

# HART Product Sourcebook



## **HART** SURE SEAL O-RING UNIONS

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# The HART Solution For Leak-Free Unions

HART Industrial O-Ring Unions are engineered to provide Class 3000 and 6000 Service and are the most popular union in the industry for general-purpose applications. The flat-face design provides a turbulence-free fit across the seats. This is ideal where piping requirements dictate the need for a flat face seal to make and break the pipeline.

HART Unions are available in nearly any combination of connection types, sizes, reductions, transitions, material combinations, and o-ring seals for any application. Our expert engineers are ready to help specify the perfect union to meet your application needs.

## HART Sure-Seal Technology: *At any pressure, HART o-rings strengthen the seal rather than loosen it!*

### Static Seal

The o-ring is fitted into a machined groove between the two halves of the union. When the halves are drawn together, the o-ring compresses to an ovalized cross-section, forming a positive, resilient seal that blocks the fluid, thus sealing even at low or no pressure.



### Under Load

Pressure is increased the o-ring is forced to flow and is "squeezed" into the downstream side causing the o-ring to conform to the shape of the end, blocking the groove gap. The more the system pressure increases, the more effective the seal.



### Straight-Away Breakout

Flat-faced construction allows for slipping the component without disturbing the surrounding sections. Pipe alignment is much easier with HART unions since it is unnecessary to spring the line during make-up or disassembly.



## Standard O-Ring Union Features:

- **Interchangeable End Connections:** Threaded (female and male NPT), sweat, socket weld, and butt weld ends are interchangeable. This feature reduces overall costs by eliminating unnecessary nipples, bushings, couplings, and inserts.
  - ex) Female NPT x Socket Weld, Female NPT x Male NPT, Butt Weld x Male NPT, Female NPT x Copper Sweat, and more!*
- **O-Ring Isolation:** The o-ring seal is strategically located in the thread piece face eliminating o-ring media contact and added protection against abrasives and erosion. A variety of o-rings for any application are available. The o-ring seal allows for a smooth thru-bore, providing a turbulence-free fit across the seats.
- **Precision Machined Components:** All unions are precision machined to provide high quality and fail-safe leak-proof reliability.
- **Material Versatility:** Unions can be provided in all standard metals or combinations. This includes 304 Stainless, 316 Stainless, A105 Carbon Steel, Brass, Monel 400, Hastelloy, and Titanium.
- **Excellent Vibration Resistance:** Seals will not loosen, even under extreme pressure and pressure surges.
- **No Maintenance:** Once initial seal is made, no further tightening is required.

## Endless Connection Capabilities Within HART Unions!

**Dielectric Transition Union**  
Brass FNPT to MNPT Stainless

**Dielectric Reducing Union**  
Brass 3/4" FNPT to 1/2" Copper Sweat

**Transition Union**  
Copper Sweat to Male MNPT

**Orifice Restriction Union**  
0.5" O.D. Tube

**Dielectric Insulating Union**  
MNPT Stainless to MNPT Carbon Steel

**Dielectric Insulating Union**  
Copper to Aluminum

**Cap/Plug Union**  
Service Access

**Dielectric Reducing Union**  
Carbon Steel 3/4" FNPT to Copper 1/2" FNPT

**TRANSITION:** HART unions can be used to transition between different materials AND connection types, saving cost and space for multiple fittings!

**REDUCING:** HART unions can be used as a reducer between different connection sizes within the same fitting!



# Threaded Unions

HART unions are available in female threaded end connections to suit various applications and configurations. Female threaded end connections are available in Class 3000 and Class 6000 union configurations and offer the same reliable, leak-free seal.



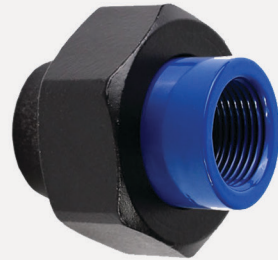
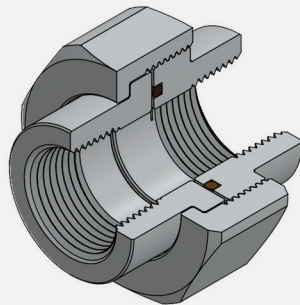
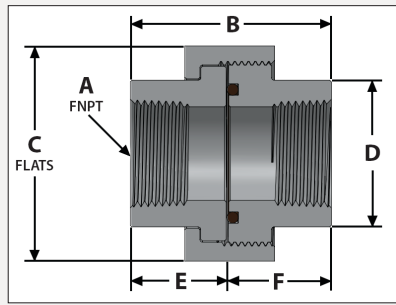
Female pipe threads are internal threads that you would typically see on the end of a pipe or system; these mate into a corresponding male or external thread. The thread's tapered design allows for mechanical sealing without the need for a gasket, though typically, pipe sealant compound ("pipe dope") or tape is used at higher pressures. Common abbreviations include: *FNPT*, Female NPT, *FIP* (female iron pipe).

Note: Female threaded unions come standard with Female NPT (National Pipe Taper) connections, but BSPT (British Standard Pipe Taper) threads are also available as a custom option.

## 3131 Series

### Female Threaded (FNPT) Union, Class 3000

SIZE	A-FNPT	B	C-HEX	D	E-TAIL	F-THREAD	LBS
3131-1	1/4"	1.76	1.38	0.75	0.80	0.96	0.33
3131-2	3/8"	2.01	1.82	1.13	0.94	1.07	0.70
3131-3	1/2"	2.01	1.82	1.13	0.94	1.07	0.70
3131-4	3/4"	2.16	2.15	1.38	1.03	1.13	1.00
3131-5	1"	2.60	2.50	1.75	1.25	1.35	1.75
3131-6	1-1/4"	2.77	3.06	2.16	1.38	1.39	2.50
3131-7	1-1/2"	3.11	3.38	2.38	1.53	1.58	3.50
3131-8	2"	3.28	3.88	2.88	1.55	1.73	4.25
3131-9	2-1/2"	4.01	5.00	3.61	1.99	2.02	6.00
3131-10	3"	4.28	5.75	4.30	2.14	2.14	8.00



## 6161 Series

### Female Threaded (FNPT) Union, Class 6000

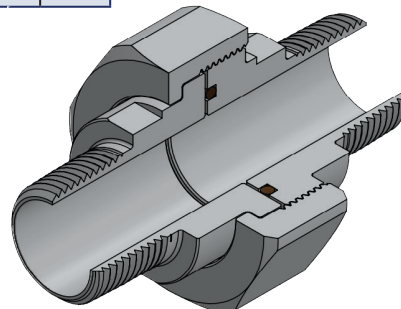
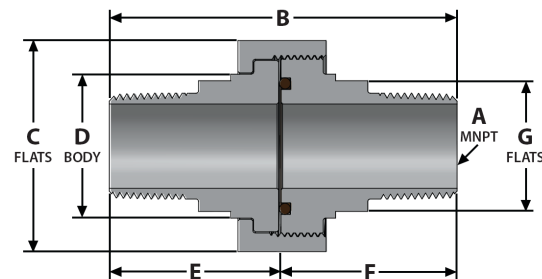
SIZE	A-FNPT	B	C-HEX	D	E-TAIL	F-THREAD	LBS
6161-1	1/4"	2.01	1.82	1.13	0.94	1.07	0.70
6161-2	3/8"	2.01	1.82	1.13	0.94	1.07	0.70
6161-3	1/2"	2.16	2.15	1.38	1.03	1.13	1.00
6161-4	3/4"	2.60	2.50	1.75	1.25	1.35	1.75
6161-5	1"	2.77	3.06	2.16	1.38	1.39	2.50
6161-6	1-1/4"	3.11	3.38	2.38	1.53	1.58	3.50
6161-7	1-1/2"	3.28	3.88	2.88	1.55	1.73	4.25
6161-8	2"	4.01	5.00	3.61	1.99	2.02	6.00
6161-9	2-1/2"	4.28	5.75	4.30	2.14	2.14	8.00

## 3232 Series

### Male Threaded (MNPT) Union, Class 3000

Note: Schedule 40 wall thickness standard for Class 3000 unless otherwise requested. Schedule 10, 80, 160, XXH also available.

