ThorburnFlex

Custom Hose Assemblies

Coupling Systems

Wire Reinforced Flexpipe

# MINING & SMELTING

## Engineered Solutions For Pipe Motion

Canada

www.thorburnflex.com

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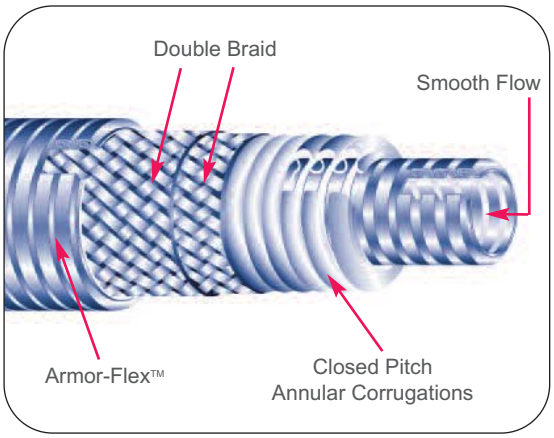
# Oxylance™ Oxygen Lance Hose Assemblies

### Thorburn's Oxylance™ Series M - Oxygen Lance Hose

Thorburn manufactures metallic oxygen lance hose assemblies for the critical transfer of oxygen to the basic oxygen furnace (BOF) providing temperature resistance up to 815°C without deterioration, zero leakage and complete oxygen compatibility.




Metallic oxygen lance hose cross-section

## Applications

- Withstands external combustion
- Leak proof under pressure & vacuum service
- Withstands temperatures up to 815°C
- Cleaned & degreased for oxygen transfer service
- Smooth flow, reduces pressure loss
- No age hardening, no shelf life limitations
- Longer cycle life than a rubber hose assembly

# Thorburn's Custom Metallic Hose Assemblies

Thorburn's stainless steel metallic hose assemblies with O-Seal, 37° & buttweld fitting to end joints

**Hose material:** Core SA 240 Type 321, 316 Braid A580 Type 304
**Fitting material:** Forged SA 105, SA 182
**Dimensions as per:** ASTM B16.11, BS3799 & ISO Standards
**Seamless pipe as per:** SA 106 Type B, ASME SA 312
**Welding procedures as per:** ASME Section IX

### Isolates Thermal & Mechanical Movement

Thorburn's metallic hose assemblies are specifically designed to isolate lateral deflection stress, piping misalignment and provide for bends to simplify installation while remaining liquid and gas tight.

Thorburn's metallic hose assemblies with rigid pipe assemblies and Thorburn's Fry-Sil insulation jacketing

# Custom Insulated Furnace Door Hose Assemblies

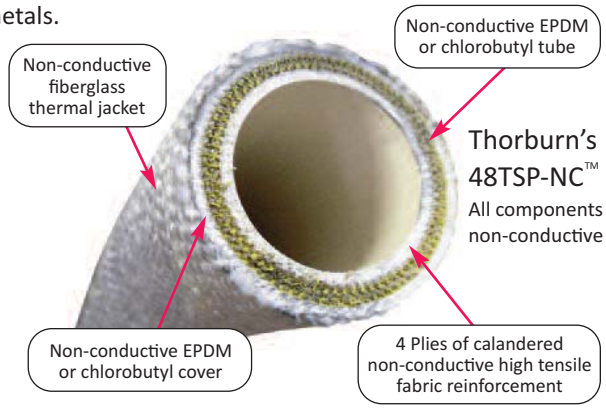
Conductive & non-conductive furnace door hose assemblies with crimped ends & available with stainless steel braid.

### 48TSP™ Conductive & 48TSP-NC™ Non-Conductive Hose

Designed for service in steel mills, arc furnaces and all types of operations where the hose assembly must be resistant to heat radiation, open flame and splashes of white-hot metals and temperatures up to 1000°C. Thorburn's 48TSP™/48TSP-NC™ provides flexing and heat resistance to open flame and splashes of white-hot metals.

