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## **Hydraulic Fitting**

Thread Identification Manual  
U.S.A. 2014

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**ContiTech**

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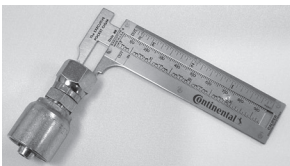
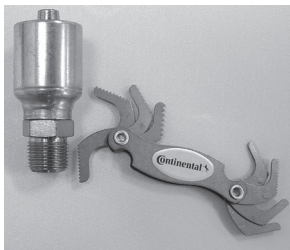
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It is important to properly identify a fitting so that an assembly can be connected correctly within the hydraulic system. This manual can be used as a guide in the identification of major thread types, including North American threads, British Threads, French Threads, German Threads and Japanese Threads. The Continental ContiTech Thread Identification Kit includes calipers, a North American/Metric thread pitch gauge and seat gauges.

To identify a fitting, 1) first select country of origin for the fitting; 2) identify the fitting visually, using illustrations in the proper section of this manual; 3) measure ID, OD, thread pitch and seat angles using the proper tools; 4) compare measurements to the tables in this manual.



Information in this manual supersedes all previously printed material and is current as of August 2014. Due to continual improvements, Continental ContiTech reserves the right to alter products and procedures without prior notice. For the most current information, visit us online at [www.contitech.us](http://www.contitech.us).

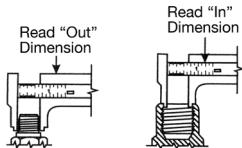
## Measuring Threads and Seat Angles

Tools required: ID/OD Calipers, Seat Angle Gauge (English and Metric), Thread Pitch Gauge

### Measuring Threads

---

A caliper is used to measure the OD of male threads and the ID of female threads. Measure at the largest point. In some cases, threads may be worn, and the exact measurement taken may not match exactly to the thread charts. For accuracy, it is recommended the male thread be measured.

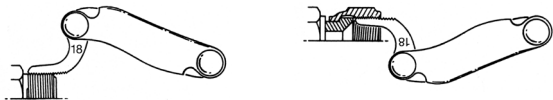


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## Measuring Thread Pitch

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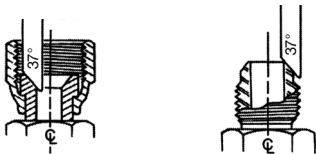
A Thread Pitch Gauge is used to determine the number of threads per inch or the distance between threads in a metric connection. To assure an accurate reading, make sure the fit of the thread gauge is snug.



## Measuring Seat Angle

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A Seat Angle Gauge is used to measure the angle of the sealing surface. For either male or female fittings, place the gauge on the sealing surface. An accurate reading is taken when the gauge is parallel to the centerline of the coupling.



## Compare Measurements to Tables

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ID/OD measurements, thread pitch and seat angle will be used to identify the fitting. Measurements taken can be used to compare with the dimensions found on charts in the following pages.

As an example, a fitting will be defined as:

Continental ContiTech EP B2-NPMX-0606 with 3/8-18 threads.

From the hydraulic catalog, the fitting can be identified as a NPTF/MALE/SWIVEL.

The -6 fitting has 3/8-18 threads, which can be identified using the calipers, thread gauge and the following tables.

## Fitting Standards

There are five basic fitting standards. They are identified as North American, British, French, German and Japanese.

## North American Thread Types

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Also known as American Dryseal Pipe Threads, the thread types include NPTF, NPSF and NPSM.

N - National

S - Straight Thread

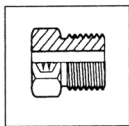
F - Fuels

P - Pipe

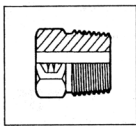
T - Tapered Thread

M - Mechanical Joint

Pipe threads can be either straight or tapered. The first step in identifying this fitting is to determine if the thread is parallel (straight) or tapered.



Parallel Threads



Tapered Threads

### Parallel Threads

A straight thread is not used for sealing fluids. In this type of fitting, a seal is achieved with an O-Ring, a metal seal or a seat machined into



the end of the fitting. A straight thread can be determined by laying a straightedge against the threads. If all the threads are parallel to the centerline of the fitting, then it is a straight thread.

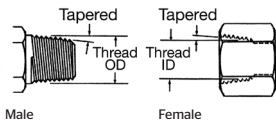
### Tapered Threads

A tapered thread seals by the interference in the engagement of the male and female threads. These threads deform when they are tightened, causing metal deformation and a pressure-tight joint. Thread sealants are commonly used in this connection. A tapered thread can be determined by laying a straightedge against the threads.

A fitting may also be referred to by its Dash number. The Dash number is a universal abbreviation for sizing pipe systems. The following charts will show a Dash number for each fitting. The Dash number comes from the dimension of the port of the fitting. It is the dimension in 1/16 of an inch. A 3/8" port would be 6/16" or a Dash 6 (-6).

<b>in.</b>	<b>1/16</b>	<b>Dash Size</b>	<b>in.</b>	<b>1/16</b>	<b>Dash Size</b>
1/8	2/16	-2	1	16/16	-16
1/4	4/16	-4	1¼	20/16	-20
3/8	6/16	-6	1½	24/16	-24
1/2	8/16	-8	2	32/16	-32
3/4	12/16	-12			

## NPTF



### Identification

National pipe tapered mechanical, tapered thread

### Seal

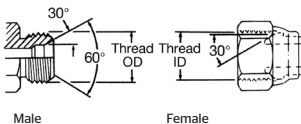
The thread is tapered and sealing takes place with the deformation of the threads. The NPTF male has a 30-degree seat and will mate with the NPTF

female, also with tapered threads, but no seat. A thread sealant is commonly used. A NPTF male with 30-degree seat will mate with a NPSM female, which has straight threads and a 30-degree inverted seat. The sealing takes place on the 30-degree seat.

### Application

The NPTF fitting is a dryseal thread, commonly used in fluid power systems but not recommended by the National Fluid Power Association for hydraulic applications.

## NPSM



place by compression of the 30-degree seat on the chamfer. The threads hold the connection mechanically.

### Identification

National pipe tapered mechanical, tapered thread

### Seal

Both male and female have a straight thread and 30-degree seat and chamfer. The seal takes

### Application

Used in fluid power systems.

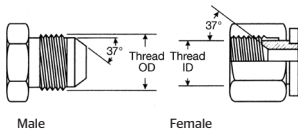
### Thread Identification Table

NPTF/NPSF/NPSM

Dash Size	Nominal Size (in.)	# of Threads per in.	Female Thread ID (in.)	Male Thread OD (in.)
-2	1/8	27	23/64	13/32
-4	1/4	18	15/32	35/64
-6	3/8	18	19/32	43/64
-8	1/2	14	3/4	27/32
-12	3/4	14	61/64	1 1/16
-16	1	11 1/2	1 13/64	1 5/16
-20	1 1/4	11 1/2	1 17/32	1 43/64
-24	1 1/2	11 1/2	1 25/32	1 29/32
-32	2	11 1/2	2 1/4	2 3/8

## SAE Thread Types

### JIC 37° Flare (SAE J514)



#### Identification

Straight threads. Both male and female have 37-degree seat.

#### Seal

The seal is made on the 37-degree flare seat. The threads hold the connection mechanically. Only connect male SAE 37 with female SAE 37.

#### Application

SAE specifies use with high-pressure hydraulic tubing.

#### Comments

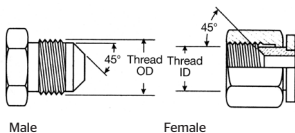
Commonly known as JIC fittings and found in fluid power systems. Use caution when identifying this fitting, as the threads are the same as SAE J512 45-degree in -2, -3, -4, -5, -8 and -10 sizes. The sealing surface angles are different, however.

