

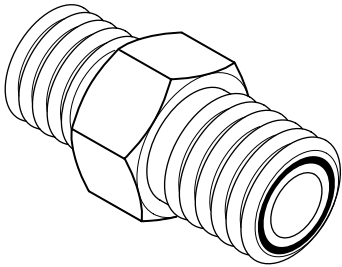


**FITTINGS - STEEL TUBE,
O-RING FACE SEAL (ORFS) &
STRAIGHT PORT THREAD O-RING**

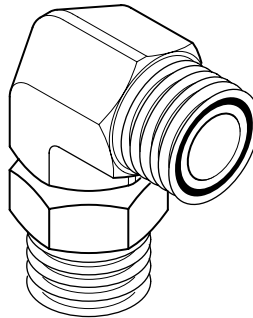
RENEWAL PARTS

Supersedes: Nothing

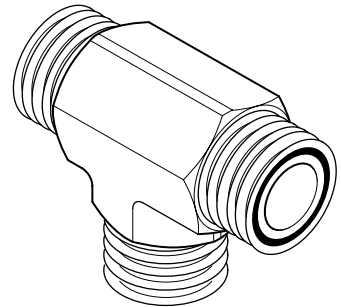
Form 50.20-RP2 (1204)



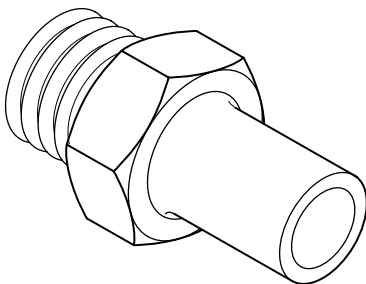
**STRAIGHT THREAD
CONNECTOR**



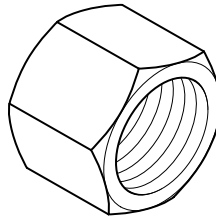
**STRAIGHT THREAD
ELBOW**



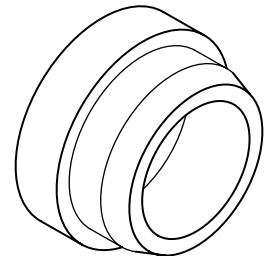
UNION TEE



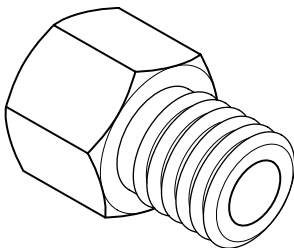
TUBE ADAPTER



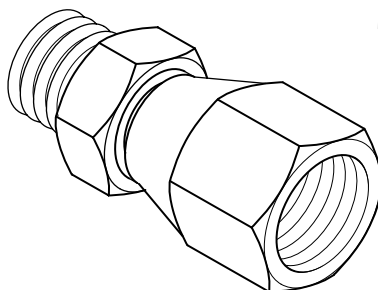
**O-RING FACE SEAL
TUBE NUT**



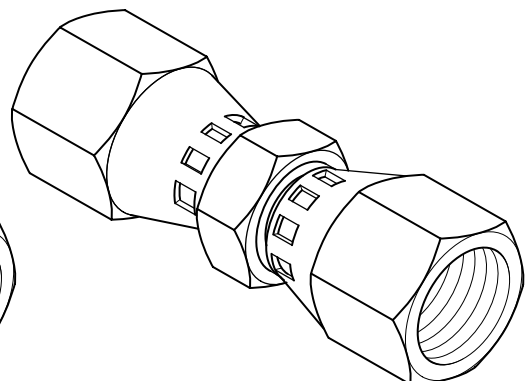
**ORFS BRAZE
SLEEVE**



**CONVERSION
ADAPTER**



**SWIVEL
CONNECTOR**



**SWIVEL NUT
UNION**

IMPORTANT!

READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in

which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to areas of potential hazard:



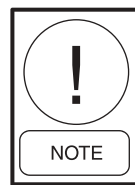
DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



CAUTION identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution. Usually an instruction will be given, together with a brief explanation.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



NOTE is used to highlight additional information which may be helpful to you.



All piping must be in accordance with YORK's published specifications and must be performed ONLY by qualified personnel. YORK will not be responsible for damages/problems resulting from improper connections to the compressor or piping system components. Failure to follow this will void the manufacturer's warranty and cause serious damage to property or injury to persons.

CHANGEABILITY OF THIS DOCUMENT

In complying with YORK's policy for continuous product improvement, the information contained in this document is subject to change without notice. While YORK makes no commitment to update or provide current information automatically to the manual owner, that information, if applicable, can be obtained by contacting the nearest YORK Applied Systems Service office.

It is the responsibility of operating/service personnel as to the applicability of these documents to the equipment in question. If there is any question in the mind of operating/service personnel as to the applicability of these documents, then, prior to working on the equipment, they should verify with the owner whether the equipment has been modified and if current literature is available.

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SCOPE

This renewal parts manual covers the line of steel tube fittings known as straight thread O-ring fittings, intended for joining tube end to tube end, tube end to tapered pipe thread, tube end to straight (port) thread or straight thread to straight thread connection.

BACKGROUND

YORK Large Tonnage Centrifugal Chiller (LTC) compressor ports as well as refrigerant and oil piping systems components have evolved the type of fittings and tubing being used. YORK legacy chillers compressors have historically had pipe thread ports and the refrigerant and oil system components used a mix of copper and steel tubing with 45° Angle Flare fittings used with copper tubing and 37° Angle Flare fittings used with steel tubing (typically 0.035 wall, 20 ga. tubing). Current design YORK LTC compressor ports are Straight Thread O-Ring and the refrigerant and oil piping systems components use O-Ring Face Seal (ORFS) type fittings and stainless steel tubing having a minimum of 0.049 (20 ga.) or 0.065 (16 ga.) wall thickness. O-Ring seal mechanical connections have proven superior to Angle Flare and/or Pipe thread connections in LTC systems for minimizing the potential of refrigerant and/or oil system leaks in accordance with ASHRAE Standard 147.

PURPOSE

This Renewal Parts publication is useful for field interconnections between YORK LTC legacy (NPT & Angle Flare) and current design (Straight Thread O-Ring and ORFS) compressors as well as refrigerant and oil system components, such as encountered during the field installation of a Driveline RetroKit.

The components listed within this manual are intended to be used during the normal course of LTC retrofit and/or service to the compressor or system piping.

The objective is to provide a means to:

- (a) Field adapt preexisting system piping to current design compressor ports and component fittings.
- (b) Minimize or reduce the potential for system leaks by replacing, and/or reducing the number of, Angle Flare or Pipe Thread mechanical-joint connections to the current LTC design O-ring seal type in accordance with ASHRAE Standard 147.

It is preferable to replace/convert Angle Flare tubing ends using brazed-joint adapter sleeves, tubes, etc. rather than using an Angle Flare to O-ring conversion fitting resulting in additional mechanical-joint connections.

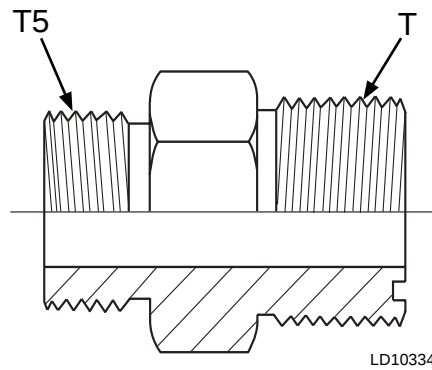
REFERENCES – NORMATIVE

- (a) ANSI/SAE Standard J1926: Straight Thread O-Ring Port Connections for General Use and Fluid Power
- (b) ANSI Standard B1.20.3: Dryseal Pipe Threads
- (c) ANSI/SAE Standard J1453: Fitting O-Ring Face Seal
- (d) SAE J514: Hydraulic Tube Fittings 37° Angle Flare
- (e) Aerospace Standard AS-568: Size Standard for O-Rings
- (f) ANSI/ASHRAE Standard 147: Reducing the Release of Halogenated Refrigerants from Refrigerating and Air-Conditioning Equipment and Systems.

