



On-Shore Drilling



Off-Shore Drilling



Fracking

OIL DRILLING & EXPLORATION HOSE ASSEMBLIES

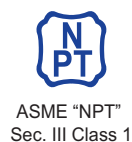
Engineered Solutions For Pipe Motion



www.thorburnflex.com



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.



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

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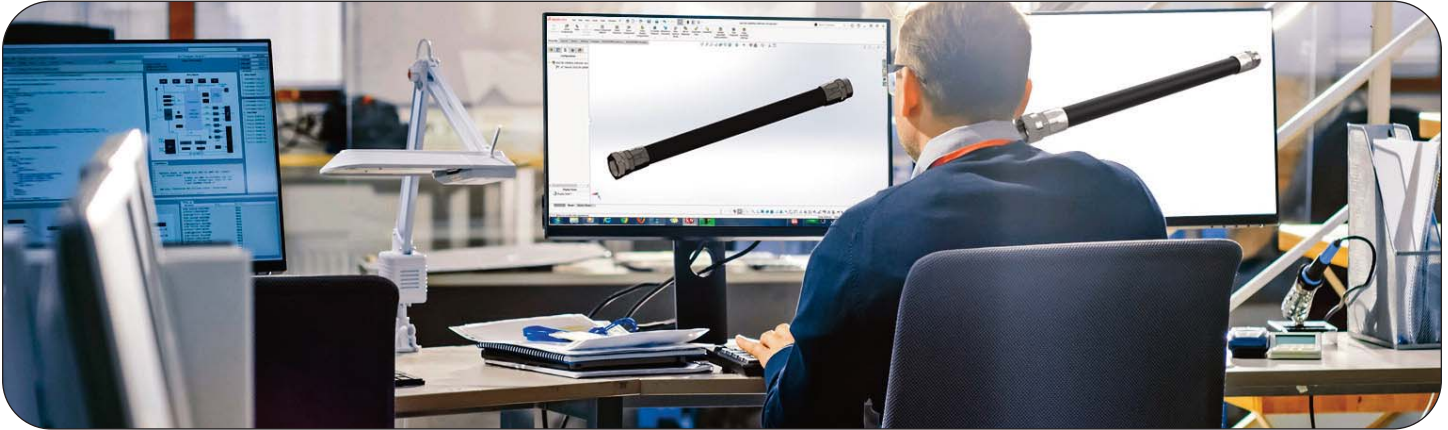
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Engineered Industrial Hose Assemblies



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 analyse and provide innovative solutions for pipe and duct motion problems including dynamic vibration, nonlinear static, linear static, thermal gradient through material wall thickness, acoustic impedance and fatigue using a common model data structure and integrated solver technology.

Design & Materials

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

Welding and Fabrication Capabilities

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

NDT/NDE Programs & Design Verification Testing

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

Fabrication Certification

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

Quality Assurance Certification & Compliance

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



Hose Assembly Burst Testing (up to 4000 bar)

Industrial 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



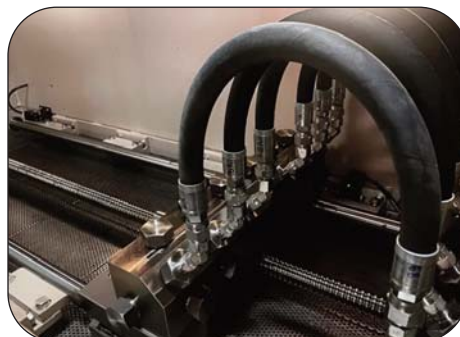
Precision Machining



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

Upstream, Midstream, Downstream



Upstream

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

Core activities of Upstream include:

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

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

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

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

Midstream

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

Core activities of Midstream include:

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

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

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

Downstream

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

Core activities of Downstream include:

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

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

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

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

Typical Upstream Hose Applications



On-Shore Drilling



Off-Shore Drilling



Mud Logging



Fracking



Well Control



Cementing Operations



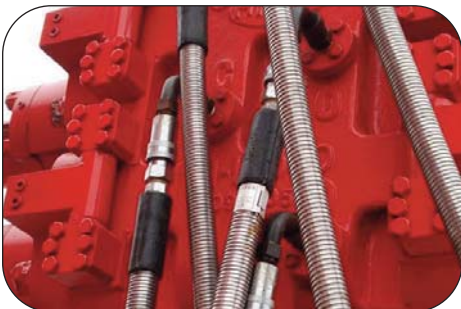
Choke and Kill Lines



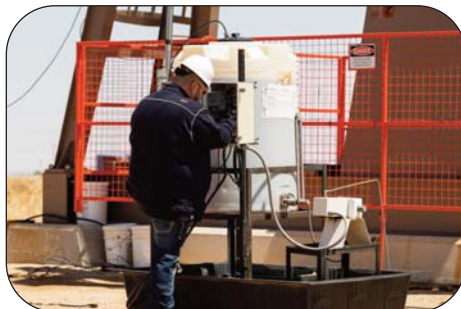
Oil Rig Fluid Handling



Mud Pump Discharge Lines



BOP Control

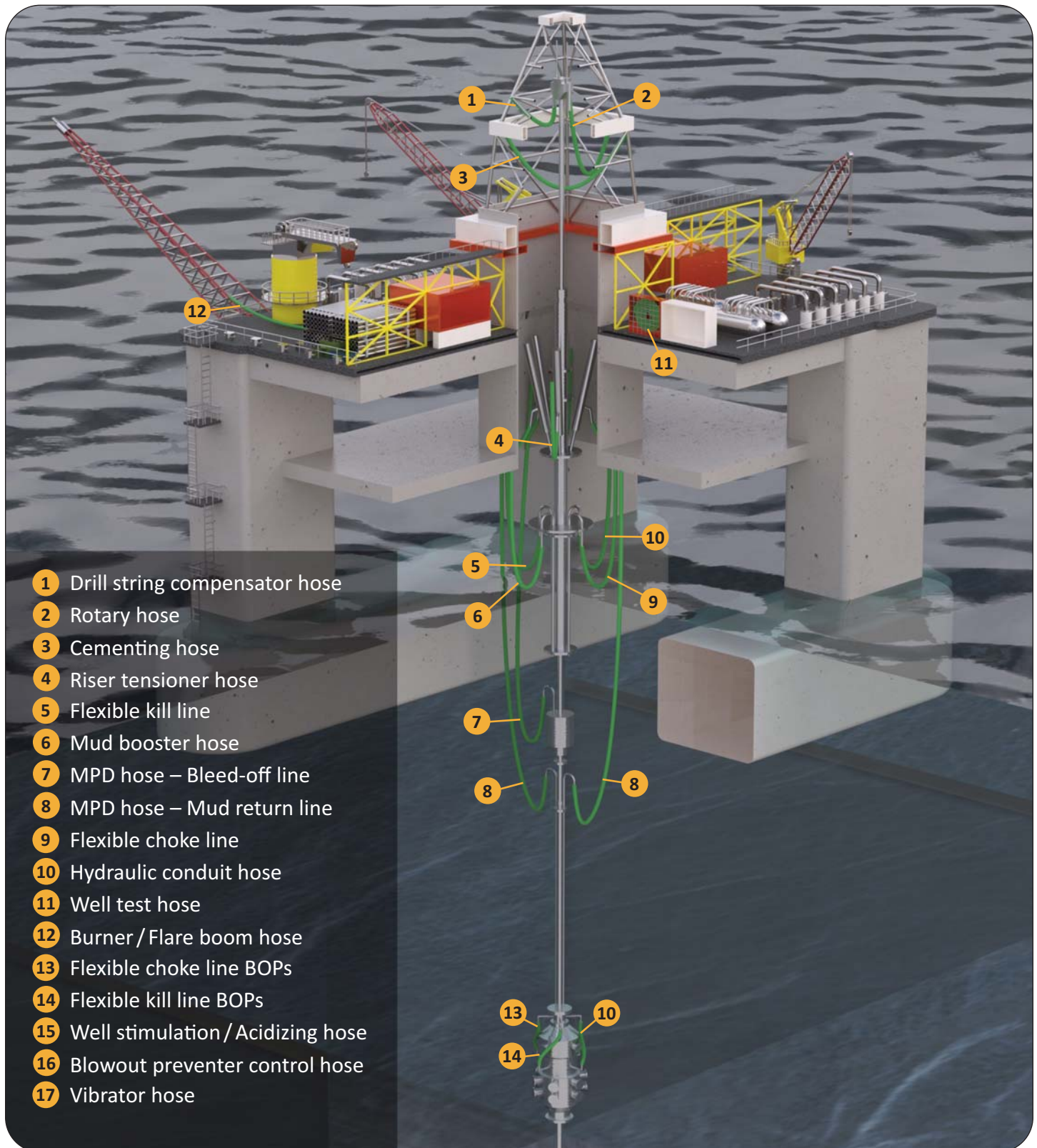


Chemical Injection in Drill Fluid Systems

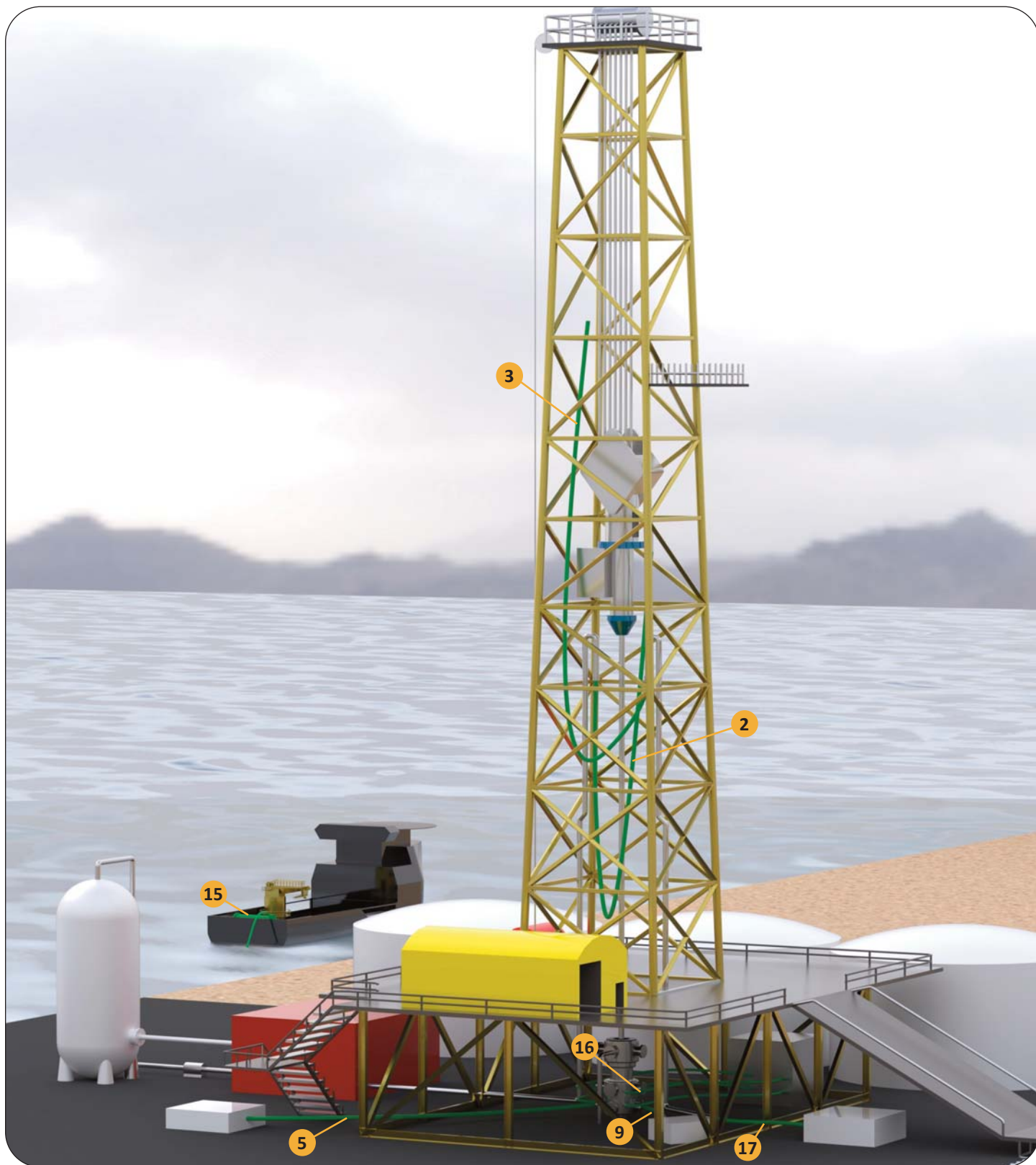


Rig Cooling & Fire Suppression

Exploration Hose Upstream Applications - Off-Shore



Exploration Hose Upstream Applications - On-Shore



General Hose Assembly Information



Hose Body Features

Liner Material Options

NBR (Type D): Standard oil-resistant liner for drilling muds, hydrocarbons, and general oilfield fluids.

HNBR: High-temperature, sour service, and harsh chemical fluids

UHMW: Ultra-high molecular weight polyethylene liner; exceptional abrasion resistance for sand-laden drilling muds, proppants, cuttings, and slurries.

PTFE: Maximum chemical resistance, non-stick flow, and compatibility with sour, aggressive, or high-temperature fluids. Ideal for acids, solvents, and specialty chemical injection.

Neoprene (Type C): Excellent resistance to weather, ozone, moderate oils, and general-purpose fluids; ideal for surface hoses exposed to environmental stress.

Minimum Bending Radius (MBR)

Calculated from the hose centerline, ensures safe bending without compromising structural integrity.

Maximum Recommended Flow Velocities

Dry gas: 20 m/s

Liquid: 15 m/s

Gaseous liquid: 8 m/s

Fire Resistance

Optional rating up to 1,300 °F (704 °C) for 30 minutes on hoses with bonded couplings. Certified to Lloyd's Register OD 1000/499 and API 16C standards.

External Protection

Abrasion, UV, and weather-resistant covers available on request for harsh environments.

Production Length Tolerances

≤6.4 m: ±64 mm >6.4 m: ±1% of hose length

Flange Type Hose Assembly



Hub Type Hose Assembly



Hammer Lug Union Type Hose Assembly



Hose Tube Selection Guide

PTFE Tube

Constructed from premium PTFE (Polytetrafluorethylene), providing an ultra-smooth, chemically inert internal flow path ideal for aggressive drilling and production fluids. PTFE offers outstanding resistance to acids, bases, solvents, hydrocarbons, and H₂S-containing media, ensuring long-term stability with zero contamination or chemical degradation. Its low friction coefficient minimizes pressure loss and prevents fluid buildup, while its excellent thermal stability allows reliable performance across wide temperature and pressure ranges. The PTFE tube delivers superior durability, non-stick properties, and unmatched compatibility, making it the ideal liner material for high-pressure drilling and well control hose assemblies.

Applications

- Handling Highly Corrosive or Aggressive Fluids
- Purity-Sensitive, or Non-Contaminating Flows
- Extreme Chemical + Temperature Combination
- H₂S-containing fluids (sour service)

NBR (Type D) Tube

A high-performance nitrile rubber inner tube engineered for demanding drilling, well servicing, and high-pressure fluid transfer applications. Formulated with enhanced acrylonitrile content, Type D NBR provides excellent resistance to oil-based drilling muds, hydrocarbons, diesel, crude oil, and refined petroleum products, while maintaining strong abrasion and tear resistance under high pressure and dynamic flexing. NBR Type D tube offers a balanced combination of oil resistance, flexibility, temperature stability, and wear protection, making it the industry-standard liner for most API 7K and 16C high-pressure hose assemblies.

Applications

- Low Temperature Drilling Operations
- Well Servicing
- Cementing & Stimulation
- Choke & Kill Systems

HNBR Tube

A premium, high-performance inner liner engineered for demanding oilfield environments requiring superior heat, oil, and chemical resistance. Through hydrogenation, the nitrile polymer structure is strengthened, giving HNBR exceptional durability against high-temperature oil-based drilling fluids, sour gas (H₂S), amine-based mud treatments, and aggressive completion or stimulation chemicals.

Applications

- High-Temperature Oil-Based Drilling Fluids
- Sour Service (H₂S) and Harsh Chemical Exposure
- High-Pressure / High-Fatigue Service Applications
- Extreme Weather or Environmental Conditions

UHMW Tube

A highly durable, chemically resistant inner liner engineered for abrasive and corrosive fluid handling in oilfield and industrial applications. Its extremely high molecular weight provides exceptional abrasion resistance, allowing the tube to withstand sand-laden drilling muds, proppant slurries, cuttings, and other solids-rich fluids with minimal wear.

Applications

- Abrasive Fluids With Sand or Solids
- High-Solids Drilling Mud
- Chemical Transfer and Corrosive Fluids
- Frac and Stimulation Operations

Neoprene (Type C) Tube

A versatile chloroprene rubber (CR) inner liner designed for robust performance in oilfield, industrial, and general-purpose applications. It offers excellent resistance to weathering, ozone, oxidation, and moderate chemicals, making it ideal for hoses exposed to harsh environments and fluctuating outdoor conditions. It provides a balanced combination of mechanical strength, flexibility, and abrasion resistance, ensuring reliable performance in dynamic fluid transfer operations. It is suitable for handling water, mild oils, air, and various general-purpose chemicals, and is particularly effective in applications where moderate chemical resistance and temperature stability are required.

Applications

- Coolant and Drilling Fluid Lines
- Surface and General-Purpose Fluid Transfer
- Weather-Exposed Hoses
- Low-to-Moderate Oil or Hydrocarbon Fluids



Oilfield Industry Hose Standards

API 7K Sets the industry standard for drilling and well-servicing hoses and equipment, ensuring they perform reliably under high pressures, cyclic loads, and harsh oilfield conditions. Equipment built to API 7K standards delivers durability, safety, and long service life, making it the trusted choice for contractors and service companies seeking dependable, high-performance solutions for drilling, cementing, and well-servicing operations.

API 7K Pressure Grades:

- A** = 1500 psi
- B** = 2000 psi
- C** = 4000 psi
- D** = 5000 psi
- E** = 7500 psi

API 16C covers the design, manufacture, testing, and performance requirements for choke and kill systems, including flexible choke and kill lines, manifolds, and control equipment used in drilling, well control, and subsea operations. The standard ensures that these high-pressure components can safely handle extreme pressures, temperature variations, and corrosive well-bore fluids during well control events.

API 16D Specifies the design, performance, and testing requirements for control systems for drilling well control equipment, including BOP control systems and associated instrumentation. It ensures that these systems remain reliable and functional during extreme conditions, such as, fire exposure, high pressure, and harsh operating environments, to maintain safe well control operations.

API 16K Sets the industry standard for casing and tubing running equipment, ensuring safe, reliable, and efficient handling of heavy tubulars in demanding oilfield operations. Designed and tested to withstand extreme loads, high pressures, and harsh environments, API 16K-compliant equipment delivers durability, operational safety, and long service life for both on-shore and offshore drilling. Ideal for drilling contractors and service companies seeking performance, reliability, and peace of mind in tubular handling and running operations.

API RP 14E provides recommended practices for the design and operation of offshore piping systems, focusing on proper material selection, flow velocity limits, corrosion control, and erosion prevention to ensure safe, reliable performance in offshore oil and gas facilities.

NACE MR-01-75 (ISO 15156) defines material requirements for equipment used in sour gas service, ensuring resistance to H₂S-induced corrosion and sulfide stress cracking. Components built to this standard offer enhanced durability and reliability in harsh, high-H₂S oilfield environments.

FSL Levels for High Pressure Hose Assemblies

The API 7K standard for rotary, mud, and cement hoses, and the API 16C standard for flexible choke and kill lines, both define Flexible Specification Levels (FSL) to classify a hose's performance, testing requirements, and safety capability. Selecting the correct FSL rating is critical: it ensures that each hose can safely withstand the pressures, temperature ranges, dynamic loads, and service conditions encountered during drilling operations. For the safety and reliability of the drilling system, it is essential that both purchasers and operators carefully evaluate their operational environment and choose the appropriate FSL level to meet the demands of their application.

FSL Levels for Mud and Cement Hoses in API 7K

FSL 0 – For Cement Hoses Only

FSL 0 applies exclusively to cement hoses and represents the baseline qualification level defined by API standards. To meet FSL 0 requirements, the hose must undergo a deformation test under pressure, as well as ambient and low-temperature bending tests to verify flexibility and structural integrity. Unlike higher specification levels, no pressure-pulsation prototype testing is required, making FSL 0 suitable for cementing applications where dynamic pressure cycling is not expected.

FSL 1 – For Rotary, Vibrator, and Jumper Hoses in Normal Service Conditions

FSL 1 applies to rotary, vibrator, and jumper hoses operating under standard drilling conditions. In addition to meeting all FSL 0 qualification tests, FSL 1 requires a low-frequency pressure pulsation prototype test to verify the hose's ability to withstand moderate dynamic loading. To comply with FSL 1, the hose must successfully complete 1,000 pressure cycles (maximum 5 minutes per cycle) at its maximum operating temperature, demonstrating reliable performance in typical drilling environments.

FSL 2 – For Rotary, Vibrator, and Jumper Hoses Exposed to High-Frequency Pressure Pulsations

FSL 2 applies to rotary, vibrator, and jumper hoses used in applications where high-frequency pressure pulsations are expected, such as directional drilling, managed pressure drilling, or other dynamic drilling environments. To meet FSL 2 requirements, the hose must first pass all FSL 0 prototype tests, and then successfully complete a high-frequency pressure pulsation prototype test consisting of 10,000 pressure cycles (maximum 10 seconds per cycle) at its maximum operating temperature. This level ensures dependable performance under rapid cyclic loading and more demanding drilling conditions.

FSL Levels for Flexible Choke & Kill Lines in API 16C

FSL 0 – Essential Qualification for API 16C Choke & Kill Lines

FSL 0 provides the baseline safety assurance for flexible choke & kill lines. At this level, the hose must pass key integrity tests—including hydrostatic pressure, bending flexibility, burst testing, and gas exposure, to confirm safe performance in standard well-control conditions. The gas exposure test includes three rapid decompressions, followed by a 7-day hold at design pressure and maximum temperature, plus 30 days at design pressure and ambient temperature. Final validation is completed with a 30-minute test at 1.5× design pressure.

FSL 1 – Enhanced Fire Safety Qualification

To achieve FSL 1 under API 16C, the hose must meet all FSL 0 requirements and additionally pass a demanding fire test. The hose is tested at design pressure while exposed to 1,300°F (704°C) external heat for 30 minutes with zero leakage. FSL 1 provides elevated safety assurance for choke & kill lines operating in environments where fire resistance is critical.

FSL 2 – High-Temperature Kick Resistance

To qualify for FSL 2 under API 16C, the hose must meet all FSL 0 requirements and undergo a demanding high-temperature exposure test designed to simulate a severe well-control kick. During testing, the hose is slowly heated internally to 350°F (177°C) while maintained at design pressure, and must operate for one hour without leakage. After this hold period, the internal temperature is increased further until the hose ultimately reaches its failure point. FSL 2 certification ensures the hose can withstand extreme high-temperature, high-pressure events common in critical well-control scenarios.

FSL 3 – Maximum High-Temperature and Fire Protection

FSL 3 represents the highest safety and performance level for API 16C flexible choke & kill lines. In addition to all FSL 2 tests, the hose must successfully pass a fire test at design pressure with 1,300°F (704°C) external temperature for 30 minutes, without any leakage. This ensures the hose delivers maximum protection in extreme high-temperature and fire-risk scenarios, making it ideal for the most demanding well-control operations.

Oil Exploration Hose



Thorburn Series 1TOFH Rotary & Vibrator Hose

(API 7K Spec. FSL 1, FSL 2)



Key Features

- API 7K Grade D and Grade E performance
- FSL 1 and FSL 2 pulsation qualification
- Multi-spiral steel reinforcement withstands pressure and vibration
- HNBR tube resists drilling fluids and abrasion
- Hydrostatically tested at 1.5-times design pressure
- Lengths to 200 feet reduce intermediate connections

Thorburn Series 1TOFH: is a purpose-built API 7K rotary and vibrator hose designed for continuous high-pressure drilling-mud circulation where pressure pulsation, vibration, flexing and rig movement demand more than a conventional mud hose. Its HNBR tube provides excellent resistance to drilling fluids and abrasion, while multiple high-tensile steel-wire spirals provide pressure strength with controlled flexibility. Grade D assemblies are rated to 5,000 psi design pressure and hydrostatically tested to 7,500 psi. The 3-1/2-inch Grade E version is rated to 7,500 psi and tested to 11,250 psi. Available in FSL 1 or FSL 2, 1TOFH provides an API-qualified connection from mud pump to standpipe and standpipe to swivel or top drive.

Applications

- Standpipe-to-swivel rotary drilling mud circulation
- Mud pump-to-standpipe high-pressure vibrator service
- Standpipe-to-top-drive flexible drilling-fluid connection
- Offshore drilling requiring movement and vibration accommodation
- High-pressure water- and oil-based drilling mud transfer
- Deep drilling requiring Grade E pressure capability

Construction

Standard: API 7K Spec. FSL 1, FSL 2

Tube: UHMW abrasion and drilling-fluid resistant

Reinforcement: Multi-spiraled, high tensile steel wire

Cover: Abrasion, oil, weather and ozone-resistant synthetic rubber

Operating Temperature:

FSL 1: -22°F to 180°F (-30°C to 82°C)

FSL 2: -22°F to 212°F (-30°C to 100°C)

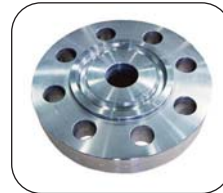
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		API Grade	Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi		mm	in	kg/m	lb/ft
1TOFH48-5K*	76	3	127	5.0	345	5,000	517	7,500	D	800	31.5	18	12.1
1TOFH56-5K*	89	3 1/2	140	5.5	345	5,000	517	7,500	D	900	35.4	21	14.1
1TOFH56-7.5K*	89	3 1/2	142	5.6	517	7,500	776	11,250	E	1100	43.3	39	26.2
1TOFH64-5K*	102	4	150	5.9	345	5,000	517	7,500	D	900	35.4	22	14.8

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

* Add suffix FSL1, FSL2 if applicable. Example: 1TOFH48-5K-FSL1

Thorburn Series 2TOFH Rotary & Vibrator Hose

(API 7K Spec. FSL 1, FSL 2) for High Temperature Drilling & Sour Gas Service



Key Features

- API 7K Grade C, D and E
- FSL 1/FSL 2 severe pulsation capability
- Sour-service liner for H₂S-containing drilling fluids
- Tested to 1.5 times design pressure
- Two- through six-inch sizes maximize application coverage
- Multi-spiral reinforcement controls vibration and pressure loading

Thorburn Series 2TOFH: is a severe-service API 7K rotary and vibrator hose engineered for high-temperature, sour-service drilling. Its qualified sour-service liner and reinforced construction withstand H₂S fluids, severe vibration, elevated temperatures, and pressure pulsation. Available in 2–6 inch sizes, Grade C, D, and E provide 4,000–7,500 psi design pressures, with FSL 1 or 2 configurations for demanding drilling environments.

Applications

- High-temperature drilling with H₂S-containing drilling muds
- Sour-well mud circulation between standpipe and top drive
- Mud-pump-to-standpipe vibrator service under severe pressure pulsation
- Deep directional drilling requiring Grade E pressure capability

Construction

Standard: API 7K Spec. FSL 1, FSL 2

Tube: HNBR blend Qualified H₂S-resistant sour-service liner

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -22°F to 250°F (-30°C to 121°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		API Grade	Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi		mm	in	kg/m	lb/ft
2TOFH32-4K*	51	2	104	4.1	276	4,000	414	6,000	C	700	27.6	15	10.1
2TOFH32-5K*	51	2	104	4.1	345	5,000	517	7,500	D	700	27.6	15	10.1
2TOFH40-4K*	64	2 1/2	114	4.5	276	4,000	414	6,000	C	700	27.6	16	10.8
2TOFH40-5K*	64	2 1/2	114	4.5	345	5,000	517	7,500	D	700	27.6	16	10.8
2TOFH40-7.5K*	64	2 1/2	136	5.4	517	7,500	776	11,250	E	1100	43.3	31	208
2TOFH48-4K*	76	3	126	5.0	276	4,000	414	6,000	C	800	31.5	18	12.1
2TOFH48-5K*	76	3	126	5.0	345	5,000	517	7,500	D	800	31.5	18	12.1
2TOFH48-7.5K*	76	3	149	5.9	517	7,500	776	11,250	E	1200	47.2	35	23.5
2TOFH56-4K*	89	3 1/2	140	5.5	276	4,000	414	6,000	C	900	35.4	21	14.1
2TOFH56-5K*	89	3 1/2	140	5.5	345	5,000	517	7,500	D	900	35.4	21	14.1
2TOFH56-7.5K*	89	3 1/2	162	6.4	517	7,500	776	11,250	E	1300	51.2	39	26.2
2TOFH64-4K*	102	4	153	6.0	276	4,000	414	6,000	C	1000	39.4	24	16.1
2TOFH64-5K*	102	4	153	6.0	345	5,000	517	7,500	D	1000	39.4	24	16.1
2TOFH64-7.5K*	102	4	175	6.9	517	7,500	776	11,250	E	1400	55.1	44	29.6
2TOFH80-5K*	127	5	213	8.4	345	5,000	517	7,500	D	1500	59.1	67	45.0
2TOFH80-7.5K*	127	5	213	8.4	517	7,500	776	11,250	E	1500	59.1	67	45.0
2TOFH96-5K*	152	6	224	8.8	345	5,000	517	7,500	D	1700	66.9	57	38.3
2TOFH96-7.5K*	152	6	248	9.8	517	7,500	776	11,250	E	1800	70.9	93	62.5

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

* Add suffix FSL1, FSL2 if applicable. Example: 2TOFH32-5K-FSL1

Thorburn Series 3TOFH Rotary & Vibrator Hose

(API 7K Spec. FSL 1, FSL 2) for Low Temperature Arctic Drilling



Key Features

- API 7K Grade C, D and E
- FSL 1/FSL 2 pulsation-qualified construction
- Flexible to -40°F for Arctic drilling
- Proprietary low-temperature NBR resists cold cracking
- Multi-spiral reinforcement controls vibration and pressure loading
- Hydrostatically tested at 1.5-times design pressure

Thorburn Series 3TOFH: is an Arctic-service API 7K rotary and vibrator hose engineered for extreme cold drilling. Its proprietary low-temperature NBR tube maintains flexibility, toughness, and pressure integrity to -40°F (-40°C). Multi-spiral high-tensile steel reinforcement withstands vibration, pressure pulsation, and dynamic movement. Available in 2–4 inch sizes, Grade C, D, and E provide 4,000-7,500 psi design pressures, with FSL 1 or FSL 2 qualification and 1.5 times hydrostatic testing.