#### Thread Identification Table

JIC 37° Flare

<b>Dash Size</b>	<b>Nominal Size (in.)</b>	<b>Thread Size</b>	<b>Female Thread ID (in.)</b>	<b>Male Thread OD (in.)</b>
-2	1/8	5/16-24	17/64	5/16
-3	3/16	3/8-24	21/64	3/8
-4	1/4	7/16-20	25/64	7/16
-5	5/16	1/2-20	29/64	1/2
-6	3/8	9/16-18	1/2	9/16
-8	1/2	3/4-16	11/16	3/4
-10	5/8	7/8-14	13/16	7/8
-12	3/4	1 <sup>1</sup> / <sub>16</sub> -12	31/32	1 <sup>1</sup> / <sub>16</sub>
-14	7/8	1 <sup>3</sup> / <sub>16</sub> -12	17/64	1 <sup>3</sup> / <sub>16</sub>
-16	1	1 <sup>5</sup> / <sub>16</sub> -12	1 <sup>15</sup> / <sub>64</sub>	1 <sup>5</sup> / <sub>16</sub>
-20	1 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub> -12	1 <sup>35</sup> / <sub>64</sub>	1 <sup>5</sup> / <sub>8</sub>
-24	1 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>8</sub> -12	1 <sup>51</sup> / <sub>64</sub>	1 <sup>7</sup> / <sub>8</sub>
-32	2	2 <sup>1</sup> / <sub>2</sub> -12	2 <sup>27</sup> / <sub>64</sub>	2 <sup>1</sup> / <sub>2</sub>

## SAE 45° Flare (SAE J512)



### Identification

Straight threads. Both male and female have 45-degree seat.

### Seal

The seal is made on the 45-degree flare seat. The threads hold the connection mechanically. Only connect male SAE 45 with female SAE 45.

### Application

Commonly used in low-pressure, refrigeration and automotive piping systems, and are frequently constructed of brass and connected to copper tubing.

### Comments

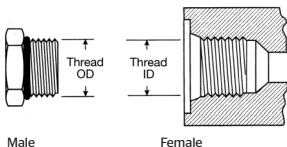
Use caution when identifying this fitting as the threads are the same as SAE J512 37-degree (JIC), in -2, -3, -4, -5, -8 and -10 sizes. The sealing surface angles are different, however.

### Thread Identification Table

SAE 45° Flare

<b>Dash Size</b>	<b>Nominal Size (in.)</b>	<b>Thread Size</b>	<b>Female Thread ID (in.)</b>	<b>Male Thread OD (in.)</b>
-2	1/8	5/16-24	17/64	5/16
-3	3/16	3/8-24	21/64	3/8
-4	1/4	7/16-20	25/64	7/16
-5	5/16	1/2-20	29/64	1/2
-6	3/8	5/8-18	9/16	5/8
-7	7/16	1 1/16-16	5/8	1 1/16
-8	1/2	3/4-16	1 1/16	3/4
-10	5/8	7/8-14	1 3/16	7/8
-12	3/4	1 1/16-14	63/64	1 1/16

## O-Ring Boss Straight Thread (SAE J514)



### Identification

Male fitting has a straight thread and an O-Ring. The female port has a straight thread and a chamfer to accept the O-Ring.

### Seal

The seal takes place by compressing the O-Ring into the chamfer. The threads hold the

connection mechanically. Only connect O-Ring boss male with O-Ring boss female.

### Application

Recommended by the National Fluid Power Association for optional leakage control in medium- and high-pressure hydraulic systems.

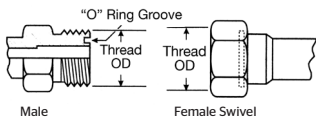
### Thread Identification Table

Straight Thread O-Ring Boss



<b>Dash Size</b>	<b>Tube Size (in.)</b>	<b>Nominal Size (in.)</b>	<b>Thread Size</b>	<b>Female Thread ID (in.)</b>	<b>Male Thread OD (in.)</b>
-2	1/8	5/16	5/16-24	17/64	5/16
-3	3/16	3/8	3/8-24	21/64	3/8
-4	1/4	7/16	7/16-20	25/64	7/16
-5	5/16	1/2	1/2-20	29/64	1/2
-6	3/8	9/16	9/16-18	1/2	9/16
-8	1/2	3/4	3/4-16	11/16	3/4
-10	5/8	7/8	7/8-14	13/16	7/8
-12	3/4	1 1/16	1 1/16-12	31/32	1 1/16
-14	7/8	1 3/16	1 3/16-12	17/64	1 3/16
-16	1	1 5/16	1 5/16-12	115/64	1 5/16
-20	1 1/4	1 5/8	1 5/8-12	135/64	1 5/8
-24	1 1/2	1 7/8	1 7/8-12	151/64	1 7/8
-32	2	2 1/2	2 1/2-12	227/64	2 1/2

## O-Ring Face Seal (SAE J1453 ORS/ORFS)



### Identification

Male fitting has a straight thread and an O-Ring. Female has a straight thread and a machined flat face.

### Seal

The seal takes place by compressing the O-Ring onto

the flat face of the female. The threads hold the connection mechanically.

### Application

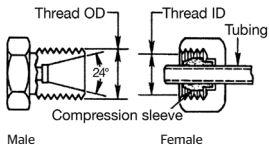
Fittings are intended for hydraulic systems where elastomeric seals are accepted to overcome leakage and leak resistance. This connection offers the very best leakage control.

### Thread Identification Table

O-Ring Face Seal (ORFS)

Dash Size	Nominal Size (in.)	Thread Size	Female Thread ID (in.)	Male Thread OD (in.)
-4	1/4	9/16-18	1/2	9/16
-6	3/8	11/16-16	5/8	11/16
-8	1/2	13/16-16	3/4	13/16
-10	5/8	1-14	15/16	1
-12	3/4	1 <sup>3</sup> / <sub>16</sub> -12	1 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
-16	1	1 <sup>7</sup> / <sub>16</sub> -12	1 <sup>11</sup> / <sub>32</sub>	1 <sup>7</sup> / <sub>16</sub>
-20	1 <sup>1</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub> -12	1 <sup>19</sup> / <sub>32</sub>	1 <sup>11</sup> / <sub>16</sub>
-24	1 <sup>1</sup> / <sub>2</sub>	2-12	1 <sup>29</sup> / <sub>32</sub>	2

## SAE J514 Flareless Tube Fitting



compression sleeve as the female nut is tightened onto the male thread. A seal is formed between the compression sleeve, the male 24-degree seat and tubing.

### Identification

Male and female have straight threads. Male has 24-degree seat.

### Seal

Female includes a compression sleeve for the sealing surface.

A seal is formed with the

### Application

Used to adapt steel tubing to a hydraulic hose assembly.

### Thread Identification Table

Flareless Tube Fitting

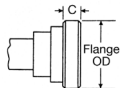
(see table on next page)

## (SAE J514 Flareless Tube Fitting continued)

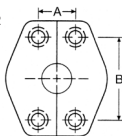
Dash Size	Tube Size (in.)	Nominal Size (in.)	Thread Size	Female Thread ID (in.)	Male Thread OD (in.)
-2	1/8	5/16	5/16-24	17/64	5/16
-3	3/16	3/8	3/8-24	21/64	3/8
-4	1/4	7/16	7/16-20	25/64	7/16
-5	5/16	1/2	1/2-20	29/64	1/2
-6	3/8	9/16	9/16-18	1/2	9/16
-8	1/2	3/4	3/4-16	11/16	3/4
-10	5/8	7/8	7/8-14	13/16	7/8
-12	3/4	1 1/16	1 1/16-12	31/32	1 1/16
-14	7/8	1 3/16	1 3/16-12	17/64	1 3/16
-16	1	1 5/16	1 5/16-12	1 15/64	1 5/16
-20	1 1/4	1 5/8	1 5/8-12	1 35/64	1 5/8
-24	1 1/2	1 7/8	1 7/8-12	1 51/64	1 7/8
-32	2	2 1/2	2 1/2-12	2 27/64	2 1/2

## Code 61/Code 62/Caterpillar® Flange (SAE J518)

SAE Code 61 and Code 62



Male



4-Bolt Split Flange

### Identification

The female port is an unthreaded hole surrounded with 4 bolt holes in a rectangular pattern. The male consists of a flanged head, grooved for an O-Ring, and a flange with holes to match the port.

