







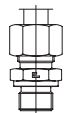
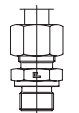
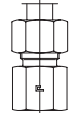







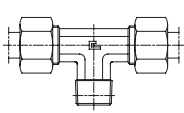

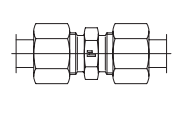




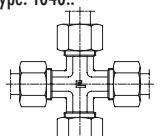
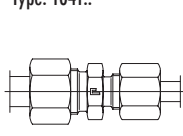



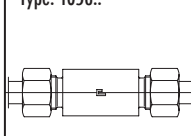

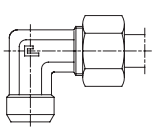
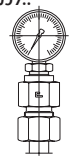
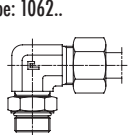
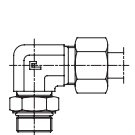




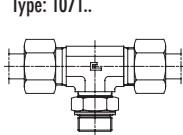

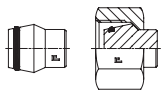





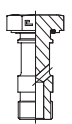




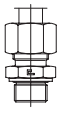





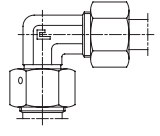
DIN 2353



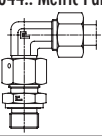
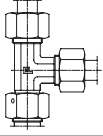
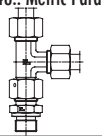
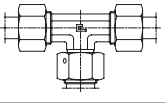
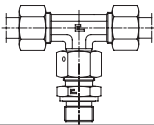
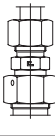

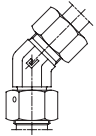



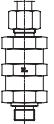
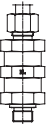
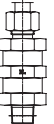

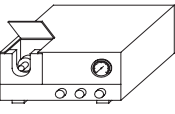
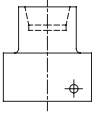
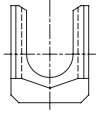
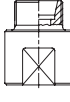

DIN

**CARBON STEEL AND STAINLESS STEEL
PRODUCT**

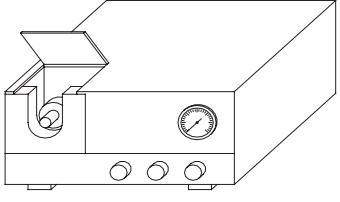
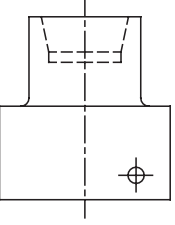
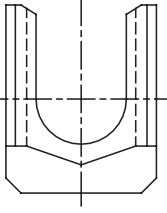
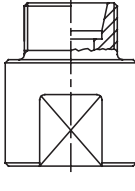

FIGURATIVE INDEX – FITTINGS DIN 2353 – ISO 8434-1

General instructions	Quality assurance	Allowed temperatures	Finish treatments	Tubes to be used	Threaded ends	Prescriptions to comply with
Utilisation standards	Safety factors	Seals on threads	End treatments	Tables follow up	Gas - Metric UNF - NPT	Assembly instructions
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Type: 1101..BP 	Type: 1001.. 	Type: 1001...4 	Type: 1002.. 	Type: 1003.. BSPP Type: 1004.. Metric Paral. 	Type: 1005.. BSPP Type: 1006.. Metric Paral. 	Type: 1007.. BSPP Type: 1008.. Metric Paral. 
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Type: 1009.. UNF/UN-2A 	Type: 1013.. BSPP Type: 1014.. Metric Paral. 	Type: 1015.. BSPP Type: 1016.. 	Type: 1017.. BSPT Type: 1018.. NPT 	Type: 1019.. Metric Taper 	Type: 1020.. BSPT 	Type: 1021.. NPT Type: 1022.. Metric Taper 
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Type: 1025.. BSPT Type: 1026.. NPT 	Type: 1030.. BSPT Type: 1031.. NPT 	Type: 1035.. 	Type: 1036.. 	Type: 1037.. 	Type: 1038.. 	Type: 1039.. 
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Type: 1040.. 	Type: 1041.. 	Type: 1045.. 	Type: 1049.. BSPP 	Type: 1055.. 	Type: 1056.. 	Type: 1057.. 
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Type: 1058.. 	Type: 1059.. 	Type: 1061.. BSPP Type: 1062.. 	Type: 1063.. UNF/UN-2A 	Type: 1064.. BSPP Type: 1065.. 	Type: 1066.. UNF/UN-2A 	Type: 1067.. BSPP Type: 1068.. 
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Type: 1069.. UNF/UN-2A 	Type: 1070.. BSPP Type: 1071.. 	Type: 1072.. UNF/UN-2A 	Type: 1073.. Type: 1073.. -D. 	Type: 1074.. BSPP 	Type: 1075.. BSPP 	Type: 1076.. BSPP Type: 1077.. 
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Type: 1078.. BSPP Type: 1079.. 	Type: 1080.. 	Type: 1081.. BSPP Type: 1082.. 	Type: 1084.. BSPP 	Type: 1085.. 	Type: 1086.. 	Type: 1087.. 
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Type: 1088.. BSPP Type: 1089.. 	Type: 6005.. BSPP Type: 6006.. 	Type: 6007.. BSPP Type: 6008.. 	Type: 6009.. UNF/UN-2A 	Type: 6010.. NPT 	Type: 6035.. 	Type: 6042.. 
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FIGURATIVE INDEX – FITTINGS DIN 2353 – ISO 8434-1

Type: 6043.. BSPP Type: 6044.. Metric Paral. 	Type: 6046.. 	Type: 6047.. BSPP Type: 6048.. Metric Paral. 	Type: 6050.. 	Type: 6051.. BSPP Type: 6052.. Metric Paral. 	Type: 6053.. 	Type: 6054.. 
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Type: 6055.. 	Type: 6060.. BSPP 	Type: 6061.. 	Type: 5001.. 	Type: 5002.. BSPP Type: 5003.. Metric Paral. 	Type: 5004.. BSPP Type: 5005.. Metric Paral. 	Type: 5006.. BSPT Type: 5007.. NPT 
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Type: 5008.. BSPT Type: 5009.. NPT 	Type: 100000 	Type: 1000.. 	Type: 1000.. 	Type: 1000.. 	Type: 1000.. 	Compatible fluids table
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ASSEMBLY TOOLS DIN 2353 - ISO 8434-1

PREASSEMBLY MACHINE			MANDREL MACHINE	PLATFORM MACHINE	MANUAL PREASSEMBLY TOOL	24° TOOL
						
Series	Ø Tube	Ordering Machine	Ordering Mandrel	Ordering Platform	Ordering Preassembly	Ordering 24° tool
L	6	100000	100001	100021-83 M	100061	204
	8		100002	100022-83 M	100062	205
	10		100003	100023-83 M	100063	206
	12		100004	100024-83 M	100064	207
	15		100005	100025-83 M	100065	208
	18		100006	100026-83 M	100066	209
	22		100007	100027-83 M	100067	210
	28		100008	100028-83 M	100068	211
	35		100009	100029-83 M	100069	212
	42		100010	100030-83 M	100070	213
S	6	100000	100011	100031-83 M	100071	204
	8		100012	100032-83 M	100072	205
	10		100013	100033-83 M	100073	206
	12		100014	100034-83 M	100074	207
	14		100015	100035-83 M	100075	214
	16		100016	100036-83 M	100076	215
	20		100017	100037-83 M	100077	216
	25		100018	100038-83 M	100078	217
	30		100019	100039-83 M	100079	218
	38		100020	100040-83 M	100080	219

ORDERING EXAMPLES (Carbon steel)

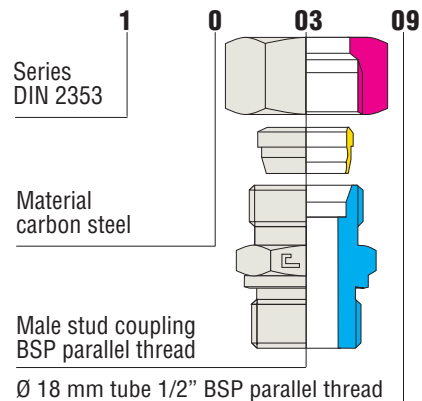
ORDERING EXAMPLES (Stainless steel)

B3 STANDARD RING

- If you require a male stud coupling for a Ø 18 mm tube with 1/2" BSP parallel thread made of carbon steel with standard ring, order: 100309

B3 STANDARD RING

- If you require a male stud coupling for a Ø 18 mm tube with 1/2" BSP parallel thread made of stainless steel with standard ring, order: 110309

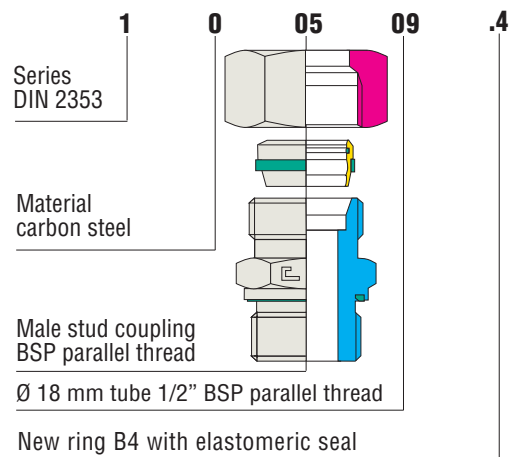


B4 PATENTED RING

- If you require a male stud coupling for a Ø 18 mm tube with 1/2" BSP parallel thread made of carbon steel with elastomeric NBR seal on the threaded end, specify: 100509.4
- If you require the VITON® seal, add "V" after the last fourth number 100509.4V

B4 PATENTED RING

- If you require a male stud coupling for a Ø 18 mm tube with 1/2" BSP parallel thread made of stainless steel with elastomeric Viton® seal on the threaded end, specify: 110309.4
- If you require the NBR seal, add "N" after the last fourth number 110309.4N

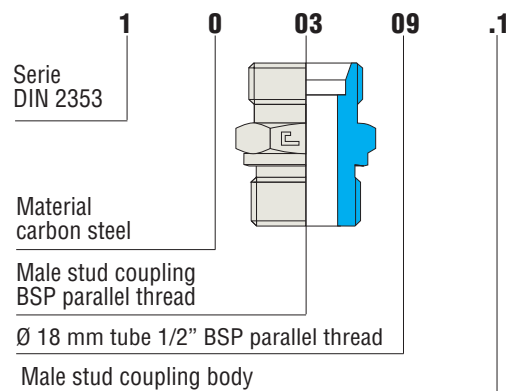


BODY FOR B3 – B4

- If you require the carbon steel body add 1 at the end of the fitting code to order: 100309.1

BODY FOR B3 – B4

- If you require the stainless steel body only, add 1 at the end of the fitting code to order: 110309.1



DELIVERIES

- Cast S.p.A. fittings are delivered in the configurations shown in the pictures of this catalogue.
- Available on scheduled orders only: it means that the article is slow moving and will be delivered within 90 days.
- Available on request only: it means that the article is not commonly in stock; please contact our offices for further delivery details.

VITON® is a DuPont Dow Elastomers Trade Mark



DIN 2353



B3

**CARBON STEEL AND STAINLESS STEEL PRODUCT
STANDARD DOUBLE CUTTING EDGE RING ASSEMBLED ON
ALL CAST PRODUCTION TO ASSURE SEALING AND SAFETY.
AVAILABLE IN CARBON AND STAINLESS STEEL**

THEORY OF OPERATION

The Cast fitting, manufactured according to ISO 8434-1/DIN 2353, is a mechanical fitting with a double cutting edge ring for double stapling on the tube.

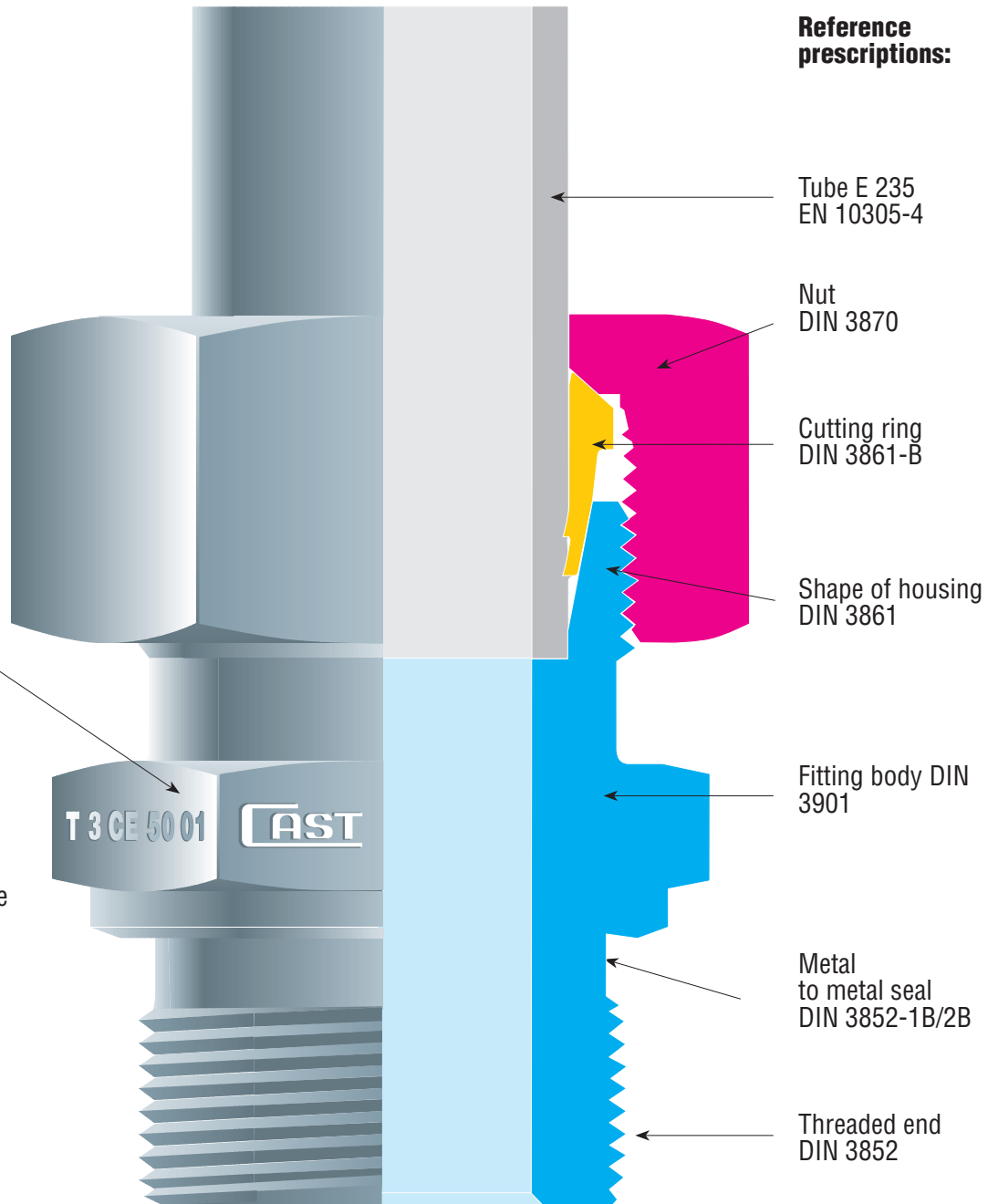
The B3 ring helps fast assembly of removable tubes, avoids welding, tapping and flaring, thus assuring maximum simplicity for complex oleo-dynamic systems. During tightening by the nut, the ring deforms according to the bore of the 24° cone of the fitting and bites into the steel tube, producing two deep cuts, the first of which is visible due to the lifting of an outer edge on the diameter of the tube, ensuring water tightness and anti-unthreading of the ring. The second groove (invisible) balances the forces on the whole ring, prevents vibrations from reaching the first groove and stops the stapling of the tube at a predetermined value.