## Applications

- Roof cooling
- Furnace door
- Side panel
- Water supply
- Gas injection
- Hydraulic



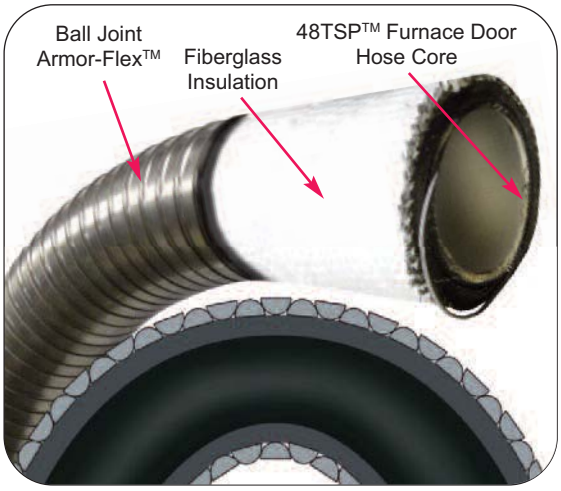

# Fry-Sil Fire Jacket & Fire Tape

Thorburn's FJ72™ Fry-Sil Fire Jacket & FJ73™ Fire Tape withstands molten splash up to 800ºC and ambient heat and up to 300ºC of direct continuous heat

Thorburn's FJ72™ Fry-Sil Fire Jacket & FJ73™ Fire Tape is ideal for protection against high exterior ambient heat in flexible piping applications. Thorburn's Fire jacket & tape are made from woven fiberglass insulation and 100% iron oxide silicone rubber. and slips on easily and expands over fittings and connectors.

Thorburn's Dielectric 48TSP-NC™ intregal rubber flanged connector system with Thorburn's FJ72™ Fry-Sil Fire Jacket

# Thorburn's Armor-Flex™ Protection For 48TSP™ Hose Assemblies




Thorburn's Armor-Flex™ is not interlocking which does not reduce the 48TSP's flexibilty or bend radius

### Ball Joint Armor-Flex™

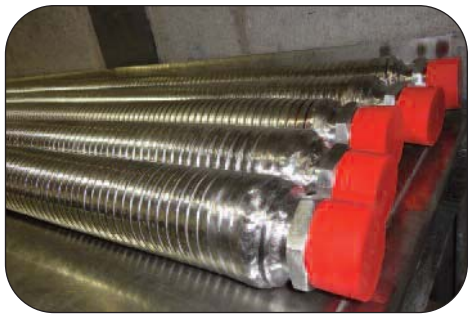
Ball Joint Armor-Flex™ hose assemblies are tested in a combustible environment at 1100°C

**Armor-Flex™ operates in...**

- Extreme heat
- Abrasion
- Molten splash

## Advantages

- Unlimited flex life
- Minimum force to flex
- Kink resistant
- Available in steel, stainless steel & inconel



Thorburn's 48TSP™ hose assemblies externally protected withThorburn's ball joint Armor-Flex™

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# Thorburn's Potflex™ Hose Assemblies

Over 30,000 Potflex™ hose assemblies in service

PotFlex™ is completely non-conductive making it a perfect electrical insulator

### Potroom Dielectric Compressed Air Flexible Piping Systems

Thorburn's PotFlex™ technology was specifically developed for the aluminum smelting industry's need for a superior alternative to traditional rubber & nylon compressed air dielectric flexible piping. PotFlex™ is the flexible component used to transfer compressed air to the pneumatic control valves to the crust breaker/feeder cylinders. Potflex™ is used in pneumatic control, main exhaust, main feed, feeder & crust breaker lines and general potroom hook-up lines.

## Advantages

- Reduces stress in the piping system
- Absorbs and dampens vibration
- Compensates for misalignment, thermal expansion & contraction
- Simplifies component installation or servicing
- PTFE tube will not dry out like rubber

# THORFLEX™ Polypropylene & PTFE Composite Hose Assemblies

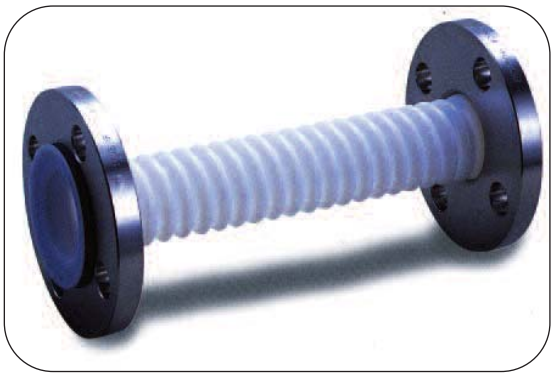
### Flexible & Lightweight for Ease of Handling

Specifically designed for service with a large variety of industrial petrochemicals in use today. Chemical resistance is achieved by the use of 6 seamless polypropylene tubes incorporated in the body of each hose. The seamless tubes eliminate any potential leak paths but does not sacrifice flexibility, durability or safety in any way.

