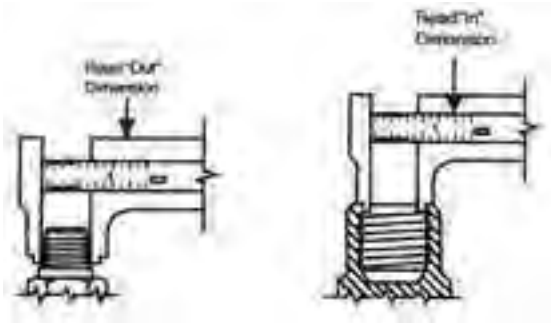
Fitting Identification

Measuring Threads and Seat Angles

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

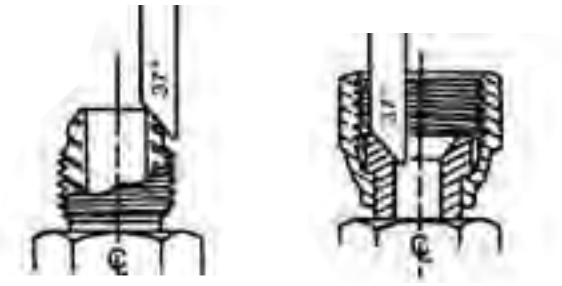
Measuring Threads

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.



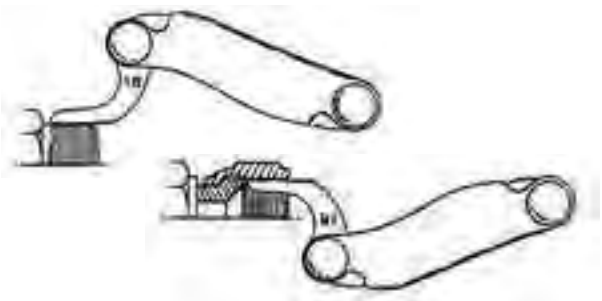
Measuring Seat Angle

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.



Measuring Thread Pitch

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



Comparing Measurements to the Tables

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 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 calipers, thread gauge and the following tables.

Fitting Identification
Fitting Standards

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

North American Thread Types

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

N – National
F – Fuels
T – Tapered Thread
S – Straight Thread
P – Pipe
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

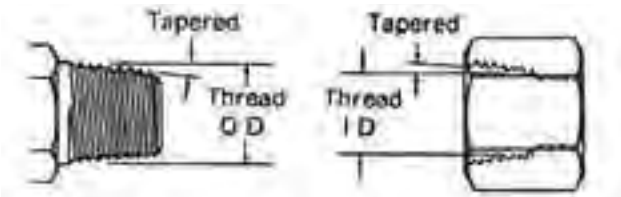
A straight thread is not used for sealing fluids. In this type of fitting, a seal is achieved with an O-ring, a metal seal, or a seat machined into the end of the fitting. A straight thread can be determined by laying a straightedge against the threads. If all the threads are parallel to the centerline of the fitting, then it is a straight thread.

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. If the straightedge is not parallel to the centerline of the fitting and the threads taper towards the centerline of the fitting, then it is a tapered thread.

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).

Inch	1/16	SAP #
1/8	2/16	-2
1/4	4/16	-4
3/8	6/16	-6
1/2	8/16	-8
3/4	12/16	-12
1	16/16	-16
1¼	20/16	-20
1½	24/16	-24
2	32/16	-32

NPTF



Male Female

Identification
National Pipe Tapered Fuels. Tapered thread.

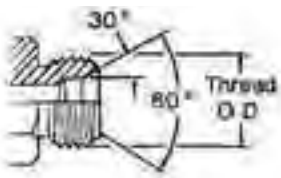
Seal
The thread is tapered and sealing takes place with the deformation of the threads. The NPTF male has a 30-degree seat and will mate with the NPTF female, also with tapered threads, but no seat. A thread sealant is commonly used. An NPTF male with 30-degree seat will mate with an NPSM female, which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

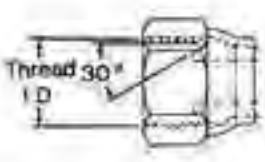
Fitting Identification
Fitting Standards

SAE Thread Types

NPSM



Male



Female

Identification
National Pipe Straight Mechanical. Straight thread.

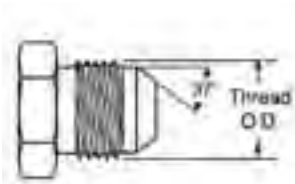
Seal
Both male and female have a straight thread and 30-degree seat and chamfer. The seal takes place by compression of the 30-degree seat on the chamfer. The threads hold the connection mechanically.

Application
Used in fluid power systems.

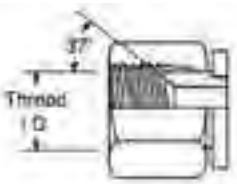
Thread Identification Table
NPTF/NPSF/NPSM

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

JIC 37° Flare (SAE J514)



Male



Female

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.

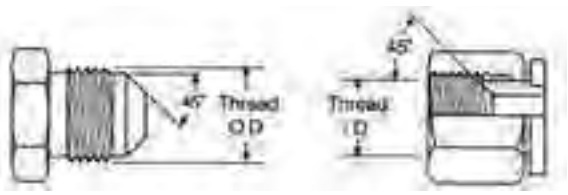
Application
SAE specifies use with high-pressure hydraulic tubing.