COUPLING SYSTEM DIN 2353

Traceability decoding:

CAST =
Logo of the
Manufacturer

- T =
Production plant
- 3 =
Year of manufacture
- CE =
Made in EEC
- 50 =
Type of steel used
- 01 =
Heat number of the
steel used



TECHNICAL CHARACTERISTICS

CAST fittings assure perfect seal regardless of the fluid used, provided that no corrosive fluids are employed and the nominal pressures be respected.

Fittings are manufactured in three ranges to be chosen according to the required working conditions.

The "LL" extra light range, suitable for low and medium working pressures up to 100 bars.

The "L" light duty series for applications characterised by medium high pressures of maximum 500 bars.

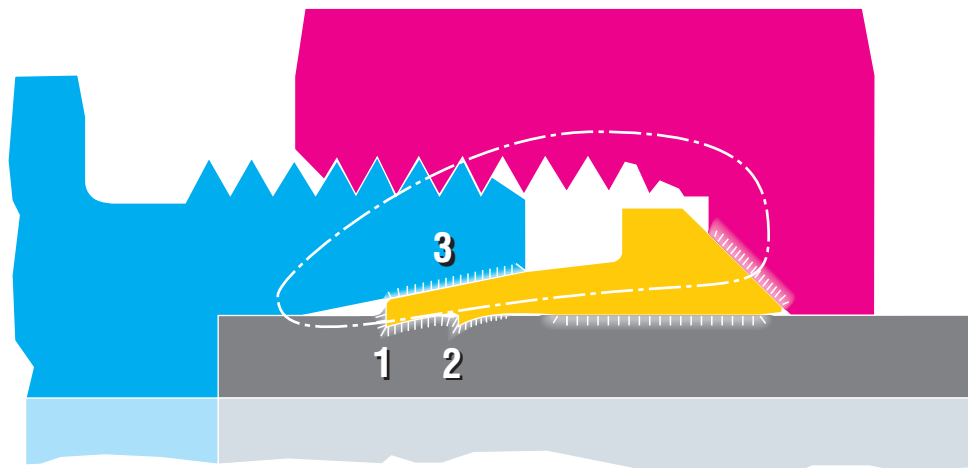
The "S" heavy duty series for harsh applications characterised by high temperatures and a maximum pressure of 800 bars.

Normal vibrations do not alter the fitting's performance, which, even at maximum values, retains its characteristics of absolute reliability.

Before assembly on the metal tube



After assembly on the metal tube



Field of force



Pressure surfaces



Sealing points

1 - 2 - 3



DIN 2353



**NEW SIX-SEALS CUTTING RING.
THE INTERNATIONAL INDUSTRIAL PATENT NR. 864061 OF 10/03/99
COMPLEMENTS AND DOES NOT REPLACE THE STANDARD RING CUR-
RENTLY IN USE.**

AVAILABLE IN CARBON AND STAINLESS STEEL

B4

THEORY OF OPERATION

The Cast fitting, manufactured according to ISO 8434-1/DIN 2353, is a mechanical fitting with a double cutting edge ring for double stapling on the tube.

"B4" is a highly innovative, deformable, double clinching, double edge ring with double elastomer seal.

It is assembled according to well-known techniques and is perfectly interchangeable with all types of rings used on 24° cone fittings complying with ISO 8434-1/DIN 2353 standards.

The ring helps fast assembly of removable tubes, avoids welding, tapping and flaring, thus assuring maximum simplicity for complex oleo-dynamic systems. During tightening by the nut, the ring deforms according to the bore of the 24° cone of the fitting and bites into the steel tube, producing two deep cuts, the first of which is visible due to the lifting of an outer edge on the diameter of the tube, ensuring water tightness and anti-unthreading of the ring. The second groove (invisible) balances the forces on the whole ring, prevents vibrations from reaching the first groove and stops the stapling of the tube at a predetermined value.

COUPLING SYSTEM DIN 2353

Reference prescriptions:

Tube E 235
EN 10305-4

Nut
DIN 3870

O-ring seal
CAST

Cutting ring
DIN 3861-B

Flat washer seal **CAST**

Shape of housing
DIN 3861

Fitting body
DIN 3901

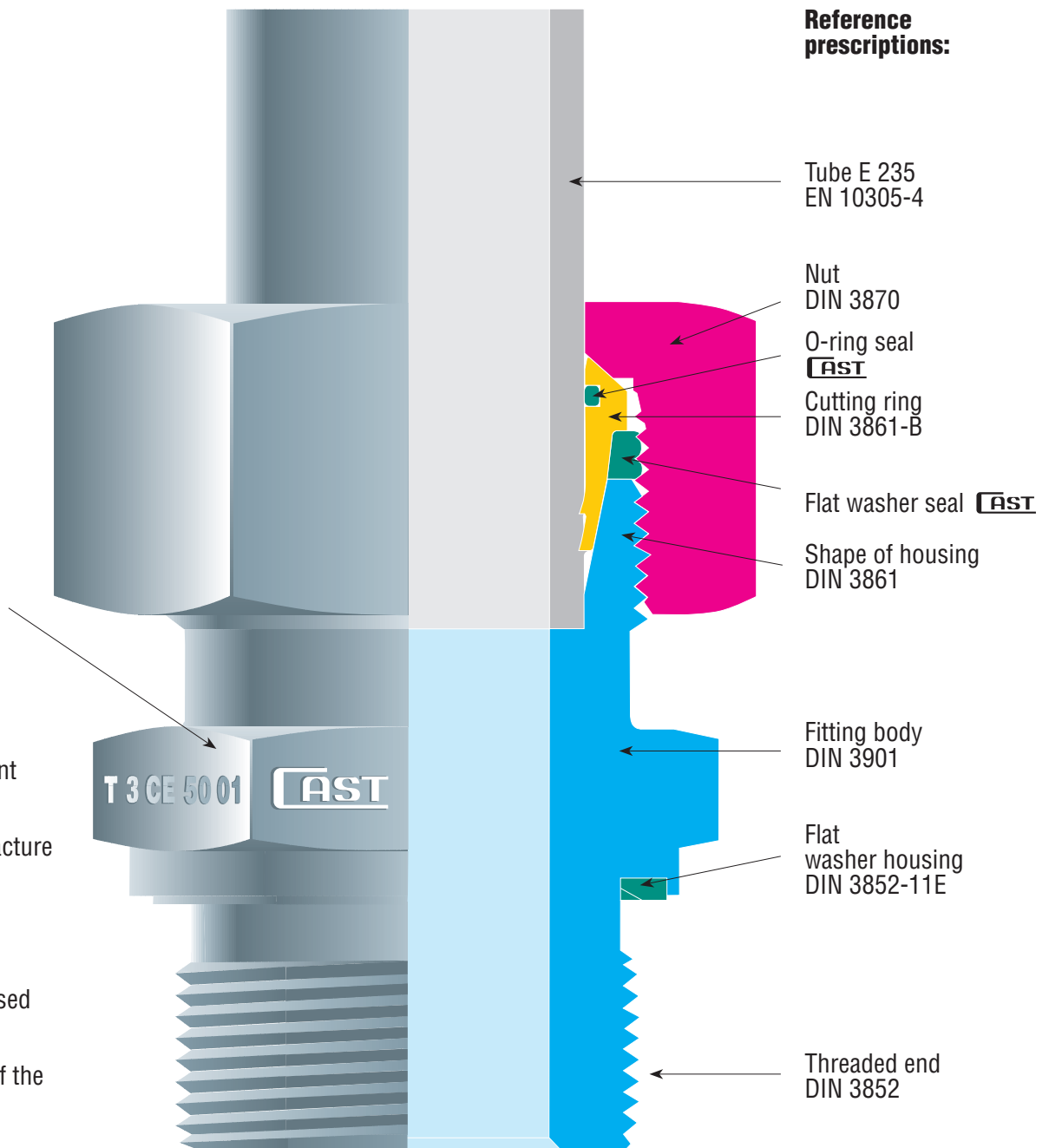
Flat washer housing
DIN 3852-11E

Threaded end
DIN 3852

Traceability decoding:

CAST =
Logo of the
Manufacturer

- T =
Production plant
- 3 =
Year of manufacture
- CE =
Made in EEC
- 50 =
Type of steel used
- 01 =
Heat number of the
steel used



TECHNICAL CHARACTERISTICS

The “B4” ring assures perfect tightness of the circuit regardless of the fluid used, provided that corrosive fluids are avoided and the nominal pressures of the fittings are complied with. The fittings on which the “B4” rings are mounted are manufactured in two series, which are used according to the operating conditions.

The “L” light duty series for applications characterised by medium high pressures of maximum 500 bars.

The “S” heavy duty series for harsh applications characterised by high temperatures and a maximum pressure of 800 bars.

Normal vibrations do not alter the fitting’s performance, which, even at maximum values, retains its characteristics of absolute reliability.

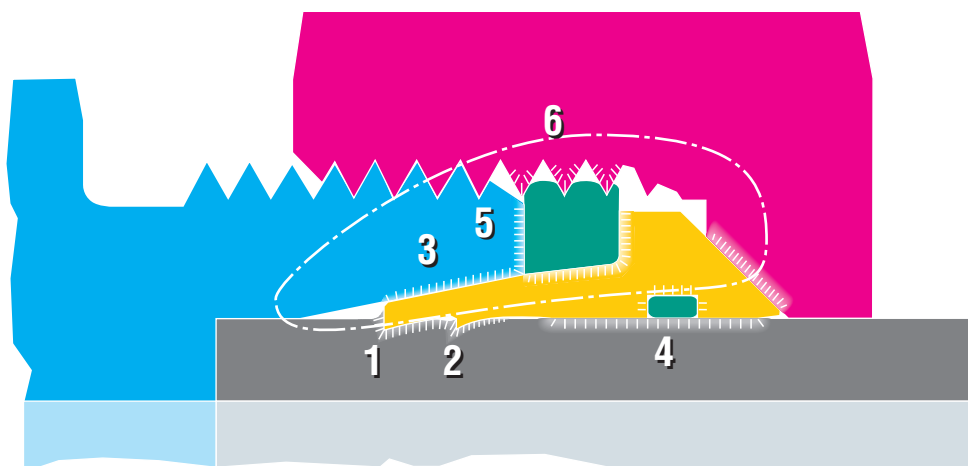
When the fitting, ring, nut, tube system is assembled, the flat seal is compressed between the head of the cutting ring and the front of the fitting body. The mechanical pressure applied to the flat seal causes flexure towards the outside, with a consequent increase in diameter. The deformation causes the compressed material of the seal to fill the turns of the thread of the nut free from the closing coupling with the fitting body, assuring locking of the nut and preventing any vibration-induced loosening of this.

When the fitting is disassembled with the tool and nut, the flat seal goes back to its original shape, without any damage, freeing the nut threads used previously, also allowing for the manual unscrewing of the same nut.

Before assembly on the metal tube



After assembly on the metal tube



Field of force



Pressure surfaces



Sealing points

1 - 2 - 3 - 4 - 5 - 6

TECHNICAL INNOVATION

For many years now there has been an increasing imperative market demand for fluid system components that guarantee three main factors:

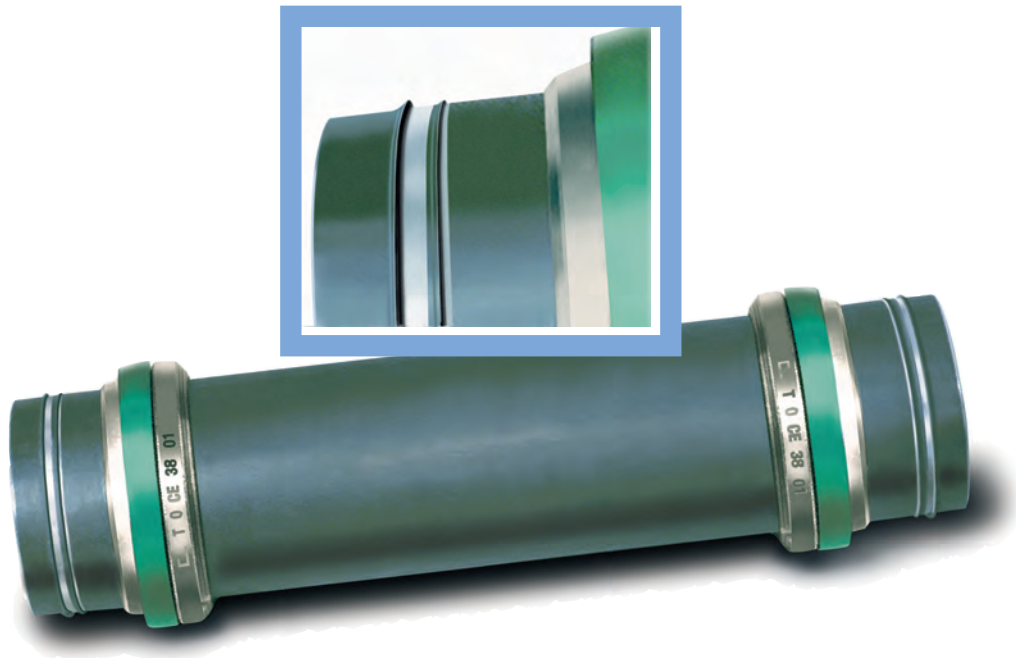
SAFETY, EASY ASSEMBLY, LEAKAGE-FREE TIGHTNESS.

These elements, now considered essential for a safe working environment (Law 626/94), product liability (Presidential Decree 224-EEC 85/374) and for the entire environmental protection system, have promoted the development of the new “B4” ring as an effective response to all the above-mentioned problems.

