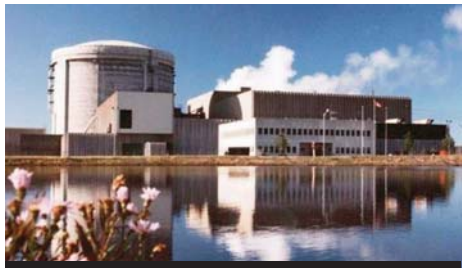
ThorburnFlex

Chemical Processing



Clean Power Generation

Material Processing

CHEMICAL
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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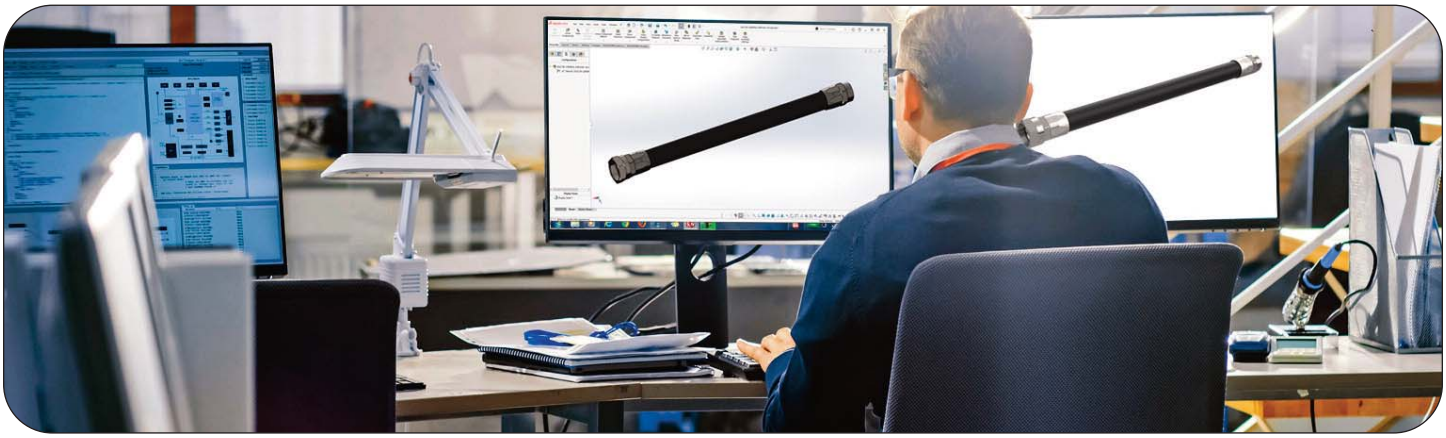
Edition 08/14/2025

Table Of Contents

Engineered Industrial Hose Assemblies



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 analyze 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)

Chemical 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

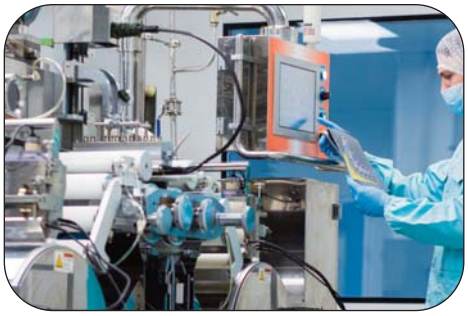
Typical Industries That Use Chemical Hose Assemblies


Petro-Chemical Plants


Material Processing


Marine & Offshore


Loading / Unloading


Pharmaceutical


Food & Beverage


Mining

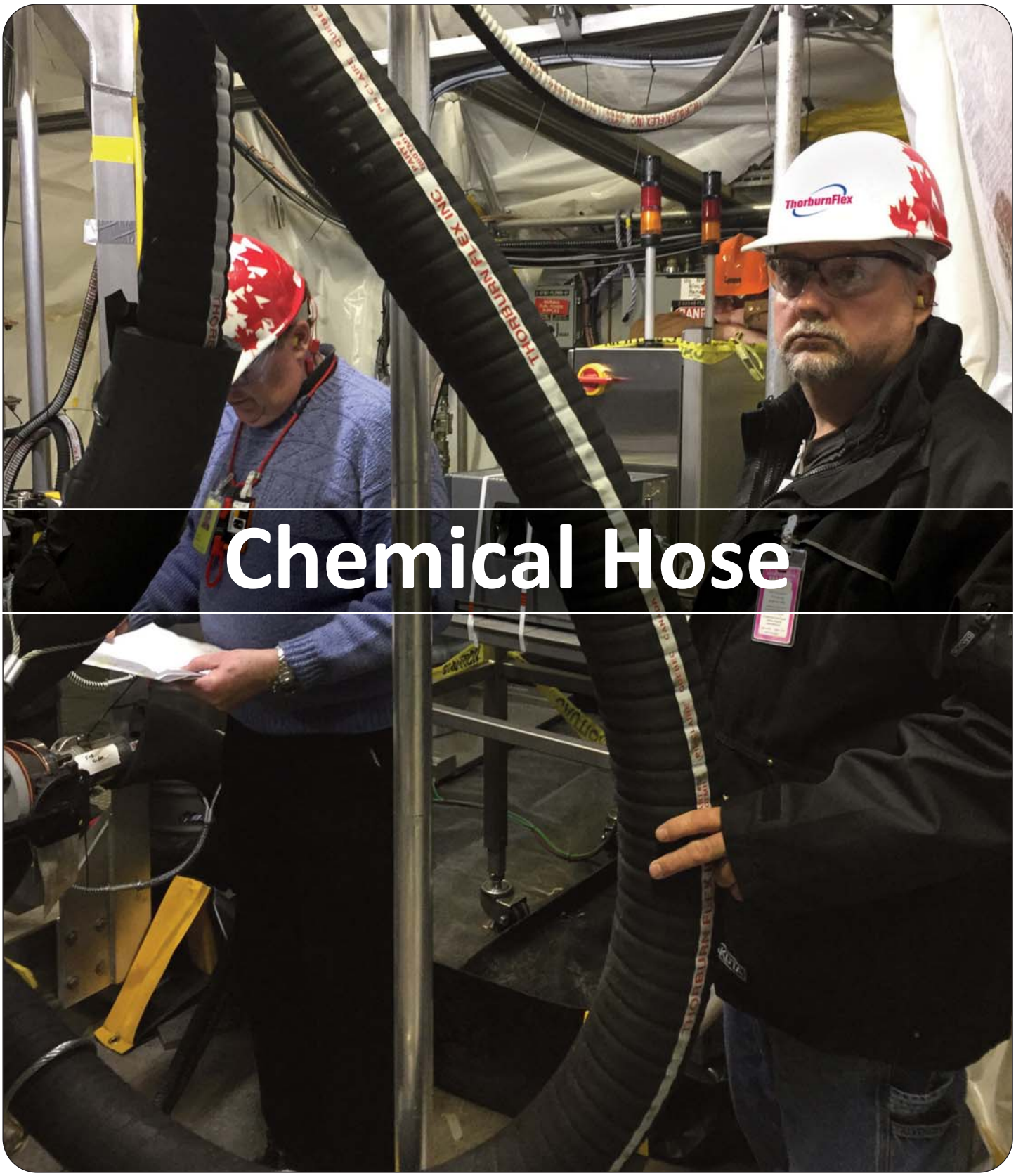

Sanitary & Waste Service


Hydro-Demolition


Agriculture


Construction Sites


Quarries



Chemical Hose

Thorburn Rubber Chemical Hose Assemblies

Thorburn's premium series of rubber chemical suction and discharge hose assemblies are engineered for performance, reliability, and ease of handling. Lightweight yet highly durable and flexible, these assemblies are designed for full vacuum and high-pressure discharge service in the most demanding environments.

Manufactured with advanced liner materials—including UHMWPE, XLPE, PTFE, FEP, EPDM,CSM, and FKM—Thorburn hoses provide exceptional chemical resistance and compatibility across hundreds of aggressive fluid transfer applications.

All assemblies feature Thorburn's proprietary 360° crimped fitting system, "Thor-Crimp™" for secure, leak-free connections. Standard end fittings are precision-machined from 316 stainless steel and supplied with Certified Mill Test Reports (CMTRs) for full material traceability upon request. For highly corrosive media, PTFE-encapsulated fittings are also available.

Each hose assembly is hydrostatically tested to 1.5 times the rated working pressure and built with a minimum 4:1 safety factor. Canadian CRN registration is available upon request for additional compliance assurance.

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)559TCU

UHMW-PE High Pressure Hose

Key Features

- Ultra High Pressure Design is reinforced with four layers of high-tensile steel wire braid to withstand extreme pressures
- UHMW-PE Tube provides outstanding chemical resistance, suitable for handling over 98% of industrial chemicals.
- Abrasion resistant liner is highly resistant to abrasion, 10 times more durable than carbon steel
- Liner is odorless, tasteless, non-toxic and FDA-Compliant - safe for food, pharmaceutical, and potable water applications.
- Built-in static wire and conductive tube prevent electrostatic build-up in high flow volatile chemical transfer applications.
- Designed for fixed installations & demanding industrial applica - tions where maximum strength and safety are required.

Thorburn Series (N)559TCU: is engineered for extreme performance, the Thorburn Series (N)559TCU features an Ultra High Molecular Weight Polyethylene (UHMWPE) tube, delivering exceptional chemical resistance—compatible with 98% of all known chemicals. What sets this hose apart is its rugged construction: reinforced with either four spiraled high-tensile steel wire layers in alternating directions for increased flex- ibility and ultra high-pressure environments.

Applications

Chemical Processing Transfer of highly aggressive acids, solvents, and caustics at ex- treme pressures in chemical plants, refineries, and offloading terminals.
Mining and Mineral Processing Transfer of high-pressure slurries or reagents with minimal risk of permeation or hose degradation.
Pharmaceutical and Food Processing Transfer of high- purity media and cleaning so- lutions (CIP/SIP) due to UHMW-PE's FDA compliance and low permeability to gases and moisture.
Pulp & Paper Industry Chemical injection and bleaching agents transferred under high pressure with resistance to aggressive chlorinated compounds.
Aerospace & Defense Critical fluid systems requiring both ultra-high pressure and chemical compatibility, such as fueling systems or decontamination units.

Construction

Tube: Transparent UHMWPE
Reinforcement: Four plies of plated high tensile spiral steel wire
Cover: Black smooth specially compounded abrasion and ozone resistant EPDM

Specifications

Temperature: -40°C (-40°F) to 82°C (180°F)
Vacuum Rating: Full
Safety Factor: 4:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)559TCU06	10	3/8	21	0.83	345	5000	1380	20000	127	5	0.82	0.55
(N)559TCU08	15	1/2	24	0.94	345	5000	1380	20000	152	6	0.94	0.63
(N)559TCU12	20	3/4	32	1.26	345	5000	1380	20000	229	9	1.60	1.08
(N)559TCU16	25	1	40	1.57	345	5000	1380	20000	305	12	1.93	1.30
(N)559TCU20	32	1 1/4	47	1.85	276	4000	1103	16000	381	15	3.02	2.03
(N)559TCU24	40	1 1/2	57	2.24	276	4000	1103	16000	457	18	3.57	2.40
(N)559TCU32	50	2	80	3.15	207	3000	827	12000	610	24	7.80	5.24
(N)559TCU48	80	3	108	4.25	207	3000	827	12000	914	36	12.0	8.10
(N)559TCU64	100	4	139	5.47	207	3000	827	12000	1219	48	17.8	12.0

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCU

UHMW-PE Medium Pressure Hose

Thorburn Series (N)59TCU: is designed for medium-pressure applications that features a premium smooth tube made of Ultra High Molecular Weight Polyethylene (UHMWPE) liner providing the safe and efficient transfer of aggressive chemicals, corrosive liquids, and solvents—handling up to 98% of known chemicals. Its highly abrasion-resistant liner offers exceptional durability—10x that of carbon steel, and 2x XLPE—making it ideal for both suction and discharge service. The liner is odorless, tasteless, non-toxic, and FDA-compliant, ensuring maximum purity and hygiene service. Unlike the 559TCU, which is built for ultra high-pressure applications with multi-wire reinforcement, the (N)59TCU is optimized for medium- pressure suction and discharge operations where chemical resistance and hygienic transfer are critical. Ideal when flexibility, cleanliness, and chemical resistance are needed.

Key Features

- UHMW-PE liner handles over 98% of all industrial chemicals, acids, and solvents—ideal for versatile plant-wide use.
- Lightweight and easier to handle than metal or high- pressure hoses, in tight spaces or in frequent movement applications.
- Suitable for both vacuum and pressure transfer operations in mobile or stationary systems.
- UHMW-PE offers high abrasion resistance for longer service life when transferring aggressive and abrasive media.
- Liner is odorless, tasteless, non-toxic and FDA-Compliant - safe for food, pharmaceutical, and potable water applications.
- Built-in static wire ensures safe use in environments with flammable or volatile chemicals
- Provides high-end chemical compatibility at a lower cost than PTFE-lined hoses.

Applications

Chemical transfer in industrial plants (acids, caustics, solvents – up to 98% of chemicals and petroleum products, loading and unloading, pumping suction & gravity flow
Food and beverage processing Dairy, juice, wine, syrup, alcohol
Pharmaceutical Cosmetic bulk transfer
Potable Water Delivery and suction
Sanitary suction and discharge in bioprocessing or clean environments
Tanker and IBC (Intermediate Bulk Container) unloading where moderate pressure is sufficient

Construction

Tube: Smooth UHMW-PE firmly bonded to a black synthetic rubber
Reinforcement: High tensile calendered fabric with a spring wire helix
Cover: Black or green smooth specially compounded EPDM

Specifications

Temperature: -40°C (-40°F) to 82°C (180°F)
Vacuum Rating: Full
Safety Factor: 4:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min.Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCU08	15	1/2	23	0.91	21	300	83	1200	51	2	0.35	0.24
(N)59TCU12	20	3/4	30	1.18	21	300	83	1200	102	4	0.52	0.35
(N)59TCU16	25	1	40	1.57	21	300	83	1200	152	6	0.90	0.60
(N)59TCU20	32	1 1/4	46	1.80	21	300	83	1200	203	8	1.19	0.80
(N)59TCU24	40	1 1/2	53	2.09	21	300	83	1200	254	10	1.61	1.08
(N)59TCU32	50	2	66	2.60	21	300	83	1200	305	12	2.07	1.39
(N)59TCU40	65	2 1/2	78	3.07	21	300	83	1200	356	14	2.82	1.89
(N)59TCU48	80	3	94	3.70	21	300	83	1200	406	16	3.53	2.37
(N)59TCU64	100	4	118	4.65	14	200	55	800	457	18	5.22	3.50
(N)59TCU96	150	6	177	6.97	10	150	41	600	508	20	8.20	5.50

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
***Not to be used with strong oxidizing agents such as nitric and chromic acids. For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCUXL

Ultra-Flexible Corrugated UHMW-PE Low Pressure Hose

Thorburn Series (N)59TCUXL: features a smooth-bore Ultra High Molecular Weight Polyethylene (UHMW-PE) tube with a lightweight, flat-corrugated cover designed for superior flexibility and kink resistance. Engineered for manual handling suction and discharge applications, this hose delivers exceptional chemical resistance while offering significantly improved maneuverability over standard smooth-cover designs. Ideal for operations requiring moderate pressure containment, frequent bending, coiling or movement by hand. Thorburn Series 59TCUXL hose sets a new standard in ease of use and operator comfort.

Key Features

- Flat corrugated cover that allows tighter bend radii and easier manual handling, especially in dynamic or confined spaces.
- Corrugated design improves structural integrity under bending, making it more resistant to kinking during frequent movement.
- Lightweight and ergonomically designed for easier drag and repositioning and ideal for transfer applications requiring frequent connection/disconnection.
- Has all the chemical resistance, abrasion durability, and FDA compliance of the 59TCU, with a lower pressure rating.
- Optimized for portable & mobile use and Preferred for truck-mounted, drum transfer, and portable skid applications where hose movement is frequent.

Applications

Chemical Transfer of acids, chemicals, solvents and petroleum products, loading and unloading, pumping suction, gravity flow or pressure discharge. Designed for manual handling in confined or mobile applications, the making it ideal for:
Portable water, Chemical tote transfer, Drum and IBC unloading, temporary or mobile tank hook-ups.

Construction

Tube: Smooth UHMW-PE firmly bonded to a green synthetic rubber
Reinforcement: High tensile calendered fabric with a double spring wire helix
Cover: Green or black corrugated specially compounded EPDM

Specifications

Temperature: -40°C (-40°F) to 82°C (180°F)
Vacuum Rating: Full
Safety Factor: 4:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min.Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCUXL16	25	1	37	1.46	10	150	41	600	100	4	0.67	0.47
(N)59TCUXL20	32	1 1/4	45	1.77	10	150	41	600	130	5	1.00	0.67
(N)59TCUXL24	40	1 1/2	51	2.01	10	150	41	600	150	6	1.19	0.80
(N)59TCUXL32	50	2	64	2.52	10	150	41	600	200	8	1.34	0.90
(N)59TCUXL40	65	2 1/2	79	3.10	10	150	41	600	250	10	2.14	1.44
(N)59TCUXL48	80	3	91	3.58	10	150	41	600	300	12	2.91	1.95
(N)59TCUXL64	100	4	118	4.64	10	150	41	600	400	16	3.70	2.48

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TC

XLPE Medium Pressure Hose

Key Features

- Utilizes a Cross-Linked Polyethylene (XLPE) inner tube offering excellent chemical resistance for a broad range of acids, solvents, and caustics.
- Good flexibility & handling that maintains a balance of chemical resistance & handling characteristics suitable for moderate-duty chemical transfer operations.
- Full Suction and Discharge Service: Like the 59TCU, the 59TC is capable of full vacuum service, targeted at applications with less demanding abrasion or chemical resistance requirements.

Thorburn Series (N)59TC: features a smooth Cross-Linked Polyethylene (XLPE) tube with excellent chemical resistance, capable of handling a wide range of acids, high aromatic hydrocarbons, alkalis, and solvents in both suction and discharge applications. The 59TC is a more economical choice for industrial chemical transfer where FDA or ultra-high purity is not required. This versatile hose reduces the need for specialized hoses across diverse chemical environments.