SIZE	A-MNPT	B	C-HEX	D	E-TAIL	F-THREAD	G-FLAT	LBS
3232-1	1/4"	3.13	1.38	0.75	1.52	1.62	0.63	0.40
3232-2	3/8"	3.52	1.82	1.13	1.72	1.80	1.00	0.80
3232-3	1/2"	3.72	1.82	1.13	1.82	1.90	1.00	0.80
3232-4	3/4"	3.82	2.15	1.38	1.87	1.95	1.15	1.25
3232-5	1"	4.23	2.50	1.75	2.06	2.17	1.50	2.00
3232-6	1-1/4"	4.51	3.06	2.16	2.25	2.26	1.88	2.90
3232-7	1-1/2"	4.44	3.38	2.38	2.19	2.25	2.13	3.80
3232-8	2"	4.63	3.88	2.88	2.22	2.41	2.56	5.00
3232-9	2-1/2"	5.99	5.00	3.61	2.98	3.01	3.25	7.00
3232-10	3"	6.18	5.75	4.30	3.09	3.09	4.00	9.50



## 6262 Series

### Male Threaded (MNPT) Union, Class 6000

Note: Schedule 80 wall thickness standard for Class 6000 unless otherwise requested. Schedule 10, 40, 160, XXH also available.

SIZE	A-MNPT	B	C-HEX	D	E-TAIL	F-THREAD	G-FLAT	LBS
6262-1	1/4"	3.52	1.82	1.13	1.72	1.80	1.00	0.80
6262-2	3/8"	3.72	1.82	1.13	1.82	1.90	1.00	0.80
6262-3	1/2"	3.82	2.15	1.38	1.87	1.95	1.15	1.25
6262-4	3/4"	4.23	2.50	1.75	2.06	2.17	1.50	2.00
6262-5	1"	4.51	3.06	2.16	2.25	2.26	1.88	2.90
6262-6	1-1/4"	4.44	3.38	2.38	2.19	2.25	2.13	3.80
6262-7	1-1/2"	4.63	3.88	2.88	2.22	2.41	2.56	5.00
6262-8	2"	5.99	5.00	3.61	2.98	3.01	3.25	7.00
6262-9	2-1/2"	6.18	5.75	4.30	3.09	3.09	4.00	9.50

# Socket Weld Unions

HART offers many welded connection styles, including socket weld pipe unions. Socket weld unions are used as a permanent, welded connection between two pipes or piping systems. HART can manufacture standard and customized socket weld unions specified to S10, S40, S80, S160, and XXH welding schedules in Class 3000 and Class 6000 applications.

Socket weld unions come with ASME B16.11 and B36.10M female socket connections where a stainless or steel pipe can be inserted and welded for a rigid, secure connection.

HART's socket weld connections are interchangeable with other HART welded and threaded connection styles. They can be manufactured various materials, including but not limited to carbon steel 12L14 or A105, stainless steel 304 or 316, Monel 400, Hastelloy, and Aluminum. HART also offers tube-style socket weld unions (3434 series) for welding tubes instead of pipes.

Note: Pipe O.D. male socket weld and tube O.D. male socket weld ("stub") ends are available as a custom option.



## 3333 Series

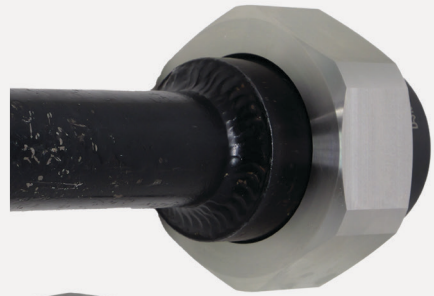
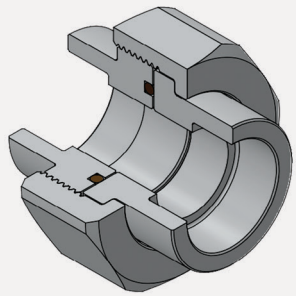
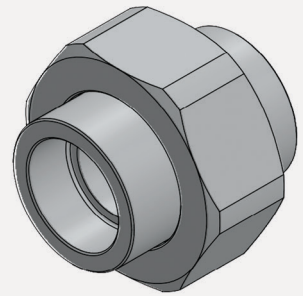
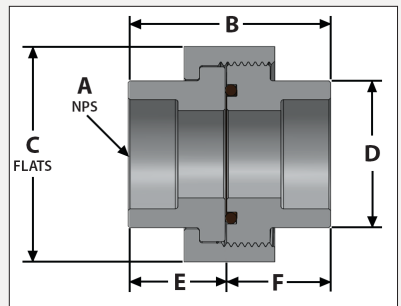
### Socket Weld Pipe Union, Class 3000

SIZE	A-NPS	B	C-HEX	D	E-TAIL	F-THREAD	LBS
3333-1	1/4"	1.76	1.38	0.75	0.80	0.96	0.33
3333-2	3/8"	2.01	1.82	1.13	0.94	1.07	0.70
3333-3	1/2"	2.01	1.82	1.13	0.94	1.07	0.70
3333-4	3/4"	2.16	2.15	1.38	1.03	1.13	1.00
3333-5	1"	2.60	2.50	1.75	1.25	1.35	1.75
3333-6	1-1/4"	2.77	3.06	2.16	1.38	1.39	2.50
3333-7	1-1/2"	3.11	3.38	2.38	1.53	1.58	3.50
3333-8	2"	3.28	3.88	2.88	1.55	1.73	4.25
3333-9	2-1/2"	4.01	5.00	3.61	1.99	2.02	6.00
3333-10	3"	4.28	5.75	4.30	2.14	2.14	8.00

## 6363 Series

### Socket Weld Pipe Union, Class 6000

SIZE	A-NPS	B	C-HEX	D	E-TAIL	F-THREAD	LBS
6363-1	1/4"	2.01	1.82	1.13	0.94	1.07	0.70
6363-2	3/8"	2.01	1.82	1.13	0.94	1.07	0.70
6363-3	1/2"	2.16	2.15	1.38	1.03	1.13	1.00
6363-4	3/4"	2.60	2.50	1.75	1.25	1.35	1.75
6363-5	1"	2.77	3.06	2.16	1.38	1.39	2.50
6363-6	1-1/4"	3.11	3.38	2.38	1.53	1.58	3.50
6363-7	1-1/2"	3.28	3.88	2.88	1.55	1.73	4.25
6363-8	2"	4.01	5.00	3.61	1.99	2.02	6.00
6363-9	2-1/2"	4.28	5.75	4.30	2.14	2.14	8.00