### Seal

The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port. The threaded bolts hold the connection mechanically.

### Application

Commonly used in fluid power

systems, worldwide, and usually in connection on pumps and motors. The fitting is available in two pressure ratings. Code 61, Form R, PN 35/350 bar, Type I is referred to as the “standard” series and can withstand an operating pressure of 3000–5000 psi depending on size. Code 62, Form S, PN 415 bar Type II is the heavy-duty, 6000 psi series. While the design is the same, bolt hole spacing and flanged head diameters are larger for the higher pressure Code 62 fitting.

### Comments

SAE J518, DIN 20066, ISO/DIS 6162 and JIS B 8363 are interchangeable, except for the bolt sizes. The -10 is not available as an SAE standard size. Caterpillar® flanges, which have the same flange OD as SAE

(continued on next page)

(Continued)

Code 62, have a thicker flange head, which is the “C” dimension in the table.

### How to Measure

Measure port hole diameter using calipers. The port hole diameter is the Nominal Flange Size. Measure the longest bolt

hole spacing from center to center, which is Dimension “B,” or the Flange OD for further identification.

### Thread Identification Tables

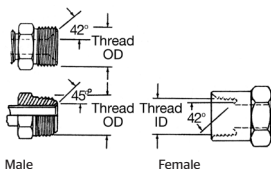
Code 61/Code62/CAT®

Nominal Flange Size (in.)	Code 61			
	Flange OD	A	B	C
1/2	1.188	0.688	1.500	0.265
5/8	1.345			0.265
3/4	1.500	0.875	1.875	0.265
1	1.750	1.031	2.062	0.315
1¼	2.000	1.188	2.312	0.315
1½	2.375	1.406	2.750	0.315
2	2.812	1.688	3.062	0.375
2½	3.312	2.000	3.500	0.375
3	4.000	2.438	4.188	0.375
3½	4.500	2.750	4.750	0.422
4	5.000	3.062	5.125	0.442
5	6.000	3.625	6.000	0.442

Nominal Flange Size (in.)	Code 62			
	Flange OD	A	B	C
1/2	1.250	0.718	1.594	0.305
3/4	1.625	0.937	2.000	0.245
1	1.875	1.093	2.250	0.375
1¼	2.125	1.250	2.625	0.405
1½	2.500	1.437	3.125	0.495
2	3.125	1.750	3.812	0.495

Nominal Flange Size (in.)	Caterpillar® Code 62			
	Flange OD	A	B	C
3/4	1.625	0.938	2.000	0.560
1	1.875	1.094	2.250	0.560
1¼	2.125	1.250	2.625	0.560
1½	2.500	1.438	3.125	0.560
2	3.125	1.750	3.812	0.560

## SAE 45° Inverted Flare (SAE J512)



The female has a straight thread and a 42-degree inverted flare.

### Seal

The seal takes place on the flared surfaces. The threads hold the connection in place mechanically.

### Identification

Male fitting, with a straight thread, can either be a 45-degree flare as a tube fitting or a 42-degree seat as a machined adapter.

### Application

Fitting is frequently used in automotive systems.

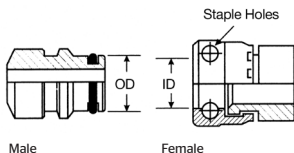
### Thread Identification Table

SAE 45° Inverted Flare

Dash Size	Nominal Size (in.)	Thread Size	Female Thread ID (in.)	Male Thread OD (in.)
-2	1/8	5/16-28	9/32	5/16
-3	3/16	3/8-24	21/64	3/8
-4	1/4	7/16-24	25/64	7/16
-5	5/16	1/2-20	29/64	1/2
-6	3/8	5/8-18	37/64	5/8
-7	7/16	1 1/16-18	5/8	1 1/16
-8	1/2	3/4-18	45/64	3/4
-10	5/8	7/8-18	13/16	7/8
-12	3/4	1 1/16-16	1	1 1/16



## SAE J1467 Clip Fastener



Male

Female

inserted through the two holes, locking the connection together.

### Seal

The seal is formed between the O-Ring on the male fitting and the smooth bore of the female fitting.

### Identification

The male has an external O-Ring with a groove to accept a clip. The female has a smooth bore with two holes to accept a "U"-shaped clip. With the male fitting inserted into the female fitting, a clip is

### Application

Commonly used for hydraulic application in underground mines.

### Thread Identification Table

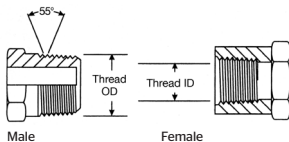
SAE J1467 Clip Fastener

Dash Size	Nominal Size (in.)	Female Thread ID (in.)	Male Thread OD (in.)
-4	1/4	19/32	19/32
-6	3/8	51/64	25/32
-8	1/2	61/64	15/16
-12	3/4	1 9/64	1 9/64
-16	1	1 25/64	1 7/32
-20	1 1/4	1 13/16	1 13/16
-24	1 1/2	2 11/64	2 5/32
-32	2	2 17/32	2 33/64

## British Thread Types

### BSPT (British Standard Pipe Tapered)

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#### Identification

The British Standard Pipe Tapered is very similar to the NPTF fitting. Male fitting has a tapered thread. BSP threads are also known as Whitworth threads.

#### Seal

The BSPT male can be connected with a BSPT female

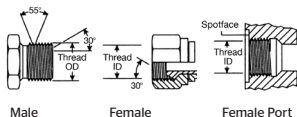
or BSPP female. In either case, the seal is made within the threads through thread distortion. A thread sealant is recommended.

#### Comments

The BSPT fitting, although similar to the NPTF fitting, is not interchangeable. The thread pitch is different in most cases and the thread angle is 55 degrees for the BSPT, versus the 60 degrees found on NPTF threads.

(see table on page 27)

## BSPP (British Standard Pipe Parallel)



Male

Female

Female Port

by compression of the 30-degree seat on the chamfer. The threads hold the connection mechanically.

### Identification

The British Standard Pipe Parallel would be similar to the NPSM fitting. BSP threads are also known as Whitworth threads.

### Seal

The BSPP male will connect with the BSPP female or female port. Both male and female have a straight thread and 30-degree seat and chamfer. The seal takes place

### Comments

The BSPP fitting, although similar to the NPSM fitting, is not interchangeable. The thread pitch is different in most cases and the thread angle is 55 degrees for the BSPP, versus the 60 degrees found on NPSM threads.

### Thread Identification Table

BSPT and BSPP

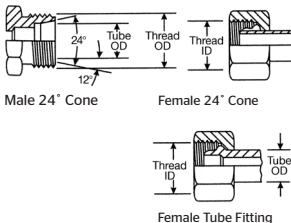
(see table on next page)

(BSPT and BSPP continued)

<b>Dash Size</b>	<b>Nominal Size (in.)</b>	<b>Thread Size</b>	<b>Female Thread ID (in.)</b>	<b>Male Thread OD (in.)</b>
-2	1/8	1/8-28	11/32	3/8
-4	1/4	1/4-19	15/32	17/32
-6	3/8	3/8-19	19/32	21/32
-8	1/2	1/2-14	3/4	13/16
-10	5/8	5/8-14	13/16	29/32
-12	3/4	3/4-14	31/32	1 1/32
-16	1	1-11	1 7/32	1 11/32
-20	1 1/4	1 1/4-11	1 17/32	1 21/32
-24	1 1/2	1 1/2-11	1 25/32	1 7/8
-32	2	2-11	2 7/32	2 11/32

## French Thread Types

### Millimetrique and GAZ 24°



#### Identification

GAZ fittings have a 24-degree seat and straight, metric threads. While similar to DIN fittings, the French use fine threads on all sizes while the DIN fitting may have a coarse thread on the larger sizes.