REFERENCES – INFORMATIVE

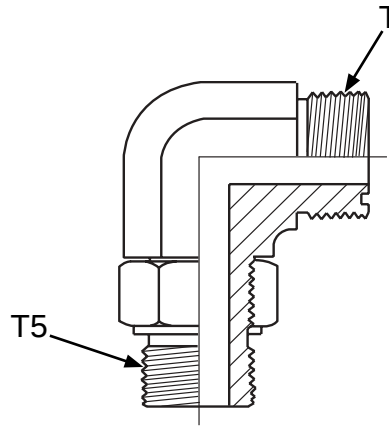
For fittings listed herein that do not have York P/Ns assigned and/or for information regarding fittings not listed, consult the Parker [Industrial Tube Fittings, Adapters and Equipment Catalog 4300](http://www.parker.com/tfd/cat/pdf/files/open.pdf) @ <http://www.parker.com/tfd/cat/pdf/files/open.pdf>.

To Order a copy of the Industrial Tube Fittings Catalog 4300 and accompanying CD, call 1-800-272-7537 or E-mail c-parker@parker.com.

**FIGURE 1 - STRAIGHT THREAD CONNECTOR****TABLE 1 - STRAIGHT THREAD CONNECTOR**

NOMINAL TUBE SIZES		TUBE END		PORT END		FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	3/16	9/16-18	011	3/8-24	903	023-20215-000	
	1/4	9/16-18	011	7/16-20	904	023-18993-000	023-17525-000
	3/8	9/16-18	011	9/16-18	906		
	1/2	9/16-18	011	3/4-16	908		
3/8	3/8	11/16-16	012	9/16-18	906	023-18976-000	
	1/4	11/16-16	012	7/16-20	904		
	5/16	11/16-16	012	1/2-20	905	023-22121-000	
	1/2	11/16-16	012	3/4-16	908	023-18992-000	023-17526-000
	5/8	11/16-16	012	7/8-14	910		
1/2	1/2	13/16-16	014	3/4-16	908	023-18983-000	023-17527-000
	3/8	13/16-16	014	9/16-18	906		
	5/8	13/16-16	014	7/8-14	910		
	3/4	13/16-16	014	1-1/16-12	912	023-20200-000	
	1	13/16-16	014	1-5/16-12	916		
5/8	5/8	1-14	016	7/8-14	910		
	1/2	1-14	016	3/4-16	908		
	3/4	1-14	016	1-1/16-12	912		
3/4	3/4	1-3/16-12	018	1-1/16-12	912	023-18290-000	023-17528-000
	1/2	1-3/16-12	018	3/4-16	908	023-20858-000	
	5/8	1-3/16-12	018	7/8-14	910	023-20201-000	
	1	1-3/16-12	018	1-5/16-12	916	023-20224-000	
7/8	7/8	1-5/16-12	020	1-3/16-12	914		
1	1	1-7/16-12	021	1-5/16-12	916	023-18972-000	023-17524-000
	3/4	1-7/16-12	021	1-1/16-12	912	023-18974-000	
	1-1/4	1-7/16-12	021	1-5/8-12	920	023-20203-000	
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920	023-20230-000	
	1	1-11/16-12	025	1-5/16-12	916		
	1-1/2	1-11/16-12	025	1-7/8-12	924		
1-1/2	1-1/2	2-12	029	1-7/8-12	924		
	1-1/2	2-12	029	1-5/8-12	920		
2	2	2-1/2-12	135	2-1/2-12	932		

O-Ring Seal P/N's listed in Table 29

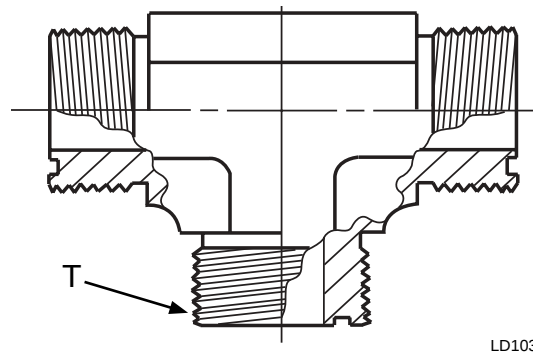


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FIGURE 2 - STRAIGHT THREAD ELBOW**TABLE 2 - STRAIGHT THREAD ELBOW**

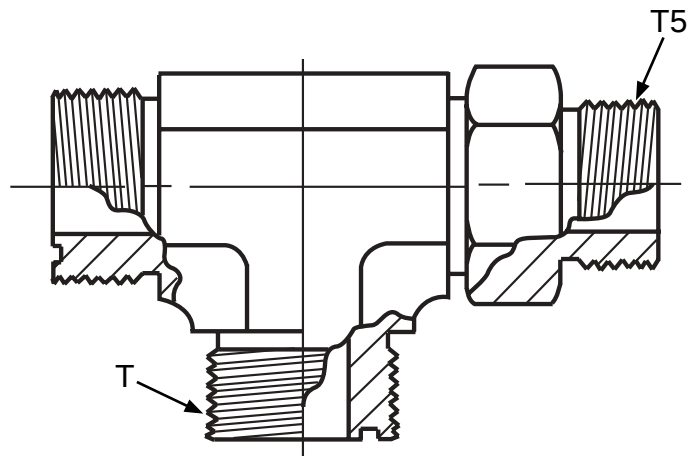
NOMINAL TUBE SIZES		TUBE END		PORT END		FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	1/4	9/16-18	011	7/16-20	904		
	3/8	9/16-18	011	9/16-18	906		
	1/2	9/16-18	011	3/4-16	908		
3/8	3/8	11/16-16	012	9/16-18	906	023-18980-000	023-17530-000
	1/4	11/16-16	012	7/16-20	904	023-20818-000	
	1/2	11/16-16	012	3/4-16	908	023-18981-000	
	5/8	11/16-16	012	7/8-14	910	023-19099-000	
	3/4	11/16-16	012	11/16-16	912		
1/2	1/2	13/16-16	014	3/4-16	908	023-18982-000	023-17532-000
	3/8	13/16-16	014	9/16-18	906		
	5/8	13/16-16	014	7/8-14	910		
	3/4	13/16-16	014	1-1/16-12	912		
5/8	5/8	1-14	016	7/8-14	910		
	1/2	1-14	016	3/4-16	908		
	3/4	1-14	016	1-1/16-12	912		
3/4	3/4	1-3/16-12	018	1-1/16-12	912	023-18291-000	023-17531-000
	1/2	1-3/16-12	018	3/4-16	908	023-21937-000	
	5/8	1-3/16-12	018	7/8-14	910	023-21938-000	
	1	1-3/16-12	018	1-5/16-12	916	023-20213-000	
7/8	7/8	1-5/16-12	020	1-3/16-12	914		
1	1	1-7/16-12	021	1-5/16-12	916	023-18292-000	
	3/4	1-7/16-12	021	1-1/16-12	912		
	1-1/4	1-7/16-12	021	1-5/8-12	920		
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920		
	1	1-11/16-12	025	1-5/16-12	916		
	1-1/2	1-11/16-12	025	1-7/8-12	924		
1-1/2	1-1/2	2-12	029	1-7/8-12	924		
	1-1/4	2-12	029	1-5/8-12	920		
2	2	2-1/2-12	135	2-1/2-12	932		