Applications

- Arctic mud circulation between standpipe and top drive
- Cold-weather mud pump-to-standpipe high-pressure vibrator service
- Offshore drilling in sub-zero marine environments
- Winterized onshore drilling and remote exploration rigs

Construction

Standard: API 7K Spec. FSL 1, FSL 2

Tube: Thorburn proprietary low-temperature NBR formulation, Type D

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion and weather-resistant synthetic rubber

Operating Temperature: -40°F to 180°F (-40°C to 82°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		API Grade	Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi		mm	in	kg/m	lb/ft
3TOFH32-4K	51	2	103	4.1	276	4,000	414	6,000	C	700	27.6	14	9.4
3TOFH32-5K	51	2	103	4.1	345	5,000	517	7,500	D	700	27.6	14	9.4
3TOFH40-4K	64	2 1/2	113	4.5	276	4,000	414	6,000	C	1700	66.9	15	10.1
3TOFH40-5K	64	2 1/2	113	4.5	345	5,000	517	7,500	D	700	27.6	15	10.1
3TOFH40-7.5K	64	2 1/2	136	5.4	517	7,500	776	11,250	E	800	31.5	31	20.8
3TOFH48-4K	76	3	126	5.0	276	4,000	414	6,000	C	800	31.5	18	12.1
3TOFH48-5K	76	3	126	5.0	345	5,000	517	7,500	D	800	31.5	18	12.1
3TOFH48-7.5K	76	3	148	5.8	517	7,500	776	11,250	E	1100	43.3	34	22.8
3TOFH56-4K	89	3 1/2	140	5.5	276	4,000	414	6,000	C	900	35.4	21	14.1
3TOFH56-5K	89	3 1/2	140	5.5	345	5,000	517	7,500	D	900	35.4	21	14.1
3TOFH56-7.5K	89	3 1/2	162	6.4	517	7,500	776	11,250	E	1300	51.2	38	25.5
3TOFH64-4K	102	4	152	6.0	276	4,000	414	6,000	C	1000	39.4	23	15.5
3TOFH64-5K	102	4	152	6.0	345	5,000	517	7,500	D	1000	39.4	23	15.5
3TOFH64-7.5K	102	4	174	6.9	517	7,500	776	11,250	E	1400	55.1	42	28.2

Only sold as a hose assembly. * Add suffix FSL1, FSL2 if applicable. Example: 3TOFH32-5K-FSL1

Thorburn Series 4TOFH Mud & Cementing Hose

(API 7K Spec. FSL 0, FSL 1) for High-Pressure Well Service



Key Features

- API 7K FSL 0/FSL 1 configurations
- 5,000 and 10,000 psi working pressures
- 2.5:1 minimum burst safety factor
- Neoprene-blend tube handles abrasive cement slurries
- Multi-spiral reinforcement withstands severe pressure loading
- Tested at 1.5-times design pressure

Thorburn Series 4TOFH: is a dedicated API 7K mud and cementing hose for high-pressure well construction where conventional rotary hoses are not optimized for dense, abrasive cement slurries. Unlike 1TOFH standard rotary service, 2TOFH high-temperature sour service, and 3TOFH Arctic service, 4TOFH uses a Neoprene-blend Type C tube and heavy multi-spiral reinforcement for repeated mud circulation and cementing duty. The 2-inch range is available in 5,000 psi Grade D and dedicated 10,000 psi cementing configurations, each hydrostatically tested to 1.5 times working pressure. FSL 0 supports cement-hose qualification, while FSL 1 supports normal mud, vibrator, and jumper service, making 4TOFH ideal for cementing manifolds, pumps, and drilling-fluid connections on rigs.

Applications

- Cementing pump manifold-to-cementing head high-pressure connection
- High-pressure transfer of abrasive cement slurries
- Mud pump-to-standpipe drilling-fluid circulation service
- Offshore cementing and drilling-fluid jumper service

Construction

Standard: API 7K Spec. FSL 0, FSL 1

Tube: HNBR Blend, Type M, smooth bore

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature:

5K PSI: -22°F to 180°F (-30°C to 82°C), **10K PSI:** -22°F to 250°F (-30°C to 100°C)

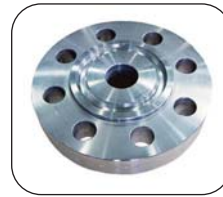
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
4TOFH32-5K*	51	2	71	2.8	350	5,000	517	7,500	700	27.6	7.3	4.9
4TOFH32-10K*	51	2	71	2.8	690	10,000	1,035	15,000	700	27.6	7.3	4.9

Only sold as a hose assembly. * Add suffix FSL0, FSL1 if applicable. Example: 4TOFH32-5K-FSL1

Thorburn Series 5TOFH Underbalanced Drilling Hose

(API 7K Spec. FSL 1) for Gas, Air, Foam & Mist Drilling Service



Key Features

- Handles air, gas, and foam drilling fluids
- High-pressure and pulsation resistant
- Flexible and kink-resistant
- Corrosion and chemical-resistant
- Durable multi-layer reinforcement
- API 7K compliance for quality, safety, and reliability

Thorburn Series 5TOFH: is Thorburn's specialized API 7K FSL 1 underbalanced drilling hose for air, gas, foam and mist drilling where conventional mud hoses are not designed for repeated gas exposure. Unlike 1TOFH standard service, 2TOFH high-temperature sour service, 3TOFH Arctic service and 4TOFH cementing service, 5TOFH incorporates a gas-decompression-resistant liner and multi-spiral reinforcement for compressible-media pressure cycling, vibration and flexing. Offered in 2-through 4-inch sizes, Grade C, D and E constructions provide 4,000, 5,000 and 7,500 psi design pressures. Every assembly is hydrostatically tested to 1.5 times design pressure, making 5TOFH ideal for standpipe-to-top-drive connections requiring controlled high-pressure fluid delivery.

Applications

- Standpipe-to-top-drive connections for underbalanced air drilling operations
- High-pressure foam and mist drilling circulation systems
- Aerated drilling-fluid delivery during underbalanced drilling operations
- Gas-assisted drilling requiring decompression-resistant hose construction

Construction

Standard: API 7K Spec. FSL 1

Tube: Proprietary gas-decompression-resistant liner

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -4°F to 180°F (-20°C to 82°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
5TOFH32-4K*	51	2	94	3.7	276	4,000	414	6,000	900	35.4	10	6.7
5TOFH32-5K*	51	2	94	3.7	345	5,000	517	7,500	900	35.4	10	6.7
5TOFH40-4K*	64	2 1/2	108	4.3	276	4,000	414	6,000	1200	47.2	13	8.7
5TOFH40-5K*	64	2 1/2	110	4.3	345	5,000	517	7,500	1200	47.2	15	10.1
5TOFH40-7.5K*	64	2 1/2	124	4.9	517	7,500	776	11,250	1300	51.2	22	14.8
5TOFH48-4K*	76	3	122	4.8	276	4,000	414	6,000	1200	47.2	15	10.1
5TOFH48-5K*	76	3	124	4.9	345	5,000	517	7,500	900	35.4	17	11.4
5TOFH48-7.5K*	76	3	142	5.6	517	7,500	776	11,250	1200	47.2	31	20.8
5TOFH56-4K*	89	3 1/2	138	5.4	276	4,000	414	6,000	1000	39.4	20	13.4
5TOFH56-5K*	89	3 1/2	138	5.4	345	5,000	517	7,500	1000	39.4	20	13.4
5TOFH56-7.5K*	89	3 1/2	156	6.1	517	7,500	776	11,250	1400	55.1	35	23.5
5TOFH64-4K*	102	4	150	5.9	276	4,000	414	6,000	1500	59.0	22	14.8
5TOFH64-5K*	102	4	164	6.5	345	5,000	517	7,500	1500	59.0	32	21.5
5TOFH64-7.5K*	102	4	168	6.6	517	7,500	776	11,250	1600	63.0	39	26.2

Only sold as a hose assembly. * Add suffix FSL1 if applicable. Example: 5TOFH32-5K-FSL1

Thorburn Series 6TOFH Cementing Hose

(API 7K Spec. FSL 0) for Dedicated Cementing Service



Key Features

- API 7K FSL 0 cementing qualification
- 5,000 to 15,000 psi working pressures
- Two- through four-inch sizes increase versatility
- Multi-spiral reinforcement withstands extreme pressure loading
- Abrasion-resistant tube handles dense cement slurries
- Tested at 1.5-times design pressure

Thorburn Series 6TOFH: is Thorburn's dedicated API 7K FSL 0 cementing hose engineered for high-pressure well construction and completion service. Its multi-spiral, high-tensile steel reinforcement provides pressure containment, flexibility, and durability during abrasive cement slurry transfer. Available in 2–4 inch sizes with 5,000, 10,000, and 15,000 psi working pressures, each assembly is hydrostatically tested to 1.5 times working pressure. Ideal for critical cementing connections on-shore and offshore.

Applications

- Cementing pump-to-manifold high-pressure slurry transfer
- Manifold-to-cementing-head flexible connections during well completions
- High-pressure primary cementing for casing installation
- Remedial squeeze cementing and well intervention operations

Construction

Standard: API 7K Spec. FSL 0

Tube: NBR, Type C, cement-slurry resistant **Optional :** UHMW or HNBR

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -13°F to 212°F (-25°C to 100°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 5,000 PSI: 2.5:1, 10,000 PSI: 2.25:1, 15,000 PSI: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
6TOFH32-5K*	51	2	103	4.1	345	5,000	689	10,000	700	27.6	14	9.4
6TOFH32-10K*	51	2	123	4.8	689	10,000	1034	15,000	1000	39.4	26	17.5
6TOFH32-15K*	51	2	140	5.5	1034	15,000	1551	22,500	1400	55.1	40	26.9
6TOFH40-5K*	64	2 1/2	113	4.5	345	5,000	689	10,000	700	27.6	15	10.1
6TOFH40-10K*	64	2 1/2	136	5.4	689	10,000	1034	15,000	1100	43.3	30	20.2
6TOFH40-15K*	64	2 1/2	153	6.0	1034	15,000	1551	22,500	1500	59.1	45	30.2
6TOFH48-5K*	76	3	126	5.0	345	5,000	689	10,000	800	31.5	18	12.1
6TOFH48-10K*	76	3	136	5.4	689	10,000	1034	15,000	1100	43.3	30	20.2
6TOFH48-15K*	76	3	166	6.5	1034	15,000	1551	22,500	1600	63.0	53	35.6
6TOFH64-5K*	102	4	166	6.5	345	5,000	689	10,000	1200	47.2	33	22.2
6TOFH64-10K*	102	4	192	7.6	689	10,000	1034	15,000	1700	66.9	61	41.0
6TOFH64-15K*	102	4	209	8.2	1034	15,000	1551	22,500	1500	59.1	82	55.1

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

* Add suffix FSL0 if applicable. Example: 6TOFH32-5K-FSL0

Thorburn Series 7TOFH Mud Booster Hose

(API 7K Spec. FSL 0, FSL 1) for Large-Bore High-Flow Offshore Riser Boosting



Key Features

- API 7K Grade D and E
- Large 4- and 5-inch full-flow bore
- 5,000 and 7,500 psi working pressures
- Smooth NBR bore maximizes mud flow
- Multi-spiral reinforcement handles dynamic pressure pulsations
- Tested at 1.5-times design pressure

Thorburn Series 7TOFH: is a large-bore API 7K mud booster hose engineered for high-volume drilling-fluid transfer. Its smooth-bore NBR tube and multi-spiral steel reinforcement support high-rate mud circulation, pressure pulsation, and continuous rig movement. Available in 4- and 5-inch sizes, Grade D and E constructions provide 5,000 and 7,500 psi working pressures. Each assembly is hydrostatically tested to 1.5 times working pressure and available in FSL 1 for demanding offshore and deepwater drilling applications.

Applications

- LMRP mud boosting to improve marine riser returns
- High-volume drilling-fluid supply to subsea riser systems
- Deepwater drilling requiring increased annular return velocity
- Offshore mud booster lines between rig and LMRP

Construction

Standard: API 7K Spec. FSL 0, FSL 1

Tube: NBR, Type C, drilling-mud resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -13°F to 212°F (-25°C to 100°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		API Grade	Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi		mm	in	kg/m	lb/ft
7TOFH64-5K*	102	4	151	5.9	345	5000	517	7500	D	90	3.5	22	14.8
7TOFH64-7.5K*	102	4	174	6.9	517	7500	776	11250	E	1400	55.1	42	28.2
7TOFH80-5K*	127	5	212	8.4	345	5000	517	7500	D	1500	59.1	64	43.0
7TOFH80-7.5K*	127	5	212	8.4	517	7500	776	11250	E	1500	59.1	64	43.0

Only sold as a hose assembly. * Add suffix FSL0, FSL1 if applicable. Example: 7TOFH64-5K-FSL0

Thorburn Series 8TOFH Hydraulic Conduit Hose

(API 7K Spec. FSL 1, FSL 2) for Subsea BOP High-Pressure Hydraulic Power Supply



Key Features

- API 7K FSL 1/FSL 2 configurations
- Grade D and E working pressures
- Full-flow NBR bore carries hydraulic control fluid
- Multi-spiral reinforcement absorbs motion and vibration
- 2- through 3½-inch sizes support high flow
- Tested at 1.5-times design pressure

Thorburn Series 8TOFH: is Thorburn's dedicated API 7K hydraulic conduit hose for supplying high-pressure hydraulic power to subsea BOP functions where rigid piping cannot accommodate riser movement, vibration and moon-pool dynamics. Unlike 1TOFH standard rotary, 2TOFH sour/high-temperature, 3TOFH Arctic, 4TOFH mud/cementing, 5TOFH underbalanced, 6TOFH cementing and 7TOFH mud-booster hoses, 8TOFH carries hydraulic control fluid rather than drilling media. Its smooth NBR bore and multi-spiral steel reinforcement maintain pressure integrity during continuous offshore motion. Offered in 2-, 2½-, 3- and 3½-inch sizes, Grade D and E constructions provide 5,000 and 7,500 psi working pressures. FSL 1/FSL 2 qualification and 1.5-times hydrostatic testing make 8TOFH ideal for critical subsea BOP conduit service.

Applications

- Supplying hydraulic power from drilling rig to subsea BOP
- Hydraulic conduit across moon-pool movement and vibration zones
- Subsea BOP functions requiring high-pressure hydraulic supply
- Flexible hydraulic connections between riser and drilling facility

Construction

Standard: API 7K Spec. FSL 0, FSL 1

Tube: NBR, Type C, hydraulic-fluid resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -13°F to 212°F (-25°C to 100°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		API Grade	Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi		mm	in	kg/m	lb/ft
8TOFH32-5K*	51	2	103	4.1	345	5000	517	7500	D	700	27.6	14	9.4
8TOFH40-5K*	64	2 1/2	113	4.5	345	5000	517	7500	D	700	27.6	15	10.1
8TOFH48-5K*	76	3	126	5.0	345	5000	517	7500	D	800	31.5	18	12.1
8TOFH56-5K*	89	3 1/2	140	5.5	345	5000	517	7500	D	900	35.4	21	14.1

Only sold as a hose assembly. * Add suffix FSL1, FSL2 if applicable. Example: 8TOFH64-5K-FSL1

Thorburn Series 9TOFH Flexible Choke & Kill Line Hose

(API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3) for Critical Well-Control Service



Key Features

- API 16C FSL 0 through FSL 3
- 5,000 to 15,000 psi working pressures
- 2.25:1 minimum burst safety factor
- H₂S-resistant liner for sour-service well control
- Armor-Flex protects against external mechanical damage
- Hydrostatically tested at 1.5-times design pressure

Thorburn Series 9TOFH: is Thorburn's dedicated API 16C flexible choke and kill hose for well-control service where pressure containment, sour-fluid compatibility, heat resistance and emergency reliability are essential. Unlike 1TOFH through 8TOFH drilling, cementing, booster and hydraulic families, 9TOFH is specifically designed to connect BOP, choke manifold and kill-line equipment while safely handling formation fluids and kill muds. Offered in 2- through 4-inch sizes, 9TOFH provides 5,000, 10,000 and 15,000 psi working pressures with 1.5-times hydrostatic testing. HNBR/UHMW fluid barriers, multi-spiral steel reinforcement and optional Armor-Flex protection support offshore movement, abrasion and sour-service exposure. FSL 0 through FSL 3 configurations allow performance selection for standard, fire-tested and high-temperature well-control applications

Applications

- Surface choke manifold-to-BOP flexible well-control connections
- Kill-line pumping of weighted mud during well-control operations
- Offshore riser choke-and-kill flexible connections
- Sour-service well control with H₂S-containing formation fluids

Construction

Standard: API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3,

Tube: HNBR, qualified by service requirement

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -4°F to 266°F (-20°C to 130°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
9TOFH32-5K*	51	2	89	3.5	345	5,000	517	7,500	1000	39.4	10	6.7
9TOFH48-5K*	76	3	115	4.5	345	5,000	517	7,500	1200	47.2	15	10.1
9TOFH56-5K*	89	3 1/2	133	5.2	345	5,000	517	7,500	1400	55.1	20	13.4
9TOFH64-5K*	102	4	147	5.8	345	5,000	517	7,500	1600	63.0	30	20.2
9TOFH32-10K*	51	2	96	3.8	689	10,000	1034	15,000	1200	47.2	15	10.1
9TOFH40-10K*	64	2 1/2	126	5.0	689	10,000	1034	15,000	1600	63.0	25	16.8
9TOFH48-10K*	76	3	140	5.5	689	10,000	1034	15,000	1600	63.0	33	22.2
9TOFH64-10K*	102	4	167	6.6	689	10,000	1034	15,000	1800	70.9	52	34.9
9TOFH32-15K*	51	2	101	4.0	1034	15,000	1551	22,500	1400	55.1	21	14.1
9TOFH48-15K*	76	3	141	5.6	1034	15,000	1551	22,500	1600	63.0	33	22.2
9TOFH64-15K*	102	4	171	6.7	1034	15,000	1551	22,500	2000	78.7	56	37.6

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

* Add suffix FSL0, FSL1, FSL2, FSL3 if applicable. Example: 9TOFH32-5K-FSL0

Thorburn Series 10TOFH Mud Booster Hose

(API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3) for Standard & Fire-Rated Configurations



Key Features

- API 16C FSL 0 through FSL 3
- 5,000 and 10,000 psi working pressures
- Standard and fire-rated configurations available
- HNBR tube supports elevated-temperature mud service
- 2.5:1 minimum burst safety factor
- Armor-Flex protects against external mechanical damage

Thorburn Series 10TOFH: is Thorburn's dedicated API 16C mud booster hose for high-flow, high-pressure subsea circulation where conventional API 7K booster hoses reach their service limits. Unlike 1TOFH through 8TOFH drilling-service hoses and 9TOFH choke-and-kill hose, 10TOFH is built specifically for 4-inch offshore booster lines operating at 5,000 or 10,000 psi. Its HNBR tube, multi-spiral steel reinforcement and Armor-Flex protection provide pressure integrity, temperature resistance and durability during continuous riser movement and pulsating flow. Standard and fire-rated configurations are available through FSL 3, with every assembly hydrostatically tested to 1.5 times design pressure. 10TOFH is ideal for LMRP mud boosting, deepwater riser circulation and critical offshore circulation service systems.

Applications

- LMRP mud boosting for deepwater marine riser circulation
- High-pressure booster pump-to-riser flexible mud connections
- Offshore drilling requiring increased annular return velocity
- High-flow drilling mud supply to subsea riser systems

Construction

Standard: API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3

Tube: High-temperature HNBR, drilling-fluid resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -4°F to 250°F (-20°C to 121°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Type	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
		mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
10TOFH64-S-5K*	STANDARD	102	4	178	7.0	345	5,000	543	7,875	1500	59.1	42	28.2
10TOFH64-F-5K*	FIRE RATED	102	4	184	7.2	345	5,000	543	7,875	1500	59.1	46	30.9
10TOFH64-S-10K*	STANDARD	102	4	224	8.8	689	10,000	1034	15,000	1500	59.1	94	63.2
10TOFH64-F-10K*	FIRE RATED	102	4	237	9.3	689	10,000	1034	15,000	1500	59.1	104	69.9

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

* Add suffix FSL0, FSL1, FSL2, FSL3 if applicable. Example: 10TOFH64-S-5K-FSL0

Thorburn Series 11TOFH Hydraulic Conduit Hose

(API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3) for Large-Bore Subsea Hydraulic Power Supply



Key Features

- API 16C FSL 0 through FSL 3
- 5,000 psi working pressure across all sizes
- 2.5:1 minimum burst safety factor
- Standard and fire-rated configurations available
- HNBR bore resists hydraulic fluids and heat
- Optional Armor-Flex protects against external damage

Thorburn Series 11TOFH: is Thorburn's dedicated API 16C hydraulic conduit hose for transmitting high-pressure hydraulic control fluid between surface equipment and subsea BOP systems. Unlike 8TOFH API 7K hydraulic conduit service and 9TOFH/10TOFH well-control fluid hoses, 11TOFH is purpose-built for critical hydraulic power transmission under API 16C service requirements. Its smooth HNBR bore, multi-spiral steel reinforcement and optional Armor-Flex protection provide pressure integrity during riser movement, vibration and offshore handling. Offered exclusively at 5,000 psi in 2-, 2½- and 3-inch sizes, every assembly is hydrostatically tested to 7,500 psi with a 2.5:1 minimum burst safety factor. Standard and fire-rated configurations through FSL 3 support demanding offshore well-control installations worldwide operations.

Applications

- Surface-to-subsea hydraulic power transmission for BOP control systems
- Large-bore hydraulic conduit service on marine drilling risers
- Flexible hydraulic connections across dynamic moon-pool movement zones
- High-pressure control-fluid supply to subsea well-control equipment

Construction

Standard: API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3

Tube: High-performance HNBR, hydraulic-fluid resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -4°F to 212°F (-20°C to 100°C)

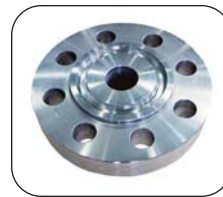
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Type	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
		mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
11TOFH32-S-5K*	STANDARD	51	2	116	4.6	345	5,000	517	7,500	900	35.4	25	16.8
11TOFH32-F-5K*	FIRE RATED	51	2	123	4.8	345	5,000	517	7,500	900	35.4	28	18.8
11TOFH40-S-5K*	STANDARD	64	2 1/2	128	5.0	345	5,000	517	7,500	1000	39.4	29	19.5
11TOFH40-F-5K*	FIRE RATED	64	2 1/2	136	5.4	345	5,000	517	7,500	1000	39.4	32	21.5
11TOFH48-S-5K*	STANDARD	76	3	141	5.6	345	5,000	517	7,500	900	35.4	32	21.5
11TOFH48-F-5K*	FIRE RATED	76	3	148	5.8	345	5,000	517	7,500	1000	39.4	37	24.9

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

* Add suffix FSL0, FSL1, FSL2, FSL3 if applicable. Example: 11TOFH32-S-5K-FSL0

Thorburn Series 12TOFH Blowout Preventer Control Hose

(API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3, API 16D) for Fire-Resistant Hydraulic BOP Control Service



Key Features

- API 16D dedicated BOP control service
- 5,000 psi working pressure across all sizes
- 4:1 minimum burst safety factor
- Flame-resistant construction maintains emergency hydraulic control
- Multi-spiral reinforcement withstands severe pressure cycling
- Optional Armor-Flex protects exposed control lines

Thorburn Series 12TOFH: is Thorburn's dedicated API 16D blowout preventer control hose for critical hydraulic actuation where fire resistance, pressure integrity and dependable response are essential. Unlike 11TOFH large-bore hydraulic conduit service, 12TOFH is sized specifically for BOP control circuits, remote panels, accumulators and well-control actuators. Its oil-resistant NBR tube, multi-spiral steel reinforcement and flame-resistant cover maintain hydraulic power during severe rig conditions and emergency operation. Offered from 1/2 through 2 inches, every size is rated to 5,000 psi working pressure, hydrostatically tested to 7,500 psi and designed for a 4:1 minimum burst safety factor. Optional Armor-Flex protection adds mechanical protection for demanding offshore installations and exposed control-line routing worldwide.

Applications

- Hydraulic actuation of ram and annular BOP preventers
- Accumulator-to-BOP high-pressure hydraulic control connections
- Remote BOP control panels on offshore drilling rigs
- Fire-exposed hydraulic circuits requiring continued well-control capability

Construction

Standard: API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3, API 16D

Tube: NBR Type C, oil and hydraulic-fluid resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Flame-resistant synthetic rubber compound

Operating Temperature: -4°F to 212°F (-20°C to 100°C)

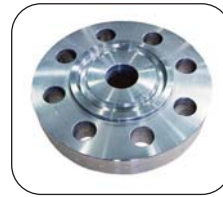
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
12TOFH08-5K*	13	1/2	35	1.4	345	5,000	1379	20,000	250	9.8	1.7	1.1
12TOFH12-5K*	19	3/4	41	1.6	345	5,000	1379	20,000	330	13.0	2.5	1.7
12TOFH16-5K*	25	1	46	1.8	345	5,000	1379	20,000	375	14.8	2.8	1.9
12TOFH20-5K*	32	1 1/4	56	2.2	345	5,000	1379	20,000	460	18.1	4.3	2.9
12TOFH24-5K*	38	1 1/2	65	2.6	345	5,000	1379	20,000	540	21.3	5.8	3.9
12TOFH32-5K*	51	2	78	3.1	345	5,000	1379	20,000	700	27.5	7.8	5.2

Only sold as a hose assembly.

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

* Add suffix FSL0, FSL1, FSL2, FSL3 if applicable. Example: 12TOFH32-5K-FSL0

Thorburn Series 13TOFH Well Test Production Hose

(API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3) for High-Pressure Well Testing & Production Flowback



Key Features

- API 16C FSL 0 through FSL 3
- 5,000 to 15,000 psi working pressures
- Rapid-decompression-resistant HNBR liner for gas service
- 2.25:1 minimum burst safety factor
- All pressure classes available through four-inch bore
- Armor-Flex protects external protection

Thorburn Series 13TOFH: is Thorburn's dedicated well-test production hose for sustained high-pressure transfer of produced oil, gas and condensate during drill-stem and production testing. Unlike 1TOFH–8TOFH drilling-service hoses and 9TOFH–12TOFH well-control and hydraulic families, 13TOFH is optimized for continuous hydrocarbon flow and repeated rapid-decompression cycles. Its H₂S-resistant, decompression-resistant HNBR liner and multi-spiral steel reinforcement maintain pressure integrity during dynamic flowback and separator service. Offered in 2-, 3- and 4-inch sizes, every size is available at 5,000, 10,000 and 15,000 psi working pressure. API 16C FSL 0 through FSL 3 configurations, 1.5-times hydrostatic testing and optional Armor-Flex protection support demanding onshore and offshore well-test operations with sour fluids and gas exposure.