Applications

Chemical Processing: Handling aggressive acids, alkalis, and solvents
Bulk chemical loading/unloading: Railcars, tank trucks, barges
Storage Terminal Transfer: Pump connection lines, manifold systems
Pharmaceutical and cosmetic transfer: Where cross-contamination must be avoided
Industrial Cleaning Operations: Using strong cleaning agents
Agricultural: Herbicide and pesticide transfer
Paint and Coating Operations: Solvent-resistant transfer lines

Construction

Tube: Smooth clear Cross Linked Polyethylene bonded to a black synthetic rubber
Reinforcement: High tensile calendered fabric with a spring wire helix
Cover: Black or green smooth specially compounded EPDM

Specifications

Temperature: -40°C (-40°F) to 82°C (180°F)
Vacuum Rating: Full
Safety Factor: 4:1

Note: Thorburn's 59TC is a legacy hose that is being replaced by the more versatile 59TCU Hose.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TC08	15	1/2	23	0.91	21	300	83	1200	51	2	0.35	0.24
(N)59TC12	20	3/4	30	1.18	21	300	83	1200	102	4	0.52	0.35
(N)59TC16	25	1	40	1.57	21	300	83	1200	152	6	0.90	0.60
(N)59TC20	32	1 1/4	46	1.80	21	300	83	1200	203	8	1.19	0.80
(N)59TC24	40	1 1/2	53	2.09	21	300	83	1200	254	10	1.61	1.08
(N)59TC32	50	2	66	2.60	21	300	83	1200	305	12	2.07	1.39
(N)59TC40	65	2 1/2	78	3.07	21	300	83	1200	356	14	2.82	1.89
(N)59TC48	80	3	94	3.70	21	300	83	1200	406	16	3.53	2.37
(N)59TC64	100	4	118	4.65	14	200	55	800	457	18	5.22	3.50
(N)59TC96	150	6	177	6.97	10	150	41	600	508	20	8.20	5.50

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCXL

Ultra-Flexible Corrugated XLPE Low Pressure Hose

Thorburn Series (N)59TCXL: features a flexible, flat-corrugated construction with exceptional kink resistance—ideal for easy handling in demanding chemical transfer applications. Built with a Cross-Linked Polyethylene (XLPE) tube, it delivers broad chemical compatibility and is especially suited for high aromatic hydrocarbons acids, alkalis, and solvents. With a construction nearly identical to the 59TCUXL, the key difference lies in its XLPE liner, offering a cost-effective alternative to UHMW-PE while still maintaining excellent chemical resistance and durability. Its lightweight design and superior flexibility make it purpose-built for more demanding flexibility and handling in dynamic environments.

Key Features

- Flat corrugated cover that allows tighter bend radii and easier manual handling, especially in dynamic or confined spaces.
- Corrugated profile enhances structural strength during bending, reducing the risk of kinking and flow restriction.
- Easier to maneuver, drag, or reposition by hand - especially in portable or high-use environments like drum filling, tote transfer, or skid-mounted systems.
- Maintains the excellent broad-spectrum chemical resistance of the 59TC, using the same Cross-Linked Polyethylene tube.
- Well suited for applications where hoses are connected/disconnected or moved regularly, reducing fatigue on both the hose and the operator.

Applications

Manual Drum & Tote Transfer: Ideal for frequent repositioning by hand
Short-Run Flexible Jumpers: Where tight bends or compact routing is required
Portable Chemical Pump Connections: Easy to coil, deploy, and stow
Field Tank Sampling & Mobile Fluid Transfer Units: Where hose agility is critical
Chemical Distribution Depots: Where varied routing is needed across bays
Maintenance Operations: For flushing, cleaning, and temporary service lines

Construction

Tube: Smooth clear cross linked Polyethylene firmly bonded to a green synthetic rubber
Reinforcement: High tensile calendered fabric witha double spring wire helix
Cover: Green or black corrugated specially compounded EPDM

Specifications

Temperature: -40°C (-40°F) to 82°C (180°F)
Vacuum Rating: Full
Safety Factor: 4:1

Note: Thorburn's 59TCXL is a legacy hose that is being replaced by the more versatile 59TCUXL Hose.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCXL16	25	1	37	1.46	10	150	41	600	100	4	0.67	0.47
(N)59TCXL20	32	1 1/4	45	1.77	10	150	41	600	130	5	1.00	0.67
(N)59TCXL24	40	1 1/2	51	2.01	10	150	41	600	150	6	1.19	0.80
(N)59TCXL32	50	2	64	2.52	10	150	41	600	200	8	1.34	0.90
(N)59TCXL40	65	2 1/2	79	3.10	10	150	41	600	250	10	2.14	1.44
(N)59TCXL48	80	3	91	3.58	10	150	41	600	300	12	2.91	1.95
(N)59TCXL64	100	4	118	4.64	10	150	41	600	400	16	3.70	2.48

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCV/(N)59TCVH

FKM High-Temperature Acid & Solvent Medium Pressure Hose

Thorburn Series (N)59TCV/(N)59TCVH: is a premium chemical transfer hose specifically engineered for high-temperature service and aggressive media. Built with a fluoroelastomer (FKM) tube, it offers superior resistance to concentrated acids, high-aromatic hydrocarbons, chlorinated solvents, and oxidizing agents—making it the hose of choice for the most demanding high temperature chemical environments. Thorburn Series (N)59TCVH is designed for very high temperature applications up to 200°C. The FKM liner sets the (N)59TCVH apart by enabling: Continuous service temperatures up to 204°C (400°F), exceptional resistance to permeation and chemical attack, longer service life in harsh, high-temperature chemical applications. The (N)59TCVH is purpose-built for operations where standard UHMW-PE or XLPE hoses are not thermally suitable. They represents one of Thorburn's highest-grade solutions for extreme high temperature chemical transfer.

Key Features

- FKM inner tube provides outstanding resistance to highly aggressive chemicals, including aromatic hydrocarbons, chlorinated solvents, acids, and oils.
- (N)59TCVH handles continuous service temperatures up to +204°C (400°F), making it ideal for hot chemical transfer.
- Engineered for both full suction and discharge applications.
- Durable FKM outer cover resists weathering, chemicals, oils, and external wear.
- Incorporates a static wire and conductive tube for safe use with flammable or explosive media.
- Suitable for use with a wide spectrum of industrial solvents, acids, and oil-based chemicals where standard liners are insufficient.
- Durable multi-ply reinforcement with high-strength synthetic fabric and embedded wire helix for strength, flexibility, and pressure resistance.

Applications

- High-temperature acid unloading and transfer
- Aromatic solvent and fuel handling
- Aliphatic and Halogenated hydrocarbons
- Chlorinated hydrocarbon service
- Pharmaceutical and specialty chemical production
- Aggressive waste recovery and processing

Construction

Tube: FKM chemical and heat resistant
Reinforcement: (N)59TCV - Multi-ply high tensile calendared fabric with a high tensile spring wire helix | (N)59TCVH - Multi-ply high tensile calendared Aramid fabric with a high tensile spring wire helix
Cover: Black smooth FKM Grade A

Specifications

Temperature: (N)59TCV -40°C (-40°F) to 107°C (225°F)
(N)59TCVH -40°C (-40°F) to 204°C (400°F)
Vacuum Rating: Full
Safety Factor: 4:1

WARNING: Not suitable for ketones, acetone, esters, amines, organic acids, acetic acid, MEK, ethyl acetate and highly polar chemicals.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCV(H)08	15	1/2	23	0.91	21	300	83	1200	51	2	0.25	0.17
(N)59TCV(H)12	20	3/4	31	1.22	21	300	83	1200	102	4	0.28	0.19
(N)59TCV(H)16	25	1	40	1.56	21	300	83	1200	152	6	1.24	0.83
(N)59TCV(H)20	32	1 1/4	71	2.80	21	300	83	1200	203	8	1.48	0.99
(N)59TCV(H)24	40	1 1/2	52	2.06	21	300	83	1200	254	10	1.86	1.25
(N)59TCV(H)32	50	2	67	2.63	21	300	83	1200	305	12	2.58	1.73
(N)59TCV(H)40	65	2 1/2	83	3.25	21	300	83	1200	356	14	3.65	2.45
(N)59TCV(H)48	80	3	95	3.75	21	300	83	1200	406	16	4.41	2.96
(N)59TCV(H)64	100	4	122	4.80	14	200	55	800	457	18	7.00	4.20
(N)59TCV(H)96	150	6	176	6.94	10	150	41	600	508	20	11.61	7.79

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCVXL/(N)59TCVHXL

Ultra-Flexible Corrugated High Performance FKM Low Pressure Acid Hose

Thorburn Series (N)59TCVXL: is a lightweight, highly flexible chemical transfer hose featuring a corrugated cover and a fluoroelastomer (FKM/Viton®) tube. Designed to handle solvents, hydrocarbons, aromatic compounds, and corrosive acids, it delivers superior chemical resistance and excellent performance in elevated temperature applications. With a construction like the 59TCUXL, the key difference lies in its FKM liner, which provides enhanced compatibility with aggressive and high-aromatic media. Its corrugated design ensures easy handling, tight bend radii, and kink resistance, making it ideal for mobile and confined-space installations. For applications requiring even higher temperature resistance, Thorburn Series 59TCVHXL is available, rated up to 204°C (400°F) for continuous service. The 59TCVXL is Thorburn's premium FKM solution where both chemical compatibility, thermal resilience and flexibility are critical.

Key Features

- Corrugated FKM outer cover for enhanced flexibility, easier handling, and reduced bending stress compared to the smooth cover 59TCV.
- Corrugated design provides superior resistance to kinking, making it ideal for dynamic or tight-radius applications.
- (N)59TCVHXL maintains the same high-temperature +204°C (400°F), chemical-resistant FKM liner as the 59TCV for aggressive media.
- Easy to drag, position, and coil - ideal for portable systems, drum handling, and field operations requiring frequent movement.
- Offers the same pressure & suction performance as 59TCV, with added handling advantages and reduced pressure rating.
- Includes built-in static wire for safe transfer of flammable or volatile chemicals.

Applications

- High-aromatic chemical, aliphatic and solvent transfer
- Chlorinated hydrocarbon and Halogenated hydrocarbons handling
- Fuel blending and loading stations
- High-temperature acid and waste recovery lines
- Flexible connections in process or portable systems
- Animal and vegetable oils transfer Service

Construction

Tube: FKM chemical and heat resistant
Reinforcement:
(N)59TCVXL - multi-ply high tensile calendared fabric with a high tensile spring wire helix | (N)59TCVHXL - multi-ply high tensile calendared Aramid fabric with a high tensile spring wire helix
Cover: Black corrugated FKM Grade A

Specifications

Temperature: (N)59TCVXL -40°C (-40°F) to 107°C (225°F)
(N)59TCVHXL -40°C (-40°F) to 204°C (400°F)
Vacuum Rating: Full
Safety Factor: 4:1

WARNING: Not suitable for ketones, acetone, esters, amines, organic acids, acetic

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCV(H)XL16	25	1	37	1.46	10	150	41	600	100	4	0.71	0.48
(N)59TCV(H)XL20	32	1 1/4	45	1.77	10	150	41	600	130	5	0.89	0.59
(N)59TCV(H)XL24	40	1 1/2	51	2.01	10	150	41	600	150	6	1.03	0.69
(N)59TCV(H)XL32	50	2	64	2.52	10	150	41	600	200	8	1.67	1.10
(N)59TCV(H)XL40	65	2 1/2	79	3.10	10	150	41	600	250	10	2.17	1.46
(N)59TCV(H)XL48	80	3	91	3.58	10	150	41	600	300	12	2.87	1.93
(N)59TCV(H)XL64	100	4	118	4.64	10	150	41	600	400	16	4.43	2.98

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)TR440/441

Smooth Bore PTFE High Pressure Transfer Hose

Key Features

- Broader chemical compatibility than UHMW-PE (used in 559TCU)
- Smoother flow with lower pressure drop and easier cleaning
- Non-contaminating, ideal for ultra-pure or corrosive applications
- Static-safe option (TR441) for explosive-risk environments

Thorburn Series TR440/441 is engineered for high-pressure, full-flow chemical transfer where maximum flexibility, light weight, and chemical purity are essential. Featuring a smooth bore PTFE or FEP liner, this hose is ideal for extremely aggressive media such as sulfuric acid, hydrochloric acid, and solvents in demanding applications. While the construction mirrors the robust reinforcement of the 559TCU, the TR440/441 features a PTFE core, offering superior chemical inertness, non-stick properties, and exceptional resistance to heat, permeation, and aging. The TR440/441 series is Thorburn's high-performance alternative to UHMW-PE hoses—offering the highest level of chemical resistance with a higher temperature with the pressure capability and flexibility required for today's most demanding applications.

Applications

- High-pressure acid and solvent transfer
- Chemical blending and dosing systems
- High-purity processing lines
- Flammable media transfer requiring static dissipation

Construction

Tube: TR440 - Smooth unpigmented PTFE or FEP firmly bonded to synthetic rubber.
TR441 - Smooth PTFE with added antistatic conductive carbon black.
Reinforcement: Two steel wire braids or four ply steel wire
Cover: Black smooth specially compounded abrasion and ozone resistant EPDM

Specifications

Temperature: -55°C (-67°F) to 150°C (300°F)
Vacuum Rating: Full
Safety Factor: 4:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)TR440(441)06	10	3/8	21	0.83	345	5000	138	20000	127	5	0.82	0.55
(N)TR440(441)08	15	1/2	24	0.94	345	5000	138	20000	152	6	0.94	0.63
(N)TR440(441)12	20	3/4	32	1.26	345	5000	138	20000	229	9	1.60	1.08
(N)TR440(441)16	25	1	40	1.57	345	5000	138	20000	305	12	1.93	1.30
(N)TR440(441)20	32	1 1/4	47	1.85	276	4000	110	16000	381	15	3.02	2.03
(N)TR440(441)24	40	1 1/2	57	2.24	276	4000	110	16000	457	18	3.57	2.40
(N)TR440(441)32	50	2	80	3.15	207	3000	83	12000	610	24	7.80	5.24
(N)TR440(441)48	80	3	108	4.25	207	3000	83	12000	914	36	12.0	8.10
(N)TR440(441)64	100	4	139	5.47	207	3000	83	12000	1219	48	17.8	12.0

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)TR40/41

Smooth Bore PTFE Medium Pressure Transfer Hose

Thorburn Series TR40/41 is engineered for full-flow, high-purity chemical transfer where maximum flexibility, minimum weight, and exceptional chemical resistance are essential. Featuring a smooth bore PTFE or FEP inner core, the hose is ideal for handling caustic, corrosive, and ultra-pure media without risk of contamination or degradation. The TR40/41 series represents Thorburn's most advanced chemical hose solution—combining chemical inertness, purity, safety, and performance in a lightweight, highly flexible package. Thorburn's TR40 model is jacketed with a durable EPDM-blend cover for enhanced flexibility, superior abrasion resistance, and reliable handling. Thorburn's TR41 version incorporates 15% carbon black in the PTFE core for electrical conductivity, protecting against static charge buildup and ensuring safe performance in volatile environments.

Key Features

- Exceptional chemical inertness compatible with virtually all aggressive media
- Ultra-low friction smooth bore tube ensures minimal pressure drop and easy cleaning
- Non-aging, non-stick core resists deterioration, cracking and contamination
- Extended service life engineered for demanding, long-term use

Applications

- High-purity chemical processing
- Pharmaceutical and biotech applications
- Solvent and corrosive chemicals transfer lines
- Flammable liquid handling
- Clean and Sterilize in place (CIP/SIP) solutions
- Eliminates the risk of bacteria and leaching in plasma transfer.

Construction

Tube: **TR40** - Smooth unpigmented PTFE or FEP firmly bonded to synthetic rubber.
TR41 - Smooth PTFE with add ed antistatic conductive carbon black.
Reinforcement: Multiple layers of high tensile calendared polyester and spring steel helix wire
Cover: Blue smooth specially compounded EPDM

Specifications

Temperature: -51°C (-60°F) to 150°C (300°F)
Vacuum Rating: Full
Safety Factor: 4:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)TR40(41)08	15	1/2	25	0.97	35	500	138	2000	76	3	0.52	0.35
(N)TR40(41)12	20	3/4	32	1.27	35	500	138	2000	102	4	0.92	0.62
(N)TR40(41)16	25	1	38	1.48	31	450	124	1800	178	7	1.15	0.75
(N)TR40(41)20	32	1 1/4	45	1.75	28	400	110	1600	229	9	1.46	0.98
(N)TR40(41)24	40	1 1/2	52	2.04	24	350	97	1400	254	10	1.79	1.20
(N)TR40(41)32	50	2	65	2.54	21	300	83	1200	356	14	2.23	1.50
(N)TR40(41)40	65	2 1/2	77	3.04	17	250	69	1000	457	18	3.50	2.35
(N)TR40(41)48	80	3	97	3.81	10	150	55	800	533	21	3.72	2.50
(N)TR40(41)64	100	4	127	5.00	10	150	55	800	990	39	5.21	3.50
(N)TR40(41)96	150	6	181	7.13	7	100	48	700	1473	58	7.07	4.75

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCH

CSM Lined High Temperature Medium Pressure Hose

Key Features

- Excellent resistance to acids, alcohols, caustics, and general chemicals.
- Superior weathering and ozone resistance and ideal for outdoor use.
- 59TCH delivers a balanced combination of chemical resistance, heat tolerance, and durability, making it an ideal solution for facilities seeking performance without the higher cost of premium fluoroelastomer-lined hoses.

Thorburn Series (N)59TCH: is a versatile, high-temperature suction and discharge hose designed for a broad spectrum of industrial chemical transfer applications. Featuring a CSM (Chlorosulfonated Polyethylene) liner, the hose delivers excellent resistance to heat, weathering, ozone, and a wide range of aggressive chemicals, making it a reliable choice for demanding environments. Built with a rugged, all-weather, abrasion-resistant outer cover, Thorburn Series 59TCH is well-suited for both indoor and outdoor operations. Its construction is similar to Series 59TCV, but with a CSM tube, offering an economical alternative while still providing robust chemical resistance.

Applications

- Petrochemical transfer
- Tank truck and railcar unloading
- Industrial chemical handling
- Acid and alcohol transfer
- General-purpose plant service

Construction

Tube: Seamless CSM
Reinforcement: Multiple plies of polyester with spring helix
Cover: Black smooth weather and chemical resistant CSM

Specifications

Temperature: -30°C (-22°F) to 107°C (225°F)
Vacuum Rating: Full
Safety Factor: 4:1

WARNING: Not suitable for ketones, esters, chlorinated or oxidizing acids, nitro compounds, and aromatic hydrocarbons.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCH08	15	1/2	23	0.91	21	300	83	1200	51	2	0.25	0.17
(N)59TCH12	20	3/4	31	1.22	21	300	83	1200	102	4	0.28	0.19
(N)59TCH16	25	1	40	1.56	21	300	83	1200	152	6	1.24	0.83
(N)59TCH20	32	1 1/4	71	2.80	21	300	83	1200	203	8	1.48	0.99
(N)59TCH24	40	1 1/2	52	2.06	21	300	83	1200	254	10	1.86	1.25
(N)59TCH32	50	2	67	2.63	21	300	83	1200	305	12	2.58	1.73
(N)59TCH40	65	2 1/2	83	3.25	21	300	83	1200	356	14	3.65	2.45
(N)59TCH48	80	3	95	3.75	21	300	83	1200	406	16	4.41	2.96
(N)59TCH64	100	4	122	4.80	14	200	55	800	457	18	7.00	4.20
(N)59TCH96	150	6	176	6.94	10	150	41	600	508	20	11.61	7.79

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCHXL

Ultra-Flexible Corrugated CSM Lined Low Pressure Hose

Thorburn Series (N)59TCHXL: is a lightweight, highly flexible chemical suction and discharge hose designed for multi-purpose, high-temperature service. Featuring a corrugated construction for superior flexibility and handling, it is lined with CSM (Chlorosulfonated Polyethylene), offering reliable resistance to acids, caustics, solvents, and alcohols, along with excellent weathering, ozone, and abrasion resistance. While structurally similar to Thorburn Series 59TCVXL, the 59TCHXL uses a CSM liner instead of FKM, providing a cost-effective solution for less aggressive but still demanding chemical environments.