#### Seal

The French Metric (GAZ) male with 24-degree seat will mate with the female, 24-degree cone or the female tube fitting.

#### Comments

The Millimetrique Series is used with whole number metric OD tubing and the GAZ Series is used with fractional number metric OD pipe size tubing.

#### Thread Identification Table

French Metric Millimetrique

(see table on next page)

(French Metric Millimetric Continued)

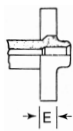
Metric Thread (Dia. x Pitch)	Female Thread ID		Male Thread OD		Tube OD	
	mm	in.	mm	in.	mm	in.
M 12 x 1.0	11.0	0.43	12.0	0.47	6	0.24
M 14 x 1.5	12.5	0.49	14.0	0.55	8	0.31
M 16 x 1.5	14.5	0.57	16.0	0.63	10	0.39
M 18 x 1.5	16.5	0.65	18.0	0.71	12	0.47
M 20 x 1.5	18.5	0.73	20.0	0.79	14	0.55
M 22 x 1.5	20.5	0.81	22.0	0.87	15	0.59
M 24 x 1.5	22.5	0.89	24.0	0.94	16	0.63
M 27 x 1.5	25.5	1.00	27.0	1.06	18	0.71
M 30 x 1.5	28.5	1.12	30.0	1.18	22	0.87
M 33 x 1.5	31.5	1.24	33.0	1.30	25	0.98
M 36 x 1.5	34.5	1.36	36.0	1.42	28	1.10
M 39 x 1.5	37.5	1.48	39.0	1.54	30	1.18
M 42 x 1.5	40.5	1.59	42.0	1.65	32	1.26
M 45 x 1.5	43.5	1.71	45.0	1.77	35	1.38
M 48 x 1.5	46.5	1.83	48.0	1.89	38	1.50
M 52 x 1.5	50.5	1.99	52.0	2.05	40	1.57
M 54 x 2.0	51.9	2.04	54.0	2.13	45	1.77

## Thread Identification Table

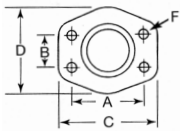
French Metric GAZ 24° Cone

Dash Size (Dash)	Metric Thread (Dia. x Pitch)	Female Thread ID		Male Thread OD		Tube OD	
		mm	in.	mm	in.	mm	in.
-6	M 20 x 1.5	18.5	0.73	20.0	0.78	13.25	0.52
-8	M 24 x 1.5	22.5	0.89	24.0	0.94	16.75	0.66
-10	M 30 x 1.5	28.5	1.12	30.0	1.18	21.25	0.83
-12	M 36 x 1.5	34.5	1.36	36.0	1.41	26.75	1.05
-16	M 45 x 1.5	43.5	1.71	45.0	1.77	33.50	1.32
-20	M 52 x 1.5	50.5	1.99	52.0	2.04	42.25	1.66

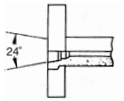
## GAZ Poclain 24° Flange



Male



Flange Clamp



Female

with a 24-degree seat is different from an SAE flange in that there is a lip that protrudes from the flange face.

### Seal

The male flange will connect with a female flange or port. The seal is made on the 24-degree seat.

### Thread Identification Table

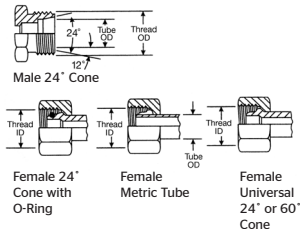
GAZ Poclain 24° Flange

Nominal Size (in.)	(A)	(B)	(C)	(D)	(E)	(F)
1/2	1.57	0.72	2.20	1.89	0.55	0.35
5/8	1.57	0.72	2.20	1.89	0.55	0.35
3/4	2.00	0.94	2.75	2.38	0.71	0.43



## German Thread Types

### DIN 2353 24° Cone



#### Identification

Both male and female have straight metric threads. The male has a 24-degree seat and a recessed counter bore which matches the tube OD used with it. The female can be any of three styles including a 24-degree cone with an O-Ring, a metric tube fitting, or a universal 24- or 60-degree cone. Use a 12-degree gauge

to measure seat angle as the dimension is taken from the fitting centerline.

#### Seal

Sealing takes place between the 24-degree seat in the male end and the respective sealing area in the female end.

#### Comments

There is a light and heavy version of this coupling. Proper identification is made by measuring the thread size and tube OD. The heavy-duty version has a smaller tube OD than the light-duty version, but has a thicker wall section.

#### Thread Identification Table

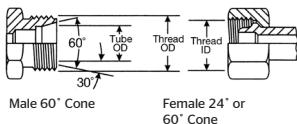
DIN 2353 24° Cone

(see table on next page)

(DIN 2353 24° Cone continued)

Metric Thread (Dia. x Pitch)	Female Thread ID		Male Thread OD		Tube OD Light Series		Tube OD Heavy Series	
	mm	in.	mm	in.	mm	in.	mm	in.
M 12 x 1.5	10.5	0.41	12	0.47	6	0.24		
M 14 x 1.5	12.5	0.49	14	0.55	8	0.31	6	0.24
M 16 x 1.5	14.5	0.57	16	0.63	10	0.39	8	0.31
M 18 x 1.5	16.5	0.65	18	0.71	12	0.47	10	0.39
M 20 x 1.5	18.5	0.73	20	0.79			12	0.47
M 22 x 1.5	20.5	0.81	22	0.87	15	0.59	14	0.55
M 24 x 1.5	22.5	0.89	24	0.94			16	0.63
M 26 x 1.5	24.5	0.96	26	1.02	18	0.71		
M 30 x 2.0	28.5	1.12	30	1.18	22	0.87	20	0.79
M 36 x 2.0	33.9	1.33	36	1.42	28	1.10	25	0.98
M 42 x 2.0	39.9	1.57	42	1.65			30	1.18
M 45 x 2.0	42.9	1.69	45	1.77	35	1.38		
M 52 x 2.0	49.9	1.96	52	2.05	42	1.65	38	1.50

## DIN 3863 60° Cone



### Identification

Both male and female have straight metric threads. Use a 30-degree gauge to measure seat angle as this dimension is taken from the fitting centerline.

### Seal

The male has a 60-degree seat. The female has a 24- or 60-degree seat. The seal takes place by contact between the 60-degree seat in the male end and the respective sealing area in the female end.

### Thread Identification Table

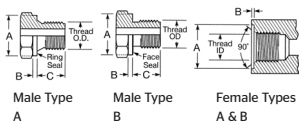
DIN 3863 60° Cone

(see table on next page)

(DIN 3863 60° Cone continued)

Metric Thread (Dia. x Pitch)	Female Thread ID		Male Thread OD		Tube OD 60° Cone	
	mm	in.	mm	in.	mm	in.
M 12 x 1.5	10.5	0.41	12	0.47	6	0.21
M 14 x 1.5	12.5	0.49	14	0.55	8	0.41
M 16 x 1.5	14.5	0.57	16	0.63	10	0.39
M 18 x 1.5	16.5	0.65	18	0.71	12	0.47
M 22 x 1.5	20.5	0.81	22	0.87	15	0.59
M 26 x 1.5	24.5	0.96	26	1.02	18	0.71
M 30 x 2.0	28.5	1.12	30	1.18	22	0.87
M 38 x 2.0	36.5	1.44	38	1.50	28	1.10
M 45 x 2.0	43.5	1.71	45	1.77	35	1.38
M 52 x 2.0	50.5	1.99	52	2.05	42	1.65

## DIN 3852 Types A & B



### Seal

The seal occurs when the ring seal in type A or the face seal in type B connects with the face of the female port.

### Identification

Both male and female, type A (light-duty) and type B (heavy-duty) have straight threads.