O-Ring Seal P/N's listed in Table 29

**FIGURE 3 - ORFS UNION TEE****TABLE 3 - ORFS UNION TEE**

NOMINAL TUBE SIZES TUBE SIDE (INCHES)	TUBE END		FITTING ONLY	
	'T' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
			STEEL	STAINLESS STEEL
1/4	9/16-18	011		
3/8	11/16-16	012	023-21883-000	
1/2	13/16-16	014		
5/8	1-14	016		
3/4	1-3/16-12	018	023-18913-000	
7/8	1-5/16-12	020		
1	1-7/16-12	021		
1-1/4	1-11/16-12	025	023-20843-000	
1-1/2	2-12	029	023-21907-000	
2	2-1/2-12	135		

O-Ring Seal P/N's listed in Table 29

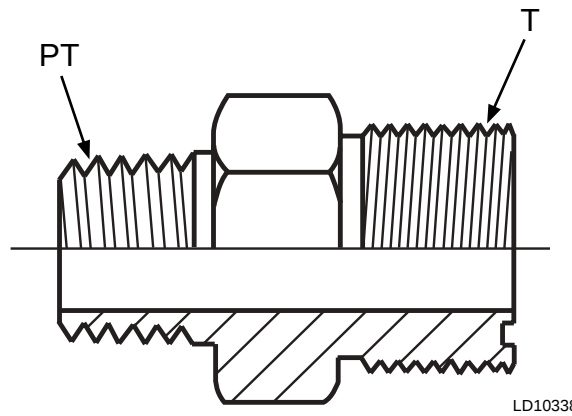


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FIGURE 4 - STRAIGHT THREAD RUN TEE**TABLE 4 - STRAIGHT THREAD RUN TEE**

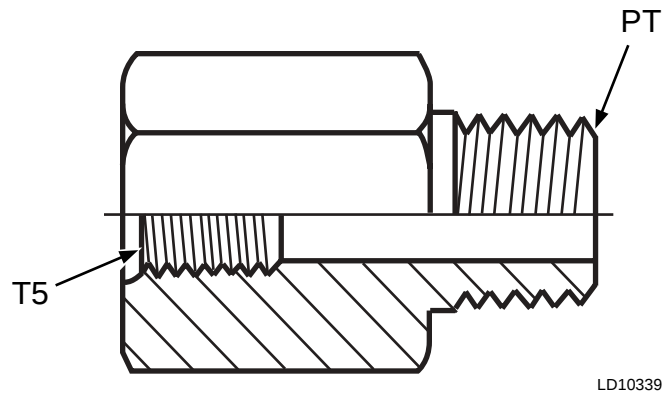
NOMINAL TUBE SIZES		TUBE END		PORT END		FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	1/4	9/16-18	011	7/16-20	904		
3/8	3/8	11/16-16	012	9/16-18	906		
1/2	1/2	13/16-16	014	3/4-16	908		
5/8	5/8	1-14	016	7/8-14	910		
3/4	3/4	1-3/16-12	018	1-1/16-12	912	023-18293-000	
3/4	1	1-3/16-12	018	1-5/16-12	916		
1	1	1-7/16-12	021	1-5/16-12	916		
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920		
1-1/2	1-1/2	2-12	029	1-7/8-12	924		

O-Ring Seal P/N's listed in Table 29

**FIGURE 5 - ORFS X MALE PIPE CONNECTOR****TABLE 5 - ORFS X MALE PIPE CONNECTOR**

NOMINAL TUBE SIZES		TUBE END		PORT END	FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'PT' THREAD NPTF	PART NUMBER	
					STEEL	STAINLESS STEEL
1/4	1/8	9/16-18	011	1/8-27		
	1/4	9/16-18	011	1/4-18		
	3/8	9/16-18	011	3/8-18		
3/8	1/4	11/16-16	012	1/4-18	023-22096-000	
	3/8	11/16-16	012	3/8-18	023-20850-000	
	1/2	11/16-16	012	1/2-14		
1/2	3/8	13/16-16	014	3/8-18		
	1/4	13/16-16	014	1/4-18		
	1/2	13/16-16	014	1/2-14	023-22101-000	
	3/4	13/16-16	014	3/4-14		
5/8	1/2	1-14	016	1/2-14		
	3/4	1-14	016	3/4-14		
3/4	3/4	1-3/16-12	018	3/4-14	023-18289-000	
	1/2	1-3/16-12	018	1/2-14	023-22099-000	
	1	1-3/16-12	018	1-11 1/2		
1	1	1-7/16-12	021	1-11 1/2	023-18274-000	
	3/4	1-7/16-12	021	3/4-14		
1-1/4	1-1/4	1-11/16-12	025	1-1/4-11 1/2		
	1	1-11/16-12	025	1-11 1/2		
1-1/2	1-1/2	2-12	029	1-1/2-11 1/2		

O-Ring Seal P/N's listed in Table 29

**FIGURE 6 - PIPE X STRAIGHT THREAD CONVERSION ADAPTER****TABLE 6 - PIPE X STRAIGHT THREAD CONVERSION ADAPTER**

STRAIGHT THREAD 'T5' THREAD UN/UNF-2B	PIPE THREAD 'PT' THREAD NPTF	FITTING ONLY	
		PART NUMBER	
		STEEL	STAINLESS STEEL
7/16-20	1/8-27		
1/2-20	1/8-27		
1/2-20	1/4-18	023-19090-000	
9/16-18	1/4-18	023-20848-000	
9/16-18	3/8-18	023-22149-000	
3/4-16	3/8-18		
7/8-14	1/2-14		
3/4-16	3/4-14		
1-5/8-12	1-1/2-11 1/2	023-20170-000	

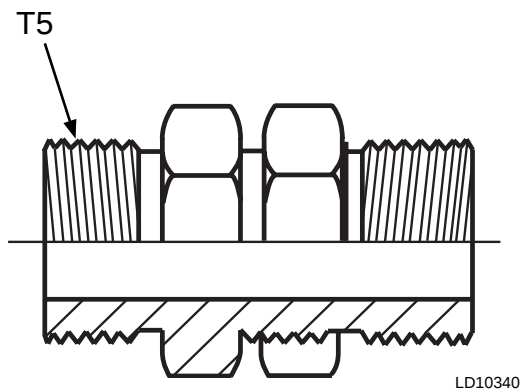
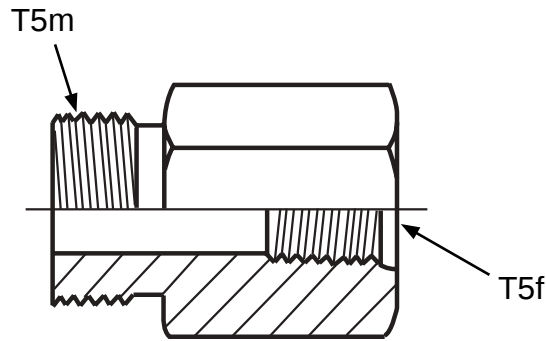


