



Socket Weld, Threaded Pipe & O-Seal Unions



# **COUPLINGS & CONNECTORS**

**Engineered Solutions For Pipe Motion**



[www.thorburnflex.com](http://www.thorburnflex.com)

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



### Features

- 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
- Dielectric insulating unions prevent galvanic corrosion deterioration
- Hammer Lug Nut for fast make and break
- Ideal union to seal Oxygen, Nitrogen
- 3000, 6000 & 9000 psi ratings available

### Technical Data

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

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. Thorburn's O-Seal™ Unions are designed to comply with current industry standards for pressure piping. These standards include ANSI B31.1 "Power Piping", ANSI B16.11, MSS SP83 "Forged Steel Fittings Socket Welded & Threads" and ASME "Boiler & Pressure Vessel Code".

Traditional metal to metal union sealing surfaces rust when they are stored outside and are exposed to humidity. When this happens and installed in piping systems, it is inevitable that leaks will occur and it doesn't matter how much torque is applied to stop the leaks, the traditional metal to metal unions will continue to leak. This becomes an extremely frustrating experience for contractors, EPCs and owners especially when it occurs during project commissioning and testing.

Thorburn's O-Seal™ Unions are an excellent alternative to metal to metal seat unions because they are dimensionally similar to the MSS SP83 forged union and will not leak because the seal is made on the O-Ring not on the metal to metal seat like traditional unions.



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

## Don't settle for leaky metal on metal sealing pipe unions



3000 lb MSS SP83 forged union with rusted sealing surfaces leaking with no pressure in the piping line. Once the sealing surfaces are rusted or compromised, they will always leak no matter how much torqued is applied

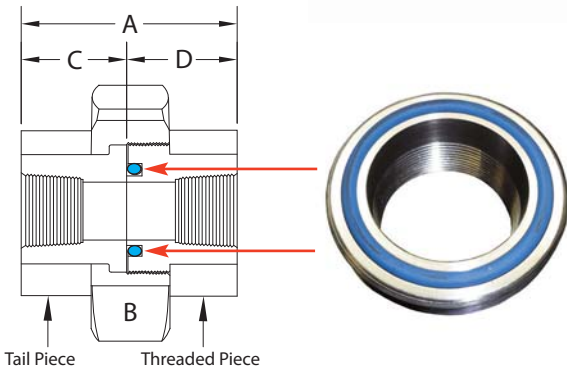


Thorburn's O-Seal (blue) 3000 lb union uses an elastomeric seal that compensates and seals on any compromised surfaces no matter how rusted or scratched

# Connectors - Socket Weld, Threaded Pipe & O-Seal Unions



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



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

Note: millimeters have been rounded

## How to Order (N)UO Series Pipe Unions

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

## Part Number Example & Description

(Part number must follow the order listed below)

**UO-FP-FP-16-1-H-S6-D**

<b>UO</b>	O-Seal Union
<b>FP</b>	Tail Piece - Female FNPT Pipe
<b>FP</b>	Thread Piece - Female FNPT Pipe
<b>16</b>	Size 1 inch
<b>1</b>	3000 lbs Class
<b>H</b>	EPDM O-Ring Material
<b>S6</b>	Stainless Steel Material
<b>D</b>	Dielectric Insulation Option

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

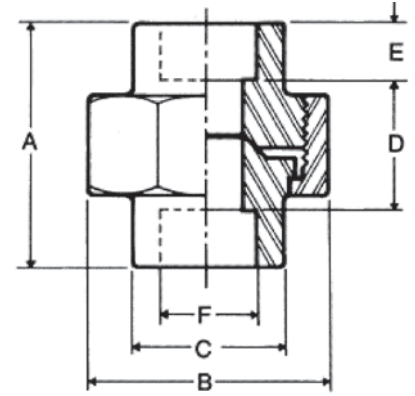
## Socket Weld Unions

A socket welded union is a good choice where high leakage integrity and great structural strength are important design considerations. SW fittings are used for pipelines conveying flammable, toxic or expensive material where no leakage can be permitted and steam goes up to 600 psi (41 bar).