PRODUCT CONCEPT

The most original aspect of the product is that the structure of the existing ring has been used, inserting an O-Ring in the inside part to obtain another seal on the tube used; a flat seal has been used on the outer diameter to obtain two additional seals.

The main idea behind the development of the “B4” was to design a new cutting ring able to go one step beyond the known techniques and solve the problem of minor losses of tightness, leaks, sweating and loosening of the system fastening nut. With this new ring, the double clinching of the steel tube is still possible, as well as, for obvious reasons of safety, the visual inspection of the correct coupling between the ring and the steel tube, maintaining the perfectly functional current system of assembly that is widely known to product users.



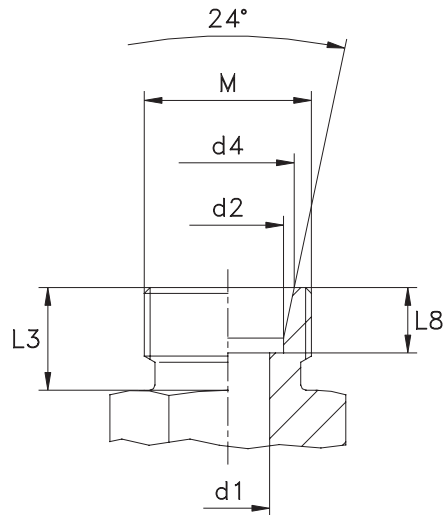
SEALING

B4” solves the problem of absolute tightness in the following way:

- On the outer diameter of the steel tube, with the double cutting edges and with an O-Ring placed inside the ring that provides a first seal with an elastomeric material that did not exist before.
- In the 24° cone of the fitting body, with an increase in the metal-on-metal contact area and with a flat seal placed statically on the outer diameter of the cutting ring which, when compressed between the head of the ring and the front of the fitting body, provides a second seal with an elastomeric material that did not exist before.
- In the thread of the system fastening nut, with the flat seal. When this is compressed between the head of the ring and the front of the fitting body, it fills the threads of the nut that are not engaged in clinching of the coupling system, thus providing a third seal with an elastomeric material that did not exist before.
- Basically, the “B4” provides six points of seal, of which three metal to metal and three by means of two soft elastomeric seals (the flat seal assures two sealing points), thus obtaining a product that ensures complete tightness without any leakage risk, even in particularly harsh operating conditions.

DEFINITION OF CONE SIZE TO DIN 3861 STANDARDS THREAD DIAMETERS TO DIN 3853 STANDARDS

Allowed for B3-B4-BP rings



Series	Bar (DIN 2353)	ØTube	Metric Thread	d1	d2 ^{B11}	d4 ^{+0,1}	L3	L8 ^{+0,3}
LL	100	4	M8x1	3	4	5	8	4
		6	M10x1	4,5	6	7,5	8	5,5
		8	M12x1	6	8	9,5	9	5,5
L	250	6	M12x1,5	4	6	8,1	10	7
		8	M14x1,5	6	8	10,1	10	7
		10	M16x1,5	8	10	12,3	11	7
		12	M18x1,5	10	12	14,3	11	7
		15	M22x1,5	12	15	17,3	12	7
	160	18	M26x1,5	15	18	20,3	12	7,5
		22	M30x2	19	22	24,3	14	7,5
	100	28	M36x2	24	28	30,3	14	7,5
		35	M45x2	30	35	38	16	10,5
42		M52x2	36	42	45	16	11	
S	630	6	M14x1,5	4	6	8,1	12	7
		8	M16x1,5	5	8	10,1	12	7
		10	M18x1,5	7	10	12,3	12	7,5
		12	M20x1,5	8	12	14,3	12	7,5
		14	M22x1,5	10	14	16,3	14	8
	400	16	M24x1,5	12	16	18,3	14	8,5
		20	M30x2	16	20	22,9	16	10,5
		25	M36x2	20	25	27,9	18	12
	250	30	M42x2	25	30	33	20	13,5
		38	M52x2	32	38	41	22	16

GENERAL INSTRUCTIONS FOR B3 - B4 - BP RINGS

- Before starting the preassembly make sure that the pierce of the machine and the hardened blocks are in perfect working order. Further inspections are necessary during the preassembly (every 30-50 tightenings). For this purpose we recommend you to use a control buffer 1000... pierce and replace any block out of tolerance.
- Over the whole tightening phase the tube must be in touch with the inner part of the body of the fitting. If this does not happen, the ring will advance with the tube without indenting it, making the coupling not functional and requiring the operation to be carried out again. The tube must not turn with the nut during the tightening phase; the capability of the ring to rotate, once the pre-assembly is done, is not a deficiency but rather a consequence of the right elasticity of the ring. Always check that the tube is correctly indented. If the indentation does not cover 80% of the cutting ring front side then the assembly is not functional and must be done again. Indicated pressures in the catalogue are for steel tubes only.
- In case thin wall tubes are used, specially mild tubes, or tubes in RILSAN or similar, the assembling is possible, but a suitable reinforcement must be inserted into the end of the tube that is going to be tightened. Without the reinforcement it is not possible to operate with the materials mentioned above. In this case, carefully assess the working pressure.
- Before assembling the preassembled tube to the equipment it is necessary to check that the tube and the fitting are aligned. Fittings should never be used to correct a wrong alignment or to be a support for the tube. Extremely long tubes or tubes under-going high stress must be fixed by using some support to avoid excessive vibrations. A poor alignment could damage the operation of the system.
- The proper lubrication of the components involved in the tightening is essential for good system operation. We advise the use of mineral oils or torquen tension for carbon steel fittings, consisting of anti-seizing compound (Nickel based), Chesterton or similar, for stainless steel fittings.
- The fittings and the valves in this technical catalogue may be used for fluid-dynamic connections only. Indicated pressures in the catalogue are for steel tubes only.
- Mixing carbon and stainless steel components is not allowed.

UTILISATION STANDARDS FOR B3 - B4 - BP

CARBON STEEL FITTINGS

- High quality tubes must be employed to assure correct use and related technical performance of the carbon steel fitting. The use of tubes without the aforementioned characteristics may seriously impair the efficiency of the fitting. We recommend using the following tubes only: calibrated, seamless, cold drawn and threaded tubes. Normalised with inert gas, made of material E235 according to EN 10305-4 (ST 37.4 according to DIN 1630 I DIN 2391). The maximum hardness allowed on the outside diameter of the tube is 75 HRB.
- All carbon steel tubes with a diameter of more than 10 mm must be pre-assembled using the specific preassembly machine. If this is not available, hardened blocks, to be clamped in vice for manual preassembly, must be used. Remember to oil the thread, nut and ring. If hardened pre-assembly blocks are not available, normal straight fittings can be used. The fitting used once must be replaced at each tightening. During preassembly, pay special attention to parts such as reducing standpipes and nipples as these are made of raw materials characterised by higher resistance compared with the cuts made on annealed tubes. These parts must always be pre-assembled on hardened or 24° cones (for all diameters).

STAINLESS STEEL FITTINGS

- High quality tubes must be employed to assure correct use and related technical performance of stainless steel fittings. The use of tubes without the aforementioned characteristics may seriously impair the efficiency of the fitting. We recommend using the following tubes only: calibrated and polished, cold drawn seamless tubes 1.4571 as per UNI EN 10216-5 or ASTM A 269; the maximum permitted hardness, measured on the outer diameter of the tube, is 85 HRB. Electrically welded tubes may be used, provided that these comply with the mechanical tolerances of the aforementioned standards and related hardness values for fittings compliant with SAE J514, BS 5200, SAE J1453.
- All stainless steel tubes must be pre-assembled using the specific preassembly machine. If this is not available, hardened blocks must be used for manual preassembly. In this case, make sure that the bench and vice in which the block is clamped are firmly fastened to prevent any possibility of movement caused by the twisting moment applied to the nut during the preassembly phase. Assembly or preassembly operations directly on the stainless steel fitting are not allowed.

QUALITY ASSURANCE ACCORDING TO UNI EN ISO 9001:2008

The Quality Assurance System complies with UNI EN ISO 9001:2008, certificate (N.90/94/S) issued by the RINA certification authority recognised by IQNET at European level.

CAST S.p.A. has obtained the product homologation with the following registers:

- Germanischer Lloyd for carbon steel fittings with "B3" standard ring;
- RINA for carbon steel and stainless steel fittings with "B3" standard ring and "B4" patented ring;
- DNV for carbon steel and stainless steel fittings with "B3" standard ring and "B4" patented ring, JIC 37° complying with SAE J514, ORFS complying with SAE J1453 and for fittings for braided flexible tubes of the 80 series. CAST S.p.A. fully complies with the reference standards.

At the customer's request, our Quality Service will issue certificates of origin for the materials used to manufacture the products delivered. E.g.: Document 3.1.

Our Quality Experts are always ready to provide customers with advice, guide them around our facilities and inform them about the traceability system applied on our entire production range.

METROLOGY-TESTING LAB

A metrology lab equipped with state-of-the-art metallography microscopes, profile projectors, durometers, profilometers, micro-durometers, micro-meters, surface plates, comparators, buffers for various series of threads, etc., and a testing lab, equipped with three benches for static and dynamic tests, up to a pressure of 4000 bars, ensure the right tools for research, development, quality and safety control of our production.

Highly trained specialised staff ensure that the technology is always up-to-date and that the knowledge and means are used in the best way possible, in compliance with the company's ethics.

COMPONENT TESTING ON THE ENTIRE PRODUCT RANGE

In addition to the normal dimensional checks carried out during machining, percentage inspections of the finished product, practical tightness and fatigue tests, CAST fittings undergo coupling tests between the various parts. This check is carried out on the entire production. At the customer's request, our Product Test and Inspection Service issues a certificate of the tests carried out: checking of static seal at low and high pressure, dynamic seal at high pressure (maximum working pressure + 33%) as per ISO 19879 and ISO 6803. If required by the customer, tests can be carried out by various Third Party Authorities including: RINA-DVGW-Lloyd's Register of Shipping-Det Norske Veritas-Germanischer Lloyd-American Bureau of Shipping (to be specified on the order).

SAFETY FACTORS

"B3", "B4" and "BP" rings provide the right answer to safety problems so that absolute functional reliability between the ring, the steel tube and the fitting body is guaranteed by the double clinching and automatic locking of the cuts on the steel tube (assured by the particular shape of the ring). If on one side we increase the safe fastening, on the other we set a precise mechanical limit at the cutting of the tube, with the certainty of correct function.

- The nominal working pressures (bar) given in the catalogue indicate the maximum permissible pressures (including pressure peaks). For higher pressure the items must be tested in accordance with the manufacturer for specific applications.
- The safety factor is 4:1 and is intended with static load and with the temperature at the values indicated in the CAST S.p.A. Catalogue (series DI N, JIC, BS and ORFS) for tube connection. The same safety factor 4:1 is intended for parallel threaded end fittings with elastomeric seal.
- For stud couplings with taper or parallel threaded end fittings with metal to metal seal, the safety factor is 2.5:1.
- It is understood that the product is guaranteed only if the full connection is made entirely with our products and components.



*Destructive testing with 28x3 carbon steel tube.
The tube burst at 1050 bars without any leakage or sweating from the sealing points.*

GENERAL INFORMATION

• STEEL USED ON ALL SERIES

With a view to R&D and continuous improvement, our company has examined the issues of best usage of the raw material for the creation of our product. The steels used are all of the finest quality and are exclusively purchased from leading European steel works. All the batches used have testing documentation 3.1 reporting the number of heat as well as the chemical characteristics and mechanical characteristics. The above applies to carbon steel and stainless steel. The reference standards for the raw material normally used before are in line with the following principles: UNI EN 10087, UNI EN 10083-2, UNI EN 10025, UNI EN 10088-3 and so on.

• ALLOWED STEEL TEMPERATURES

Carbon Steel -40°C to + 120°C, according to ISO 8434
Stainless steel -60°C to + 200°C, according to ISO 8434

• PRESSURE REDUCTIONS

The allowed working pressure for stainless steel fittings manufactured with 1.4571 must be reduced according to the working temperature registered as per ISO 8434.
In case of multi-components systems all the parameters must be calculated on the weakest component used.

Type of steel	Working temperature	Lowering percentage
1.4571	≥ 50°C	- 4%
1.4571	≥ 100°C	- 11%
1.4571	≥ 200°C	- 20%

• GASKETS AND O-RINGS

The gaskets and o-rings used on valves and fittings are normally manufactured in NBR and have a working temperature of -35°C and +100°C. For higher temperatures VITON® gaskets and o-rings are suggested with working temperatures between -25°C and +200°C.

The gaskets made of NBR used in the valves and for the end seals have a hardness of 85±5 shores, while those in VITON® have a hardness of 80±5 shores.

The o-rings made of NBR and VITON® have a hardness of 80±5 shores, except for those used on the tube side seal of the ORFS fittings, which have a hardness of 90±5 shores.

The gaskets and o-rings, just like the products they are assembled on, must be managed according to DIN 7716 (requisites for the stocking of rubber and India rubber products).

• SEALS ON THREADED ENDS

To obtain the maximum performance, the taper male thread is to be matched with the taper female thread. The cylindrical male thread is to be matched with the cylindrical female thread. It is possible to match a taper male thread with a cylindrical female thread, but this combination is technically valid only in pipings where medium/low performance is required, and is never to be used where high pressures are applied. In case of matching of a cylindrical thread with relatively soft material, it is advisable to use the plain gasket type of seal that guarantees a perfect seal even with a relatively low tightening torque.

• CARBON STEEL FITTINGS FINISH TREATMENT

All Cast S.p.A. fittings, valves and components undergo surface treatment protection of the type: Zinc plating Fe/Zn 7 IV-Fe/Zn8 b/c 1 B UNI ISO 2081-4520, plus FINIGARD 460 top coat, equivalent to a Cathodic electrolytic zinc-plating with trivalent chromium. The fitting acts as a cathode (negative), the zinc which is deposited acts as an anode (positive), the deposited thickness is around 8+12 µm.

To be able to reach the resistance of 400 hours ±15% to white salt and 750 hours ±15% to red salt, a top coat is applied which, in addition to guaranteeing the required performance, facilitates assembly.

The top coat has the task of filling all the micro cavities in the zinc-plating treatment, which represent an initial part of the corrosion outbreaks. By sealing these micro defects, the zinc-plating treatment significantly improves its protective performance to the values indicated previously. The resistance to corrosion of this new type of zinc-plating notably increases compared to the previous one. The appearance has a silver colour with yellow shades.

It complies with current European environmental laws on hazardous waste and with the European EVL standard as it uses trivalent chromium (CrIII), in compliance with local laws protecting the health of people and the precautionary principle of protecting our environment.