FIGURE 7 - STRAIGHT THREAD UNION

TABLE 7 - STRAIGHT THREAD UNION

STRAIGHT THREAD		FITTING ONLY	
'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
		STEEL	STAINLESS STEEL
7/16-20	904		
9/16-18	906		
3/4-16	908	023-18973-000	
7/8-14	910	023-17643-000	
1-1/16-12	912		
1-5/16-12	916	023-18979-000	
1-5/8-12	920	023-18294-000	
1-7/8-12	924		
2-1/2-12	932		

O-Ring Seal P/N's listed in Table 29

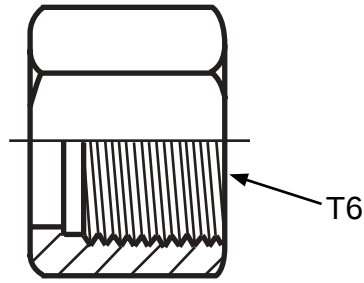


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FIGURE 8 - STRAIGHT THREAD REDUCER / EXPANDER**TABLE 8 - STRAIGHT THREAD REDUCER / EXPANDER**

FEMALE END		MALE END		FITTING ONLY	
'T5f' THREAD UN/UNF-2B	O-RING AS568-	'T5m' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
				STEEL	STAINLESS STEEL
7/16-20	904	7/16-20	904	023-21791-000	
9/16-18	906	7/16-20	904		
7/16-20	904	9/16-18	906		
3/4-16	908	9/16-18	906		
9/16-18	906	3/4-16	908		
7/8-14	910	3/4-16	908	023-17680-000	
9/16-18	906	7/8-14	910		
3/4-16	908	7/8-14	910		
1-1/16-12	912	7/8-14	910		
3/4-16	908	1-1/16-12	912		
7/8-14	910	1-1/16-12	912		
1-5/16-12	916	1-1/16-12	912		
3/4-16	908	1-5/16-12	916		
7/8-14	910	1-5/16-12	916		
1-1/16-12	912	1-5/16-12	916	023-21967-000	
1-5/8-12	920	1-5/16-12	916		
9/16-18	906	1-5/8-12	920		
1-1/16-12	912	1-5/8-12	920		
1-5/16-12	916	1-5/8-12	920		
1-7/8-12	924	1-5/8-12	920		
1-1/16-12	912	1-7/8-12	924		
1-5/16-12	916	1-7/8-12	924		
1-5/8-12	920	1-7/8-12	924		
1-7/8-12	924	2-1/2-12	932		
2-1/2-12	932	1-5/8-12	920		

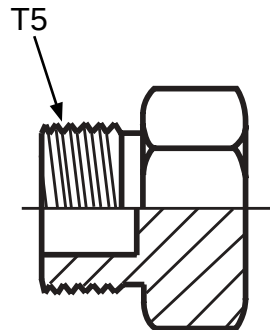
O-Ring Seal P/N's listed in Table 29



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FIGURE 9 - O-RING FACE SEAL TUBE NUT**TABLE 9 - O-RING FACE SEAL TUBE NUT**

NOMINAL TUBE O.D. (INCHES)	TUBE NUT 'T6' THREAD UN/UNF-2B	FITTING ONLY	
		PART NUMBER	
		STEEL	STAINLESS STEEL
1/4	9/16-18	023-19075-000	023-17539-000
3/8	11/16-16	023-18977-000	023-17533-000
1/2	13/16-16	023-18984-000	023-17541-000
5/8	1-14		
3/4	1-3/16-12	023-18286-000	023-17535-000
7/8	1-3/16-12		
7/8	1-5/16-12		
1	1-7/16-12	023-18287-000	023-17537-000
1-1/4	1-11/16-12	023-20231-000	
1-1/2	2-12	023-19073-000	
2	2-1/2-12		



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FIGURE 10 - STRAIGHT THREAD HEX HEAD PLUG**TABLE 10 - STRAIGHT THREAD HEX HEAD PLUG**

STRAIGHT THREAD		FITTING ONLY	
'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
		STEEL	STAINLESS STEEL
5/16-24	902		
3/8-24	903	023-20217-000	
7/16-20	904	023-18279-000	
1/2-20	905	023-20226-000	
9/16-18	906	023-18962-000	
3/4-16	908	023-18280-000	
7/8-14	910	023-18961-000	
1-1/16-12	912	023-18295-000	
1-3/16-12	914	023-18281-000	
1-5/16-12	916	023-18282-000	
1-5/8-12	920	023-18283-000	
1-7/8-12	924	023-22389-000	
2-1/2-12	932		

O-Ring Seal P/N's listed in Table 29

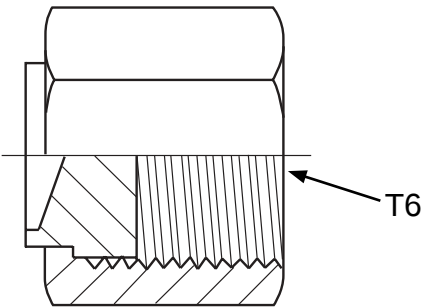
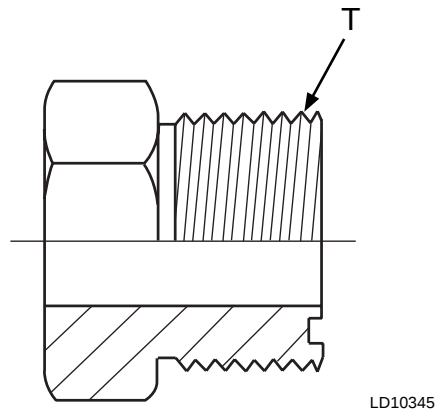


FIGURE 11 - ORFS TUBE END CAP

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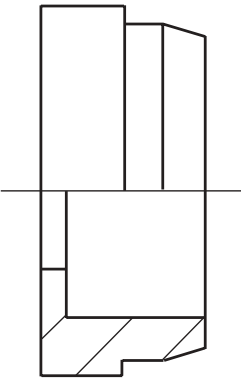
TABLE 11 - ORFS TUBE END CAP

NOMINAL TUBE O.D. (INCHES)	TUBE CAP 'T6' THREAD UN/UNF-2B	FITTING ONLY	
		PART NUMBER	
		STEEL	STAINLESS STEEL
1/4	9/16-18	023-19006-000	
3/8	11/16-16	023-19007-000	
1/2	13/16-16	023-19008-000	
5/8	1-14		
3/4	1-3/16-12	023-18288-000	
7/8	1-5/16-12		
1	1-7/16-12	023-18255-000	
1-1/4	1-11/16-12	023-22390-000	
1-1/2	2-12	023-19093-000	
2	2-1/2-12		

**FIGURE 12 - ORFS TUBE END PLUG****TABLE 12 - ORFS TUBE END PLUG**

NOMINAL TUBE SIZES TUBE SIDE (INCHES)	TUBE END		FITTING ONLY	
	'T' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
			STEEL	STAINLESS STEEL
1/4	9/16-18	011	023-21763-001	
3/8	11/16-16	012	023-21763-002	
1/2	13/16-16	014	023-21763-003	
5/8	1-14	016	023-21763-004	
3/4	1-3/16-12	018	023-21763-005	
7/8	1-5/16-12	020	023-21763-006	
1	1-7/16-12	021	023-21763-007	
1-1/4	1-11/16-12	025	023-21763-008	
1-1/2	2-12	029	023-21763-009	
2	2-1/2-12	135	023-21763-010	

O-Ring Seal P/N's listed in Table 29



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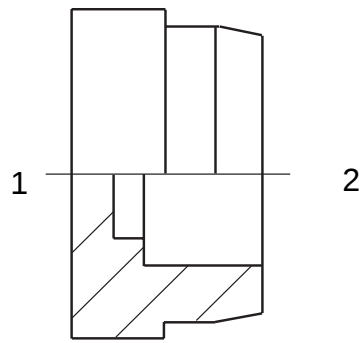
FIGURE 13 - ORFS BRAZE SLEEVE

TABLE 13 - ORFS BRAZE SLEEVE

NOMINAL TUBE O.D. (INCHES)	FITTING ONLY	
	PART NUMBER	
	STEEL	STAINLESS STEEL
1/4	023-19088-000	023-17540-000
3/8		023-17534-000
1/2	023-19089-000	023-17542-000
5/8		
3/4	023-18914-000	023-17536-000
7/8		
1	023-18911-000	023-17538-000
1-1/4	023-20846-000	
1-1/2		
2		



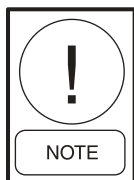
The brazing of ORFS Braze Sleeves to Steel and/or Stainless Steel Tubing requires the use of silver based brazing filler metal for brazing ferrous and non-ferrous metals and with general purpose brazing flux for silver brazing. Refer to APPLICATION (see note 2) for materials specifications and approved supplier products.