Key Features

- Flexible corrugated design that is easy to handle and maneuver in tight spaces.
- CSM liner that is highly resistant to a broad range of chemicals, heat, and weather exposure.
- Lightweight and durable that is ideal for mobile or outdoor chemical handling.

Applications

- General-purpose petrochemical transfer
- Suction and discharge of acids and caustics
- Tank farm and bulk chemical loading
- Outdoor transfer where ozone and UV resistance are essential

Construction

Tube: Seamless CSM
Reinforcement: Multiple plies of polyester with a double spring wire helix
Cover: Black corrugated weather and chemical resistant CSM

Specifications

Temperature: -40°C (-40°F) to 107°C (225°F)
Vacuum Rating: Full
Safety Factor: 4:1

WARNING: Not suitable for ketones, esters, chlorinated or oxidizing acids, nitro compounds, and aromatic hydrocarbons.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCHXL16	25	1	36	1.4	10	150	41	600	100	4	0.71	0.48
(N)59TCHXL20	32	1 1/4	44	1.7	10	150	41	600	130	5	0.89	0.59
(N)59TCHXL24	40	1 1/2	48	1.9	10	150	41	600	150	6	1.03	0.69
(N)59TCHXL32	50	2	61	2.4	10	150	41	600	200	8	1.67	1.10
(N)59TCHXL40	65	2 1/2	74	3.0	10	150	41	600	250	10	2.17	1.46
(N)59TCHXL48	80	3	89	3.5	10	150	41	600	300	12	2.87	1.93
(N)59TCHXL64	100	4	117	4.6	10	150	41	600	400	16	4.43	2.98

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCE

EPDM Lined Chemical & Hot Air Medium Pressure Hose

Thorburn Series (N)59TCE: is a high-quality EPDM-lined hose designed for dual-purpose service: reliable chemical transfer and high-temperature hot air handling. Its construction mirrors the rugged design of the 59TCH, but features both an EPDM tube and EPDM cover, offering excellent heat, ozone, abrasion, and chemical resistance. Purpose-built for both suction and discharge, this hose performs exceptionally well in liquid waste, oxidizer transfer, and hot blower applications, while maintaining long-term durability in harsh operating environments.

Key Features

- EPDM tube for strong resistance to oxidizers, alcohols, ketones, and alkaline chemicals.
- EPDM cover provides outstanding resistance to heat, weathering, and abrasion.
- Withstands elevated temperatures and is ideal for dry bulk unloading and hot air blower lines.
- Reinforced for reliable performance in both stationary and mobile transfer systems.

Applications

- Liquid waste and effluent transfer
- High-temperature blower and dry bulk discharge
- Tank truck chemical loading/unloading
- Transfer of alcohols, vegetable and animal fats, and strong oxidizing agents
- Transfer of ketones, MEK and alkaline chemicals

Construction

Tube: Black acid resistant EPDM
Reinforcement: High tensile calendered fabric with embedded helix wire
Cover: Black smooth weather and chemical resistant EPDM

Specifications

Temperature: -40°C (-40°F) to 107°C (225F)
Vacuum Rating: Full
Safety Factor: 4:1

WARNING: Not suitable for Aromatic hydrocarbons, petroleum solvents, and mineral oils.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCE08	15	1/2	23	0.91	21	300	83	1200	51	2	0.25	0.17
(N)59TCE12	20	3/4	31	1.22	21	300	83	1200	102	4	0.28	0.19
(N)59TCE16	25	1	40	1.56	21	300	83	1200	152	6	1.24	0.83
(N)59TCE20	32	1 1/4	71	2.80	21	300	83	1200	203	8	1.48	0.99
(N)59TCE24	40	1 1/2	52	2.06	21	300	83	1200	254	10	1.86	1.25
(N)59TCE32	50	2	67	2.63	21	300	83	1200	305	12	2.58	1.73
(N)59TCE40	65	2 1/2	83	3.25	21	300	83	1200	356	14	3.65	2.45
(N)59TCE48	80	3	95	3.75	21	300	83	1200	406	16	4.41	2.96
(N)59TCE64	100	4	122	4.80	14	200	55	800	457	18	7.00	4.20
(N)59TCE96	150	6	176	6.94	10	150	41	600	508	20	11.61	7.79

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)59TCEXL

Ultra-Flexible Corrugated EPDM Chemical & Hot Air Low Pressure Hose

Thorburn Series (N)59TCEXL: is a lightweight, highly flexible EPDM-lined hose designed for both chemical transfer and high-temperature blower service. Built with a corrugated construction for superior handling and kink resistance, it offers excellent performance in suction and discharge applications. Constructed similarly to the 59TCHXL, the 59TCEXL features an EPDM tube and cover, providing enhanced resistance to heat, oxidation, ozone, and mild chemicals—making it a versatile, dual-purpose solution.

Key Features

- EPDM liner resists strong oxidizers, ketones, alcohols, and organic waste.
- Corrugated cover ensures superior flexibility for tight routing and frequent handling.
- All-weather EPDM cover protects against abrasion, UV, and high temperatures.
- Stands out as an all-purpose hose offering the flexibility of a corrugated design with the temperature and chemical resistance of EPDM, making it ideal for operations requiring multi-functional performance in a single hose.

Applications

- Liquid waste and sludge transfer
- Oxidizing chemical suction and discharge
- Vegetable and animal fat handling
- High-temperature dry bulk blower service
- Tank truck and railcar chemical loading
- Transfer of ketones, MEK and alkaline chemicals

Construction

Tube: Black acid resistant EPDM
Reinforcement: High tensile calendered fabric with a double spring wire helix
Cover: Black corrugated weather and chemical resistant EPDM

Specifications

Temperature: -40°C (-40°F) to 107°C (225F)
Vacuum Rating: Full
Safety Factor: 4:1

WARNING: Not suitable for Aromatic hydrocarbons, petroleum solvents, and mineral oils.

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)59TCEXL16	25	1	36	1.4	10	150	41	600	100	4	0.71	0.48
(N)59TCEXL20	32	1 1/4	44	1.7	10	150	41	600	130	5	0.89	0.59
(N)59TCEXL24	40	1 1/2	48	1.9	10	150	41	600	150	6	1.03	0.69
(N)59TCEXL32	50	2	61	2.4	10	150	41	600	200	8	1.67	1.10
(N)59TCEXL40	65	2 1/2	74	3.0	10	150	41	600	250	10	2.17	1.46
(N)59TCEXL48	80	3	89	3.5	10	150	41	600	300	12	2.87	1.93
(N)59TCEXL64	100	4	117	4.6	10	150	41	600	400	16	4.43	2.98

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Thorburn Rubber Chemical Hose Assemblies

Thorburn Series (N)120SD

Ultra-Flexible Lightweight EPDM Suction Hose for Ambient Temperature Vacuum Service with PVC Helix

Thorburn Series (N)120SD: is Thorburn's lightest and most flexible EPDM suction hose, specifically engineered for applications where ease of handling and cost-effectiveness are essential. Designed for low-pressure, primarily suction service, this smooth bore hose features an external PVC helix that enhances drag resistance, making it ideal for dragging over rough surfaces in extended lengths. Optimized for non-critical temperature operations, the (N)120SD is not intended for high-heat or high-pressure environments, clearly setting it apart from Thorburn's higher-spec chemical and pressure-rated hose lines. Its lightweight and corrugated-flex design provide exceptional maneuverability in the field.

Key Features

- Ultra-lightweight EPDM construction for unmatched flexibility and handling ease
- Smooth bore for efficient flow in suction applications
- External PVC helix for abrasion resistance and easy dragging
- Limited maximum temperature rating, suitable for ambient and moderate conditions
- Primarily for suction and low-pressure transfer applications
- Most cost-effective solution in Thorburn's chemical and industrial hose lineup

Applications

- Construction site dewatering
- Liquid waste and septic handling
- Cesspool cleaning
- Agricultural irrigation and fluid transfer
- Marine utility suction service
- Light-duty dry or liquid chemical suction that are compatible with EPDM and PVC

Construction

Tube: Smooth acid resistant EPDM
Reinforcement: High Tensile fabric and External polyethylene helix
Cover: Green Polyethylene helix and specially formulated rubber.

Specifications

Temperature: -40°C (-40°F) to 60°C (140°F)
Vacuum Rating: Full @ 40°C (104°F)
Safety Factor: 4:1

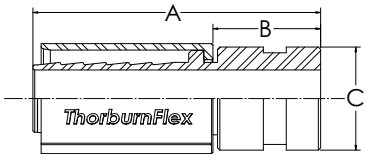
Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
(N)120SD16	25	1	34	1.34	3.5	50	13.9	200	51	2	0.34	0.23
(N)120SD20	32	1 1/4	43	1.70	3.5	50	13.9	200	76	3	0.51	0.34
(N)120SD24	40	1 1/2	51	2.00	3.5	50	13.9	200	76	3	0.60	0.40
(N)120SD32	50	2	64	2.50	3.5	50	13.9	200	127	5	1.00	0.67
(N)120SD40	65	2 1/2	79	3.10	3.5	50	13.9	200	152	6	1.37	0.92
(N)120SD48	80	3	91	3.60	2.8	40	11.0	160	178	7	1.67	1.10
(N)120SD64	100	4	119	4.70	2.4	35	9.7	140	279	11	2.74	1.84
(N)120SD96	150	6	175	6.90	1.4	20	5.5	80	508	20	4.57	3.07

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart (Pg 85)**

Crimp End Fittings

Thorburn Crimp End Fittings

Series VC | Victaulic Couplings

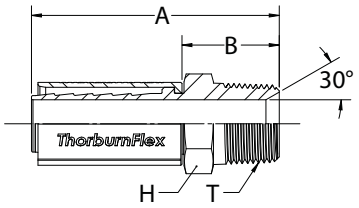


Part Number	Nominal Hose I.D.		Fitting Size		A		B - Cutoff Allowance		C O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08VC	1/2	12	1/2	12	4.50	114	3.00	75	1.26	32
TR40-12-12VC	3/4	20	3/4	20	4.75	121	3.00	75	1.26	32
TR40-16-16VC	1	25	1	25	5.25	133	3.50	89	1.63	41
TR40-24-24VC	1 1/2	40	1 1/2	40	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 Crimp End Fittings

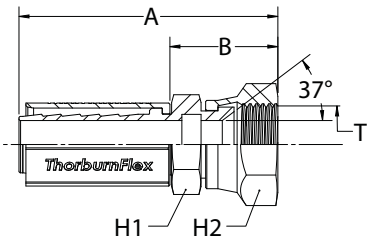
Series MP | Male Pipe NPT Rigid



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
TR40-04-04MP	1/4	6	1/4	6	1/4-18	2.13	54	0.94	24	0.56
TR40-06-06MP	3/8	10	3/8	10	3/8-18	2.25	57	1.11	28	0.69
TR40-08-08MP	1/2	12	1/2	12	1/2-14	2.91	74	1.48	37	0.88
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

Series FJX | Female JIC 37° Swivel

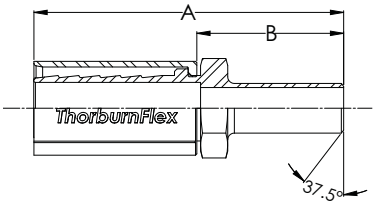


Part Number	Nominal Hose I.D.		Fitting Size		Thread Size	A		B - Cutoff Allowance		H2 Hex	H1 Hex
	Inch	mm	Inch	mm		Inch	mm	Inch	mm	Inch	Inch
TR40-04-04FJX	1/4	6	1/4	6	7/16-20	2.13	54	1.04	26	0.33	0.56
TR40-06-06FJX	3/8	10	3/8	10	9/16-18	2.25	57	1.12	28	0.75	0.75
TR40-08-08FJX	1/2	12	1/2	12	3/4-16	2.76	70	1.32	34	0.69	0.88
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

Thorburn Crimp End Fittings

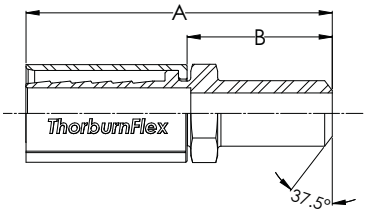
Series BWT | Butt Weld Tube



Part Number	Nominal Hose I.D.		Tube O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08BWT	1/2	12	1/2	12	3.75	95	1.50	38
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

Series BWP | Butt Weld Pipe

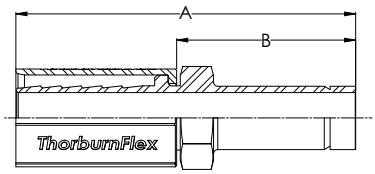


Part Number	Nominal Hose I.D.		Pipe O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08BWP	1/2	12	0.9	23	3.75	95	1.50	38
TR40-12-12BWP	3/4	20	1.1	28	4.00	100	1.70	43
TR40-16-16BWP	1	25	1.3	33	4.25	108	1.70	43
TR40-24-24BWP	1 1/2	40	1.9	48	4.50	114	2.70	69
TR40-32-32BWP	2	50	2.4	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

Thorburn Crimp End Fittings

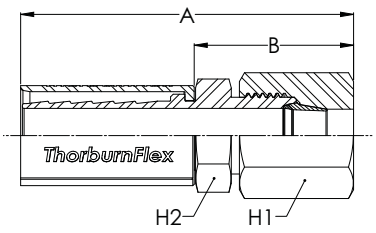
Series T | Tube Stub



Part Number	Nominal Hose I.D.		Tube O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-04-04T	1/4	6	1/4	6	1.96	49	0.80	20
TR40-06-06T	3/8	10	3/8	10	2.42	61	1.22	31
TR40-08-08T	1/2	12	1/2	12	2.91	74	1.44	37
TR40-12-12T	3/4	20	3/4	20	3.53	90	1.84	47
TR40-16-16T	1	25	1	25	3.78	96	1.94	49
TR40-24-24T	1 1/2	40	1 1/2	40	5.22	133	2.53	64
TR40-32-32T	2	50	2	50	6.82	173	3.26	83

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

Series TC | Swagelok™ Compatible Tube Fitting With Nut & Ferrule



Part Number	Nominal Hose I.D.		Tube O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-04-04TC	1/4	6	1/4	6	2.02	51	0.82	21
TR40-06-06TC	3/8	10	3/8	10	2.48	63	1.28	33
TR40-08-08TC	1/2	12	1/2	12	2.81	71	1.34	34
TR40-12-12TC	3/4	20	3/4	20	3.44	87	1.75	44
TR40-16-16TC	1	25	1	25	3.61	92	1.92	49
TR40-24-24TC	1 1/2	40	1 1/2	40	5.12	130	2.43	62
TR40-32-32TC	2	50	2	50	6.72	171	3.16	80

Materials: 316 Stainless Steel. Material ordering codes are found on Page 69
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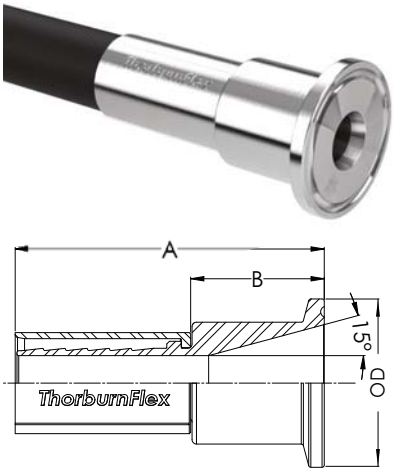
Thorburn Crimp End Fittings

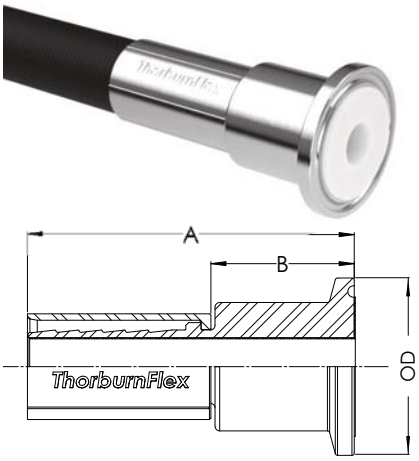
Series TC | Tri-Clamp Sanitary Flange



Part Number	Nominal Hose I.D.		Nominal Flange Size		A		B - Cutoff Allowance		Flange I.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08STC	1/2	12	1/2	12	2.3	58	1.25	32	0.88	22	1.98	50.5
TR40-12-12STC	3/4	20	3/4	20	2.3	58	1.25	32	0.88	22	1.98	50.5
TR40-16-16STC	1	25	1	25	2.3	58	1.25	32	0.88	22	1.98	50.5
TR40-24-24STC	1 1/2	40	1 1/2	40	2.5	64	1.25	32	1.39	35	1.98	50.5
TR40-32-32STC	2	50	2	50	2.6	66	1.25	32	1.87	47	2.52	64
TR40-48-48STC	3	75	3	75	2.9	74	1.25	32	2.87	73	3.58	91
TR40-64-64STC	4	100	4	100	3.5	89	1.25	32	3.83	97	4.68	119

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

Series STCE | Tri-Clamp Sanitary Flange PTFE Encapsulated



Part Number	Nominal Hose I.D.		Nominal Flange Size		A		B - Cutoff Allowance		Flange I.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08STCE	1/2	12	1/2	12	2.3	58	1.25	32	0.88	22	1.98	50.5
TR40-12-12STCE	3/4	20	3/4	20	2.3	58	1.25	32	0.88	22	1.98	50.5
TR40-16-16STCE	1	25	1	25	2.70	69	1.25	32	0.88	22	1.98	50.5
TR40-24-24STCE	1 1/2	40	1 1/2	40	3.04	77	1.25	32	1.39	35	1.98	50.5
TR40-32-32STCE	2	50	2	50	3.23	82	1.25	32	1.87	47	2.52	64
TR40-48-48STCE	3	75	3	75	4.65	118	1.25	32	2.87	73	3.58	91
TR40-64-64STCE	4	100	4	100	5.09	129	1.25	32	3.83	97	4.68	119

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

Series TCDC | Tapered Tri-Clamp Dust Caps

Part Number	Nominal Hose I.D.	
	Inch	mm
TCDC-08-P-X	1/2	13
TCDC-12-P-X	3/4	19
TCDC-16-P-X	1	25
TCDC-24-P-X	1 1/2	38

Part Number	Nominal Hose I.D.	
	Inch	mm
TCDC-32-P-X	2	51
TCDC-48-P-X	3	76
TCDC-64-P-X	4	102

X = Colors - Red (R), Blue (B), Grey (G), Yellow (Y)

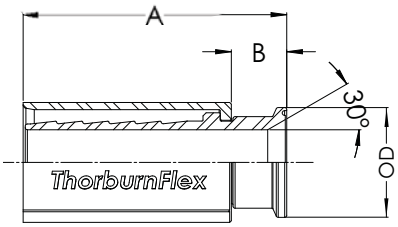
Protect sanitized pipelines and flow equipment from dust, insects, and contamination with snap-on style end dust caps. Made from durable polypropylene, they ensure system integrity while supporting color-coded facility programs to reduce cross-contamination and improve organization.