The zinc-plating will be identified by reading the traceability codes of the year of production, starting from 2013. The new zinc-plating applies from this date onwards.

• STAINLESS STEEL FITTINGS FINISH TREATMENT

All the fittings and valves are treated with a chemical cleaning process that eliminates all oxides and burrs due to the machining phase, without altering or damaging the product. After this, a bath cleans the product and takes away any residual impurities. The piece at the end of the treatment looks really bright, perfect for oleo-dynamic industrial applications.

• THERMAL TREATMENTS FOR STAINLESS STEEL RINGS

After being machined, the rings are heat treated to harden the surface. This type of treatment, on stainless steel cutting rings, may decrease the amagnetivity of the ring itself. A slight amagnetivity is therefore inevitable and does not indicate a defect.

• ANTI-POLLUTION TREATMENT

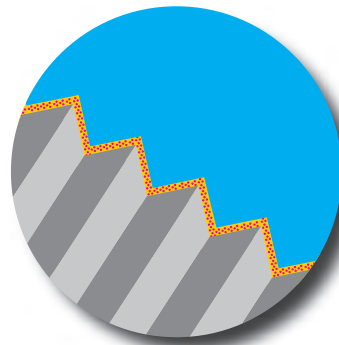
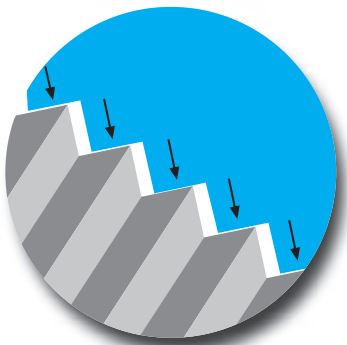
• CAST S.p.A, with a view to “Continuous Improvement”, has implemented an operating system to avoid contamination from dust or working residues occurring inside its production facilities, which may in some way jeopardise the function of the component and damage the actuators (valves, cylinder, etc) from the entire circuit.

• In short, all of CAST S.p.A.’s fittings, after various checks and treatments during the entire production cycle, undergo a last process/check to cancel the micro bubbles on the threads, insert any o-Rings or gaskets, clean dust, burrs or processing dross and cap the component to maintain the result obtained with these operations until the use.

• The reference standards that CAST S.p.A. uses to check the level of cleanliness of its pipe fittings are the following: ISO 16232-3 and ISO 16323-1 O.

• For flexible hoses and rigid steel tubes, flushing is advised before installation or system execution.

• LUBRICATION OF THE STAINLESS STEEL THREADS



STAINLESS STEEL FITTINGS

- The special characteristics of this type of steel (hard but mild) require special attention to be paid to avoid problems.
- One of these requirements is the correct lubrication of all the components to be done during pre-assembling and assembling.
- Therefore, always use the right lubricant to create functional and safe systems to be able to assemble and dismantle the system without effort, seizures and at an affordable price.

ANTI-SEIZING COMPOUND (NICKEL BASIS)

- The anti-seizing compound (Nickel Basis) exposed to a strong pressure originates “millions of grains of Nickel” rolling between the surfaces.
- It allows a safer tightening and an easier unblocking. This compound may be used both indoors and outdoors.
- It protects the threads from wearing out and breaking, keeps away rust and corrosion.
- Nickel covers the connected surfaces avoiding any founding or welding and moreover there is only pure colloidal nickel and no trace of carbonic deposits.
- Compliant with specification Mi I. 907 D.
- Approved by the Ministry of Agriculture of the United States of America (USAD).
- Packaging weight 227 gr. Art. 82356. N.B.:
- Do not use on systems with oxygen or in the presence of ammonia or acetylene.

• CARBON STEEL TUBES ALLOWED ON ALL SERIES

- For carbon steel tubes we advise using calibrated seamless cold drawn tubes, normalised with inert gas, in E235 material according to EN 10305-4 (ST 37.4 according to DIN 1630 I DIN 2391).
- Maximum allowed hardness on the outside diameter of the tube is 75HRB.
- The pressures stated in the table below are generally intended at a constant rate and with temperatures ranging between -40°C and + 120°C.

ØTube mm	Tolerance EN 10305-4 mm	Thickness mm	Static DIN 2413-I pressure bar	Dynamic DIN 2413-III pressure bar	Weight Kg/m
4	±0,1	0,5	313	274	0,047
4		1	522	502	0,075
6	±0,1	1	389	374	0,123
6		1,5	549	528	0,166
6		2	692	665	0,197
8	±0,1	1	333	289	0,222
8		1,5	431	441	0,240
8		2	549	528	0,296
8		2,5	658	632	0,339
10	±0,1	1	282	249	0,222
10		1,5	373	358	0,314
10		2	478	460	0,395
10		2,5	576	553	0,462
10		3	666	641	0,518
12	±0,08	1 ⁽¹⁾	235	210	0,271
12		1,5	353	305	0,388
12		2	409	393	0,493
12		2,5	495	476	0,586
12		3	576	553	0,666
12		3,5	651	627	0,734
14	±0,08	1,5	302	265	0,462
14		2	403	343	0,592
14		2,5	434	417	0,709
14		3	507	487	0,814
14		3,5	576	553	0,906
15	±0,08	1,5	282	249	0,499
15		2	376	323	0,641
15		2,5 ⁽³⁾	409	393	0,771
15		3	478	460	0,888
16	±0,08	1 ⁽³⁾	176	161	0,370
16		1,5 ⁽²⁻³⁾	264	234	0,536
16		2	353	305	0,691
16		2,5	386	372	0,832
16		3	452	435	0,962
18	±0,08	1 ⁽³⁾	157	143	0,419
18		1,5 ⁽¹⁾	235	210	0,610
18		2	313	274	0,789
18		2,5	392	335	0,956
18		3	409	393	1,111
18		4 ⁽³⁾	522	502	1,381

ØTube mm	Tolerance EN 10305-4 mm	Thickness mm	Static DIN 2413-I pressure bar	Dynamic DIN 2413-III pressure bar	Weight Kg/m
20	±0,08	2 ⁽²⁻³⁾	282	249	0,888
20		2,5	353	305	1,079
20		3	373	358	1,258
20		3,5	426	410	1,424
20		4	478	460	1,578
22	±0,08	1,5 ⁽³⁾	192	174	0,758
22		2 ⁽¹⁾	256	228	0,986
22		2,5	320	280	1,202
22		3	385	329	1,406
22		4 ⁽³⁾	441	424	1,766
22		5 ⁽³⁾	532	512	2,367
25	±0,08	2 ⁽¹⁾	226	202	1,134
25		2,5	282	249	1,387
25		3	338	294	1,628
25		4	394	379	2,072
25		4,5	437	420	2,275
25		5 ⁽³⁾	478	460	2,466
28	±0,08	2 ⁽¹⁾	201	182	1,282
28		2,5	252	224	1,572
28		3	302	265	1,850
28		4 ⁽³⁾	403	343	2,368
28		5 ⁽³⁾	434	417	2,836
30	±0,08	2 ⁽²⁻³⁾	168	171	1,381
30		2,5	235	210	1,695
30		3	282	249	1,998
30		4	376	323	2,565
30		5 ⁽³⁾	409	393	3,083
32	±0,15	3 ⁽³⁾	265	235	2,146
32		4 ⁽³⁾	353	305	2,762
32		5 ⁽³⁾	387	372	3,329
35	±0,15	2 ⁽¹⁾	161	147	2,189
35		2,5	201	182	2,004
35		3	242	216	2,367
35		4	322	281	3,058
38	±0,15	3 ⁽²⁻³⁾	223	200	2,589
38		4	297	261	3,354
38		5	371	319	4,069
42	±0,2 ⁽⁴⁾	3	201	182	2,885
42		4	269	238	3,749

(1) Tubes that require a support sleeve if used for DIN 2353 applications only

(2) Tubes to be used for 37° fittings compliant with ISO 8434-2/SAE J514

(3) Tubes to be used for ORFS fittings compliant with ISO 8434-3/SAE J1453

(4) Due to a technical choice, CAST S.p.A. builds the 042 tube housing with a tolerance of 811.

CALCULATION PRESSURES

The calculation of the pressure with static load is made to DIN 2413-1 with yield point K= 235N/mm².

For tubes with an external/internal diameter ratio >1.35, calculation is made to DIN 2413-III but with yield point K= 235N/mm².

The calculation of the pressure with dynamic stress is made to DIN 2413-III with permanent fatigue strength K= 226N/mm².

Safety factor S= 1.5

Allowance factor c= 0.8 for 4mm Ø tube, c= 0.85 for 6-8mm Ø tube, c= 0.9 for >8mm Ø tube

Corrosion: no additional allowance is considered for pressure calculations.

• STAINLESS STEEL TUBES ALLOWED ON ALL SERIES

- For stainless steel tubes we advise using calibrated and polished, seamless, cold drawn tubes in material 1.4571 as per UNI EN 10216-5 or ASTM
- Maximum allowed duration on the outside diameter of the tube is 85 HRB.
- The pressures stated in the table below are generally intended at a constant rate and with temperatures ranging between -60°C and + 200°C.

ØTube mm	Tolerance EN 10305-4 mm	Thickness mm	Static DIN 2413-I pressure bar	Weight Kg/m
4	±0,1	0,5	326	0,048
4		1	544	0,076
6	±0,1	1	406	0,125
6		1,5	572	0,169
6		2	721	0,200
8	±0,1	1	347	0,225
8		1,5	449	0,244
8		2	572	0,301
8		2,5	686	0,344
10	±0,1	1	294	0,225
10		1,5	389	0,319
10		2	498	0,401
10		2,5	601	0,469
10	±0,08	3	694	0,526
12		1 ⁽¹⁾	245	0,275
12		1,5	368	0,394
12		2	426	0,500
12	±0,08	2,5	516	0,595
12		3	601	0,676
12		3,5	679	0,745
14	±0,08	1,5	315	0,469
14		2	420	0,601
14		2,5	452	0,720
14		3	529	0,826
14	±0,08	3,5	601	0,920
15		1,5	294	0,507
15		2	392	0,651
15	±0,08	2,5 ⁽³⁾	426	0,782
15		3	498	0,902
16	±0,08	1 ⁽³⁾	183	0,373
16		1,5 ⁽²⁻³⁾	275	0,544
16		2	368	0,702
16		2,5	402	0,845
16		3	471	0,977
18	±0,08	1 ⁽³⁾	163	0,423
18		1,5 ⁽¹⁾	245	0,619
18		2	326	0,801
18		2,5	409	0,971
18		3	426	1,128
18		4 ⁽³⁾	544	1,401

ØTube mm	Tolerance EN 10305-4 mm	Thickness mm	Static DIN 2413-I pressure bar	Weight Kg/m
20	±0,08	2 ⁽²⁻³⁾	294	0,902
20		2,5	368	1,095
20		3	389	1,277
20		3,5	444	1,446
20		4	498	1,602
22	±0,08	1,5 ⁽³⁾	200	0,764
22		2 ⁽¹⁾	267	1,001
22		2,5	334	1,220
22		3	401	1,427
22		4 ⁽³⁾	459	1,802
22	±0,08	5 ⁽³⁾	555	2,402
25		2 ⁽¹⁾	236	1,151
25		2,5	294	1,408
25		3	352	1,653
25		4	411	2,104
25	±0,08	4,5	456	2,310
25		5 ⁽³⁾	498	2,490
28		2 ⁽¹⁾	210	1,301
28		2,5	263	1,596
28		3	315	1,878
28	±0,08	4 ⁽³⁾	420	2,403
28		5 ⁽³⁾	452	2,878
30		2 ⁽²⁻³⁾	175	1,402
30	±0,08	2,5	245	1,721
30		3	294	2,028
30		4	392	2,604
30		5 ⁽³⁾	426	3,110
32	±0,15	3 ⁽³⁾	275	2,177
32		4 ⁽³⁾	368	2,803
32		5 ⁽³⁾	403	3,378
35	±0,15	2 ⁽¹⁾	168	2,222
35		2,5	210	2,034
35		3	252	2,403
35		4	336	3,104
38	±0,15	3 ⁽²⁻³⁾	232	2,628
38		4	310	3,405
38		5	387	4,131
42	±0,2 ⁽⁴⁾	3	210	2,929
42		4	280	3,806

- (1) Tubes that require a support sleeve if used for DIN 2353 applications only
(2) Tubes to be used for 37° fittings compliant with ISO 8434-2/SAE J514
(3) Tubes to be used for ORFS fittings compliant with ISO 8434-3/SAE J453
(4) Due to a technical choice, CAST S.p.A. builds the 042 tube housing with a tolerance of 811.

CALCULATION PRESSURES

The calculation of the pressure with static load is made to DIN 2413-1 with yield point $K = 245\text{N/mm}^2$.

For tubes with an external/internal diameter ratio >1.35 calculation is made to DIN 2413-111 but with yield point $K = 245\text{N/mm}^2$.

Pressures with dynamic stress according to DIN 2413-111 are not listed because in EN 10216-5 the permanent fatigue stress K is also not listed. We recommend, for calculation in accordance to DIN 2413-111, to assume a value $K = 190\text{N/mm}^2$.

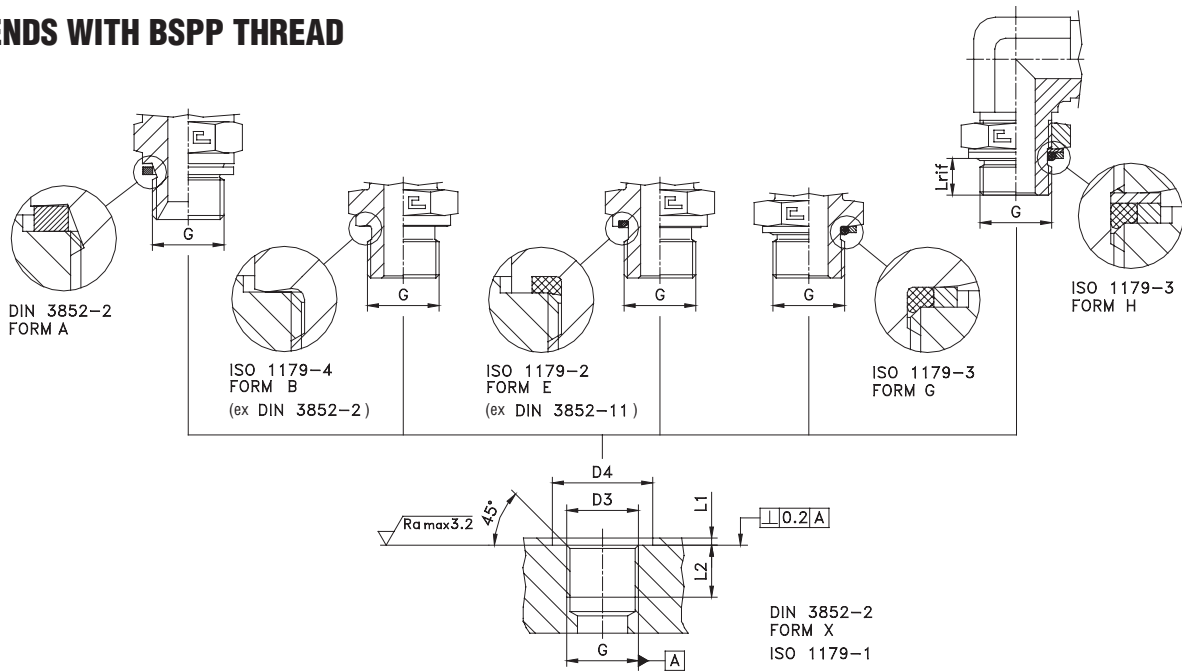
Safety factor $S = 1.5$

Allowance factor $c = 0.9$

Corrosion: no additional allowance is considered for pressure calculations.