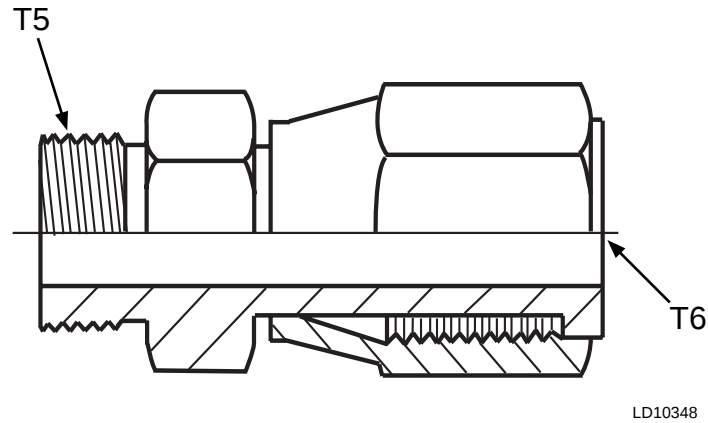
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FIGURE 15 - ORFS BRAZE REDUCER SLEEVE**TABLE 15 - ORFS BRAZE REDUCER SLEEVE**

NOMINAL (INCHES)		FITTING ONLY	
'1'	'2'	PART NUMBER	
ORFS	TUBE O.D.	STEEL	STAINLESS STEEL
3/8	1/4	023-20880-001	
1/2	1/4	023-20880-002	
1/2	3/8	023-20880-003	
5/8	1/4	023-20880-004	
5/8	3/8	023-20880-005	
5/8	1/2	023-20880-006	
3/4	1/4	023-20880-007	
3/4	3/8	023-20880-008	
3/4	1/2	023-20880-009	
3/4	5/8	023-20880-010	
3/4	7/8	023-20880-011	
1	1/2	023-20880-012	
1	5/8	023-20880-013	
1	3/4	023-20880-014	
1	7/8	023-20880-015	
1-1/4	3/4	023-20880-016	
1-1/4	1	023-20880-017	
1-1/2	1	023-20880-018	
1-1/2	1-1/4	023-20880-019	

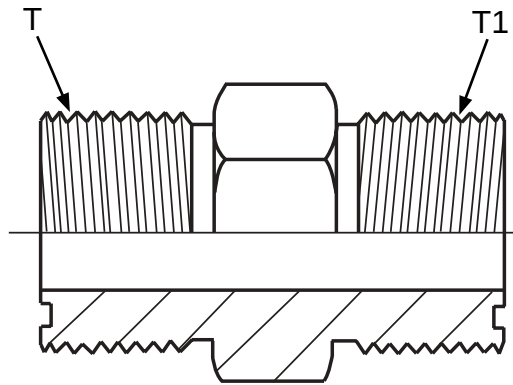


The brazing of ORFS Braze Sleeves to Steel and/or Stainless Steel Tubing requires the use of silver based brazing filler metal for brazing ferrous and non-ferrous metals and with general purpose brazing flux for silver brazing. Refer to APPLICATION (see note 2) for materials specifications and approved supplier products.

**FIGURE 16 - STRAIGHT THREAD SWIVEL CONNECTOR****TABLE 16 - STRAIGHT THREAD SWIVEL CONNECTOR**

NOMINAL TUBE SIZES		TUBE END		PORT END		FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T6' THREAD UN/UNF-2B	O-RING AS568-	'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	1/4	9/16-18	011	7/16-20	904		
3/8	3/8	11/16-16	012	9/16-18	906		
1/2	1/2	13/16-16	014	3/4-16	908		
5/8	5/8	1-14	016	7/8-14	910		
3/4	3/4	1-3/16-12	018	1-1/16-12	912	023-20214-000	
3/4	1	1-3/16-12	018	1-5/16-12	916		
1	1	1-7/16-12	021	1-5/16-12	916		
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920		

O-Ring Seal P/N's listed in Table 29

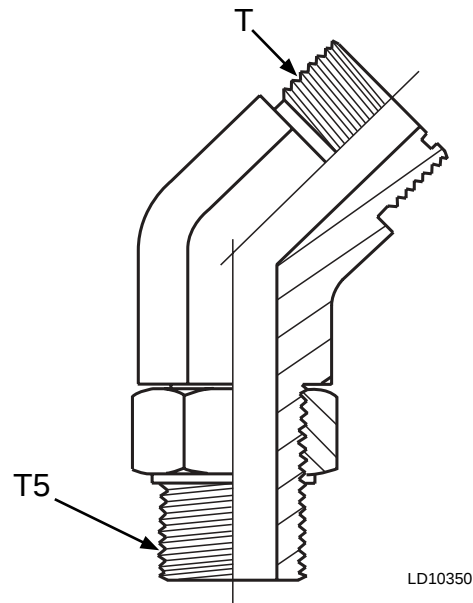


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FIGURE 17 - ORFS UNION**TABLE 17 - ORFS UNION**

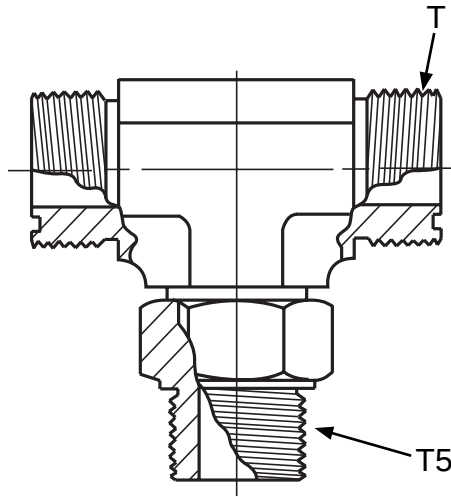
NOMINAL TUBE SIZES		TUBE END		TUBE END		FITTING ONLY	
'T' O.D. (INCHES)	'T1' O.D. (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'T1' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	1/4	9/16-18	011	9/16-18	011		
3/8	3/8	11/16-16	012	11/16-16	012	023-20258-000	
3/8	1/4	11/16-16	012	9/16-18	011		
1/2	1/2	13/16-16	014	13/16-16	014		
1/2	3/8	13/16-16	014	11/16-16	012		
5/8	5/8	1-14	016	1-14	016		
5/8	1/2	1-14	016	13/16-16	014		
3/4	3/4	1-3/16-12	018	1-3/16-12	018	023-20731-000	
3/4	5/8	1-3/16-12	018	1-14	016		
3/4	1	1-3/16-12	018	1-5/16-12	916		
7/8	7/8	1-5/16-12	020	1-5/16-12	020		
1	1	1-7/16-12	021	1-7/16-12	021	023-20223-000	
1	3/4	1-7/16-12	021	1-3/16-12	018	023-22132-000	
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920	023-20259-000	
1-1/2	1-1/2	2-12	029			023-21916-000	
2	2	2-1/2-12	135				