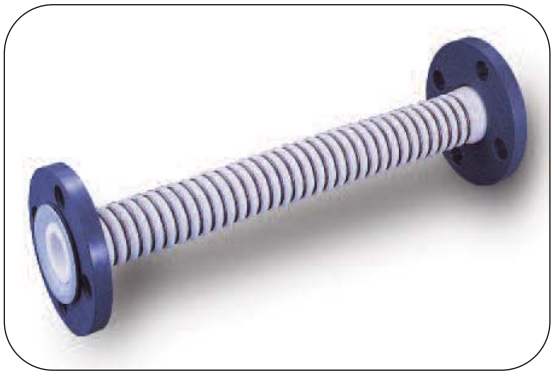
## Advantages

- Light and easy to handle
- Extremely low temperature flexing
- Double end-to-end electrical continuity
- Resists dragging wear and abrasion
- Complies with Canadian Coast Guard Specifications
  US Coast Guard regulations: 33CFR Sections 154.500 & 154.810
  British Standard BS5842 (1980)

# TEF-FLEX™ Corrugated PTFE Hose Assemblies



**559T -** For aerospace material specifications without wire



**559TW -** External root reinforcement wire to increase tight radius bending stability

### 559T/559TW TEF-FLEX™ Hose Assemblies

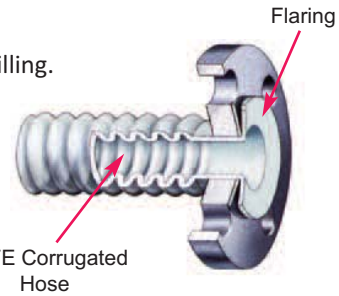
Thorburn's 559T Tef-Flex™ hose assemblies offer the flexibility and universal corrosion resistance of PTFE. Thorburn's 559T are used as a flexible element to transfer corrosive media in process reactors and vessels. They are available with external root wire made of 316SS material to increase tight radius bending stability (559TW). Available with polypropylene, Kynar and SS304 braid for higher pressure applications. CRN available upon request.

## Applications

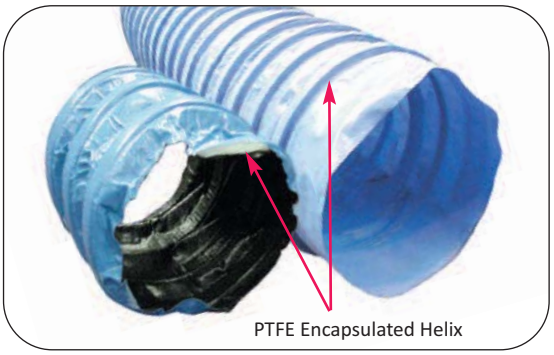
- Unmatched corrosive resistance capabilities
- Non-stick, self-cleaning & low coefficient of friction
- Meets pharmacopoeia class VI & 3A standards
- Ultra flexible & resistant to temperature fluctuations
- Properties do not change over time
- Made of pure PTFE material with no pigments

### Vanstone Floating Flanges

Providing only PTFE contact with media.
Standard flanges 316SS material 150 lbs drilling.
Available in Vinyl Ester Fiberglass (VEF) composite type.