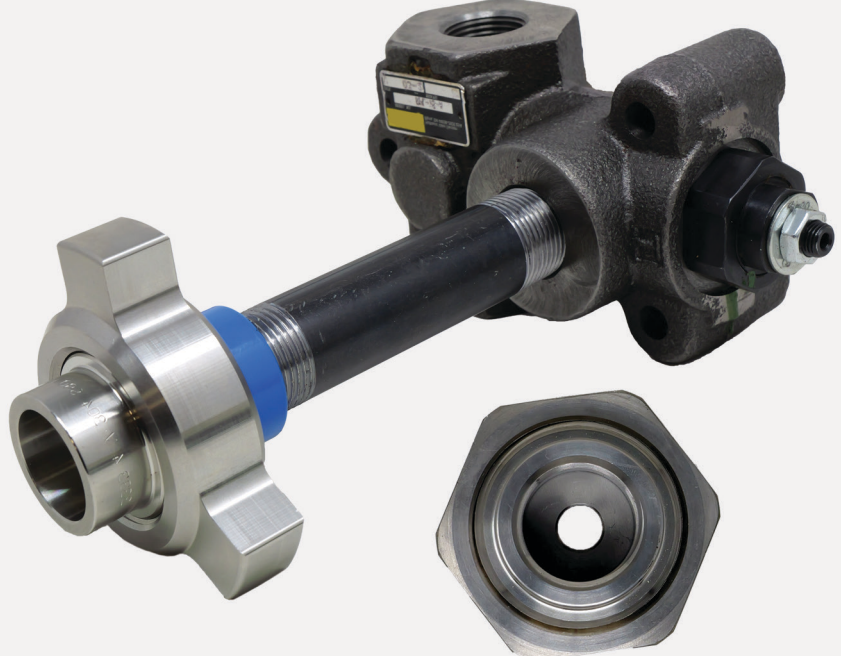
## 3434 Series

### Socket Weld Tube Union, Class 3000

Note: Socket Bore is TUBE O.D.  
Customer to provide mating tube wall thickness when ordering (example: 0.065").

SIZE	A-O.D.	B	C-HEX	D	E-TAIL	F-THREAD	LBS
3434-1	1/4"	1.76	1.38	0.75	0.80	0.96	0.33
3434-2	3/8"	2.01	1.82	1.13	0.94	1.07	0.70
3434-3	1/2"	2.01	1.82	1.13	0.94	1.07	0.70
3434-4	3/4"	2.16	2.15	1.38	1.03	1.13	1.00
3434-5	1"	2.60	2.50	1.75	1.25	1.35	1.75
3434-6	1-1/4"	2.77	3.06	2.16	1.38	1.39	2.50
3434-7	1-1/2"	3.11	3.38	2.38	1.53	1.58	3.50
3434-8	2"	3.28	3.88	2.88	1.55	1.73	4.25
3434-9	2-1/2"	4.01	5.00	3.61	1.99	2.02	6.00
3434-10	3"	4.28	5.75	4.30	2.14	2.14	8.00

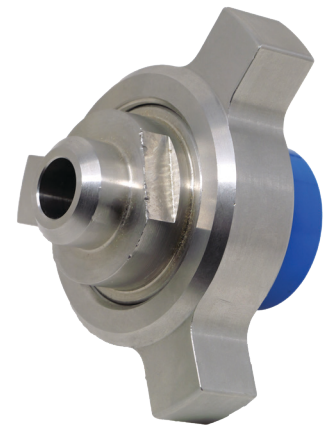
Note for interior union waterway bore:  
Schedule 40 is standard for Class 3000 and Schedule 80 is standard for Class 6000 unless otherwise requested.





# Butt Weld Unions

HART offers a wide range of welded connection styles, including butt weld pipe unions. Butt weld unions are used as a permanent, welded connection between two pipes or piping systems. HART manufactures standard and customized butt weld unions specified to S10, S40, S80, S160, and XXH welding schedules in both Class 3000 and Class 6000 applications. Tube O.D. butt weld ends are available as a custom option.



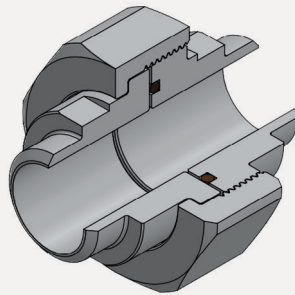
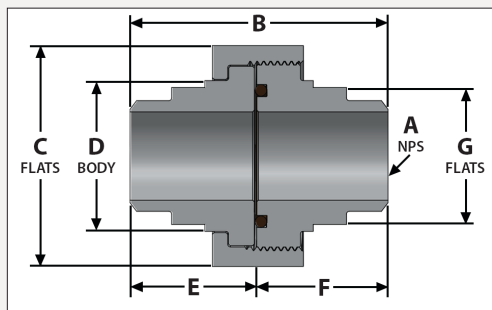
These come with ASME B16.9 standard butt weld connections with a standard 37.5 degree bevel. This allows industry-standard butt weld stainless or steel pipe to be mated and welded for a secure connection.

HART's butt weld connections are interchangeable with other HART welded and threaded connection styles and can be manufactured in various materials including, but not limited to, 12L14 or A105/A350-LF2 carbon steel, 304/L and 316/L, Monel 400, Hastelloy, and Aluminum.

## 3535 Series

### Butt Weld Pipe Union, Class 3000

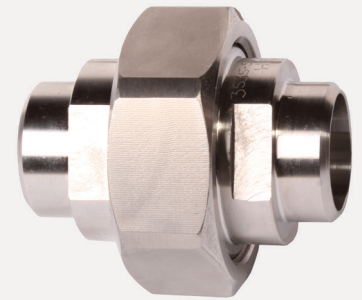
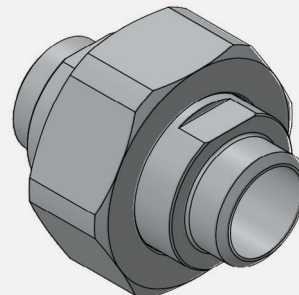
SIZE	A-NPS	B	C-HEX	D	E-TAIL	F-THREAD	G-FLAT	LBS
3535-1	1/4"	2.71	1.38	0.75	1.31	1.41	0.63	0.33
3535-2	3/8"	2.90	1.82	1.13	1.41	1.49	1.00	0.70
3535-3	1/2"	2.90	1.82	1.13	1.41	1.49	1.00	0.70
3535-4	3/4"	2.98	2.15	1.38	1.45	1.53	1.15	1.00
3535-5	1"	3.01	2.50	1.75	1.45	1.56	1.50	1.75
3535-6	1-1/4"	3.25	3.06	2.16	1.62	1.63	1.88	2.50
3535-7	1-1/2"	3.14	3.38	2.38	1.54	1.60	2.13	3.50
3535-8	2"	3.47	3.88	2.88	1.64	1.83	2.56	4.25
3535-9	2-1/2"	3.59	5.00	3.61	1.78	1.81	3.25	6.00
3535-10	3"	3.65	5.75	4.30	1.84	1.81	4.00	8.00