Thread Identification Table
JIC 37° Flare

Dash Size	Nominal Size	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	in.
-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 1/16-12	31/32	1 1/16
-14	7/8	1 3/16-12	1 7/64	1 3/16
-16	1	1 5/16-12	1 15/64	1 5/16
-20	1 1/4	1 5/8-12	1 35/64	1 5/8
-24	1 1/2	1 7/8-12	1 51/64	1 7/8
-32	2	2 1/2-12	2 27/64	2 1/2

Fitting Identification
Fitting Standards

SAE 45° Flare (SAE J512)



Male Female

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.

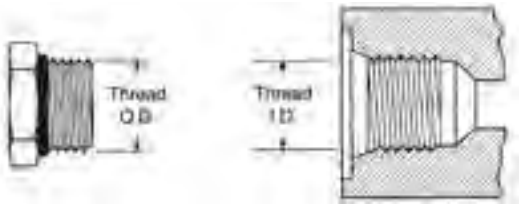
Application
Commonly used in low-pressure, refrigeration and automotive piping systems and are frequently constructed of brass and connected to copper tubing.

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

Dash Size	Nominal Size	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	in.
-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	11/16-16	5/8	11/16
-8	1/2	3/4-16	11/16	3/4
-10	5/8	7/8-14	13/16	7/8
-12	3/4	1 1/16-14	63/64	1 1/16

O-Ring Boss Straight Thread (SAE J514)



Male Female

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.

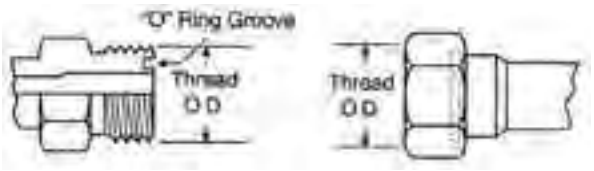
Application
Recommended by the National Fluid Power Association for optimal leakage control in medium- and high-pressure hydraulic systems.

Thread Identification Table
Straight Thread O-Ring Boss

Dash Size	Nominal Size	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	in.
-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 1/16-12	31/32	1 1/16
-14	7/8	1 3/16-12	1 7/64	1 3/16
-16	1	1 5/16-12	1 15/64	1 5/16
-20	1 1/4	1 5/8-12	1 35/64	1 5/8
-24	1 1/2	1 7/8-12	1 51/64	1 7/8
-32	2	2 1/2-12	2 27/64	2 1/2

Fitting Identification
Fitting Standards

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



Male Female

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

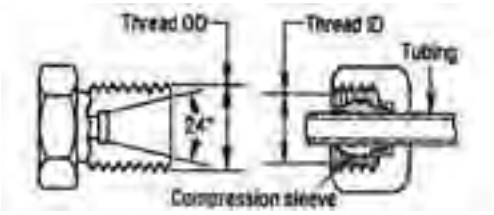
Seal
The seal takes place by compressing the O-ring onto the flat face of the female. The threads hold the connection mechanically.

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	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	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 3/16-12	1 1/8	1 3/16
-16	1	1 7/16-12	1 11/32	1 7/16
-20	1 1/4	1 11/16-12	1 19/32	1 11/16
-24	1 1/2	2-12	1 29/32	2

SAE J514 Flareless Tube Fitting



Male Female

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 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.

Application
Used to adapt steel tubing to a hydraulic hose assembly.

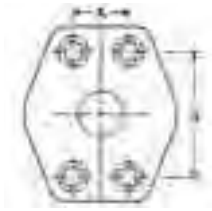
Thread Identification Table
Flareless Tube Fitting

Dash Size	Tube Size	Nominal Size	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	in.	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	1 7/64	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

Fitting Identification
Fitting Standards

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

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 3,000–5,000 psi depending on size. Code 62, Form S, PN 415 bar Type II is the heavy-duty, 6,000 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 Code 62, have a thicker flange head, which is the "C" dimension in the table.

How to Measure
1. Measure port hole diameter [nominal flange size (in.)] using calipers.
2. Measure the longest bolt hole spacing from center to center, which is Dimension "B."
3. Or the flange OD for further identification.

Thread Identification Table
Code 61/Code 62/CAT®

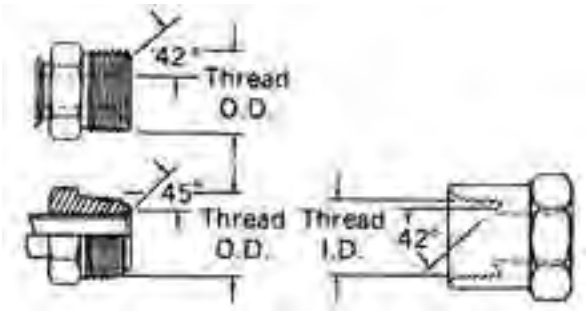
Nominal Flange Size	Code 61			
in.	**Flange OD**	**A**	**B**	**C**
1/2	1.188	0.688	1.500	0.265
5/8	1.345			0.265
3/4	1.500	0.875	1.875	0.265
1	1.750	1.031	2.062	0.315
1¼	2.000	1.188	2.312	0.315
1½	2.375	1.406	2.750	0.315
2	2.812	1.688	3.062	0.375
2½	3.312	2.000	3.500	0.375
3	4.000	2.438	4.188	0.375
3½	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	Code 62			
in.	**Flange OD**	**A**	**B**	**C**
1/2	1.250	0.718	1.594	0.305
3/4	1.625	0.937	2.000	0.345
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	Caterpillar® Code 62			
in.	**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