- The insufficient thickness of the tube walls, or the too low longitudinal resistance of the tubes (particularly mild soft steel) may result in problems with the cutting, with relevant loss of seal and a drastic decrease in the safety factor. This aspect must be considered when choosing the tube. It is a good rule to pick tubes that make it so that the internal flare (decreasing of the internal diameter) does not exceed 3/10 of a millimetre up to an outer diameter of 16mm and 4/10 of a millimetre for greater diameters.

STUD ENDS WITH BSPP THREAD



Series	Ø Tube	Thread Gas	D3	D4 min			L1 max	L2 min	L ref	Torque [Nm] ^{+10%}						
				form A/B/E	form G/H	form A				form B	form E	form E (caps 1076..)	form G	form G (caps 1078..)	form H	
DIN	L	6	G 1/8	9,8	15	17,2	1	8	7,5	-	20	20	10	20	10	20
		8-10	G 1/4	13,2	20	20,7	1,5	12	10,2	-	45	45	25	45	25	45
		12	G 3/8	16,7	23	24,5	2	12	10,4	-	70	70	40	70	40	70
		15-18	G 1/2	21	28	29,6	2,5	14	13,1	-	130	85	75	85	75	85
		22	G 3/4	26,5	33	36,9	2,5	16	13,5	-	170	170	120	170	120	170
		28	G 1	33,3	41	46,1	2,5	18	14,7	-	330	330	230	330	230	330
		35	G 1 1/4	42	51	54	2,5	20	14,7	-	510	430	300	430	300	430
	42	G 1 1/2	47,9	56	60,5	2,5	22	14,7	-	600	510	360	510	360	510	
	S	6-8	G 1/4	13,2	20	20,7	1,5	12	10,2	-	55	55	25	55	25	55
		10-12	G 3/8	16,7	23	24,5	2	12	10,4	-	85	80	40	80	40	80
		14-16	G 1/2	21	28	29,6	2,5	14	13,1	-	150	110	75	110	75	110
		20	G 3/4	26,5	33	36,9	2,5	16	13,5	-	280	170	120	170	120	170
		25	G 1	33,3	41	46,1	2,5	18	14,7	-	330	330	230	330	230	330
		30	G 1 1/4	42	51	54	2,5	20	14,7	-	510	430	300	430	300	430
38		G 1 1/2	47,9	56	60,5	2,5	22	14,7	-	680	510	360	510	360	510	
JIC 37° - BS 5200	6	G 1/8	9,8	15	17,2	1	8	7,5	20	-	20	-	20	-	20	
	8-10	G 1/4	13,2	20	20,7	1,5	12	10,2	35	-	45	-	45	-	45	
	12	G 3/8	16,7	23	24,5	2	12	10,4	70	-	70	-	70	-	70	
	14-15-16	G 1/2	21	28	29,6	2,5	14	13,1	85	-	85	-	85	-	85	
	-	G 5/8	23	31	-	2,5	16	-	105	-	-	-	-	-	-	
	18-20	G 3/4	26,5	33	36,9	2,5	16	13,5	120	-	170	-	170	-	170	
	25	G 1	33,3	41	46,1	2,5	18	14,7	180	-	330	-	330	-	330	
	30-32	G 1 1/4	42	51	54	2,5	20	14,7	260	-	430	-	430	-	430	
38	G 1 1/2	47,9	56	60,5	2,5	22	14,7	290	-	510	-	510	-	510		
-	G 2	59,7	69	73,3	3	24	-	380	-	640	-	640	-	640		
ORFS	6	G 1/8	9,8	15	17,2	1	8	7,5	-	-	20	-	20	-	20	
	8-10	G 1/4	13,2	20	20,7	1,5	12	10,2	-	-	55	-	55	-	55	
	12	G 3/8	16,7	23	24,5	2	12	10,4	-	-	80	-	80	-	80	
	14-15-16	G 1/2	21	28	29,6	2,5	14	13,1	-	-	110	-	110	-	110	
	18-20	G 3/4	26,5	33	36,9	2,5	16	13,5	-	-	170	-	170	-	170	
	22-25	G 1	33,3	41	46,1	2,5	18	14,7	-	-	330	-	330	-	330	
	28-30-32	G 1 1/4	42	51	54	2,5	20	14,7	-	-	430	-	430	-	430	
	35-38	G 1 1/2	47,9	56	60,5	2,5	22	14,7	-	-	510	-	510	-	510	

Performance:

-pressure capacity
 -sealing characteristics
 -additional sealing required
 -safety factor

Sealing form A

good
 good
 no
 2,5:1

Sealing form B:

good
 good
 no
 2,5:1

Sealing form E:

excellent
 excellent
 no
 4:1

Sealing form G:

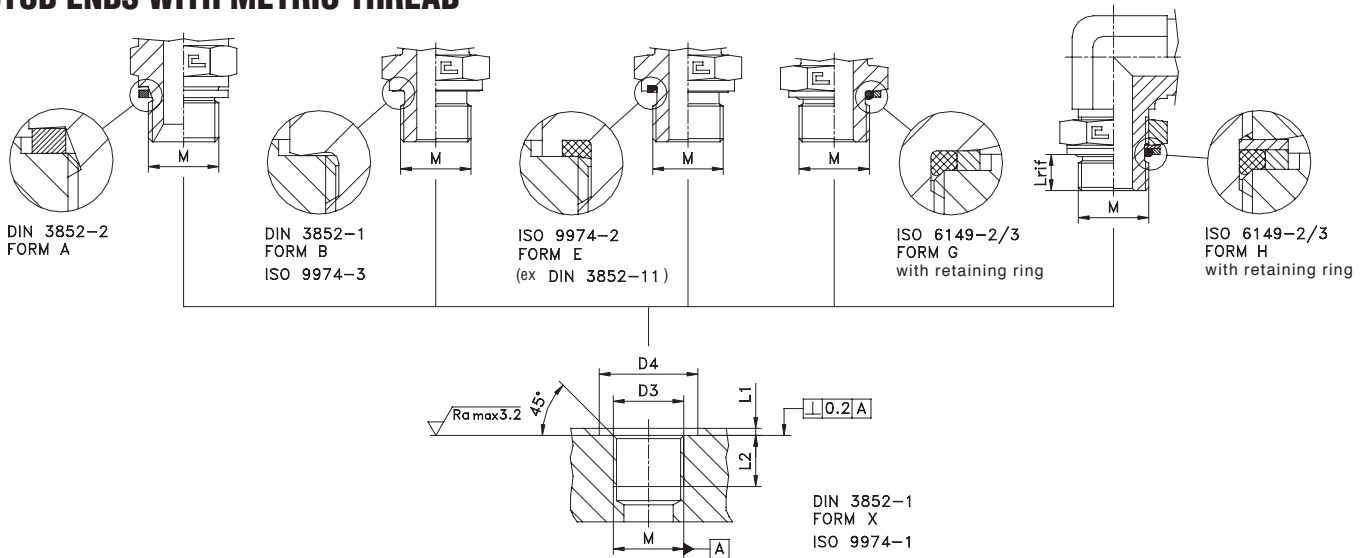
excellent
 excellent
 no
 4:1

Sealing form H:

excellent
 excellent
 no
 4:1

Notes: The values in the tightening tables are approximate and derive from practical tests run at the laboratory in Casalgrasso (CN), which may vary based on the materials and tolerances of the components used.

STUD ENDS WITH METRIC THREAD

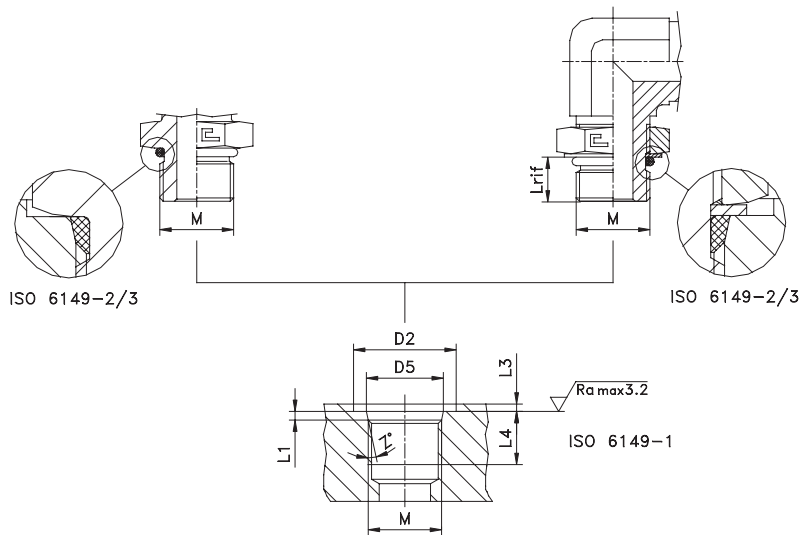


Series	Ø Tube	Thread Gas	D3	D4 min		L1 max	L2 min	L ref	Torque [Nm] ^{+10%}							
				form A/B/E	form G/H				form A	form B	form E	form E (caps 1076..)	form G	form G (caps 1078..)	form H	
DIN	L	6	M10x1	10	15	16	1	8	7,6	-	20	20	10	20	10	20
		8	M12x1,5	12	18	19	1,5	12	9,7	-	30	30	20	30	20	30
		10	M14x1,5	14	20	21	1,5	12	9,7	-	45	45	35	50	35	50
		12	M16x1,5	16	23	24	1,5	12	10,2	-	60	55	40	55	40	55
		15	M18x1,5	18	25	26	2	12	10,9	-	80	70	45	70	45	70
		18	M22x1,5	22	28	29	2,5	14	12	-	130	120	90	120	90	120
		22	M26x1,5	26	33	-	2,5	16	-	-	180	170	120	-	120	-
		22	M27x2	27	33	35	2,5	16	13,8	-	-	-	120	170	120	170
		28	M33x2	33	41	43	2,5	18	13,8	-	330	330	230	330	230	330
	35	M42x2	42	51	52	2,5	20	13,8	-	470	430	300	430	300	430	
	S	42	M48x2	48	56	57	2,5	22	15,3	-	600	510	360	510	360	510
		6	M12x1,5	12	18	19	1,5	12	9,7	-	40	40	20	40	20	40
		8	M14x1,5	14	20	21	1,5	12	9,7	-	55	55	35	55	35	55
		10	M16x1,5	16	23	24	1,5	12	10,2	-	80	70	40	70	40	70
		12	M18x1,5	18	25	26	2	12	10,9	-	105	85	45	85	45	85
		14	M20x1,5	20	27	28	2	14	12	-	150	120	85	120	85	120
		16	M22x1,5	22	28	29	2,5	14	12	-	170	130	90	130	90	130
		20	M27x2	27	33	35	2,5	16	13,8	-	200	170	120	170	120	170
25		M33x2	33	41	43	2,5	18	13,8	-	390	330	230	330	230	330	
JIC 37° - BS 5200	30	M42x2	42	51	52	2,5	20	13,8	-	510	430	300	430	300	430	
	38	M48x2	48	56	57	2,5	22	15,3	-	680	510	360	510	360	510	
	6	M10x1	10	15	16	1	8	7,6	20	-	20	-	20	-	20	
	8	M12x1,5	12	18	19	1,5	12	9,7	30	-	30	-	30	-	30	
	10	M14x1,5	14	20	21	1,5	12	9,7	45	-	45	-	45	-	45	
	12	M16x1,5	16	23	24	1,5	12	10,2	60	-	55	-	55	-	55	
	14-15-16	M18x1,5	18	25	26	2	12	10,9	80	-	70	-	70	-	70	
	14-15-16	M20x1,5	20	27	28	2	14	12	105	-	105	-	105	-	105	
	14-15-16	M22x1,5	22	28	29	2,5	14	12	130	-	120	-	120	-	120	
	-	M26x1,5	26	33	-	2,5	16	-	160	-	-	-	-	-	-	
	18-20	M27x2	27	33	35	2,5	16	13,8	-	-	170	-	170	-	170	
	-	M30x1,5	30	37	-	2,5	-	-	190	-	-	-	-	-	-	
22-25	M33x2	33	41	43	2,5	18	13,8	-	-	330	-	330	-	330		
-	M38x1,5	38	45	-	2,5	-	-	230	-	-	-	-	-	-		
28-30-32	M42x2	42	51	52	2,5	20	13,8	-	-	430	-	430	-	430		
-	M45x1,5	45	53	-	2,5	-	-	280	-	-	-	-	-	-		
35-38	M48x2	48	56	57	2,5	22	15,3	-	-	510	-	510	-	510		
ORFS	6	M10x1	10	15	16	1	8	8,6	-	-	20	-	20	-	20	
	8-10	M12x1,5	12	18	19	1,5	12	9,7	-	-	40	-	40	-	40	
	8-10	M14x1,5	14	20	21	1,5	12	9,7	-	-	55	-	55	-	55	
	12	M16x1,5	16	23	24	1,5	12	11,2	-	-	70	-	70	-	70	
	14-15-16	M18x1,5	18	25	26	2	12	12,4	-	-	85	-	85	-	85	
	14-15-16	M22x1,5	22	28	29	2,5	14	14	-	-	130	-	130	-	130	
	18-20	M27x2	27	33	35	2,5	16	16,3	-	-	170	-	170	-	170	
	22-25	M33x2	33	41	43	2,5	18	16,3	-	-	330	-	330	-	330	
	28-30-32	M42x2	42	51	52	2,5	20	16,8	-	-	430	-	430	-	430	
	35-38	M48x2	48	56	57	2,5	22	19,3	-	-	510	-	510	-	510	

Performance:	Sealing form A	Sealing form B:	Sealing form E:	Sealing form G:	Sealing form H:
-pressure capacity	good	good	excellent	excellent	excellent
-sealing characteristics	good	good	excellent	excellent	excellent
-additional sealing required	no	no	no	no	no
-safety factor	2,5:1	2,5:1	4:1	4:1	4:1

Notes: The values in the tightening tables are approximate and derive from practical tests run at the laboratory in Casalgrasso (CN), which may vary based on the materials and tolerances of the components used.