Applications

- Drill-stem testing from wellhead to surface test separator
- Production testing of oil, gas and condensate wells
- High-pressure flowback from wellhead to surface test equipment
- Sour-service well testing with H₂S-containing production fluids

Construction

Standard: API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3

Tube: RGD-resistant HNBR, H₂S and hydrocarbon resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Flame-resistant, abrasion, oil and weather-resistant synthetic rubber

Operating Temperature: -4°F to 212°F (-20°C to 100°C)

Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Type	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
		mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
13TOFH32-F-5K*	FIRE RATED	51	2	138	5.4	345	5,000	517	7,500	1100	43.3	33	22.2
13TOFH32-F-10K*	FIRE RATED	51	2	159	6.3	689	10,000	1034	15,000	1000	39.4	50	33.6
13TOFH32-F-15K*	FIRE RATED	51	2	196	7.7	1034	15,000	1551	22,500	1000	39.4	86	57.8
13TOFH48-F-10K*	FIRE RATED	76	3	186	7.3	689	10,000	1034	15,000	1000	39.4	64	43.0
13TOFH48-F-15K*	FIRE RATED	76	3	223	8.8	1034	15,000	1551	22,500	1000	39.4	104	69.9
13TOFH64-F-10K*	FIRE RATED	102	4	236	9.3	689	10,000	1034	15,000	1500	59.1	108	72.5
13TOFH64-F-15K*	FIRE RATED	102	4	243	9.6	1034	15,000	1551	22,500	1600	63.0	121	81.3

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

* Add suffix FSL0, FSL1, FSL2, FSL3 if applicable. Example: 13TOFH32-F-5K-FSL0

Thorburn Series 14TOFH Offshore Hose

(API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3) for High-Pressure Chemical Service



Key Features

- API 16C FSL 0 through FSL 3
- 10,000 and 15,000 psi working pressures
- Chemical-resistant liner handles aggressive acidizing fluids
- 2.25:1 minimum burst safety factor
- Optional Armor-Flex protects against external damage
- Tested at 1.5-times design pressure

Thorburn Series 14TOFH: is Thorburn's dedicated API 16C well-stimulation hose for high-pressure acidizing, chemical treatment and intervention service where aggressive fluids make conventional drilling and well-control hoses unsuitable. Unlike 1TOFH through 13TOFH, 14TOFH uses a highly chemical-resistant thermoplastic liner and multi-spiral steel reinforcement to withstand acid solutions, stimulation chemicals, pressure cycling and offshore movement. Offered in 2-, 3- and 4-inch sizes, every size is available at 10,000 and 15,000 psi working pressure and hydrostatically tested to 1.5 times design pressure. FSL 0 through FSL 3 configurations, 2.25:1 minimum burst safety factor and optional Armor-Flex protection make 14TOFH ideal for matrix acidizing, fracture acidizing and high-pressure offshore well intervention operations worldwide.

Applications

- Matrix acidizing through high-pressure offshore stimulation systems
- Fracture acidizing with aggressive chemical treatment fluids
- High-pressure well stimulation from pumps to treatment manifold
- Sour-service stimulation with H₂S-containing treatment fluids

Construction

Standard: API 16C Spec. FSL 0, FSL 1, FSL 2, FSL 3,

Tube: High-chemical-resistance thermoplastic liner, acid-service qualified

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Flame, abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -4°F to 266°F (-20°C to 130°C)

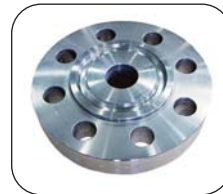
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Type	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
		mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
14TOFH32-S-10K*	STANDARD	51	2	146	5.8	689	10,000	1034	15,000	900	35.4	40	26.9
14TOFH32-F-10K*	FIRE RATED	51	2	159	6.3	689	10,000	1034	15,000	900	35.4	46	30.9
14TOFH32-S-15K*	STANDARD	51	2	181	7.1	1034	15,000	1551	22,500	800	31.5	72	48.4
14TOFH32-F-15K*	FIRE RATED	51	2	194	7.6	1034	15,000	1551	22,500	800	31.5	79	53.1
14TOFH48-S-10K*	STANDARD	76	3	174	6.9	689	10,000	1034	15,000	1000	39.4	54	36.3
14TOFH48-F-10K*	FIRE RATED	76	3	187	7.4	689	10,000	1034	15,000	1000	39.4	61	41.0
14TOFH48-S-15K*	STANDARD	76	3	211	8.3	1034	15,000	1551	22,500	1000	39.4	95	63.8
14TOFH48-F-15K*	FIRE RATED	76	3	217	8.5	1034	15,000	1551	22,500	1000	39.4	99	66.5
14TOFH64-S-10K*	STANDARD	102	4	224	8.8	689	10,000	1034	15,000	1500	59.1	94	63.2
* 14TOFH64-F-10K	FIRE RATED	102	4	237	9.3	689	10,000	1034	15,000	1500	59.1	104	69.9

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

* Add suffix FSL0, FSL1, FSL2, FSL3 if applicable. Example: 14TOFH32-S-10K-FSL0

Thorburn Series 15TOFH Slim Hole Rotary Hose

for Compact High-Pressure Mud Circulation



Key Features

- Compact construction reduces routing space and handling weight
- 2,000 to 5,000 psi size-dependent working pressures
- High-temperature HNBR tube resists mud and oil
- Multi-spiral reinforcement withstands pulsation and repeated flexing
- Tested at 1.5-times design pressure
- 2.5:1 minimum burst safety factor

Thorburn Series 15TOFH: is Thorburn's compact slim-hole rotary hose for mud circulation on portable, workover, exploration and space-constrained drilling rigs. Unlike the pressure, temperature, fluid and well-control specializations of 1TOFH through 14TOFH, 15TOFH is defined by reduced hose diameter, lower handling weight and tighter routing. Its high-temperature HNBR tube and multi-spiral steel reinforcement resist drilling mud, oil, vibration and pressure pulsation. Offered from 1 through 4 inches, working pressures range from 2,000 to 5,000 psi depending on size, with every assembly hydrostatically tested to 1.5 times design pressure. 15TOFH is ideal for slim-hole, workover, water-well, core-drilling and mobile rigs where conventional rotary hose consumes unnecessary space and adds handling weight.

Applications

- High-pressure mud circulation on compact and portable drilling rigs
- Workover rigs requiring reduced hose weight and routing space
- Slim-hole exploration drilling with restricted mast and deck clearance
- Water-well and core drilling with pulsating mud pumps

Construction

Tube: High-temperature HNBR, oil and drilling-mud resistant

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -4°F to 250°F (-20°C to 121°C)

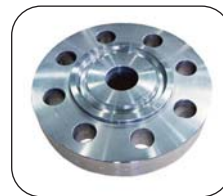
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.5:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
15TOFH16-5K	25	1	39	1.5	345	5,000	345	7,500	300	11.8	2.0	1.3
15TOFH20-5K	32	1 1/4	50	2.0	345	5,000	345	7,500	400	15.7	4.3	2.9
15TOFH24-5K	38	1 1/2	57	2.2	345	5,000	345	7,500	500	20.0	5.0	3.4
15TOFH32-5K	51	2	71	2.8	345	5,000	345	7,500	600	23.6	6.9	4.6
15TOFH40-3K	64	2 1/2	81	3.2	207	3,000	310	4,500	700	27.6	4.9	3.3
15TOFH48-3K	76	3	99	3.9	207	3,000	310	4,500	700	27.6	4.9	3.3
15TOFH64-3K	102	4	144	5.7	207	3,000	310	4,500	1000	39.4		
15TOFH40-2.5K	64	2 1/2	88	3.5	172	2,500	256	3,750	700	27.6	5.4	3.6
15TOFH48-2K	76	3	99	3.9	138	2,000	207	3,000	800	31.5	6.8	4.6
15TOFH64-2K	102	4	124	4.9	138	2,000	207	3,000	1000	39.4	8.9	6.0

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Thorburn Series 16TOFH High Pressure Fracking Hose for High-Pressure Fracturing Service



Key Features

- 15,000 and 20,000 psi design pressures
- 20,000 psi available in three bore sizes
- UHMW/UPE liner resists severe proppant abrasion
- 2.25:1 minimum burst safety factor
- Multi-spiral reinforcement controls extreme pressure pulsation
- Tested at 1.5-times design pressure

Thorburn Series 16TOFH: is Thorburn's dedicated high-pressure frac hose for abrasive proppant and fracturing-fluid transfer where conventional drilling hoses are not designed for continuous sand erosion and extreme pressure cycling. Unlike 1TOFH through 15TOFH, 16TOFH combines a full-flow UHMW/UPE liner with heavy multi-spiral steel reinforcement for severe slurry abrasion, pulsation, vibration and repeated flexing. Available in 15,000 psi configurations and 20,000 psi designs in 2, 2½ and 3-inch sizes, every assembly is hydrostatically tested to 1.5 times design pressure with a 2.25:1 minimum burst safety factor. 16TOFH is ideal for frac pump, manifold, missile and treatment-line connections requiring flexible high-pressure transfer, reduced rigid iron and dependable service during demanding operations.

Applications

- High-pressure frac pump-to-manifold flexible connections
- Proppant-laden slurry transfer across hydraulic fracturing spreads
- 20,000 psi frac lines for extreme-pressure treatment service
- Pump-down lines for shale and tight-formation stimulation

Construction

Tube: High-abrasion-resistant UHMW/UPE liner

Reinforcement: Multiple spirals of high-tensile steel wire

Cover: Abrasion, oil, ozone and weather-resistant synthetic rubber

Operating Temperature: -20°F to 212°F (-29°C to 100°C)

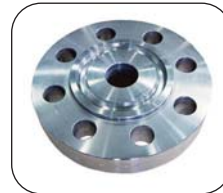
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 2.25:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
16TOFH32-15K	51	2	103	4.1	1034	15000	1551	22500	36	1.4	20	13.4
16TOFH40-15K	64	2 1/2	128	5.1	1034	15000	1551	22500	38	1.5	27	18.1
16TOFH48-15K	76	3	142	5.6	1034	15000	1551	22500	41	1.6	33	22.2
16TOFH64-15K	102	4	171	6.7	1034	15000	1551	22500	51	2.0	56	37.6
16TOFH80-15K	127	5	215	8.5	1034	15000	1551	22500	53	2.1	86	57.8
16TOFH88-15K	139	5 1/2	240	9.5	1034	15000	1551	22500	56	2.2	110	73.9
16TOFH96-15K	152	6	250	9.8	1034	15000	1551	22500	58	2.3	125	84.0
16TOFH32-20K	51	2	112	4.4	1379	20000	2068	30000	38	1.5	26	17.5
16TOFH40-20K	64	2 1/2	133	5.2	1379	20000	2068	30000	41	1.6	36	24.2
16TOFH48-20K	76	3	145	5.7	1379	20000	2068	30000	43	1.7	42	28.2

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

Thorburn Series 17TOFH Mud Degasser Hose

for Gas-Cut Mud Return Service



Key Features

- 2,000 psi working pressure across all sizes
- 4:1 minimum burst safety factor
- UHMWPE liner resists abrasive drilling solids
- Two-spiral reinforcement reduces weight while maintaining strength
- Large 3 and 4-inch unrestricted flow bore
- Flexible construction absorbs rig vibration and movement

Thorburn Series 17TOFH: is Thorburn's dedicated 2,000 psi degasser hose for transferring gas-cut drilling mud from mud-gas separators to mud tanks after initial gas separation. Unlike 1TOFH through 16TOFH high-pressure drilling, well-control, stimulation and frac hoses, 17TOFH is optimized for continuous return-flow service containing entrained gas, abrasive solids and conditioned drilling mud. Its UHMWPE-lined tube and dual high-tensile steel-wire spirals provide abrasion resistance, gas compatibility, flexibility and vibration control without unnecessary hose weight. 17TOFH is ideal for degasser discharge, poor-boy separator return lines and rig mud-conditioning systems requiring dependable, unrestricted flow during demanding drilling operations.

Applications

- Mud-gas separator discharge to drilling mud tanks
- Gas-cut drilling mud return after initial gas separation
- Poor-boy degasser discharge and mud recovery lines
- Rig mud-conditioning and gas-management circulation systems

Construction

Tube: UHMWPE-lined drilling-mud and abrasion-resistant compound

Reinforcement: Two spirals of high-tensile steel wire

Cover: Neoprene Type C blend, abrasion and weather resistant

Operating Temperature: -18°F to 200°F (-28°C to 93°C)

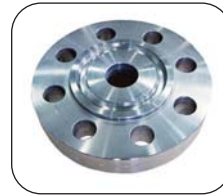
Maximum Hose Length: 60 m (200 ft)

Safety Factor: 4:1

Crimped End Fittings:



API Hammer Unions
(Pg. 34 - 45)



API Flanges
(Pg. 46 - 57)



API Hub Connectors
(Pg. 58 - 65)

Thorburn Part #	Nominal Hose I.D.		Nominal Hose O.D.		Design Pressure		Test Pressure		Minimum Bend Radius		Weight	
	mm	in	mm	in	bar	psi	bar	psi	mm	in	kg/m	lb/ft
17TOFH48-2K	76	3	96	3.8	138	2,000	556	8,000	900	35.4	6	4.0
17TOFH64-2K	102	4	128	5.0	138	2,000	556	8,000	1000	39.4	10	6.7

Only sold as a hose assembly. Maximum temperature for UHMW is 82°C (180°F). For higher temperatures use HNBR

Fire Rating: Meets Lloyd's register OD/1000/499 @ 1292°F (700°C)(5 min) in accordance to the guidelines of API 16D and 704°C (30 min) API 16C

Thorburn Series AF - Ball Joint Armor-Flex™ Hose Guard



Thorburn's Armor-Flex™ Hose Guard (Cover) will not restrict bending

Thorburn Series AF Ball Joint Armor-Flex™ is different than standard interlock hose in that there is no interlocking parts to restrict hose bending. Armour-Flex is made from concave and convex sections that roll off each other when the hose is bending. It can be used as an outer shield for both metallic and elastomeric hoses. Combined with insulation, Armour-Flex™ can operate in environments up to 1100°C and provides protection against molten splash and abrasion.

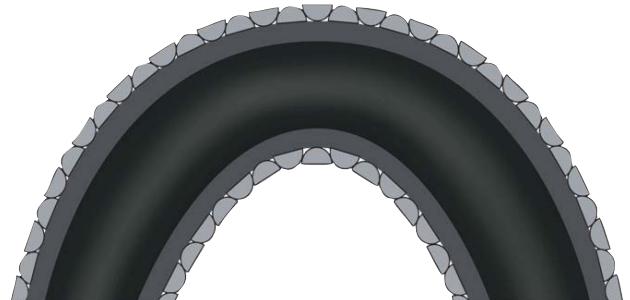
Advantages

- Will not restrict bending
- Unlimited flex life and kink resistant
- Minimum force to flex
- Available in steel and stainless steel

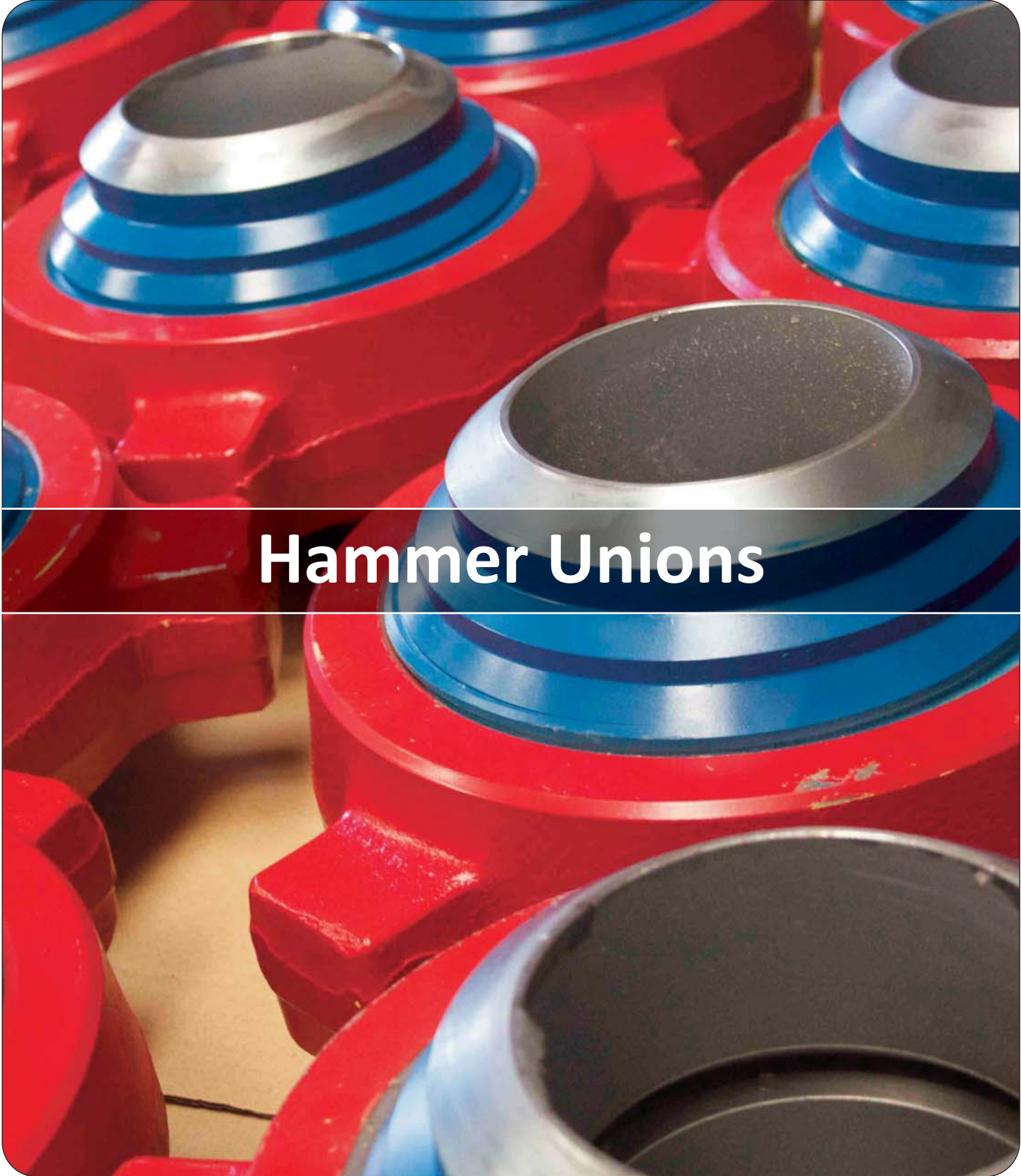
Material Codes: AF = Carbon Steel
AFS4 = 304SS
AFS6 = 316SS



Thorburn's Ball Joint Armor-Flex™ tested at 1100°C



No interlocking parts to restrict bending



Hammer Unions

Thorburn Series THU API Hammer Unions



Thorburn Series THU Hammer Unions are heavy-duty, quick-connect pipe fittings designed for fast, secure connections in high-pressure oilfield applications. Built to handle extreme pressures, vibration, and abrasive fluids, they provide a reliable seal for manifolds, flowlines, fracturing equipment, mud tanks, and other critical wellsite systems. Manufactured from high-strength alloy steel, Hammer Unions feature precision-machined metal-to-metal or elastomer-sealed connections that ensure leak-free performance under demanding operating conditions. Their rugged design allows crews to make up or break connections rapidly using only a hammer, reducing downtime and improving operational efficiency.

Hammer Unions are essential components for safe, dependable fluid transfer in drilling, cementing, fracturing, and production operations. Hammer unions range from low-pressure water, air, and mud service (Fig 50/100 series) to high-pressure oil, gas, cementing, and fracturing operations (Fig 602–1502). Each figure designation corresponds to a specific pressure rating and service type, with color-coded subs and nuts for easy field identification. Lower-pressure figures (50, 100, 200 series) utilize elastomer seals for dependable service in non-critical applications, while higher-pressure unions (400, 602, 1002, 1502) feature precision metal-to-metal sealing for superior performance under extreme pressure, vibration, and temperature fluctuations.



Features

- Three lug nuts and self-locking ACME threads allow fast, secure make-up and break-out.
- Color-coded to ensure quick and easy identification.
- Special identification system for sour gas (H₂S) unions.
- Meets NACE MR0175 and API RP-14E requirements.
- Manufactured from high-quality steel complying with ASTM and/or AISI standards.
- Metal-to-metal seal design: spherical male sub and angular female sub provides reliable sealing through the ball-and-tangent interface.
- Available in sizes from 1/2" to 6" with cold working pressures from 500 psi to 20,000 psi.
- Fully interchangeable with most major brands of hammer unions.

Thorburn Series THU API Hammer Unions

Figure Number	Color Code		Pressure Rating (PSI)				Nominal Pipe Size										
			Standard Service		Sour Gas Service		in	1/2	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
	Nut	Sub	Cold Working	Test	Cold Working	Test	mm	13	25	32	38	50	65	80	100	125	150
50			500	750	-	-											
100			1000	1500	-	-											
101			1000	1500	-	-											
200			2000	3000	2000	3000											
201			2000	3000	2000	3000											
206			2000	3000	2000	3000											
207			2000	3000	2000	3000											
211			2000	3000	-	-											
300			2000	3000	-	-											
400			4000	6000	4000	6000											
602			6000	9000	6000	9000											
1002			10000	15000	7500	11250											
1003			10000	15000	7500	11250											
1004			10000	15000	7500	11250											
1502			15000	22500	10000	15000											
2002			20000	3000	-	-											
2202			-	-	15000	22500											
6666			6000	9000	-	-											

Thorburn Series THU API Hammer Unions



Thorburn Series THU50 Fig. 50

Pressure Rating: 500 psi - Red Nut, Red Subs

End Connections: Threaded, Socket Weld

Sealing: Metal-to-metal

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- Low-pressure suction and return lines
- Mud, cement, and drilling fluid circulation
- Well service and workover operations
- Frac water supply and low-pressure surface lines
- Low-pressure manifolds and mixing systems

Thorburn Series THU50 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU50-64	102	4	130	5.1	158	6.2	500	34	750	52	-	-	-	-	12.2	26.9
THU50-80	127	5	133	5.2	142	5.6	500	34	750	52	-	-	-	-	10.2	22.5



Thorburn Series THU100 Fig. 100

Pressure Rating: 1000 psi - Black Nut, Yellow Subs

End Connections: Threaded, Butt Weld

Sealing: Metal-to-metal

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- Mud lines and low-pressure drilling fluid transfer
- Water suction and discharge lines
- Tank-connection service on rigs and wellsites
- Low-pressure flowline connections in workover and completion operations
- Cement return lines (low pressure)

Thorburn Series THU100 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU100-32	51	2	74	2.9	82	3.2	1000	69	1500	103	-	-	-	-	2.6	5.7
THU100-40	64	2 1/2	91	3.6	108	4.3	1000	69	1500	103	-	-	-	-	5.2	11.5
THU100-48	76	3	102	4.0	117	4.6	1000	69	1500	103	-	-	-	-	6.3	13.9
THU100-64	102	4	119	4.7	125	4.9	1000	69	1500	103	-	-	-	-	8.8	19.4
THU100-80	127	5	147	5.8	152	6.0	1000	69	1500	103	-	-	-	-	14.7	32.4
THU100-96	152	6	165	6.5	174	6.9	1000	69	1500	103	-	-	-	-	21.0	46.3

Thorburn Series THU API Hammer Unions



Thorburn Series THU101 Fig. 101

Pressure Rating: 1000 psi - Beige Nut, Yellow Subs

End Connections: Threaded

Sealing: O-ring (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- Low-pressure fluid transfer lines
- Water, mud, and air service on drilling and workover sites
- Tank, pit, and manifold tie-ins
- Suction and return lines on low-pressure pumps
- Temporary rig and field connections

Thorburn Series THU101 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU101-80	127	5	140	5.5	204	8.0	1000	69	1500	103	-	-	-	-	15.0	33.1



Thorburn Series THU200 Fig. 200

Pressure Rating: 2000 psi - Blue Nut, Grey Subs

End Connections: Threaded, Butt Weld

Sealing: Metal-to-metal

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Low-pressure water lines
- Air, steam, and gas service
- Tank truck connections
- Mud service lines in drilling operations

Thorburn Series THU200 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU200-16	25	1	50	2.0	67	2.6	2000	138	3000	207	2000	138	3000	207	0.8	1.8
THU200-20	32	1 1/4	55	2.2	71	2.8	2000	138	3000	207	2000	138	3000	207	1.1	2.4
THU200-24	38	1 1/2	61	2.4	76	3.0	2000	138	3000	207	2000	138	3000	207	1.5	3.3
THU200-32	51	2	74	2.9	81	3.2	2000	138	3000	207	2000	138	3000	207	5.5	12.1
THU200-40	64	2 1/2	92	3.6	105	4.1	2000	138	3000	207	2000	138	3000	207		
THU200-48	76	3	108	4.3	116	4.6	2000	138	3000	207	2000	138	3000	207	6.8	15.0
THU200-64	102	4	127	5.0	125	4.9	2000	138	3000	207	2000	138	3000	207	9.5	20.9
THU200-80	127	5	140	5.5	166	6.5	2000	138	3000	207	2000	138	3000	207	15.1	33.3
THU200-96	152	6	163	6.4	169	6.7	2000	138	3000	207	2000	138	3000	207	19.3	42.5

Thorburn Series THU API Hammer Unions



Thorburn Series THU201 Fig. 201

Pressure Rating: 2000 psi - Gold Nut, Grey Subs

End Connections: Threaded, Butt Weld

Sealing: O-ring on Female Sub (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Low pressure fluid transfer lines
- Mud, water, and air service on drilling and workover sites
- Suction and return lines on low-pressure pumps
- Utility and general-purpose flowlines around rigs and production facilities

Thorburn Series THU201 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU201-40	64	2 1/2	119	4.7	154	6.1	2000	138	3000	207	2000	138	3000	207	8.8	19.4



Thorburn Series THU206 Fig. 206

Pressure Rating: 2000 psi - Blue Nut, Grey Subs

End Connections: Threaded, Butt Weld

Sealing: O-ring on Male Sub (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Medium-pressure mud and drilling fluid lines
- Tank and manifold connections
- Low to medium-pressure cement return lines
- Well service and workover operations

Thorburn Series THU206 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU206-16	25	1	50	2.0	67	2.6	2000	138	3000	207	2000	138	3000	207	0.8	1.8
THU206-20	32	1 1/4	55	2.2	71	2.8	2000	138	3000	207	2000	138	3000	207	1.1	2.4
THU206-24	38	1 1/2	61	2.4	76	3.0	2000	138	3000	207	2000	138	3000	207	1.5	3.3
THU206-32	51	2	74	2.9	81	3.2	2000	138	3000	207	2000	138	3000	207	5.5	12.1
THU206-40	64	2 1/2	96	3.8	105	4.1	2000	138	3000	207	2000	138	3000	207	4.5	
THU206-48	76	3	108	4.3	116	4.6	2000	138	3000	207	2000	138	3000	207	6.8	15.0
THU206-64	102	4	127	5.0	125	4.9	2000	138	3000	207	2000	138	3000	207	9.5	20.9
THU206-80	127	5	140	5.5	166	6.5	2000	138	3000	207	2000	138	3000	207	15.1	33.3
THU206-96	152	6	163	6.4	169	6.7	2000	138	3000	207	2000	138	3000	207	19.3	42.5

Thorburn Series THU API Hammer Unions



Thorburn Series THU207 Fig. 207

Pressure Rating: 2000 psi - Blue Cap, Grey Subs

End Connections: Threaded, Butt Weld

Sealing: O-ring on Blanking Cap (NBR, HNBR, FKM, PTFE)

Materials: Plated Steel, 316 Stainless Steel

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Medium-pressure mud lines in drilling operations
- Cement return and slurry lines
- Tank and manifold connections on rigs
- Well service and workover lines

Thorburn Series THU207 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU207-48	76	3	70	2.8	98	3.9	2000	138	3000	207	2000	138	3000	207	4.4	9.7
THU207-64	102	4	91	3.6	111	4.4	2000	138	3000	207	2000	138	3000	207	7.4	16.3
THU207-96	152	6	125	4.9	142	5.6	2000	138	3000	207	2000	138	3000	207	20.8	45.9



Thorburn Series THU211 Fig. 211

Pressure Rating: 2000 psi - Grey Nut, Blue Subs

End Connections: Threaded

Sealing: O-ring on Male Sub, (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- Medium to low pressure fluid transfer lines
- Mud, water, and drilling fluid service
- Suction and return lines on pumps
- Temporary rig and workover connections
- Tank, pit, and manifold tie-ins

Thorburn Series THU211 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU211-32	51	2	77	3.0	88	3.5	2000	138	3000	207	-	-	-	-	3.0	6.6
THU211-48	76	3	108	4.3	116	4.6	2000	138	3000	207	-	-	-	-	6.4	14.1

Thorburn Series THU API Hammer Unions



Thorburn Series THU300 Fig. 300

Pressure Rating: 2000 psi - Grey Nut, Yellow Subs
15000 psi - Zinc Plated Nut, Zinc Plated Subs

End Connections: Threaded

Sealing: O-ring on Female Sub (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- Medium-pressure fluid transfer lines
- Mud, water, and drilling fluid circulation
- Rig and workover auxiliary lines
- Tank, pit, and manifold connections

Thorburn Series THU300 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU300-08	13	1/2	46	1.8	76	3.0	15000	1034	20000	1379	-	-	-	-	0.8	1.8
THU300-16	25	1	54	2.1	67	2.6	2000	138	3000	207	-	-	-	-	0.9	2.0
THU300-32	51	2	73	2.9	95	3.7	2000	138	3000	207	-	-	-	-	1.1	2.4



Thorburn Series THU400 Fig. 400

Pressure Rating: 4000 psi - Black Nut, Red Subs

End Connections: Threaded, Butt Weld

Sealing: O-ring on Male Sub (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- High-pressure mud lines in drilling operations
- Cement return and slurry lines
- Flowlines and manifolds on rigs and wellsites
- Well service, workover, and stimulation lines

Thorburn Series THU400 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU400-32	51	2	90	3.5	130	5.1	4000	276	6000	414	4000	276	6000	414	5.7	12.6
THU400-48	76	3	106	4.2	156	6.1	4000	276	6000	414	4000	276	6000	414	9.1	20.0
THU400-64	102	4	128	5.0	208	8.2	4000	276	6000	414	4000	276	6000	414	14.2	31.3
THU400-80	127	5	170	6.7	282	11.1	2500	172	4000	276	2500	172	4000	276	22.5	49.6
THU400-96	152	6	196	7.7	290	11.4	2500	172	4000	276	2500	172	4000	276	31.1	69.0