O-Ring Seal P/N's listed in Table 29

**FIGURE 18 - 45° STRAIGHT THREAD ELBOW****TABLE 18 - 45° STRAIGHT THREAD ELBOW**

NOMINAL TUBE SIZES		TUBE END		PORT END		FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	1/4	9/16-18	011	7/16-20	904		
1/4	3/8	9/16-18	011	9/16-18	906		
3/8	3/8	11/16-16	012	9/16-18	906		
3/8	1/4	11/16-16	012	7/16-20	904		
3/8	1/2	11/16-16	012	3/4-16	908		
1/2	1/2	13/16-16	014	3/4-16	908		
1/2	3/8	13/16-16	014	9/16-18	906		
1/2	5/8	13/16-16	014	7/8-14	910		
5/8	5/8	1-14	016	7/8-14	910		
5/8	1/2	1-14	016	3/4-16	906		
5/8	3/4	1-14	016	1-1/16-12	912		
3/4	3/4	1-3/16-12	018	1-1/16-12	912	023-20272-000	
3/4	5/8	1-3/16-12	018	7/8-14	910		
3/4	1	1-3/16-12	018	1-5/16-12	916		
7/8	7/8	1-5/16-12	020	1-3/16-12	914		
1	1	1-7/16-12	021	1-5/16-12	916	023-22089-000	
1	3/4	1-7/16-12	021	1-1/16-12	912		
1	1-1/4	1-7/16-12	021	1-5/8-12	920		
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920	023-20225-000	
1-1/2	1-1/2	2-12	029	1-7/8-12	924		

O-Ring Seal P/N's listed in Table 29



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FIGURE 19 - STRAIGHT THREAD BRANCH TEE**TABLE 19 - STRAIGHT THREAD BRANCH TEE**

NOMINAL TUBE SIZES		TUBE END		PORT END		FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'T5' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
						STEEL	STAINLESS STEEL
1/4	1/4	9/16-18	011	7/16-20	904		
3/8	3/8	11/16-16	012	9/16-18	906	023-20260-000	
1/2	1/2	13/16-16	014	3/4-16	908		
5/8	5/8	1-14	016	7/8-14	910		
3/4	3/4	1-3/16-12	018	1-1/16-12	912		
1	1	1-7/16-12	021	1-5/16-12	916		
1-1/4	1-1/4	1-11/16-12	025	1-5/8-12	920		
1-1/2	1-1/2	2-12	029	1-7/8-12	924		

O-Ring Seal P/N's listed in Table 29

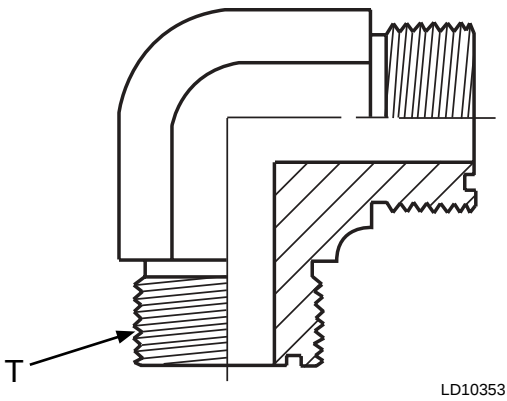
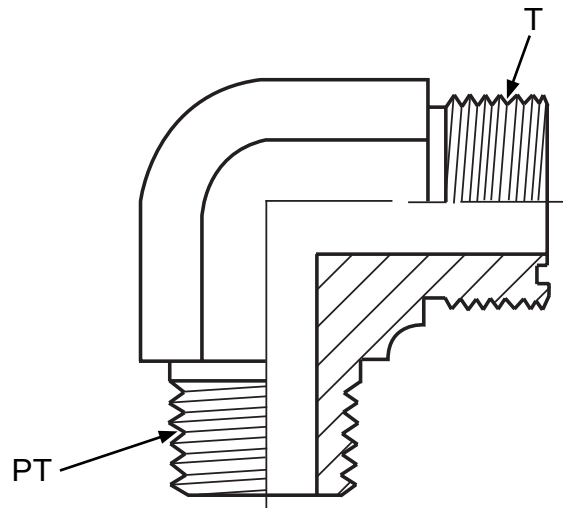


FIGURE 20 - ORFS ELBOW

TABLE 20 - ORFS ELBOW

NOMINAL TUBE SIZE	TUBE END		FITTING ONLY	
	'T' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
			STEEL	STAINLESS STEEL
1/4	9/16-18	011		
3/8	11/16-16	012		
1/2	13/16-16	014		
5/8	1-14	016		
3/4	1-3/16-12	018		
7/8	1-5/16-12	020		
1	1-7/16-12	021	023-20237-000	
1-1/4	1-11/16-12	025		
1-1/2	2-12	029		
2	2-1/2-12	135		

O-Ring Seal P/N's listed in Table 29



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FIGURE 21 - MALE PIPE ELBOW**TABLE 21 - MALE PIPE ELBOW**

NOMINAL TUBE SIZES		TUBE END		PORT END	FITTING ONLY	
TUBE SIDE (INCHES)	PORT SIDE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'PT' THREAD NPTF	PART NUMBER	
					STEEL	STAINLESS STEEL
1/4	1/8	9/16-18	011	1/8-27		
	1/4	9/16-18	011	1/4-18		
	3/8	9/16-18	011	3/8-18		
3/8	1/4	11/16-16	012	1/4-18		
	3/8	11/16-16	012	3/8-18	023-22100-000	
	1/2	11/16-16	012	1/2-14	023-22095-000	
1/2	3/8	13/16-16	014	3/8-18		
	1/4	13/16-16	014	1/4-18		
	1/2	13/16-16	014	1/2-14		
	3/4	13/16-16	014	3/4-14		
5/8	1/2	1-14	016	1/2-14		
	3/4	1-14	016	3/4-14		
3/4	3/4	1-3/16-12	018	3/4-14	023-20722-000	
	1/2	1-3/16-12	018	1/2-14		
	1	1-3/16-12	018	1-11 1/2		
7/8	3/4	1-5/16-12	020	3/4-14		
1	1	1-7/16-12	021	1-11 1/2	023-22090-000	
	3/4	1-7/16-12	021	3/4-14		
1-1/4	1-1/4	1-11/16-12	025	1-1/4-11 1/2		
1-1/2	1-1/2	2-12	029	1-1/2-11 1/2		
	1-1/4	2-12	029	1-1/4-11 1/2		