# Thorburn's Bootflex™ Flue Gas Seal Membranes

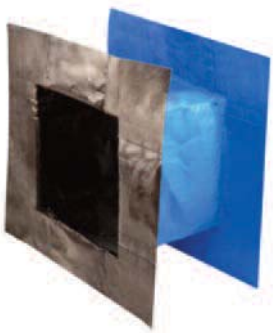



### Corrosion-Resistant PTFE Flexible Ducting Systems

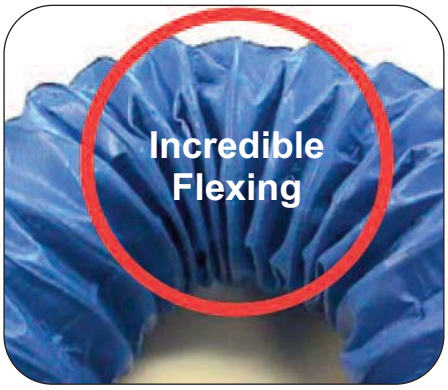
Thorburn's Bootflex™ is a strong laminated PTFE seal that encapsulates a stainless steel or PTFE coil (for extremely corrosive applications), which joins together two PTFE multi-directional flame retardant linings. Thorburn's Bootflex™ is used in applications which require a high degree of inflammability and corrosion resistance. Thorburn's Bootflex™ PTFE multi-directional lining is impervious to most chemicals.

## Advantages

- Stand alone temperature of -73°C to 315°C
- Pressure ± 1300mm (50") H2O
- Flame retardant & non-flammable
- Sizes range from 25mm (1") to 760mm (30")
- Meets factory mutual test 4910, for evaluating flame, smoke & corrosion parameters of clean room materials.
- Made of 100% PTFE making it virtually chemically inert



BootFlex™ rectangular flange assembly



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# Thorburn's Rigid Piping Assemblies

Thorburn Malaysia rigid pipe final assembly before packaging

## Carbon & Stainless Steel Rigid Piping Systems

Thorburn's Malaysian factory manufactured all the rigid pipe spools and fittings for Koniambo nickel smelter in New Caledonia.

**Fitting Material:**
Forged SA 105, SA 182,

**Dimensions as per:**
ASTM B 16.11, BS3799 & ISO Standards

**Seamless Pipe as per:**
SA 106 Type B, ASME SA 312

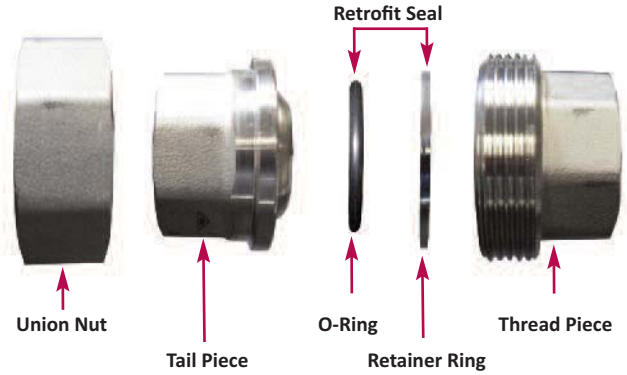
**Welding Procedures as per:**
ASME Section IX

3000 lb union pipe assembly with retrofit seals

# Thorburn's Retrofit Seals™ Stop Leaking Unions

Thorburn Retrofit Seals™ are specifically designed to solve union leak problems caused by sealing surfaces that are pitted, scratched or rusted by changing the metal-to-metal seal to a reinforced O-Ring seal (like a hydraulic fitting).

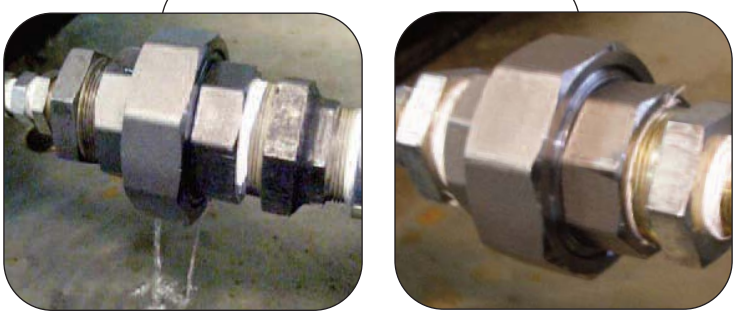
Thorburn's Retrofit O-Ring & Retainer Ring Seals stop leaking unions




## Features & Benefits

- Fits MSSPC-83, 3000 lbs (200 bar), 300 lbs (20 bar), 150 lbs/10 bar unions.
- Retainer ring plated steel or 316SS
- O-Ring material BUNA N, fluorocarbon

**Leak Tight Sealing**



When metal sealing surfaces are rusted, pitted or scratched, a leak tight seal cannot be achieved. Install Thorburn's Retrofit Seal, hand tighten the union and it will provide a leak tight seal up to 200 bar (3000 psi)

# Thorburn's O-Seal Unions

Thorburn O-Seal Unions are recommended where piping requirements dictate the necessity of having a flat face seat to make and break the pipeline or when leaky metal-to-metal seat unions are unacceptable.