### Advantages:

- The pipe need not be beveled for weld preparation
- Temporary tack welding is not needed for alignment
- Replaces threaded fittings to reduce the risk of leakage
- Materials are SA105, SA182 & SA350
- Manufactured in accordance with ASME B16.11



## MSS-SP-83 Class 3000 Socket Weld Unions

SIZE (in)	A	B	C	D	E	F	WEIGHT (lbs)
1/8	1 11/16	1 31/64	53/64	25/32	7/16	0.420	0.380
1/4	1 11/16	1 31/64	53/64	25/32	7/16	0.555	0.360
3/8	1 27/32	1 11/16	1	31/32	7/16	0.690	0.500
1/2	2	1 15/16	1 3/16	1 3/32	7/16	0.855	0.695
3/4	2 5/16	2 3/8	1 15/32	1 5/32	9/16	1.065	1.175
1	2 7/16	2 25/32	1 25/32	1 3/8	9/16	1.330	1.540
1 1/4	2 7/8	3 23/64	2 7/32	1 45/64	9/16	1.675	2.590
1 1/2	3	3 23/32	2 35/64	1 7/8	9/16	1.915	3.410
2	3 1/2	4 27/64	3 1/16	2 1/16	11/16	2.406	5.120
2 1/2	4 1/2	5 15/64	2 3/8	2 3/8	7/8	2.906	6.750
3	4 7/16	6 5/32	2 7/16	2 7/16	1	3.535	12.625

NOTE: ASME B31.1 Para. 127.3 says; The pipe or tube shall be installed into the socket to the maximum depth and then withdrawn approximately 1/16 inch (1.6 mm) from contact between the end of the pipe and shoulder of the socket.

## MSS-SP-83 Class 6000 Socket Weld Unions

SIZE (in)	A	B	C	D	E	F	WEIGHT (lbs)
1/8	1 11/15	1 31/64	53/64	25/32	7/16	0.420	0.50
1/4	1 27/32	1 11/16	1	31/32	7/16	0.555	0.56
3/8	2	1 15/16	1 3/16	1 3/32	7/16	0.690	0.75
1/2	2 5/16	2 3/8	1 15/32	1 5/32	9/15	0.855	1.25
3/4	2 7/16	2 25/32	1 25/32	1 3/8	9/16	1.065	1.75
1	2 7/8	3 23/64	2 7/32	1 45/64	9/16	1.330	3.00
1 1/4	3	3 23/32	2 35/64	1 7/8	9/16	1.675	3.75
1 1/2	3 1/2	4 27/64	3 1/16	2 1/16	11/16	1.915	6.00
2	4 1/8	5 15/64	3 9/16	2 3/8	7/8	2.406	10.5

### Part Number Example & Description

(Part number must follow the order listed below - Ordering Codes on Page 2)

**UB-SP-SP-16-1-H-S6-D**

<b>UB</b>	MSS-SP-83 Union	<b>1</b>	3000 lbs Class
<b>SP</b>	Socket Weld Tailpiece	<b>S6</b>	316 Stainless Steel
<b>SP</b>	Socket Weld Threadpiece	<b>H</b>	Handle Bar Option
<b>16</b>	Size 1 inch		

# | Connectors - Socket Weld, Threaded Pipe & O-Seal Unions

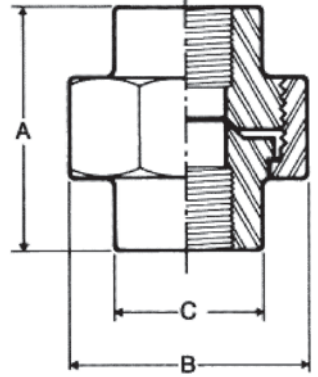
## FNTP Threaded Unions

The American National Pipe Thread Tapered is the best known and most widely used connection where the pipe thread provides both the mechanical joint and the hydraulic seal. NPT has tapered male and female threads which seals with PTFE tape or adjoining compound.



### Advantages:

- No specialized installation skills are required
- Leakage integrity is excellent where vibration is not encountered
- Internal pipe threads are NPT in accordance with ASME B1.20.1
- Gauging procedures and practice are in accordance with ASME B1.20.1 Section 8



## MSS-SP-83 Class 3000 FNTP Threaded Unions

SIZE (in)	A	B	C
1/8	1 11/16	1 31/64	53/64
1/4	1 11/16	1 31/64	53/64
3/8	1 27/32	1 11/16	1
1/2	2	1 15/16	1 3/16
3/4	2 5/16	2 3/8	1 15/32
1	2 7/16	2 25/32	1 25/32
1 1/4	2 7/8	3 23/64	2 7/32
1 1/2	3	3 23/32	2 35/64
2	3 1/2	4 27/64	3 1/16
2 1/2	4 1/2	5 15/64	2 3/8
3	4 7/16	6 5/32	2 7/16