Thorburn Series THU API Hammer Unions



Thorburn Series THU602 Fig. 602

Pressure Rating: 6,000 psi - Black Nut, Orange Subs

End Connections: Threaded, Butt Weld

Sealing: Lip type sealing ring (Buna N)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Stimulation and fracking lines
- High-pressure mud and cement lines
- Well testing and flowback operations
- Manifolds and flowline connections on drilling & completion sites

Thorburn Series THU602 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU602-32	51	2	90	3.5	130	5.1	6000	414	9000	621	6000	414	9000	621	5.7	12.6
THU602-48	76	3	106	4.2	156	6.1	6000	414	9000	621	6000	414	9000	621	9.1	20.1
THU602-64	102	4	128	5.0	208	8.2	6000	414	9000	621	6000	414	9000	621	14.2	31.3
THU602-80	127	5	170	6.7	282	11.1	6000	414	9000	621	6000	414	9000	621	22.5	49.6
THU602-96	152	6	196	7.7	290	11.4	6000	414	9000	621	6000	414	9000	621	28.8	63.5



Thorburn Series THU1003 Fig. 1003

Pressure Rating: 10,000 psi (3") 7500 psi (4", 5") - Black Nut, Green Subs

End Connections: Threaded, Butt Weld

Sealing: Lip type sealing ring (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- High-pressure fracturing and stimulation lines
- Critical production and choke-and-kill service
- Well servicing and workover operations under extreme pressure
- High-pressure flowback and well testing

Thorburn Series THU1003 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU1003-48	76	3	122	4.8			10000	689	15000	1034	7500	517	11250	776	21.5	47.4
THU1003-64	102	4	152	6.0	277	10.9	7500	517	11250	776	5000	345	7500	517	35.4	78.0
THU1003-80	127	5*	152	6.0	277	10.9	7500	517	11250	776	5000	345	7500	517	36.1	79.6

* Available in But Weld Ends only

Thorburn Series THU API Hammer Unions



Thorburn Series THU1002 Fig. 1002

Pressure Rating: 10,000 psi (1"-4"), 7,500 (5"-6") - Red Nut, Blue Subs

End Connections: Threaded, Butt Weld

Sealing: Lip type sealing ring (Buna N)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Stimulation and fracking lines and choke-and-kill service
- Extreme high-pressure well service and workover operations
- High-pressure flowback and well testing lines
- Mud, cement, and slurry transfer at elevated pressures

Thorburn Series THU1002 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU1002-16	25	1	56	2.2	90	3.5	10000	689	15000	1034	7500	517	11250	776	1.6	3.5
THU1002-20	32	1 1/4	78	3.1	124	4.9	10000	689	15000	1034	7500	517	11250	776	4.1	9.0
THU1002-24	38	1 1/2	79	3.1	125	4.9	10000	689	15000	1034	7500	517	11250	776	4.2	9.3
THU1002-32	51	2	94	3.7	135	5.3	10000	689	15000	1034	7500	517	11250	776	6.3	13.9
THU1002-48	76	3	114	4.5	157	6.2	10000	689	15000	1034	7500	517	11250	776	10.2	22.3
THU1002-64	102	4	132	5.2	208	8.2	10000	689	15000	1034	7500	517	11250	776	15.8	34.8
THU1002-80	127	5	159	6.3	232	9.1	7500	517	11250	776	5000	345	7500	517	30.2	66.6
THU1002-96	152	6	178	7.0			7500	517	11250	776	5000	345	7500	517	41.3	91.1



Thorburn Series THU1004 Fig. 1004 | Red Nut, Grey Subs

Pressure Rating: 10,000 psi - Red Nut, Grey Subs

End Connections: Butt Weld

Sealing: Lip type sealing ring (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- High-pressure fluid transfer lines
- Fracturing, acidizing, and stimulation service
- High-pressure cementing and treating iron connections
- Choke and kill service flowlines

Thorburn Series THU1004 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU1004-80	127	5	152	6.0	210	8.3	10000	689	15000	1034	7500	517	11250	776	38.6	85.0
THU1004-96	152	6	184	7.2	238	9.4	10000	689	15000	1034	7500	517	11250	776	63.5	140.0

Thorburn Series THU API Hammer Unions



Thorburn Series THU1502 Fig. 1502

Pressure Rating: 15,000 psi - Blue Nut, Red Subs

End Connections: Threaded, Butt Weld

Sealing: Lip type sealing ring (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- High-pressure hydraulic fracturing lines
- Stimulation and well treatment operations
- High-pressure mud, cement, and slurry transfer
- Critical production and choke-and-kill service

Thorburn Series THU1502 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU1502-16	25	1	70	2.8			15000	1034	22500	1551	10000	689	15000	1034	4.1	9.0
THU1502-24	38	1 1/2	89	3.5	114	4.5	15000	1034	22500	1551	10000	689	15000	1034	7.4	16.3
THU1502-32	51	2	102	4.0	178	7.0	15000	1034	22500	1551	10000	689	15000	1034	9.1	20.0
THU1502-48	76	3	124	4.9	194	7.6	15000	1034	22500	1551	10000	689	15000	1034	15.5	34.1
THU1502-64	102	4	153	6.0	218	8.6	15000	1034	22500	1551	10000	689	15000	1034	33.0	72.8
THU1502-80	127	5	166	6.5	229	9.0	15000	1034	22500	1551	10000	689	15000	1034	43.1	95.0
THU1502-96	152	6	183	7.2	248	9.8	15000	1034	22500	1551	10000	689	15000	1034	65.8	145.0



Thorburn Series THU2002 Fig. 2002

Pressure Rating: 20,000 psi - Green Nut, Grey Subs

End Connections: Butt Weld

Sealing: Lip type sealing ring (NBR, HNBR, FKM, PTFE)

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- High-pressure mud service lines
- Cementing and circulating lines
- High-pressure water, drilling fluid, and utility transfer
- Blowdown lines and wellsite pressure loops
- High-pressure manifold connections Frac water supply and return lines

Thorburn Series THU2002 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU2002-32	51	2	70	2.8	119	4.7	20000	1379	30000	2068	-	-	-	-	3.7	8.2
THU2002-48	76	3	89	3.5	114	4.5	20000	1379	30000	2068	-	-	-	-	7.4	16.3
THU2002-64	102	4	102	4.0	178	7.0	20000	1379	30000	2068	-	-	-	-	9.5	20.9

Thorburn Series THU API Hammer Unions



Thorburn Series THU2202 Fig. 2202 | Green Nut, Green Subs

Pressure Rating: 15,000 psi - Green Nut, Green Subs

End Connections: Butt Weld

Sealing: Lip type sealing ring (NBR, HNBR, FKM, PTFE), Stainless Steel anti-extrusion ring

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Sour Gas Service: Materials Conform to NACE Standard MR-01-75 & API-14E

Applications

- Designed specifically for sour gas service
- Wellsite sour gas circulation and bleed-off lines
- Tank, separator, and heater-treater sour fluid tie-ins
- H₂S-contaminated water, mud, and utility service

Thorburn Series THU2202 Specifications

Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU2202-32	51	2	70	2.8	119	4.7	-	-	-	-	15000	1034	22500	1551	3.7	8.2
THU2202-48	76	3	89	3.5	114	4.5	-	-	-	-	15000	1034	22500	1551	7.4	16.3
THU2202-64	102	4	102	4.0	178	7.0	-	-	-	-	15000	1034	22500	1551	9.5	20.9



Thorburn Series THU6666 Fig. 6666

Pressure Rating: 20,000 psi - Red Nut, Blue Subs

End Connections: Threaded

Sealing: Metal-to-metal

Union Materials: Forged ASTM A105/4130/4140, 316SS, 316LSS

Nut Materials: Alloy Steel Grade 4130/4140/4145

Applications

- Choke and kill high-pressure service lines
- HP fluid transfer where metal-to-metal sealing is required
- High-pressure cementing systems
- Coiled tubing and snubbing high-pressure connections
- Acidizing and chemical injection high-pressure circuits

Thorburn Series THU6666 Specifications

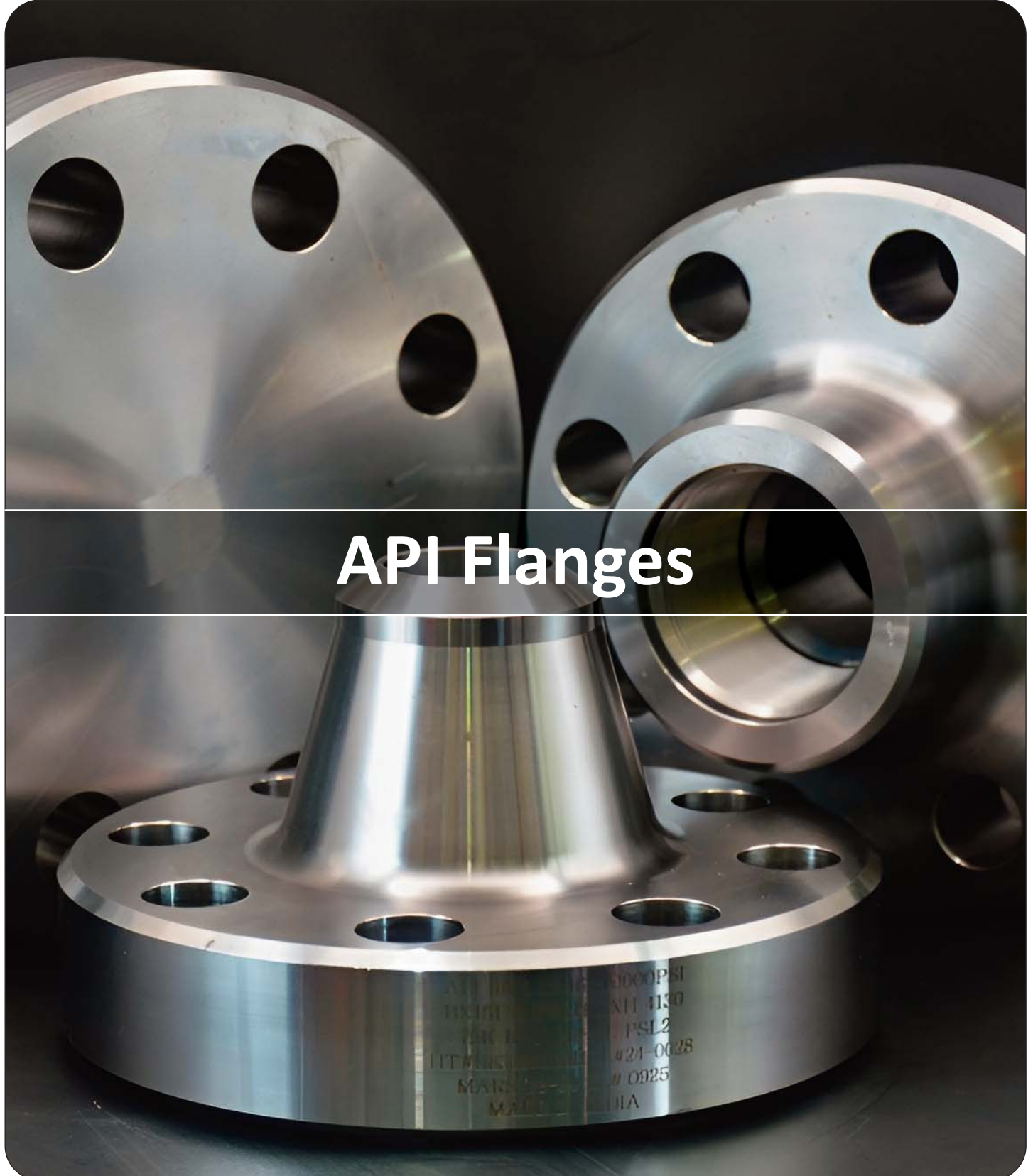
Thorburn Part #	Nominal Bore Size		Nut Radius		Total Length		Pressure Rating								Weight	
							Standard Service				Sour Gas Service					
							Cold Working		Test		Cold Working		Test			
	mm	in	mm	in	mm	in	PSI	bar	PSI	bar	PSI	bar	PSI	bar	kg	lbs
THU6666-24	38	1 1/2	72	2.8	106	4.2	6000	414	9000	621	-	-	-	-	3.0	6.6
THU6666-32	51	2	88	3.5	149	5.7	6000	414	9000	621	-	-	-	-	5.7	12.6

How to Order Thorburn Series THU API Hammer Unions



Model	Fig. #	Nominal Bore Size	Connection	Nut Material	Body Material	Service Type	Seal Material
THU	200	48	SW	N2	U1	SG	N
THU = Hammer Union	50 400 100 602 101 1002 200 1003 201 1004 206 1502 207 2002 211 2202 300 6666	8 = 1/2 (13 mm) 16 = 1 (25 mm) 20 = 1 1/2 (38 mm) 32 = 2 (51 mm) 40 = 2 1/2 (64 mm) 48 = 3 (76 mm) 56 = 3 1/2 (89 mm) 64 = 4 (102 mm) 80 = 5 (127 mm) 96 = 6 (152 mm)	SW = Socket Weld BW40 = Butt Weld SCH40 BW60 = Butt Weld SCH60 BW80 = Butt Weld SCH80 BWXXH = Butt Weld Extra, Extra Heavy TH = Female Threaded XX = Specify	N1 = 4130 N2 = 4140 N3 = 4145 NX = Specify	U1 = ASTM A105 U2 = 4130 U3 = 4140 U3 = 4145 S6 = 316SS S6L = 316LSS NX = Specify	Standard Leave Blank SG = Sour Gas	M = Metal to Metal O-Ring D = NBR N = HNBR I = FKM J = PTFE Z = Other (Specify)

API Flanges



Thorburn Series FL6A - API 6A Flanges



Thorburn API 6A flanges are precision-engineered connections designed for high-pressure oilfield and drilling applications. Manufactured to API 6A requirements, these flanges provide secure, leak-tight performance in wellheads, trees, manifolds, choke and kill systems, and high-pressure flowlines. Available in multiple pressure ratings and material classes, API flanges ensure reliable operation in both standard and sour-service environments.

Features

- Manufactured to API 6A standards for high-pressure oilfield and drilling applications.
- High-strength alloy and carbon steel construction for durability in harsh environments.
- Precision-machined sealing surfaces ensure reliable, leak-tight performance.
- Multiple pressure ratings up to 5,000 psi (6B) and up to 20,000 psi (6BX).
- Available in standard and sour-service material classes, meeting NACE MR0175 requirements.
- Broad compatibility with wellheads, trees, manifolds, choke & kill systems, and flowlines.
- Bolted flange design allows secure connection and easy installation or maintenance.
- RTJ gasket options for high-pressure sealing (required for 6BX).
- Full range of sizes with multiple ring gasket profiles available.
- Engineered for structural integrity under pressure cycling and high-load conditions.

Applications

- Wellhead equipment including casing heads, tubing heads, and Christmas trees.
- Choke and kill systems on drilling and well-control equipment.
- High-pressure flowlines for drilling, completion, and production operations.
- Manifolds such as choke manifolds, kill manifolds, frac manifolds & test manifolds.
- Blowout preventer (BOP) stacks and associated control equipment.
- Valves, spools, adapters, and connectors in high-pressure process piping.
- Separator and test equipment used in well testing operations.
- Service equipment such as fracturing units, cementing units, and stimulation skids.
- Offshore and onshore production facilities requiring API 6A-compatible connections.
- Critical sour-gas environments where NACE-compliant materials are required.



Thorburn Series FL6A - API 6A Flanges



Thorburn API 6A Type 6B Flanges

Thorburn API 6A Type 6B flanges are purpose-built for upstream oil and gas operations requiring dependable pressure containment up to 5,000 psi. Their raised-face sealing surface provides consistent gasket engagement, ensuring reliable sealing integrity under thermal cycling, vibration, and wellsite handling stresses commonly encountered during drilling, completion, and production activities.

Manufactured to strict API 6A material, temperature, and PSL performance requirements, Type 6B flanges deliver proven compatibility with wellhead assemblies, frac isolation equipment, valves, choke manifolds, and test systems. The bolted design supports fast make-up, excellent misalignment tolerance, and ease of maintenance—critical for reducing NPT in remote or high-activity wellsite environments.

Engineered for high structural strength, corrosion resistance, and long-term durability, API 6A Type B flanges maintain sealing performance during pressure testing, stimulation rig-ups, flowback operations, and routine production service.

Thorburn API 6A Type 6BX Flanges

Thorburn API 6A Type 6BX flanges are engineered for high-pressure, extreme-service oilfield operations with working pressures up to 20,000 psi. Designed for maximum safety in critical well-control systems, 6BX flanges incorporate a pressure-energized RTJ (ring-type joint) gasket that delivers a metal-to-metal seal, ensuring exceptional leak resistance under severe dynamic loads, high stress cycles, and rapid pressure fluctuations.

Built to meet stringent API 6A material classes, temperature ratings, and PSL requirements, Type 6BX flanges provide superior structural integrity and fatigue resistance. Their design minimizes gasket extrusion and maintains sealing performance even during shock loading, hydraulic hammer, and high-rate flow conditions commonly experienced in HP/HT wells. Ideal for environments where equipment failure is not an option, Thorburn Type 6BX flanges deliver proven reliability, enhanced sealing security, and long-life performance in the most demanding upstream applications.

API 6A Flange Materials

Carbon Steel (Standard Service)

(F1) ASTM A105: Forged to offer dependable strength and weldability for general-pressure piping components.

(F2) ASTM A105N: The most common grade for ambient and high temperature service.

(F3) ASTM A350 LF2: Used for low-temperature applications.

(F4) ASTM A694 (F42 to F70): High-yield carbon steel used for high pressure transmission lines.

Alloy Steel (High Pressure / API 6A)

(F5) AISI 4130 (60K & 75K): Used for API 6A flanges, specifically for high pressure (up to 20,000psi) oilfield equipment

Stainless Steel (Corrosive Service)

(F6) ASTM A182 F304/304L: General purpose corrosion resistance

(F7) ASTM A182 F316/316L: Higher resistance to chlorides and pitting, used in marine service or chemical processing

(F8) Duplex (F51): High-strength stainless steel with excellent corrosion resistance

(F9) Super Duplex (F53/F55): Engineered for exceptional strength and superior corrosion resistance

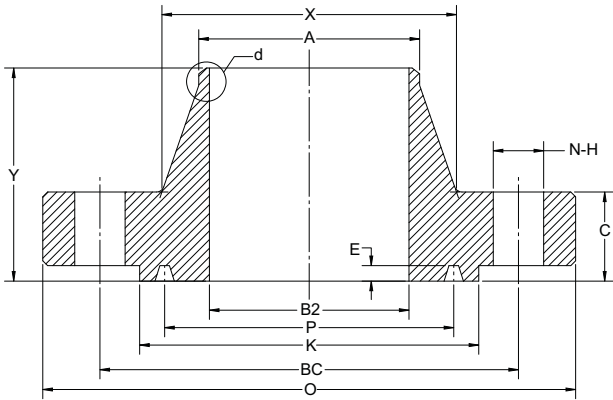
Thorburn Series FL6A - API 6A Flanges



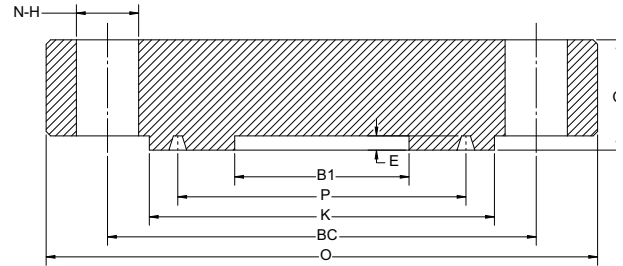
Type 6B Flanges - Specifications

Maximum Working Pressure	2,000 PSI	3,000PSI	5,000PSI	10,000PSI	15,000 PSI	20,000 PSI
Test Pressure	3,000 PSI	4,500 PSI	7,500 PSI	15,000 PSI	22,000 PSI	30,000 PSI
Product Specification Levels	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3
API Temperature Rating	K (-60°C) to Y (345°C)	K (-60°C) to Y (345°C)	K (-60°C) to Y (345°C)	K (-60°C) to Y (345°C)	K (-60°C) to Y (345°C)	K (-60°C) to Y (345°C)
Integral, Blind, Target Blind & Test Flanges and Studded Blocks						
Minimum Yield/ Minimum Tensile Material	60,000 PSI 85,000 PSI API 60K	60,000 PSI 85,000 PSI API 60K	60,000 PSI 85,000 PSI API 60K	60,000 PSI 85,000 PSI API 60K	75,000 PSI 95,000 PSI API 75K	75,000 PSI 95,000 PSI API 75K
Weld Neck Flanges						
Minimum Yield/ Minimum Tensile Material	45,000 PSI 70,000 PSI API 45K	45,000 PSI 70,000 PSI API 45K	45,000 PSI 70,000 PSI API 45K	60,000 PSI 85,000 PSI API 60K	75,000 PSI 95,000 PSI API 75K	75,000 PSI 95,000 PSI API 75K

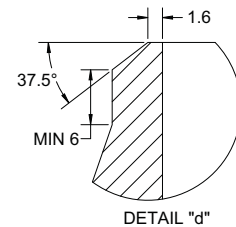
Thorburn Series FL6A - API 6A Flanges



WELD NECK RING TYPE FLANGE



BLIND RING TYPE FLANGE



DETAIL "d"

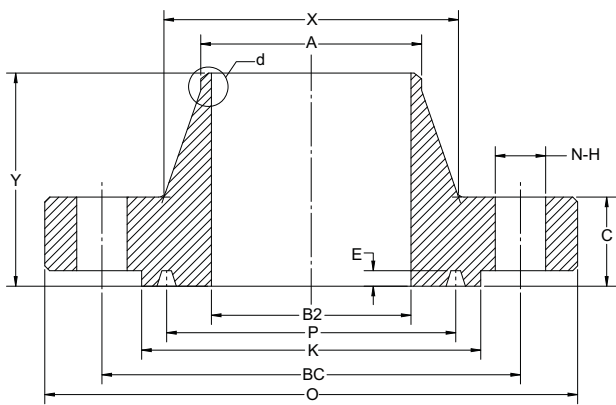
API6A Weld Neck Ring Type 6B - 2,000 PSI

Part #	Size (in)	B2	O	C	K	P	E	X	BC	N	H	Y	A	Ring # (R/RX)
WFL6A-6B2K-33	2 1/16	53	165	33	108	82.6	7.9	84	127	8	20	81	60	23
WFL6A-6B2K-41	2 9/16	64	190	37	127	101.6	7.9	100	149	8	23	88	73	26
WFL6A-6B2K-50	3 1/8	79	210	40	148	123.8	7.9	117	168	8	23	91	89	31
WFL6A-6B2K-65	4 1/16	103	275	46	175	149.2	7.9	152	216	8	26	110	114	37
WFL6A-6B2K-82	5 1/8	123	330	52	210	181.0	7.9	189	267	8	29	122	141	41
WFL6A-6B2K-113	7 1/16	147	355	56	241	211.2	7.9	222	292	12	29	126	168	45
WFL6A-6B2K-144	9	199	420	64	302	269.9	7.9	273	349	12	32	141	219	49
WFL6A-6B2K-176	11	248	510	72	356	323.9	7.9	343	432	16	35	160	273	53
WFL6A-6B2K-218	13 5/8	-	560	75	413	381.0	7.9	400	489	20	35	-	-	57
WFL6A-6B2K-268	16 3/4	-	685	84	508	469.9	7.9	495	603	20	42	-	-	65
WFL6A-6B2K-340	21 1/4	-	815	99	835	584.2	9.7	610	724	24	45	-	-	73

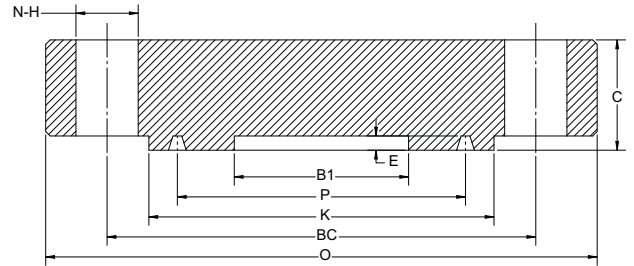
API6A Blind Ring Type 6B - 2,000 PSI

Part #	Size (in)	B1	O	C	K	P	E	BC	N	H	Ring # (R/RX)
BFL6A-6B2K-33	2 1/16	53	165	33	108	82.6	7.9	127	8	20	23
BFL6A-6B2K-41	2 9/16	66	190	37	127	101.6	7.9	149	8	23	26
BFL6A-6B2K-50	3 1/8	82	210	40	148	123.8	7.9	168	8	23	31
BFL6A-6B2K-65	4 1/16	109	275	46	175	149.2	7.9	216	8	26	37
BFL6A-6B2K-82	5 1/8	131	330	52	210	181.0	7.9	267	8	29	41
BFL6A-6B2K-113	7 1/16	182	355	56	241	211.2	7.9	292	12	29	45
BFL6A-6B2K-144	9	229	420	64	302	269.9	7.9	349	12	32	49
BFL6A-6B2K-176	11	280	510	72	356	323.9	7.9	432	16	35	53
BFL6A-6B2K-218	13 5/8	347	560	75	413	381.0	7.9	489	20	35	57
BFL6A-6B2K-268	16 3/4	426	685	84	508	469.9	7.9	603	20	42	65
BFL6A-6B2K-340	21 1/4	541	815	99	835	584.2	9.7	724	24	45	73

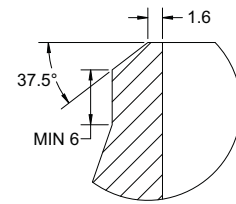
Thorburn Series FL6A - API 6A Flanges - Type 6B



WELD NECK RING TYPE FLANGE



BLIND RING TYPE FLANGE



DETAIL "d"

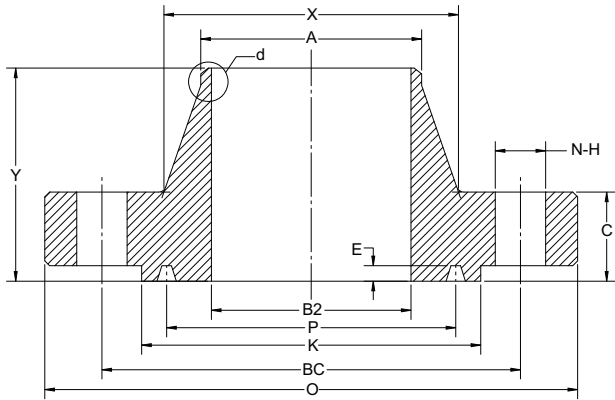
API6A Weld Neck Ring Type 6B - 3,000 PSI

Part #	Size (in)	B2	O	C	K	P	E	X	BC	N	H	Y	A	Ring # (R/RX)
WFL6A-6B3K-33	2 1/16	50	215	46	124	95	7.9	105	165	8	26	110	60	24
WFL6A-6B3K-41	2 9/16	60	245	49	137	108	7.9	124	191	8	29	113	73	27
WFL6A-6B3K-50	3 1/8	74	240	46	156	124	7.9	127	191	8	26	110	89	31
WFL6A-6B3K-65	4 1/16	98	290	52	181	149	7.9	159	235	8	32	122	114	37
WFL6A-6B3K-82	5 1/8	123	350	59	216	181	7.9	191	279	8	35	135	141	41
WFL6A-6B3K-113	7 1/16	147	380	64	241	211	7.9	235	318	12	32	148	168	45
WFL6A-6B3K-144	9	190	470	72	308	270	7.9	299	394	12	39	170	219	49
WFL6A-6B3K-176	11	237	545	78	362	324	7.9	368	470	16	39	192	273	53
WFL6A-6B3K-218	13 5/8	-	610	87	419	381	7.9	419	533	20	39	-	-	57
WFL6A-6B3K-268	16 3/4	-	705	100	524	470	11.2	508	616	20	45	-	-	66
WFL6A-6B3K-332	20 3/4	-	855	121	648	584	12.7	622	749	20	54	-	-	74

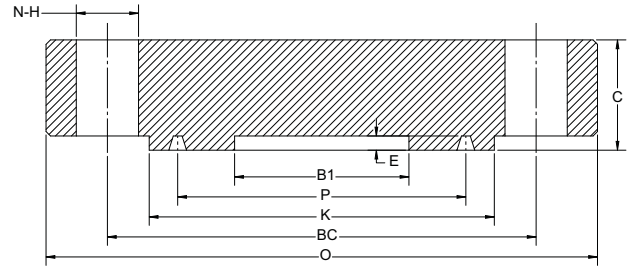
API6A Blind Ring Type 6B - 3,000 PSI

Part #	Size (in)	B1	O	C	K	P	E	BC	N	H	Ring # (R/RX)
BFL6A-6B3K-33	2 1/16	50	215	46	124	95	7.9	165	8	26	24
BFL6A-6B3K-41	2 9/16	60	245	49	137	108	7.9	191	8	29	27
BFL6A-6B3K-50	3 1/8	74	240	46	156	124	7.9	191	8	26	31
BFL6A-6B3K-65	4 1/16	98	290	52	181	149	7.9	235	8	32	37
BFL6A-6B3K-82	5 1/8	123	350	59	216	181	7.9	279	8	35	41
BFL6A-6B3K-113	7 1/16	147	380	64	241	211	7.9	318	12	32	45
BFL6A-6B3K-144	9	190	470	72	308	270	7.9	394	12	39	49
BFL6A-6B3K-176	11	237	545	78	362	324	7.9	470	16	39	53
BFL6A-6B3K-218	13 5/8	-	610	87	419	381	7.9	533	20	39	57
BFL6A-6B3K-268	16 3/4	-	705	100	524	470	11.2	616	20	45	66
BFL6A-6B3K-332	20 3/4	-	855	121	648	584	12.7	749	20	54	74