STUD ENDS WITH METRIC THREAD (ISO 6149)



Series	Maximum working pressure (bar)		Ø Tube	Metric Thread	D2 min	D5	L1	L3 max	L4 min	L rif	Z°	Torque [Nm] ^{+10%} ₀		
	ISO 6149 STRAIGHT	ISO 6149 SWIVEL										ISO 6149 STRAIGHT	ISO 6149 SWIVEL	
DIN	L	315	315	6	M10x1	16	11,1	1,6	1	10	8,6	12	15	15
		315	315	8	M12x1,5	19	13,8	2,4	1,5	11,5	11,1	15	25	25
		315	315	10	M14x1,5	21	15,8	2,4	1,5	11,5	11,1	15	30	30
		315	250	12	M16x1,5	24	17,8	2,4	1,5	13	11,6	15	35	35
		315	250	15	M18x1,5	26	19,8	2,4	2	14,5	12,3	15	40	40
		315	250	18	M22x1,5	29	23,8	2,4	2	15,5	13,4	15	55	55
		160	160	22	M27x2	34	29,4	3,1	2	19	15,8	15	85	85
		160	160	28	M33x2	43	35,4	3,1	2,5	19	15,8	15	140	140
		160	160	35	M42x2	52	44,4	3,1	2,5	19,5	15,8	15	180	180
	160	160	42	M48x2	57	50,4	3,1	2,5	22	17,3	15	230	230	
	S	630	400	6	M12x1,5	19	13,8	2,4	1,5	11,5	11,1	15	30	30
		630	400	8	M14x1,5	21	15,8	2,4	1,5	11,5	11,1	15	40	40
		630	400	10	M16x1,5	24	17,8	2,4	1,5	13	11,6	15	50	50
		630	400	12	M18x1,5	26	19,8	2,4	2	14,5	12,3	15	60	60
		400	400	14	M20x1,5	27	21,8	2,4	2	14,5	13,4	15	70	70
		400	400	16	M22x1,5	29	23,8	2,4	2	15,5	13,4	15	85	85
		400	400	20	M27x2	34	29,4	3,1	2	19	15,8	15	150	150
		400	315	25	M33x2	43	35,4	3,1	2,5	19	15,8	15	260	260
250		250	30	M42x2	52	44,4	3,1	2,5	19,5	15,8	15	280	280	
250	200	38	M48x2	57	50,4	3,1	2,5	22	17,3	15	360	360		
JIC 37° - BS 5200	400	315	6	M10x1	16	11,1	1,6	1	10	8,6	12	15	15	
	400	315	8-10	M12x1,5	19	13,8	2,4	1,5	11,5	11,1	15	25	25	
	350	315	8-10	M14x1,5	21	15,8	2,4	1,5	11,5	11,1	15	30	30	
	315	250	12	M16x1,5	24	17,8	2,4	1,5	13	11,6	15	35	35	
	315	250	14-15-16	M18x1,5	26	19,8	2,4	2	14,5	12,3	15	40	40	
	315	250	14-15-16	M20x1,5	27	21,8	2,4	2	14,5	13,4	15	50	50	
	315	250	14-15-16	M22x1,5	29	23,8	2,4	2	15,5	13,4	15	55	55	
	200	160	18-20	M27x2	34	29,4	3,1	2	19	15,8	15	85	85	
	200	160	22-25	M33x2	43	35,4	3,1	2,5	19	15,8	15	140	140	
	200	160	28-30-32	M42x2	52	44,4	3,1	2,5	19,5	15,8	15	180	180	
	200	160	35-38	M48x2	57	50,4	3,1	2,5	22	17,3	15	230	230	
	ORFS	630	400	6	M10x1	16	11,1	1,6	1	10	9,6	12	15	15
630		400	8-10	M12x1,5	19	13,8	2,4	1,5	11,5	11,1	15	30	30	
630		400	8-10	M14x1,5	21	15,8	2,4	1,5	11,5	11,1	15	40	40	
630		400	12	M16x1,5	24	17,8	2,4	1,5	13	12,6	15	50	50	
630		400	14-15-16	M18x1,5	26	19,8	2,4	2	14,5	12,3	15	60	60	
400		400	14-15-16	M22x1,5	29	23,8	2,4	2	15,5	15,4	15	85	85	
400		400	18-20	M27x2	34	29,4	3,1	2	19	18,3	15	150	150	
400		315	22-25	M33x2	43	35,4	3,1	2,5	19	18,3	15	260	260	
250		250	28-30-32	M42x2	52	44,4	3,1	2,5	19,5	18,8	15	280	280	
250		250	35-38	M48x2	57	50,4	3,1	2,5	22	21,3	15	360	360	

Performance:

- pressure capacity
- sealing characteristics
- additional sealing required
- safety factor

Seal STRAIGHT:

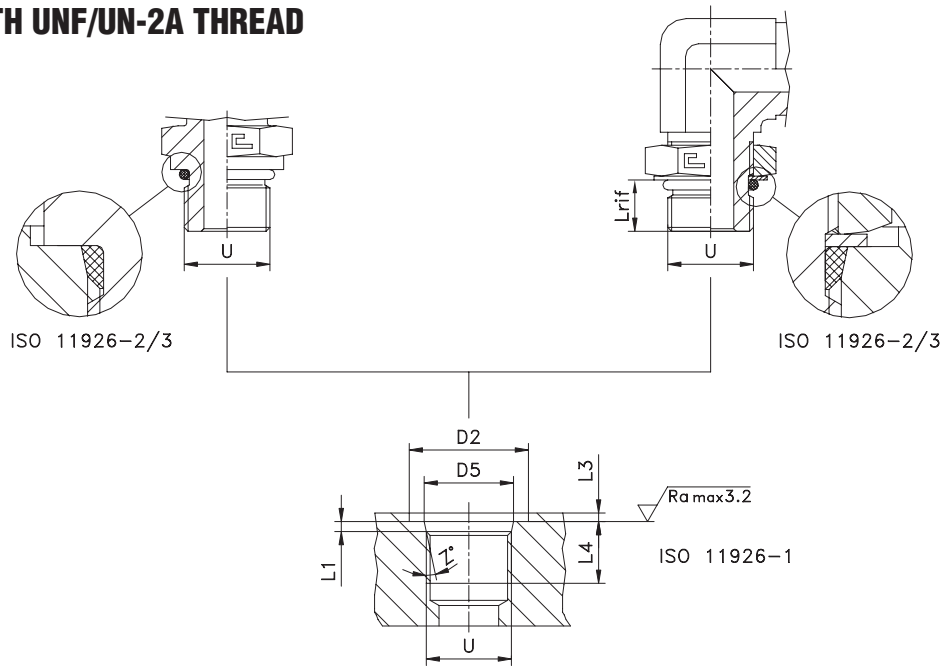
- excellent
- excellent
- no
- 4:1

Seal SWIVEL:

- excellent
- excellent
- no
- 4:1

Note: 1) To obtain the ISO 6149 type of sealing please take out the retaining ring from the standard fitting.
 2) The values in the tightening tables are approximate and derive from practical tests run at the laboratory in Casalgrasso (CN), which may vary based on the materials and tolerances of the components used.

STUD END WITH UNF/UN-2A THREAD



Series	Ø Tube	UnF/Un thread	D2 min	D5	L1	L3 max	L4 min	L rif	Z°	Torque [Nm] ^{+10%} ₀		
										STRAIGHT	SWIVEL	
DIN	L	6	7/16-20 UNF-2A	21	12,45	2,4	1,6	11,5	9,9	12	20	20
		8-10	1/2-20 UNF-2A	23	14,05	2,4	1,6	11,5	9,9	12	25	25
		12	9/16-18 UNF-2A	25	15,7	2,5	1,6	12,7	11,1	12	30	30
		15-18	3/4-16 UNF-2A	30	20,65	2,5	2,4	14,3	12,5	15	45	45
		18	7/8-14 UNF-2A	34	24	2,5	2,4	16,7	14,5	15	55	55
		22	1 1/16-12 UN-2A	41	29,2	3,3	2,4	19	16,8	15	85	85
		28	1 5/16-12 UN-2A	49	35,55	3,3	3,2	19	16,8	15	130	130
	S	35	1 5/8-12 UN-2A	58	43,55	3,3	3,2	19	16,8	15	170	170
		42	1 7/8-12 UN-2A	65	49,9	3,3	3,2	19	16,8	15	180	180
		6-8	1/2-20 UNF-2A	23	14,05	2,4	1,6	11,5	9,9	12	25	25
		10-12	9/16-18 UNF-2A	25	15,7	2,5	1,6	12,7	11,1	12	35	35
		14-16	3/4-16 UNF-2A	30	20,65	2,5	2,4	14,3	12,5	15	60	60
		16	7/8-14 UNF-2A	34	24	2,5	2,4	16,7	14,5	15	85	85
		20	1 1/16-12 UN-2A	41	29,2	3,3	2,4	19	16,8	15	150	150
JIC 37°	25	1 5/16-12 UN-2A	49	35,55	3,3	3,2	19	16,8	15	230	230	
	30	1 5/8-12 UN-2A	58	43,55	3,3	3,2	19	16,8	15	250	250	
	38	1 7/8-12 UN-2A	65	49,9	3,3	3,2	19	16,8	15	320	320	
	6	7/16-20 UNF-2A	21	12,45	2,4	1,6	11,5	9,9	12	20	20	
	8	1/2-20 UNF-2A	23	14,05	2,4	1,6	11,5	9,9	12	25	25	
	10	9/16-18 UNF-2A	25	15,7	2,5	1,6	12,7	11,1	12	30	30	
	12	3/4-16 UNF-2A	30	20,65	2,5	2,4	14,3	12,5	15	45	45	
	14-15-16	7/8-14 UNF-2A	34	24	2,5	2,4	16,7	14,5	15	55	55	
ORFS	18-20	1 1/16-12 UN-2A	41	29,2	3,3	2,4	19	16,8	15	85	85	
	25	1 5/16-12 UN-2A	49	35,55	3,3	3,2	19	16,8	15	130	130	
	30-32	1 5/8-12 UN-2A	58	43,55	3,3	3,2	19	16,8	15	170	170	
	38	1 7/8-12 UN-2A	65	49,9	3,3	3,2	19	16,8	15	180	180	
	6	7/16-20 UNF-2A	21	12,45	2,4	1,6	11,5	11,4	12	20	20	
	8-10	9/16-18 UNF-2A	25	15,7	2,5	1,6	12,7	12,2	12	35	55	
	12	3/4-16 UNF-2A	30	20,65	2,5	2,4	14,3	13,8	15	60	60	
	14-15-16	7/8-14 UNF-2A	34	24	2,5	2,4	16,7	16,3	15	85	85	
ORFS	18-20	1 1/16-12 UN-2A	41	29,2	3,3	2,4	19	18,6	15	150	150	
	22-25	1 5/16-12 UN-2A	49	35,55	3,3	3,2	19	18,6	15	230	230	
	28-30-32	1 5/8-12 UN-2A	58	43,55	3,3	3,2	19	18,6	15	250	250	
	35-38	1 7/8-12 UN-2A	65	49,9	3,3	3,2	19	18,6	15	320	320	

Performance:

- pressure capacity
- sealing characteristics
- additional sealing required
- safety factor

Seal STRAIGHT:

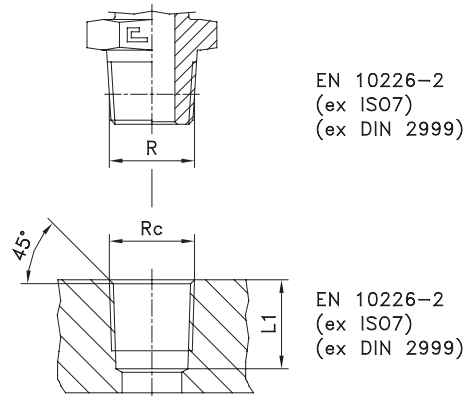
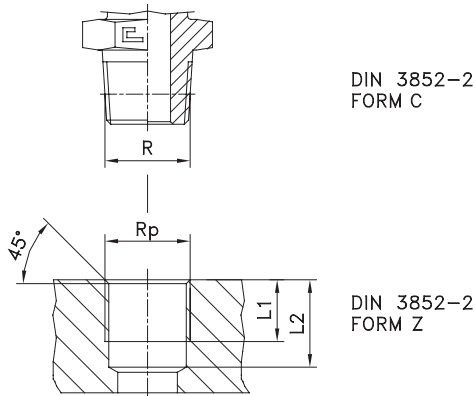
- excellent
- excellent
- no
- 4:1

Seal SWIVEL:

- excellent
- excellent
- no
- 4:1

Note: The values in the tightening tables are approximate and derive from practical tests run at the laboratory in Casalgrasso (CN), which may vary based on the materials and tolerances of the components used.