Sizes 1/2" and 3/4":
Colors: Red, Blue, Grey, Yellow
Chain: No Chain

Sizes 1", 1 1/2", 2", 3", 4":
Colors: Red, Blue, Grey, Yellow
Chain: Optional (add suffix "CH" at the end of the part number).

Thorburn Crimp End Fittings

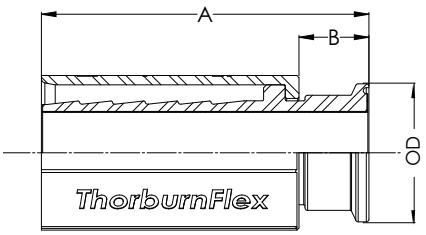
Series MSC | Mini Sanitary Flange



Part Number	Nominal Hose I.D.		Nominal Flange Size		A		B - Cutoff Allowance		Flange I.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08MSC	1/2	12	1/2	12	3.07	78	1.25	32	0.38	9.7	0.98	25
TR40-12-12MSC	3/4	20	3/4	20	3.19	81	1.25	32	0.63	16	0.98	25

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

Series MSCE | Mini Sanitary Flange PTFE Encapsulated

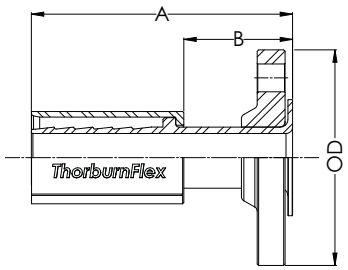


Part Number	Nominal Hose I.D.		Nominal Flange Size		A		B - Cutoff Allowance		Flange I.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08MSCE	1/2	12	1/2	12	3.07	78	1.25	32	0.38	9.7	0.98	25
TR40-12-12MSCE	3/4	20	3/4	20	3.19	81	1.25	32	0.63	16	0.98	25

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

Thorburn Crimp End Fittings

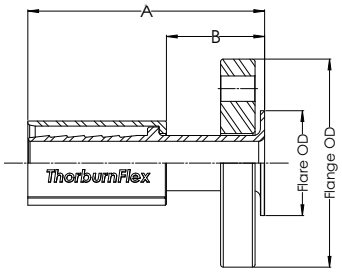
Series LF | Swivel Flange 150 lbs



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
TR40-08-08LF	1/2	12	2.9	74	1.40	36	4	2.38	1.37	34.9	3.50	89
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

Series LFPN | Swivel Flange PN10/PN16

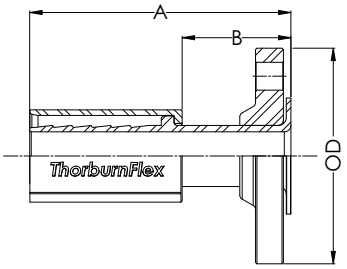


Part Number	Nominal Flange Size		A		B - Cutoff Allowance		Bolt Holes	Bolt Circle	Stub Flare O.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	#	Inch	Inch	mm	Inch	mm
TR40-08-08LFPN	1/2	12	2.9	74	1.40	36	4	2.56	1.77	45	3.74	95
TR40-12-12LFPN	3/4	20	3.1	79	1.50	38	4	2.95	2.28	58	4.13	105
TR40-16-16LFPN	1	25	3.4	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).

Thorburn Crimp End Fittings

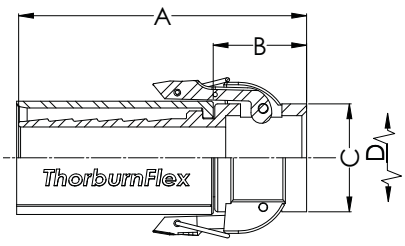
Series FL150E | Swivel Flange 150 lbs PTFE Encapsulated



Part Number	Nominal Hose I.D.		Nominal Flange Size		A		B - Cutoff Allowance		Bolt Circle		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08FL150E	1/2	12	1/2	12	3.1	79	1.3	33	2.4	61	3.5	89
TR40-12-12FL150E	3/4	20	3/4	20	3.2	81	1.4	36	2.8	71	3.9	99
TR40-16-16FL150E	1	25	1	25	3.4	86	1.5	38	3.1	79	4.3	109
TR40-20-20FL150E	1 1/4	30	1 1/4	30	3.5	89	1.5	38	3.5	89	4.6	117
TR40-24-24FL150E	1 1/4	40	1 1/4	40	3.7	94	1.6	41	3.9	99	5.0	127
TR40-32-32FL150E	2	50	2	50	4.1	104	1.8	46	4.8	122	6.0	152
TR40-48-48FL150E	3	75	3	75	5.6	142	2.5	64	6	152	7.5	191
TR40-64-64FL150E	4	100	4	100	6.2	157	3	76	7.5	191	9	229
TR40-96-96FL150E	6	150	6	150	7.5	191	4	102	9.5	241	11	279

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

Series C | Female “Type C” Cam & Groove Couplings

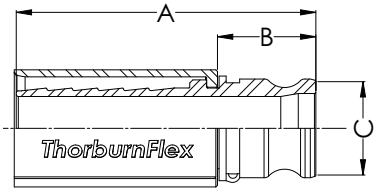


Part Number	Nominal Hose I.D.		Fitting Size		A		B Cutoff Allowance		C O.D.		D - Ext Cam Arms	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08C	1/2	12	1/2	12	4.00	100	2.50	64	2.11	54	4.51	115
TR40-12-12C	3/4	20	3/4	20	4.25	108	2.50	64	2.11	54	4.51	115
TR40-16-16C	1	25	1	25	4.75	121	3.00	75	2.44	62	5.10	130
TR40-24-24C	1 1/2	40	1 1/2	40	6.25	159	3.50	89	3.56	90	7.16	182
TR40-32-32C	2	50	2	50	7.50	191	4.00	100	3.94	100	7.54	192
TR40-48-48C	3	75	3	75	8.00	202	4.50	114	5.46	139	9.56	243
TR40-64-64C	4	100	4	100	8.25	210	4.75	121	6.56	167	10.56	271
TR40-96-96C	6	150	6	150	10.25	260	6.00	152	10.16	258	16.26	413

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

Thorburn Crimp End Fittings

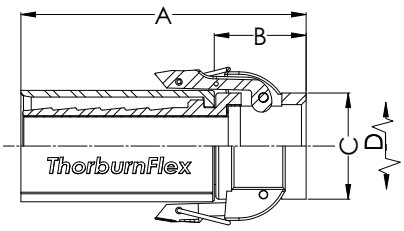
Series E | Male "Type E" Camlock Couplings



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
TR40-08-08E	1/2	12	1/2	12	4.50	114	3.00	75	1.26	32
TR40-12-12E	3/4	20	3/4	20	4.75	121	3.00	75	1.26	32
TR40-16-16E	1	25	1	25	5.25	133	3.50	89	1.63	41
TR40-24-24E	1 1/2	40	1 1/2	40	6.75	171	4.00	100	2.14	54
TR40-32-32E	2	50	2	50	8.03	204	4.50	114	2.64	67
TR40-48-48E	3	75	3	75	8.75	222	5.25	133	3.70	94
TR40-64-64E	4	100	4	100	9.00	229	5.50	140	4.71	120
TR40-96-96E	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

Series CE | Female "Type C" Camlock PTFE Encapsulated Couplings

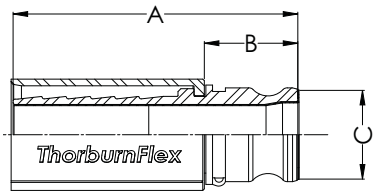


Part Number	Nominal Hose I.D.		Fitting Size		A		B Cutoff Allowance		C O.D.		D - Ext. Cam Arms	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08CE	1/2	12	1/2	12	4.00	100	2.50	64	2.11	54	4.51	115
TR40-12-12CE	3/4	20	3/4	20	4.25	108	2.50	64	2.11	54	4.51	115
TR40-16-16CE	1	25	1	25	4.75	121	3.00	75	2.44	62	5.10	130
TR40-24-24CE	1 1/2	40	1 1/2	40	6.25	159	3.50	89	3.56	90	7.16	182
TR40-32-32CE	2	50	2	50	7.50	191	4.00	100	3.94	100	7.54	192
TR40-48-48CE	3	75	3	75	8.00	202	4.50	114	5.46	139	9.56	243
TR40-64-64CE	4	100	4	100	8.25	210	4.75	121	6.56	167	10.56	271
TR40-96-96CE	6	150	6	150	10.25	260	6.00	152	10.16	258	16.26	413

Materials: 316 Stainless Steel insert encapsulated with PTFE. Material ordering codes are found on Page 69

Thorburn Crimp End Fittings

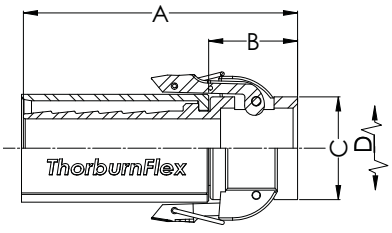
Series EE | Male "Type E" Camlock PTFE Encapsulated Couplings



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
TR40-08-08EE	1/2	12	1/2	12	4.50	114	3.00	75	1.26	32
TR40-12-12EE	3/4	20	3/4	20	4.75	121	3.00	75	1.26	32
TR40-16-16EE	1	25	1	25	5.25	133	3.50	89	1.63	41
TR40-24-24EE	1 1/2	40	1 1/2	40	6.75	171	4.00	100	2.14	54
TR40-32-32EE	2	50	2	50	8.03	204	4.50	114	2.64	67
TR40-48-48EE	3	75	3	75	8.75	222	5.25	133	3.70	94
TR40-64-64EE	4	100	4	100	9.00	229	5.50	140	4.71	120
TR40-96-96EE	6	150	6	150	11.00	279	6.7	170	7.09	180

Materials: 316 Stainless Steel insert encapsulated with PTFE. Material ordering codes are found on Page 69

Series CP | Female "Type C" Camlock Polypropylene Couplings

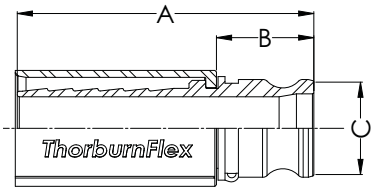


Part Number	Nominal Hose I.D.		Fitting Size		A		B - Cutoff Allowance		C O.D.		D - Ext. Cam Arms	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-08-08CP	1/2	12	1/2	12	4.00	100	2.50	64	2.11	54	4.51	115
TR40-12-12CP	3/4	20	3/4	20	4.25	108	2.50	64	2.11	54	4.51	115
TR40-16-16CP	1	25	1	25	4.75	121	3.00	75	2.44	62	5.10	130
TR40-24-24CP	1 1/2	40	1 1/2	40	6.25	159	3.50	89	3.56	90	7.16	182
TR40-32-32CP	2	50	2	50	7.50	191	4.00	100	3.94	100	7.54	192
TR40-48-48CP	3	75	3	75	8.00	202	4.50	114	5.46	139	9.56	243
TR40-64-64CP	4	100	4	100	8.25	210	4.75	121	6.56	167	10.56	271
TR40-96-96CP	6	150	6	150	10.25	260	6.00	152	10.16	258	16.26	413

Materials: 316 Stainless Steel Ferrule with Polypropylene insert. Material ordering codes are found on Page 69
Maximum Pressure: 90 PSI - 3/4" (20 mm) to 2" (50 mm) | 50 PSI - 3" (75 mm) to 4" (100 mm)
Maximum Temperature: 60°C (140°F)

Thorburn Crimp End Fittings

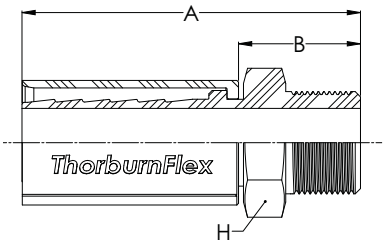
Series EP | Male "Type E" Camlock Polypropylene Couplings



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
TR40-08-08EP	1/2	12	1/2	12	4.50	114	3.00	75	1.26	32
TR40-12-12EP	3/4	20	3/4	20	4.75	121	3.00	75	1.26	32
TR40-16-16EP	1	25	1	25	5.25	133	3.50	89	1.63	41
TR40-24-24EP	1 1/2	40	1 1/2	40	6.75	171	4.00	100	2.14	54
TR40-32-32EP	2	50	2	50	8.03	204	4.50	114	2.64	67
TR40-48-48EP	3	75	3	75	8.75	222	5.25	133	3.70	94
TR40-64-64EP	4	100	4	100	9.00	229	5.50	140	4.71	120
TR40-96-96EP	6	150	6	150	11.00	279	6.7	170	7.09	180

Materials: 316 Stainless Steel Ferrule with Polypropylene insert. Material ordering codes are found on Page 69
Maximum Pressure: 90 PSI - 3/4" (20 mm) to 2" (50 mm) | 50 PSI - 3" (75 mm) to 4" (100 mm)
Maximum Temperature: 60°C (140°F)

Series MPP | Polypropylene Hex Male Pipe

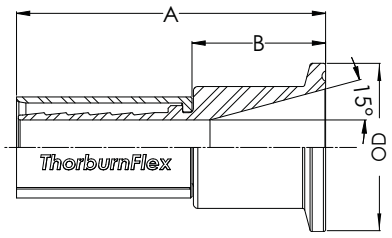


Part Number	Nominal Hose I.D.		Fitting Size		Thread Size	A		B - Cutoff Allowance		H Hex
	Inch	mm	Inch	mm		Inch	mm	Inch	mm	Inch
TR40-12-12MPP	3/4	20	3/4	20	3/4-14	3.00	75	1.62	41	1.13
TR40-16-16MPP	1	25	1	25	1-11 1/2	3.27	83	1.72	44	1.38
TR40-24-24MPP	1 1/2	40	1 1/2	40	1 1/2-11 1/2	3.58	91	2.07	53	2.00
TR40-32-32MPP	2	50	2	50	2-11 1/2	3.93	99	2.23	57	2.50

Materials: 316 Stainless Steel Ferrule with Polypropylene insert. Material ordering codes are found on Page 69
Maximum Pressure: 90 PSI - 3/4" (20 mm) to 2" (50 mm) | 50 PSI - 3" (75 mm) to 4" (100 mm)
Maximum Temperature: 60°C (140°F)

Thorburn Crimp End Fittings

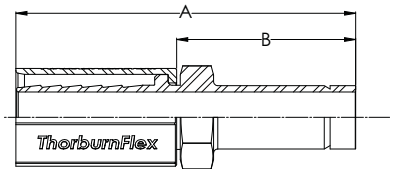
Series STCP | Polypropylene Tri-Clamp Sanitary Flange



Part Number	Nominal Hose I.D.		Nominal Flange Size		A		B - Cutoff Allowance		Flange I.D.		Flange O.D.	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-16-16STCP	1	25	1	25	2.70	69	1.25	32	0.87	22	1.98	50
TR40-24-24STCP	1 1/2	40	1 1/2	40	3.04	77	1.25	32	1.39	35	1.98	50
TR40-32-32STCP	2	50	2	50	3.23	82	1.25	32	1.87	47	2.52	64

Materials: 316 Stainless Steel Ferrule with Polypropylene insert. Material ordering codes are found on Page 69
Maximum Pressure: 90 PSI - 3/4" (20 mm) to 2" (50 mm) | 50 PSI - 3" (75 mm) to 4" (100 mm)
Maximum Temperature: 60°C (140°F)

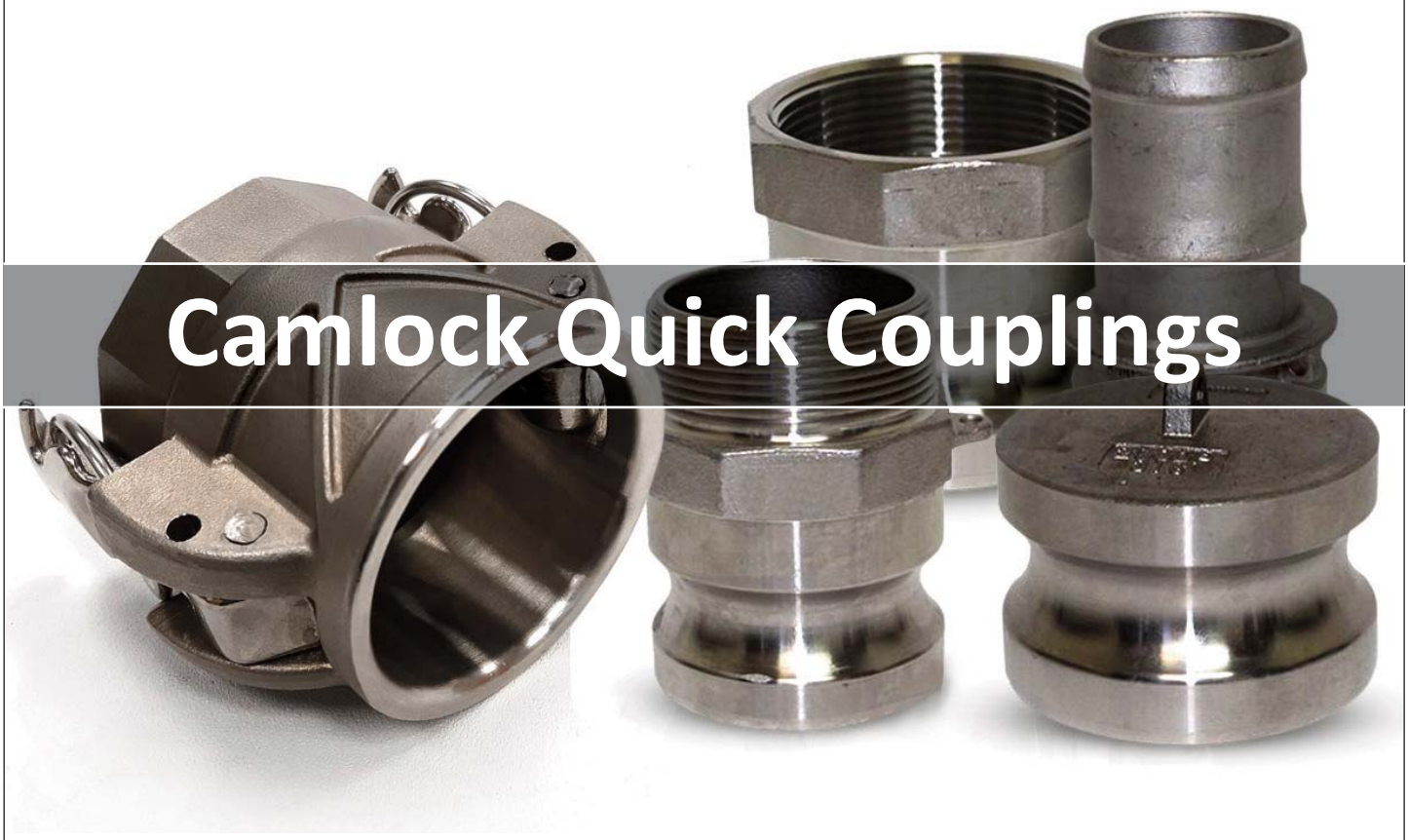
Series TP | Polypropylene Tube Stub



Part Number	Nominal Hose I.D.		Tube O.D.		A		B - Cutoff Allowance	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
TR40-04-04TP	1/4	6	1/4	6	1.96	49	0.80	20
TR40-06-06TP	3/8	10	3/8	10	2.42	61	1.22	31
TR40-08-08TP	1/2	12	1/2	12	2.91	74	1.44	37
TR40-12-12TP	3/4	20	3/4	20	3.53	90	1.84	47
TR40-16-16TP	1	25	1	25	3.78	96	1.94	49
TR40-24-24TP	1 1/2	40	1 1/2	40	5.22	133	2.53	64
TR40-32-32TP	2	50	2	50	6.82	173	3.26	83

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

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.