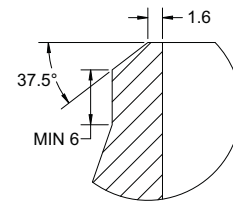
Thorburn Series FL6A - API 6A Flanges - Type 6B



WELD NECK RING TYPE FLANGE



BLIND RING TYPE FLANGE



DETAIL "d"

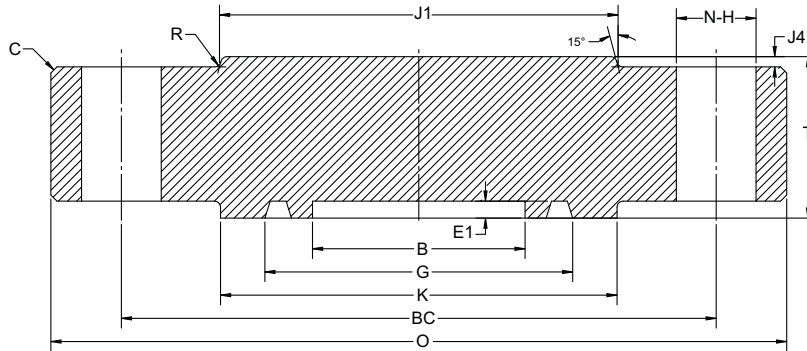
API6A Weld Neck Ring Type 6B - 5,000 PSI

Part #	Size (in)	B2	O	C	K	P	E	X	BC	N	H	Y	A	Ring # (R/RX)
WFL6A-6B3K-33	2 1/16	50	215	46	124	95	7.9	105	165	8	26	110	60	24
WFL6A-6B3K-41	2 9/16	60	245	49	137	108	7.9	124	191	8	29	113	73	27
WFL6A-6B3K-50	3 1/8	74	265	56	168	137	7.9	133	203	8	32	125	89	35
WFL6A-6B3K-65	4 1/16	98	310	62	194	162	7.9	162	241	8	35	132	114	39
WFL6A-6B3K-82	5 1/8	123	375	81	229	194	7.9	197	292	8	42	164	141	44
WFL6A-6B3K-113	7 1/16	147	395	92	248	211	9.7	229	318	12	39	181	168	46
WFL6A-6B3K-144	9	190	485	103	318	270	11.2	292	394	12	45	224	219	50
WFL6A-6B3K-176	11	237	585	119	371	324	11.2	368	483	12	51	265	273	54

API6A Blind Ring Type 6B - 5,000 PSI

Part #	Size (in)	B1	O	C	K	P	E	BC	N	H	Ring # (R/RX)
BFL6A-6B3K-33	2 1/16	53	215	46	124	95	7.9	165	8	26	24
BFL6A-6B3K-41	2 9/16	66	245	49	137	108	7.9	191	8	29	27
BFL6A-6B3K-50	3 1/8	82	265	56	168	137	7.9	203	8	32	35
BFL6A-6B3K-65	4 1/16	109	310	62	194	162	7.9	241	8	35	39
BFL6A-6B3K-82	5 1/8	131	375	81	229	194	7.9	292	8	42	44
BFL6A-6B3K-113	7 1/16	182	395	92	248	211	9.7	318	12	39	46
BFL6A-6B3K-144	9	229	485	103	318	270	11.2	394	12	45	50
BFL6A-6B3K-176	11	280	585	119	371	324	11.2	483	12	51	54

Thorburn Series FL6A - API 6A Flanges - Type 6BX



BLIND RING TYPE FLANGE

API6A Blind Ring Type 6BX - 2,000 PSI

Part #	Size (in)	OD	C	E1	G	K	T	J1	J4	R	BC	N	H	Ring # (R/RX)
FL6A-6BX2K-332	26 3/4	1040	6	21	768	805	126	836	9.7	16	953	20	48	167
FL6A-6BX2K-480	30	1120	6	23	862	908	134	932	17.5	16	1040	32	45	303

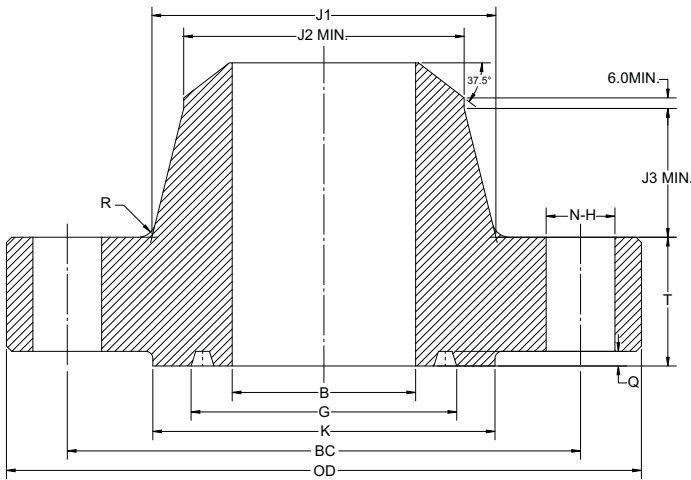
API6A Blind Ring Type 6BX - 3,000 PSI

Part #	Size (in)	OD	C	E1	G	K	T	J1	J4	R	BC	N	H	Ring # (R/RX)
FL6A-6BX3K-332	26 3/4	1100	6	21	774	832	161	870	0	16	1000	24	54	168
FL6A-6BX3K-480	30	1185	6	23	862	922	167	970	12.7	16	1091	32	51	303

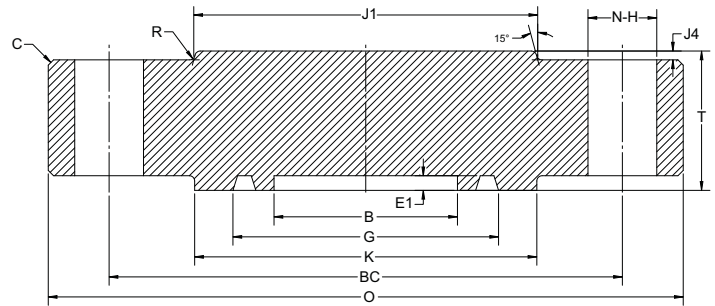
API6A Blind Ring Type 6BX - 5,000 PSI

Part #	Size (in)	OD	C	E1	G	K	T	J1	J4	R	BC	N	H	Ring # (R/RX)
FL6A-6BX5K-218	13 5/8	675	6	14	408	457	113	461	24	16	591	16	45	160
FL6A-6BX5K-268	16 3/4	770	6	8	478	535	130	556	18	19	676	16	51	162
FL6A-6BX5K-300	18 3/4	905	6	18	564	627	166	675	19	16	803	20	54	163
FL6A-6BX5K-340	21 1/4	990	6	19	633	702	181	759	22	18	886	24	54	165

Thorburn Series FL6A - API 6A Flanges - Type 6BX



WELD NECK RING TYPE FLANGE



BLIND RING TYPE FLANGE

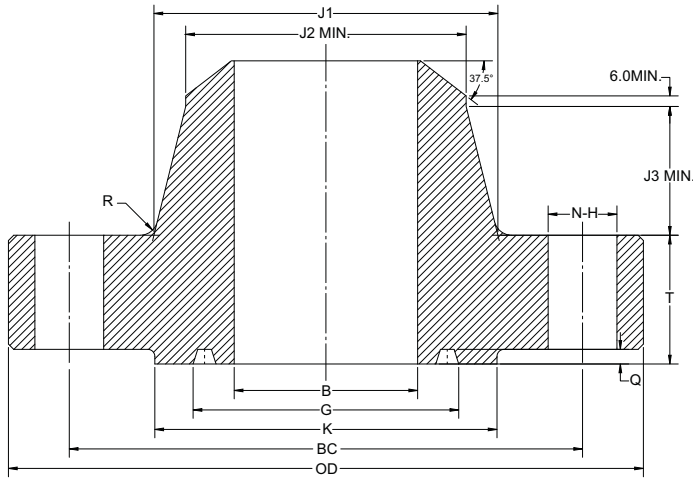
API6A Weld Neck Ring Type 6BX - 10,000 PSI

Part #	Size (in)	B	OD	C	Q (Max.)	G	K	T	J1	J2	J3	R	BC	N	H	Ring # (R/RX)
WFL6A-6BX10K-31	1 13/16	47	185	3	5.6	77.8	105	42	89	65	49	10	146	8	23	151
WFL6A-6BX10K-33	2 1/16	53	200	3	6.0	86.2	111	44	100	75	52	10	159	8	23	152
WFL6A-6BX10K-41	2 9/16	66	230	3	6.8	102.8	132	51	121	92	57	10	184	8	26	153
WFL6A-6BX10K-49	3 1/16	79	270	3	7.5	119.0	152	58	142	110	64	10	216	8	29	154
WFL6A-6BX10K-65	4 1/16	104	315	3	8.3	150.6	185	70	183	146	73	10	259	8	32	155
WFL6A-6BX10K-82	5 1/8	131	360	3	9.5	176.7	221	79	224	183	81	10	300	12	32	169
WFL6A-6BX10K-113	7 1/16	180	480	6	11.1	241.8	302	103	302	254	95	16	403	12	42	156
WFL6A-6BX10K-144	9	229	550	6	12.7	299.1	359	124	375	327	94	16	476	16	42	157
WFL6A-6BX10K-176	11	280	655	6	14.3	357.2	429	141	451	400	103	16	565	16	48	158
WFL6A-6BX10K-218	13 5/8	347	770	6	15.9	432.6	518	168	553	495	114	16	673	20	51	159
WFL6A-6BX10K-268	16 3/4	426	870	6	8.3	478.3	576	168	656	602	78	19	776	24	51	162
WFL6A-6BX10K-300	18 3/4	477	1040	6	18.3	577.9	697	223	753	675	156	16	926	24	61	164
WFL6A-6BX10K-340	21 1/4	541	1145	6	19.1	647.9	781	241	848	762	165	21	1022	24	67	166

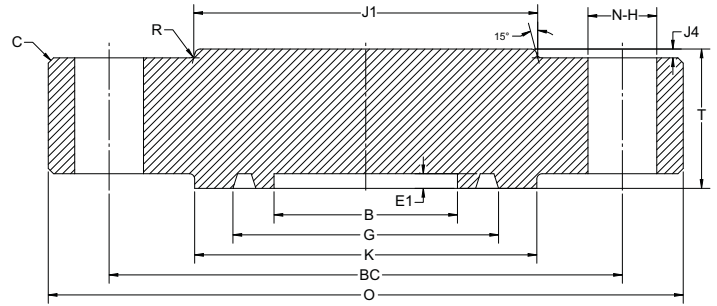
API6A Blind Ring Type 6BX - 10,000 PSI

Part #	Size (in)	B	OD	C	E1	Q (Max.)	G	K	T	J1	J4	R	BC	N	H	Ring # (R/RX)
BFL6A-6BX10K-31	1 13/16	47	185	3	-	5.6	77.8	105	42	89	-	10	146	8	23	151
BFL6A-6BX10K-33	2 1/16	53	200	3	-	6.0	86.2	111	44	100	-	10	159	8	23	152
BFL6A-6BX10K-41	2 9/16	66	230	3	-	6.8	102.8	132	51	121	-	10	184	8	26	153
BFL6A-6BX10K-49	3 1/16	79	270	3	-	7.5	119.0	152	58	142	-	10	216	8	29	154
BFL6A-6BX10K-65	4 1/16	104	315	3	-	8.3	150.6	185	70	183	-	10	259	8	32	155
BFL6A-6BX10K-82	5 1/8	131	360	3	10	9.5	176.7	221	79	224	6	10	300	12	32	169
BFL6A-6BX10K-113	7 1/16	180	480	6	11	11.1	241.8	302	103	302	10	16	403	12	42	156
BFL6A-6BX10K-144	9	229	550	6	13	12.7	299.1	359	124	375	10	16	476	16	42	157
BFL6A-6BX10K-176	11	280	655	6	14	14.3	357.2	429	141	451	14	16	565	16	48	158
BFL6A-6BX10K-218	13 5/8	347	770	6	16	15.9	432.6	518	168	553	18	16	673	20	51	159
BFL6A-6BX10K-268	16 3/4	426	870	6	8	8.3	478.3	576	168	656	30	19	776	24	51	162
BFL6A-6BX10K-300	18 3/4	477	1040	6	18	18.3	577.9	697	223	753	25	16	926	24	61	164
BFL6A-6BX10K-340	21 1/4	541	1145	6	19	19.1	647.9	781	241	848	32	21	1022	24	67	166

Thorburn Series FL6A - API 6A Flanges - Type 6BX



WELD NECK RING TYPE FLANGE



BLIND RING TYPE FLANGE

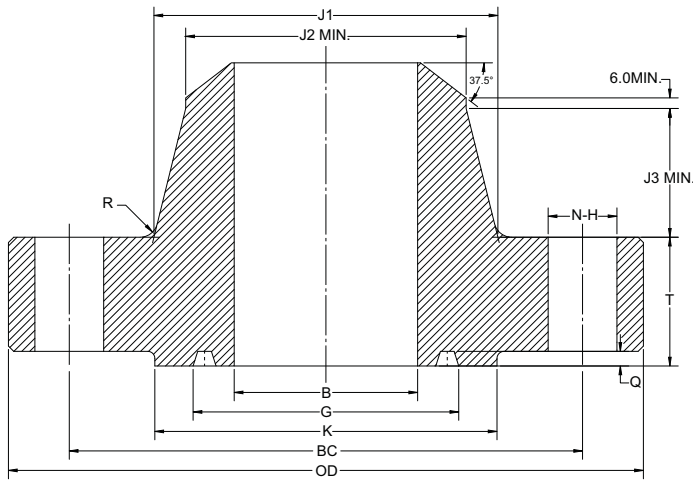
API6A Weld Neck Ring Type 6BX - 15,000 PSI

Part #	Size (in)	B	OD	C	Q (Max.)	G	K	T	J1	J2	J3	R	BC	N	H	Ring # (R/RX)
WFL6A-6BX15K-31	1 13/16	47	210	3	5.6	77.8	106	45	98	71	48	10	160	8	26	151
WFL6A-6BX15K-33	2 1/16	53	220	3	6.0	86.2	114	51	111	83	54	10	175	8	26	152
WFL6A-6BX15K-41	2 9/16	66	255	3	6.8	102.8	133	57	129	100	57	10	200	8	29	153
WFL6A-6BX15K-49	3 1/16	79	290	3	7.5	119.0	154	64	154	122	84	10	230	8	32	154
WFL6A-6BX15K-65	4 1/16	104	360	3	8.3	150.6	194	79	195	159	73	10	291	8	39	155
WFL6A-6BX15K-82	5 1/8	131	420	3	9.5	176.7	225	99	245	200	82	16	343	12	42	169
WFL6A-6BX15K-113	7 1/16	180	505	6	11.1	241.8	305	119	325	276	92	16	429	16	42	156
WFL6A-6BX15K-144	9	229	650	6	12.7	299.1	381	146	432	349	124	16	552	16	51	157
WFL6A-6BX15K-176	11	280	815	6	14.3	357.2	454	187	584	427	236	16	711	20	64	158
WFL6A-6BX15K-218	13 5/8	347	885	6	15.9	432.6	541	205	595	529	114	25	772	20	61	159
WFL6A-6BX15K-300	18 3/4	477	1160	6	18.3	577.9	722	256	813	730	156	25	1016	20	80	164

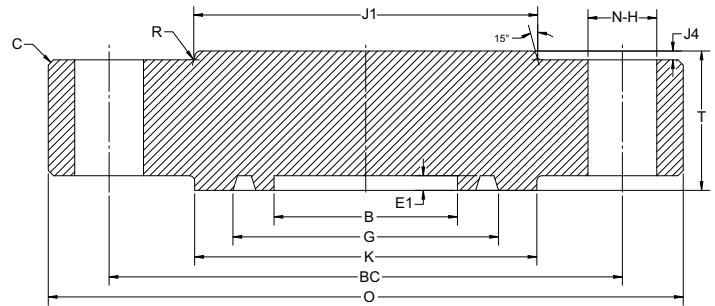
API6A Blind Ring Type 6BX - 15,000 PSI

Part #	Size (in)	B	OD	C	E1	Q (Max.)	G	K	T	J1	J4	R	BC	N	H	Ring # (R/RX)
BFL6A-6BX15K-31	1 13/16	47	210	3	-	5.6	77.8	106	45	98	-	10	160	8	26	151
BFL6A-6BX15K-33	2 1/16	53	220	3	-	6.0	86.2	114	51	111	-	10	175	8	26	152
BFL6A-6BX15K-41	2 9/16	66	255	3	-	6.8	102.8	133	57	129	-	10	200	8	29	153
BFL6A-6BX15K-49	3 1/16	79	290	3	-	7.5	119.0	154	64	154	-	10	230	8	32	154
BFL6A-6BX15K-65	4 1/16	104	360	3	-	8.3	150.6	194	79	195	-	10	291	8	39	155
BFL6A-6BX15K-82	5 1/8	131	420	3	10	9.5	176.7	225	99	245	6	16	343	12	42	169
BFL6A-6BX15K-113	7 1/16	180	505	6	11	11.1	241.8	305	119	325	8	16	429	16	42	156
BFL6A-6BX15K-144	9	229	650	6	13	12.7	299.1	381	146	432	14	16	552	16	51	157
BFL6A-6BX15K-176	11	280	815	6	14	14.3	357.2	454	187	584	13	16	711	20	64	158
BFL6A-6BX15K-218	13 5/8	347	885	6	16	15.9	432.6	541	205	595	18	25	772	20	61	159
BFL6A-6BX15K-300	18 3/4	477	1160	6	18	18.3	577.9	722	256	813	35	25	1016	20	80	164

Thorburn Series FL6A - API 6A Flanges - Type 6BX



WELD NECK RING TYPE FLANGE



BLIND RING TYPE FLANGE

API6A Weld Neck Ring Type 6BX - 20,000 PSI

Part #	Size (in)	B	OD	C	Q (Max.)	G	K	T	J1	J2	J3	R	BC	N	H	Ring # (R/RX)
WFL6A-6BX20K-31	1 13/16	47	255	3	5.6	77.8	117	64	133	110	49	10	203	8	29	151
WFL6A-6BX20K-33	2 1/16	53	285	3	6.0	86.2	132	72	154	127	52	10	230	8	32	152
WFL6A-6BX20K-41	2 9/16	66	325	3	6.8	102.8	151	79	173	145	59	10	262	8	35	153
WFL6A-6BX20K-49	3 1/16	79	355	3	7.5	119	171	86	192	160	64	10	287	8	39	154
WFL6A-6BX20K-65	4 1/16	104	445	3	8.3	150.6	219	106	243	206	73	10	357	8	48	155
WFL6A-6BX20K-113	7 1/16	180	655	6	11.1	241.8	352	165	386	338	97	16	554	16	54	156
WFL6A-6BX20K-144	9	229	805	6	12.7	299.1	441	205	481	429	108	25	686	16	67	157
WFL6A-6BX20K-176	11	280	885	6	14.3	357.2	505	224	567	508	103	25	749	16	74	158
WFL6A-6BX20K-218	13 5/8	347	1160	6	15.9	432.6	614	292	694	629	133	25	1016	20	80	159

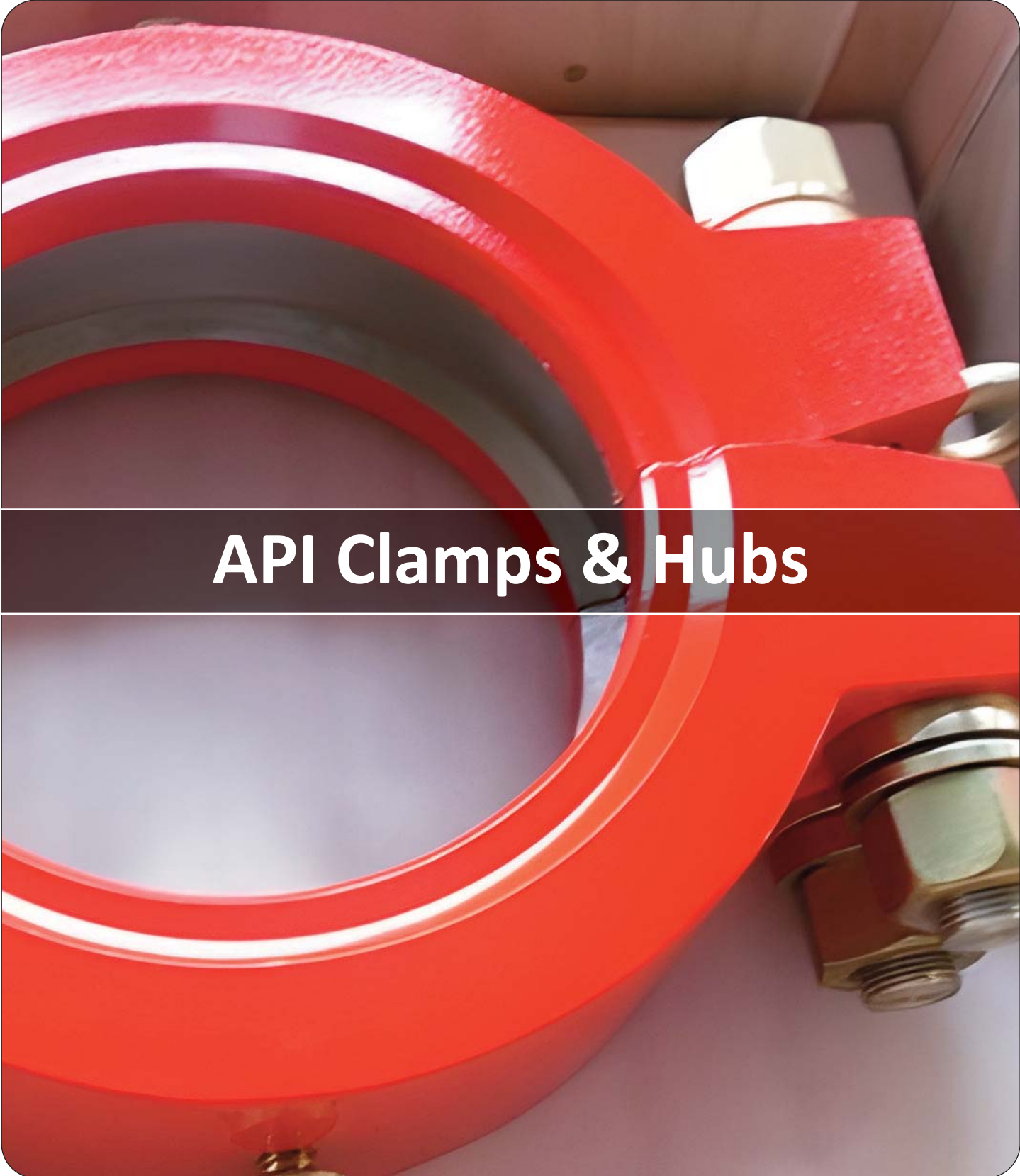
API6A Blind Ring Type 6BX - 20,000 PSI

Part #	Size (in)	B	OD	C	E1	Q (Max.)	G	K	T	J1	J4	R	BC	N	H	Ring # (R/RX)
BFL6A-6BX20K-31	1 13/16	47	255	3	-	5.6	77.8	117	64	133	-	10	203	8	29	151
BFL6A-6BX20K-33	2 1/16	53	285	3	-	6.0	86.2	132	72	154	-	10	230	8	32	152
BFL6A-6BX20K-41	2 9/16	66	325	3	-	6.8	102.8	151	79	173	-	10	262	8	35	153
BFL6A-6BX20K-49	3 1/16	79	355	3	-	7.5	119	171	86	192	-	10	287	8	39	154
BFL6A-6BX20K-65	4 1/16	104	445	3	-	8.3	150.6	219	106	243	-	10	357	8	48	155
BFL6A-6BX20K-113	7 1/16	180	655	6	11	11.1	241.8	352	165	386	8	16	554	16	54	156
BFL6A-6BX20K-144	9	229	805	6	13	12.7	299.1	441	205	481	6	25	686	16	67	157
BFL6A-6BX20K-176	11	280	885	6	14	14.3	357.2	505	224	567	13	25	749	16	74	158
BFL6A-6BX20K-218	13 5/8	347	1160	6	16	15.9	432.6	614	292	694	14	25	1016	20	80	159

How to Order Thorburn Series FL6A - API 6A Flanges



Model	Ring Type Joint	API Type	Pressure Rating	Nominal Bore Size	Flange Material
FL6A	W	6B	5K	65	F7
FL6A = API 6A Flange	W = Weld Neck B = Blind	6B = API 6A Type 6B 6BX = API 6A Type 6BX	2K = 2000 PSI 3K = 3000 PSI 5K = 5000 PSI 10K = 10000 PSI 15K = 15000 PSI 20K = 20000 PSI	Sizes are measured in 1/16 of an inch. Example: 33 = 2 1/16" 50 = 3 1/8" 65 = 4 1/16" 82 = 5 1/8" 218 = 13 5/8" 340 = 21 1/4"	F1 = ASTM A105 F2 = ASTM A105N F3 = ASTM A350 LF2 F4 = ASTM A694 F5 = AISI 4130 F6 = ASTM A182 F304 F7 = ASTM A182 F304L F8 = ASTM A182 F316 F9 = ASTM A182 F316L F10 = Duplex (F51) F11 = Super Duplex (F53) F12 = Super Duplex (F55)



API Clamps & Hubs

Thorburn Series ACH API 6A Hub Connectors



Thorburn Clamps and Hubs are purpose-engineered to deliver durable, high-integrity connections for critical well-control systems. Built in accordance with API 16 standards, these compact clamp-type connectors provide a reliable solution for joining blowout preventers, choke and kill manifolds, drilling risers, and other high-pressure equipment where safety and performance cannot be compromised. Precision-machined hubs ensure accurate alignment and maintain a secure metal-to-metal sealing interface, while the robust clamp assembly applies uniform radial loading for a tight, repeatable, and leak-resistant connection. Manufactured from premium alloy steels and heat-treated for strength, Thorburn Clamps and Hubs are designed to withstand extreme pressures, dynamic loads, and harsh drilling environments. Their lighter weight and smaller footprint, compared to traditional flanged connections, allow for faster installation, improved handling, and reduced rig-up time—making them the connector of choice for operators seeking dependable performance and operational efficiency. Thorburn Clamps and Hubs deliver proven reliability in demanding applications across onshore and offshore drilling, completion, and intervention operations

Features

- API 16A compliant construction
- High-strength alloy steel for durability & 360° adjustability
- Precision-machined hubs with metal-to-metal sealing
- Uniform radial loading for reliable connections
- Compact, lightweight design for easier handling
- Quick make-up and break-out withstands high pressure and shock loads
- Corrosion-resistant finishes available and suitable for BOP stacks, risers, and well-control systems

Applications

- Blowout Preventer (BOP) stacks
- Drilling risers and subsea well-control systems
- Choke and kill manifolds for high-pressure drilling and workover operations
- Surface and subsea pressure-control equipment
- Well-intervention and completion systems
- High-pressure conduit and connector assemblies
- OEM well-control equipment manufacturing and integration

Thorburn Series ACH API 6A Hub Connectors

Specifications

CLAMPS and HUBS as per API 16A / API 6A

Hubs are available Integral

Rings Joints Type: BX and RX

Sizes & Rating

Clamps: Clamp N°1 to ClampN°28 - 2,000 PSI to 20,000 PSI

Hubs: 1 13/16in to 21 1/4in– 2,000 PSI to 20,000 PSI

Design Codes

API 16A: 1 13/16" to 21 1/4" - 2,000 PSI to 20,000 PSI Specification for Drill Through Equipment.

API 6A: Specification for Subsea Wellhead and Tree Equipment

ASME VIII Div. 2: Rules for Construction of Pressure Vessels

Sour Gas Standard: H2S Nace MR0175/ISO 15156

Clamp Materials: Forged low-alloy steel (AISI 4130/4140) - Can be modified for SSC resistance

Special Clamp Materials: DUPLEX, SUPER DUPLEX, INCONEL® (Available upon request)

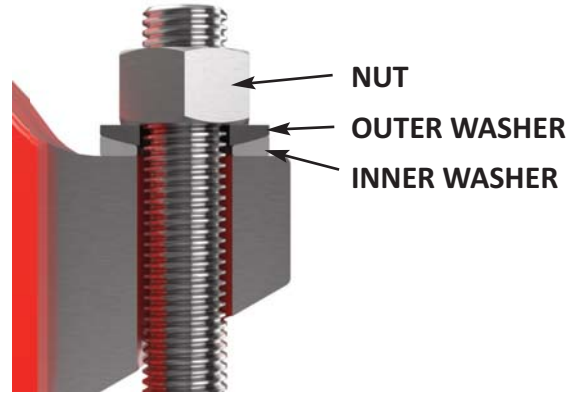
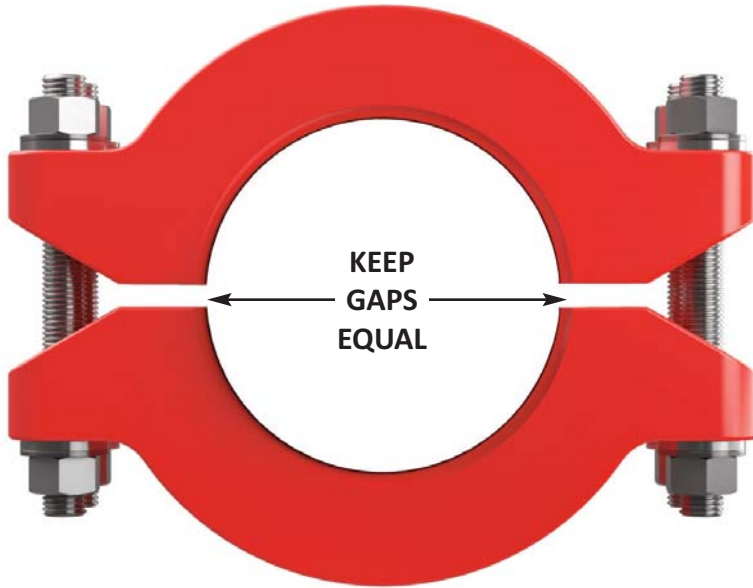
Hub Materials: Plated Steel, DUPLEX 2205/UNS S31803 (for corrosion Subsea service), SUPER DUPLEX/UNS S32750 & UNS S32760, INCONEL® 625 & INCONEL® 718, Alloy 825 for severe service.