## MSS-SP-83 Class 6000 Female Threaded Unions

SIZE (in)	A	B	C
1/8	1 11/15	1 31/64	53/64
1/4	1 27/32	1 11/16	1
3/8	2	1 15/16	1 3/16
1/2	2 5/16	2 3/8	1 15/32
3/4	2 7/16	2 25/32	1 25/32
1	2 7/8	3 23/64	2 7/32
1 1/4	3	3 23/32	2 35/64
1 1/2	3 1/2	4 27/64	3 1/16
2	4 1/8	5 15/64	3 9/16

### Part Number Example & Description

(Part number must follow the order listed below - Ordering Codes on Page 2)

**UB-FP-FP-16-1-H-S6-D**

<b>UB</b>	MSS-SP-83 Union	<b>1</b>	3000 lbs Class
<b>FP</b>	Female FNPT Tailpiece	<b>S6</b>	316 Stainless Steel
<b>FP</b>	Female FNPT Threadpiece	<b>H</b>	Handle Bar Option
<b>16</b>	Size 1 inch		

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

“Make leakproof flange connections in seconds!”

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

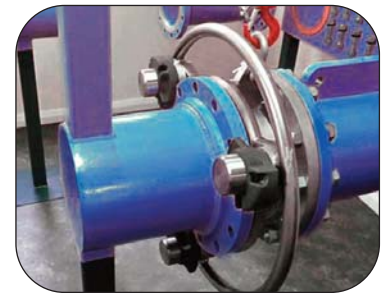


### Features & Benefits

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



Traditional flanged bolted connection



Thorburn Big Cam™ quick flanged connection

Thorburn Part Number	Nominal Pipe Size	Flange OD 150lbs ANSI	Flange Thickness	Seal ID	Number of Cams	Minimum Locking Range	Maximum Locking Range	Number of Studs	Stud Dimensions	Weight (lbs)
(N)BC48*XY	3	7 1/2	15/16	4	2	5/8	1 1/8	4	5/8 X 2 5/8	20
(N)BC64*XY	4	9	15/16	4	2	5/8	1 1/8	4	5/8 X 2 5/8	42
(N)BC80*XY	5	10	15/16	6 5/16	2	11/16	1 3/16	8	3/4 X 2 3/4	45
(N)BC96*XY	6	11	1	7 5/16	2	3/4	1 1/4	8	3/4 X 2 3/4	48
(N)BC128*XY	8	13 1/2	1 1/8	9 1/16	3	7/8	1 3/8	8	3/4 X 2 3/4	74
(N)BC160*XY	10	16	1 3/16	11 9/16	3	15/16	1 7/16	12	7/8 X 3 1/4	86
(N)BC192*XY	12	19	1 1/4	13 3/8	4	1	1 1/2	12	7/8 X 3 1/4	122
(N)BC224*XY	14	21	1 3/8	15	4	1 1/8	1 5/8	12	1 X 3 3/4	150
(N)BC256*XY	16	23 1/2	1 7/8	16 15/16	5	1 3/16	1 11/16	16	1 X 4 1/4	186
(N)BC320*XY	20	27 1/2	1 11/16	21 1/2	6	1 7/16	1 15/16	20	1 1/8 X 4 3/4	252
(N)BC384*XY	24	32	1 15/16	25 1/2	7	1 11/16	2 3/16	20	1 1/4 X 5 1/2	303
(N)BC448*XY	28	35 1/2	2 1/16	29 1/4	9	1 11/16	2 7/16	28	1 1/4 X 6	371

**\* Material Codes**

**X Specify Coupling Material - A = Aluminum, CS = Carbon Steel, S6 = 316 Stainless Steel**

**Y Specify Gasket Material - D = Buna N, N = Neoprene, H = EPDM, J = PTFE, I = Viton**

**Note:** 150lbs flanges are standard. For 300lbs ANSI Flange insert suffix 3 at the end of ordering code (also available in European and DIN Classes) insert suffix PN10, PN16, PN25 at the end of ordering code

### Part Number Example & Description

(Part number must follow the order listed below)