STUD ENDS WITH BSPT THREAD



Series	Ø Tube	BsPt thread (DIN 3852-2 form C)	L1	L2	
DIN	L	6	R 1/8	5,5	8,5
		8-10	R 1/4	8,5	12,5
		12	R 3/8	8,5	12,5
		15-18	R 1/2	10,5	16,5
		22	R 3/4	13	19
		28	R 1	-	-
		35	R 1 1/4	-	-
		42	R 1 1/2	-	-
	S	6-8	R 1/4	8,5	12,5
		10-12	R 3/8	8,5	12,5
		14-16	R 1/2	10,5	16,5
		20	R 3/4	13	19
		25	R 1	-	-
		30	R 1 1/4	-	-
	38	R 1 1/2	-	-	

Series	Ø Tube	BSPT thread (EN 10226-2)	L1
JIC 37°	6	R 1/8	7,4
	8	R 1/4	11
	10	R 3/8	11,4
	12-14-15-16	R 1/2	15
	18-20	R 3/4	16,3
	25	R 1	19,1
	30-32	R 1 1/4	21,4
	38	R 1 1/2	21,4
BS 5200	-	R 1/8	7,4
	-	R 1/4	11
	-	R 3/8	11,4
	-	R 1/2	15
	-	R 3/4	16,3
	-	R 1	19,1
	-	R 1 1/4	21,4
	-	R 1 1/2	21,4
	-	R 2	25,7

Performance:
-pressure capacity
-sealing characteristics
-additional sealing required
-safety factor

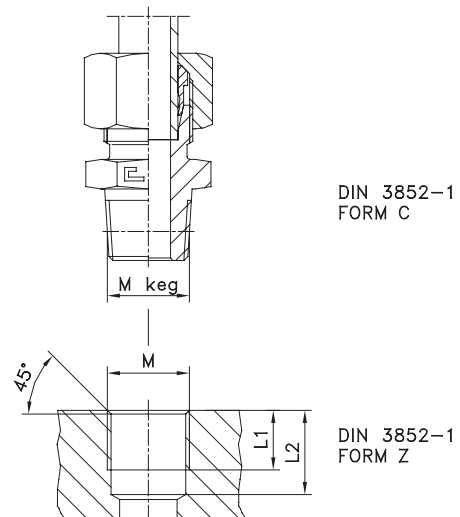
Sealing form C:
low-medium
low-medium
Yes
2,5:1

Performance:
-pressure capacity
-sealing characteristics
-additional sealing required
-safety factor

Taper sealing:
low-medium
low-medium
Yes
2,5:1

STUD ENDS WITH BSPT THREAD

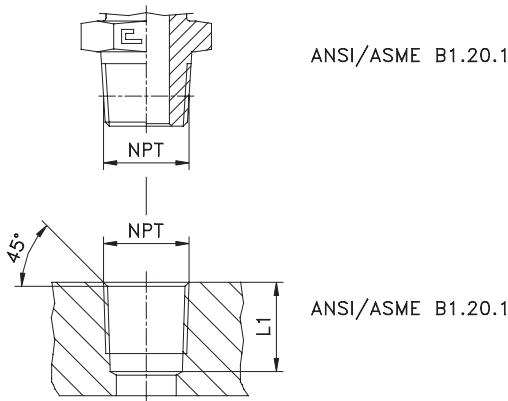
Serie	Ø Tubo	Thread Metric Taper	L1	L2	
DIN	L	6	M10x1 keg	5,5	10
		8	M12x1,5 keg	8,5	13,5
		10	M14x1,5 keg	8,5	13,5
		12	M16x1,5 keg	8,5	13,5
		15	M18x1,5 keg	8,5	13,5
		18	M22x1,5 keg	10,5	15,5
	S	6	M12x1,5 keg	8,5	13,5
		8	M14x1,5 keg	8,5	13,5
		10	M16x1,5 keg	8,5	13,5
		12	M18x1,5 keg	8,5	13,5
		14	M20x1,5 keg	10,5	15,5
		16	M22x1,5 keg	10,5	15,5



Performance:
-pressure capacity
-sealing characteristics
-additional sealing required
-safety factor

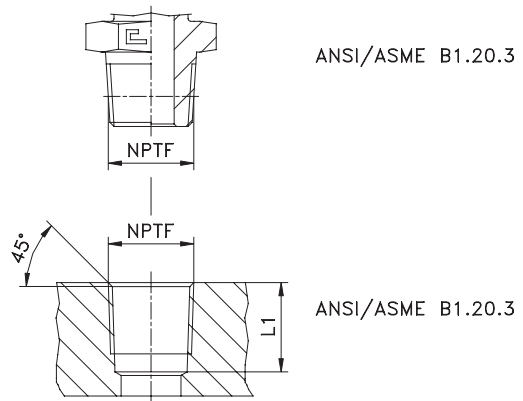
Taper sealing C:
low-medium
low-medium
Yes
2,5:1

STUD ENDS WITH NPT/NPTF THREAD



ANSI/ASME B1.20.1

ANSI/ASME B1.20.1



ANSI/ASME B1.20.3

ANSI/ASME B1.20.3

Series	Ø Tube	NPT thread	L1	
DIN	L	6	1/8-27 NPT	11,6
		8-10	1/4-18 NPT	16,4
		12	3/8-18 NPT	17,4
		15-18	1/2-14 NPT	22,6
		22	3/4-14 NPT	23,1
		28	1-11,5 NPT	27,8
		35	1 1/4-11,5 NPT	28,3
		42	1 1/2-11,5 NPT	28,3
	S	6-8	1/4-18 NPT	16,4
		10-12	3/8-18 NPT	17,4
		14-16	1/2-14 NPT	22,6
		20	3/4-14 NPT	23,1
		25	1-11,5 NPT	27,8
		30	1 1/4-11,5 NPT	28,3
BS 5200	-	1/8-27 NPT	11,6	
	-	1/4-18 NPT	16,4	
	-	3/8-18 NPT	17,4	
	-	1/2-14 NPT	22,6	
	-	3/4-14 NPT	23,1	
	-	1-11,5 NPT	27,8	
	-	1 1/4-11,5 NPT	28,3	
	-	1 1/2-11,5 NPT	28,3	
-	2-11,5 NPT	29		

Performance:
 -pressure capacity
 -sealing characteristics
 -additional sealing required
 -safety factor

Taper sealing:
 low-medium
 low-medium
 Yes
 2,5:1

Series	Ø Tube	NPTF thread	L1
JIC 37° - ORFS	6-8	1/8-27 NPTF	11,6
	8-10	1/4-18 NPTF	16,4
	12	3/8-18 NPTF	17,4
	14-15-16	1/2-14 NPTF	22,6
	18-20	3/4-14 NPTF	23,1
	22-25	1-11,5 NPTF	27,8
	28-30-32	1 1/4-11,5 NPTF	28,3
	35-38	1 1/2-11,5 NPTF	28,3

Performance:
 -pressure capacity
 -sealing characteristics
 -additional sealing required
 -safety factor

Taper sealing:
 low-medium
 low-medium
 Yes
 2,5:1

• PRESCRIPTIONS TO COMPLY WITH FOR ALL THE SERIES

- Only use CAST products and components for the same assembly to prevent claims and damage to people and objects.
- Apply completely the general instructions, utilisation standards, safety factors, assembly instructions and working pressures for the specific fitting used.
- Closely respect the working temperature ranges, the relevant pressure changes reported and stay within the set values in bars.
- Respect the indicated tightening values as well as the assembly instructions.
- Lubricate all the components, as indicated in the assembly instructions, with specific products.
- All carbon steel connections must be pre-assembled before being mounted onboard the machine. It is not allowed to assemble them directly on the machine.
- All stainless steel connections must be pre-assembled or flared with hardened tools before being mounted onboard the machine. It is not allowed to assemble them directly on the machine.
- Only use the carbon steel and stainless steel tubes mentioned on pages 25 and 26.
- Use support sleeves on thin tubes.
- It is not advisable to mix carbon and stainless steel components together in the same connection.
- Always check the correct alignment of the system, tubes, connections and actuators.
- It is mandatory to always check the correct incision of the cutting ring on the tube!
- Thoroughly check the collapse of the fitting hole (insert) with the prescribed "P-N P" buffers to ensure the correct stapling of the tube, fitting and sleeve for series 80
- The use of non-compliant tubes, fittings or connections is not allowed.
- It is not allowed to alter CAST products in any way.
- Fully comply with all the indications contained in this Technical Commercial Catalogue.
- In case of doubt always follow the principle of prudence

Failure to follow any of these prescriptions may alter the functionality of the products and void any guarantee.



It is not allowed to mix and use components from production of different manufacturers of oleo-dynamic fittings. The product traceability coding applies.



Users are not allowed to made changes to or repair the oleo-dynamic fittings we manufacture; in such case lawbreakers will be liable for their actions and any damage caused to the environment, people and objects.



Fluids under pressure may cause serious damage to people and objects; it is thus necessary to always pay the utmost attention, fully respecting the applicable prescriptions and adopting the principle of prudence to avoid any accident to oneself and the others.

• PRODUCT LIABILITY - VALID FOR ALL THE SERIES

Pres. Decree 224- EEC 85/347 states that: " ... the responsibility will be charged to the negligent part ... ". This means that the manufacturer will be held legally liable only if the product actually proves faulty in terms of project, execution/production due to negligence or malice.

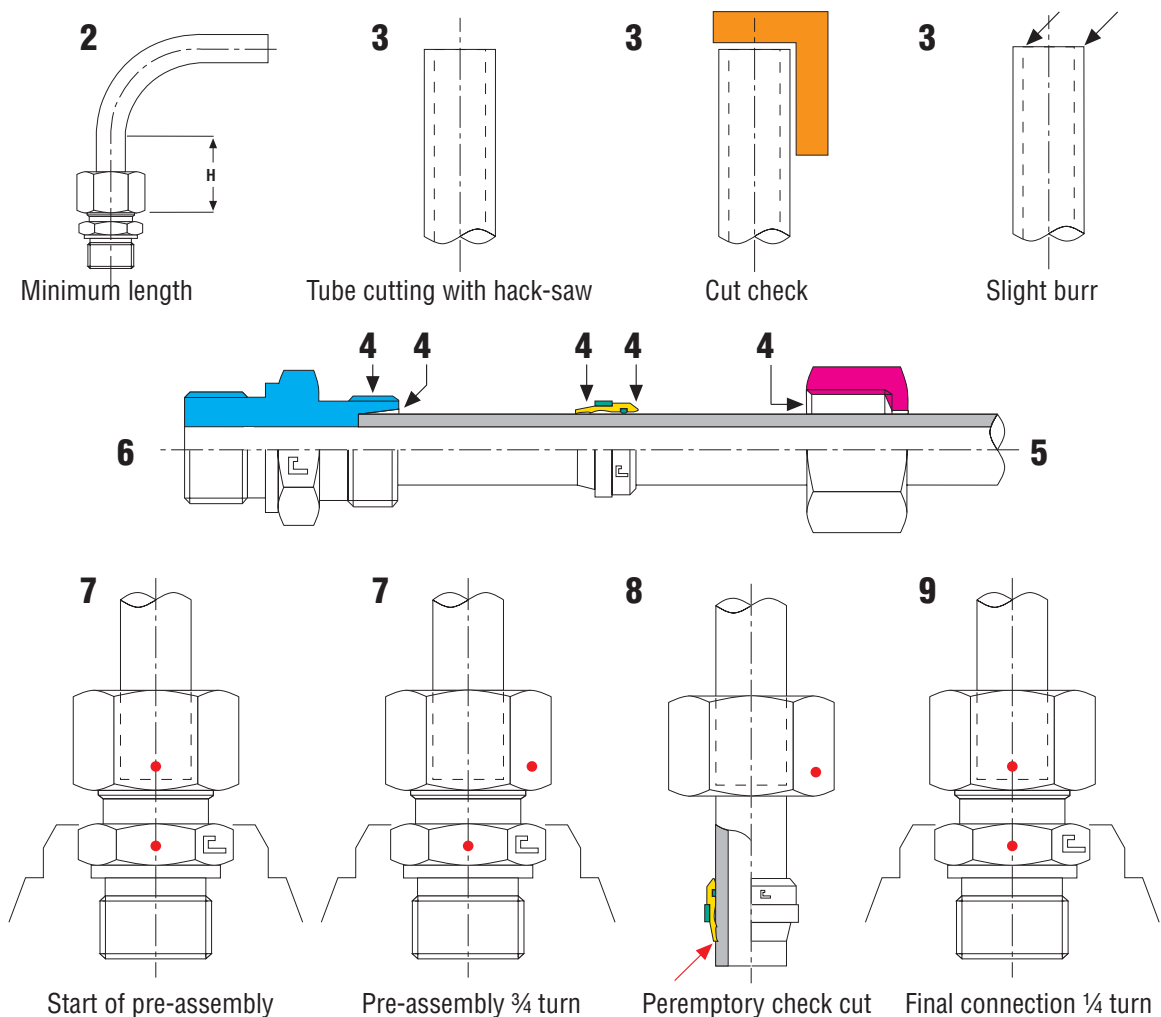
The distributor making the sale must make sure that its customer is aware of all the technical issues relating the product, such as assembly instructions, and that the product is used for the right applications.

Likewise the End User will be considered liable if, due to negligence, superficiality or malice, he/she did not scrupulously follow the Manufacturer's prescriptions (Commercial Technical Catalogue), which must be provided to him/her as technical support by the Distributor selling the product. Should the end user be lack this technical documentation, our offices will be glad to send it to him/her.

By virtue of this legal regulation, CAST S.p.A. declines any responsibility in case the user fails to strictly and entirely comply with the GENERAL INSTRUCTIONS, UTILISATION STANDARDS, SAFETY FACTORS, ASSEMBLY INSTRUCTIONS, WORKING PRESSURES as well as any other technical indication clearly stated in this Commercial Technical Catalogue and/or the product was changed or altered by anyone other than CAST S.p.A.. Failure to respect these imperative prescriptions or any changes made may alter the functionality of the products and void any guarantee. The mentioned regulation provides for an excess of €500.00.

ASSEMBLY INSTRUCTIONS ACCORDING TO DIN 3859-2 FOR B3 - B4 - BP

1. Before pre-assembly, make sure that all the tools to be used are in perfect working order. Replace any non-complying tool.
2. The segment of the tube to be pre-assembled must have a straight section at least twice the length of the nut (length H). Roundness must comply with DIN 2391.
3. Cut the tube square by using an appropriate hack-saw (do not use roller type tube cutters). Check that the cut is properly made at 90°. Remove any internal and external burrs.
4. Oil the 24° cone, the thread of the body, the cutting ring and the nut with suitable products. = →
5. Fit the nut and the cutting ring on the tube as shown. The larger diameter of the cutting ring must face the nut.
6. Insert the tube on the 24° cone until it comes into contact with the stop. Tighten the nut by hand until the cutting ring rests firmly on the nut. Then tighten the nut with a wrench until the cutting edge of the ring is in contact with the tube and prevents rotation of this.
7. Holding the tube against its stop and making sure it does not rotate, tighten the nut by 3/4 of a turn. This way, the cutting edge of the ring cuts into the outer part of the tube for the necessary depth and raises an edge in front of its cutting edge while the second cutting edge clinches the tube at the same time.
8. Loosen the nut and check that there is a clearly raised edge all round the tube. The edge must cover 80% of the front of the cutting ring according to DIN 3859 part II. This check is peremptory for the safety of all concerned!!! If the raised edge is not satisfactory, pre-assembly must be repeated.
9. If pre-assembly has been carried out correctly, fit the tube on the machine, close with a wrench until a certain resistance is encountered and then tighten for a further 1/4 turn with wrench to wrench contrast.
10. ISO 19879 envisages a maximum of six couplings to be made on the same connection opening. Increase the blocking by 15° at every closure.
11. All the pre-assembly of stainless steel fittings must be performed with hardened tools (blocks or machines).