Recommended Bolt Torque

Bolt Size	Fluoropolymer Coated Bolts (B7/L7)	Uncoated Bolts (B7/L7) Lubricated with API 5A2 Thread Compound
(in)	(ft - lbs)	(ft - lbs)
7/8 - 9UN	185	313
1 - 8UN	280	474
1 1/8 - 8UN	400	696
1 1/4 - 8UN	550	953
1 3/8 - 8UN	735	1281
1 1/2 - 8UN	960	1676
1 5/8 - 8UN	1225	2146
1 7/8 - 8UN	1890	3331
2 1/4 - 8UN	3270	5821
2 1/2 - 8UN	4500	8028
3 - 8UN	7780	13982
3 1/4 - 8UN	9900	17830
4 - 8UN	18475	33461

Thorburn Series AHC API 6A Hub Connector Clamps



INSTALL CLAMP HALVES SO MARKINGS ON BOTH HALVES APPEAR ON THE SAME SIDE OF THE CLAMP

TIGHTEN THE CLAMP TOGETHER EVENLY ON BOTH SIDES

Series AHC-C API 6A Clamps

Part #	Clamp	Nominal Bore Size		Working Pressure		Ring Gasket Number		Bolt Size	Weight	
	#	(in)	(mm)	(PSI)	(bar)	(RX)	(BX)	(in)	kg	lbs
AHC-C1-30-10K*	1	1 13/16	46.0	10,000	689	20*	151	7/8-9UNX7	23	51
AHC-C1-33-5K*	1	2 1/16	52.3	5,000	345	23*	152	7/8-9UNX7	23	51
AHC-C2-30-15K*	2	1 13/16	46.0	15,000	1034	20*	151	7/8-9UNX8	33	73
AHC-C2-33-10K*	2	2 1/16	52.3	10,000	689	23*	152	7/8-9UNX8	33	73
AHC-C2-41-5K*	2	2 9/16	65.1	5,000	345	24*	153	7/8-9UNX8	33	73
AHC-C3-30-20K	3	1 13/16	46.0	20,000	1379	-	151	1-8UNX9	68	150
AHC-C3-33-15K	3	2 1/16	52.3	15,000	1034	23*	152	1-8UNX9	68	150
AHC-C3-33-20K	3	2 1/16	52.3	20,000	1379	-	152	1-8UNX9	68	150
AHC-C3-41-15K	3	2 9/16	65.1	15,000	1034	24*	153	1-8UNX9	68	150
AHC-C4-41-10K	4	2 9/16	65.1	10,000	689	24*	153	1-8UNX8 1/2	36	80
AHC-C4-50-5K	4	3 1/8	79.3	5,000	345	27*	154	1-8UNX8 1/2	36	80
AHC-C5-49-10K	5	3 1/16	77.8	10,000	689	27*	154	1-8UNX8 1/2	37	82
AHC-C5-65-5K	5	4 1/16	103.2	5,000	345	35*	155	1-8UNX8 1/2	37	82
AHC-C6-41-20K	6	2 9/16	65.1	20,000	1379	-	153	1 1/8-8UNX9 3/4	66	146
AHC-C6-49-15K	6	3 1/16	77.8	15,000	1034	27	154	1 1/8-8UNX9 3/4	66	146
AHC-C6-65-10K	6	4 1/16	103.2	10,000	689	35	155	1 1/8-8UNX9 3/4	66	146

* Not API

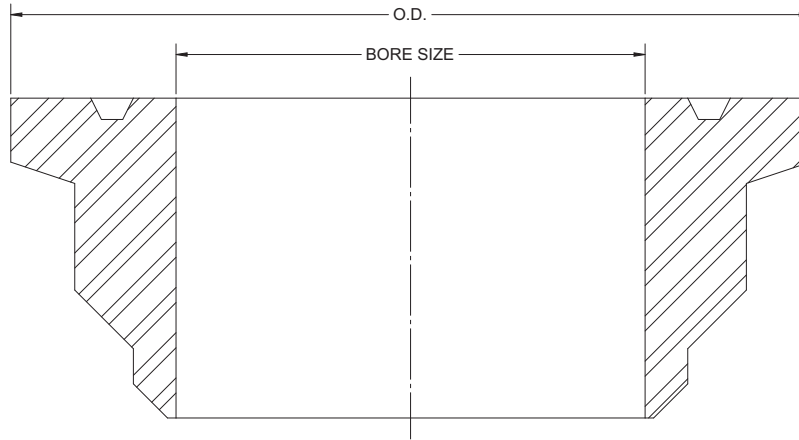


Thorburn Series AHC API 6A Hub Connector Clamps

Part #	Clamp	Nominal Bore Size		Working Pressure		Ring Gasket Number		Bolt Size	Weight	
	#	(in)	(mm)	(PSI)	(bar)	(RX)	(BX)	(in)	kg	lbs
AHC-C7-82-10K	7	5 1/8	130.2	10,000	689	-	169*	1 3/8-8UNX12	106	234
AHC-C7-113-5K	7	7 1/16	179.4	5,000	345	45*	-	1 3/8-8UNX12	106	234
AHC-C8-49-20K	8	3 1/16	77.9	20,000	1379	-	154	1 1/2-8UNX13 1/2	141	310
AHC-C8-65-15K	8	4 1/16	103.2	15,000	1034	-	155	1 1/2-8UNX13 1/2	141	310
AHC-C8-82-15K	8	5 1/8	130.2	15,000	1034	-	169*	1 1/2-8UNX13 1/2	141	310
AHC-C8-113-5K	8	7 1/16	179.4	5,000	345	-	156	1 1/2-8UNX13 1/2	141	310
AHC-C8-113-10K	8	7 1/16	179.4	10,000	689	45*	-	1 1/2-8UNX13 1/2	141	310
AHC-C8-144-5K	8	9	228.6	5,000	345	49*	157	1 1/2-8UNX13 1/2	141	310
AHC-C9-176-3K	9	11	279.4	3,000	207	53	-	1 3/8-8UNX13	129	285
AHC-C10-65-20K	10	4 1/16	103.2	20,000	1379	-	155	1 7/8-8UNX17	277	610
AHC-C10-113-10K	10	7 1/16	179.4	10,000	689	-	156	1 7/8-8UNX17	277	610
AHC-C10-113-15K	10	7 1/16	179.4	15,000	1034	45*	-	1 7/8-8UNX17	277	610
AHC-C10-144-10K	10	9	228.6	10,000	689	49*	157	1 7/8-8UNX17	277	610
AHC-C10-176-5K	10	11	279.4	5,000	345	53*	158	1 7/8-8UNX17	277	610
AHC-C11-218-3K	11	13 5/8	346.1	3,000	207	57	-	1 3/8-8UNX15 3/4	170	375
AHC-C12-268-2K	12	16 3/4	425.5	2,000	138	65	-	1 3/8-8UNX15	136	300
AHC-C13-176-10K	13	11	279.4	10,000	689	53*	-	2 1/4-8UNX19 1/4	378	834
AHC-C13-218-5K	13	13 5/8	346.1	5,000	345	57*	160	2 1/4-8UNX19 1/4	378	834
AHC-C14-268-3K	14	16 3/4	425.5	3,000	207	65	-	1 5/8-8UNX18 1/4	220	485
AHC-C15-113-20K	15	7 1/16	179.4	20,000	1379	-	156	2 1/2-8UNX20 3/4	760	1676
AHC-C15-176-15K	15	11	279.4	15,000	1034	-	158	2 1/2-8UNX20 3/4	760	1676
AHC-C15-218-10K	15	13 5/8	346.1	10,000	689	57*	159	2 1/2-8UNX20 3/4	760	1676
AHC-C16-340-2K	16	21 1/4	539.8	2,000	138	73*	-	1 5/8-8UNX18 3/4	238	525
AHC-C17-332-3K	17	20 3/4	527.1	3,000	207	73*	-	2 1/4-8UNX20	370	815
AHC-C18-332-2K	18	20 3/4	527.1	2,000	138	73*	-	2 1/4-8UNX20	517	1140
AHC-C18-332-3K	18	20 3/4	527.1	3,000	207	73*	-	2 1/4-8UNX20	517	1140
AHC-C18-340-2K	18	21 1/4	539.8	2,000	138	73	-	2 1/4-8UNX20	517	1140
AHC-C19-268-5K	19	16 3/4	425.5	5,000	345	-	162	2 1/2-8UNX23 1/2	619	1365
AHC-C20-480-1K	20	30	762.0	1,000	69	-	-	1 5/8-8UNX17 1/2	435	960
AHC-C22-113-15K	22	7 1/16	179.4	15,000	1034	-	156	2 1/4-8UNX18	417	920
AHC-C22-176-10K	22	11	279.4	10,000	689	-	158	2 1/4-8UNX18	417	920
AHC-C25-113-2K	25	7 1/16	179.4	2,000	138	45	-	7/8-9UNX8 1/2	57	125
AHC-C26-300-15K	26	18 3/4	476.3	15,000	1034	-	164	4-8UNX35	2092	4612
AHC-C26-340-10K	26	21 1/4	539.8	10,000	689	-	166	4-8UNX35	2092	4612
AHC-C27-300-10K	27	18 3/4	476.3	10,000	689	-	164	3 1/4-8UNX26 1/2	1346	2968
AHC-C27-340-5K	27	21 1/4	539.8	5,000	345	-	165	3 1/4-8UNX26 1/2	1346	2968
AHC-C28-176-20K	28	11	279.4	20,000	1379	-	158	3-8UNX24 1/4	1059	2335
AHC-C28-218-15K	28	13 5/8	346.1	15,000	1034	-	159	3-8UNX24 1/4	1059	2335
AHC-C28-268-10K	28	16 3/4	425.5	10,000	689	-	162	3-8UNX24 1/4	1059	2335

* Not API

Thorburn Series ACH API 6A Hub Connectors



Thorburn API Type 16B Integral Hub Connection - 2000 PSI

Part #	Nominal Size & Bore Size	O.D.	Total Thickness	Large Diameter of Neck	Neck Length for Clamp Clearance	Ring Gasket Number	Clamp Number
	(in)	(mm)	(mm)	(mm)	(mm)		
AHC-H16B-113-C25-2K	7 1/16	263.52	36.65	225.42	63.50	RX-45	25
AHC-H16B-268-C12-2K	16 3/4	517.52	32.23	482.60	79.50	RX-65	12
AHC-H16B-340-C18-2K	21 1/4	669.92	47.54	622.30	127.00	RX-73	18

Thorburn API Type 16B Integral Hub Connection - 3000 PSI

Part #	Nominal Size & Bore Size	O.D.	Total Thickness	Large Diameter of Neck	Neck Length for Clamp Clearance	Ring Gasket Number	Clamp Number
	(in)	(mm)	(mm)	(mm)	(mm)		
AHC-H16B-176-C9-3K	11	396.90	35.53	355.60	79.50	RX-53	9
AHC-H16B-218-C11-3K	13 5/8	466.75	33.93	425.45	81.02	RX-57	11
AHC-H16B-268-C14-3K	16 3/4	539.75	37.05	498.47	93.47	RX-65	14

Thorburn API Type 16B Integral Hub Connection - 5000 PSI

Part #	Nominal Size & Bore Size	O.D.	Total Thickness	Large Diameter of Neck	Neck Length for Clamp Clearance	Ring Gasket Number	Clamp Number
	(in)	(mm)	(mm)	(mm)	(mm)		
AHC-H16B-33-C1-5K	2 1/16	127.78	29.61	92.86	56.38	BX-152	1
AHC-H16B-41-C2-5K	2 9/16	146.83	29.61	111.91	57.65	BX-153	2
AHC-H16B-50-C4-5K	3 1/8	160.32	29.61	125.42	59.94	BX-154	4
AHC-H16B-65-C5-5K	4 1/16	193.67	30.40	158.75	60.45	BX-155	5
AHC-H16B-113-C8-5K	7 1/16	336.55	41.19	295.27	85.85	BX-156	8
AHC-H16B-144-C8-5K	9	336.55	41.19	295.27	85.85	BX-157	8
AHC-H16B-176-C10-5K	11	412.75	42.01	371.47	104.90	BX-158	10
AHC-H16B-218-C13-5K	13 5/8	523.87	47.52	482.60	123.95	BX-160	13
AHC-H16B-268-C19-5K	16 3/4	650.87	45.16	609.60	139.70	BX-162	19
AHC-H16B-340-C27-5K	21 1/4	793.75	92.20	708.02	171.45	BX-165	27

Thorburn Series ACH API 6A Hub Connectors

Thorburn API Type 16BX Integral Hub Connection - 10,000 PSI

Part #	Nominal Size & Bore Size	O.D.	Total Thickness	Large Diameter of Neck	Neck Length for Clamp Clearance	Ring Gasket Number	Clamp Number
	(in)	(mm)	(mm)	(mm)	(mm)		
AHC-H16BX-29-C1-10K	1 13/16	127.78	29.61	92.86	56.38	BX-151	1
AHC-H16BX-33-C2-10K	2 1/16	146.83	29.61	111.91	57.65	BX-152	2
AHC-H16BX-41-C4-10K	2 9/16	160.32	29.61	125.42	59.94	BX-153	4
AHC-H16BX-49-C5-10K	3 1/16	193.67	30.40	158.75	60.45	BX-154	5
AHC-H16BX-65-C6-10K	4 1/16	214.29	33.27	173.02	71.62	BX-155	6
AHC-H16BX-113-C10-10K	7 1/16	412.75	41.98	371.47	104.90	BX-156	10
AHC-H16BX-144-C10-10K	9	412.75	41.98	371.47	104.90	BX-157	10
AHC-H16BX-176-C22-10K	11	524.51	51.68	473.07	120.65	BX-158	22
AHC-H16BX-218-C15-10K	13 5/8	565.15	58.64	523.87	134.87	BX-159	15
AHC-H16BX-268-C28-10K	16 3/4	711.20	76.32	635.00	156.71	BX-162	28
AHC-H16BX-300-C27-10K	18 3/4	793.75	92.20	708.02	171.45	BX-164	27
AHC-H16BX-340-C26-10K	21 1/4	863.60	101.72	774.70	208.78	BX-166	26

Thorburn API Type 16BX Integral Hub Connection - 15,000 PSI

Part #	Nominal Size & Bore Size	O.D.	Total Thickness	Large Diameter of Neck	Neck Length for Clamp Clearance	Ring Gasket Number	Clamp Number
	(in)	(mm)	(mm)	(mm)	(mm)		
AHC-H16BX-29-C2-15K	1 13/16	146.83	29.61	111.91	54.65	BX-151	2
AHC-H16BX-33-C3-15K	2 1/16	155.57	29.61	114.30	81.78	BX-152	3
AHC-H16BX-41-C3-15K	2 9/16	155.57	29.61	114.30	81.78	BX-153	3
AHC-H16BX-49-C6-15K	3 1/16	216.83	33.27	173.02	71.62	BX-154	6
AHC-H16BX-65-C8-15K	4 1/16	336.55	41.19	295.27	85.85	BX-155	8
AHC-H16BX-113-C22-15K	7 1/16	523.90	51.68	473.07	12.365	BX-156	22
AHC-H16BX-176-C15-15K	11	565.15	58.64	523.87	137.87	BX-158	15
AHC-H16BX-218-C28-15K	13 5/8	711.20	76.32	635.00	156.71	BX-159	28
AHC-H16BX-300-C26-15K	18 3/4	863.60	101.72	774.70	208.78	BX-164	26

Thorburn API Type 16BX Integral Hub Connection - 20,000 PSI

Part #	Nominal Size & Bore Size	O.D.	Total Thickness	Large Diameter of Neck	Neck Length for Clamp Clearance	Ring Gasket Number	Clamp Number
	(in)	(mm)	(mm)	(mm)	(mm)		
AHC-H16BX-29-C3-20K	1 13/16	155.57	41.19	114.30	81.78	BX-151	3
AHC-H16BX-33-C3-20K	2 1/16	155.57	41.19	114.30	81.78	BX-152	3
AHC-H16BX-41-C6-20K	2 9/16	214.29	33.27	173.02	71.62	BX-153	6
AHC-H16BX-49-C8-20K	3 1/16	336.55	41.19	295.27	85.85	BX-154	8
AHC-H16BX-65-C10-20K	4 1/16	412.75	41.98	371.47	104.90	BX-155	10
AHC-H16BX-113-C25-20K	7 1/16	565.15	58.64	523.87	134.87	BX-156	25
AHC-H16BX-176-C28-20K	11	711.12	76.32	635.00	156.71	BX-158	28

How to Order Thorburn Series ACH API 6A Hub Connectors

API 6A Hubs

Model	API Type	Nominal Bore Size	Pressure Rating	Hub Material
AHC-H	16BX	218	10K	H32
API 6A Hub	16B = API 6A Type 6B 16BX = API 6A Type 6BX	Sizes are measured in 1/16 of an inch. Example: 29 = 1 13/16" 33 = 2 1/16" 50 = 3 1/8" 65 = 4 1/16" 82 = 5 1/8" 218 = 13 5/8" 340 = 21 1/4"	2K = 2000 PSI 3K = 3000 PSI 5K = 5000 PSI 10K = 10000 PSI 15K = 15000 PSI 20K = 20000 PSI	H27 = A105 H28 = Duplex 2205 H29 = Super Duplex 2507 H32 = Alloy (Heat Treated) H10 = Inconel 625 H12 = Inconel 825 HX = Specify
				

API 6A Clamps

Model	Nominal Bore Size	Clamp #	Pressure Rating	Clamp Material	Bolts
AHC-C	218	15	10K	C28	
API 6A Clamp	Sizes are measured in 1/16 of an inch. Example: 29 = 1 13/16" 33 = 2 1/16" 50 = 3 1/8" 65 = 4 1/16" 82 = 5 1/8" 218 = 13 5/8" 340 = 21 1/4"	1 11 22 2 12 25 3 13 26 4 14 27 5 15 28 6 16 7 17 8 18 9 19 10 20	2K = 2000 PSI 3K = 3000 PSI 5K = 5000 PSI 10K = 10000 PSI 15K = 15000 PSI 20K = 20000 PSI	C27 = A105 C28 = Duplex 2205 C29 = Super Duplex 2507 C32 = Alloy (Heat Treated) C10 = Inconel 625 C12 = Inconel 825 CX = Specify	BJ = PTFE Coated None = Leave Blank
					

Note: Nuts & Bolts Included with Clamp

Ring Gaskets

Model	Ring Gasket Type	Ring Gasket Number	Pressure Rating	Ring Gasket Material																																				
AHC-G	BX	159	10K	GS6																																				
Ring Gasket	RX = High Pressure BX = Very High Pressure	<table><tr><th>RX</th><th>BX</th><th>BX</th></tr><tr><td>20</td><td>151</td><td>164</td></tr><tr><td>23</td><td>152</td><td>165</td></tr><tr><td>24</td><td>153</td><td>166</td></tr><tr><td>27</td><td>154</td><td>169</td></tr><tr><td>35</td><td>155</td><td></td></tr><tr><td>45</td><td>156</td><td></td></tr><tr><td>49</td><td>157</td><td></td></tr><tr><td>53</td><td>158</td><td></td></tr><tr><td>57</td><td>159</td><td></td></tr><tr><td>65</td><td>160</td><td></td></tr><tr><td>73</td><td>162</td><td></td></tr></table>	RX	BX	BX	20	151	164	23	152	165	24	153	166	27	154	169	35	155		45	156		49	157		53	158		57	159		65	160		73	162		2K = 2000 PSI 3K = 3000 PSI 5K = 5000 PSI 10K = 10000 PSI 15K = 15000 PSI 20K = 20000 PSI	GCS = Low Carbon Steel GS4 = 304SS GS6 = 306SS G28 = Duplex 2205 G29 = Super Duplex 2507 G32 = Alloy (Heat Treated) G10 = Inconel 625 G12 = Inconel 825 GX = Specify
RX	BX	BX																																						
20	151	164																																						
23	152	165																																						
24	153	166																																						
27	154	169																																						
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Special Purpose Fittings

Thorburn API Approved High Pressure Swivel Joints



Thorburn high-pressure swivel joints are engineered to deliver reliable, smooth rotational movement in demanding oilfield fluid-handling systems. Manufactured with precision-machined components, Thorburn swivel joints are built to withstand extreme pressures, cyclic loading, and harsh operating environments. Their advanced sealing systems ensure dependable leak resistance, while heavy-duty bearing assemblies provide consistent 360° rotation under continuous flow.

Thorburn Series TSRSJ High Pressure Short Radius Swivel Joints

Provide compact, durable rotational movement for fluid systems with tight space constraints. Their reduced-radius design enables easy installation while maintaining high-pressure integrity and smooth 360° rotation. Built from alloy steel with heavy-duty bearings and advanced sealing, these swivels deliver reliable performance in cementing units, compact manifolds, and mobile well-service equipment.

Thorburn Series TLSSJ Very High Pressure Long Radius Swivel Joints

Combine ultra-high pressure capability with superior flow efficiency. Their extended-radius design reduces turbulence and erosion, making them ideal for high-rate, abrasive service such as fracturing, cementing, and acidizing. Constructed from premium alloys with precision bearings, these swivels ensure smooth rotation, excellent wear resistance, and long service life in demanding oilfield operations.

Features

- 360° rotational capability to reduce hose twisting, kinking, and mechanical stress.
- Designed for very high pressure applications
- Extra long radius elbows for better flow characteristics
- Easy to use and field repairable (Repair kits are available)
- Multiple end-connection options, including NPT, hammer union, flanged, or API-compatible connections
- Full-bore flow path to minimize pressure drop and turbulence
- Available in sour-gas-compatible materials to meet NACE MR0175/ISO 15156 requirements

Applications

- Mud lines
- Water lines
- Hydraulic control lines
- Rotary line connections
- Blow out preventer lines
- Cementing and circulating hoses
- Offshore wellhead connections
- Choke-and kill-lines

Thorburn Series SRSJ API Approved High Pressure Swivel Joints

Thorburn High Pressure Short Radius Swivel Joints

Short Radius high-pressure swivel joints are engineered to provide compact, robust rotational movement in tight-space fluid-handling systems. Designed with a reduced-radius bend, these swivels offer maximum installation flexibility while maintaining strong pressure integrity and smooth rotational performance under demanding operating conditions. Manufactured from high-strength alloy steels and equipped with heavy-duty bearing assemblies, Short Radius swivels deliver reliable 360° movement while handling high pressures, pulsation, and mechanical loads common in well service operations.

Specifications

Sizes: 3/4" to 4"

Materials: Plated Steel, Special Alloy Steel
(Meet ASTM & AISI Standards)

Pressure: 6,000 PSI (Working), 22,500 PSI (Test)

End Fittings: Hammer Unions (See Specifications Chart)

Working Temperature: -29°C to 121°C



Style 10



Style 20



Style 30



Style 40



Style 50



Style 60



Style 70



Style 80

Thorburn Series LSSJ API Approved High Pressure Swivel Joints

Thorburn Very High Pressure Long Radius Swivel Joints

Long Sweep high-pressure swivel joints are engineered for superior flow efficiency and extended service life in demanding oilfield fluid-handling applications. Featuring a smooth, extended-radius bend, these swivels minimize turbulence and erosion, making them ideal for abrasive, high-velocity, or high-solids environments such as cementing, fracturing, acidizing, and mud circulation systems. Constructed from high-strength alloy steels and fitted with heavy-duty bearings, Long Sweep swivel joints provide reliable 360° rotation under continuous pressure and cyclic loading.

Specifications

Sizes: 2", 3", 4"

Materials: Plated Steel, Special Alloy Steel
(Meet ASTM & AISI Standards)

Pressure: 15,000 PSI (Working), 22,500 PSI (Test)

End Fittings: Hammer Unions (See Specifications Chart)

Working Temperature: -29°C to 121°C

Standards (Sour Gas): NACE Standard MR-01-75,
API RP-14-E



Style 10



Style 20



Style 30



Style 40



Style 50



Style 60



Style 70



Style 80



Style 100

Thorburn API Approved High Pressure Swivel Joints

Swivel Joint Model	Cold Working Pressure (PSI)	Material	End Connections	Sizes (in)						
				3/4	1	1 1/4	1 1/2	2	3	4
Short Radius High Pressure Swivel Joints	6000	Alloy Steel	Female Line Pipe Threads	●	●	●	●	●	●	●
			Fig. 602 Union	●	●	●	●	●	●	●
Long Sweep Very High Pressure Swivel Joints	7500	Alloy Steel	Fig. 1002 Union					●	●	●
	10000	Alloy Steel	Fig. 1502 Union					●	●	●
	10000	Alloy Steel	Female Line Pipe Threads					●	●	●
			Fig. 1002 Union					●	●	●
	15000	Alloy Steel	Fig. 2202 Union					●	●	
	15000	Alloy Steel	Fig. 1502 Union					●	●	●
	20000	Alloy Steel	Fig. 2002 Union					●	●	

How to Order Thorburn API Approved High Pressure Swivel Joints

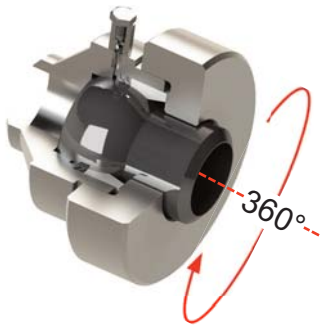
Model	Colors*	Nominal Size	Style	1st End	2nd End	End Material*	Service Type	Seal Material
LSSJ	48	48	20	F1	T1	CS	CS	B
SRSJ = Short Radius LSSJ = Long Sweep	GY = Grey GR = Green LB = Light Blue RD = Red YE = Yellow DB = Dark Blue PL = Purple	12 = 3/4 16 = 1 20 = 1 1/2 32 = 2 48 = 3 64 = 4	10 60 20 70 30 80 40 90 50 100	F1 = Flanged ANSI Class 150 F2 = Flanged ANSI Class 300 T1 = Female NPT B1 = Butt Weld SW = Socket Weld XX = Special (Specify)		CS = Plated Steel SA = Special Alloy	Standard Leave Blank SG = Sour Gas	B = Buna N I = FKM C = Neoprene H = EPDM J = PTFE X = Other (Specify)

*API Standards do not mandate colors for high pressure swivel joints. **Some materials may not be available for certain sizes. Contact Thorburn.