## 6565 Series

### Butt Weld Pipe Union, Class 6000

SIZE	A-NPS	B	C-HEX	D	E-TAIL	F-THREAD	G-FLAT	LBS
6565-1	1/4"	2.90	1.82	1.13	1.41	1.49	1.00	0.70
6565-2	3/8"	2.90	1.82	1.13	1.41	1.49	1.00	0.70
6565-3	1/2"	2.98	2.15	1.38	1.45	1.53	1.15	1.00
6565-4	3/4"	3.01	2.50	1.75	1.45	1.56	1.50	1.75
6565-5	1"	3.24	3.06	2.16	1.62	1.63	1.88	2.50
6565-6	1-1/4"	3.14	3.38	2.38	1.54	1.60	2.13	3.50
6565-7	1-1/2"	3.47	3.88	2.88	1.64	1.83	2.56	4.25
6565-8	2"	3.59	5.00	3.61	1.78	1.81	3.25	6.00
6565-9	2-1/2"	3.65	5.75	4.30	1.84	1.81	4.00	8.00

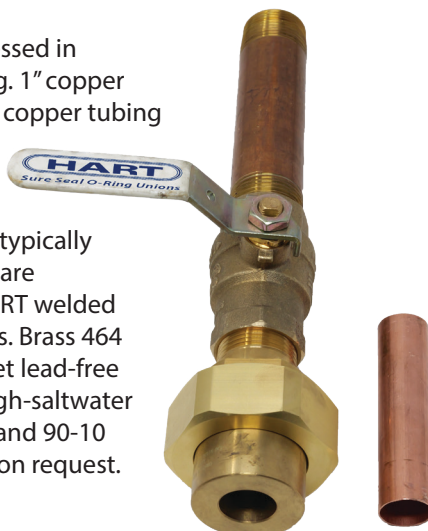


## Copper Sweat/Braze Unions

HART offers a many sweated and brazed connection styles, including copper sweat tube unions. Copper sweat unions are used as a permanent, sweated (or brazed) connection between two copper tubes or tubing systems. HART has the capability to manufacture standard and customized copper sweat unions suitable for K, L, and M style copper tubing in Class 3000 and Class 6000 applications.

Copper sweat unions are expressed in nominal copper tubing size (e.g. 1" copper sweat unions mate with 1-inch copper tubing which is 1.125" O.D.).

Copper sweat connections are typically manufactured using brass and are interchangeable with other HART welded and threaded connection styles. Brass 464 (naval brass) is available to meet lead-free requirements. For marine or high-saltwater / corrosive applications, 70-30 and 90-10 Copper-Nickel are available upon request.

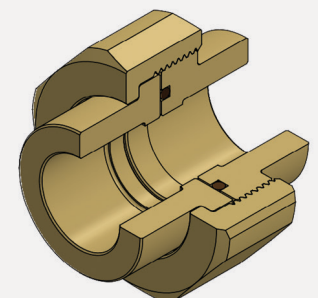
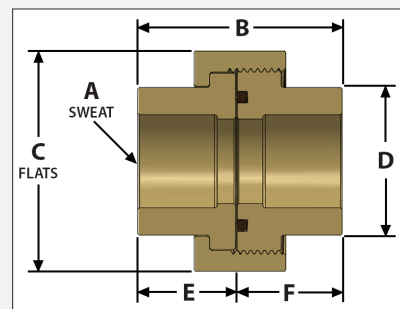


## 3636 Series

### Copper Sweat Tube Union, Class 3000

Size is for nominal copper tubing (K, L, or M). Example: 1/2" nominal copper sweat / tubing is 0.625" O.D.

SIZE	A-TUBE	B	C-HEX	D	E-TAIL	F-THREAD	LBS
3636-1	1/4"	1.76	1.38	0.75	0.80	0.96	0.33
3636-2	3/8"	2.01	1.82	1.13	0.94	1.07	0.70
3636-3	1/2"	2.01	1.82	1.13	0.94	1.07	0.70
3636-4	3/4"	2.16	2.15	1.38	1.03	1.13	1.00
3636-5	1"	2.60	2.50	1.75	1.25	1.35	1.75
3636-6	1-1/4"	2.77	3.06	2.16	1.38	1.39	2.50
3636-7	1-1/2"	3.11	3.38	2.38	1.53	1.58	3.50
3636-8	2"	3.28	3.88	2.88	1.55	1.73	4.25
3636-9	2-1/2"	4.01	5.00	3.61	1.99	2.02	6.00
3636-10	3"	4.28	5.75	4.30	2.14	2.14	8.00



# Dielectric Insulating Series - Galvanic Corrosion Prevention

## Class 3000 and 6000 Unions

Engineered to provide the most effective and efficient method of preventing electrolytic deterioration and galvanic corrosion, eliminating current flow. The thermo-baked epoxy polymer coating provides >600 volts/mil dielectric resistance (3-6 mil typ.).

### Coating Features (ASSE Standard #1079-2005):

- Excellent resistance to wear, abrasion, and shipping.
- Provides resistance to rust/corrosion per ASTM B-117 salt fog tests.
- Excellent resistance to ultraviolet light.
- Superior adhesion to all available HART union metals/materials.

### Physical Properties:

- Operating Temperature: -100 ° F (-73 ° C) to +300 ° F (149 ° C)
- Typical coating thickness: 3-6 mil
- Dielectric strength: >600 volts/mil (ASTM D149)
- Pencil hardness: H (ASTM B3363)
- Volume resistivity:  $1.26 \times 10^{16} \Omega\text{-cm}$  (ASTM D257)
- Gloss finish: High



### Fluid/Solvent Resistance (ASTM D1308-79):

- 40% Hydrochloric Acid / 40% Sulfuric Acid  
**No Effect**
- 87 Octane Unleaded Gasoline  
**No Effect**
- NaOH (50%) Sodium Hydroxide (room temp)  
**No Effect**
- Ethylene Glycol at room temperature  
**No Effect**

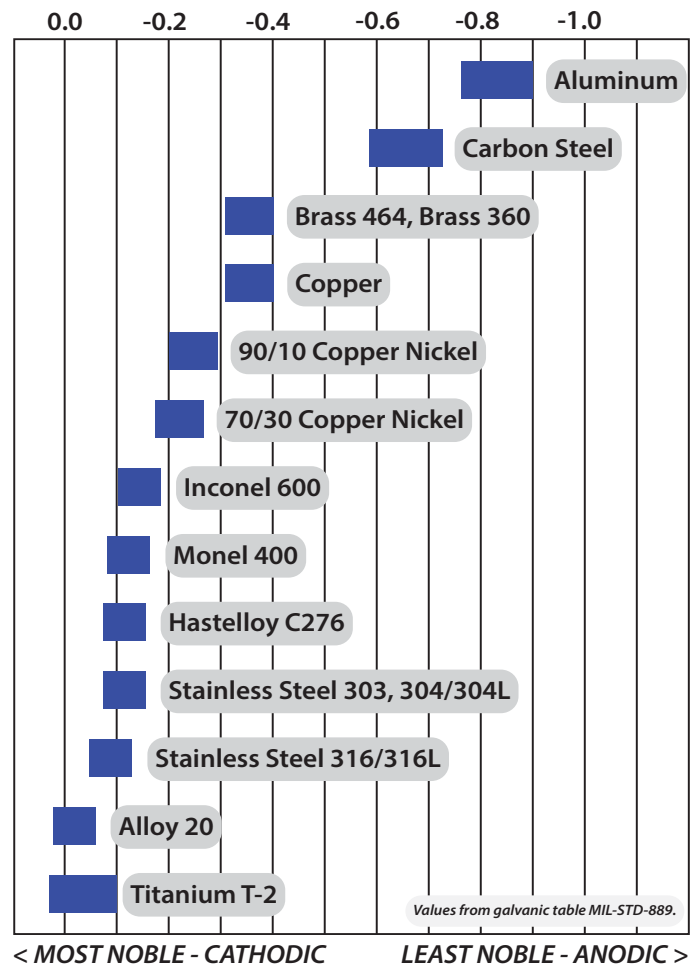
Config	Description	Config	Description	Class
D-3131	FNPT x FNPT	D-3232	MNPT x MNPT	3000
D-3132	FNPT x MNPT	D-3231	MNPT x FNPT	3000
D-3133	FNPT x Pipe Socket Weld	D-3233	MNPT x Pipe Socket Weld	3000
D-3134	FNPT x Tube Socket Weld	D-3234	MNPT x Tube Socket Weld	3000
D-3135	FNPT x Butt Weld	D-3235	MNPT x Butt Weld	3000
D-3136	FNPT x Copper Sweat	D-3236	MNPT x Copper Sweat	3000
D-6161	FNPT x FNPT	D-6262	MNPT x MNPT	6000
D-6162	FNPT x MNPT	D-6261	MNPT x FNPT	6000
D-6163	FNPT x Pipe Socket Weld	D-6263	MNPT x Pipe Socket Weld	6000
D-6165	FNPT x Butt Weld	D-6265	MNPT x Butt Weld	6000