O-Seal Unions Sealing is not contingent upon the quality of the metal surfaces. The O-Ring seal can accommodate metal surfaces that are rusted, pitted, dented or scratched, and won't leak!


Standard unions leak tight integrity is contingent upon the quality of the metal-to-metal sealing surfaces. When metal sealing surfaces become rusted, pitted, dented or scratched, they leak...


Thorburn O-Seal Unions are easy to connect & disconnect and will provide continuous leak tight integrity


Thorburn O-Seal Unions are the ideal union choice where long term leak tight sealing is desired without retightening!

### Model TOS - Leak tight sealing every time

Thorburn O-Seal Unions are recommended where piping requirements dictate the necessity of having a flat face seat to make and break the pipeline or when leaky metal-to-metal seat unions are unacceptable.

## Features & Benefits

- Materials: SA 105 Carbon Steel, SA 182 Type 316. Option SA 350LF2, Hastelloy, Inconel
- ASME B31.1, B31.3 & ANSI B16.11 forged steel fittings
- Never needs retightening, no maintenance
- Won't vibrate loose even under extreme vibration or pressure surges
- Unlimited brake/remake
- Hand tight pressures to 200 bar
- Flat face construction, easy slip in & out
- 3000, 6000 & 9000 psi ratings available
- Ideal union to seal oxygen, nitrogen and other gases (contact Thorburn for details)

## O-Seal Options

- Hammer lug nut for fast make and break
- Dielectric-insulating unions - The most effective method of preventing electrolytic deterioration

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# Thorburn Socket Weld Cam-Lock Quick Coupling System

**Connects/Disconnects in Seconds & Eliminates Hose Replacement Site Welding**

## Thorburn's Quick Coupling System Solution

**Model 733 DSW (Female) & 633 FSW (Male)**

The Pyrometallurgical process typically have water cooling hose assemblies which are found in the side wall and roof casing. The hose assemblies are connected to the casing using a ball type socket weld union system conforming to MSS SP 83 2006 3000lbs. When a hose assembly requires replacement, the assembly is removed by disassembling the union so that the socket weld portion of the union remains on the casing. The new hose assembly is then threaded on to the socket weld end that is on the casing.

Thorburn's Model 733 DSW Female Socket Weld Cam-Lock Quick Coupling End with Guard-Lok™ Safety Locking Mechanism & Model 633 FSW Male Socket Weld Cam-Lock Quick Coupling End

The problem occurs when the socket weld threads and the swivel union nut threads are not compatible. This requires the removal of the socket weld portion of the union from the casing through a laborious gauging process, rewelding a new socket weld union end followed by a non-destructive examination (NDE). This procedure is time consuming and costly to the operator.

MSS SP 83 2006 3000 lbs thread incompatibility leads to time consuming and costly hose assembly changeouts

Thorburn's Model 48TSP-NC Furnace Door Hose Assembly with FJ72 Fry-Sil Fire Jacket and Thorburn's Socket Weld Cam-Lock Coupling System with Guard-Lok™ Safety Mechanism

Furthermore, the MSS SP 83 2006 3000lbs standard does not require a uniform thread profile. Therefore the threads are different from one manufacturer to another and the threads can also be different from batch to batch from the same manufacturer.

## Thorburn's Solution

Installing Thorburn's water cooling hose assemblies with socket weld male (633 FSW) or female (733 DSW) Cam-Lock quick couplings allows the hose assembly to be connected or disconnected from the roof or side wall casing in seconds and eliminates time consuming and costly hose replacement site welding.

Thorburn's socket weld Cam-Lock style quick coupling system makes changeouts quick and easy

Thorburn's socket weld Cam-Lock Series quick couplings provides an alternative welding method to attach Thorburn's Cam-Lock couplings to a pipe. Thorburn's socket weld Cam-Locks are manufactured to the MIL-C27487 specifications which allows for complete interchangeability.

