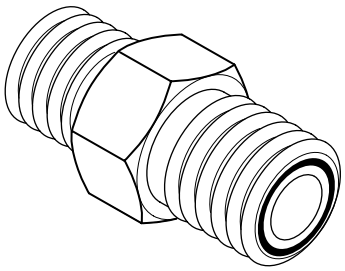
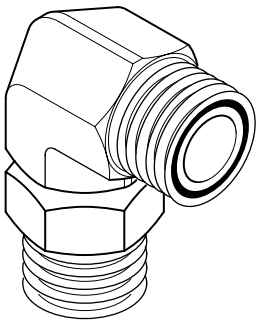
FITTINGS - STEEL TUBE, O-RING FACE SEAL (ORFS) & STRAIGHT PORT THREAD O-RING

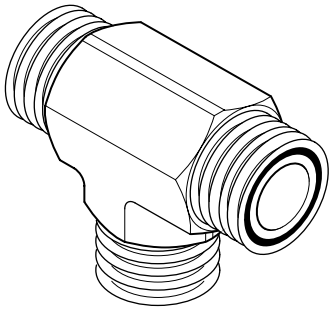
RENEWAL PARTS | Supersedes: Nothing | Form 50.20-RP2 (1204)



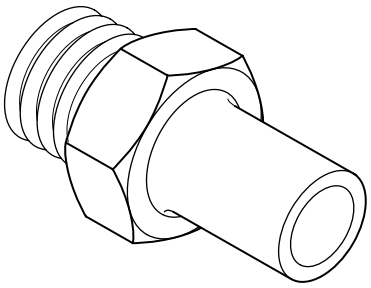
STRAIGHT THREAD CONNECTOR



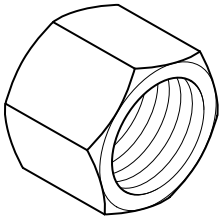
STRAIGHT THREAD ELBOW



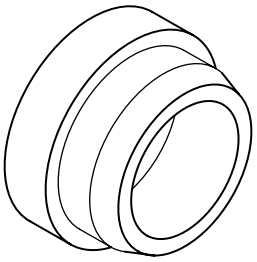
UNION TEE



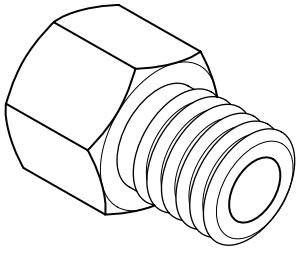
TUBE ADAPTER



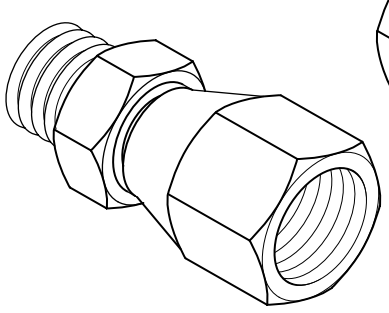
O-RING FACE SEAL TUBE NUT



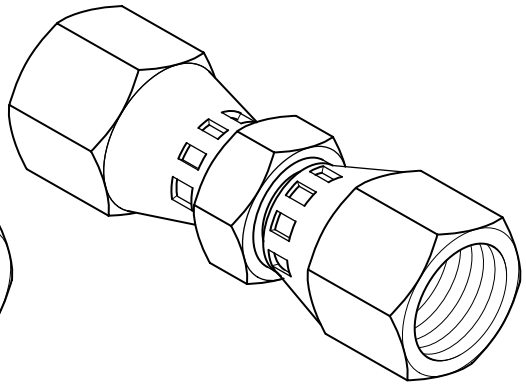
ORFS BRAZE SLEEVE



CONVERSION ADAPTER



SWIVEL CONNECTOR



SWIVEL NUT UNION

LD10333

TABLE 29 - O-RING SEALS, NEOPRENE

PART NO.	AS 568-	THREAD SIZE (NOM. TUBE SIZE)	MATERIAL
028-12961-001	904	7/16 - 20 UNF - 2A (1/4 TUBE)	RED
002	905	1/2 - 20 UNF - 2A (5/16 TUBE)	BLACK
003	906	9/16 - 18 UNF - 2A (3/8 TUBE)	BLACK
004	908	3/4 - 16 UNF - 2A (1/2 TUBE)	BLACK
005	910	7/8 - 14 UNF - 2A (5/8 TUBE)	BLACK
006	912	1-1/16 - 12 UN - 2A (3/4 TUBE)	BLACK
007	914	1-3/16 - 12 UN - 2A (7/8 TUBE)	BLACK
008	916	1-5/16 - 12 UN - 2A (1" TUBE)	BLACK
009	136	2-1/4 - 12 UN - 2A	BLACK
010	932	2-1/2 - 12 UN - 2A	BLACK
011	011	9/16 - 18 UNF - 2A (1/4" FACE SEAL)	BLACK
012	012	11/16 - 16 UNF - 2A (3/8" FACE SEAL)	BLACK
013	014	13/16 - 16 UNF -2A (1/2" FACE SEAL)	BLACK
014	016	1 - 14 UNF - 2A (5/8" FACE SEAL)	BLACK
015	018	1-3/16 - 12 UN - 2A (3/4" FACE SEAL)	BLACK
016	021	1-7/16 - 12 UN - 2A (1" FACE SEAL)	BLACK
017	920	1-5/8 - 12 UN - 2A (1-1/4 TUBE)	BLACK
018	022	1-1/8 - 18 UNEF - 2A	BLACK
019	029	2-12 UN-2A (1-1/2" FACE SEAL)	BLACK
020	924	1-7/8 -12 UN-2A (1-1/2" TUBE)	BLACK
021	903	3/8-24 UNF-2A (3/16 TUBE)	BLACK
022	025	1-11/16 12 UN - 2A (1-1/4" FACE SEAL)	BLACK
023	235	2" NORRIS VALVE	BLACK
024	237	2-1/2" NORRIS VALVE	BLACK
025	346	3" NORRIS VALVE	BLACK
026	430	4" NORRIS VALVE	BLACK
027	437	5" NORRIS VALVE	BLACK
028	440	6" NORRIS VALVE	BLACK
029	446	8" NORRIS VALVE	BLACK
030	451	10" NORRIS VALVE	BLACK
031	455	12" NORRIS VALVE	BLACK
032	458	14" NORRIS VALVE	BLACK
033	462	16" NORRIS VALVE	BLACK
034	466	18" NORRIS VALVE	BLACK