**Example 1**

**BC48-S6-H-3**

**Example 2**

**BC48-S6-H-PN25**

**Example 1**

<b>BC48</b>	Big Cam 3 inch pipe size
<b>S6</b>	Material: 316SS
<b>H</b>	Gasket Material: EPDM
<b>3</b>	300 lbs ANSI Flange

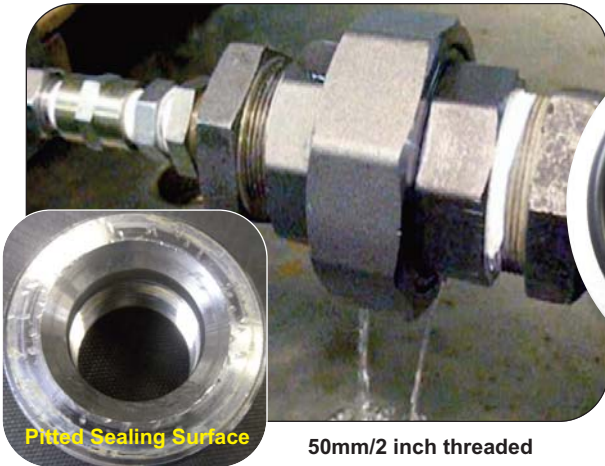
**Example 2**

<b>BC48</b>	Big Cam DIN80 pipe size
<b>S6</b>	Material: 316SS
<b>H</b>	Gasket Material: EPDM
<b>PN25</b>	PN25 Flange

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

## Thorburn Retrofit Seals

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 an O-Ring seal (like a hydraulic fitting).



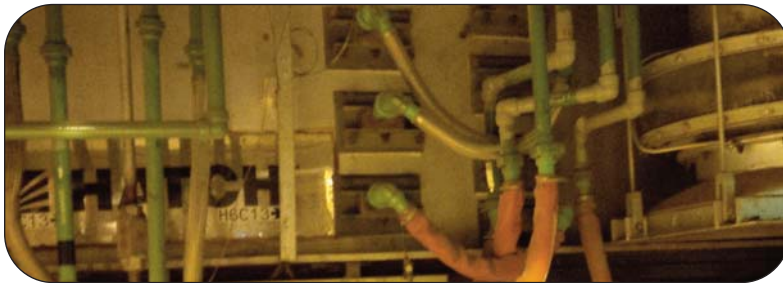
**Pitted Sealing Surface**

50mm/2 inch threaded metal-to-metal seal 3000lbs union (leaking at 0 psi / 0 bar)

**“Thorburn Retrofit Seals Stops Leaking Unions”**



The same union with Thorburn Retrofit Seal installed (Not leaking when hand tightened to 5500 psi / 367 bar)



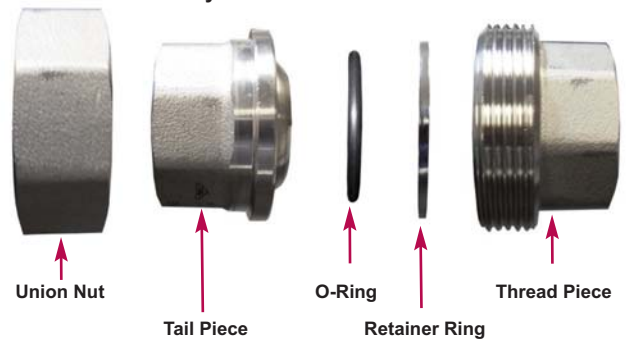
Thorburn Retrofit Seal installed on the unions at the Koniambo New Caledonia jobsite eliminating leakage

### Features & Benefits:

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

## Thorburn Retrofit Seal Assembly

Fast & Easy Installation on standard union!



SIZE	Union Type	Union Material	O-Ring Material**
16 (1")*	1 = 3000 lbs*	CS = CARBON	D = BUNA N*
20 (1 1/4")	2 = 6000 lbs	STEEL*	I = FLUOROCARBON
24 (1 1/2")	3 = 300 lbs	S4 = 304SS	(VITON)
32 (2")	4 = 150 lbs	S6 = 316SS	Z = OTHER
40 (2 1/2")	X = OTHER	YY = OTHER	(Specify)
64 (4")	(Specify)	(Specify)	

\* Standard Product

\*\* In all cases, retainer ring will be same material as union to prevent galvanic corrosion

## Part Number Example & Description

(Part number must follow the order listed below)