## What is Galvanic Corrosion?

Galvanic corrosion, also known as bimetallic corrosion, is a common mode of corrosion failure that is largely preventable by proper pipeline corrosion design.

Galvanic corrosion occurs when two dissimilar metals are in contact with each other while in the presence of an electrolyte, such as saltwater or soil. One metal becomes the anode and corrodes faster than usual, while the other becomes the cathode and corrodes slower than usual. This is important as the more significant the difference between the two metals, the greater rate of galvanic corrosion.

For any combination of dissimilar metals, the metal with the lower number (further right) will act as an anode and corrode preferentially.



Use HART Dielectric Insulating Coating to prevent galvanic corrosion!



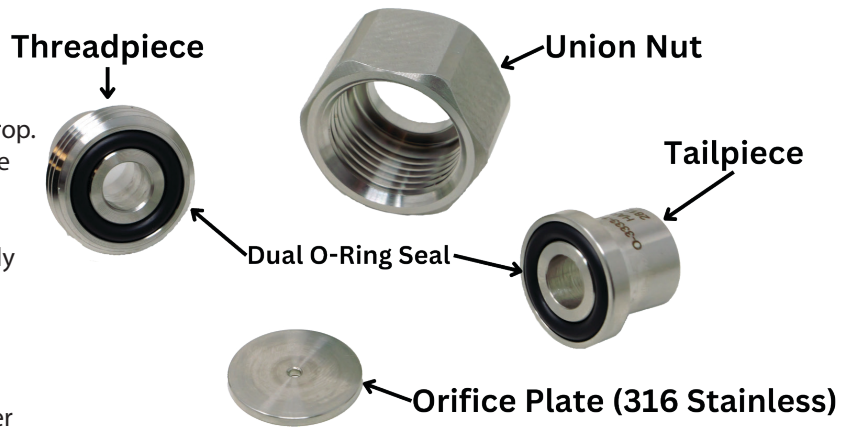
# Orifice Restriction Series

## Class 3000 and 6000 Unions

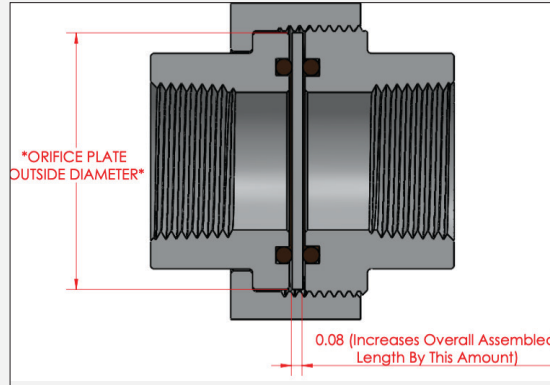
Engineered to provide the most effective and efficient method for precisely regulating flow and allowing a predetermined pressure drop. The union is designed with a double o-ring to ensure a zero-leakage seal.

Orifice unions are available in various materials and contain an easily replaceable orifice plate. The assembly is capable of a wide range of pressure and temperature applications. Flow rates can be easily changed by inserting replaceable metering plates into the union.

Note: Orifice plates can be provided blank or pre-drilled to customer specifications at no additional cost.



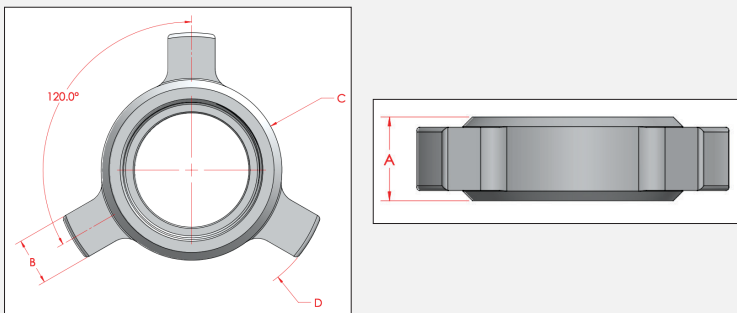
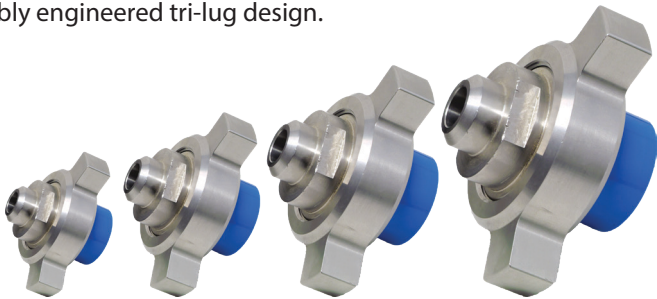
Union Size	Orifice Plate Outside Diameter (in)	HART Orifice Plate Part Number
1	1.000	O-3-1
2	1.375	O-3-2
3	1.375	O-3-3
4	1.625	O-3-4
5	2.000	O-3-5
6	2.500	O-3-6
7	2.750	O-3-7
8	3.240	O-3-8
9	3.950	O-3-9



# Hammer Lug Nut Option

## Class 3000 and 6000 Unions

HART Sure-Seal O-Ring Unions only require hand-tight + 1/4 turn to seal, but where applications require a hammer lug nut, HART offers a durably engineered tri-lug design.



Union Size	A (in)	B (in)	C-diameter (in)	D-diameter (in)
2	0.86	0.75	2.12	3.37
3	0.86	0.75	2.12	3.37
4	0.97	0.75	2.45	3.70
5	1.00	0.75	2.87	4.37
6	1.28	0.75	3.31	4.81
7	1.23	0.75	3.62	5.37
8	1.23	1.00	4.37	6.12
9 and up	Please contact for more information.			