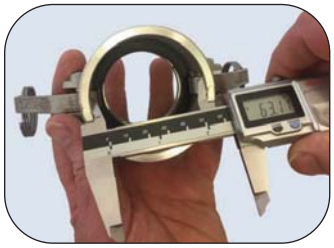
European standard

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.

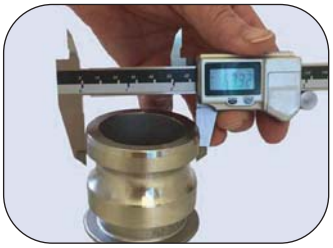
Camlock fittings produced to EN 14420-7 are interchangeable with those produced to the original MIL-C-27487 standard, but differ in terms of hose tail design, thread, and part number. A flat thread seal has been added to the female threaded parts and a smooth hose shank complying with EN 14420-7/DIN 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 97)

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

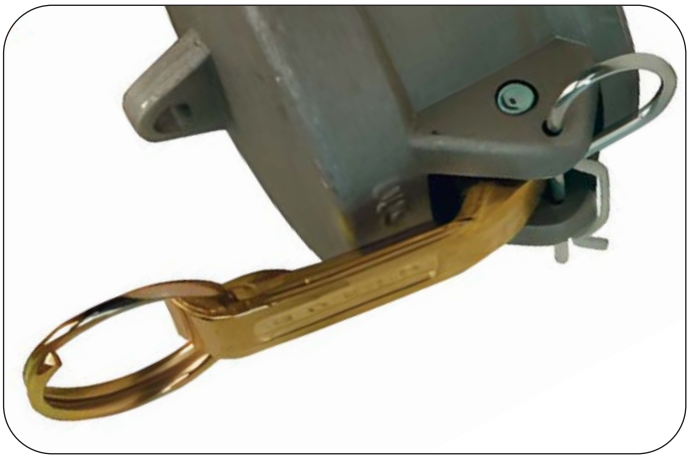
Butt Weld to Male Adapter

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-HD08-S6*	733D-HD08-S6	633A-HD08-S6	633FSW-HD08-S6	633FBW-HD08-S6	1/2	12
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 61 to 68)

Thorburn Camlock Quick Couplings

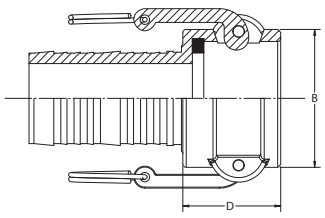
Thorburn Style 733 with Guard-Lok™
Thorburn's Camlock high pressure coupling series 733 have a mechanism built into the levers to prevent accidental disconnection during operation.



Thorburn Style 633 with Pin Lock
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)



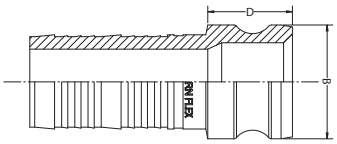
Female Camlock Coupler Hose End 733C/633C

(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-08	.5	13	.5	13	4.51	115	2.11	54	2.4	61
(N)733C(633C)-XX-Y-12	.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 61-68)

Thorburn Camlock Quick Couplings

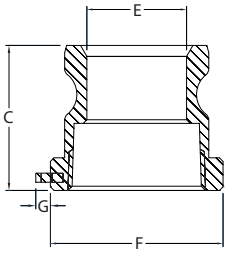


Male Camlock Hose End 633E

(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-08	.5	13	.5	13	1.26	32	2.6	67
(N)633E-XX-12	.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 61-68)



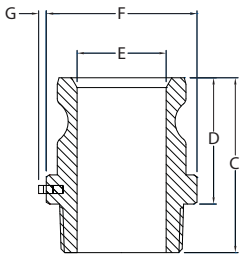
Female Camlock Adapter 633A

(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-08	.5	13	.5	13	1.6	41	.53	13
(N)633A-XX-12	.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

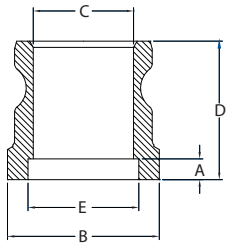


Male Camlock Adapter 633F

(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-08	.5	13	.5	13	2.47	63	1.67	42
(N)633F-XX-12	.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)

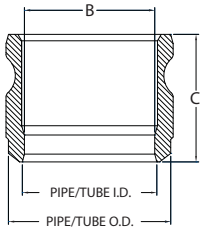
Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633ASW-XX-08	.5	13	.30	8	1.00	25	.53	14
(N)633ASW-XX-12	.75	20	.30	8	1.25	32	.75	20
(N)633ASW-XX-16	1.0	25	.30	8	1.45	37	.88	22
(N)633ASW-XX-20	1.25	32	.30	8	2.00	50	1.06	27
(N)633ASW-XX-24	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 633FBW

(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)

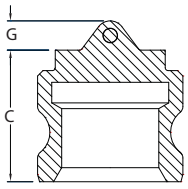


Part Number	Adapter/Coupler Size		Hose Shank Size		(B) Outside Diameter		(D) Exposed Length	
	in	mm	in	mm	in	mm	in	mm
(N)633FBW-XX-08	.5	13	1.43	36	.53	13	2.6	67
(N)633FBW-XX-12	.75	20	1.40	35	.75	19	2.6	67
(N)633FBW-XX-16	1.0	25	1.74	44	.88	22	3.0	76
(N)633FBW-XX-20	1.25	32	1.99	51	1.06	27	3.5	89
(N)633FBW-XX-24	1.5	38	2.06	52	1.25	32	3.6	91
(N)633FBW-XX-32	2.0	50	2.50	64	1.75	44	4.0	102
(N)633FBW-XX-40	2.5	64	2.44	62	2.14	54	4.5	114
(N)633FBW-XX-48	3.0	76	2.75	70	2.81	71	4.75	121
(N)633FBW-XX-64	4.0	102	2.88	73	3.75	95	5.0	127
(N)633FBW-XX-96	6.0	152	3.00	76	5.84	148	6.7	170

Code: XX = S6 (316SS)

Camlock Plug Adapter 633DP

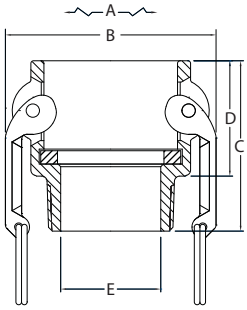
(Use prefix "N" only for ASME Code Applications)
Material: SA351 CF8M/SA479 T316 | Code: XX = S6 (316SS), AL (Aluminum)
Pressure: 250 psi (2.5" ID or less), 150 psi (3"- 6" ID) - Stainless Steel Only



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-08	.5	13	1.06	27	.5	13	.53	13
(N)633DP-XX-12	.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

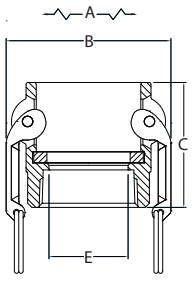


Male Camlock Adapter Coupler 733B/633B

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-08	.5	13	.5	13	4.51	115	2.11	54	2.10	53	1.25	32	.56	14
(N)733B(633B)-XX-Y-12	.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)



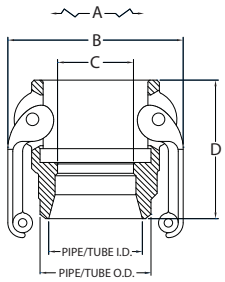
Female Camlock Adapter Coupler 733D/633D

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-08	.5	13	.5	13	4.51	115	2.11	54	2.10	53	.67	17
(N)733D(633D)-XX-Y-12	.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

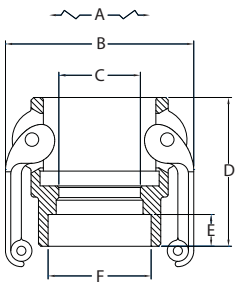


Butt Weld Camlock Adapter Coupler 733FBW/733FBW-HD/633FBW

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-08	.5	13	4.21	107	1.82	46	.56	14	2.0	50
(N)733FBW(-HD)(633FBW)-XX-Y-12	.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 733FBW-HD Only. When ordering 633FBW, 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)



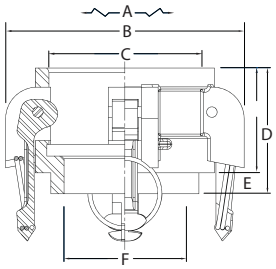
Socket Weld Camlock Adapter Coupler 733DSW/733DSW-HD/633DSW

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-08	.5	13	4.21	107	1.82	46	.56	14	2.00	50	.50	13	.88	22	.52	13
(N)733DSW(-HD)(633DSW)-XX-Y-12	.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 733DSW-HD Only. When ordering 633DSW, 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

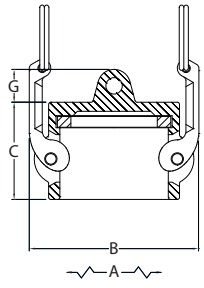


Socket Weld Heavy Duty Camlock Adapter Coupler 733DSW4-HD

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)733DSW-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)733DSW-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)733DSW-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)733DSW-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 733DSW4-HD Only. 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)



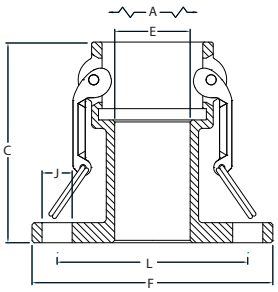
Camlock Dust Cap 733DC/633DC

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-08	.5	13	4.21	107	1.82	46	1.30	33	.5	13
(N)733DC(633DC)-XX-Y-12	.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 733DC Only. When ordering 633DC, 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

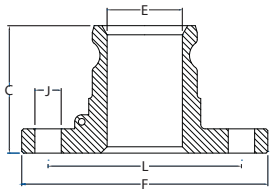


Camlock Flanged Adapter Coupler 633-PFC 150# PN10

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



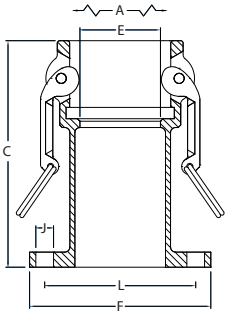
Camlock Flanged Adapter 633-PFE 150# PN10

(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

Note: Part Number Material Codes: XX = S6 (316SS), AL (Aluminum)
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

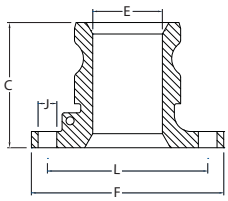


Camlock 633-TTC Tank & Truck Adapter Coupler

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: Part Number Material Codes: XX = S6 (316SS), AL (Aluminum)
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

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

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-6	-	6 inch Brass "S" Hook Chain
TCHB-12	-	12 inch Brass "S" Hook Chain
-	TCHS6-6	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 80BSC EN14420-3/DIN 2817 Bolt-On Safety Clamps (Pg 57)

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
71FBSPP08-S6	71FBSPP08-BB	15	1/2	1/2
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
72FBSPP08-S6	72FBSPP08-BB	15	1/2	1/2
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
73MBSPT08-S6	73MBSPT08-BB	15	1/2	1/2
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
74MBSPT08-S6	74MBSPT08-BB	15	1/2	1/2
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 53-54) or
EN 14420-4 hose flange couplings (Pg 55-56)

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 60)

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
81FBSPP08-S6	81FBSPP08-BB	15	1/2	1/2
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

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
82FBSPP08-S6	82FBSPP08-BB	15	1/2	1/2
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
83FLXS08XX-S6	83FLXS08XX-BB	15	1/2
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
84FLXS08XX-S6	84FLXS08XX-BB	15	1/2
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

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.

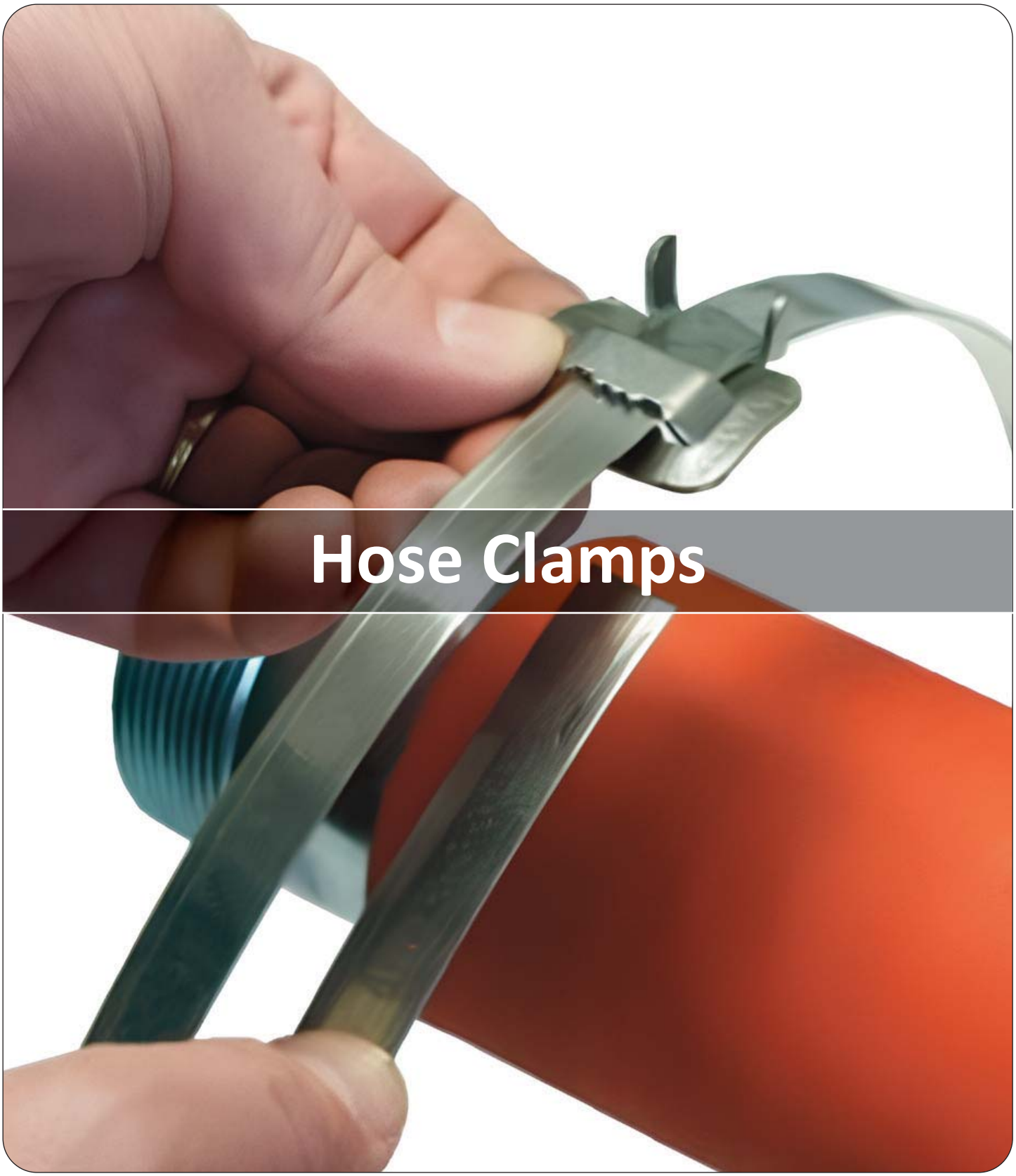
Application
- Steam and hot water use
- Food
- Pharmaceutical Industry
- Transport Industry

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 58-59)



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 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

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-038-CP	06	1/4	11	0.79	20	0.75
TSS-063-CP	10	3/8	17	0.98	25	1.00
TSS-088-CP	12	1/2	23	1.13	30	1.19
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-038-S6	06	1/4	11	0.79	20	0.75
TSSS-063-S6	10	3/8	17	0.98	25	1.00
TSSS-088-S6	12	1/2	23	1.13	30	1.19
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.