035	112	(STUD) - 1/2-20 UNF	BLACK
909	---	NEN 176 - G2	BLACK

LD10361

NOTE: RED - Neoprene per ASTM D2000M3BC710A14B14E014E034Z
BLACK - Neoprene per ASTM D2000M3BC710A14B14E014E034

APPENDIX

ABBREVIATIONS

Although the following abbreviations may have broader interpretations elsewhere in the industry, their speci c meanings within this manual are as follows:

NPT: American Standard Taper Pipe Threads for General Use

NPTF: Dryseal American Standard Taper Pipe

SAE: denotes Straight Thread per SAE J1926

ORFS: O-Ring Face Seal

ORB: O-Ring Boss, externally threaded

ORP: O-Ring Port, internally threaded

DEFINITIONS

Although the following terms may have broader interpretations elsewhere in the industry, their speci c meanings within this manual are as follows:

Boss: A relatively short protrusion or projection from the surface of a forging or casting, often cylindrical in shape. Typically externally threaded.

Boss, Pipe: A boss which conforms to pipe thread standards.

Boss, Straight Thread: A boss which conforms to straight thread standard SAE J1926. It typically employs an O-ring compressed in a wedge-shaped cavity for sealing.

Brazing: The joining of metals through the use of heat and capillary ow of a ller metal. The ller metal having a melting temperature above 840 degrees Fahrenheit, but below the melting point of the metals being joined.

Fitting: A connector or closure for uid lines and passages.

Flux: In brazing, cutting, soldering or welding, material used to dissolve or facilitate the removal of oxides and other undesirable substances.

Joint, Mechanical: A gas-tight joint obtained by joining metal parts through a positive holding mechanical construction (such as anged joint, screwed joint, ared joint, or O-ring seal).

Joint, Brazed: A gas-tight joint obtained by joining metal parts with alloys that melt at temperatures higher than 800°F (426°C) but less than the melting temperatures of the joined parts.

Joint, Welded: A gas-tight joint obtained by the joining of metal parts in the plastic or molten state or through the use of ller metals that melt at temperatures 800°F (426°C) and above.