# Custom Options

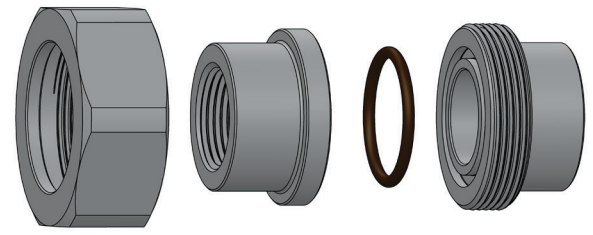
HART Sure-Seal O-Ring Unions can be customized to order with special non-standard options such as British Standard Pipe Taper Threads (BSPT-F and BSPT-M), butt weld O.D. ends, male pipe stub ends, wire lock nut, and even ACME threads for demanding applications.

Contact our Sales Engineering Team for more information about made-to-order solutions in near-stock delivery times!



# O-Ring Sure Seal Options

Engineered to provide Class 3000 and 6000 Service and are the most popular union in the industry for general purpose applications. The flat-face design provides turbulence-free fit across seats. This design is ideal where piping requirements dictate the need for a flat face seal to make and break the pipeline.



HART offers Viton, Buna-N, EPDM, Steam EPDM, and Teflon as standard options, but other elastomers and seals are available to fit your specific application needs.

Typical Properties				
	Viton® (FKM-A)	Buna-N (NBR)	Ethylene-Propylene (EPDM)	Steam EPDM (Parker® E0962-90)
<b>Color</b>	Brown	Black	Black	Black
<b>Temperature Range</b>	-17°F (-27°C) to 437°F (225°C)	-31°F (-35°C) to 230°F (110°C)	-65°F (-54°C) to 300°F (149°C)	-65°F (-54°C) to 500°F (260°C) <i>Short durations in steam up to 600°F (315°C)</i>
<b>Applications &amp; Chemical Resistance</b>	Oil, natural gas, gasoline, fuels and hydrocarbons, organic solvents and chemicals.  Non-Polar Chemicals including acids and chlorinated solvents.	Oil, natural gas, gasoline, mineral oils, aliphatic hydrocarbons, hydraulic fluids	Hot and cold water, steam (up to 300°F), glycol brake fluids, many organic and inorganic acids, soda and potassium alkalis, etc.	Hot and cold water, steam (up to 300°F), glycol brake fluids, many organic and inorganic dilute acids, soda and potassium alkalis, amines, hydrogen sulfide, ozone, steam/oil mixtures (<10% petroleum)
<b>Notes</b>	Low compression set. Excellent resistance to aging and ozone.  <i>Not recommended for polar chemical applications (hot water, MEK, acetone, steam, anhydrous ammonia, etc),</i>	Excellent compression set resistance.  <i>Not recommended for highly aromatic fuels and hydrocarbons, UV and ozone exposure, chlorinated hydrocarbons, polar solvents and chemicals, glycol brake fluids.</i>	Excellent resistance to aging and ozone. ANSI/NSF-61 approved version available upon request.  <i>Not recommended for petroleum and mineral oil products (oils, greases, fuels, natural gas)</i>	Excellent resistance to aging and ozone.  <i>Not recommended for petroleum and mineral oil products (oils, greases, fuels, natural gas)</i>
<b>Image</b>				
	Teflon® (PTFE)	Hydrogenated Nitrile (HNBR)	Kalrez® 4079 (FFKM)	Neoprene® Polychloroprene (CR)
<b>Color</b>	White	Black	Black	Black
<b>Temperature Range</b>	-328°F (-200°C) to 482°F (250°C)	-30°F (-34.4°C) to 325°F (163°C)	20°F (-5°C) to 600°F (315°C)	-40°F (-40°C) to 250°F (125°C)
<b>Applications &amp; Chemical Resistance</b>	Cryogenics, inert to nearly all known chemicals and solvents.  <i>Not recommended for chlorine trifluoride and elemental fluorine at extremely high temperatures</i>	Increased temperature resistance and newly developed automotive fuels, R-134a, oil lubricants.	Most universal chemical resistance of all the elastomers. Offers high-temperature stability for demanding applications. Kalrez compounds available for H2S performance as well.	Good resistance to water, refrigerants, water, ozone, UV weathering, ammonia, low-temp water solvents, and silicone oil.
<b>Notes</b>	<i>PTFE's stiffness lacks the spring-back resiliency of elastomer o-rings, thus requiring periodic replacement when breaking and re-making a union seal.</i>	Excellent compression set resistance.  <i>Not recommended for highly aromatic fuels and hydrocarbons, UV and ozone exposure, chlorinated hydrocarbons, polar solvents and chemicals, glycol brake fluids.</i>	<i>Often used for semiconductor environments. Offers excellent resistance to chemical attack and low volume swell.</i>	<i>Not recommended for highly aromatic fuels and hydrocarbons, benzene, chlorinated hydrocarbons, polar solvents and chemicals, glycol brake fluids.</i>
<b>Image</b>				

Viton®, Teflon®, Neoprene®, Kalrez®, and Parker® are registered trademarks of their respective owners.



# O-Ring Part Numbers

## Class 3000

HART Size	Nominal Size	HART Part Numbers					
		Viton	Buna-N	PTFE	EPDM	Steam EPDM	Spiralwound Gasket
1	1/4"	3-1-V	3-1-B	3-1-T	3-1-E	3-1-ES	3-1-G
2	3/8"	3-2-V	3-2-B	3-2-T	3-2-E	3-2-ES	3-2-G
3	1/2"	3-3-V	3-3-B	3-3-T	3-3-E	3-3-ES	3-3-G
4	3/4"	3-4-V	3-4-B	3-4-T	3-4-E	3-4-ES	3-4-G
5	1"	3-5-V	3-5-B	3-5-T	3-5-E	3-5-ES	3-5-G
6	1-1/4"	3-6-V	3-6-B	3-6-T	3-6-E	3-6-ES	3-6-G
7	1-1/2"	3-7-V	3-7-B	3-7-T	3-7-E	3-7-ES	3-7-G
8	2"	3-8-V	3-8-B	3-8-T	3-8-E	3-8-ES	3-8-G
9	2-1/2"	3-9-V	3-9-B	3-9-T	3-9-E	3-9-ES	Please call
10	3"	3-10-V	3-10-B	3-10-T	3-10-E	3-10-ES	Please call
11	3-1/2"	3-11-V	3-11-B	3-11-T	3-11-E	3-11-ES	Please call
12	4"	3-12-V	3-12-B	3-12-T	3-12-E	3-12-ES	Please call

## Class 6000

HART Size	Nominal Size	HART Part Numbers				
		Viton	Buna-N	PTFE	EPDM	Steam EPDM
1	1/4"	6-1-V	6-1-B	6-1-T	6-1-E	6-1-ES
2	3/8"	6-2-V	6-2-B	6-2-T	6-2-E	6-2-ES
3	1/2"	6-3-V	6-3-B	6-3-T	6-3-E	6-3-ES
4	3/4"	6-4-V	6-4-B	6-4-T	6-4-E	6-4-ES
5	1"	6-5-V	6-5-B	6-5-T	6-5-E	6-5-ES
6	1-1/4"	6-6-V	6-6-B	6-6-T	6-6-E	6-6-ES
7	1-1/2"	6-7-V	6-7-B	6-7-T	6-7-E	6-7-ES
8	2"	6-8-V	6-8-B	6-8-T	6-8-E	6-8-ES
9	2-1/2"	6-9-V	6-9-B	6-9-T	6-9-E	6-9-ES
10	3"	6-10-V	6-10-B	6-10-T	6-10-E	6-10-ES
11	3-1/2"	6-11-V	6-11-B	6-11-T	6-11-E	6-11-ES

## Steam Service up to 500 ° F

HART Unions are available with the innovative Parker™ E0962-90 compound EPDM o-ring for excellent performance in steam up to 500 ° F.