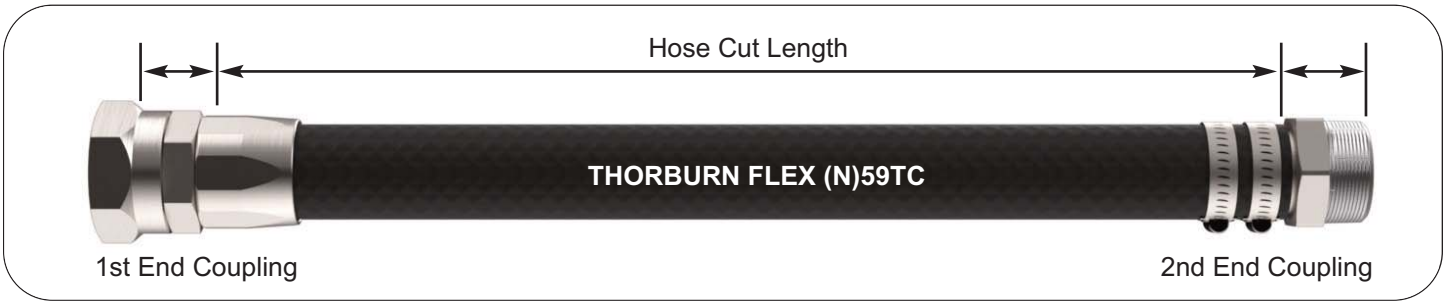
Plated Steel	Nominal Hose Size		Sleeve ID		Sleeve Length	
Part #	mm	in	mm	in	mm	in
TSL-113-CP	20	3/4	29	1.13	54	2.13
TSL-138-CP	20	3/4	35	1.38	54	2.13
TSL-150-CP	25	1	38	1.50	57	2.31
TSL-163-CP	25	1	41	1.63	57	2.31
TSL-175-CP	25	1	44	1.75	57	2.31
TSL-213-CP	38	1 1/2	54	2.13	60	2.38
TSL-263-CP	52	2	67	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-125-S6	6	1/4	32	1.25	54	2.13
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 Chemical 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
59TC	32	02	S6	CRS6	01	S6	CL2S6	120	

Hose Type

(N)559TCU	(9)
(N)59TCU	(10)
(N)59TCUXL	(11)
(N)59TC	(12)
(N)59TCXL	(13)
(N)59TCV	(14)
(N)59TCVH	(14)
(N)59TCVXL	(15)
(N)59TCVHXL	(15)
(N)TR40	(16)
(N)TR41	(16)
(N)TR440	(17)
(N)TR441	(17)
(N)59TCH	(18)
(N)59TCHXL	(19)
(N)59TCE	(20)
(N)59TCEXL	(21)
(N)120SD	(22)

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

Tri-Clamp Sanitary Flange
TCDC-X | Dust Caps
(X=Specify Color | R, B, G, Y) (29)

Camlock Adapters - Refer to Codes Below
TQ | Safety Pin (51)
TCHCS | Sash Chain (51)
TCH-X | "S" Hook Chain (51)
X=Specify Material & Chain Length

Thorburn Standard Crimp Hose Couplings

01-Series VC | Victaulic Couplings (24)
02-Series MP | Male Pipe NPT Rigid (25)
03-Series FJX | Female JIC 37° Swivel (25)
04-Series BWT | Butt Weld Tube (26)
05-Series BWP | Butt Weld Pipe (26)
06-Series TS | Tube Stub (27)
07-Series TF | Tube Fitting With Nut & Ferrule (27)
08-Series TC| Tri-Clamp Sanitary Flange (28)
09-Series STCE | Tri-Clamp Sanitary Flange PTFE Encapsulated (28)
10-Series MSC | Mini Sanitary Flange (29)
11-Series MSCE | Mini Sanitary Flange PTFE Encapsulated (29)
12-Series LF | Swivel Flange 150 lbs (30)
13-Series LFPN | Swivel Flange PN10/PN16 (30)
14-Series LF150E | Swivel Flange 150# PTFE Encapsulated (31)
15-Series C | Female "Type C" Cam & Groove Couplings (31)
16-Series E | Male "Type E" Camlock Couplings (32)
17-Series CE |Female "Type C" Camlock PTFE Encapsulated (32)
18-Series EE | Male "Type E" Camlock PTFE Encapsulated (33)
19-Series CP | Female "Type C" Camlock Polypropylene (33)
20-Series EP | Male "Type E" Camlock Polypropylene (34)
21-Series MPP | Polypropylene Hex Male Pipe (34)
22-Series STCP | Polypropylene Sanitary Flange (35)
23-Series TP | Polypropylene Tube Stub (35)

Thorburn Series 733 Guard Lok™ Camlock Couplings

24-733C-HD-Female Hose Shank Coupler- 4 Lever (40)
25-Style 733-C | Female Camlock Coupler (41)

Thorburn Series 733 Adapters

26-733D-HD-Female NPT Coupler - 4 Lever (40)
27-Style 733-B | Male Camlock Adapter (45)
28-Style 733-D | Female Camlock Adapter (45)
29-Style 733FBW | Butt Weld Camlock Adapter (46)
30-Style 733FBW-HD | Butt Weld Camlock Adapter (46)
31-Style 733-DSW | Socket Weld Camlock Adapter (46)
32-Style 733-DSW-HD | Socket Weld Camlock Adapter (46)
33-Style 733-DSW4-HD |Socket Weld Camlock Adapter (47)
34-Style 733-DC | Camlock Dust Cap (47)

Thorburn Series 633 Pin Lock Camlock Couplings

35-Style 633-C | Female Camlock Coupler (41)
36-Style 633-E | Male Camlock (42)

Thorburn Series 633 Pin Lock Camlock Adapters

37-633A-HD-Female NPT Adapter (40)
38-633FSW-HD-Adapter to Socket Weld (40)
39-633FBW-HD-Adapter to Butt Weld (40)
40-Style 633-A | Adapter Female NPT (42)
41-Style 633-F | Adapter Male NPT (43)
42-Style 633-ASW | Socket Weld Camlock Adapter (43)
43-Style 633-ABW | Butt Weld Camlock Adapter (44)
44-Style 633-DP | Camlock Plug Adapter (44)
45-Style 633-B | Male Camlock Adapter (45)
46-Style 633-D | Female Camlock Adapter (45)
47-Style 633FBW | Butt Weld Camlock Adapter (46)
48-Style 633-DSW | Socket Weld Camlock Adapter (46)
49-Style 633-DC | Camlock Dust Cap (47)
50-Style 633-PFC | Camlock Flanged Adapter 150# (48)
51-Style 633-PFC | Camlock Flanged Adapter PN10 (48)
52-Style 633-PFE | Camlock Flanged Adapter 150# (48)
53-Style 633-PFE | Camlock Flanged Adapter PN10 (48)
54-Style 633-TTC | Flanged Tank & Truck Adapter (49)
55-Style 633-TTE | Flanged Tank & Truck Adapter (49)
56-Style 633-90CC | 90° X 90° Coupler (50)
57-Style 633-90EC| Coupler X Male Adapter (50)
58-Style 633-90FPC | Coupler X Female NPT (50)

Thorburn Series 70 Hose Couplings for Bolt-On Safety Clamps

59-Style 71FBSPP | Female BSPP-Smooth Stem EN 14420-5/DIN 2817 (53)
60-Style 72FBSPP | Female BSPP-Serrated Stem EN 14420-5/DIN 2817 (54)
61-Style 73MBSPT | Male BSPT-Smooth Stem EN 14420-5/DIN 2817 (54)
62-Style 74MBSPT | Male BSPT-Serrated Stem EN 14420-5/DIN 2817 (54)
63-Style 75FLX | Fixed Flange-Smooth Stem EN 14420-4/DIN 2817 (55)
64-Style 76FLX | Fixed Flange-Serrated Stem EN 14420-4/DIN 2817 (55)
65-Style 77FLXS | Swivel Flange-Smooth Stem EN 14420-4/DIN 2817 (56)
66-Style 78FLXS | Swivel Flange-Serrated Stem EN 14420-4/DIN 2817 (56)

Thorburn Series 80 Hose Couplings for Bolt-On Safety Clamps

67-Style 81FBSPP | Female BSPP Fitting-EN 14423/DIN 2826 (58)
68-Style 82MBSPT | Male BSPT Fitting-EN 14423/DIN 2826 (59)
69-Style 83FLX | Fixed Flange-EN 14423/DIN 2826 (59)
70-Style 84FLXS | Swivel Flange-EN 14423/DIN 2826 (59)

Thorburn Clamps

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

Crimp Ferrules

CR = Crimp

Special Purpose Chemical Hose

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.

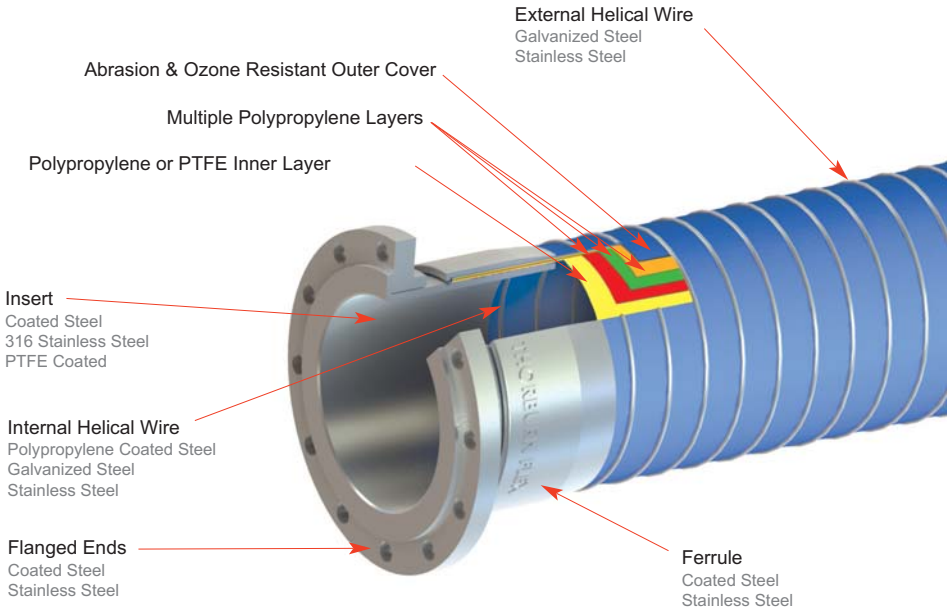
Features:

- 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:

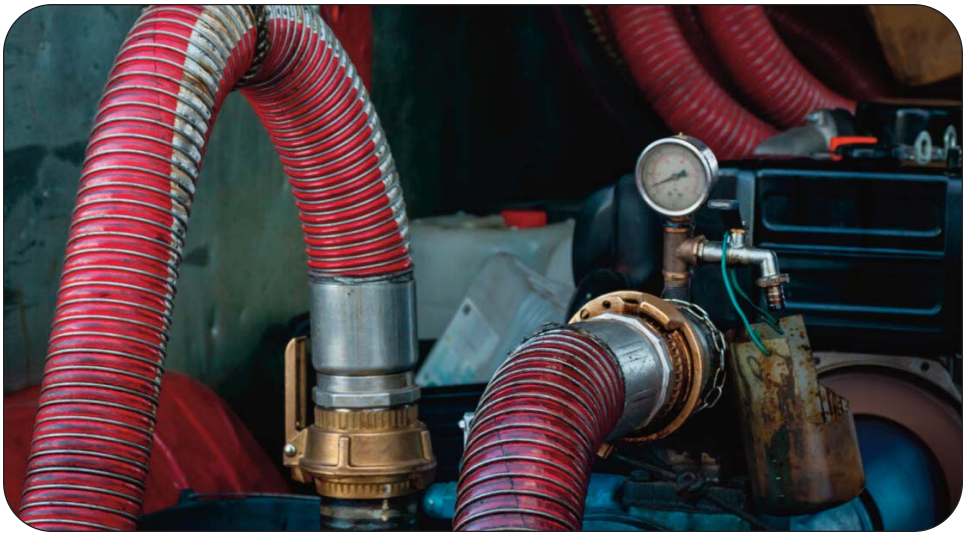
- Most corrosive acids and alkalis
- Aldehydes
- Amines
- Aliphatic
- Aromatic fuels
- Chlorinated hydrocarbons
- Alcohols
- Esters
- Ketones
- Lacquers
- Sulphuric Acid

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
- 58TCLSSP
- 58TCLSGP
- 58TCLPGP
- 58TCLSST
- 58TCLSGT
- 58TCHSSP
- 58TCHSGP
- 58TCHPGP
- 58TCHSST
- 58TCHSGT

Hose Size
- 16 = 1”
- 24 = 1.5”
- 32 = 2”
- 40 = 2.5”
- 48 = 3”
- 64 = 4”
- 96 = 6”
- 128 = 8”
- 160 = 10”
- 192 = 12”

1st End Crimp Material / 2nd End Crimp Material
- CRS6 = 316SS
- CRCS = Plated Steel

OAL
- Overall Length (Inches) Add suffix mm for millimeters

Accessories
- Leave blank for none
- Camlock Adapters - Refer to Codes Below (Pg 51)
- 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

Thorburn Series TC818 PTFE Chlorine Transfer Hose Assemblies

Chlorine Unloading Station

Chlorine Loading Platform

Thorburn Series (N)TC818: is engineered specifically for outdoor chlorine transfer service, one of the most demanding and hazardous hose applications in the industry. Designed with safety, performance, and handling in mind, the TC818 offers a reliable and internationally recognized solution for high-risk chlorine environments.

Applications

- Chlorine transfer (outdoor use only)
- Tank car loading and unloading
- Pulp and paper bleaching
- Transfer of select industrial gases (consult Thorburn for high-effusion applications)

Advantages

- Greater flexibility than metal hose for easier handling
- Stress-free flexing ideal for continuous movement applications
- Fast unloading performance
- Easy to clean PTFE interior
- Built-in visual fatigue indicators for added safety
- Approved by the Chlorine Institute as a recommended alternative to copper tube whips for filling 1-ton containers and 100/150 lb. cylinders in chlorine repackaging plants

Note: *1/2" chlorine hose is a recommended alternate by the Chlorine Institute to copper tube whips for filling one (1) ton containers, 100 lb. and 150 lb. cylinders at chlorine repackaging plants.*

Thorburn Series TC818 PTFE Chlorine Transfer Hose Assemblies

| *TC818 PTFE Hose Assembly* |

Note: *Outer Kynar braid on 1/2" chlorine hose is for abrasion protection only. For quality assurance and traceability, each assembly is stamped with a serial number which is recorded at Thorburn, along with the installation location and date. The hose is also clearly tagged with its pressure and temperature ratings.*

Features

- 1" I.D. full-flow convoluted PTFE core
- Dual PVDF braid reinforcement for maximum strength and chemical resistance
- Schedule 80 Monel male NPT fittings (1" – 11-1/2 NPT) for superior corrosion resistance
- CPE rubber outer jacket, pin-pricked and specially formulated for chlorine service
- Heavy-duty 300 series stainless steel jacket retainers to protect ends from snagging and abrasion
- 1/2" chlorine hose is a recommended alternate by the Chlorine Institute to copper tube whips for filling one (1) ton containers, 100 lb. and 150 lb. cylinders at chlorine repackaging plants.

Construction

Tube: Convoluted PTFE
Reinforcement: PTFE impregnated fiberglass and a double Kynar braid. The 1" and 1-1/2" I.D. hose is further covered by a C.P.E. abrasion jacket, pin pricked for effusion dissipation.
Cover:

Note: *Outer Kynar braid on 1/2" chlorine hose is for abrasion protection only. For quality assurance and traceability, each assembly is stamped with a serial number which is recorded at Thorburn, along with the installation location and date. The hose is also clearly tagged with its pressure and temperature ratings.*

Standards

Exceeds pressure rating requirements of the Chlorine Institute. Specification 135-3.

Temperature:
-40ºC (-40ºF) to 49ºC (120ºF)
Safety Factor: 4:1

Thorburn Part #	Hose I.D.		Hose O.D.		Design Pressure		Minimum Burst		Min. Bend Radius		Weight	
	DN	in	mm	in	bar	PSI	bar	PSI	mm	in	kg/m	lb/ft
TC818-08	15	1/2	19	0.75	35	500	138	2000	50	2.00	0.24	0.16
TC818-16	25	1	30	1.50	35	500	138	2000	90	3.50	0.61	0.41
TC818-24	40	1 1/2	53	2.10	26	375	130	1875	152	6.00	0.88	0.59
TC818-32	50	2	67	2.62	26	375	130	1875	241	9.50	1.29	0.87

Notes: 1. Prefix (N) is used when a CRN is required 2. Safety factor is 4 to 1 3. Higher temperatures and pressures available upon request 4. Tighter bend radius available upon request
5. **For detailed chemical compatibility please see Thorburn's chemical resistant chart**

How to Order Thorburn TC818 Hose Assemblies

Hose Model	Hose Size	1st End & Material	2nd End & Material	Hose Cover	Length (in)
TC818	16	05M	05M	R	120

08 = 1/2 " (DN 12)
16 = 1" (DN 25)
24 = 1 1/2 " (DN 40)
32 = 2 " (DN 50)

Ends
03 = Hex Male NPT
04 = Schedule 80 Male NPT
05 = Vanstone Flange#150
06 = Vanstone Flange PN10
07 = Vanstone Flange PN16

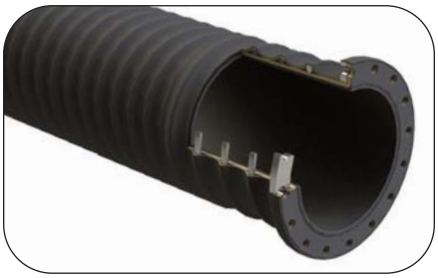
Materials
H = Hastelloy
M = Monel

Hose Covers
E = HDPE - High density Polyethylene
K = Kynar PVDF Braid
R= CPE Pin Pricked

For metric length place suffix "mm" after number

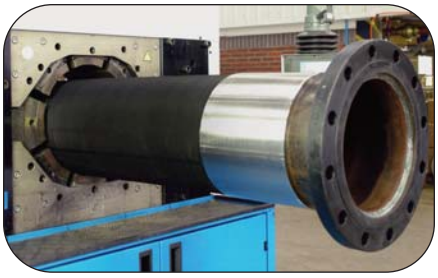
Thorburn Series (N)60TMH/61TMH

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.

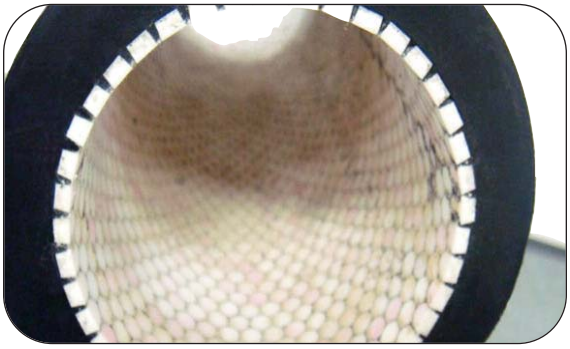
Sizes: 1/2" (12mm) to 48" (1200mm) I.D. up to 100ft (30m) long.
Longer lengths available on special order only.

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



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

Thorburn Series 60TMH/61TMH ceramic lined 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.

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.

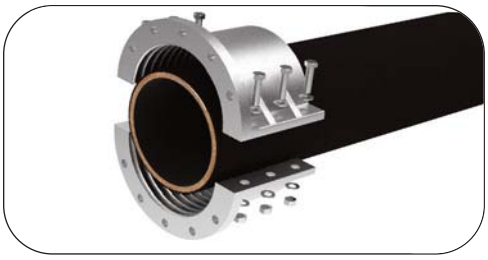
Flexible Yet Tough: Unique bead configuration delivers a flexible hose design without compromising on durability or internal protection.

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

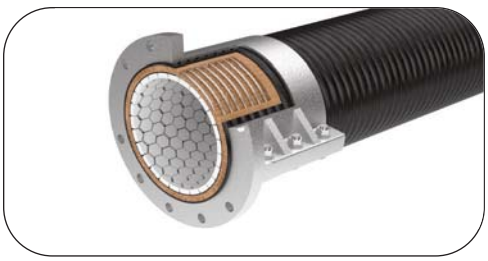
Rugged Outer Cover: Available in smooth or corrugated elastomeric construction with abrasion- and UV-resistant properties, supported by high-tensile fabric and steel wire helix reinforcement.

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 FAS150 Corrugated Cover Coupling

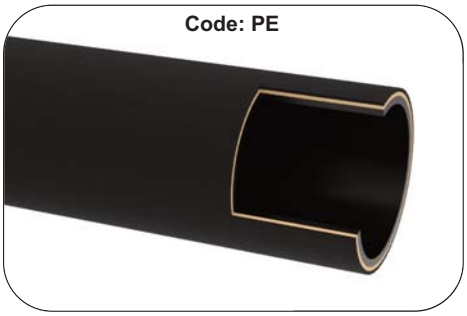
Thorburn offers a unique field-attachable solution. Hoses are supplied in bulk lengths and can be easily cut and assembled on-site using Thorburn's reusable aluminum split cast couplings — a no-weld, bolt-on solution that simplifies installation and reduces downtime.
No Process Contact: Couplings are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

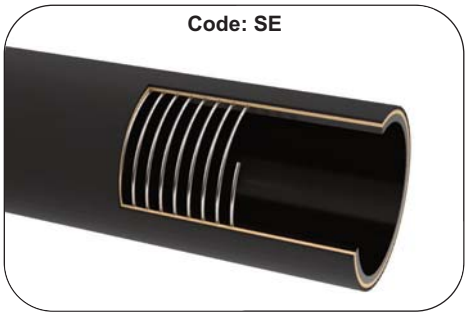
Applications

- Mineral processing plants
- Sand and gravel industries
- Cement and coal industries
- Petrochemical plants.