O-ring: A torus, or doughnut shaped object, generally made from elastomer and is used primarily for sealing.

Pipe: (NPT) A tubular metal product that includes iron pipe size (I.P.S.) and schedule number in its classi cation.

Pipe Thread, Dry Seal: (NPTF) Tapered pipe threads in which sealing is a function of root and crest interference.

Port: A terminus of a passage in a component to which conductors can be connected. Typically internally threaded.

Port, Pipe: A port which conforms to pipe thread standards.

Port, Straight Thread: A port which conforms to straight thread standards. It typically employs an O-ring compressed in a wedge-shaped cavity.

Tube: Hollow, cylindrical products having outside diameters that are not standardized for threading. Tubes are dimensionally classi ed in terms of their outside diameters and wall thicknesses.

Welding: Joining two or more pieces of metal by applying heat, pressure or both with or without ller metal, to produce a localized union through fusion or recrystallization across the interface.

APPLICATION NOTES

1. Fittings & Tubing
   Best eld practice is to use stainless steel ttings and welded stainless steel tubing in preference to carbon steel ttings or seamless tubing.
   a. Stainless Steel (SS) tubing shall be Grade TP316 or TP304.
   b. SS tubing sizes 1/4 inch & 3/8 inch nominal O.D. shall have a minimum wall thickness shall of 0.035 inch (20 gauge) to 0.049 inch (18 gauge).
   c. SS tubing sizes 1/2 inch through 2 inch nominal O.D. shall have a minimum wall thickness shall of 0.049 inch (18 gauge).
   d. SS tubing with a minimum 0.049 inch (18 gauge) wall thickness is preferred for system working pressures greater than 250 psig and/or tubing subject to pulsation or vibration.

2. Brazing of Fittings & Tubing
   The brazing of ORFS Braze Sleeves to Steel and/or Stainless Steel Tubing requires the use of silver based brazing ller metal for brazing ferrous and non-ferrous metals and with general purpose brazing ux for silver brazing as follows.

Silver Brazing Filler Metal

Chemical composition of the silver brazing ller metal used shall be:

Silver	49% to 51%
Copper	14.5% to 16.5%
Zinc	14.5% to 18.5%
Cadmium	17% to 19%

Approved Suppliers:
(a) Handy & Harman – Easy-Flo
(b) Englehard – Silvaloy 50
(c) J.W. Harris – Stay-Silv 50

Silver Brazing Flux – General Purpose

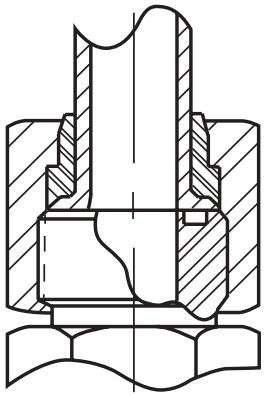
Approved Suppliers:
(a) Handy & Harman – Handy Flux (White)
(b) Englehard – Ultra Flux (White)
(c) J.W. Harris – Stay-Silv (White)

3. Thread Sealant

The following table provides an overview of the application of single component anaerobic compounds for sealing, thread lockers, cleaner and primer to pipe thread joints, straight thread o-ring ttings, and threaded fasteners.