O-Ring Seal P/N's listed in Table 29

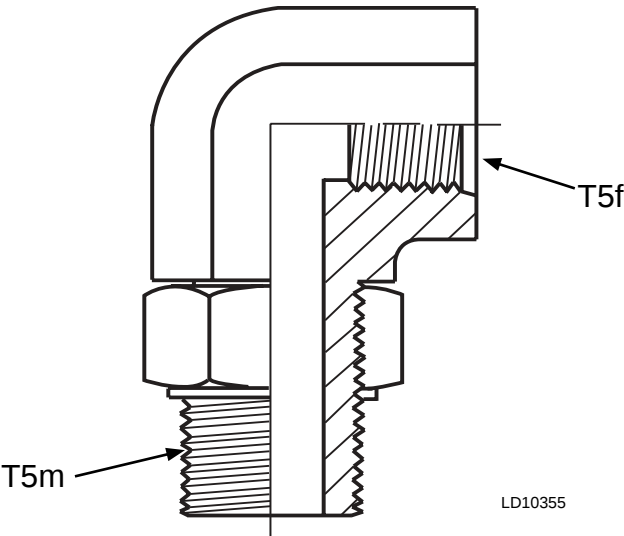
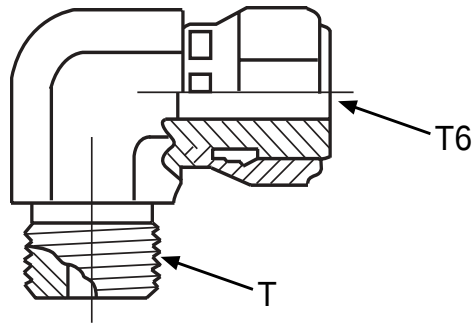


FIGURE 22 - STRAIGHT THREAD ELBOW

TABLE 22 - STRAIGHT THREAD ELBOW

NOMINAL TUBE O.D. (INCHES)	FEMALE END		MALE END	FITTING ONLY	
	'T5f' THREAD	O-RING	'T5m' THREAD	PART NUMBER	
	UN/UNF-2B	AS568-	UN/UNF-2A	STEEL	STAINLESS STEEL
1/4	7/16-20	904	7/16-20	023-20297-000	
3/8	9/16-18	906	9/16-18		
1/2	3/4-16	908	3/4-16		
5/8	7/8-14	910	7/8-14		
3/4	1-1/16-12	912	1-1/16-12		
1	1-5/16-12	916	1-5/16-12		

O-Ring Seal P/N's listed in Table 29

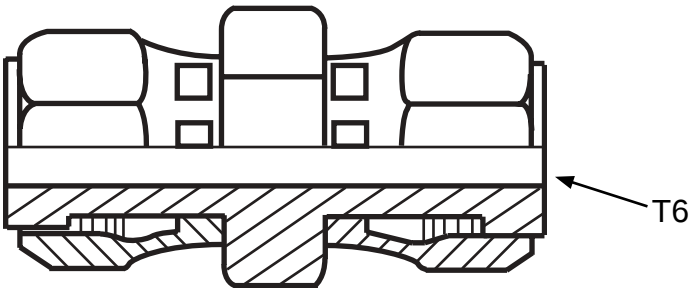


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FIGURE 23 - SWIVEL NUT ELBOW**TABLE 23 - SWIVEL NUT ELBOW**

NOMINAL TUBE O.D. (INCHES)	TUBE END 'T' THREAD UN/UNF-2A	SWIVEL END 'T6' THREAD UN/UNF-2B	FITTING ONLY	
			PART NUMBER	
			STEEL	STAINLESS STEEL
1/4	9/16 - 18	9/16 - 18		
3/8	11/16 - 16	11/16 - 16	023-21884-000	
1/2	13/16 - 16	13/16 - 16		
5/8	1 - 14	1 - 14		
3/4	1-3/16 - 12	1-3/16 - 12	023-20847-000	
7/8	1-5/16 - 12	1-5/16 - 12		
1	1-7/16 - 12	1-7/16 - 12	023-22091-000	
1-1/4	1-11/16 - 12	1-11/16 - 12		
1-1/2	2 - 12	2 - 12		

O-Ring Seal P/N's listed in Table 29



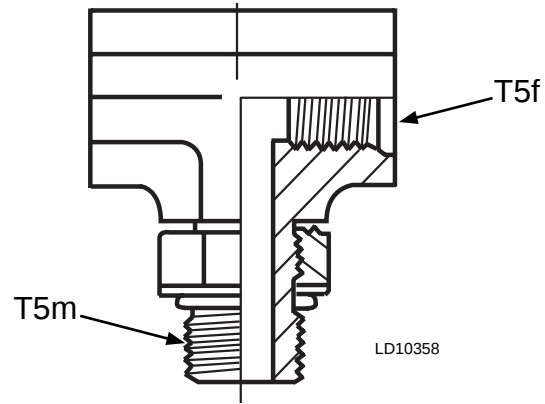
LD10357

FIGURE 24 - SWIVEL NUT UNION

TABLE 24 - SWIVEL NUT UNION

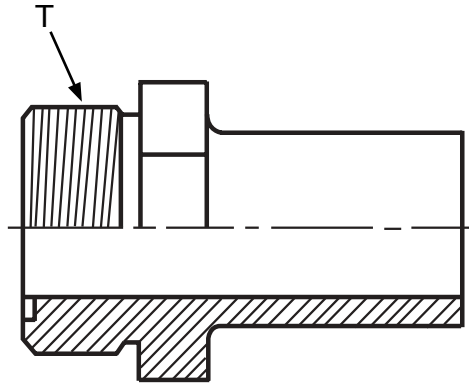
NOMINAL		SWIVEL	FITTING ONLY	
TUBE O.D. (INCHES)	TUBE O.D. (INCHES)	‘T6’ THREAD UN/UNF-2B	PART NUMBER	
			STEEL	STAINLESS STEEL
1/4	1/4	9/16-18		
3/8	3/8	11/16-16	023-20851-000	
1/2	1/2	13/16-16		
5/8	5/8	1-14		
3/4	3/4	1-3/16-12	023-22131-000	
1	1	1-7/16-12	023-22098-000	
1	3/4	1-7/16-12 & 1-3/16-16	023-22132-000	

O-Ring Seal P/N's listed in Table 29

**FIGURE 25 - STRAIGHT THREAD BRANCH TEE REDUCING****TABLE 25 - STRAIGHT THREAD BRANCH TEE REDUCING**

FEMALE END		MALE END		FITTING ONLY	
'T5m' THREAD	O-RING	'T5f' THREAD	O-RING	PART NUMBER	
UN/UNF-2A	AS568-	UN/UNF-2B	AS568-	STEEL	STAINLESS STEEL
3/4-16	908	9/16-18	906	023-20849-000	

O-Ring Seal P/N's listed in Table 29



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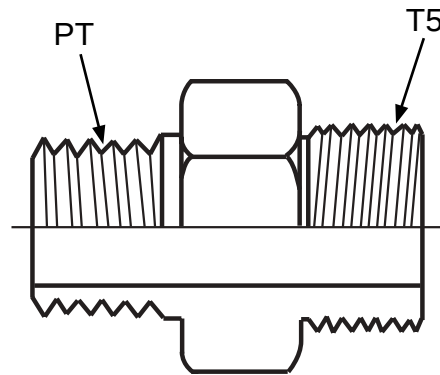
FIGURE 26 - ORFS X O.D. TUBE BRAZE ADAPTER**TABLE 26 - ORFS X O.D. TUBE BRAZE ADAPTER**

NOMINAL TUBE SIZE TUBE O.D. (INCHES)	TUBE END		FITTING ONLY	
	'T' THREAD UN/UNF-2A	O-RING AS568-	PART NUMBER	
			STEEL	STAINLESS STEEL
1	1-7/16-12	021	023-20877-000	
1-1/4	1-11/16-12	025	023-20879-000	

O-Ring Seal P/N's listed in Table 29



The brazing of ORFS to O.D Tube Braze Adapters to Steel and/or Stainless Steel Tubing requires the use of silver based brazing filler metal for brazing ferrous and non-ferrous metals and with general purpose brazing flux for silver brazing. Refer to APPLICATION (see note 2) for materials specifications and approved supplier products.