### Thread Identification Tables

DIN 3852 Types A & B

## L Light

### Male Metric Thread Parallel

Tube OD (Dia. x Pitch)	Metric Thread Size (mm)	Thread OD (in.)	A (mm)	B (mm)	C (mm)
6	10 x 1.0	10	14	1.5	8
8	12 x 1.5	12	17	2.0	12
10	14 x 1.5	14	19	2.0	12
12	16 x 1.5	16	21	2.5	12
15	18 x 1.5	18	23	2.5	12
18	22 x 1.5	22	27	3.0	14
22	26 x 1.5	26	31	3.0	16
28	33 x 2.0	33	39	3.0	18
35	42 x 2.0	42	49	3.0	20
42	48 x 2.0	48	55	3.0	22

(continued on next page)

(DIN 3852 Types A &amp; B continued)

**S Heavy**

<b>Male Metric Thread Parallel</b>					
<b>Tube OD (Dia. x Pitch)</b>	<b>Metric Thread Size (mm)</b>	<b>Thread OD (in.)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>C (mm)</b>
6	12 x 1.5	12	17	2.0	12
8	14 x 1.5	14	19	2.0	12
10	16 x 1.5	16	21	2.5	12
12	18 x 1.5	18	23	2.5	12
14	20 x 1.5	20	35	3.0	14
16	22 x 1.5	22	27	3.0	14
20	27 x 2.0	27	32	3.0	16
25	33 x 2.0	33	39	3.0	18
30	42 x 2.0	42	49	3.0	20
38	48 x 2.0	48	55	3.0	22

## Thread Identification Tables

DIN 3852 Types A & B

### L Light

Tube OD (Dia. x Pitch)	Female Metric Thread Parallel			
	Metric Thread Size (mm)	Thread ID (in.)	A (mm)	B (mm)
6	10 x 1.0	8.5	15	1.0
8	12 x 1.5	10.5	18	1.5
10	14 x 1.5	12.5	20	1.5
12	16 x 1.5	14.5	22	1.5
15	18 x 1.5	16.5	24	2.0
18	22 x 1.5	20.5	28	2.5
22	26 x 1.5	24.5	32	2.5
28	33 x 2.0	31.5	40	2.5
35	42 x 2.0	40.5	50	2.5
42	48 x 2.0	46.5	56	2.5

(continued on next page)

(DIN 3852 Types A &amp; B continued)

**S Heavy**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Metric Thread Parallel</b>			
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>	<b>B (mm)</b>
6	12 x 1.5	10.5	18	1.5
8	14 x 1.5	12.5	20	1.5
10	16 x 1.5	14.5	22	1.5
12	18 x 1.5	16.5	24	2.0
14	20 x 1.5	18.5	26	2.0
16	22 x 1.5	20.5	28	2.5
20	27 x 2.0	25.5	33	2.5
25	33 x 2.0	31.5	40	2.5
30	42 x 2.0	40.5	50	2.5
38	48 x 2.0	46.5	56	2.5



(DIN 3852 Types A &amp; B continued)

**L Light**

<b>Male Whitworth Thread Parallel (BSPP)</b>					
<b>Tube OD (Dia. x Pitch)</b>	<b>Metric Thread Size (mm)</b>	<b>Thread OD (in.)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>C (mm)</b>
6	1/8-28	3/8	14	1.5	8
8	1/4-19	1/2	17	2.0	12
10	1/4-19	1/2	19	2.0	12
12	3/8-19	21/32	21	2.5	12
15	1/2-14	13/16	23	2.5	12
18	1/2-14	13/16	27	3.0	14
22	3/4-14	11/32	31	3.0	16
28	1-11	15/16	39	3.0	18
35	1 1/4-11	1 21/32	49	3.0	20
42	1 1/2-11	1 7/8	55	3.0	22

(continued on next page)

(DIN 3852 Types A &amp; B continued)

**S Heavy**

<b>Male Whitworth Thread Parallel (BSPP)</b>					
<b>Tube OD (Dia. x Pitch)</b>	<b>Metric Thread Size (mm)</b>	<b>Thread OD (in.)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>C (mm)</b>
6	1/4-19	1/2	17	2.0	12
8	1/4-19	1/2	19	2.0	12
10	3/8-19	21/32	21	2.5	12
12	3/8-19	21/32	23	2.5	12
14	1/2-14	13/16	25	3.0	14
16	1/2-14	13/16	27	3.0	14
20	3/4-14	11/32	32	3.0	16
25	1-11	15/16	39	3.0	18
30	1 1/4-11	1 21/32	49	3.0	20
38	1 1/2-11	1 7/8	55	3.0	22

(DIN 3852 Types A &amp; B continued)

**L Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Whitworth Thread Parallel (BSPOR)</b>			
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>	<b>B (mm)</b>
6	1/8-28	11/32	15	1.0
8	1/4-19	15/32	19	1.5
10	1/4-19	15/32	19	1.5
12	3/8-19	19/32	23	2.0
15	1/2-14	3/4	27	2.5
18	1/2-14	3/4	27	2.5
22	3/4-14	31/32	33	2.5
28	1-11	1 <sup>7</sup> / <sub>32</sub>	40	2.5
35	1 <sup>1</sup> / <sub>4</sub> -11	1 <sup>17</sup> / <sub>32</sub>	50	2.5
42	1 <sup>1</sup> / <sub>2</sub> -11	1 <sup>25</sup> / <sub>32</sub>	56	2.5

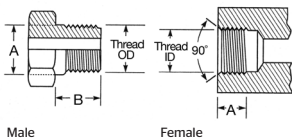
(continued on next page)

(DIN 3852 Types A &amp; B continued)

**S Heavy**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Whitworth Thread Parallel (BSPOR)</b>			
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>	<b>B (mm)</b>
6	1/4-19	15/32	19	1.5
8	1/4-19	15/32	19	1.5
10	3/8-19	19/32	23	2.0
12	3/8-19	19/32	23	2.0
14	1/2-14	3/4	27	2.5
16	1/2-14	3/4	27	2.5
20	3/4-14	31/32	33	2.5
25	1-11	17/32	40	2.5
30	1¼-11	17/32	50	2.5
38	1½-11	125/32	56	2.5

## DIN 3852 Type C



### Seal

The male will only connect with the female as shown. The seal takes place on the threads.

### Comments

Type C couplings are available in extra light (LL), light (L) and heavy (S).

### Identification

Both male and female have tapered threads and are available in metric and Whitworth threads.

### Thread Identification Tables

DIN 3852 Type C

### LL Extra Light

Tube OD (Dia. x Pitch)	Male Metric Tapered Threads			
	Metric Thread Size (mm)	A (mm)	B (mm)	Thread OD (in.)
4	8 x 1.0	8.40	8	8
5	8 x 1.0	8.40	8	8
6	10 x 1.0	10.40	8	10
8	10 x 1.0	10.40	8	10

(continued on next page)

(DIN 3852 Type C continued)

**L Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Male Metric Tapered Threads</b>			
	<b>Metric Thread Size (mm)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>Thread OD (in.)</b>
6	10 x 1.0	10.40	8	10
8	12 x 1.5	12.53	12	12
10	14 x 1.5	14.53	12	14
12	16 x 1.5	16.53	12	16
15	18 x 1.5	18.53	12	18
18	22 x 1.5	22.65	14	22

**S Heavy**

<b>Tube OD (Dia. x Pitch)</b>	<b>Male Metric Tapered Threads</b>			
	<b>Metric Thread Size (mm)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>Thread OD (in.)</b>
6	12 x 1.5	12.53	12	12
8	14 x 1.5	14.53	12	14
10	16 x 1.5	16.53	12	16
12	18 x 1.5	18.53	12	18
14	20 x 1.5	20.65	14	20
16	22 x 1.5	22.65	14	22

(DIN 3852 Type C continued)

**LL Extra Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Metric Tapered Threads</b>		
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>
4	8 x 1.0	6.5	5.5
5	8 x 1.0	6.5	5.5
6	10 x 1.0	8.5	5.5
8	10 x 1.0	8.5	5.5