Fitting Identification
Fitting Standards

SAE 45˚ Inverted Flare (SAE J512)



Male Female

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

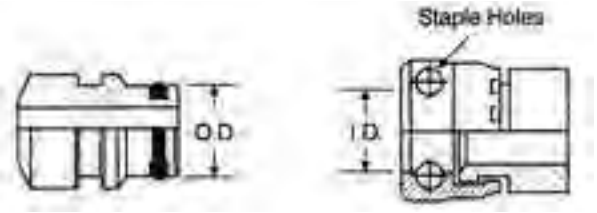
Seal
The seal takes place on the flared surfaces. The threads hold the connection in place mechanically.

Application
Fitting is frequently used in automotive systems.

Thread Identification Table
Table: SAE 45˚ Inverted Flare

Dash Size	Nominal Size	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	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	11/16-18	5/8	11/16
-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

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 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.

Application
Commonly used for hydraulic application in underground mines.

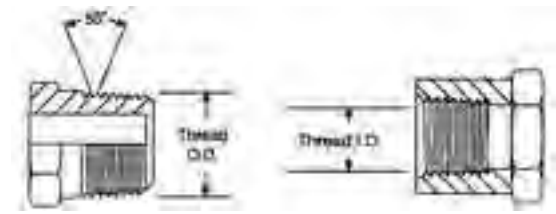
Thread Identification Table
SAE J1467 Clip Fastener

Dash Size	Nominal Size	Female Thread ID	Male Thread OD
	in.	in.	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 35/64	1 17/32
-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

Fitting Identification
Fitting Standards

British Thread Types

BSPT (British Standard Pipe Tapered)



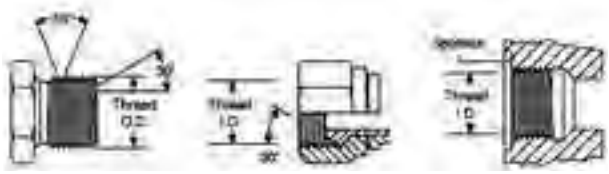
Male Female

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.

BSPP (British Standard Pipe Parallel)



Male Female Female Port

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

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.

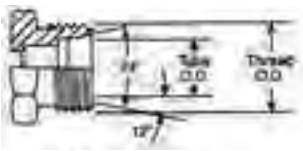
Thread Identification Table
BSPT and BSPP

Dash Size	Nominal Size	Thread Size	Female Thread ID	Male Thread OD
	in.		in.	in.
-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

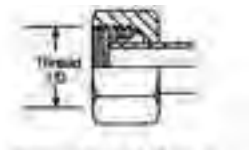
Fitting Identification
Fitting Standards

French Thread Types

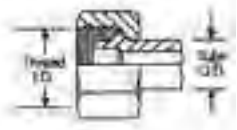
Millimetrique and GAZ 24˚



Male 24° Cone



Female 24° Cone



Female

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

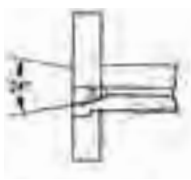
Metric Thread	Female Thread ID		Male Thread OD		Tube OD	
Dia. x Pitch	mm.	in.	mm	in.	mm	in.
M 12 x 1	11.0	0.43	12.0	0.47	6	0.24
M 14 x 1½	12.5	0.49	14.0	0.55	8	0.31
M 16 x 1½	14.5	0.57	16.0	0.63	10	0.39
M 18 x 1½	16.5	0.65	18.0	0.71	12	0.47
M 20 x 1½	18.5	0.73	20.0	0.79	14	0.55
M 22 x 1½	20.5	0.81	22.0	0.87	15	0.59
M 24 x 1½	22.5	0.89	24.0	0.94	16	0.63
M 27 x 1½	25.5	1.00	27.0	1.06	18	0.71
M 30 x 1½	28.5	1.12	30.0	1.18	22	0.87
M 33 x 1½	31.5	1.24	33.0	1.30	25	0.98
M 36 x 1½	34.5	1.36	36.0	1.42	28	1.10
M 39 x 1½	37.5	1.48	39.0	1.54	30	1.18
M 42 x 1½	40.5	1.59	42.0	1.65	32	1.26
M 45 x 1½	43.5	1.71	45.0	1.77	35	1.38
M 48 x 1½	46.5	1.83	48.0	1.89	38	1.50
M 52 x 1½	50.5	1.99	52.0	2.05	40	1.57
M 54 x 2	51.9	2.04	54.0	2.13	45	1.77

Thread Identification Table
French Metric GAZ 24° Cone

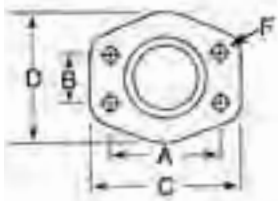
Dash Size	Metric Thread	Female Thread ID		Male Thread OD		Tube OD	
Dash	Dia. x Pitch	mm	in.	mm	in.	mm	in.
-6	M 20 X 1.5	18.5	0.73	20.0	0.78	13.25	0.52
-8	M 24 X 1.5	22.5	0.89	24.0	0.94	16.75	0.66
-10	M 30 X 1.5	28.5	1.12	30.0	1.18	21.25	0.83
-12	M 36 X 1.5	34.5	1.36	36.0	1.41	26.75	1.05
-16	M 45 X 1.5	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



Female



Female Port

Identification
Usually found on Poclain equipment. The Poclain flange 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.