Typical water cooling sidewall hose assembly installation in a Pyrometallurgical nickel smelter with MSS SP 83 2006 3000 lbs socket weld unions

# Thorburn Butt Weld Cam-Lock Quick Coupling System

**Connects/Disconnects in Seconds & Eliminates Hose Replacement Site Welding**

Thorburn's Model 733 DBW Female Butt Weld Cam-Lock Quick Coupling End with Guard-Lok™ Safety Locking Mechanism & Model 633 FBW Male Butt Weld Cam-Lock Quick Coupling End

## Thorburn's Quick Coupling System Solution

**Model 733 DBW (Female) & 633 FBW (Male)**

Thorburn's butt weld Cam-Lock Series quick couplings provides an alternative welding method to attach Thorburn's Cam-Lock couplings to a pipe. Thorburn's butt weld Cam-Locks are manufactured to the MIL-C27487 specifications which allows for complete interchange-ability. **Thorburn's Cam-Lock quick couplings should not be used for compressed gas service including steam or air but should be used for transfer of liquid media only.**

Thorburn's Butt Weld Cam-Lock style Quick Coupling system makes changeouts quick and easy

# Thorburn's Guard-Lok™ Technology

**Prevents Accidental Opening During Operation**

Thorburn's Cam-Lock couplings have an array of self-locking coupling arms for highest safety and security. The arms have mechanisms which prevent accidental disconnection during operation. The coupling arms lock themselves automatically into the coupling body in the closed position and stay locked until opened manually. Ideal for applications where vibration is present, the hose assembly is dragged or the coupling could be accidentally opened resulting in disasterous spillage.

## Advantages

- No clips, pins or buttons
- Arms lock shut with one smooth motion
- Safety is automatically provided
- Handles automatically lock to the body when closed
- Handles stay closed when released
- Prevents accidental disconnection & loss of fluids during operation
- Effortless operation and simple to unlock
- Conforms to DIN 2828 and A-A-59326 (MIL-C-27487) specifications
- Allows for Volumetric NDE (X-Ray & UT)

Thorburn's 48TSP-NC Furnace Door Hose Assembly with Cam-Lock Model 733 DBW Butt Weld Quick Coupling System installed at a Pyrometallurgical Nickel Smelter transferring dissolved chlorides

# Thorburn Flanged Quick Couplings

Thorburn's Big-Cam Model "BC" flanged quick coupling are compatible with all international flange standards connects in seconds

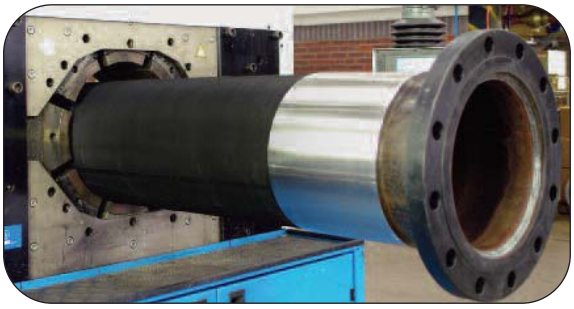
Thorburn's Cam-Lock flanged quick coupling Model 733PFC with Guard-Lok™

ThorburnFlex

*Engineered Solutions For Pipe Motion*

# 60TMH Custom Wire Reinforced Flexpipe

Available with corrugated tube & cover with integral annular rings to increase flexibility to 2X ID



Available with smooth tube & corrugated cover to provide smooth flow with bend radius of 4X ID with factory assembled permanently attached crimped ends

Thorburn's 60TMH Flexpipe is custom designed for use in piping systems that require isolation and absorption of severe noise, vibration, misalignment, lateral deflection and movements caused by mechanical or temperature changes. The 60TMH Flexpipe system replaces metal piping and is optimal for pipelines requiring resistance to electrolysis, corrosion, abrasion and water hammering.