**L Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Metric Tapered Threads</b>		
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>
6	10 x 1.0	8.5	5.5
8	12 x 1.5	10.5	8.5
10	14 x 1.5	12.5	8.5
12	16 x 1.5	14.5	8.5
15	18 x 1.5	16.5	8.5
18	22 x 1.5	20.5	10.5

(continued on next page)

(DIN 3852 Type C continued)

**S Heavy**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Metric Tapered Threads</b>		
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>
6	12 x 1.5	10.5	8.5
8	14 x 1.5	12.5	8.5
10	16 x 1.5	14.5	8.5
12	18 x 1.5	16.5	8.5
14	20 x 1.5	18.5	10.5
16	22 x 1.5	20.5	10.5

**LL Extra Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Male Whitworth Tapered Threads</b>			
	<b>Metric Thread Size (mm)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>Thread OD (in.)</b>
4	1/8-28	0.392	8	1/8
5	1/8-28	0.392	8	1/8
6	1/8-28	0.392	8	1/8
8	1/8-28	0.392	8	1/8



(DIN 3852 Type C continued)

**L Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Male Whitworth Tapered Threads</b>			
	<b>Metric Thread Size (mm)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>Thread OD (in.)</b>
6	1/8-28	0.392	8	1/8
8	1/4-19	0.532	12	1/4
10	1/4-19	0.532	12	1/4
12	3/8-19	0.670	12	3/8
15	1/2-14	0.839	14	1/2
18	1/2-14	0.839	14	1/2

**S Heavy**

<b>Tube OD (Dia. x Pitch)</b>	<b>Male Whitworth Tapered Threads</b>			
	<b>Metric Thread Size (mm)</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>Thread OD (in.)</b>
6	1/4-19	0.532	12	1/4
8	1/4-19	0.532	12	1/4
10	3/8-19	0.670	12	3/8
12	3/8-19	0.670	12	3/8
14	1/2-14	0.839	14	1/2
16	1/2-14	0.839	14	1/2

(continued on next page)

(DIN 3852 Type C continued)

**LL Extra Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Whitworth Tapered Threads</b>		
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>
4	1/8-28	11/32	5.5
5	1/8-28	11/32	5.5
6	1/8-28	11/32	5.5
8	1/8-28	11/32	5.5

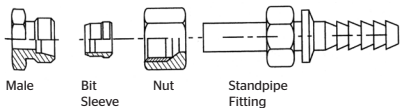
**L Light**

<b>Tube OD (Dia. x Pitch)</b>	<b>Female Whitworth Tapered Threads</b>		
	<b>Metric Thread Size (mm)</b>	<b>Thread ID (in.)</b>	<b>A (mm)</b>
6	1/8-28	11/32	5.5
8	1/4-19	15/32	8.5
10	1/4-19	15/32	8.5
12	3/8-19	19/32	8.5
15	1/2-14	3/4	8.5
18	1/2-14	3/4	10.5

(DIN 3852 Type C continued)

**S Heavy**

Tube OD (Dia. x Pitch)	Female Whitworth Tapered Threads		
	Metric Thread Size (mm)	Thread ID (in.)	A (mm)
6	1/4-19	15/32	8.5
8	1/4-19	15/32	8.5
10	3/8-19	19/32	8.5
12	3/8-19	19/32	8.5
14	1/2-14	3/4	10.5
16	1/2-14	3/4	10.5

**Standpipe Assembly****Identification**

A metric standpipe is comprised of three components attached to a male fitting. The components are a standpipe, a bite sleeve and a metric nut.

**Comments**

The bite sleeve and standpipe are selected on the basis of tube OD. A DIN light metric nut or heavy metric nut can also be selected.

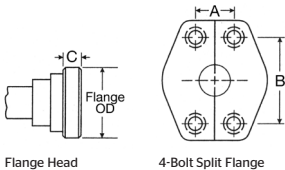
(see table on next page)

## Thread Identification Table

### Metric Standpipe Assembly

Metric DIN Tube OD (mm)	Bite Sleeve DIN Tube OD (mm)	Metric Nut Thread	
		Light	Heavy
6	6	M 12 x 1.5	
8	8	M 14 x 1.5	M 16 x 1.5
10	10	M 16 x 1.5	M 18 x 1.5
12	12	M 18 x 1.5	M 20 x 1.5
15	15	M 22 x 1.5	
16	16		M 24 x 1.5
18	18	M 26 x 1.5	
20	20		M 30 x 2.0
22	22	M 30 x 2.0	
25	25		M 36 x 2.0
28	28	M 36 x 2.0	
30	30		M 42 x 2.0
35	35	M 45 x 2.0	
38	38		M 52 x 2.0
42	42	M 52 x 2.0	

## DIN 20066 4-Bolt Flange



### Identification

The female port is an unthreaded hole surrounded with 4 bolt holes in a rectangular pattern. The male consists of a flanged head, grooved for an O-Ring, and a flange with holes to match the port.

### Seal

The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port. The threaded bolts hold the connection mechanically.

### Comments

There are two pressure ratings. Form R is similar to SAE Code 61 and is referred to as the “standard” series. Form S is similar to SAE Code 62 and is referred to as the “heavy-duty” series. The design concept is the same, but bolt diameters and flange head diameters are larger for the Form S fitting. Both metric and inch bolts are used. DIN 20066 is interchangeable with both SAE J518 and JIS B 8363.

### Thread Identification Table

DIN 20066 4-Bolt Flange

(see tables on next page)

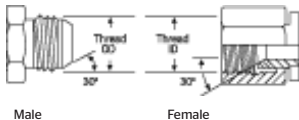
(DIN 20066 4-Bolt Flange continued)

Nominal Flange Size (in.)	Form R			
	Flange OD	A	B	C
1/2	1.188	0.688	1.500	0.265
5/8	1.345			0.265
3/4	1.500	0.875	1.875	0.265
1	1.750	1.031	2.062	0.315
1¼	2.000	1.188	2.312	0.315
1½	2.375	1.406	2.750	0.315
2	2.812	1.688	3.062	0.375
2½	3.312	2.000	3.500	0.375
3	4.000	2.438	4.188	0.375
3½	4.500	2.750	4.750	0.422
4	5.000	3.062	5.125	0.442
5	6.000	3.625	6.000	0.442

Nominal Flange Size (in.)	Form S			
	Flange OD	A	B	C
1/2	1.250	0.718	1.594	0.305
3/4	1.625	0.937	2.000	0.245
1	1.875	1.093	2.250	0.375
1¼	2.125	1.250	2.625	0.405
1½	2.500	1.437	3.125	0.495
2	3.125	1.750	3.812	0.495

## Japanese Thread Types

### JIS 30° (Parallel Pipe Threads)



#### Identification

The male and female have straight threads and a 30-degree seat.

#### Seal

The JIS 30-degree male will only connect with the JIS 30-degree female. The seal is made on the 30-degree seat. The threads hold the connection in place mechanically.

#### Comments

The JIC 37-degree flare is very similar to the JIS 30-degree flare.

To determine the difference, carefully measure the seat angle. The threads on the JIS 30 conform to JIS B 0202. While the BSPP fitting has similar threads, and also has a 30-degree seat, the JIS 30 is not interchangeable with the BSPP fitting as the British seat is inverted.

#### Thread Identification Table

JIS 30° Flare Parallel

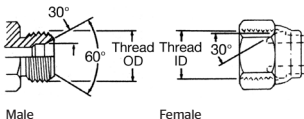
(see table on next page)

(JIS 30° Flare Parallel continued)

<b>Dash Size</b>	<b>Nominal Size (in.)</b>	<b>Thread Size</b>	<b>Male Thread OD</b>	<b>Female Thread ID</b>
-2	1/8	1/8-28	3/8	11/32
-4	1/4	1/4-19	17/32	7/16
-6	3/8	3/8-19	21/32	19/32
-8	1/2	1/2-14	13/16	3/4
-10	5/8	5/8-14	29/32	13/16
-12	3/4	3/4-14	11 <sup>1</sup> / <sub>32</sub>	15/16
-16	1	1-11	1 <sup>15</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>
-20	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub> -11	1 <sup>21</sup> / <sub>32</sub>	1 <sup>17</sup> / <sub>32</sub>
-24	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> -11	1 <sup>7</sup> / <sub>8</sub>	1 <sup>25</sup> / <sub>32</sub>
-32	2	2-11	2 <sup>11</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>



## JIS 30° Male Inverted Seat (Parallel Pipe Threads) (JIS B 0202)



seat and chamfer. The seal takes place by compression of the 30-degree seat on the chamfer. The threads hold the connection mechanically.

