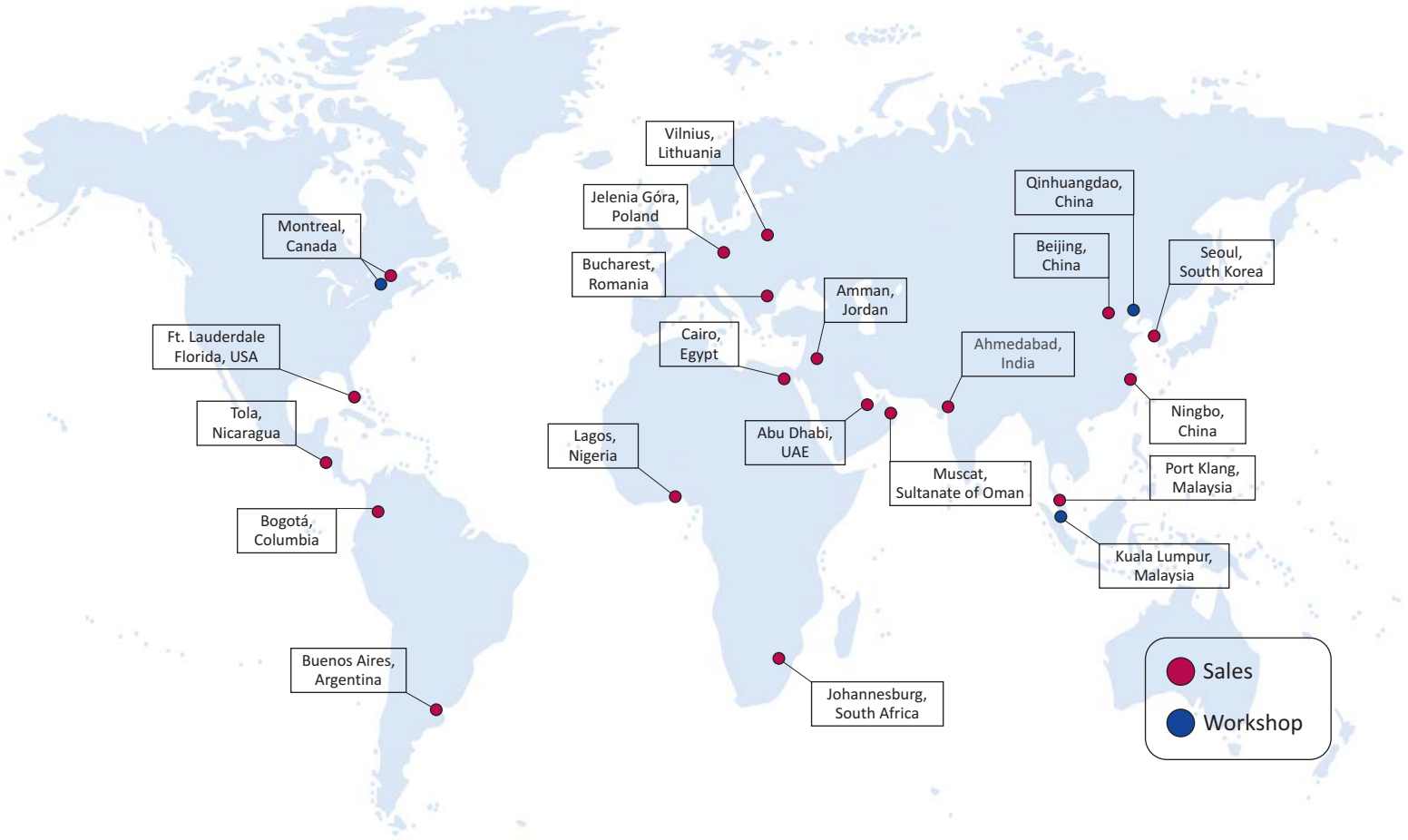
European Conformity	ISO 9001	B31.1, B31.3	ASME "NPT" Sec. III Class 1	ASME "U" Sec. VIII Div. 1	N285.0, B51 CGA CR96-001	97/23/EC Module H	UL 536

ISCIR Romania | CNCAN Romania | EN 13480-2002 | HAF 604 China | TSG China
(CRN for all Canadian Provinces)

Thorburn's Global Presence



ThorburnFlex

www.thorburnflex.com