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

## Advantages

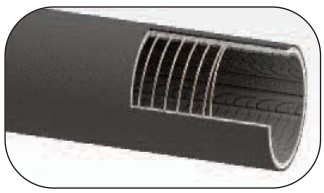
- Continuous length up to 15m with standard ANSI or DIN flange bolting
- Accommodates misalignment & lateral deflection
- Added arches to handle axial movement
- Corrugated tube & cover available to augment flexibility
- Various elastomers to suit application & environmental conditions
- Built in offset to facilitate installation & reduce stress on equipment

## Typical Applications

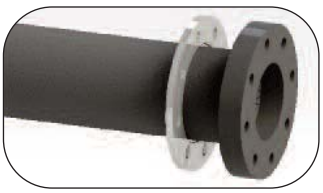
- Suction & Discharge
- Dredging
- Pump Stations
- Slurry Handling
- Mine Tailings
- Oil Suction & Discharge

# 60TMH Typical Ends

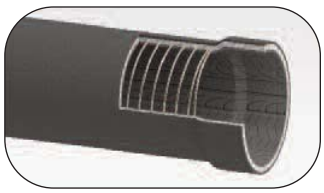
Capped End



Soft End

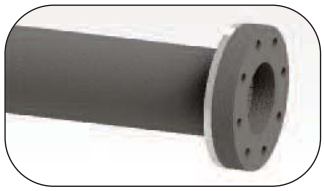


Rubber & Duck Flanges



Enlarged End

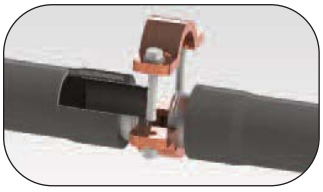
Wire To End



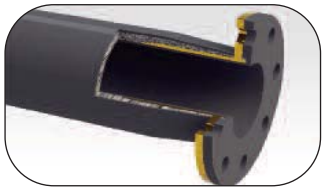
Integral Flange End

Integral Tapered Nozzle Ends

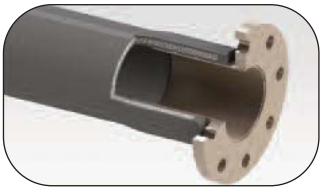
Beaded Ends With Split Flanges



Built-In Victaulic Nipple



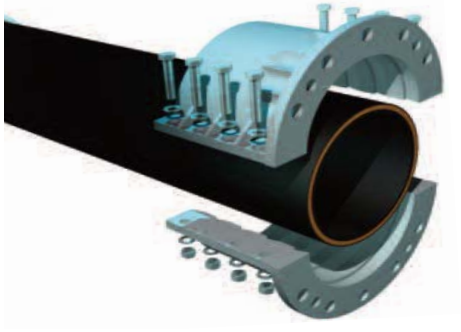
Built-In Nipple Rubber Lined Flanged 150lbs & 300lbs



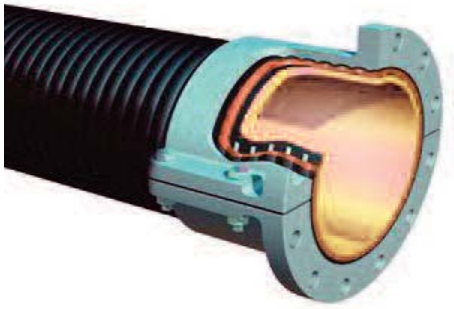
Built-In Nipple Flanged 150lbs & 300lbs

Built-In Nipple Threaded

# Field Attachable Fitting-to-End Joints for 60TMH Rubber Hoses



Thorburn FAS150 Smooth Cover Coupling



Thorburn FAS150 Corrugated Cover Coupling

Thorburn's field attachable fitting to end joints are a ready made hose assembly solution designed to accommodate urgent site custom length hose assembly requirements. The hose lengths are designed to be cut to length onsite and fitted with Thorburn's aluminum split cast coupling to provide a readymade site assembled flanged hose.

Thorburn's field attachable split cast couplings are not in contact with the process flow. The hose length can be cut to suit the intended duty, ready for installation. In addition, it allows the re-use of the split cast couplings as the fittings are not in contact with the process flow.