### Identification

The JIS 30 Parallel has straight threads, conforming to JIS B 0202.

### Seal

Both male and female have a straight thread and 30-degree

### Comments

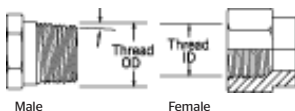
The BSPP fitting is fully interchangeable with the JIS 30, male inverted seat.

### Thread Identification Table

JIS 30° Male Inverted Seat

Dash Size	Nominal Size (in.)	Thread Size	Male Thread OD	Female Thread ID
-4	1/4	1/4-19	8/16	15/32
-6	3/8	3/8-19	21/32	19/32
-8	1/2	1/2-14	13/16	3/4
-12	3/4	3/4-14	1 1/32	31/32
-16	1	1-11	1 5/16	1 7/32
-20	1 1/4	1 1/4-11	1 21/32	1 9/16
-24	1 1/2	1 1/2-11	1 7/8	1 25/32
-32	2	2-11	2 11/32	2 1/4

## JIS Tapered Pipe (JIS B 0203)



distortion. A thread sealant is recommended.

### Comments

The JIS tapered pipe thread is similar to a BSPT fitting and is fully interchangeable.

### Identification

Both male and female have tapered threads that conform to JIS B 0203.

### Thread Identification Table

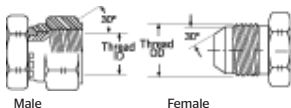
JIS Tapered Pipe

### Seal

The seal is made within the threads through thread

Dash Size	Nominal Size (in.)	Thread Size	Male Thread OD	Female Thread ID
-2	1/8	1/8-28	3/8	11/32
-4	1/4	1/4-19	17/32	7/16
-6	3/8	3/8-19	21/32	19/32
-8	1/2	1/2-14	13/16	3/4
-12	3/4	3/4-14	11/32	15/16
-16	1	1-11	1 <sup>15</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>
-20	1 1/4	1 1/4-11	1 <sup>21</sup> / <sub>32</sub>	1 <sup>17</sup> / <sub>32</sub>
-24	1 1/2	1 1/2-11	1 <sup>7</sup> / <sub>8</sub>	1 <sup>25</sup> / <sub>32</sub>
-32	2	2-11	2 <sup>11</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>

## Japanese Komatsu® 30° Flare with Metric Threads (JIS B 0207)



place by compression of the 30-degree seat on the chamfer. The threads hold the connection mechanically.

### Identification

Same as JIS B 0202, but conforms to JIS B 0207 with metric threads.

### Seal

Both male and female have a straight thread, and 30-degree seat and chamfer. The seal takes

### Comments

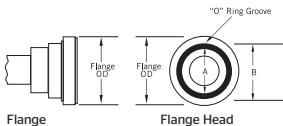
Also known as the Komatsu® style, it is used extensively on Komatsu® equipment.

### Thread Identification Table

Komatsu®-Style 30° Flare

Dash Size	Nominal Size		Metric Thread Size	Male Thread OD	Female Thread ID
	(in.)	(mm)			
-6	3/8	9.5	M 18 x 1.5	18	16.5
-8	1/2	13	M 22 x 1.5	22	20.5
-10	5/8	16	M 24 x 1.5	24	22.5
-12	3/4	19	M 30 x 1.5	30	28.5
-16	1	25	M 33 x 1.5	33	31.5
-20	1¼	32	M 36 x 1.5	36	34.5
-24	1½	38	M 42 x 1.5	42	40.5

## Komatsu® Flange Fitting



are different, an SAE O-Ring must be used when replacing the Komatsu® fitting with an SAE fitting.

### Identification

The Komatsu® Flange fitting is nearly identical to the SAE Code 61 flange fitting and fully interchangeable. As O-Ring sizes

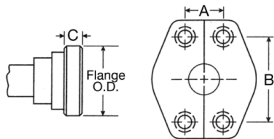
### Thread Identification Table

Komatsu®-Style Flange

#### Nominal Size

Dash Size	(in.)	(mm)	Flange OD	A	B
-8	1/2	12.7	1.188	7.280	0.984
-10	5/8	15.9	1.345	7.280	1.102
-12	3/4	19.1	1.500	0.846	1.220
-16	1	25.4	1.750	1.122	1.496
-20	1¼	31.8	2.000	1.358	1.732
-24	1½	38.1	2.375	1.750	2.125
-32	2	50.8	2.812	2.225	2.559

## JIS B 8363 4-Bolt Flange



Flange Head

4-Bolt Split Flange

### Identification

The female port is an unthreaded hole surrounded with 4 bolt holes in a rectangular pattern. The male consists of a flanged head, grooved for an O-Ring, and a flange with holes to match the port.

### Seal

The seal takes place on the O-Ring, which is compressed between the flanged head and the flat surface surrounding the port. The threaded bolts hold the connection mechanically.

### Comments

There are two pressure ratings. Type I is similar to SAE Code 61 and is referred to as the “standard” series. Type II is similar to SAE Code 62 and is referred to as the “heavy-duty” series. The design concept is the same, but bolt diameters and flange head diameters are larger for the Type II fitting. Both metric and inch bolts are used. JIS B 8363 is interchangeable with both SAE J518 and DIN 20066.

### Thread Identification Table

JIS B 8363 4-Bolt Flange

(see tables on next page)

## (JIS B 8363 4-Bolt Flange continued)

Nominal Flange Size (in.)	Type I			
	Flange OD	A	B	C
1/2	1.188	0.688	1.500	0.265
5/8	1.345			0.265
3/4	1.500	0.875	1.875	0.265
1	1.750	1.031	2.062	0.315
1¼	2.000	1.188	2.312	0.315
1½	2.375	1.406	2.750	0.315
2	2.812	1.688	3.062	0.375
2½	3.312	2.000	3.500	0.375
3	4.000	2.438	4.188	0.375
3½	4.500	2.750	4.750	0.422
4	5.000	3.062	5.125	0.442
5	6.000	3.625	6.000	0.442

Nominal Flange Size (in.)	Type II			
	Flange OD	A	B	C
1/2	1.250	0.718	1.594	0.305
3/4	1.625	0.937	2.000	0.245
1	1.875	1.093	2.250	0.375
1¼	2.125	1.250	2.625	0.405
1½	2.500	1.437	3.125	0.495
2	3.125	1.750	3.812	0.495



## BSPB (British Standard Pipe Parallel) O-Rings

### Material

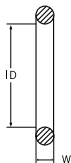
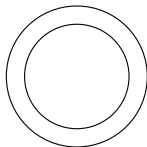
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

#### ContiTech Part #

#### ID

#### Width (W)

#### Thread Dash Size

OBSPP-04

0.256

0.039

-04

OBSPP-06

0.319

0.063

-06

OBSPP-08

0.476

0.063

-08

OBSPP-10

0.516

0.063

-10

OBSPP-12

0.673

0.063

-12

OBSPP-16

0.870

0.063

-16

OBSPP-20

1.146

0.063

-20

OBSPP-24

1.382

0.063

-24

OBSPP-32

1.890

0.059

-32

## DIN 24 Light O-Rings

### Material

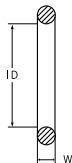
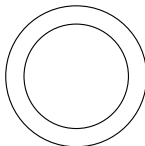
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