Thorburn (N)60TMH/61TMH Integrated Ends

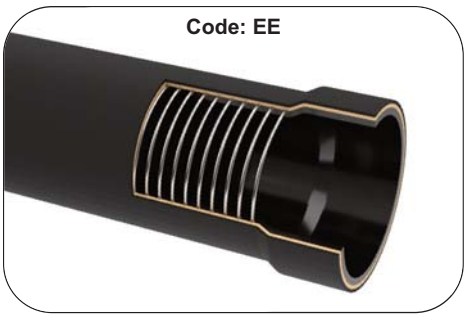


Plain End



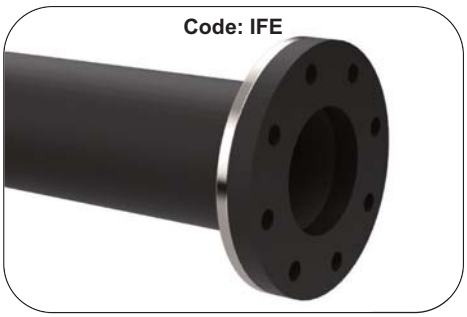
Soft End

Rubber & Duck Flanges



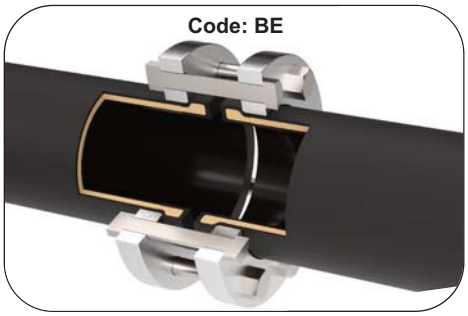
Enlarged End

Wire To End

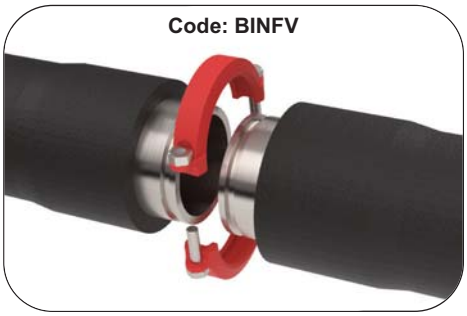


Integral Flange End

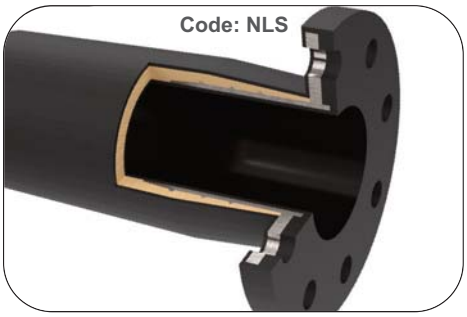
Integral Tapered Nozzle Ends



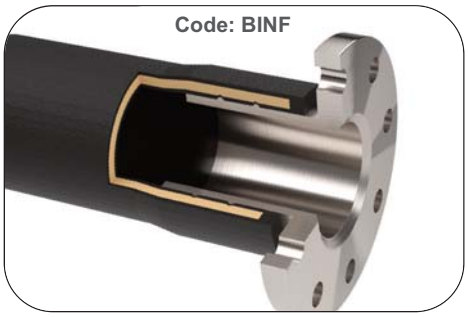
Beaded Ends With Split Flanges



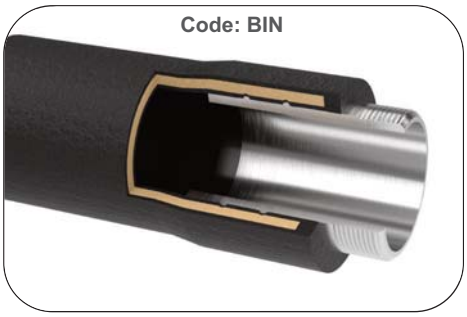
Built-In Victaulic Nipple



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

Special Purpose Couplings

(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...

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)**

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

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.

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 |

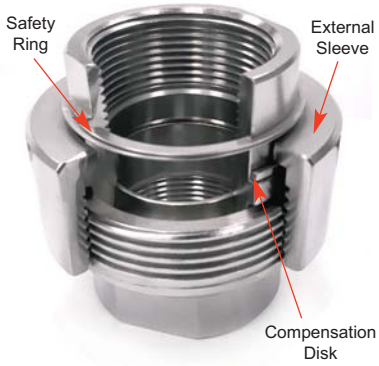
Part Number	Nominal Size		Working Pressure		Minimum Length	
	in	mm	psi	bar	in	mm
MT3TL16XYM	1	25	2400	165	3.00	80
MT3TL24XYM	1 1/2	38	2200	152	3.75	95
MT3TL32XYM	2	50	2000	138	4.00	102
MT3TL48XYM	3	80	1200	83	5.50	140
MT3TL64XYM	4	100	750	52	5.50	140

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)

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

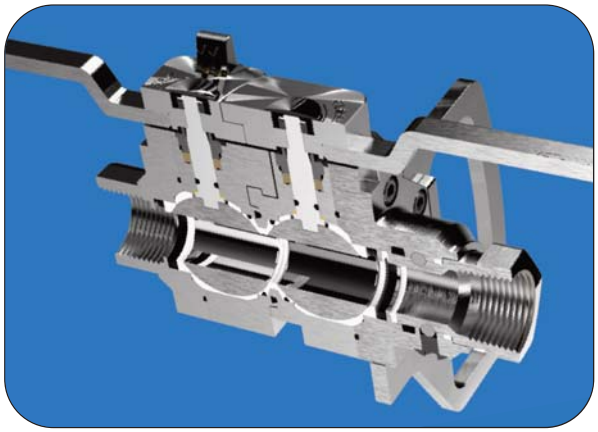
Prevents Resin Valve Blockage & Disconnection Spillage

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.

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.



Unrestricted full flow reduces pressure drop during operation

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

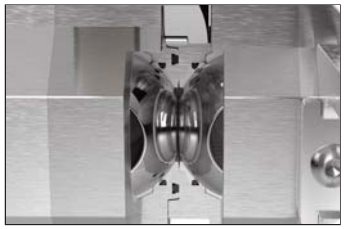
Thorburn's (N)T92H series is the worlds first dry break full flow coupling used for liquid cryogenic loading/unloading service. A sensational innovation over the poppet style cryogenic coupling which has inherent spillage when disconnected. The (N)T92H coupling has an easy turn action to connect and 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

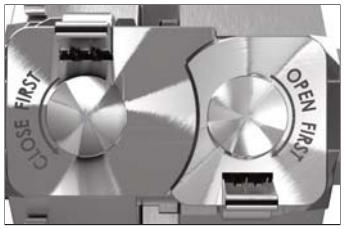
(N)T92H Built In Safety Features

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

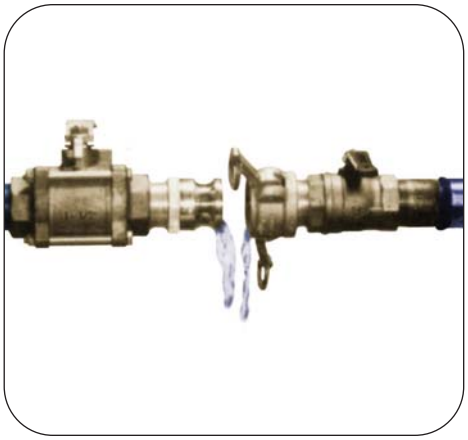
Locking Pin

(N)T92H Performance Characteristics

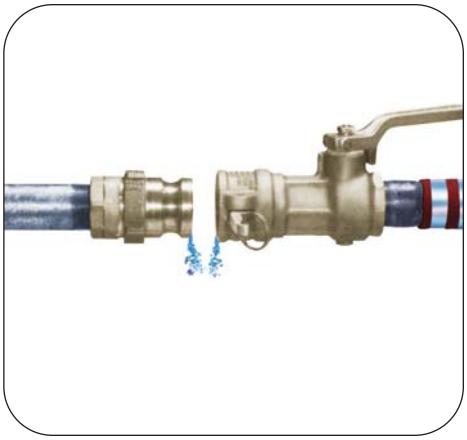
Adapter/Coupler Size		End Size		Spillage	Maximum Emissions	Flow Rate		Max. Working Pressure (min. 4-1 Safety)		Weight				Temperature			
										Male		Female		Min		Max	
in	mm	in	DIN	cc	ppm	GPM	l/min	psi	bar	lb	kg	lb	kg	°F	°C	°F	°C
1	25	3/4,1	20, 25	< 0.1	< 25	60	227	3000	207	4.02	1.82	4.23	1.92	-459	-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

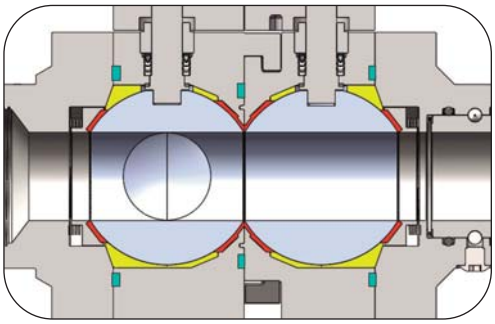


Ordinary Ball Valves Added = Spillage

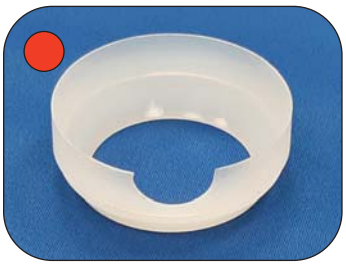


Traditional Poppet Valves = Spillage

(N)T92H Sealing Technology

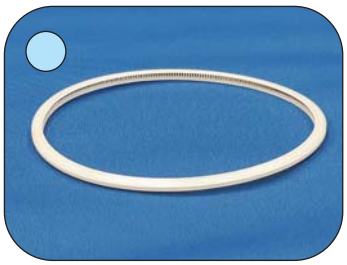


Cavity Filler - Prevents flow accumulation between ball valve and coupling body. Reduces spillage when disconnecting and prevents solids from being trapped between the rotating ball valves.
Ball Valve Seal - Flexible arch shaped ball valve seal provides constant sealing pressure and compensates for machining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

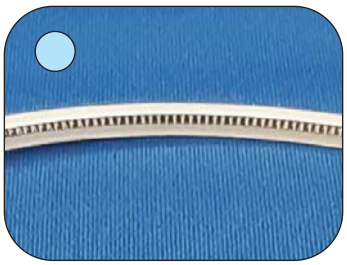


Cavity Filler

Ball Valve Seal



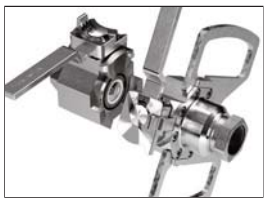
Spring Enhanced O-ring Seal



Detail of The Spring in the O-ring Seal

(N)T92H Easy to Operate Dry Break Solution

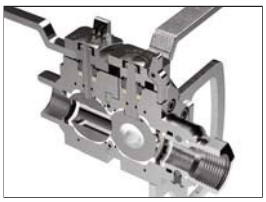
The (N)T92H coupling has an easy turn action to connect and start the product flow. The valves will not open until both coupling halves are connected properly. The coupling halves are first aligned and then connected with a push, followed by a quarter turn. There are no threads to damage by over tightening 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.



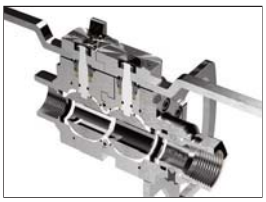
Align coupling halves

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	C	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

Accessories

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

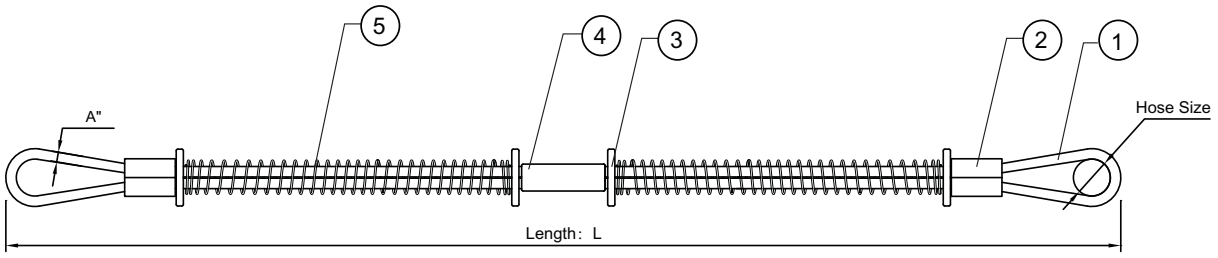
Thorburn's Series TWSR is designed for one side of the whip check to loop over a pneumatic tool such as the neck of a jackhammer and the other spring end to loop around the hose.

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

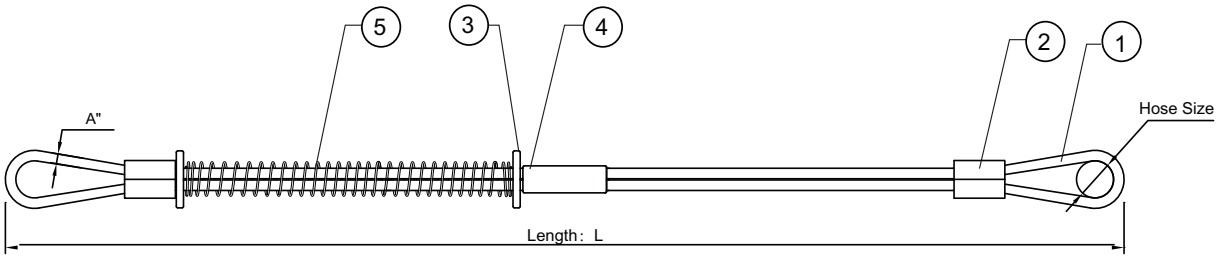
1. Wire Rope
2. Slider
3. Flat Washer
4. Ferrules
5. Spring



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.

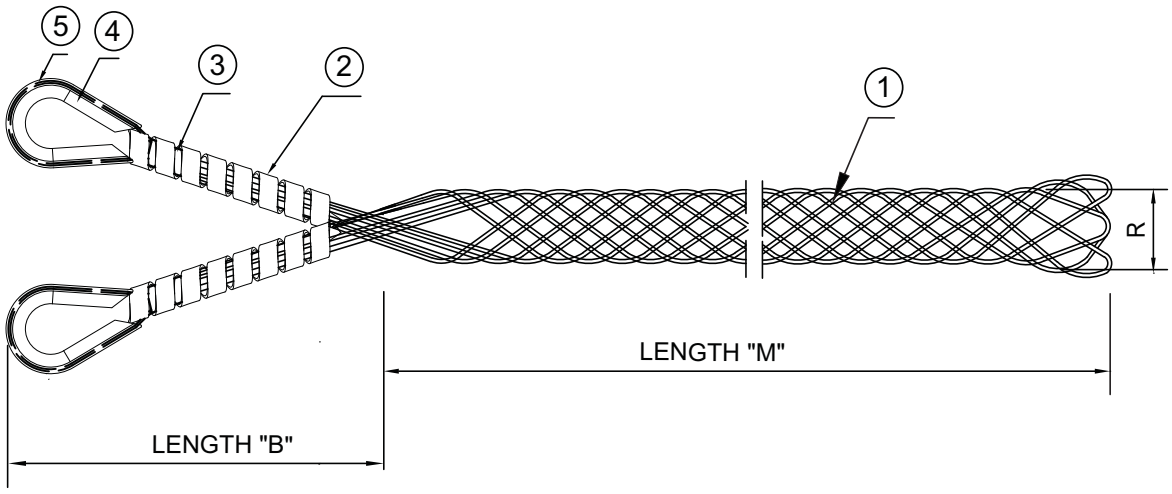
Features:

- 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



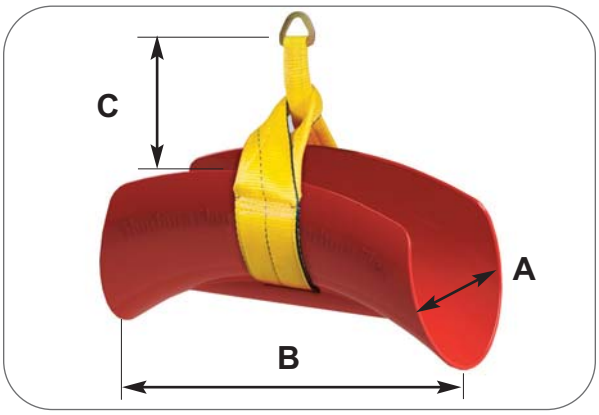
Warning: When installing a Whip Stop Safety Restraint, ensure proper fit by verifying if he diamond-pattern of the braiding is equally proportioned. If the diamonds are longer than they are wide, then the restraint is too big and the hose is at risk of slipping. After installing on the hose, pull on 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

Thorburn Series TSHP™ Specifications

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 TH20/TH40 Thor-Cart™ Hose Taxi

Thorburn ThorCart TH-20

Thorburn ThorCart TH-40

ThorCart™ Hose Taxi

Thorburn ThorCart™ Hose Taxi safely facilitate site transportation of long length hose assemblies to their installation or storage locations. ThorCarts are manufactured in two broad categories, ThorCart™ TH-20 (Light Duty) for transporting composite type hose assemblies and ThorCart TH-40™ (Heavy Duty) for transporting large diameter material handling hose assemblies. ThorCarts are custom designed to suit the specific requirements of the environment in which they will be used and prevent unnecessary abrasion damage caused by dragging the hose assemblies on the ground. The ThorCart system avoids mishandling of long length or large diameter hose assemblies such as over bending or kinking during site transportation.

ThorCart TH-40™ has a low center of gravity to prevent tipping and can be installed in tandem through a hitch system to accommodate longer hose assemblies. Thorburn ThorCarts are also designed to handle uneven ground surfaces and comes equipped with straps to secure the hose assembly in place during transportation. All Thorburn ThorCart™ wheels come standard with 360° pivot capabilities in order to move in any desired direction to the location.