## Typical Applications

- Mineral processing plants
- Sand and gravel industries
- Cement and coal industries
- Pump Stations

60TMH Split Cast Coupling Hose Assembly

# 60TMH Rubber Pipe Fittings

60TMH-E90 Rubber 45° Elbow Fitting

60TMH-T Tee Rubber Fitting

Thorburn's 60TMH rubber pipe fittings are designed to replace metal pipe fittings reducing stress and strain on equipment and piping systems. Thorburn's 60TMH rubber pipe fittings will reduce the effects of seismic & ground settling movements, noise vibration from pumps, compressors and other equipment. Thorburn's 60TMH rubber pipe fittings are custom designed and manufactured from various rubber compounds and reinforced to withstand full vacuum and pressures up to 300psi. Typical end configurations are integral flat face rubber flanges drilled to ANSI class 150 & 300 (other standard flange drillings are available)

## Advantages

- Reduces noise and vibration
- Protects pump casing
- Relieves pipe stress and strain
- Excellent for seismic & ground settling movements

**Built-In Offsets Available**
**SIZES:** 1/2" to 24" I.D. Larger sizes available on special order only.

**THORBURN FLEX - Canada**
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1-800-363-6613
(Toll Free North America)

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

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

# THOR-REEL™ Hose Reels

**Air, Water, Lube Oil & Waste Oil Evacuation Applications**

## Advantages

- Rugged assembly for heavy-duty applications
- Non sparking ratchet assembly
- Arbor disengagement to prevent damage from reverse winding
- Standard material is carbon steel – *Also available in other materials*
- Pressure up to 10,000 psi
- Sprocket drive powered by an electric, hydraulic or compressed air motor with a strap brake. (Gear driven & crank rewind also available).
- Standard inlet, outlet riser, and hub assembly are steel. Also available in stainless steel.
- Color coded utility hoses. Air (Yellow), Water(Green) Steam (Red)
- Wide variety of threaded & quick coupling ends

## Spring Rewind Hose Reels

**Hose ID Sizes: 1/2" (13 mm) through 1 1/2" (38 mm)**

**Model THR1** (Light Duty): **Hose ID:** From 1/2" through 1" I.D.
**Inlet:** 1/2" up to 1" female/male NPT 90° swivel joint.
**Swivel Joint:** 1/2" up to 1" female/male NPT. **Pressure:** up to 3000 psi
**Temperature:** -54°C (-50°F) to 100°C (212°F)

**Model THR2** (Heavy Duty): **Hose ID:** From 1/2" through 1" I.D.
**Inlet:** 1/2" up to 1" female/male NPT 90° swivel joint.
**Swivel Joint:** 1/2" up to 1" female/male NPT. **Pressure:** up to 3000 psi
**Temperature:** -54°C (-50°F) to 100°C (212°F)

**Model THR3** (Heavy Duty): **Hose ID:** From 1" through 1 1/2" I.D.
**Inlet:** 1" up to 1 1/2" female/male NPT 90° swivel joint.
**Swivel Joint:** 1" to 1 1/2" female/male NPT. **Pressure:** up to 600 psi
**Temperature:** -54°C (-50°F) to 100°C (212°F)

**NOTE:** Other sizes and/or threads can be furnished for swivel joint when specified. Reels can operate at higher temperatures and higher pressures.

## Power Rewind Hose Reels

**Hose ID Sizes: 1/2" (13 mm) through 3" (80 mm)**

**Model THR6** (Heavy Duty): **Hose ID:** From 1/2" through 1" I.D.
**Inlet:** 1/2" up to 1" female/male NPT 90° swivel joint.
**Swivel Joint:** 1/2" up to 1" female/male NPT. **Pressure:** up to 5000 psi
**Temperature:** -51°C (-60°F) to 121°C (250°F)

**Model THR7** (Heavy Duty): **Hose ID:** From 1" through 1 1/2" I.D.
**Inlet:** 1" up to 1 1/2" female/male NPT 90° swivel joint.
**Swivel Joint:** 1" up to 1 1/2" female/male NPT. **Pressure:** up to 600 psi
**Temperature:** -51°C (-60°F) to 121°C (250°F)

**Model THR9** (Heavy Duty): **Hose ID:** From 2" through 3"
**Inlet:** 2" up to 3" female/male NPT 90° swivel joint.
**Swivel Joint:** 2" to 3" female/male NPT. **Pressures:** up to 300 psi
**Temperature:** -51°C (-60°F) to 121°C (250°F)

**NOTE:** Other sizes and/or threads can be furnished for swivel joint when specified. Reels can operate at higher temperatures and higher pressures.

A flexible connector must be used between the inlet pipe and the inlet swivel joint. Some applications require a clutch / reduction unit.

ThorburnFlex