### TRS-32-1-CS-D

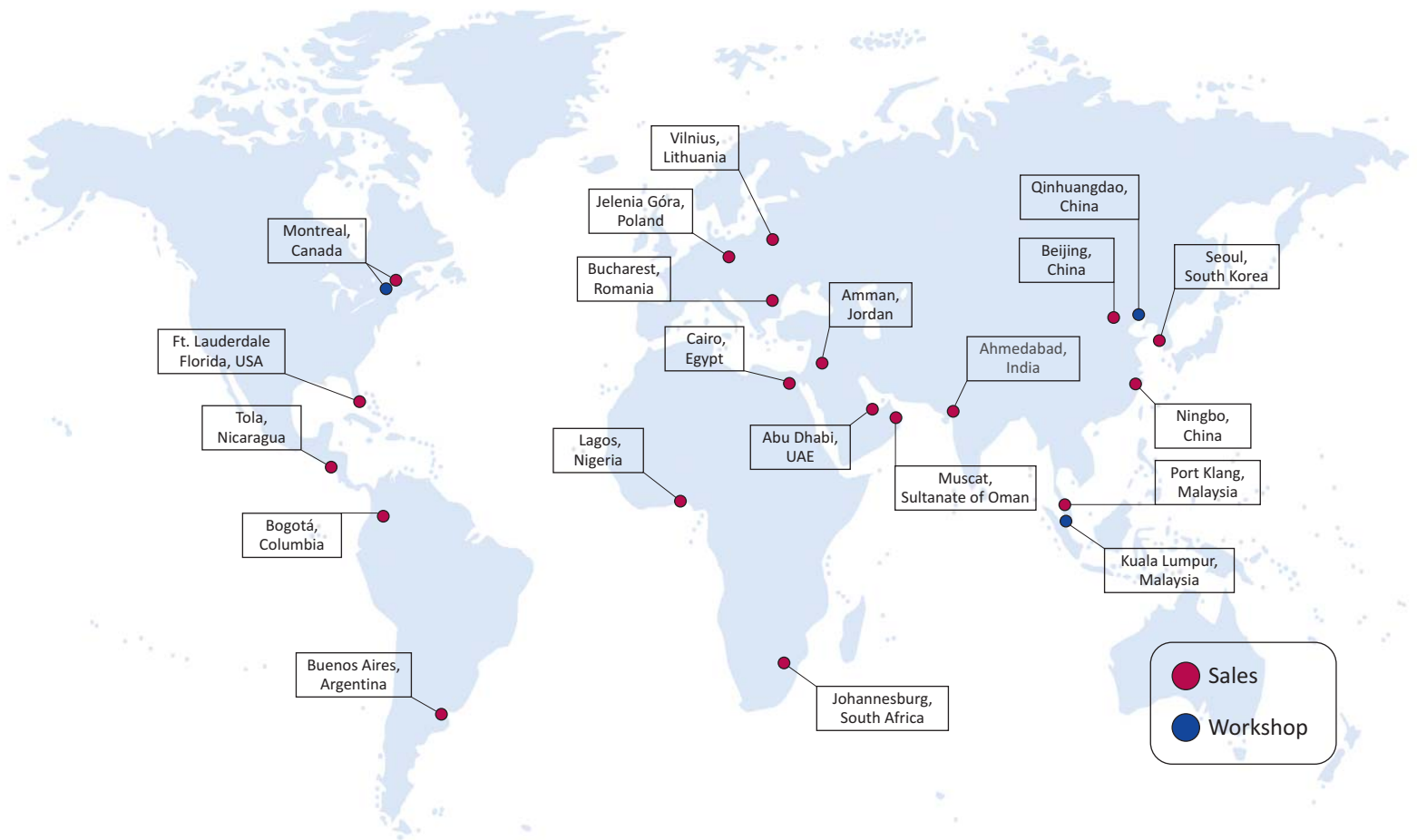
<b>TRS</b>	Thorburn Retrofit Seal
<b>32</b>	2 Inch Ring Size
<b>1</b>	3000 lbs Union Type
<b>CS</b>	Carbon Steel Union Material
<b>D</b>	BUNA N O-Ring Material

**THORBURN FLEX - Canada**  
 165 Oneida, Pointe-Claire, Quebec  
 Canada, H9R 1A9  
 Tel: +1-514-695-8710  
 Fax: +1-514-695-1321  
 sales@thorburnflex.com



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# Thorburn's Global Presence



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