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	A	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

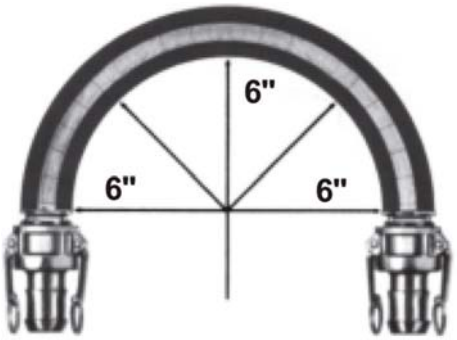
The Bend Radius is the radius to which the hose can be bent in service without damage or shortening its life. Textile reinforced hoses have a tendency to kink as the bend radius is reduced. A helical wire is used when a hose must withstand severe bends without flattening or kinking. The minimum bend 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



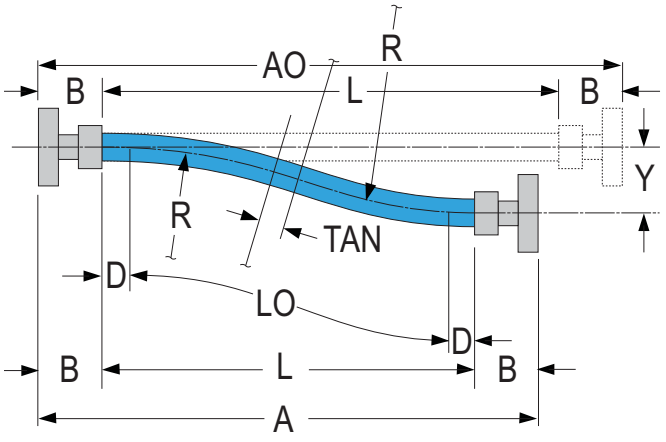
Example: to make a 180° bend with Thorburn hose which has a 2" I.D.
Given r = 6 "

$$\frac{180^\circ}{360^\circ} [2 \times 3.14 \times 6] = .5 \times 2 \times 3.14 \times 6 = 18.84"$$

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

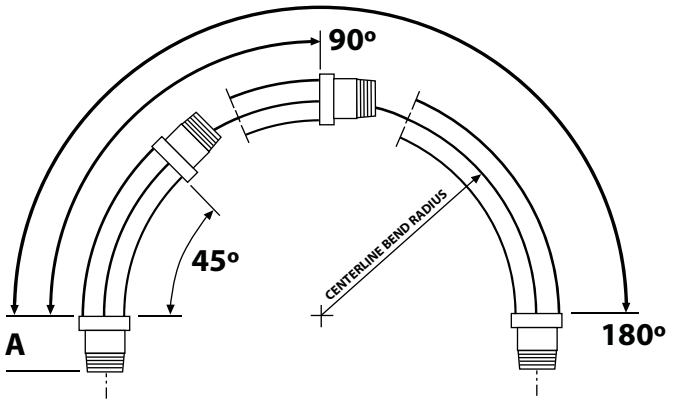
Note: Applicable for static bend only

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.

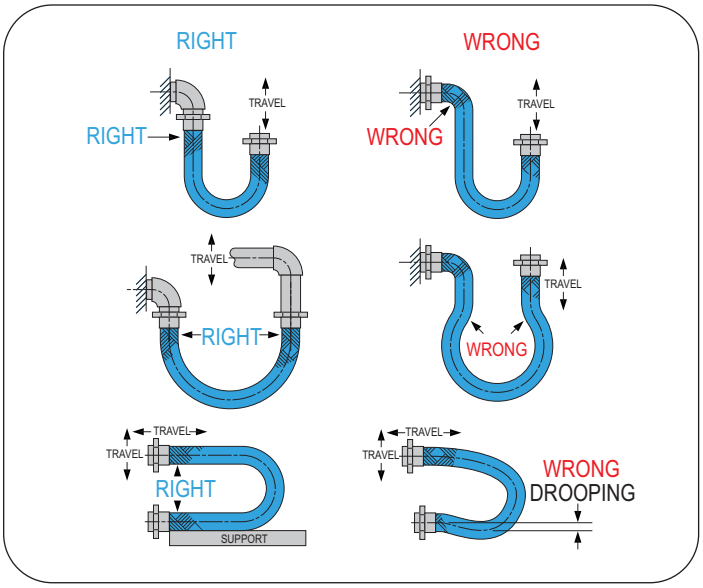


Centerline Bend Radius (in)	Minimum Live Length (in)		
	45°	90°	180°
1	1	2	4
2	2	3 1/2	7
3	2 1/2	5	10
4	3 1/2	6 1/2	13
5	4	8	16
6	5	10	20
7	5 1/2	11	22
8	6 1/2	13	26
9	7 1/2	14 1/2	29
10	8	16	32
11	9	18	36
12	10	19 1/2	39
13	10 1/2	21	42
14	11 1/2	22 1/2	45
15	12	24	48
16	13	26	52
17	13 1/2	27	54
18	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.

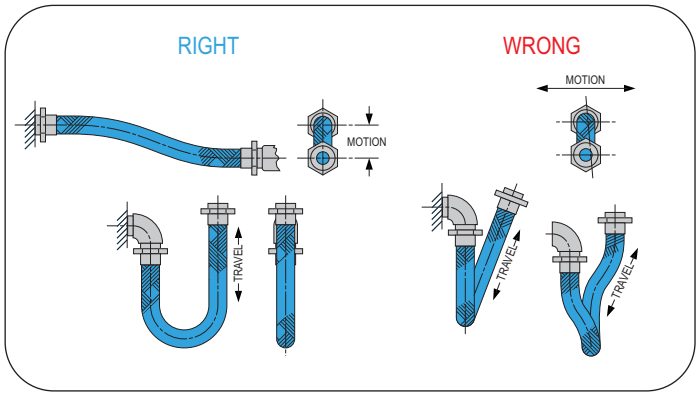


Avoid Overbending

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

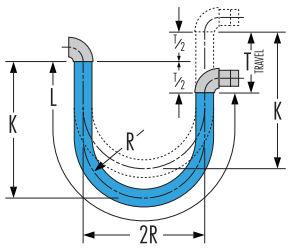
Torquing or twisting a Thorburn hose reduces service life substantially. When installing a hose, it is important that all movement originates in the same plane as the center line. Another precaution against torque is the use of a floating flange or union on one end of the assembly.

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

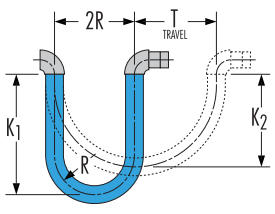
Class "A" Traveling Loops
For Maximum Vertical Travel



$L=4R+\frac{T}{2}$

$K=1.43R+\frac{T}{2}$

Class "B" Traveling Loops
For Short Horizontal Travel

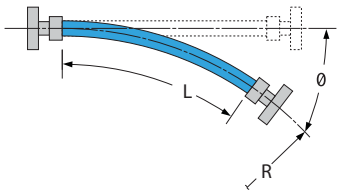


$L=4R+1.57T$

$K_1=1.43R+0.785T$

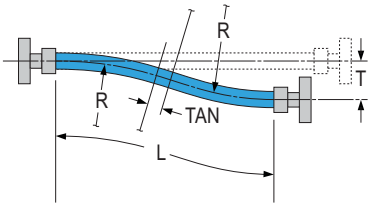
$K_2=1.43R=0.5T$

Angular Motion



$L=\frac{\pi R Ø}{180}+25$

Offset Motion



$L=\sqrt{20RT}$

Pipe Anchoring Guide

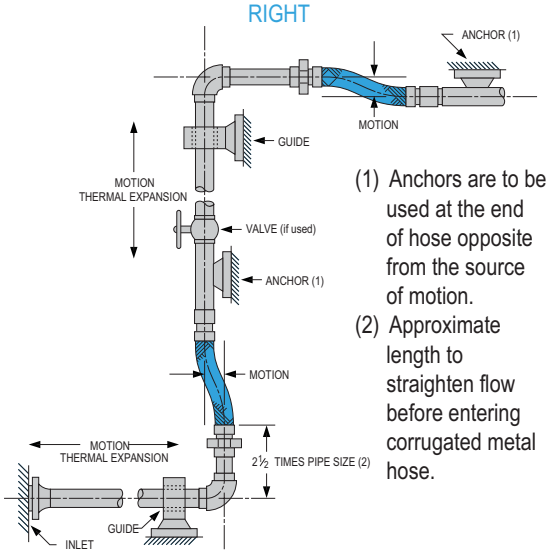
A piping system which utilizes Thorburn flexible hose assemblies to absorb pipe movement must be properly anchored and guided to assure correct functioning and maximum service life of the hose. The basic principles to be observed are:

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.

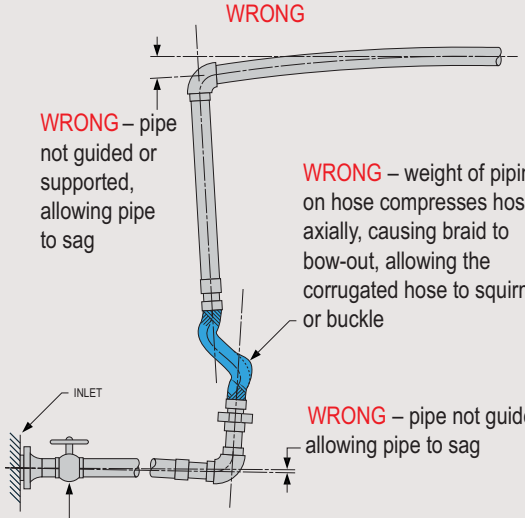
RIGHT



(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



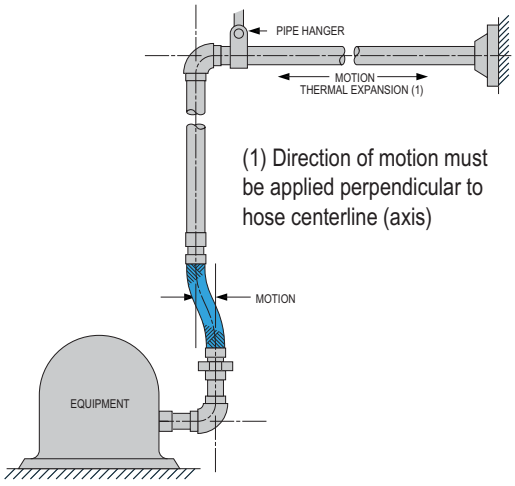
WRONG – pipe not guided or supported, allowing pipe to sag

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

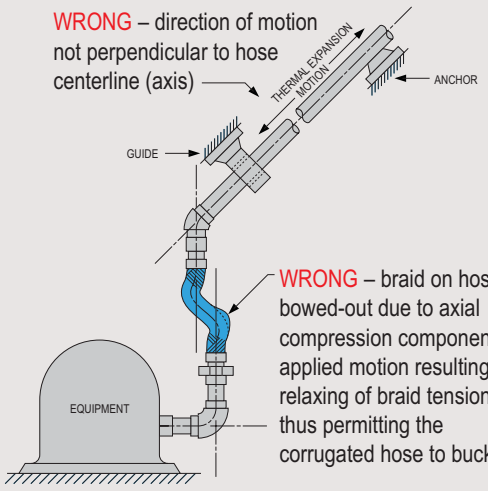
RIGHT



(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

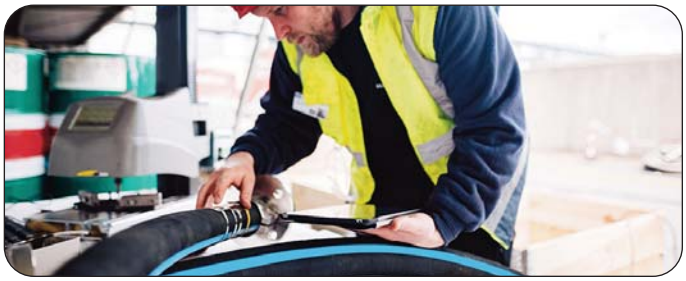
When required by the user, electrical continuity between the fittings shall be tested using an ohm meter. The hose must be clean and dry for this test.

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.

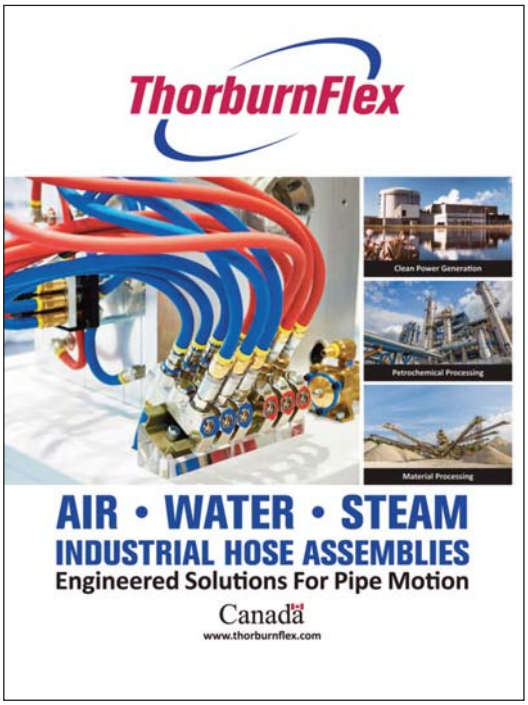
To avoid the effects of high ozone concentration, rubber hose products should not be stored near electrical equipment that may generate ozone or be stored for any lengthy period in geographical areas of known high ozone concentration. Exposure to direct or reflected sunlight — even through windows— should 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)

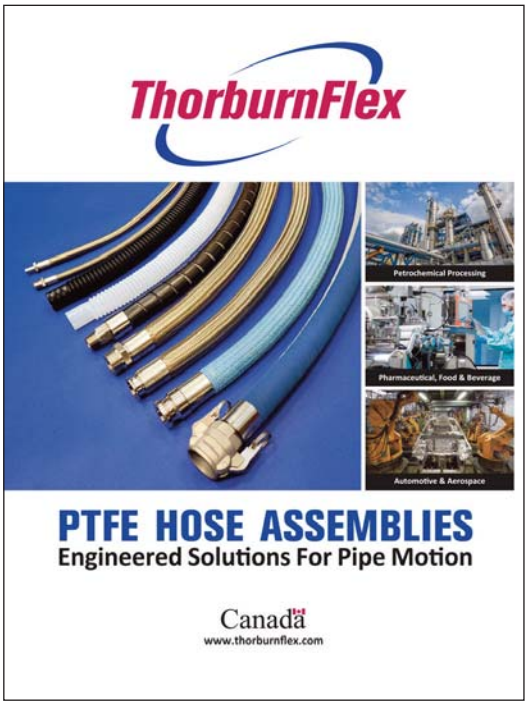
Applications

Clean Power Generation

LNG Transfer

Petro-Chemical Processing

Pulp & Paper Processing



PTFE Hose Assemblies Catalog

Thorburn's PTFE hose assemblies are engineered for extreme performance in highly demanding applications offering complete chemical inertness, low friction, non-contaminating, and non-conductive properties. Suitable for transfer operations from cryogenic temperatures up to superheated steam. Thorburn's PTFE hose assemblies can be leveraged into hundreds of demanding applications. Available in sizes from 6mm to 300mm. Thorburn offers a limited number of ETFE hose assemblies for applications requiring improved mechanical strength, lower effusion rate and stress cracking than traditional PTFE hoses Assemblies

Applicable Standards:

- ASME B31.3 Process Piping
- FDA 21 CFR 177.1550 (PTFE)
- USDA & 3A Sanitary Compliant (available options)
- EN 16643 / ISO 10380
- Available with Canadian CRN and material traceability certificates

Applications

Pharmaceutical, Food and Beverage

Automotive and Aerospace

Petro-Chemical Processing

High Temperature Autoclaves

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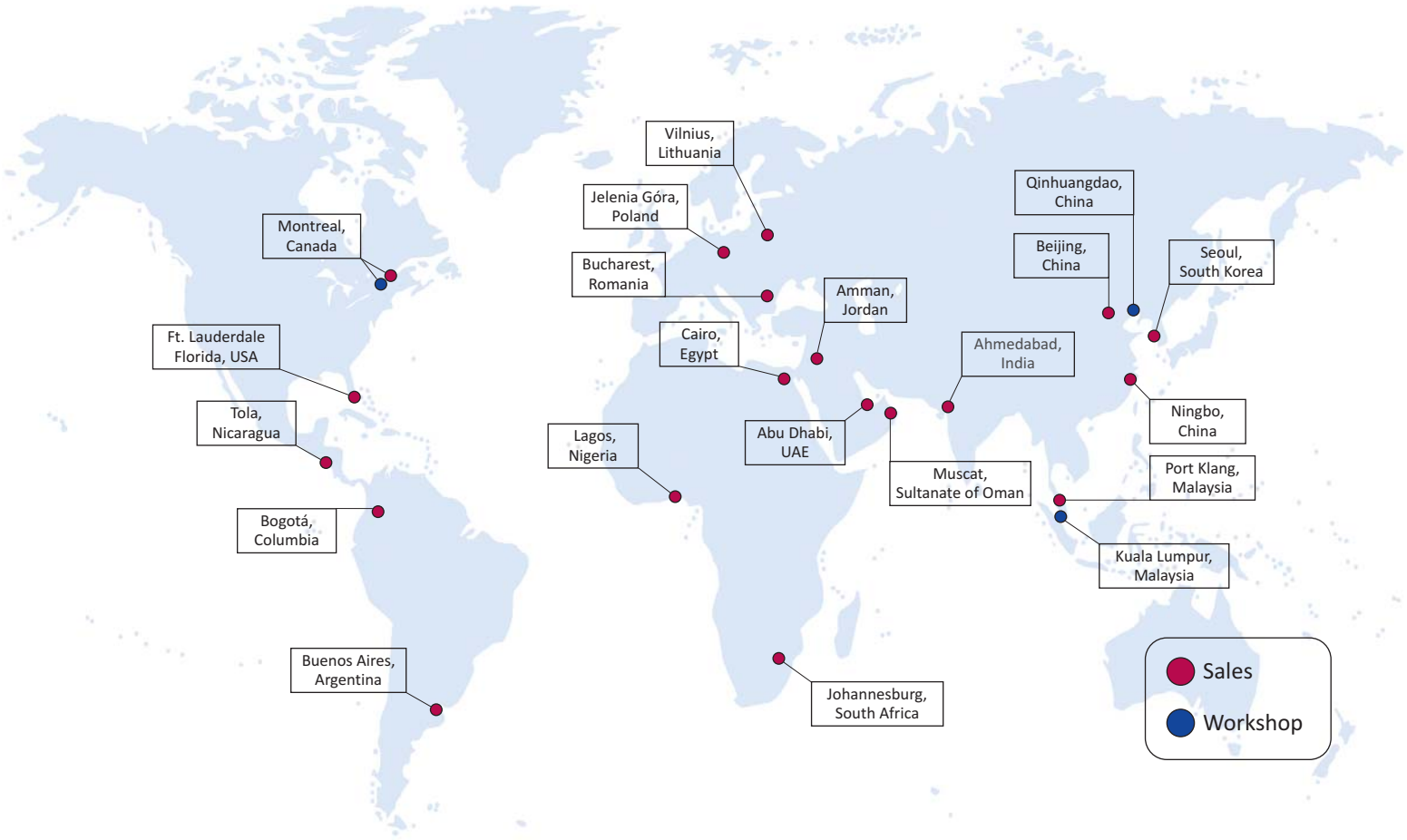
sales@thorburnflex.com

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