#### ContiTech Part #

#### ID

#### Width (W)

#### Thread Dash Size

ODIN24L-14

0.236

0.059

-14

ODIN24L-16

0.295

0.059

-16

ODIN24L-18

0.354

0.059

-18

ODIN24L-22

0.472

0.079

-22

ODIN24L-26

0.591

0.079

-26

ODIN24L-30

0.787

0.079

-30

ODIN24L-36

1.024

0.079

-36

ODIN24L-45

1.260

0.098

-45

ODIN24L-52

1.496

0.098

-52



## DIN 24 Heavy O-Rings

### Material

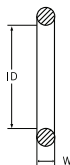
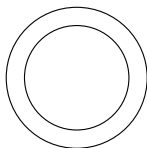
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

#### ContiTech Part #

#### ID

#### Width (W)

#### Thread Dash Size

ODIN24H-22

0.394

0.079

-22

ODIN24H-30

0.642

0.094

-30

ODIN24H-36

0.799

0.094

-36

ODIN24H-42

0.984

0.098

-42

ODIN24H-52

1.311

0.094

-52

## O-Ring Face Seal (SAE J1453 ORS/ORFS) O-Rings

### Material

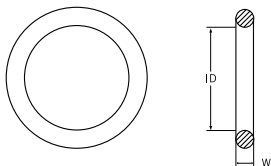
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

ContiTech Part #	ID	Width (W)	Thread Dash Size
OORFS-04	0.301	0.07	-04
OORFS-06	0.364	0.07	-06
OORFS-08	0.488	0.07	-08
OORFS-10	0.614	0.07	-10
OORFS-12	0.739	0.07	-12
OORFS-16	0.926	0.07	-16
OORFS-20	1.176	0.07	-20

## O-Ring Boss Straight (SAE J514) O-Rings

### Material

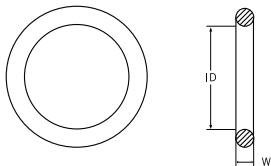
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

ContiTech Part #	ID	Width (W)	Thread Dash Size
ORB-04	0.351	0.072	-04
ORB-05	0.414	0.072	-05
ORB-06	0.468	0.078	-06
ORB-08	0.644	0.087	-08
ORB-10	0.755	0.097	-10
ORB-12	0.924	0.116	-12
ORB-16	1.171	0.116	-16

## Code 61 & 62 Flange (SAE J518) O-Rings

### Material

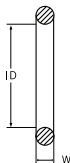
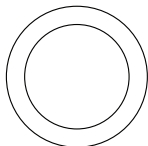
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

#### ContiTech Part #

#### ID

#### Width (W)

#### Thread Dash Size

O6162-08

0.734

0.139

-08

O6162-12

0.984

0.139

-12

O6162-16

1.296

0.139

-16

O6162-20

1.484

0.139

-20

O6162-24

1.859

0.139

-24

O6162-32

2.234

0.139

-32

O6162-40

2.734

0.139

-40

## Caterpillar® Flange O-Rings

### Material

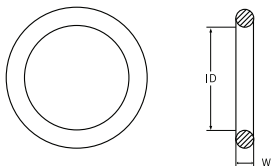
NBR

### Hardness

90 Shore A

### Temperature Range

-13°F to 257°F (-25°C to 125°C)



### Continental

ContiTech Part #	ID	Width (W)	Thread Dash Size
OCAF-12	1.000	0.197	-12
OCAF-16	1.256	0.197	-16
OCAF-20	1.504	0.197	-20
OCAF-24	1.760	0.197	-24
OCAF-32	2.516	0.197	-32

Thread Type	02	03	04	05	06
JIC 37° Flare (SAE J514)		3/8-24	7/16-20	1/2-20	9/16-18
SAE 45° J512 Flare			7/16-20	1/2-20	5/8-18
SAE 45° Inverted Flare			7/16-24	1/2-20	5/8-18
NPTF	1/8-27		1/4-18		3/8-18
NPSM			1/4-18		3/8-18
SAE J514 Flareless Tube Fitting			7/16-20		9/16-18
O-Ring Face Seal (SAE J1453 ORS/ORFS)			9/16-18		11/16-16
O-Ring Boss Straight Thread (SAE J1514)			7/16-20	1/2-20	9/16-18
BSPP (British Standard Pipe Parallel)			1/4-19		3/8-19
BSPT (British Standard Pipe Tapered)			1/4-19		3/8-19
BSP Flat Seal (British Standard Pipe)					3/8-19
JIS 30° (Parallel Pipe Threads)			1/4-19		3/8-19
Code 61 Flange (SAE J518)					
Code 62 Flange (SAE J518)					
Caterpillar® Flange					
Komatsu® Flange					
Standpipe					
DIN 24° Light					
DIN 24° Heavy					
DIN 60°					
Komatsu® 30° Flare with Metric Threads					

08	10	12	14	15	16	18	20
3/4-16	7/8-1/4	1 <sup>1</sup> / <sub>16</sub> -12	1 <sup>3</sup> / <sub>16</sub> -12		1 <sup>5</sup> / <sub>16</sub> -12		1 <sup>5</sup> / <sub>8</sub> -12
3/4-16	7/8-14	1 <sup>1</sup> / <sub>16</sub> -14					
3/4-18							
1/2-14		3/4-14			1-11 <sup>1</sup> / <sub>2</sub>		1 <sup>1</sup> / <sub>4</sub> -11 <sup>1</sup> / <sub>2</sub>
1/2-14							
3/4-16							
13/16-16	1-14	1 <sup>3</sup> / <sub>16</sub> -12			17/16-12		1 <sup>11</sup> / <sub>16</sub> -12
3/4-16	7/8-14	1 <sup>3</sup> / <sub>16</sub> -12			1 <sup>5</sup> / <sub>16</sub> -12		1 <sup>5</sup> / <sub>8</sub> -12
1/2-14	5/8-14	3/4-14			1-11		1 <sup>1</sup> / <sub>4</sub> -11
1/2-14		3/4-14			1-11		
1/2-14		3/4-14					
1/2-14		3/4-14			1-11		1 <sup>1</sup> / <sub>4</sub> -11
1.19		1.5			1.75		12
1.25		1.63			1.87		2.13
		1.63			1.87		2.13
	1.34						
8	10	12		15	16	18	20
		12 x 1.5	14 x 1.5		16 x 1.5	18 x 1.5	
					16 x 1.5	18 x 1.5	20 x 1.5
			14 x 1.5		16 x 1.5	18 x 1.5	
			14 x 1.5			18 x 1.5	

Thread Type	22	24	26	28	30
JIC 37° Flare (SAE J514)	1 $\frac{7}{8}$ -12				2 $\frac{1}{2}$ -12
SAE 45° J512 Flare					
SAE 45° Inverted Flare					
NPTF	1 $\frac{1}{2}$ -11 $\frac{1}{2}$				2-11 $\frac{1}{2}$
NPSM					
SAE J514 Flareless Tube Fitting					
O-Ring Face Seal (SAE J1453 ORS/ORFS)	2-12				
O-Ring Boss Straight Thread (SAE J1514)	1 $\frac{7}{8}$ -12				
BSPP (British Standard Pipe Parallel)	1 $\frac{1}{2}$ -11				2-11
BSPT (British Standard Pipe Tapered)					
BSP Flat Seal (British Standard Pipe)					
JIS 30° (Parallel Pipe Threads)					
Code 61 Flange (SAE J518)	2.37				2.81
Code 62 Flange (SAE J518)	2.5				3.13
Caterpillar® Flange	2.5				
Komatsu® Flange					
Standpipe	22			28	
DIN 24° Light	22 x 1.5		26 x 1.5		30 x 2.0
DIN 24° Heavy	22 x 1.5	24 x 1.5			30 x 2.0
DIN 60°	22 x 1.5		26 x 1.5		
Komatsu® 30° Flare with Metric Threads	22 x 1.5	24 x 1.5			30 x 1.5









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