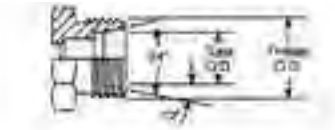
Thread Identification Table
GAZ Poclain 24° Flange

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

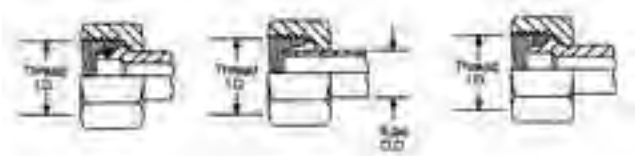
Fitting Identification
Fitting Standards

German Thread Types

DIN 2353 24˚ Cone



Male 24° Cone



Female 24° Cone with O-Ring | Female Metric Tube | Female Universal 24° or 60° 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

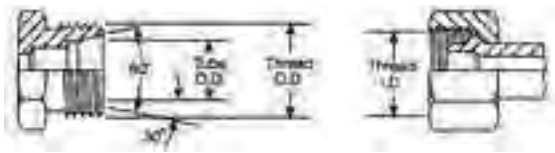
Metric Thread	Female Thread ID		Male Thread OD		Tube OD Light Series		Tube OD Heavy Series	
Dia. x Pitch	mm	in.	mm	in.	mm	in.	mm	in.
M 12 x 1½	10.5	0.41	12	0.47	6	0.24		
M 14 x 1½	12.5	0.49	14	0.55	8	0.31	6	0.24
M 16 x 1½	14.5	0.57	16	0.63	10	0.39	8	0.31
M 18 x 1½	16.5	0.65	18	0.71	12	0.47	10	0.39
M 20 x 1½	18.5	0.73	20	0.79			12	0.47
M 22 x 1½	20.5	0.81	22	0.87	15	0.59	14	0.55
M 24 x 1½	22.5	0.89	24	0.94			16	0.63
M 26 x 1½	24.5	0.96	26	1.02	18	0.71		

DIN 2353 24° Cone (Continued on next column)

DIN 2353 24° Cone (Continued)

Metric Thread	Female Thread ID		Male Thread OD		Tube OD Light Series		Tube OD Heavy Series	
Dia. x Pitch	mm.	in..	mm	in.	mm	in.	mm	in.
M 30 x 2	28.5	1.12	30	1.18	22	0.87	20	0.79
M 36 x 2	33.9	1.33	36	1.42	28	1.10	25	0.98
M 42 x 2	39.9	1.57	42	1.65			30	1.18
M 45 x 2	42.9	1.69	45	1.77	35	1.38		
M 52 x 2.	49.9	1.96	52	2.05	42	1.65	38	1.50

DIN 3863 60˚ Cone



Male 60° Cone | Female 24° or 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

Metric Thread	Female Thread ID		Male Thread OD		Tube OD 60˚ Cone	
Dia. x Pitch		in.	mm	in.	mm	in.
M 12 x 1½	10.5	0.41	12	0.47	6	0.24
M 14 x 1½	12.5	0.49	14	0.55	8	0.31
M 16 x 1½	14.5	0.57	16	0.63	10	0.39
M 18 x 1½	16.5	0.65	18	0.71	12	0.47
M 22 x 1½	20.5	0.81	22	0.87	15	0.59
M 26 x 1½	24.5	0.96	26	1.02	18	0.71
M 30 x 2	28.5	1.12	30	1.18	22	0.87
M 38 x 2	36.5	1.44	38	1.50	28	1.10
M 45 x 2	43.5	1.71	45	1.77	35	1.38
M 52 x 2	50.5	1.99	52	2.05	42	1.65

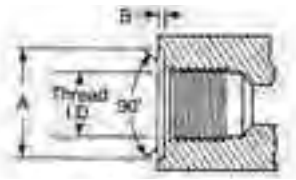
Fitting Identification

Fitting Standards

DIN 3852 Types A & B

Male Type A

Male Type B



Female Types A & B

Identification

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

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.

Thread Identification Tables

DIN 3852 Types A & B

Male Metric Thread Parallel

	Tube OD	Metric Thread Size	Thread OD	A	B	C
	mm	mm	mm	mm	mm	mm
L Light	6	10 x 1	10	14	1.5	8
	8	12 x 1½	12	17	2.0	12
	10	14 x 1½	14	19	2.0	12
	12	16 x 1½	16	21	2.5	12
	15	18 x 1½	18	23	2.5	12
	18	22 x 1½	22	27	3.0	14
	22	26 x 1½	26	31	3.0	16
	28	33 x 2	33	39	3.0	18
	35	42 x 2	42	49	3.0	20
	42	48 x 2	48	55	3.0	22
S Heavy	6	12 x 1½	12	17	2.0	12
	8	14 x 1½	14	19	2.0	12
	10	16 x 1½	16	21	2.5	12
	12	18 x 1½	18	23	2.5	12
	14	20 x 1½	20	35	3.0	14
	16	22 x 1½	22	27	3.0	14
	20	27 x 2	27	32	3.0	16
	25	33 x 2	33	39	3.0	18
	30	42 x 2	42	49	3.0	20
	38	48 x 2	48	55	3.0	22

DIN 3852 Types A & B (Continued on next column)

DIN 3852 Types A & B (Continued)

Female Metric Thread Parallel

	Tube OD	Metric Thread Size	Thread ID	A	B
	mm	mm	mm	mm	mm
L Light	6	10 x 1	8.5	15	1.0
	8	12 x 1½	10.5	18	1.5
	10	14 x 1½	12.5	20	1.5
	12	16 x 1½	14.5	22	1.5
	15	18 x 1½	16.5	24	2.0
	18	22 x 1½	20.5	28	2.5
	22	26 x 1½	24.5	32	2.5
	28	33 x 2	31.5	40	2.5
	35	42 x 2	40.5	50	2.5
	42	48 x 2	46.5	56	2.5
S Heavy	6	12 x 1½	10.5	18	1.5
	8	14 x 1½	12.5	20	1.5
	10	16 x 1½	14.5	22	1.5
	12	18 x 1½	16.5	24	2.0
	14	20 x 1½	18.5	26	2.0
	16	22 x 1½	20.5	28	2.5
	20	27 x 2	25.5	33	2.5
	25	33 x 2	31.5	40	2.5
	30	42 x 2	40.5	50	2.5
	38	48 x 2	46.5	56	2.5

Male Whitworth Thread Parallel (BSPP)

	Tube OD	Metric Thread Size	Thread OD	A	B	C
	mm	mm	in.	mm	mm	mm
L Light	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	1 1/32	31	3.0	16
	28	1-11	1 5/16	39	3.0	18
	35	1¼-11	1 21/32	49	3.0	20
	42	1½-11	1⅞	55	3.0	22
S Heavy	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	1 1/32	32	3.0	16
	25	1-11	1 5/16	39	3.0	18
	30	1¼-11	1 21/32	49	3.0	20
	38	1½-11	1⅞	55	3.0	22

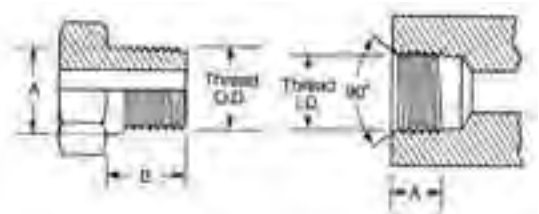
DIN 3852 Types A & B (Continued on next page)

Fitting Identification
Fitting Standards

DIN 3852 Types A & B (Continued)

	Female Whitworth Thread Parallel (BSPOR)				
	Tube OD	Metric Thread Size	Thread ID	A	B
	mm	mm	in.	mm	mm
L Light	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 7/32	40	2.5
	35	1 1/4-11	1 17/32	50	2.5
	42	1 1/2-11	1 25/32	56	2.5
S Heavy	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	1 7/32	40	2.5
	30	1 1/4-11	1 17/32	50	2.5
	38	1 1/2-11	1 25/32	56	2.5

DIN 3852 Type C



Male Female

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

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).

Thread Identification Table
DIN 3852 Type C

	Male Metric Tapered Threads				
	Tube OD	Metric Thread Size	A	B	Thread OD
	mm	mm	mm	mm	mm
LL Extra Light	4	8 x 1	8.40	8	8
	5	8 x 1	8.40	8	8
	6	10 x 1	10.40	8	10
	8	10 x 1	10.40	8	10
L Light	6	10 x 1	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 1½	16.53	12	16
	15	18 x 1½	18.53	12	18
	18	22 x 1½	22.65	14	22
S Heavy	6	12 x 1½	12.53	12	12
	8	14 x 1½	14.53	12	14
	10	16 x 1½	16.53	12	16
	12	18 x 1½	18.53	12	18
	14	20 x 1½	20.65	14	20
	16	22 x 1½	22.65	14	22

	Female Metric Tapered Threads			
	Tube OD	Metric Thread Size	Thread ID	A
	mm	mm	mm	mm
LL Extra Light	4	8 x 1	6.5	5.5
	5	8 x 1	6.5	5.5
	6	10 x 1	8.5	5.5
	8	10 x 1	8.5	5.5
L Light	6	10 x 1	8.5	5.5
	8	12 x 1½	10.5	8.5
	10	14 x 1½	12.5	8.5
	12	16 x 1½	14.5	8.5
	15	18 x 1½	16.5	8.5
	18	22 x 1½	20.5	10.5
S Heavy	6	12 x 1½	10.5	8.5
	8	14 x 1½	12.5	8.5
	10	16 x 1½	14.5	8.5
	12	18 x 1½	16.5	8.5
	14	20 x 1½	18.5	10.5
	16	22 x 1½	20.5	10.5

DIN 3852 Type C (Continued on next page)

Fitting Identification
Fitting Standards

DIN 3852 Type C (Continued)

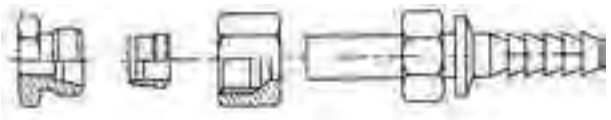
Male Whitworth Tapered Threads

	Tube OD	Thread Size	A	B	Thread OD
	mm	in.	in.	mm	in.
LL Extra Light	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
L Light	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	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

Female Whitworth Tapered Threads

	Tube OD	Thread Size	Thread ID	A
	mm	in.	in.	mm
LL Extra Light	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	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
S Heavy	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



Male Bit Sleeve Nut Fitting

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.

Thread Identification Table

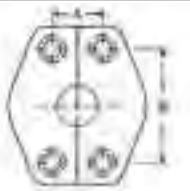
Metric Standpipe Assembly

Metric DIN Tube OD	Bite Sleeve DIN Tube OD	Metric Nut Thread	
mm	mm	Light	Heavy
6	6	M 12x1½	
8	8	M 14x1½	M 16x 1½
10	10	M 16x1½	M 18x 1½
12	12	M 18x1½	M 20x 1½
15	15	M 22x1½	
16	16		M 24x 1½
18	18	M 26x 1½	
20	20		M 30x2
22	22	M 30x2	
25	25		M 36x2
28	28	M 36x2	
30	30		M 42x2
35	35	M 45x2	
38	38		M 52x2
42	42	M 52x2	

Fitting Identification
Fitting Standards

DIN 20066 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. 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 2066 4-Bolt Flange

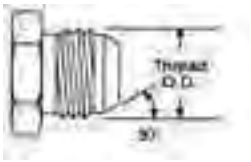
Nominal Flange Size	Form R			
in.	**Flange OD**	**A**	**B**	**C**
1/2	1.188	0.688	1.500	0.265
5/8	1.345			0.265
3/4	1.500	0.875	1.875	0.265
1	1.750	1.031	2.062	0.315
1¼	2.000	1.188	2.312	0.315
1½	2.375	1.406	2.750	0.315
2	2.812	1.688	3.062	0.375
2½	3.312	2.000	3.500	0.375
3	4.000	2.438	4.188	0.375
3½	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	Form S			
in.	**Flange OD**	**A**	**B**	**C**
1/2	1.250	0.718	1.594	0.305
3/4	1.625	0.937	2.000	0.345
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

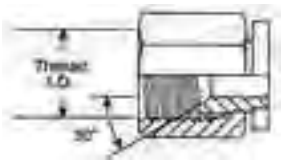
Fitting Identification
Fitting Standards

Japanese Thread Types

JIS 30˚ (Parallel Pipe Threads)



Male



Female

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

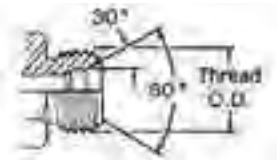
Seal
The JIS 30-degree male will only connect with the JIS 30-degree female. The seal is made on the 30-degree seat. The threads hold the connection in place mechanically.

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.

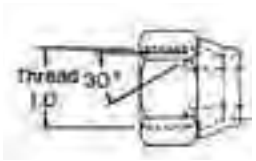
Thread Identification Table
JIS 30° Flare Parallel

Dash Size	Nominal Size	Thread Size	Male Thread OD	Female Thread ID
	in.			
-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	1 1/32	15/16
-16	1	1-11	1 5/16	1 3/16
-20	1 1/4	1 1/4-11	1 21/32	1 17/32
-24	1 1/2	1 1/2-11	1 7/8	1 25/32
-32	2	2-11	2 11/32	2 7/32

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



Male



Female

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

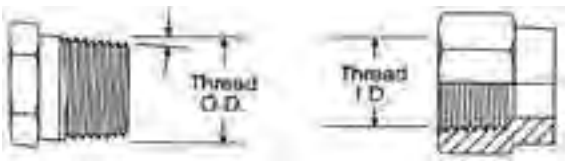
Comments
The BSPP fitting is fully interchangeable with the JIS 30, male inverted seat.

Thread Identification Table
JIS 30° Male Inverted Seat

Dash Size	Nominal Size	Thread Size	Male Thread OD	Female Thread ID
	in.			
-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

Fitting Identification
Fitting Standards

JIS Tapered Pipe (JIS B 0203)



Male Female

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

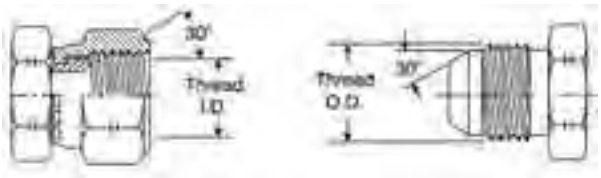
Seal
The seal is made within the threads through thread distortion. A thread sealant is recommended.

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

Thread Identification Table
JIS Tapered Pipe

Dash Size	Nominal Size	Thread Size	Male Thread OD	Female Thread ID
	in.		in.	in.
-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	1 1/32	15/16
-16	1	1-11	1 5/16	1 3/16
-20	1 1/4	1 1/4-11	1 21/32	1 17/32
-24	1 1/2	1 1/2-11	1 7/8	1 25/32
-32	2	2-11	2 11/32	2 7/32

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



Male Female

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

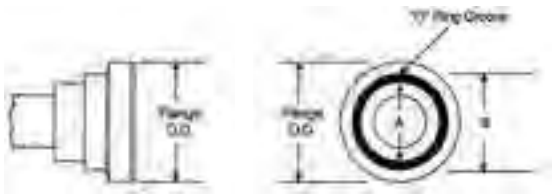
Comments
Also known as the Komatsu® style, it is used extensively on Komatsu® equipment.