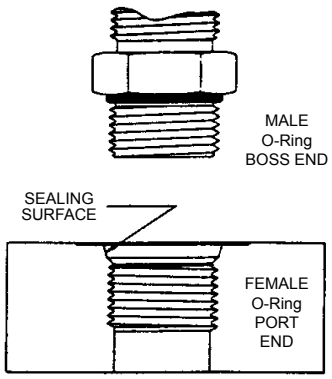
TYPE	GRADE	COLOR	PART NO.	CONTAINER SIZE	CURE SPEED STEEL @ 25°C		TEMP. RANGE	APPLICATION
					FIXTURE	FULL	°F	
Thread Locker	243	Blue	013-01678-000	50 ML	10 Min.	24 Hrs.	-65 to +300	Use on permanent refrigerant tapered thread pipe and fittings over 1/2" in diameter. For fittings 3" and over apply primer to both surfaces. Suitable with light oil contamination. Flare Fittings – apply in a thin film on the inner an outer surface of the flare and to one thread of the male threaded surface. Hand tool removable.
Gasket Sealant	518	Red	013-03086-000	50 ML	4 Hrs.	24 Hrs.	-65 to +300	Making gaskets, coating gaskets and o'-rings to improve sealing. Use with Straight Thread O-Ring components such as Sight Glasses, Heaters and Float switches by placing a film on the o-ring. **Do Not** use in the straight threads.
		Red	013-02827-000	300 ML	4 Hrs.	24 Hrs.	-65 to +300	
Thread Sealant	554	Red	013-03089-000	10 ML	30 Min.	24 Hrs.	-65 to +300	Refrigerant pipe sealant up to 1/2" dia. Diameters over 1/2" may require heat to disassemble.
		Red	013-02894-000	250 ML	30 Min.	24 Hrs.	-65 to +300	
	565	White	013-03090-000	50 ML	30 Min.	24 Hrs.	-65 to +300	Refrigerant & water sealant for removable tapered pipe thread fittings above 1/2". Use with primer on both surfaces for joints 2" and over. Use primer with aluminum and stainless steel.
		White	013-02023-000	250 ML	30 Min.	24 Hrs.	-65 to +300	
	567	White	013-02280-000	250 ML	30 Min.	24 Hrs.	-65 to +400	Refrigerant pipe sealant for removable tapered pipe thread fittings above 1/2". Use with primer on both surfaces for joints 2" and over. Has anti-gall properties for stainless steel applications. Use primer with aluminum and stainless steel.
Cleaner	7070	Clear	013-02899-000	16 OZ	---	---	---	Clean surfaces with generous spray. Wipe with clean towel when still wet to insure heavy contamination is removed.
Primer	N 7649	Green	013-01753-000	1.75 OZ	---	---	---	General purpose primer/activator for curing anaerobic adhesives. Acetone solvent. Primer should always be used with cadmium, zinc, or tin plated parts, with anodized or chromate surfaces, with stainless steel, titanium or aluminum parts, or with black oxide on steel. 013-01753-000 is a 1.75 fl. oz. bottle with brush and pump spray. 013-02986-000 is a 4.5 oz. aerosol can.
		Green	013-02986-000	4.5 OZ	---	---	---	

4. O-Ring Face Seal (ORFS) Fitting and Tube dimensional data



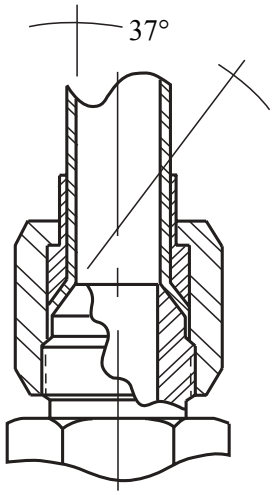
O-RING FACE SEAL FITTING TUBE END CONNECTION						
FITTING SAE	**NOMINAL TUBE O.D.**				**ORFS THREAD SIZE** SAE J1453	**O-RING**
	English		**Metric**			
Dash Size	Nominal	Decimal	Nominal	Decimal	**UNF-2A (male) UNF-2B (female)**	**AS568-**
	(in.)	(in.)	(mm)	(in.)		
-4	1/4	0.250	6	0.197	9/16-18	011
-6	3/8	0.375	10	0.315	11/16-16	012
-8	1/2	0.500	12	0.394	13/16-16	014
-10	5/8	0.625	14	0.472	1-14	016
-12	3/4	0.750	20	0.630	1-3/16-12	018
-14	7/8	0.875	22	0.787	1-5/16-12	020
-16	1	1.000	25	0.984	1-7/16-12	021
-20	1-1/4	1.250	30	1.260	1-11/16-12	025
-24	1-1/2	1.500	38	1.575	2-12	029
-32	2	2.000	50	1.969	2-1/2-12	135