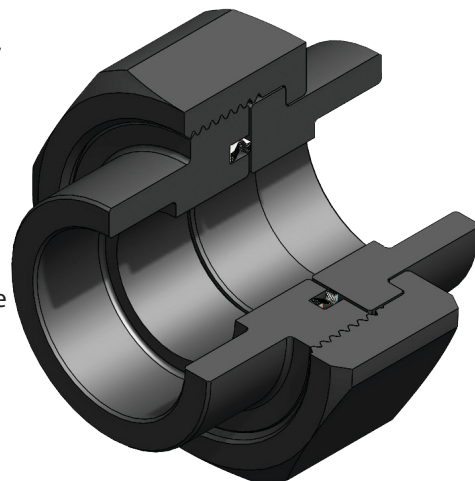
- Excellent performance in water and steam application up to 260 ° C (500 ° F)
- Can seal in steam up to 315 ° C (600 ° F) for short durations.
- Ideal for polar chemicals, including water/steam, amines, alkalines, ketones, alcohols, gaseous CO<sub>2</sub>, mixtures with less than 10% petroleum, etc.



## Super-Heated Steam and High-Temp Unions

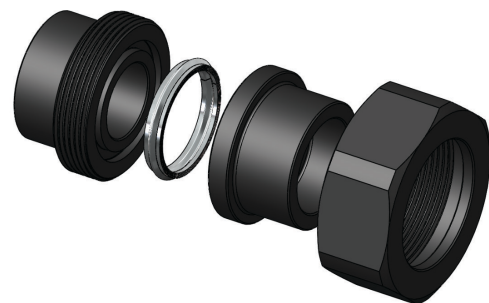
HART spiral wound gasket unions are engineered to provide class 3000 service in extreme temperatures and environmental conditions. Operational conditions such as temperature, pressure, and media will dictate the proper spiral wound gasket selection for your application.

Unions containing spiral wound gaskets can be supplied to meet national standards, such as MSS-SP-83 and ASME B16.20. The pipe union design is similar in principle to flange joints, but outperforms the difficulties associated with standard "ground-joint" pipe unions. This is accomplished by forming a seal with a replaceable spiral wound gasket without the need of a ground joint (ball & cone) finish. Our flat-face design provides turbulence-free fit across seats. This design is ideal where piping requirements dictate the need for a flat face seal to make and break the pipeline.



### Application & Performance:

- **Standard** graphite spiral wound gasket union  
Resistant to 850 ° F (450 ° C) for hydrocarbon and superheated steam service.
- **Custom** Options Available!  
Including 347 Stainless, Hastelloy, Thermiculite, and more.
- **Steam systems (superheated)**  
Saturated steam, steam trap, valve, pump, and compressor manifolds.
- **Variety of process fluids and gases to 3000 PSIG (CWP)**  
Heat transfer fluids, acids, caustics, nitrogen, hydraulic fluids, and hot oils with extreme temperatures.
- **Nuclear power plants**
- **Turbulence free:** All HART unions provide a turbulence-free fit across the seats.
- **Interchangeable spiral wound gaskets:** The common spiral wound gaskets used for the gas, oil, and power generation industries are 316 stainless steel with a graphite filler material. Options such as 347 stainless, Monel 400, Inconel 600, and Hastelloy windings are available upon request in combination with different gasket fillers (graphite, thermiculite, silicate, PTFE, etc).



## Cryogenic Systems

HART Class 3000 Unions are widely used to maintain very cold (cryogenic) temperatures to preserve liquefied gases and other substances within an enclosed piping system. These include systems such as cryogenic pumps, storage systems, piping, control valves, chillers, and dewars (containers) just to name a few. We offer o-rings to guarantee a leak-proof seal in numerous liquid gas cryogenic systems that require -65 °F to -320 °F resistance under high pressure.

We have extensive experience providing application-specific pipe unions for the following cryogenic industries: *Space, electronic, chemical manufacturing, liquid natural gas (LNG), control valves, medical, food, chilled transportation, and pharmaceutical.*

Example Customer Application Configuration: **3333-7-T-304L**  
(Socket Weld x Socket Weld, 1-1/2", PTFE Teflon O-Ring, 304L Stainless Steel)



## Oil & Gas

The Oil and Gas Industry includes exploration, extraction, refining, transporting and the marketing of products. HART has been an essential domestic manufacturer of our Sure-Seal O-ring Unions to the oil and gas industry since 1985. We have developed a deep understanding of the needs of our customers to support the various pipe union applications with a leakproof connection across the industry. Our unions are widely used on onshore and offshore drilling rigs to transfer petroleum, gas, drilling mud, cement, water, air, and many other media.

HART hammer nuts are interchangeable with standard HART union nuts and can also be manufactured with ACME style threads upon request. Hammer lug unions are particularly well-suited for high-pressure applications that need quick disconnection.

Example Customer Application Configuration: **D-3131-5-V-CS/316**  
(Dielectric, Female NPT x Female NPT, 1", Viton O-Ring, A105 Carbon Steel x 316 Stainless Steel)



## Wastewater Treatment & Filtration

HART Sure-Seal O-Ring Unions are widely used in wastewater treatment plants. Our carbon steel, stainless steel, and brass o-ring unions are the "go-to" materials for water and wastewater applications because of their proven leakproof connections and manufacturing adaptability to specific customer requirements. HART unions have been in service for over 30 years and have proven to reduce maintenance for repair, lost production time, and fines due to leakage and contamination.

We also manufacture brass unions for potable water applications with NSF/ANSI-61 approved o-rings and dielectric insulation.

Example Customer Application Configuration: **D-3136-5-EP-316/B464**  
(Dielectric, FNPT x SWEAT, 1", NSF/ANSI-61 Approved EPDM O-Ring, 316 Stainless Steel x Brass 464)



## Maritime & Military

HART provides a variety of union options to meet the maritime and military applications which require galvanic protection along with high quality. Our unions are used in critical applications requiring pressure-spike resistance along with extreme pressure in a marine piping system.

HART Sure-Seal Unions also meet the requirements for thermal shock (expansion resistance) and allow for ease of disassembly for proactive cleaning and maintenance. We provide the technical support needed to avoid selection of the wrong pipe union for these applications which can be catastrophic. Our Team has the knowledge to ensure the proper o-ring union and material specified for each type of pipeline in the marine industry.

Example Customer Application Configuration: **O-3333-5-E-316**  
(Orifice Restriction, Socket Weld x Socket Weld, 1", EPDM O-Ring, 316 Stainless Steel)





# ON-SITE / IN-PLANT TRAINING



Sure Seal O-Ring Unions

*HART Industrial Unions now offers customized Training Workshops designed to cut costs and increase process equipment reliability.*

This value-added program focuses on how HART’s innovative flat-faced “Sure Seal O-Ring Unions” will reduce downtime, increase productivity, and extend equipment life within your plant.