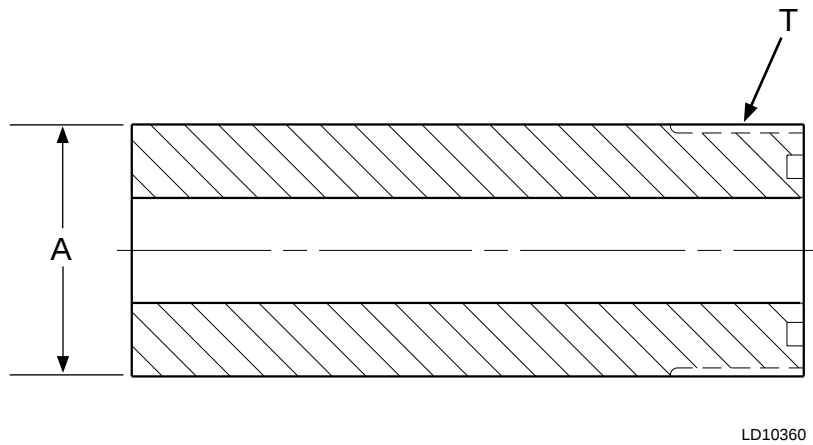


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FIGURE 27 - MALE PIPE X STRAIGHT THREAD ADAPTER**TABLE 27 - MALE PIPE X STRAIGHT THREAD ADAPTER**

PIPE THREAD	STRAIGHT THREAD		FITTING ONLY	
	'PT' THREAD NPTF	'T5' THREAD UN/UNF-2A	PART NUMBER	
			STEEL	STAINLESS STEEL
1/8 - 27		7/16-20	904	
1/4 - 18		7/16-20	904	
1/4 - 18		1/2-20	905	
1/4 - 18		9/16-18	906	
3/8 - 18		9/16-18	906	
3/8 - 18		3/4-16	908	
1/2 - 14		3/4-16	908	
1/2 - 14		7/8-14	910	023-22398-000
3/4 - 14		1-1/16 -12	912	
3/4 - 14		1-5/16 -12	916	
1 - 11-1/2		1-5/16 -12	916	
1-1/4 - 11-1/2		1-5/8 -12	920	
1-1/2 - 11-1/2		1-5/8 -12	920	023-21894-000

O-Ring Seal P/N's listed in Table 29

**FIGURE 28 - WELD COUPLING X STRAIGHT THREAD ORFS****TABLE 28 - WELD COUPLING X STRAIGHT THREAD ORFS**

NOMINAL	ORFS TUBE END		WELD COUPLING	FITTING ONLY	
TUBE (INCHES)	'T' THREAD UN/UNF-2A	O-RING AS568-	'A' O.D (INCHES)	PART NUMBER	
				STEEL	STAINLESS STEEL
1/4 - 3/8	3/4-16	908	Ø 3/4	023-18256-000	
1/2 - 5/8	1-14	016	Ø 1	023-18257-000	
3/4	1-3/16-12	018	Ø 1-3/16	023-18999-000	
(1)	1-1/4-12	(1)	Ø 1-1/4	023-18263-000	
1	1-7/16-12	021	Ø 1-7/16	023-18258-000	

O-Ring Seal P/N's listed in Table 29

(1) Weld coupling 023-18263-000 is only used with:

Teflon gasket 028-0483-000 (1 O.D. x 7/8 I.D. x 1/16 thick) and Rotalock Valve 022-09573-000 (valve stop angle vertical Rotalock 1-1/4-12un-2b x 3/4 45° flare with 1/4 45° flare guage port).

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

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

LD10361

APPENDIX

ABBREVIATIONS

Although the following abbreviations may have broader interpretations elsewhere in the industry, their specific 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 specific 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 flow of a filler metal. The filler 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 fluid 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 flanged joint, screwed joint, flared 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 filler 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 classification.

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 classified 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 filler metal, to produce a localized union through fusion or recrystallization across the interface.

APPLICATION NOTES

1. Fittings & Tubing

Best field practice is to use stainless steel fittings and welded stainless steel tubing in preference to carbon steel fittings or seamless tubing.

- Stainless Steel (SS) tubing shall be Grade TP316 or TP304.
- 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).
- 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).
- 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 filler metal for brazing ferrous and non-ferrous metals and with general purpose brazing flux for silver brazing as follows.

Silver Brazing Filler Metal

Chemical composition of the silver brazing filler 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:

- Handy & Harman – Easy-Flo
- Englehard – Silvaloy 50
- J.W. Harris – Stay-Silv 50

Silver Brazing Flux – General Purpose

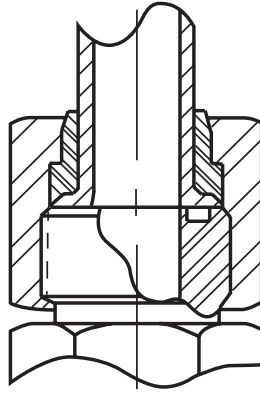
Approved Suppliers:

- Handy & Harman – Handy Flux (White)
- Englehard – Ultra Flux (White)
- J.W. Harris – Stay-Silv (White)

3. Thread Sealant

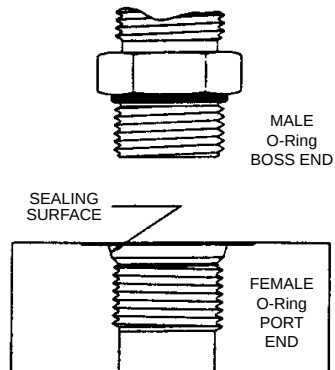
The following table provides an overview of the application of single component anaerobic compounds for sealing, thread lockers, cleaner and primer to pipe thread joints, straight thread o-ring fittings, and threaded fasteners.

TYPE	GRADE	COLOR	PART NO.	CONTAINER SIZE	CURE SPEED STEEL @ 25°C		TEMP. RANGE	<u>APPLICATION</u>
					FIX-TURE	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 and 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	---	---	---	

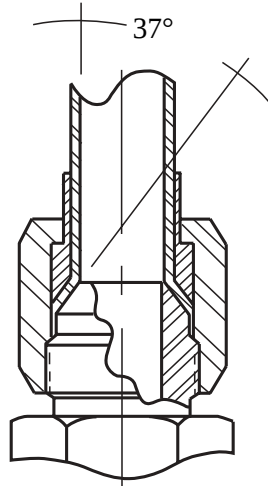
4. O-Ring Face Seal (ORFS) Fitting and Tube dimensional data

O-RING FACE SEAL FITTING TUBE END CONNECTION						
FITTING	NOMINAL TUBE O.D.				ORFS	O-RING
SAE	English		Metric		THREAD SIZE SAE J1453	
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

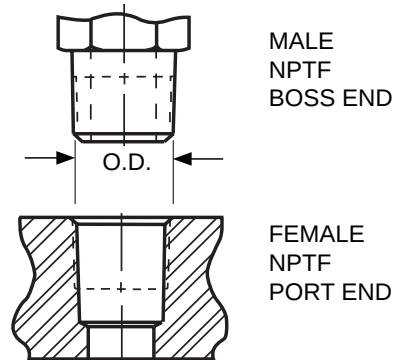
5. Straight Thread O-Ring Port dimensional data



STRAIGHT THREAD O-RING PORT DIMENSIONAL DATA						
FITTING	NOMINAL TUBE O.D.				THREAD SIZE	O-RING
SAE	English		Metric		SAE J514	
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 fluid 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

FIELD NOTES

FIELD NOTES