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

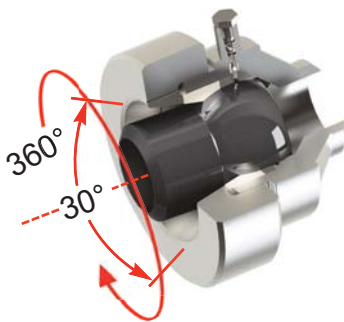


Thorburn's Ball Joint Swivel Pipe Connector is a high pressure joint that compensates for movement of piping spools and equipment while maintaining sealing integrity and relieving piping stresses. It is designed with a high temperature, high pressure Graphoil™ seal that is easily serviced through a field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



Model BJUS

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



Model BJFS

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

Features

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

Specifications

Sizes: 1 in to 24 in (Din 25 to Din 600)

Pressure Ratings: Up To ASME Class 2500

Test Pressure: 1.5 X design pressure

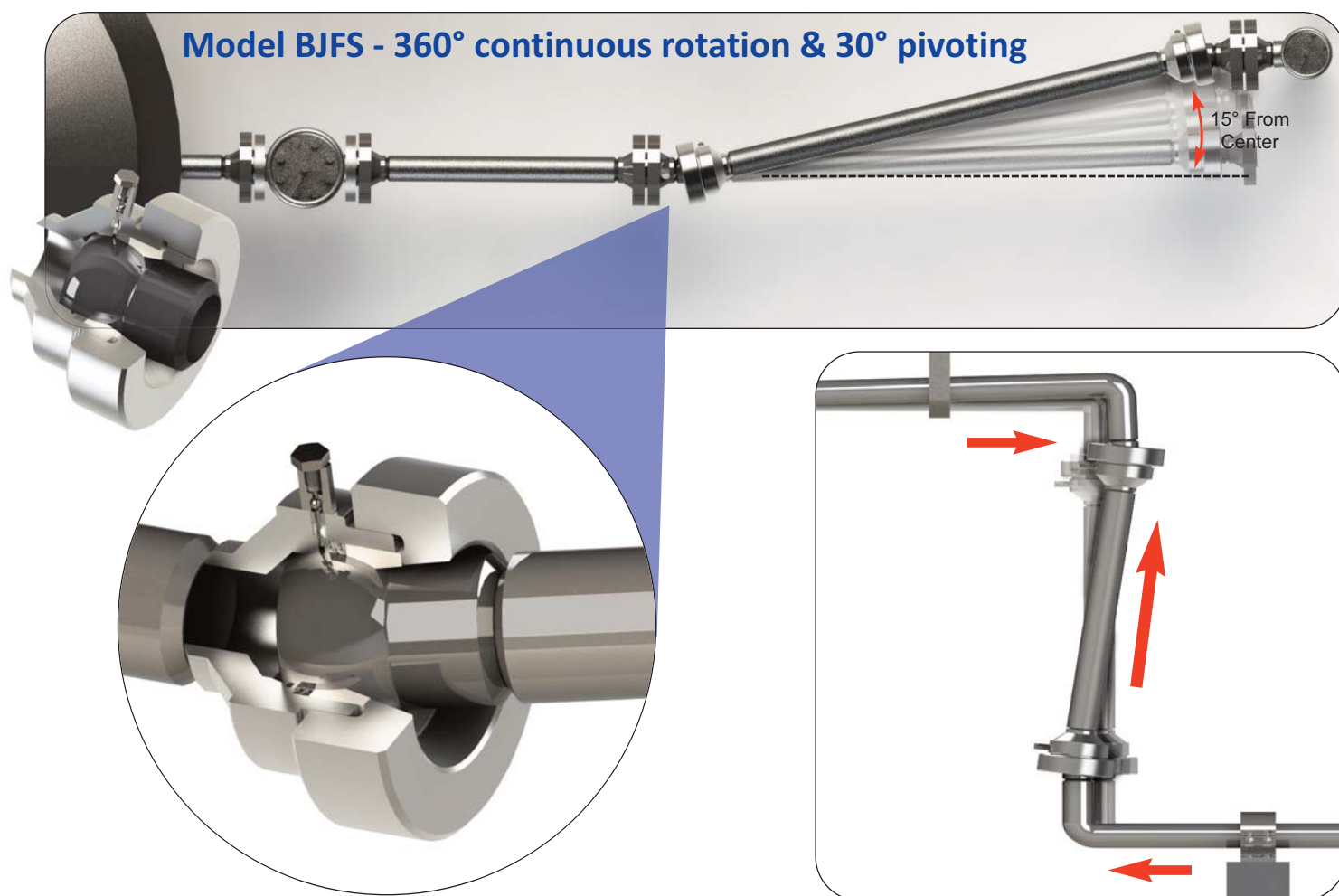
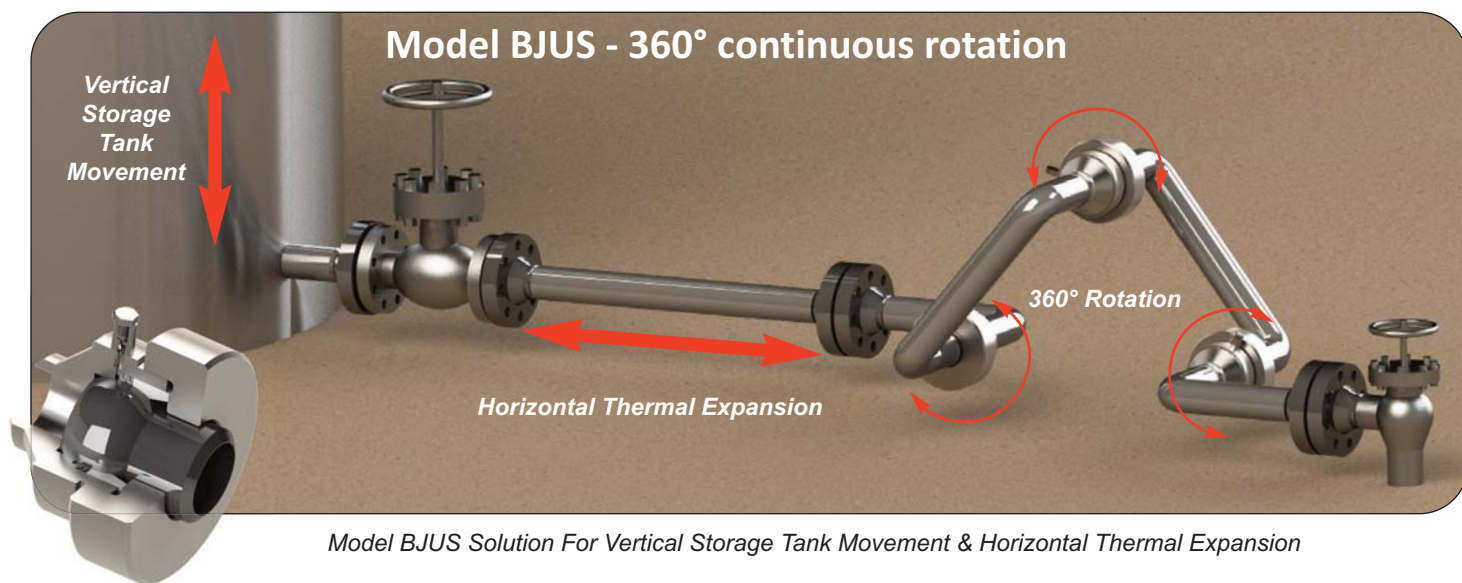
Temperature Range: Up to 1000°F (538°C)

Materials: SA105N, SA479/182 Type 316SS, SA276 Type 2205 (Super Duplex SS)

Design Codes

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

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

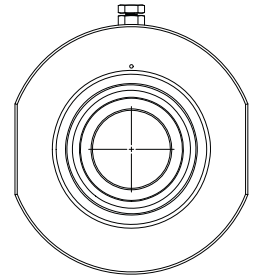
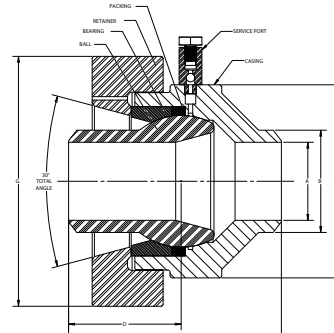
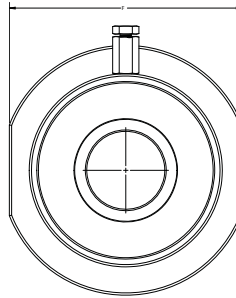
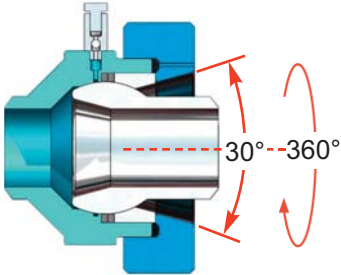


Model BJFS solutions for vertical storage tank movement & accommodating misalignment

Model BJFS horizontal & vertical thermal expansion

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors

BJUS Ball Joint Swivel

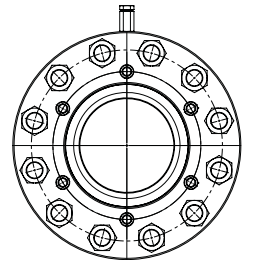
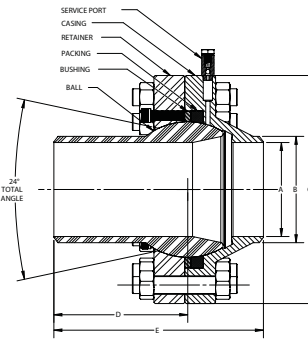
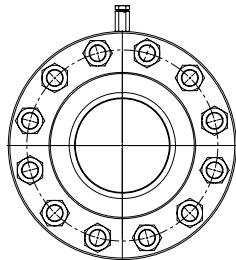
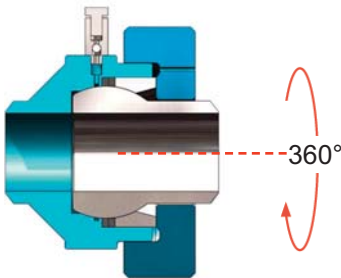


Nominal Pipe Size inches		Pressure Class ²	PN Pressure Class ²	Approximate Connector Dimensions ³												Approximate Weight ⁴	
				B		C		D		E		F		G			
in	DN	psi	bar	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
1.5	40	150 to 1500	20 to 260	1.9	48	5.9	150	3.6	92	6.8	173	6.0	152	7.0	178	30	14
2.0	50	150 to 1500	20 to 260	2.4	60	5.9	150	3.6	92	6.8	173	6.0	152	7.0	178	28	13
2.5	65	150 to 1500	20 to 260	2.9	73	7.2	183	5.0	127	9.6	243	8.3	210	9.0	229	75	34
3.0	80	150 to 1500	20 to 260	3.5	89	7.2	183	5.0	127	9.6	243	8.3	210	9.0	229	70	32
4.0	100	150 to 1500	20 to 260	4.5	114	8.4	214	5.0	127	9.6	243	10.3	260	11.0	279	105	48
5.0	125	150 to 1500	20 to 260	5.6	141	10.9	277	5.7	145	10.9	276	12.0	305	12.8	324	150	68
6.0	150	150 to 1500	20 to 260	6.6	168	10.9	277	5.7	145	10.9	276	12.0	305	12.8	324	150	68
8.0	200	150 to 900	20 to 150	8.6	219	14.5	368	6.5	165	12.0	305	16.0	406	16.5	419	245	111

Note: Custom schedules, weights, higher pressure ratings and wall thicknesses available upon request. **2.** Pipe wall thickness may reduce the pressure rating in some cases.

3. A dimension will depend on pressure class. **4.** Weights are approximate and may change depending upon pressure class.

BJFS Ball Joint Swivel



Nominal Pipe Size inches		Pressure Class ²	PN Pressure Class ²	Approximate Connector Dimensions ³								Approximate Weight ⁴	
				B		C		D		E			
in	DN	psi	bar	in	mm	in	mm	in	mm	in	mm	lbs	kg
8	200	1500	260	8.6	219	18.8	476	10.9	276	17.0	432	800	363
10	250	150 to 300	20 to 50	10.8	273	19.5	495	8.3	211	16.5	419	455	206
10	250	600	110	10.8	273	20.3	514	8.3	211	17.0	432	680	308
12	300	150 to 300	20 to 50	12.8	324	23.8	603	9.6	245	20.3	514	775	352
12	300	600	110	12.8	324	24.0	610	9.6	245	20.3	514	956	434
14	350	150 to 300	20 to 50	14.0	356	26.0	660	9.0	229	20.5	521	1065	483
14	350	600	110	14.0	356	26.0	660	9.0	229	20.5	521	1282	582
16	400	150 to 300	20 to 50	16.0	406	29.3	749	10.0	254	23.0	584	1609	730
16	400	600	110	16.0	406	29.3	749	10.0	254	23.0	584	1947	883
18	450	150 to 300	20 to 50	18.0	457	33.0	838	11.0	279	25.0	635	1901	862
18	450	600	110	18.0	457	33.0	838	11.0	279	25.0	635	2811	1275
20	500	150 to 300	20 to 50	20.0	508	35.8	908	12.0	305	27.0	686	2674	1213
20	500	600	110	20.0	508	35.8	908	12.0	305	27.0	686	3538	1605
24	600	150 to 300	20 to 50	24.0	610	41.3	1048	14.0	356	31.0	787	4766	2162
24	600	600	110	24.0	610	41.3	1048	14.0	356	31.0	787	6198	2811

Note: Custom schedules, weights, higher pressure ratings and wall thicknesses available upon request. **2.** Pipe wall thickness may reduce the pressure rating in some cases.

3. A dimension will depend on pressure class. **4.** Weights are approximate and may change depending upon pressure class.

Thorburn Series BJUS/BJFS Ball Joint Swivel Pipe Connectors



Alignment Connectors

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



Expansion Arms

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

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

Model	Size	Pressure Rating	Ends	End Material	Specify
BJFS	64	4	BW	S6	-
BJUS BJFS High temperature Graphoil™ seal packing is standard	24 = 1 1/2" (DN40) 32 = 2" (DN50) 40 = 2 1/2" (DN65) 48 = 3" (DN80) 64 = 4" (DN100) 80 = 5" (DN125) 96 = 6" (DN150) 128 = 8" (DN200) 160 = 10" (DN250) 192 = 12" (DN300) 224 = 14" (DN350) 256 = 16" (DN400) 288 = 18" (DN450) 320 = 20" (DN500) 384 = 24" (DN600)		BW = Buttweld SW = Socketweld FL1 = ANSI CL 150 FL2 = ANSI CL 300 FL3 = ANSI CL 400 FL4 = ANSI CL 600 FL5 = ANSI CL 900 FL6 = ANSI CL 1500 FL7 = ANSI CL 2500 FL8 = PN10 FL9 = PN16 FL10 = PN20 FL11 = PN50 FL12 = PN68 FL13 = PN110 FL14 = PN150 FL15 = PN260 FL16 = PN420	Carbon Steel CS = SA105 CSN = SA105N Stainless Steel S6 = SA182 316SS Duplex (2205) DX = SA276 Super Duplex (2507) DXS = SA479	X = Specify Non Standard notes. If none, leave blank

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

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



Hose Assembly Accessories

Thorburn Series HH - High Pressure Hose Hobbles



Thorburn Series HH High-pressure hose hobbles are heavy-duty safety restraint systems engineered to contain and control hoses in the event of a connection or coupling failure. Constructed from high-strength wire cable or chain with rated shackles, hobbles are installed between hose unions or anchor points to absorb energy and prevent dangerous whip-lash during high-pressure pumping, fracturing, cementing, or well-service operations. Designed to meet industry safety standards, they provide a critical layer of protection for personnel, equipment, and surrounding infrastructure in demanding oilfield environments.



2 Bolt Clamp Hose Hobble Design



4 Bolt Clamp Hose Hobble Design

Features

- Energy-absorbing design to control hose movement during coupling failure.
- Corrosion-resistant hardware for durability in harsh oilfield environments.
- Easy installation with standardized shackles, clamps, or attachment points.
- High load-capacity ratings matched to hose size, working pressure, and application.
- Compliance with industry safety practices for pressure-pumping and well service operations.

Applications

- Hydraulic fracturing (fracking) lines and high-pressure treating iron.
- Cementing operations for securing high-pressure discharge hoses.
- Coiled tubing and well stimulation units where pressurized hoses run between equipment.
- Flowback and well-testing packages with high-pressure flowlines and jumper hoses.
- Acidizing operations involving corrosive, high-pressure pumping.
- BOP control, choke & kill, and emergency well-control systems requiring secure hose restraints

Thorburn Series HH - High Pressure Hose Hobbles



Single Ear Design



Double Ear Design



Chain Restraint



Cable Restraint

Specifications

- Minimum breaking strength of 16,000 lbs
- Compliance with API standards
- Available in Sizes 1" to 6"
- Available in 2 bolt or 4 bolt designs
- Available in single ear or double ear
- Attachments are available with cable or chains
- Made of Plated Steel or 316SS

2 Bolt Hose Hobble Design

2 bolt clamps use a pair of heavy-duty clamp plates secured with two high-strength bolts to tightly grip the hose body, creating a secure attachment point for a restraint. The dual-bolt configuration ensures even clamping pressure, prevents slippage under load, and provides a reliable anchor for whip-check safety systems in high-pressure pumping, stimulation, and well-service operations.

4 Bolt Hose Hobble Design

4 bolt clamps use a robust, four-bolt clamping collar that provides maximum grip and load distribution around the hose body, creating a secure attachment point for safety restraints. The expanded bolt pattern increases holding strength, minimizes clamp deformation, and ensures reliable performance under extreme pressure, vibration, and dynamic loading. This design is preferred for larger-diameter or higher-pressure discharge and treating hoses where enhanced stability, safety, and containment are critical.

Single Ear Hose Hobble

A single-ear hose hobble features a streamlined clamp with one reinforced attachment ear, providing a lightweight, easy-to-install restraint point for securing high-pressure hoses. Its simple, low-profile design allows fast installation while maintaining reliable grip and load transfer, making it ideal for smaller-diameter or moderate-pressure hoses where effective safety restraint and reduced clamp bulk are required.

Double Ear Hose Hobble

A double-ear hose hobble incorporates two reinforced attachment ears on the clamp body, providing dual connection points for restraint cables or slings to enhance stability and load distribution. This design offers greater redundancy, improved alignment control, and stronger containment during dynamic pressure events, making it well suited for high-pressure discharge, treating, and jumper hoses where maximum safety and secure hose restraint are essential.

Chain Restraint

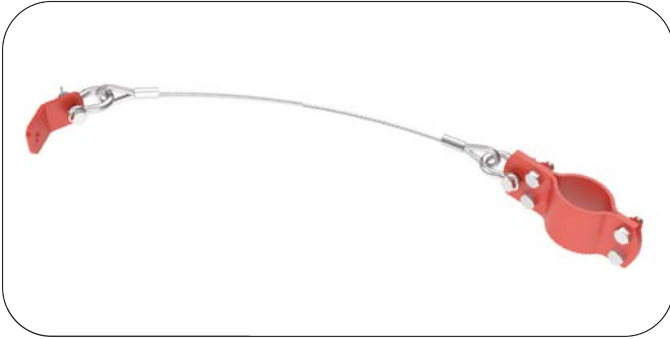
This design conforms easily to different hose diameters, provides excellent slip resistance under dynamic loads, and offers exceptional durability in harsh oilfield environments. Chain-style hobbles are widely used on high-pressure discharge, treating, and flowback hoses where rugged, flexible, and easily inspected restraint is required for maximum safety.

Cable Restraint

The steel alloy cable provides exceptional tensile strength, abrasion resistance, and energy absorption, ensuring reliable containment and whip-control in the event of a coupling failure. This design is ideal for high-pressure discharge, treating, and flowback hoses operating in harsh, abrasive, or corrosive oilfield environments where maximum durability and safety are required.

Thorburn Series HH - High Pressure Hose Hobbles

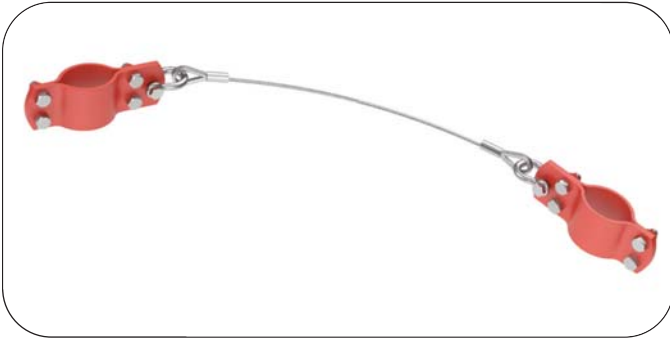
Clamp Configurations



CA-CA: Hobble Clamp to Anchor Plate with Cable



CA-CH: Hobble Clamp to Anchor Plate with Chain



CC-CA: Hobble Clamp to Hobble Clamp with Cable



CC-CH: Hobble Clamp to Hobble Clamp with Chain

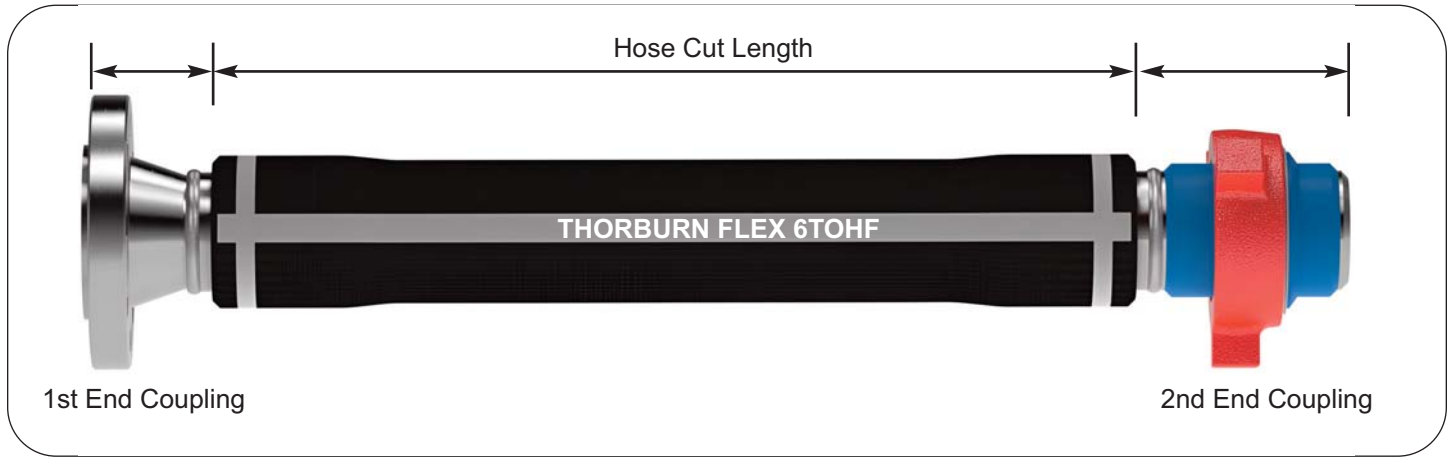
How to Order Thorburn Series HH High Pressure Hose Hobbles

Model	Size	Bolts	Ear	Ends	Material	Option
HH	48	2	SE	CC-CA	S6	LR
	16 = 1 20 = 1 1/4 24 = 1 1/2 32 = 2 40 = 2 1/2 48 = 3 56 = 3 1/2 64 = 4 80 = 5 96 = 6	2 = 2 Bolt 4 = 4 Bolt	SE = Single Ear DE = Double Ear	CA-CA= Clamp & Anchor Plate with Cable CA-CH= Clamp & Anchor Plate with Chain CC-CA = Clamp to Clamp with Cable CC-CH = Clamp to Clamp with Chain	CP = Plated Steel S6 = 316SS	LR = Lifting Ring



Optional Lifting Ring

How to Order Oil Drilling & Exploration Hose Assemblies



Hose Type	Hose Size	Pressure Rating	Tube Material	Cover Material	FSL Level	1st End Coupling	2nd End Coupling	OAL	Accessories
6TOFH	32	10K	U		FSL0	28	12	18288	HH
1TOFH (15) 2TOFH (16) 3TOFH (17) 4TOFH (18) 5TOFH (19) 6TOFH (20) 7TOFH (21) 8TOFH (22) 9TOFH (23) 10TOFH (24) 11TOFH (25) 12TOFH (26) 13TOFH (27) 14TOFH (28) 15TOFH (29) 16TOFH (30) 17TOFH (31)	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"	2K = 2000 PSI 3K = 3000 PSI 5K = 5000 PSI 10K = 10000 PSI 15K = 15000 PSI 20K = 20000 PSI	J = PTFE D = NBR N = HNBR U = UHMW C = Neoprene	Standard Rubber Leave Blank Ball Joint Armor Guard AFCS = Plated Steel AFS4 = 304SS AFS6 = 306SS	FSL0 FSL1 FSL2 FSL3			Overall Length inches Tolerances on length: +\ - 1% For metric length, put (mm) after number	
THORBURN API HAMMER UNIONS 01-Series THU50 Fig. 50 (36) 02-Series THU100 Fig. 100 (36) 03-Series THU101 Fig. 101 (37) 04-Series THU200 Fig. 200 (37) 05-Series THU201 Fig. 201 (38) 06-Series THU206 Fig. 206 (38) 07-Series THU207 Fig. 207 (39) 08-Series THU211 Fig. 211 (39) 09-Series THU300 Fig. 300 (40) 10-Series THU400 Fig. 400 (40) 11-Series THU602 Fig. 602 (41) 12-Series THU1002 Fig. 1002 (41) 13-Series THU1003 Fig. 1003 (42) 14-Series THU1004 Fig. 1004 (42) 15-Series THU1502 Fig. 1502 (43) 16-Series THU2002 Fig. 2002 (43) 17-Series THU2202 Fig. 2202 (44) 18-Series THU6666 Fig. 6666 (44) For detailed ordering of Thorburn API Hammer Unions - See Page 45 THORBURN API FLANGES 19-Series FL6A-6B2K WN 6B 2000 psi (50) 20-Series FL6A-6B2K BL 6B 2000 psi (50) 21-Series FL6A-6B3K WN 6B 3000 psi (51) 22-Series FL6A-6B3K BL 6B 3000 psi (51) 23-Series FL6A-6B5K WN 6B 5000 psi (52) 24-Series FL6A-6B5K BL 6B 5000 psi (52) 25-Series FL6A-6B2K BL 6BX 2000 psi (53) 26-Series FL6A-6BX3K BL 6BX 3000 psi (53) 27-Series FL6A-6BX5K BL 6BX 5000 psi (53) 28-Series FL6A-6BX10K WN 6BX 10000 psi (54) 29-Series FL6A-6BX10K BL 6BX 10000 psi (54) 30-Series FL6A-6BX15K WN 6BX 15000 psi (55) 31-Series FL6A-6BX15K BL 6BX 15000 psi (55) 32-Series FL6A-6BX20K WN 6BX 20000 psi (56) 33-Series FL6A-6BX20K BL 6BX 20000 psi (56) For detailed ordering of Thorburn API Flanges See Page 57 THORBURN API 6A HUB CONNECTORS 34-Series ACH2K Clamp & Hub 2000psi (61) 35-Series ACH3K Clamp & Hub 3000psi (61) 36-Series ACH5K Clamp & Hub 5000psi (61) 37-Series ACH10K Clamp & Hub 10000psi (62) 38-Series ACH15K Clamp & Hub 15000psi (62) 39-Series ACH20K Clamp & Hub 20000psi (62) For detailed ordering of Thorburn API Hub Connectors See Page 65									
Hose Assembly Accessories HH = Hose Hobble (76) None = Leave Blank For detailed ordering of Thorburn Hose Hobbles - See Page 78									



Technical Data

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 ($^{\circ}\text{C} \times (9/5) + 32 = ^{\circ}\text{F}$) | Fahrenheit to Celsius: ($(^{\circ}\text{F} - 32) \times (5/9) = ^{\circ}\text{C}$)

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	984.3	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	0.01103	11.03
1.8	49.82	3.665	1266	93.09	0.1266	0.1241	124.1	12410	0.01241	12.41
2.0	55.36	4.072	1406	103.4	0.1406	0.1379	137.9	13790	0.01379	13.79
2.2	60.90	4.479	1547	113.8	0.1547	0.1517	151.7	15170	0.01517	15.17
2.4	66.43	4.886	1687	124.1	0.1687	0.1655	165.5	16550	0.01655	16.55
2.6	71.97	5.294	1828	134.5	0.1828	0.1793	179.3	17930	0.01793	17.93
2.8	77.51	5.701	1969	144.8	0.1968	0.1930	193.0	19300	0.01930	19.30
3.0	83.04	6.108	2109	155.1	0.2109	0.2068	203.8	20680	0.02068	20.68
3.2	88.58	6.515	2250	165.5	0.2250	0.2206	220.6	22060	0.02206	22.06
3.4	94.11	6.922	2390	175.8	0.2390	0.2344	234.4	23440	0.02344	23.44
3.6	99.65	7.330	2531	186.2	0.2531	0.2482	248.2	24820	0.02482	24.82
3.8	105.2	7.737	2672	196.5	0.2672	0.2620	262.0	26200	0.02620	26.20
4.0	110.7	8.144	2812	206.9	0.2812	0.2758	275.8	27580	0.02758	27.58
4.2	116.3	8.551	2953	217.2	0.2953	0.2896	289.6	28960	0.02896	28.96
4.4	121.8	8.958	3094	227.5	0.3094	0.3034	303.4	30338	0.03034	30.34
4.6	127.3	9.366	3234	237.9	0.3234	0.3172	317.2	31720	0.03172	31.72
4.8	132.9	9.773	3375	248.2	0.3375	0.3310	331.0	33100	0.03310	33.10
5.0	138.4	10.18	3515	258.6	0.3515	0.3447	344.7	34470	0.03447	34.47
5.2	143.9	10.59	3656	268.9	0.3656	0.3585	358.5	35850	0.03585	35.85
5.4	149.5	10.99	3797	279.3	0.3797	0.3723	372.3	37230	0.03723	37.23
5.6	155.0	11.40	3937	289.6	0.3937	0.3861	386.1	38610	0.03861	38.61
5.8	160.5	11.81	4078	299.9	0.4078	0.3999	399.9	39990	0.03999	39.99
6.0	166.1	12.22	4218	310.3	0.4218	0.4137	413.7	41370	0.04137	41.37
6.2	171.6	12.62	4359	320.6	0.4359	0.4275	427.5	42750	0.04275	42.75
6.4	177.2	13.03	4500	331.0	0.4500	0.4413	441.3	44130	0.04413	44.13
6.6	182.7	13.44	4640	341.3	0.4640	0.4550	455.0	45500	0.04550	45.50
6.8	188.2	13.84	4781	351.7	0.4781	0.4688	468.8	46880	0.04688	46.88
7.0	193.8	14.25	4922	362.0	0.4921	0.4826	482.6	48260	0.04826	48.26
7.2	199.3	14.66	5062	372.3	0.5062	0.4964	496.4	49640	0.04964	49.64
7.4	204.8	15.07	5203	382.7	0.5203	0.5102	510.2	51020	0.05102	51.02
7.6	210.4	15.47	5343	393.0	0.5343	0.5240	524.0	52400	0.05240	52.40
7.8	215.9	15.88	5484	403.4	0.5484	0.5378	537.8	53780	0.05378	53.78
8.0	221.4	16.29	5625	413.7	0.5625	0.5516	551.6	55160	0.05516	55.16
8.2	227.0	16.70	5765	424.1	0.5765	0.5654	565.4	56540	0.05654	56.54
8.4	232.5	17.10	5906	434.4	0.5906	0.5792	579.2	57920	0.05792	57.92
8.6	238.0	17.51	6047	444.7	0.6046	0.5929	592.9	59290	0.05929	59.29
8.8	243.6	17.92	6187	455.1	0.6187	0.6067	606.7	60670	0.06067	60.67
9.0	249.1	18.32	6328	465.4	0.6328	0.6205	620.5	62050	0.06205	62.05
10.0	276.8	20.36	7031	517.1	0.7031	0.6895	689.5	68950	0.06895	68.95
11.0	304.5	22.40	7734	568.9	0.7734	0.7584	758.4	75840	0.07584	75.84
12.0	332.2	24.43	8437	620.6	0.8437	0.8274	827.4	82740	0.08274	82.74
13.0	359.8	26.47	9140	672.3	0.9140	0.8963	896.3	89630	0.08963	89.63
14.0	387.5	28.50	9843	724.0	0.9843	0.9652	965.2	96520	0.09652	96.52
15.0	415.2	30.54	10550	775.7	1.0550	1.0340	1034.0	103400	0.10340	103.40
16.0	442.9	32.58	11250	827.4	1.1250	1.1030	1103.0	110300	0.11030	110.30
17.0	470.6	34.61	11950	879.1	1.1950	1.1720	1172.0	117200	0.11720	117.20
18.0	498.2	36.65	12660	930.6	1.2650	1.2410	1241.0	124100	0.12410	124.10
19.0	525.9	36.68	13360	982.6	1.3360	1.3100	1310.0	131000	0.13100	131.00
20.0	553.6	40.72	14060	1034.0	1.4060	1.3790	1379.0	137900	0.13790	137.90
21.0	581.3	42.76	14770	1086.0	1.4760	1.4480	1448.0	144800	0.14480	144.80
22.0	609.0	44.79	15470	1138.0	1.5470	1.5170	1517.0	151700	0.15170	151.70
23.0	636.7	46.83	16170	1189.0	1.6170	1.5860	1586.0	158600	0.15860	158.60
24.0	664.3	48.86	16870	1241.0	1.6870	1.6550	1655.0	165500	0.16550	165.50
25.0	692.0	50.90	17580	1293.0	1.7580	1.7240	1724.0	172400	0.17240	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
	m³/h	1.699	100 CFM x 1.699 = 169.9 m³/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
	m³/h	0.06	100 l/min x 0.06 = 6 m³/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
	m³/h	3.6	10 l/s x 3.6 = 36 m³/h
m³/h (Cubic Meter / Hour)	CFM	0.5885	10 m³/h x 0.5885 = 5.885 CFM
	l/min	16.667	10 m³/h x 16.667 = 166.7 l/min
	l/s	0.2777	10 m³/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
ft³ (Cubic Foot)	gl UK	6.228	10 ft³ x 6.228 = 62.28 gl UK
	gl US	7.48	10 ft³ x 7.48 = 74.8 gl US
	l	28.32	10 ft³ x 28.32 = 283.2 l
	m³	0.0283	10 ft³ x 0.0283 = 0.283 m³
gl UK (Gallon UK)	ft³	0.1605	10 gl UK x 0.1605 = 1.605 ft³
	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
	m³	0.0045	10 gl UK x 0.0045 = 0.045 m³
gl US (Gallon US)	ft³	0.1336	10 gl US x 0.1336 = 1.336 ft³
	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
	m³	0.0037	10 gl US x 0.0037 = 0.037 m³
l (Liter)	ft³	0.0353	100 l x 0.0353 = 3.53 ft³
	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
	m³	0.001	100 l x 0.001 = 0.1 m³
m³ (Cubic meter)	ft³	35.3	10 m³ x 35.3 = 353 ft³
	gl UK	219.96	10 m³ x 219.96 = 2199.6 gl UK
	gl US	264.17	10 m³ x 264.17 = 2641 gl US
	l	1000	10 m³ 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	$^{\circ}\text{F} = (^{\circ}\text{C} \times (9/5)) + 32$	$(10^{\circ}\text{C} \times (9/5)) + 32 = 50^{\circ}\text{F}$
	K	$\text{K} = ^{\circ}\text{C} + 273.15$	$10^{\circ}\text{C} + 273.15 = 283.15 \text{ K}$
	°R	$^{\circ}\text{R} = (^{\circ}\text{C} \times (9/5)) + 491.67$	$(10^{\circ}\text{C} \times (9/5)) + 491.67 = 509.67^{\circ}\text{R}$
°F (Fahrenheit)	°C	$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times (5/9)$	$(10^{\circ}\text{F} - 32) \times (5/9) = -12.22^{\circ}\text{C}$
	K	$\text{K} = (^{\circ}\text{F} + 459.67) \times (5/9)$	$(10^{\circ}\text{F} + 459.67) \times (5/9) = 260.93 \text{ K}$
	°R	$^{\circ}\text{R} = ^{\circ}\text{F} + 459.67$	$10^{\circ}\text{F} + 459.67 = 469.67^{\circ}\text{R}$
°K (Kelvin)	°C	$^{\circ}\text{C} = \text{K} - 273.15$	$10\text{K} - 273.15 = -263.15^{\circ}\text{C}$
	°F	$^{\circ}\text{F} = (\text{K} \times (9/5)) - 459.67$	$(10\text{K} \times (9/5)) - 459.67 = -441.67^{\circ}\text{F}$
	°R	$^{\circ}\text{R} = \text{K} \times (9/5)$	$10\text{K} \times (9/5) = 18^{\circ}\text{R}$
°R (Rankine)	°C	$^{\circ}\text{C} = (^{\circ}\text{R} - 491.67) \times (5/9)$	$(10^{\circ}\text{R} - 491.67) \times (5/9) = -267.59^{\circ}\text{C}$
	°F	$^{\circ}\text{F} = ^{\circ}\text{R} - 459.67$	$10^{\circ}\text{R} - 459.67 = -449.67^{\circ}\text{F}$
	K	$\text{K} = ^{\circ}\text{R} \times (5/9)$	$10^{\circ}\text{R} \times (5/9) = 5.6 \text{ K}$

Velocity of Fluid Flow Through Hose

V	GPM	d	Calculation
Velocity	Gallons per Minute	Inside Diameter of Hose	$V = 0.408 \times \text{GPM} / d^2$

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:

Angle of bend x $2\pi r$ = minimum length of hose

360° to make bend

$\pi = 3.14$

r = given radius of hose

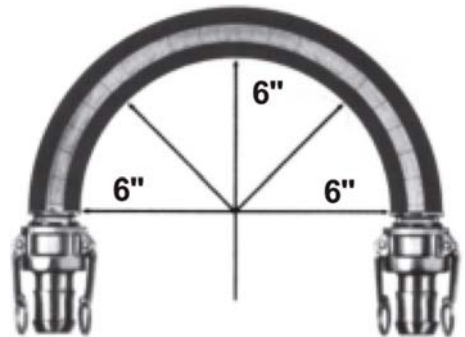
Example: to make a 180° bend with Thorburn hose which has a 2" I.D.

Given $r = 6"$

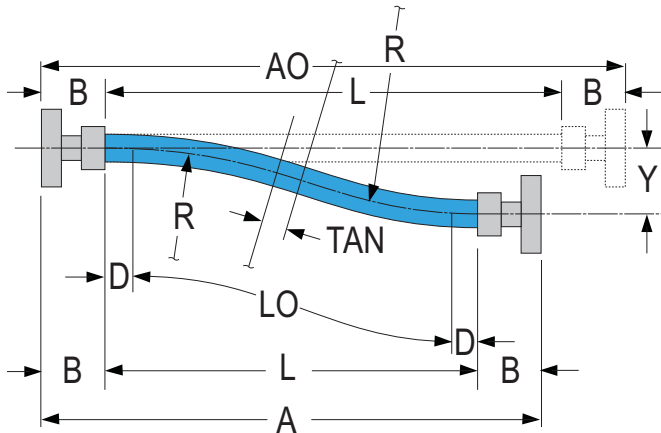
$$\frac{180^\circ}{360^\circ} [2 \times 3.14 \times 6] = .5 \times 2 \times 3.14 \times 6 = 18.84"$$

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



$$A = L + 2*B$$

$$L = L0 + 2*D$$

$$L0 = 2*Rs*acos((Rs-Y)/2*Rs)$$

See table below for sample calculated value of L0

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):

$$Y = 0.5 * Rs$$

AO = 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 ($R \geq Rs$)

Rs = Minimum static bend radius for hose

Y = Lateral offset of the installation

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
	L0= 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

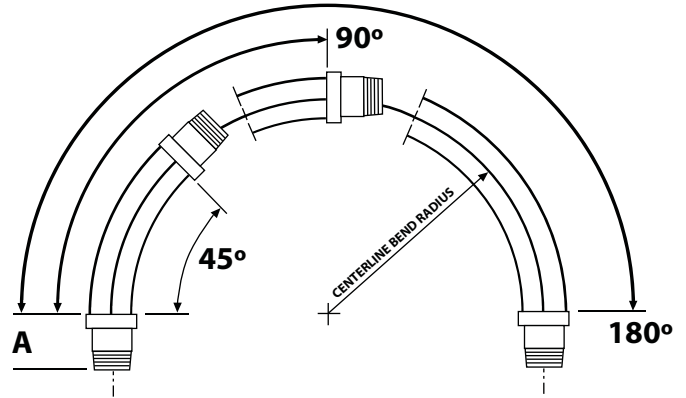
Hose Assembly Minimum Length

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.

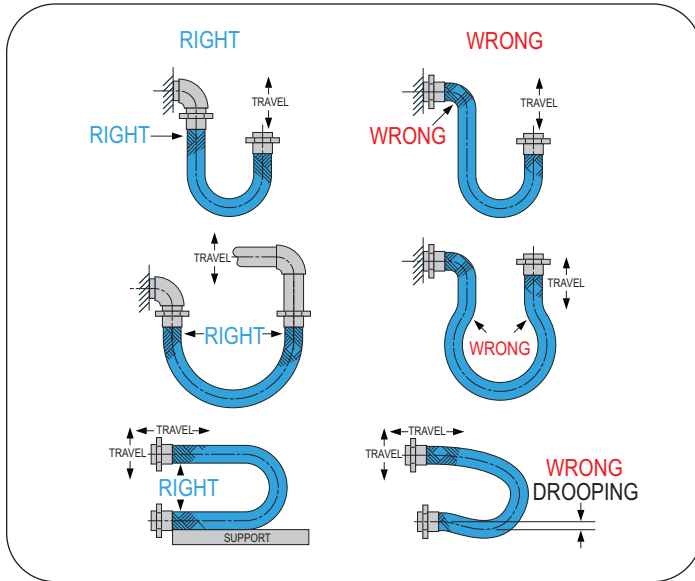


Centerline Bend Radius (in)	Minimum Live Length (in)		
	45°	90°	180°
1	1	2	4
2	2	3 1/2	7
3	2 1/2	5	10
4	3 1/2	6 1/2	13
5	4	8	16
6	5	10	20
7	5 1/2	11	22
8	6 1/2	13	26
9	7 1/2	14 1/2	29
10	8	16	32
11	9	18	36
12	10	19 1/2	39
13	10 1/2	21	42
14	11 1/2	22 1/2	45
15	12	24	48
16	13	26	52
17	13 1/2	27	54
18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

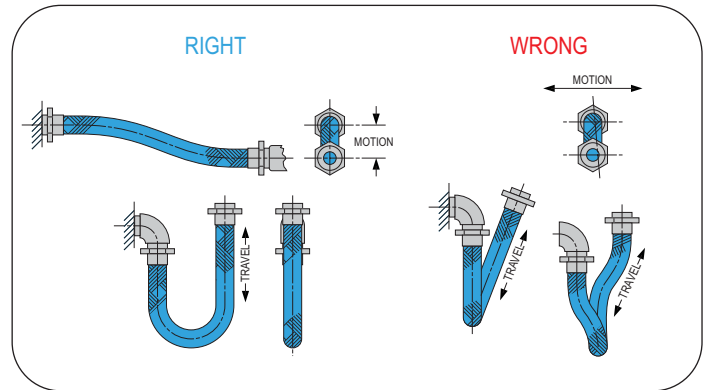


Avoid Overbending

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 installing hose in areas where they may be subjected to corrosive sprays, spills, etc.



Avoid Torque

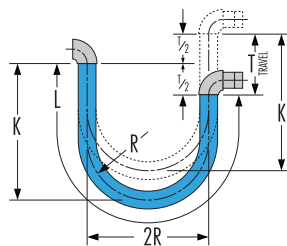
Torquing or twisting a Thorburn hose reduces service life substantially. When installing a hose, it is important that all movement originates in the same plane as the center line. Another precaution against torque is the use of a floating flange or union on one end of the assembly.

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

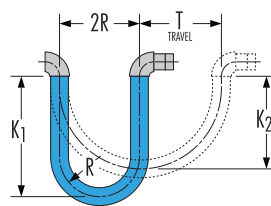
Class "A" Traveling Loops For Maximum Vertical Travel



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

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

Class "B" Traveling Loops For Short Horizontal Travel

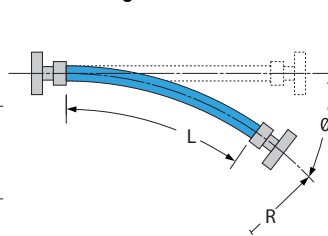


$$L = 4R + 1.57T$$

$$K_1 = 1.43R + 0.785T$$

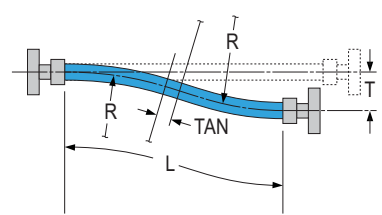
$$K_2 = 1.43R + 0.5T$$

Angular Motion



$$L = \frac{\pi R \theta}{180} + 25$$

Offset Motion



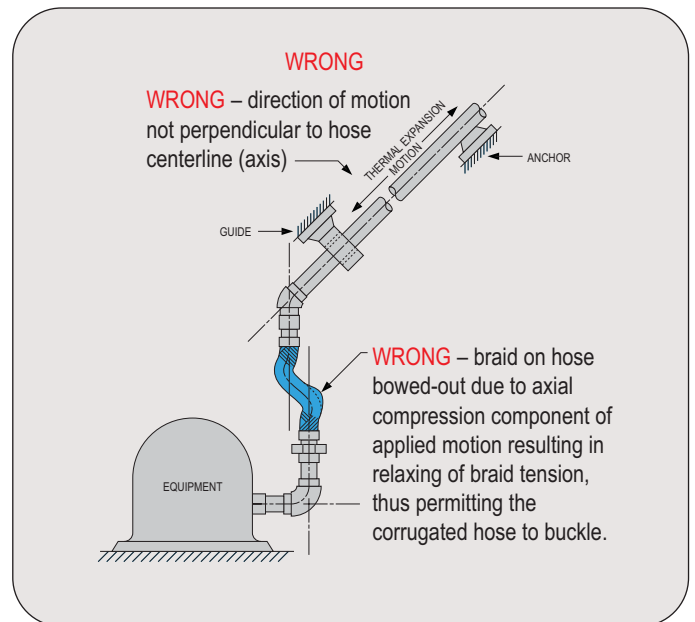
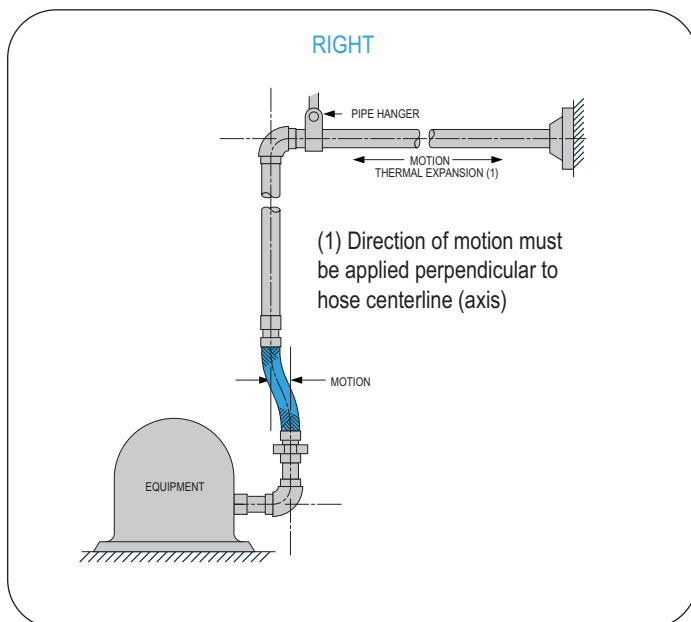
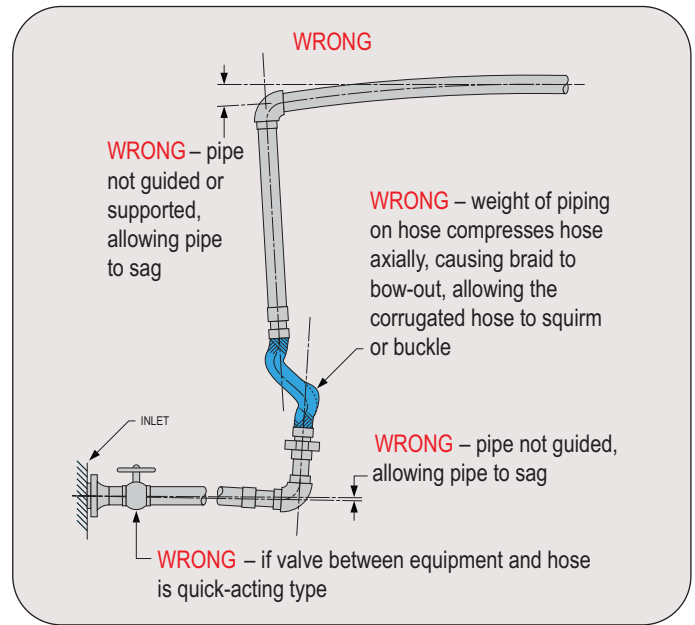
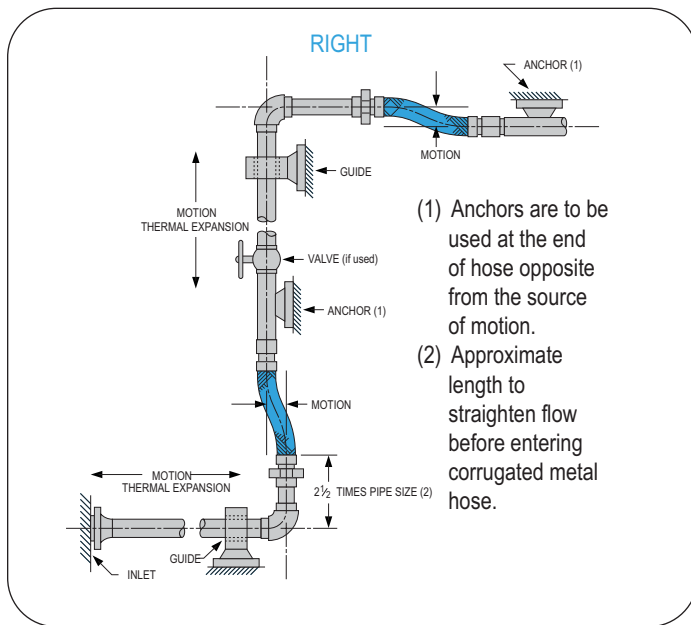
$$L = \sqrt{20RT}$$

Pipe Anchoring Guide

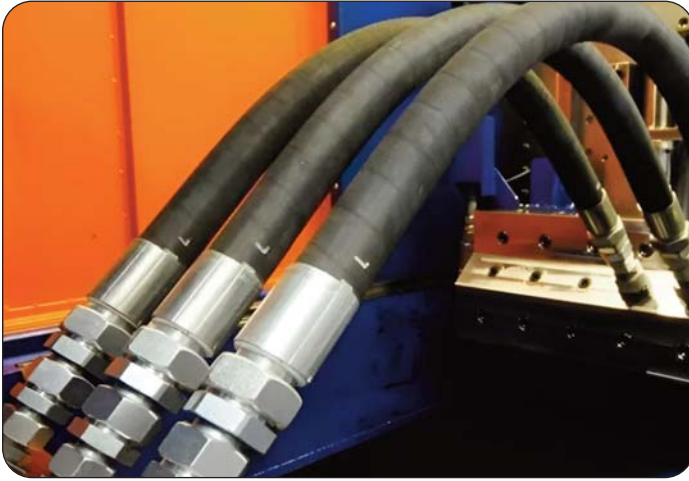
A piping system which utilizes Thorburn flexible hose assemblies to absorb pipe movement must be properly anchored and guided to assure correct functioning and maximum service life of the hose. The basic principles to be observed are:

- 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.



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 most 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

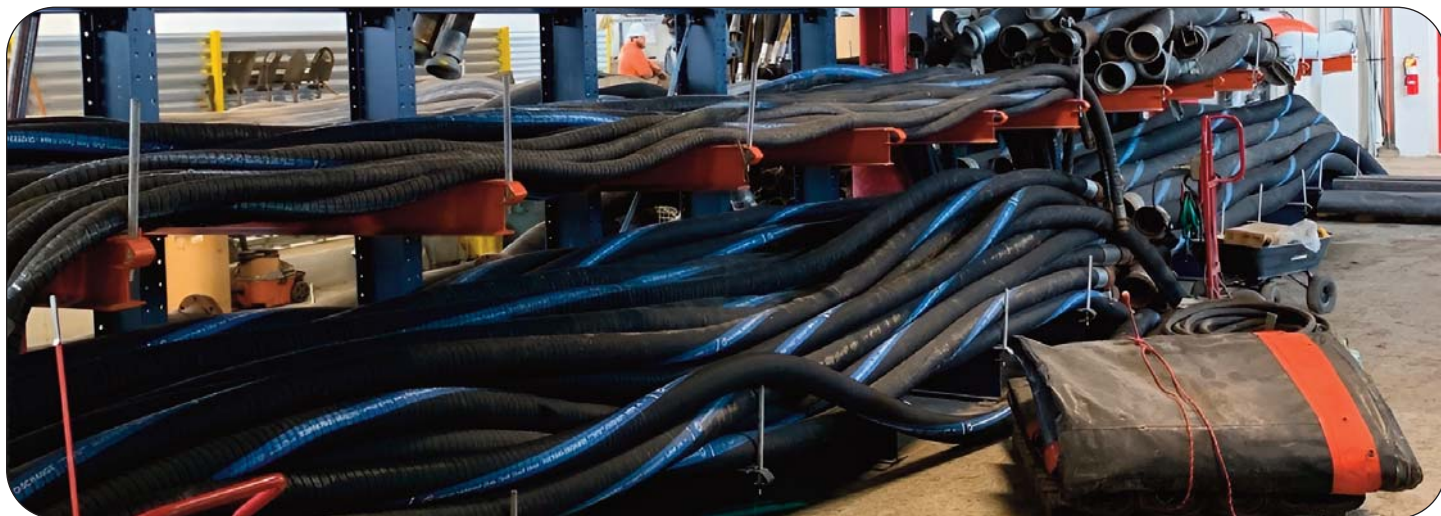
Any cuts, gouges or tears in the cover which do not expose the reinforcement should be repaired before the hose is returned to service. If the reinforcement is exposed, retire the hose from service. Covers may show surface cracking or crazing due to prolonged exposure to sunlight, ozone, or high temperature 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.

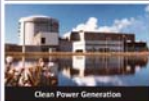
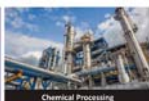
To avoid the effects of high ozone concentration, rubber hose products should not be stored near electrical equipment that may generate ozone or be stored for any lengthy period in geographical areas of known high ozone concentration. Exposure to direct or reflected sunlight — even through windows —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



CHEMICAL TRANSFER HOSE ASSEMBLIES



Chemical Hose Assemblies Catalog

Thorburn's premium rubber chemical suction and discharge hose assemblies are purpose-built for full vacuum and high-pressure transfer service for the most demanding chemical, petrochemical, and industrial environments. Lightweight yet exceptionally durable and flexible, each hose assembly features advanced liner technologies — UHMWPE, XLPE, PTFE, FEP, EPDM, CSM, and FKM — delivering outstanding resistance to hundreds of aggressive chemicals and solvents, including acids, alkalis, aromatic and chlorinated hydrocarbons. Our chemical hose assemblies are equipped with Thorburn's proprietary Thor-Crimp™ 360° crimped fitting system for a secure, leak-free connection.

Applicable Standards:

- ASME B31.1, B31.3
- EN 12115
- BS 5842
- CSA B51
- ISO 10380
- ASTM D380
- NAHAD 400/2020
- CRN Registered (upon request)

Applications



Mining, Quarries
& Dewatering



Material
Processing



Petro-Chemical
Processing



Clean Power
Generation



OIL & GAS TRANSFER HOSE ASSEMBLIES



Oil & Gas Transfer Hose Assemblies

Thorburn Flex engineers and manufactures high-performance hose assemblies for the safe transfer of petroleum products and drilling fluids across upstream, midstream, and downstream oil and gas operations. Designed for reliability in the world's most demanding environments, Thorburn hose systems combine advanced materials, precision manufacturing, and rigorous testing to deliver exceptional safety, durability, and operational performance. All assemblies are produced under ISO 9001 quality systems and engineered to meet recognized international standards including ASME B31.1, B31.3, ISO 10380, NACE MR0175 / ISO 15156, CSA B51, and PED, ensuring dependable performance in critical applications such as drilling, fracking, marine transfer, fuel terminals, and bulk petroleum handling.

Applications



Mining, Quarries
& Dewatering



Material
Processing



Chemical
Processing



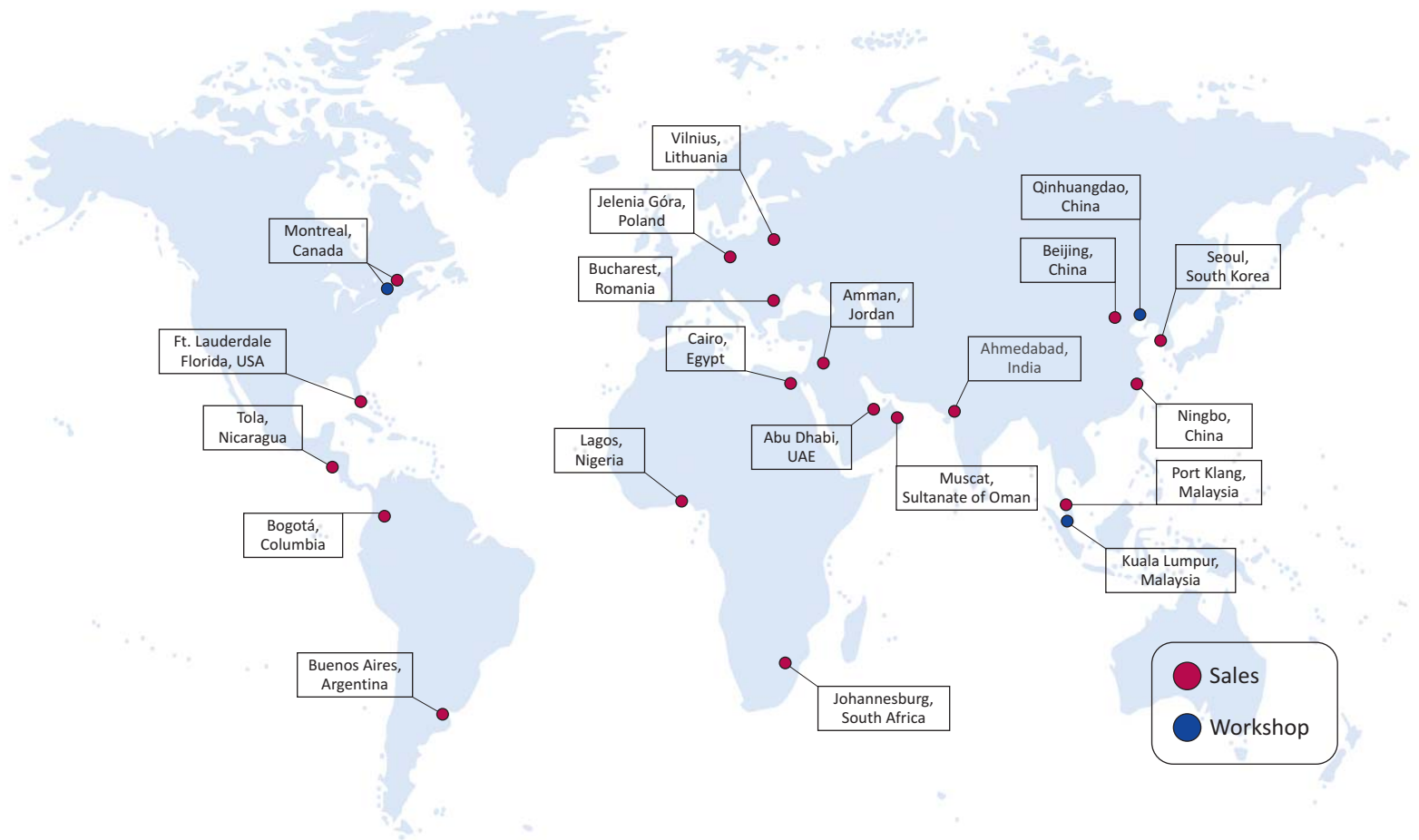
Clean Power
Generation

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