**Our one-hour hands-on training workshop, delivered by a HART Specialist, will help you to:**

- Identify applications and systems using HART Sure Seal O-Ring Unions
- Recognize common failures - cause & prevention
- Meet design standards specific to Class 3000 and 6000 Unions
- Describe transition and reducing capabilities and benefits within HART unions
- Implement future designs and innovations
- Discuss application case histories

**Training outcomes include:**

- Improved process efficiency
- Enhanced equipment reliability
- Optimized product quality
- Reduced energy costs
- Advanced operator safety
- Increased plant hygiene
- Understand the benefits of HART design vs. ball & cone



Our continuous innovations and application-specific products offer our customers a wealth of design flexibility and new methods. HART offers a variety of training opportunities to gain hands-on experience, use our products and improve manufacturing and facility operation efficiency.

**If you would like to schedule a HART In-Plant Training Workshop for your team, please call us at 1-800-769-0503 or e-mail us at [sales@hartindustries.com](mailto:sales@hartindustries.com)**



**Email**  
[sales@hartindustries.com](mailto:sales@hartindustries.com)



**Phone**  
1-800-769-0503



**Address**  
870A Four Rod Road  
Berlin, CT 06037

## HART O-RING UNIONS - MANUFACTURING SPECIFICATIONS



<b>Stainless Steel</b>	ASTM A182F304 & L ASTM A182F316 & L
<b>Carbon Steel</b>	ASTM A105, A105N, and 12L14
<b>Low Temperature</b>	ASTM A350-LF2
<b>Dimensions</b>	MSS SP-83
<b>Quality</b>	MSS SP-83
<b>Surface Finish</b>	MSS SP-83
<b>Testing</b>	MSS SP-83

<b>Butt Weld Ends</b>	ASME B16.9
<b>Socket Weld Wall</b>	ASME B36.10M
<b>Dimensions</b>	
<b>Pipe Threads</b>	ASME B1.20.1
<b>Unified Screw Threads (Nut Threads)</b>	ASME B1.1
<b>Socket Weld Ends</b>	ASME B16.11

**Union Identification** HART unions can be identified by the “WOG” pressure rating (3000 or 6000) which is included in the figure number marked on the union surface.

**Installation & Maintenance** Initial Installation: Turn nut hand tight & wrench one quarter (1/4) turn max. No further maintenance is required.

# HART

## SURE SEAL O-RING UNIONS



Scan here for more info and expert application support on HART Unions!

### HOW TO ORDER

1 Hour Response during normal business hours!

The chart below contains the necessary information to place an order. Use the appropriate code that corresponds to your application.

When a size reduction or change in material is needed, simply use a slash ("/") between the sizes or materials. Please reference the two examples below which include descriptions of the unions and their corresponding HART Part Numbers.

OPTIONS (PREFIX)		DESCRIPTION	TAIL PIECE	THREAD PIECE	SIZE	O-RING	MATERIAL	
O	ORIFICE: Flat Orifice Plate with Double O-Ring Seal	Female NPT (FNPT) Class 3000 Pipe	31	31	0 (1/8")	<b>STANDARD O-RINGS</b> V Viton® Fluorocarbon A (FKM-A) E Ethylene Propylene (EPDM) ES High-Temp Steam EPDM [up to 550°F max] (EPDM E0962) T Teflon® Tetrafluoroethylene (PTFE) B Buna-N / Nitrile (NBR) <b>SPECIALTY O-RINGS / SEALS</b> N Neoprene® Polychloroprene (CR) K Kalrez® 4079 Perfluoroelastomer (FFKM) N Hydrogenated Nitrile (HNBR) EP NSF-61 Approved Ethylene Propylene (EPDM) G Metallic Spiral Wound Graphite Seal I No O-Ring / Integral Seat ("Ball and Cone") <small>Viton®, Teflon®, Neoprene®, and Kalrez® are registered trademarks of their respective owners.</small>	A	Aluminum 6061
		Male NPT (MNPT) Class 3000 Pipe	32	32	1 (1/4")		B	Brass 360 or 464
D	DIELECTRIC (Insulating): Dielectric Coating applied to union tailpiece	Socket Weld (SW) Class 3000 Pipe	33	33	2 (3/8")		CS	A105/A350-LF2, A105 Normalized, and 12L14 CS
		Socket Weld (TUBE) Class 3000 Tube	34	34	3 (1/2")		304L	A182F304/304L Stainless Steel
H	HAMMER NUT: 3-Lug Hammer Blow / Lug Nut Option	Butt Weld (BW) Class 3000 Pipe	35	35	4 (3/4")		316L	A182F316/316L Stainless Steel
		Copper Sweat (SWEAT) Class 3000 Tube	36	36	5 (1")		73	70/30 Copper Nickel
		Female NPT (FNPT) Class 6000 Pipe	61	61	6 (1-1/4")		91	90/10 Copper Nickel
		Male NPT (MNPT) Class 6000 Pipe	62	62	7 (1-1/2")		H	Hastelloy C276
		Socket Weld (SW) Class 6000 Pipe	63	63	8 (2")		I	Inconel 600
		Socket Weld (TUBE) Class 6000 Tube	64	64	9 (2-1/2")		M	Monel 400
		Butt Weld (BW) Class 6000 Pipe	65	65	10 (3")		T	Titanium T-2
		Female NPT (FNPT) Class 6000 Pipe	61	61	11 (3-1/2")		A20	Alloy 20 (Carpenter Steel C20)
Male NPT (MNPT) Class 6000 Pipe	62	62	12 (4")					

#### SUFFIX (ADDITIONAL INFO)

**Male NPT (MNPT), Socket Weld (SW), and Butt Weld (BW):**  
Place desired Wall Thickness in parentheses. Note: S40 Standard for Class 3000 and S80 Standard for Class 6000 unless otherwise specified.

Examples: 6262-5-V-304(S160) 3335-7-E-CS(S80)

**Orifice Unions:** Place desired drilled orifice bore in parentheses.  
For blank plate, omit the bore or note "(blank)". Plates can be drilled at no additional cost!

Examples: O-3131-5-V-304(0.250") O-3333-4-B-316(blank)

#### CUSTOM OPTIONS AVAILABLE

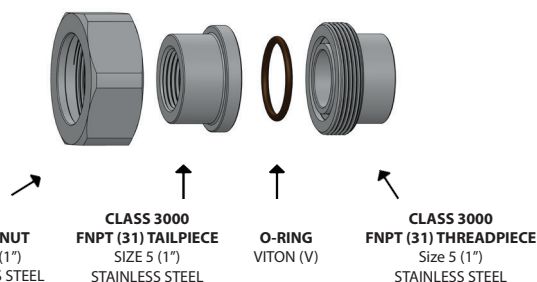
BSPT-F	BSPT (British Standard Pipe Taper) - Female, Rc
BSPT-M	BSPT (British Standard Pipe Taper) - Male, R
BW TUBE	Butt Weld with Tube O.D.
MALE PIPE END	Male Pipe End (unthreaded) for socket welding
ACME Nut	ACME Thread Nut for specialty applications

#### Example 1:

Class 3000, 1" Female NPT x 1" Female NPT, Viton O-Ring, Stainless Steel 316 connections.

**3131 - 5 - V - 316**  
Tail / Thread Size O-Ring Material

#### Detailed Breakdown:



#### Example 2:

Dielectric, Class 3000, 1" Male NPT x 3/4" Copper Sweat, EPDM O-Ring, Stainless Steel 304L Tailpiece with dielectric coating, Lead-free Brass 464 Threadpiece.

**D - 3236 - 5/4 - E - 304L/B464**  
Option Tail / Thread Size O-Ring Tail Material / Thread Material

#### Detailed Breakdown:

