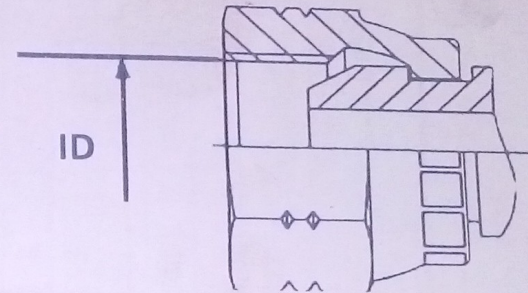
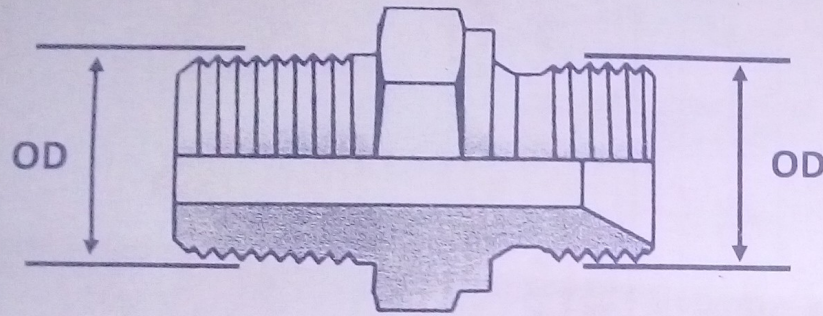


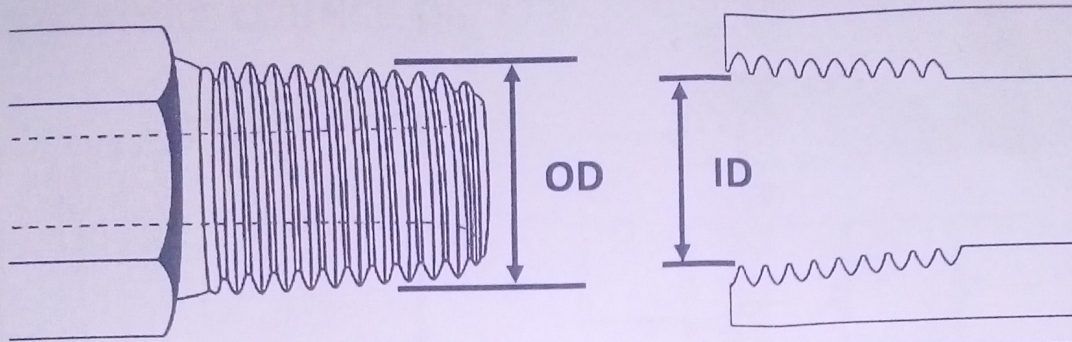
BRITISH STANDARD PIPE PARALLEL (BSPP) AND BRITISH STANDARD PIPE TAPER (BSPT)



SIZE	DASH SIZE	THREAD PITCH	BSPP MALE THREAD OD		BSPT MALE THREAD OD		BSPP FEMALE THREAD ID		BSPT FEMALE THREAD ID	
			TPI	mm	INCH	mm	INCH	mm	INCH	mm
1/8"	-02	28	9.6	0.38	9.5	0.37	8.6	0.34	8.4	0.33
1/4"	-04	19	13.0	0.51	12.8	0.50	11.9	0.47	11.2	0.44
3/8"	-06	19	16.5	0.65	16.3	0.64	15.2	0.60	14.7	0.59
1/2"	-08	14	20.8	0.82	20.4	0.80	19.1	0.75	18.3	0.72
5/8"	-10	14	22.8	0.90	22.5	0.89	20.8	0.82	20.6	0.81
3/4"	-12	14	26.3	1.04	25.9	1.02	24.6	0.97	23.9	0.94
1"	-16	11	33.1	1.30	32.6	1.28	30.7	1.21	29.7	1.17
1 1/4"	-20	11	41.8	1.64	41.1	1.62	39.4	1.55	38.6	1.52
1 1/2"	-24	11	47.7	1.88	47.0	1.85	45.5	1.79	44.5	1.75
2"	-32	11	59.5	2.34	58.6	2.31	57.4	2.26	56.4	2.22
2 1/2"	-40	11	75.1	2.95	74.1	2.92	72.6	2.86	71.9	2.83
3"	-48	11	87.9	3.46	86.6	3.41	85.4	3.36	84.6	3.33

THREAD IDENTIFICATION CHART

NATIONAL PIPE TAPERED (NPT)



SIZE	DASH SIZE	THREAD PITCH TPI	NPT MALE THREAD OD		NPT FEMALE THREAD ID	
			mm	INCH	mm	INCH
1/8"	-02	27	9.7	0.38	8.4	0.33
1/4"	-04	18	13.2	0.52	11.2	0.44
3/8"	-06	18	16.6	0.65	14.7	0.58
1/2"	-08	14	20.9	0.82	17.8	0.70
3/4"	-12	14	26.4	1.04	23.4	0.92
1"	-16	11.5	32.9	1.30	29.5	1.16
1 1/4"	-20	11.5	41.9	1.65	38.1	1.50
1 1/2"	-24	11.5	47.8	1.88	43.9	1.73
2"	-32	11.5	59.3	2.33	56.4	2.22
2 1/2"	-40	8	71.5	2.81	69.1	2.72
3"	-48	8	87.3	3.44	84.8	3.34

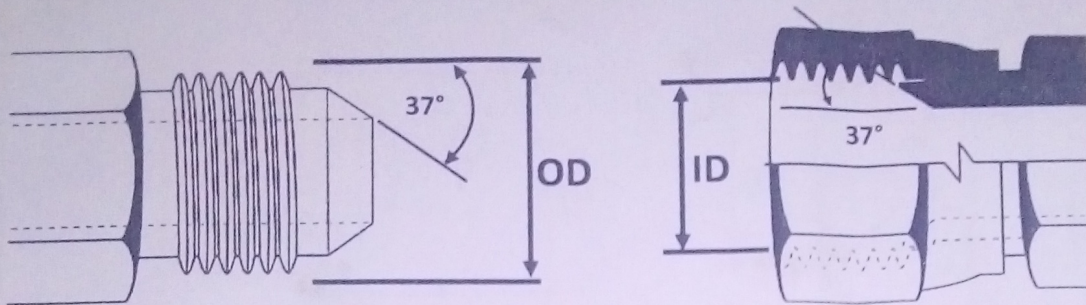
OTHER THREADS IN THIS TYPE BUT NOTE THAT ARE NOT NORMALLY INTERCHANGEABLE

- NPS NATIONAL PIPE STRAIGHT (PARALLEL)
- NPTF NATIONAL PIPE TAPER FOR FUEL
- NPSM NATIONAL PIPE STRAIGHT MECHANICAL

- SPEC ANSI/ASME B1.20.1
- SPEC SAE J476
- SPEC ANSI/ASME B1.20.1

THREAD IDENTIFICATION CHART

JOINT INDUSTRIES COUNCIL (JIC 37°)



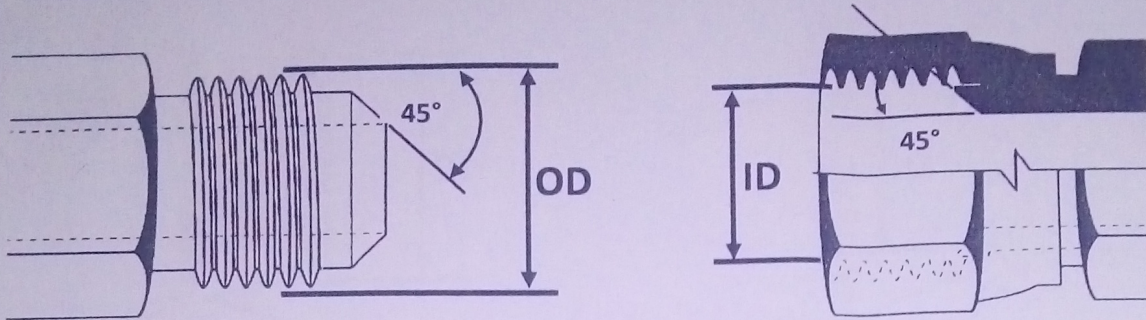
THREAD	DASH SIZE	THREAD PITCH TPI	JIC 37° MALE THREAD OD		JIC 37° FEMALE THREAD ID		TUBE SIZE
			mm	INCH	mm	INCH	
5/16"	-05	24 UNF	7.9	0.31	6.9	0.27	1/8"
3/8"	-06	24 UNF	9.5	0.38	8.5	0.33	3/16"
7/16"	-07	20 UNF	11.1	0.44	9.9	0.39	1/4"
1/2"	-08	20 UNF	12.7	0.50	11.4	0.45	5/16"
9/16"	-09	18 UNF	14.3	0.56	13.0	0.51	3/8"
3/4"	-12	16 UNF	19.1	0.75	17.5	0.69	1/2"
7/8"	-14	14 UNF	22.2	0.88	20.3	0.80	5/8"
1 1/16"	-17	12 UN	27.0	1.06	24.9	0.98	3/4"
1 3/16"	-19	12 UN	30.2	1.19	28.2	1.11	7/8"
1 5/16"	-21	12 UN	33.3	1.31	31.2	1.23	1"
1 5/8"	-26	12 UN	41.3	1.63	39.1	1.54	1 1/4"
1 7/8"	-30	12 UN	47.6	1.88	45.5	1.79	1 1/2"
2 1/2"	-40	12 UN	63.5	2.50	61.5	2.42	2"

NOTE

MOST JIC 37° AND SAE 45° FITTINGS OF THE SAME DASH SIZE WILL SCREW INTO EACH OTHER. SOME ARE DIFFERENT AND SHOULD NOT BE FORCED INTO EACH OTHER THEY MAY SEAL BUT THE DIFFERENCE IN ANGLE WILL NOT GIVE A RELIABLE SEAL MAKE SURE TO CHECK THE ANGLES WITH A SEAT ANGLE GAUGE

THREAD IDENTIFICATION CHART

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE 45°)

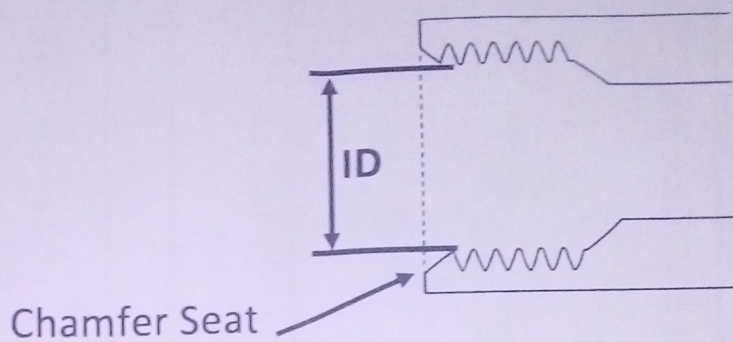
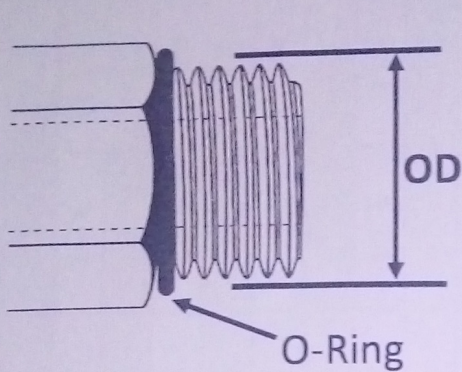


THREAD	DASH SIZE	THREAD PITCH	SAE 45° MALE THREAD OD		SAE 45° FEMALE THREAD ID		TUBE SIZE
			TPI	mm	INCH	mm	
5/16"	-05	24	7.9	0.31	6.8	0.27	1/8"
3/8"	-06	24	9.5	0.38	8.4	0.33	3/16"
7/16"	-07	20	11.1	0.44	9.9	0.39	1/4"
1/2"	-08	20	12.7	0.50	11.4	0.45	5/16"
5/8"	-10	18	15.9	0.63	14.2	0.56	3/8"
3/4"	-12	16	19.1	0.75	17.5	0.69	1/2"
7/8"	-14	14	22.2	0.88	20.6	0.81	5/8"
1 1/16"	-17	14	27.0	1.06	24.9	0.98	3/4"

THE SAE 45° FITTING IS MAINLY USED IN THE AUTOMOTIVE AND REFRIDGERATION INDUSTRY WHERE LOWER PRESSURES ARE REQUIRED. THEY ARE QUITE OFTEN MADE OF BRASS

THREAD IDENTIFICATION CHART

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE O-RING / UN O-RING)



THREAD	DASH SIZE	THREAD PITCH TPI	SAE MALE THREAD OD		SAE FEMALE THREAD ID		TUBE SIZE
			mm	INCH	mm	INCH	
5/16"	-05	24 UNF	7.9	0.31	6.9	0.27	1/8"
3/8"	-06	24 UNF	9.5	0.38	8.5	0.33	3/16"
7/16"	-07	20 UNF	11.1	0.44	9.9	0.39	1/4"
1/2"	-08	20 UNF	12.7	0.50	11.4	0.45	5/16"
9/16"	-09	18 UNF	14.3	0.56	13.0	0.51	3/8"
3/4"	-12	16 UNF	19.1	0.75	17.5	0.69	1/2"
7/8"	-14	14 UNF	22.2	0.88	20.3	0.80	5/8"
1 1/16"	-17	12 UN	27.0	1.06	24.9	0.98	3/4"
1 3/16"	-19	12 UN	30.2	1.19	28.2	1.11	7/8"
1 5/16"	-21	12 UN	33.3	1.31	31.2	1.23	1"
1 5/8"	-26	12 UN	41.3	1.63	39.1	1.54	1 1/4"
1 7/8"	-30	12 UN	47.6	1.88	45.5	1.79	1 1/2"
2 1/2"	-40	12 UN	63.5	2.50	61.5	2.42	2"

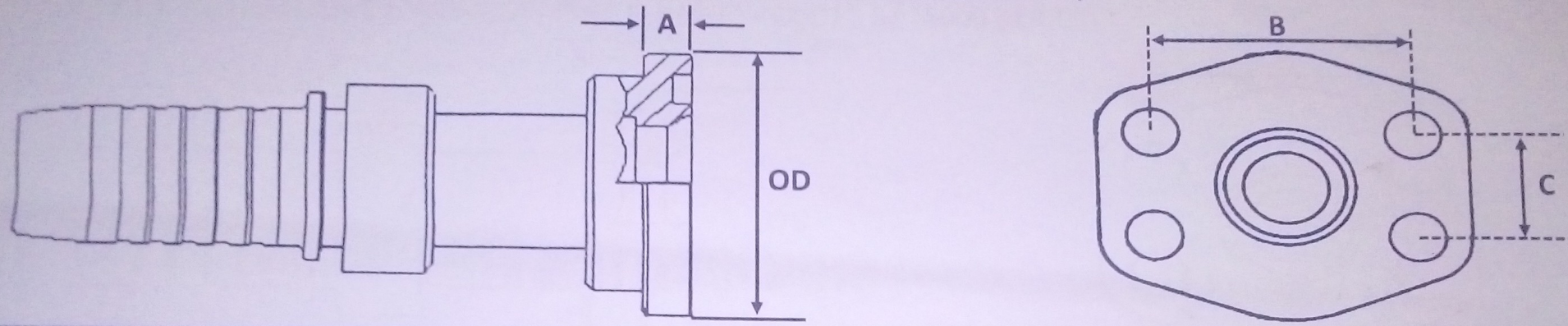
NOTE

SAE O-RING HAVE THE SAME THREADS AS JIC 37° FITTINGS BUT RELY ON A DIFFERENT SEALING MECHANISM - BEING THE O-RING

THE O-RING ONCE TIGHTENED IS PUSHED AGAINST THE CHAMFER IN THE PORT CAPURING IT BETWEEN THE FITTING ANF THE SURFACE OF THE CHAMFER THUS CREATING A SEAL

THREAD IDENTIFICATION CHART

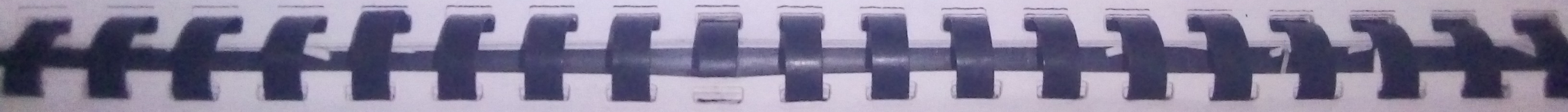
SOCIETY OF AUTOMOTIVE ENGINEERS (SAE FLANGE) - CODES 61 (3000 SERIES)



CODE 61 (3000 SERIES)

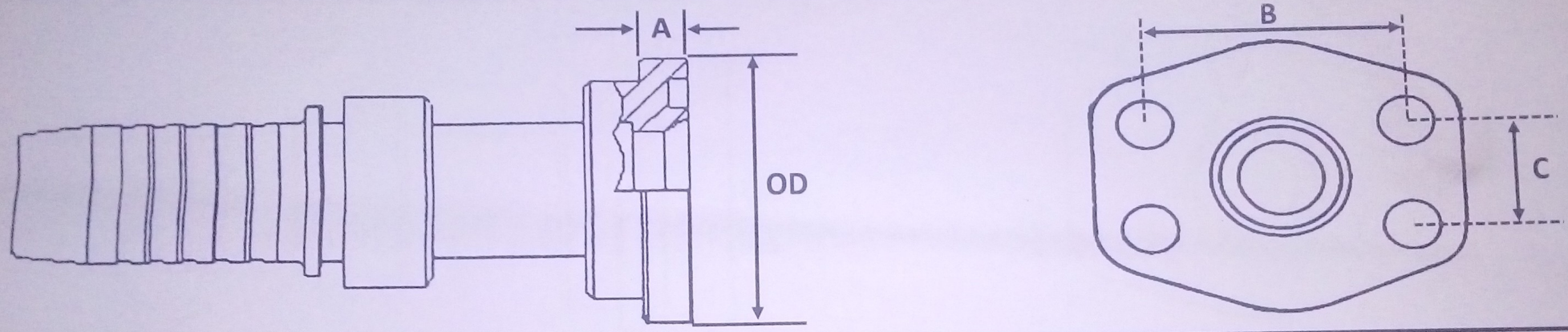
SIZE	DASH SIZE	FLANGE OD		FLANGE THICKNESS "A"		BOLT SPACING "B"		BOLT SPACING "C"		BOLT SIZE	BOLT SIZE
		mm	INCH	mm	INCH	mm	INCH	mm	INCH	METRIC	IMPERIAL
1/2"	-08	30.2	1.19	6.73	0.265	38.1	1.50	17.5	0.69	M8x35	5/16"x1 1/4"
*5/8"	-10	34.0	1.34	6.73	0.265	42.9	1.69	19.8	0.78	M8x35	5/16"x1 1/4"
3/4"	-12	38.1	1.50	6.73	0.265	47.6	1.87	22.2	0.87	M10x35	3/8"x1 1/2"
1"	-16	44.5	1.75	8.00	0.315	52.4	2.06	26.2	1.03	M10x35	3/8"x1 1/2"
1 1/4"	-20	50.8	2.00	8.00	0.315	58.7	2.31	30.2	1.19	M10x40	7/16"x1 3/4"
1 1/2"	-24	60.3	2.37	8.00	0.315	69.8	2.75	35.7	1.41	M12x45	1/2"x1 3/4"
2"	-32	71.4	2.81	9.53	0.375	77.8	3.06	42.9	1.69	M12x45	1/2"x1 3/4"
2 1/2"	-40	84.1	3.31	9.53	0.375	88.9	3.50	50.8	2.00	M12x45	1/2"x1 3/4"
3"	-48	101.6	4.00	9.53	0.375	106.4	4.19	61.9	2.44	M16x50	5/8"x2"

*5/8" FLANGES ARE MOSTLY USED ON KOMATSU EQUIPMENT
 CODE 61 FLANGES ARE RATED FOR USE UP TO 3000 PSI (206 BAR)
 MAINLY USED ON LOW PRESSURE OR RETURN LINES



THREAD IDENTIFICATION CHART

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE FLANGE) - CODES 62 (6000 SERIES)



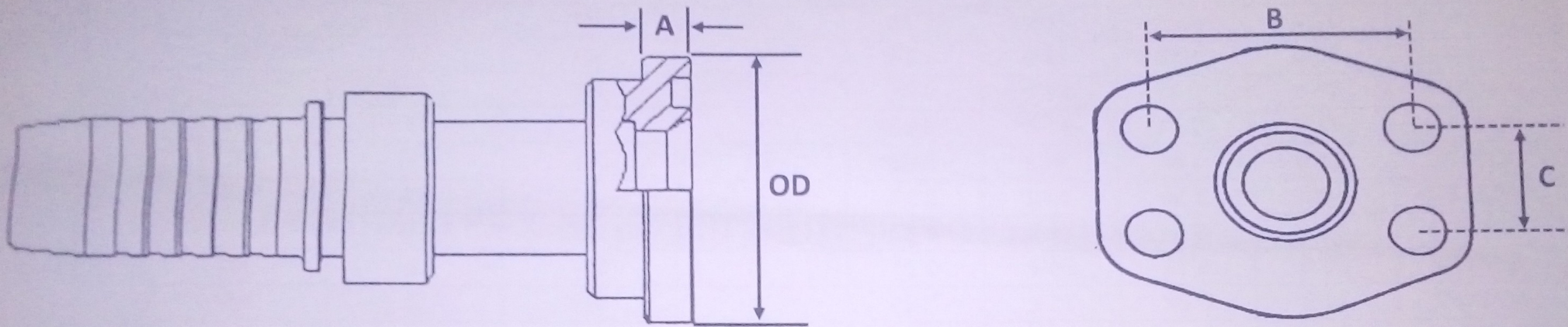
CODE 62 (6000 SERIES)

SIZE	DASH SIZE	FLANGE OD		FLANGE THICKNESS "A"		BOLT SPACING "B"		BOLT SPACING "C"		BOLT SIZE	BOLT SIZE
		mm	INCH	mm	INCH	mm	INCH	mm	INCH	METRIC	IMPERIAL
1/2"	-08	31.7	1.25	7.75	0.305	40.5	1.59	18.2	0.72	M8x35	5/16"x1 1/4"
3/4"	-12	41.3	1.63	8.76	0.345	50.8	2.00	23.8	0.94	M10x40	3/8"x1 1/2"
1"	-16	47.6	1.87	9.53	0.375	57.2	2.25	27.8	1.09	M12x45	7/16"x1 3/4"
1 1/4"	-20	54.0	2.13	10.29	0.405	66.7	2.63	31.8	1.25	M14x45	1/2"x1 3/4"
1 1/2"	-24	63.5	2.50	12.57	0.495	79.4	3.13	36.5	1.44	M16x60	5/8"x2 1/4"
2"	-32	79.4	3.13	12.57	0.495	96.8	3.81	44.5	1.75	M20x70	3/4"x2 3/4"

CODE 62 FLANGES ARE RATED FOR USE UP TO 6000 PSI (413 BAR)
MAINLY USED ON HIGH PRESSURE OR HIGH IMPULSE LINES

THREAD IDENTIFICATION CHART

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE FLANGE) - CAT™ FLANGES

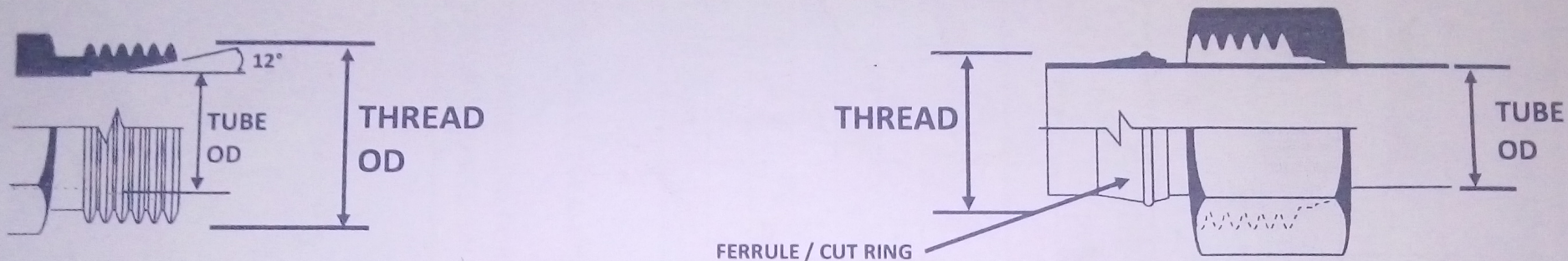


CATERPILLAR™ (CAT) FLANGE

SIZE	DASH SIZE	FLANGE OD		FLANGE THICKNESS "A"		BOLT SPACING "B"		BOLT SPACING "C"		BOLT SIZE	BOLT SIZE
		mm	INCH	mm	INCH	mm	INCH	mm	INCH	METRIC	IMPERIAL
3/4"	-12	41.3	1.63	14.2	0.560	50.8	2.000	23.8	0.938	M10x45	3/8"x1 3/4"
1"	-16	47.6	1.88	14.2	0.560	57.2	2.250	27.8	1.094	M12x45	7/16"x1 3/4"
1 1/4"	-20	54.0	2.13	14.2	0.560	66.7	2.625	31.8	1.250	M14x50	1/2"x2"
1 1/2"	-24	63.5	2.50	14.2	0.560	79.4	3.125	36.5	1.438	TBC	TBC
2"	-32	79.4	3.13	14.2	0.560	96.8	3.812	44.5	1.750	TBC	TBC

CAT FLANGES ARE RATED FOR USE UP TO 6000 PSI (413 BAR)
 MAINLY USED ON HIGH PRESSURE OR HIGH IMPULSE LINES - AND MAINLY ON CATERPILLAR™ EQUIPMENT
 THERE ARE OTHER FLANGE OPTIONS AVAILABLE E.G. POCLAIN HAVE THEIR OWN RANGE WITH DIFFERENT SIZES

DEUTSCHE INDUSTRIE NORMEN (GERMAN INDUSTRIAL STANDARD) (DIN) - METRIC

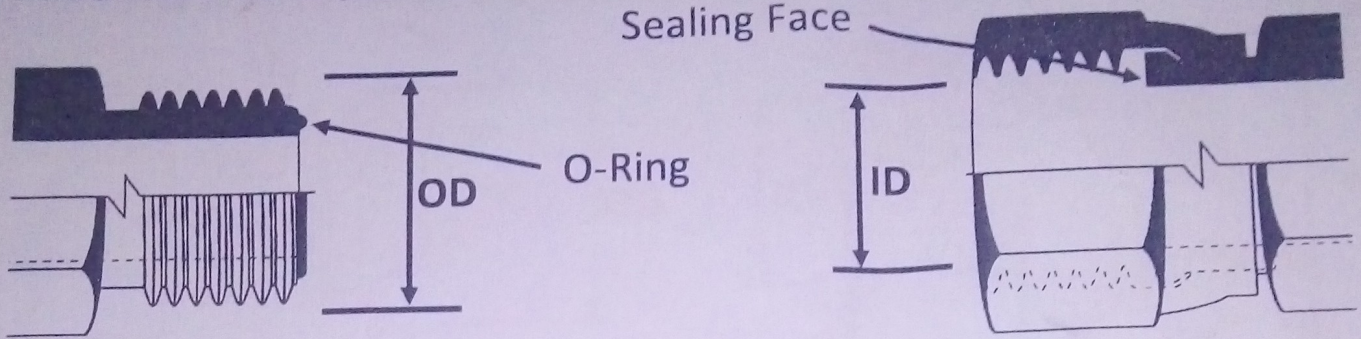


THREAD & PITCH	METRIC MALE THREAD OD		METRIC FEMALE THREAD ID		TUBE OD LIGHT SERIES (L)	METRIC FITTING REF (L)	TUBE OD HEAVY SERIES (S)	METRIC FITTING REF (S)
	mm	INCH	mm	INCH				
M12x1.5	12.0	0.47	10.5	0.41	6	06L	-	-
M14x1.5	14.0	0.55	12.5	0.49	8	08L	6	06S
M16x1.5	16.0	0.63	14.5	0.57	10	10L	8	08S
M18x1.5	18.0	0.71	16.5	0.65	12	12L	10	10S
M20x1.5	20.0	0.79	18.5	0.73	-	-	12	12S
M22x1.5	22.0	0.87	20.5	0.81	15	15L	14	14S
M24x1.5	24.0	0.94	22.5	0.89	-	-	16	16S
M26x1.5	26.0	1.02	24.5	0.96	18	18L	-	-
M30x2.0	30.0	1.18	28.0	1.10	22	22L	20	20S
M36x2.0	36.0	1.42	34.0	1.34	28	28L	25	25S
M42x2.0	42.0	1.65	40.0	1.57	-	-	30	30S
M45x2.0	45.0	1.77	43.0	1.69	35	35L	-	-
M52x2.0	52.0	2.05	50.0	1.97	42	42L	38	38S

THERE IS ALSO A VERY LIGHT DUTY SIZE AVAILABLE (LL) - MAINLY USED ON GREASING LINES IN 6mm AND SOMETIMES 8mm

THREAD IDENTIFICATION CHART

O RING FACE SEAL (ORFS)



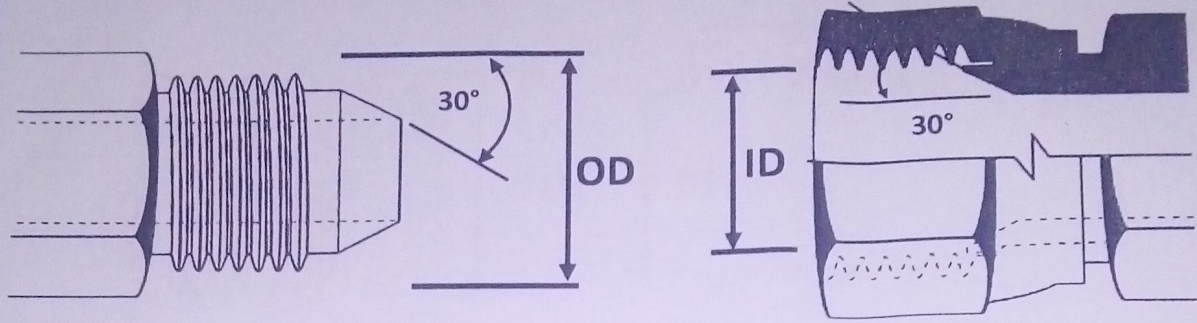
THREAD	DASH SIZE	THREAD PITCH TPI	ORFS MALE THREAD OD		ORFS FEMALE THREAD ID		TUBE SIZE
			mm	INCH	mm	INCH	
9/16"	-04	18 UNF	14.3	0.56	12.9	0.51	1/4"
11/16"	-06	16 UN	17.3	0.68	16.0	0.63	3/8"
13/16"	-08	16 UN	20.6	0.81	19.1	0.75	1/2"
1"	-10	14 UNS	25.4	1.00	23.6	0.93	5/8"
1 3/16"	-12	12 UN	30.0	1.18	28.2	1.11	3/4"
1 7/16"	-16	12 UN	36.3	1.43	34.3	1.35	1"
1 11/16"	-20	12 UN	42.7	1.68	40.6	1.60	1 1/4"
2"	-24	12 UN	51.8	2.04	48.8	1.92	1 1/2"

NOTE

ORFS FITTINGS HAVE THE O-RING ON THE FACE WHICH SEALS AGAINST THE FEMALE FLAT FACE.
THESE FITTINGS ARE IDEAL FOR AREAS WHERE TIGHT INSTALLATIONS ARE REQUIRED WITH LIMITED ACCESS AS THE FEMALE NUTS CAN BE PULLED BACK TO ALLOW FOR INSTALLATION.

THREAD IDENTIFICATION CHART

JAPANESE INDUSTRIAL STANDARD (JIS 30° FLARE)

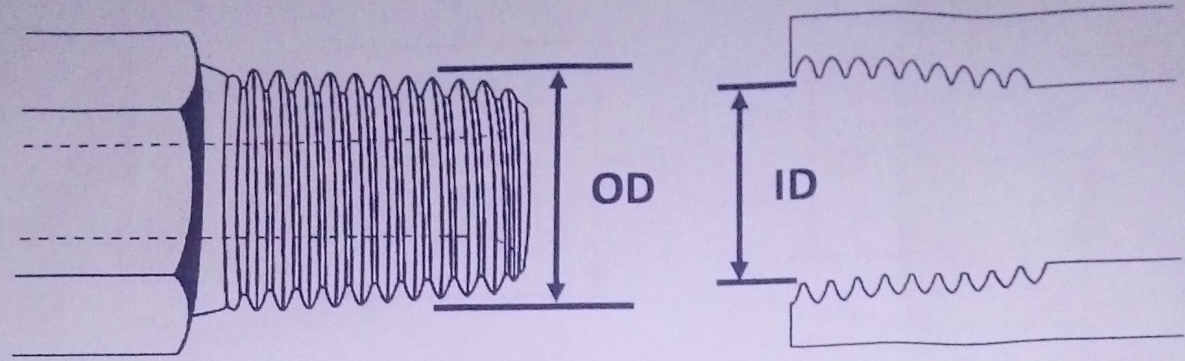


THREAD	DASH SIZE	THREAD PITCH TPI	JIS 30° MALE THREAD OD		JIS 30° FEMALE THREAD ID	
			mm	INCH	mm	INCH
1/8"	-02	28	9.6	0.38	8.6	0.34
1/4"	-04	19	13.0	0.51	11.9	0.47
3/8"	-06	19	16.5	0.65	15.2	0.60
1/2"	-08	14	20.8	0.82	19.1	0.75
5/8"	-10	14	22.8	0.90	20.8	0.82
3/4"	-12	14	26.3	1.04	24.6	0.97
1"	-16	11	33.1	1.30	30.7	1.21
1 1/4"	-20	11	41.8	1.64	39.4	1.55
1 1/2"	-24	11	47.7	1.88	45.5	1.79
2"	-32	11	59.5	2.34	57.4	2.26

NOTE

JIS 30° DEGREE CONE FITTINGS HAVE THE SAME THREAD PITCH AS BSPP THREADS BUT THEY ARE NOT INTERCHANGEABLE AS THE CONE SEATS ARE OPPOSITE ANGLES.

JAPANESE INDUSTRIAL STANDARD TAPERED (JIS TAPERED)



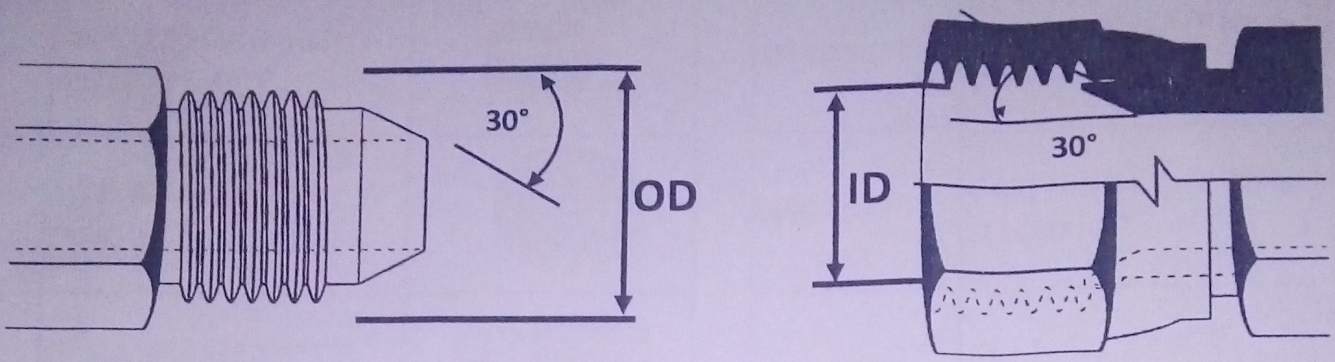
SIZE	DASH SIZE	THREAD PITCH TPI	JIS TAPER MALE THREAD OD		JIS TAPER FEMALE THREAD ID	
			mm	INCH	mm	INCH
1/8"	-02	28	9.5	0.37	8.4	0.33
1/4"	-04	19	12.8	0.50	11.2	0.44
3/8"	-06	19	16.3	0.64	14.7	0.59
1/2"	-08	14	20.4	0.80	18.3	0.72
5/8"	-10	14	22.5	0.89	20.6	0.81
3/4"	-12	14	25.9	1.02	23.9	0.94
1"	-16	11	32.6	1.28	29.7	1.17
1 1/4"	-20	11	41.1	1.62	38.6	1.52
1 1/2"	-24	11	47.0	1.85	44.5	1.75
2"	-32	11	58.6	2.31	56.4	2.22
2 1/2"	-40	11	74.1	2.92	71.9	2.83
3"	-48	11	86.6	3.41	84.6	3.33

NOTE

JIS TAPERED FITTINGS HAVE THE SAME THREAD PITCH AS BSPT THREADS BUT THEY ARE NOT INTERCHANGEABLE. BSPT FITTINGS HAVE AN INTERNAL CONE JIS TAPERED FITTING SEAL ON THE THREADS WITH TAPE OR THREAD SEALANT

THREAD IDENTIFICATION CHART

KOMATSU 30° FLARE



THREAD	SUFFIX	THREAD PITCH	KOMATSU 30° MALE THREAD OD		KOMATSU 30° FEMALE THREAD ID	
			mm	INCH	mm	INCH
M14	-1415	1.5	14.0	0.55	12.5	0.49
M18	-1815	1.5	18.0	0.71	16.5	0.65
M22	-2215	1.5	22.0	0.87	20.5	0.81
M24	-2415	1.5	24.0	0.94	22.5	0.89
M30	-3015	1.5	30.0	1.18	28.5	1.12
M33	-3315	1.5	33.0	1.30	31.5	1.24
M36	-3615	1.5	36.0	1.42	34.5	1.36

NOTE

KOMATSU 30° DEGREE CONE FITTINGS HAVE THE SAME THREAD AS METRIC FORM BUT THEY ARE NOT INTERCHANGEABLE DUE TO THE DIFFERENT SEALING ANGLES.