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 1½	18	16.5
-8	1/2	13	M 22 x 1½	22	20.5
-10	5/8	16	M 24 x 1½	24	22.5
-12	3/4	19	M 30 x 1½	30	28.5
-16	1	25	M 33 x 1½	33	31.5
-20	1 1/4	32	M 36 x 1½	36	34.5
-24	1 1/2	38	M 42 x 1.5	42	40.5

Fitting Identification
Fitting Standards

Komatsu® Flange Fitting



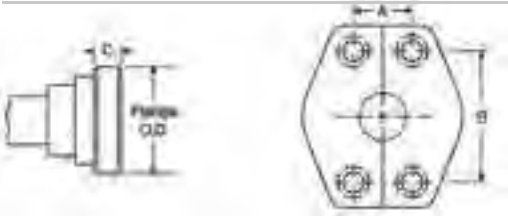
Flange Flange Head

Identification
The Komatsu® Flange fitting is nearly identical to the SAE Code 61 flange fitting and fully interchangeable. As O-ring sizes are different, an SAE O-ring must be used when replacing the Komatsu® fitting with an SAE fitting.

Thread Identification Table
Komatsu®-Style Flange

Dash Size	Nominal Size		Flange OD	A	B
	in.	mm			
-8	1/2	12.7	1.188	0.728	0.984
-10	5/8	15.9	1.345	0.728	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



Male Female

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.

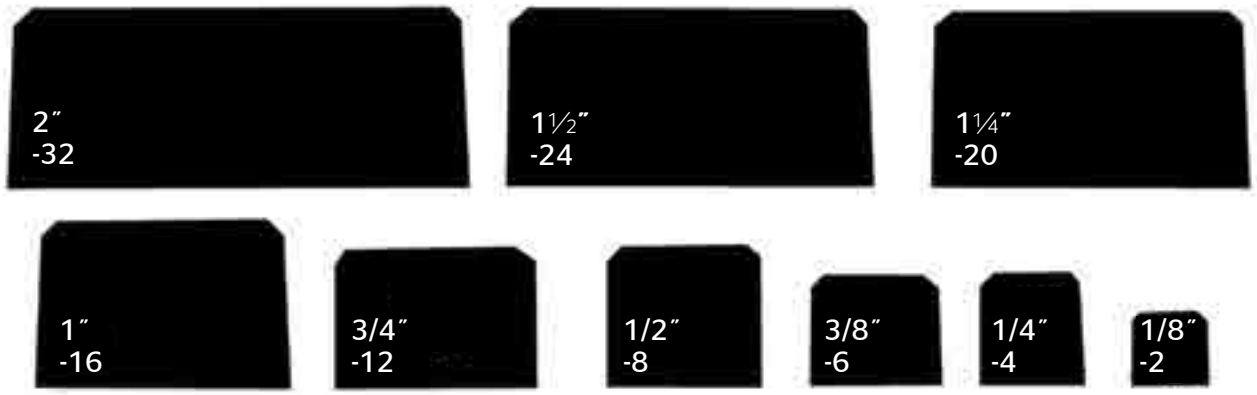
Thread Identification Table
JIS B 8363 4-Bolt Flange

Nominal Flange Size	Type I			
in.	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

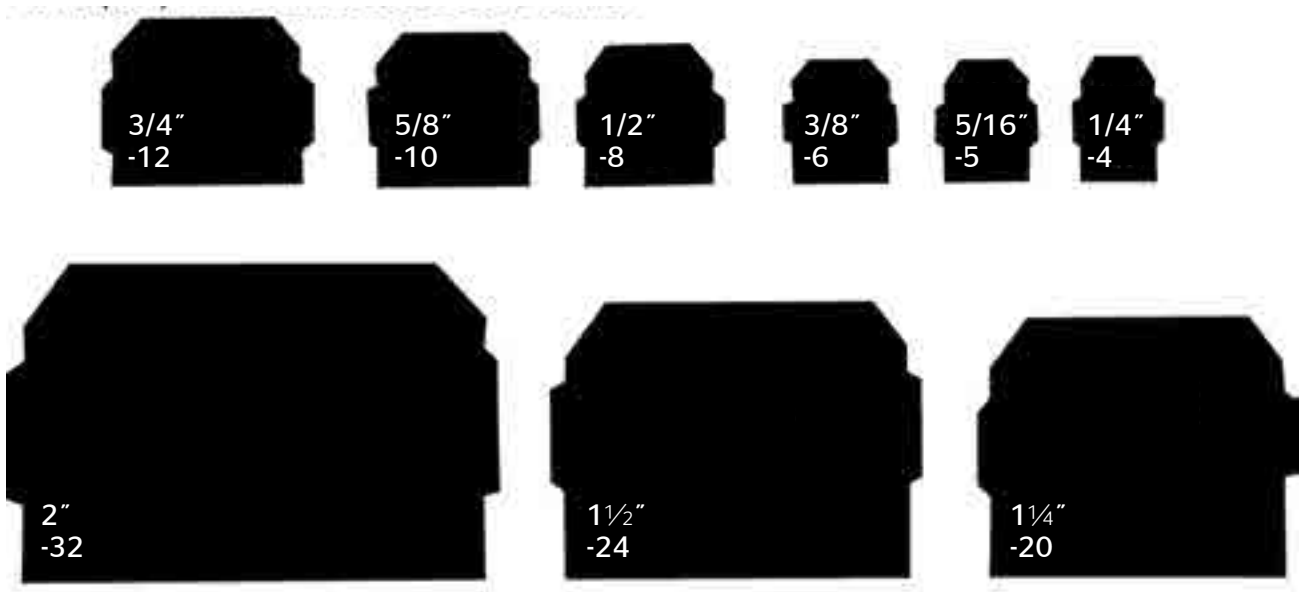
Nominal Flange Size	Type II			
in.	Flange OD	A	B	C
1/2	1.250	0.718	1.594	0.305
3/4	1.625	0.937	2.000	0.345
1	1.875	1.093	2.250	0.375
1¼	2.125	1.250	2.625	0.405
1½	2.500	1.437	3.125	0.495
2	3.125	1.750	3.812	0.495