5.Straight Thread O-Ring Port dimensional data



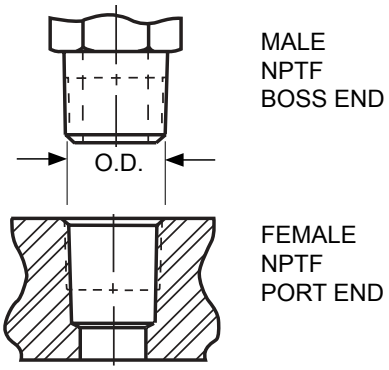
STRAIGHT THREAD O-RING PORT DIMENSIONAL DATA						
FITTING	**NOMINAL TUBE O.D.**				**THREAD SIZE** SAE J514	**O-RING**
SAE	**English**		**Metric**			
Dash Size	Nominal	Decimal	Nominal	Decimal	**UNF-2A (Boss) UNF-2B (Port)**	**AS568-**
	(in.)	(in.)	(mm)	(in.)		
-4	1/4	0.250	6	0.197	7/16-20	904
-5	5/16	0.313	8	0.236	1/2-20	905
-6	3/8	0.375	10	0.315	9/16-18	906
-8	1/2	0.500	12	0.394	3/4-16	908
-10	5/8	0.625	14	0.472	7/8-14	910
-12	3/4	0.750	20	0.630	1-1/16-12	912
-14	7/8	0.875	22	0.787	1-3/16-12	914
-16	1	1.000	25	0.984	1-5/16-12	916
-20	1-1/4	1.250	30	1.260	1-5/8-12	920
-24	1-1/2	1.500	38	1.575	1-7/8-12	924
-32	2	2.000	50	1.969	2-1/2-12	932

6. 37° Angle Flare Fitting and Tube dimensional data



37° ANGLE FLARE TUBE END CONNECTION					
FITTING	**NOMINAL TUBE O.D.**				**STRAIGHT THREAD SIZE** SAE J514
SAE	**ENGLISH**		**METRIC**		
Dash Size	Nominal	Decimal	Nominal	Decimal	**UNF-2A (male) UNF-2B (female)**
	(in.)	(in.)	(mm)	(in.)	
-4	1/4	0.250	6	0.197	7/16-20
-5	5/16	0.313	8	0.236	1/2-20
-6	3/8	0.375	10	0.315	9/16-18
-8	1/2	0.500	12	0.394	3/4-16
-10	5/8	0.625	14	0.472	7/8-14
-12	3/4	0.750	20	0.630	1-1/16-12
-14	7/8	0.875	22	0.787	1-3/16-12
-16	1	1.000	25	0.984	1-5/16-12
-20	1-1/4	1.250	30	1.260	1-5/8-12
-24	1-1/2	1.500	38	1.575	1-7/8-12
-32	2	2.000	50	1.969	2-1/2-12

7. Dryseal American Standard Taper Pipe Threads dimensional data



DRYSEAL AMERICAN STANDARD TAPER PIPE THREADS DIMENSIONAL DATA	
THREAD SIZE	**O.D.**
NPTF	Male Thread Large Diameter (in.)
1/8-27	0.41
1/4-18	0.55
3/8-18	0.68
1/2-14	0.85
3/4-14	1.06
1-11 1/2	1.33
1 1/4-11 1/2	1.67
1 1/2-11 1/2	1.91

8. Thread Designation and Standards for threads used in uid connectors

Designations and Standards for Threads Used in Fluid Connectors			
THREAD TYPE	**ABBREVIATION**	**DESCRIPTION**	**APPLICABLE STANDARDS**
TAPER PIPE	ANPT	Aeronautical National Taper Pipe Threads	MIL-P-7105
	NPT	American Standard Taper Pipe Threads for General Use	ANSI B1.20.1 FED-STD-H28/7
	NPTF	Dryseal American Standard Taper Pipe Threads (used in steel and brass fittings)	SAE J476 ANSI B1.20.3 FED-STD-H28/8

37° and 45° Flare
Nose Angles

1/8
1/4"
3/8"
1/2"

Male Pipe Thread Sizes

3/4"

1"

1-1/4"

1-1/2"

2"

5/8"
-10

1/2"
-8

3/8"
-6

1/4"
-4

1"
-16

7/8"
-14

3/4"
-12

1-1/2"
-24

1-1/4"
-20

O-Ring Face Seal (SAE J1453)

2"
-32

1-1/2"
-24

1-1/4"
-20

1"
-16

7/8"
-14

SAE (JIC) 37° Flare Nose Cone Sizes

Male Pipe Thread Sizes

FITTING END SIZE CHART

SAE (JIC) 37° Flare Nose Cone Sizes

SAE 45° Flare
Nose Cone Sizes

3/4"
-12

5/8"
-10

1/2"
-8

3/8"
-6

5/16
-5

1/4"
-4

3/4"
-12

3/8"
-6