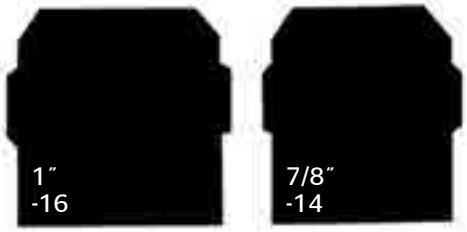
Fitting Identification
Templates

Male Pipe Thread Sizes



JIC 37° Flare (SAE J514) Thread Sizes



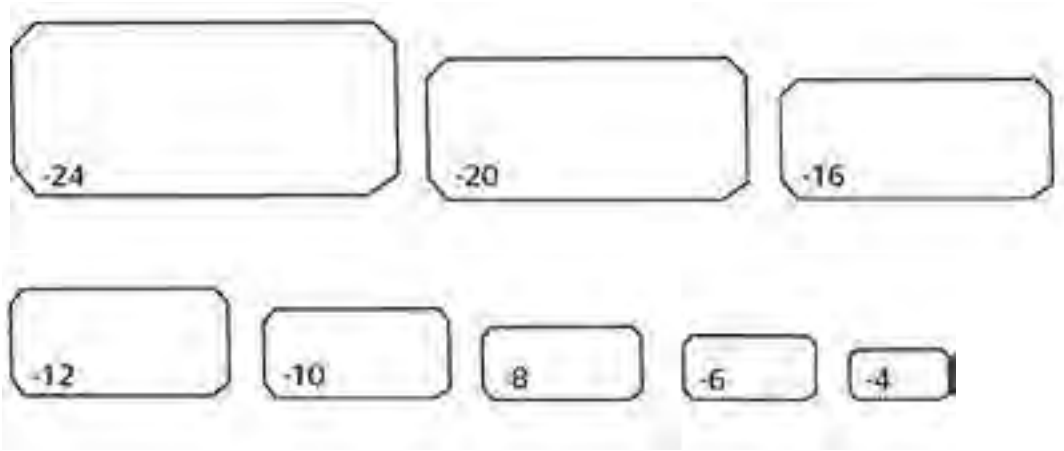


37° and 45°Flare Nose Angles

SAE 45° Flare (SAE J512) Thread Sizes

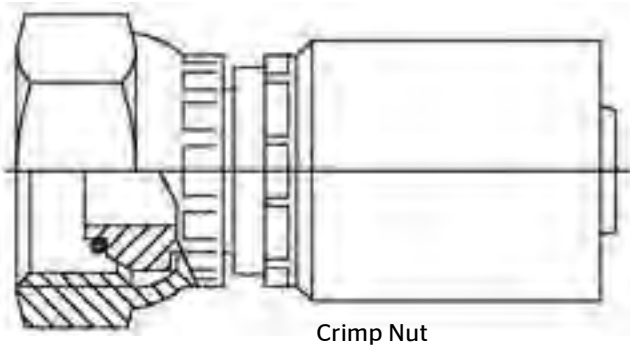
Fitting Identification
Templates (Continued)

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

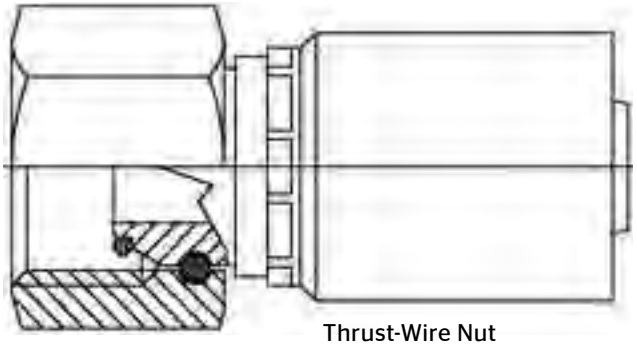


Fitting Nuts

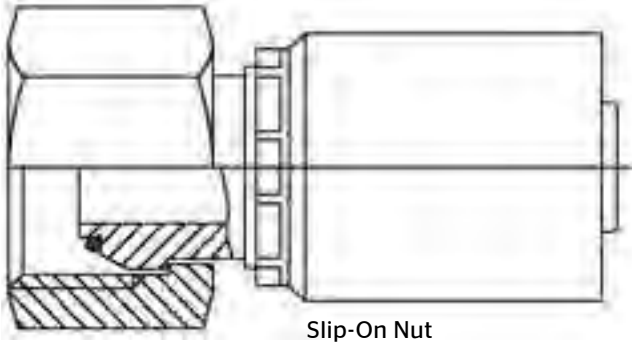
Continental ContiTech' fittings can have three types of nuts: Crimp Nut, Thrust-Wire Nut, and Slip-On Nut. Shown below are sample images with the three types of nuts.



Crimp Nut



Thrust-Wire Nut



Slip-On Nut