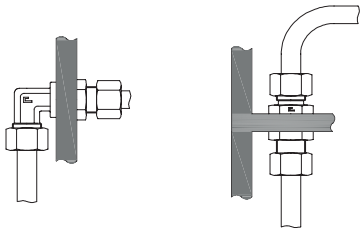


PRESCRIPTIONS FOR THE INSTALLATION OF RIGID TUBES

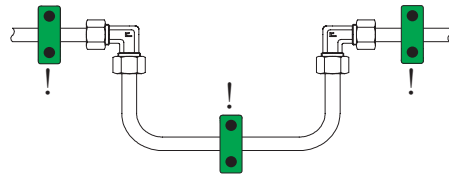
To ensure the correct cabling of an oleo-dynamic system made of (steel) rigid tubes for high pressures it is necessary to respect the provisions of the standards and of the manufacturer of the fittings. Only use high quality tubes and related fittings, scrupulously complying with the maximum working pressures and temperatures allowed. Correctly assemble the selected tubes, using collars that fit the size of the tubes. Do not fasten the tubes to electric conduits or other tubes.

When arranging the system, take into account the space needed for maintenance interventions. The tube support must be created according to the tables below. It is important to obtain the correct alignment between tubes, fittings and actuators. An aesthetically well structured system is synonym with functionality and safety.

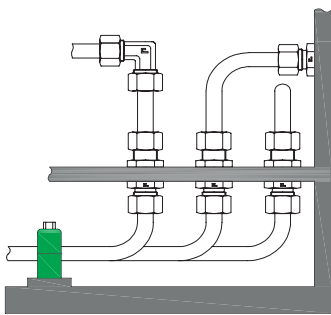
Some examples of correct installation:



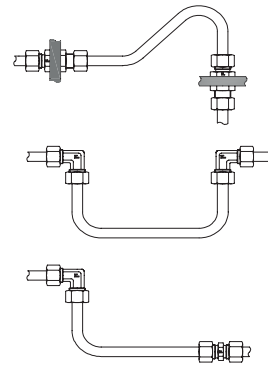
Properly fasten the fittings that host the tubes



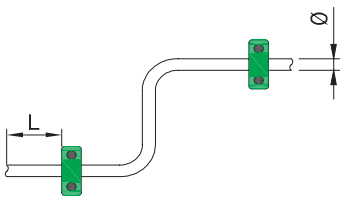
Do not excessively fasten the tubes as these must always be allowed to dilate without any problem



Do not overlay the tubes to facilitate maintenance

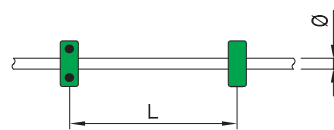


Do not subject the fittings to stress deriving from a poor alignment of the tube which must be able to expand



Follow the table indicated as closely as possible.

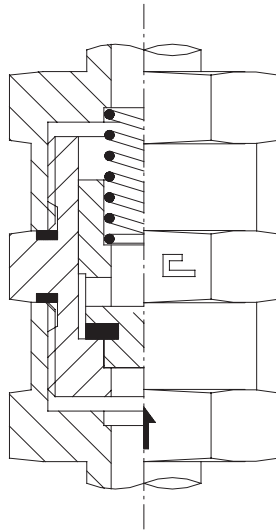
Ø Tube (mm)	L (mt)
6-12	0,5
12-22	0,6
22-32	0,7
32-38	1,0
38-42	1,3



Follow the table indicated as closely as possible.

Ø Tube (mm)	L (mt)
6-12	1,0
12-22	1,2
22-32	1,5
32-38	2,0
38-42	2,7

CAST NON RETURN VALVE



THEORY OF OPERATION

Cast S.p.A. non return valve is used in all those circuits where the fluid must flow in one way only, avoiding the flow in the opposite direction

TO OBTAIN PERFECT SEALING:

1. Make sure that all tubes are perfectly clean and that there are no impurities in the system where the fluid will flow.
2. Remove protective caps only when ready to assemble, making sure that in the assembly phase no impurities enter the system.

TECHNICAL CHARACTERISTICS

1. Cast S.p.A. non return valve assures a perfect tightness of the circuit, provided that the indicated nominal working pressures are kept as referred to in this catalogue.
2. The particular profile of its inner elements assures the correct flow with a minimum pressure drop.
3. The valve is a compact, particularly sturdy element; the seal is obtained by a plain seat metal to metal plug with an elastomeric seal gasket assuring tightness at low working pressures.
4. A basic body allows to different types of non return valves to be interchanged by applying, from time to time, the different engaged stud ends as chosen by the customer, allowing for easy logistic of the stock.
5. The valve may be used for conveying mineral oils, fuels, compressed air or gases. When ordering please specify if the fluid needs specific type of gaskets.
6. The nominal working temperature is between -40C° and $+120\text{C}^{\circ}$ Celsius degrees for carbon steel, and between -60C° and $+200\text{C}^{\circ}$ Celsius degrees for stainless steel. The limit may change according to the type of gasket used.

TECHNICAL DATA

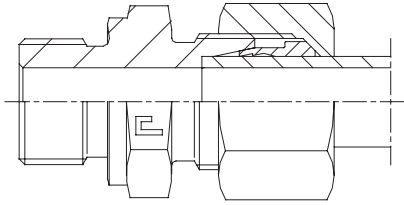
Maximum advised flow speed is 5mt/sec. The standard opening pressure is 1 bar; if specified when ordering, we can supply non return valves with an opening pressure up to 3 bars with 0.5 bar steps.

COMPONENT TESTING

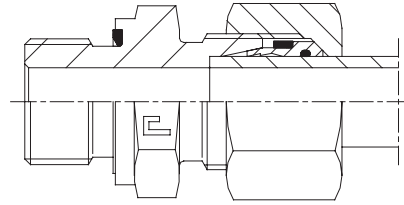
All the valves are checked for leaks at low pressure and at the opening value; high pressure tests are carried out at the maximum nominal working pressures plus 33%.

TIGHTENING TORQUES FOR B3, B4 AND BP CUTTING RINGS

DIN 3861 cone for carbon and stainless steel



Assembly of B3 ring on fitting body



Assembly of B4 ring on fitting body

Series	Ø Tube	Metric thread	Manual carbon (Nm)	Manual Stainless (Nm)	Machine carbon (Kg)	Machine Stainless (Kg)
L	6	M12x1,5	20	30	1200	1400
	8	M14x1,5	25	55	1400	1700
	10	M16x1,5	30	85	2000	2200
	12	M18x1,5	40	120	2100	2400
	15	M22x1,5	60	130	2400	3300
	18	M26x1,5	90	220	2500	3600
	22	M30x2	170	320	2600	3800
	28	M36x2	210	500	3000	6900
	35	M45x2	360	970	5500	10000
	42	M52x2	490	1110	6700	12500
S	6	M14x1,5	25	45	1200	1400
	8	M16x1,5	30	55	1400	1700
	10	M18x1,5	40	90	2000	2200
	12	M20x1,5	50	105	2100	2400
	14	M22x1,5	70	150	2400	3300
	16	M24x1,5	80	180	2500	3600
	20	M30x2	140	340	2600	6400
	25	M36x2	230	530	5000	9300
	30	M42x2	300	610	5500	10000
	38	M52x2	430	850	6700	12500

Notes:

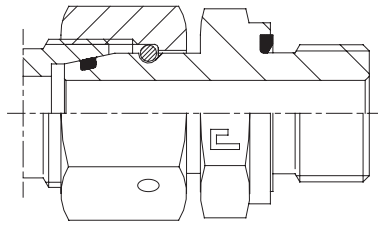
The values in the tightening tables are approximate and derive from practical tests run at the laboratory in Casalgrasso (CN), which may vary based on the materials and tolerances of the components used.

All the values expressed in Newton Meters (Nm) for the tightening torques on the cone DIN 3861 represent the torquing moment needed to have the correct incision of the pre-assembly of the tube, lifting the required 80% of the front of the edge of the cutting ring.

All the values expressed in Kilograms (Kg) for the linear push on the preassembly machine, represent the right strength necessary to have the correct incision of the preassembly lifting the required 80% of the front of the edge of the cutting ring.

Once the preassembly has been carried out correctly and after checking that all the components conform to the system requirements, complete the assembly on the system itself, first closing by wrench until you feel a certain resistance, and then doing the last 1/4 of a turn to close the fitting completely.

SERIES 60... SWIVEL NUT DIN 2353



According to DIN 2353 standards, 24° cone as per DIN 3861 and o-ring seal as per DIN 3865.

This series of fittings with revolving nut and seal on the 24° cone guaranteed by an o-ring meets the requirements of customers asking for high pressure, absolute tightness and low tightening torque.

Due to its technical characteristics this type of fitting is suitable for demanding applications, such as assembly on heavy machinery. The result is a safe fastening of the nut to the body improving the whole sealing system.

The limit of this series lies in that the sealing performed with the o-ring is limited to a single connection, leaving all the others uncovered by this excellent solution.

A new step forward was needed to improve the research and find a solution that could grant a double sealing system on all the connections involved, metal to metal plus the elastomeric sealing.

This problem has been solved by CAST S.p.A. with the new “B4” cutting ring, guaranteeing a double sealing (metal and gasket) on all the connections of the fitting.

ASSEMBLY INSTRUCTIONS FOR SWIVEL CONE SERIES DIN 2353

1. Before the assembly, check for the correct parameters of all the tools to be used and substitute those not complying to the requirements.
2. Clean the nut, fitting and tube and lubricate with the suggested products.
3. Check the correct alignment of the parts involved, then using a wrench tighten until reaching the metal to metal contact of the conical parts.
4. Repeated assembly and disassembly will not alter the functionality of the system which, each time is closed, will always provide an immediate seal, which will last over time.
5. Please refer to the related tables for the correct tightening torques to be applied.

TIGHTENING TORQUES ON THE SWIVEL CONE DIN 3861 cone for carbon and stainless steel

Series	Ø Tube	Metric thread	Torque ^{+10%} ₀ (Nm)
L	6	M12x1,5	20
	8	M14x1,5	35
	10	M16x1,5	40
	12	M18x1,5	45
	15	M22x1,5	55
	18	M26x1,5	110
	22	M30x2	130
	28	M36x2	200
	35	M45x2	220
	42	M52x2	240
S	6	M14x1,5	40
	8	M16x1,5	45
	10	M18x1,5	50
	12	M20x1,5	60
	14	M22x1,5	80
	16	M24x1,5	100
	20	M30x2	160
	25	M36x2	240
	30	M42x2	260
	38	M52x2	350

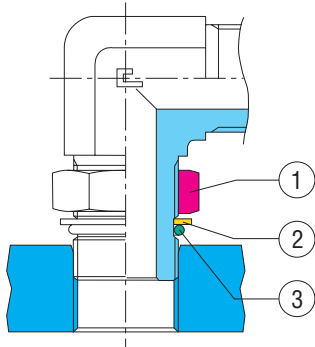
Notes:

The values in the tightening tables are approximate and derive from practical tests run at the laboratory in Casalgrasso (CN), which may vary based on the materials and tolerances of the components used.

All the values expressed in Newton Meters (Nm) for the tightening torques on the swivel cone represent the torquing moment needed to obtain the correct tightness.

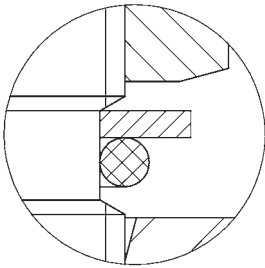
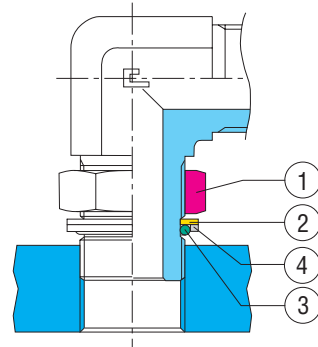
ASSEMBLY INSTRUCTIONS FOR ADJUSTABLE FITTINGS

**ISO 6149 Metric thread
ISO 11926 UNF/UN-2A thread**

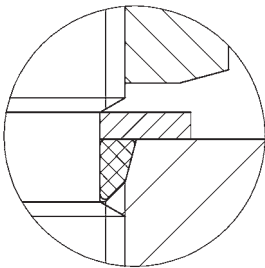
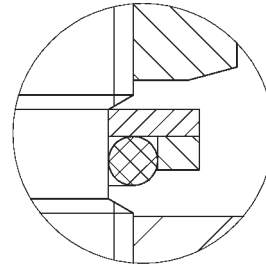


- 1 Back up hexagonal nut
- 2 Back up sleeve
- 3 O-ring
- 4 Retaining ring

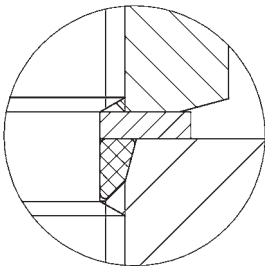
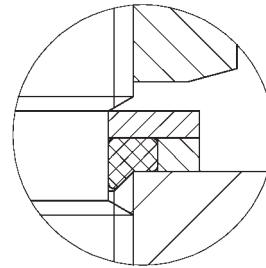
**BSPP Thread (in revision phase)
ISO 6149 Metric thread
with retaining ring**



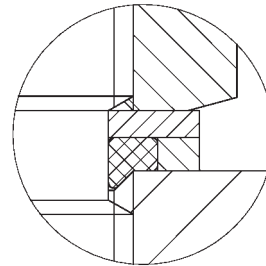
Lubricate the o-ring.
Unscrew the back up hexagonal nut and check that the back up sleeve is positioned as in the picture.
The correct position of the back up sleeve may be obtained when the fitting is screwed into the female thread.



Screw the fitting up to the point where the back up sleeve or the retaining ring is in contact with the machined surface, checking that the o-ring is positioned correctly into its shaped housing.



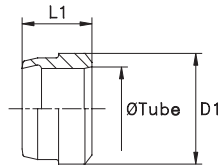
Unscrew the fitting up to a maximum of 1 turn to obtain the desired positioning.
Keep the fitting still with a wrench and block the back up hexagonal nut.
Please refer to the related tables for the correct tightening torques to be applied.



N.B. To obtain the ISO 6149 type of seal please take out the retaining ring from the standard fitting.

STAINLESS STEEL «BP» SINGLE EDGE CUTTING RING

Type: 1101..-BP



Series DIN	11.... [bar]	BP ring ordering	Ø Tube	L1	D1	
L	250	110104-BP	6	9	9	
		110105-BP	8	9	11	
		110106-BP	10	9,5	13	
		110107-BP	12	9,5	15	
		110108-BP	15	9,5	18	
	160	110109-BP	18	9,5	22	
		110110-BP	22	10,5	26	
		100	110111-BP	28	11	32
			110112-BP	35	13	41
110113-BP	42		13	48		
S	630	110104-BP	6	9	9	
		110105-BP	8	9	11	
		110106-BP	10	9,5	13	
		110107-BP	12	9,5	15	
		110118-BP	14	10	19	
	400	110119-BP	16	10,5	21	
		110120-BP	20	12	26	
		110121-BP	25	12	32	
	250	110122-BP	30	13	36	
		110123-BP	38	13	44	

“BP” CUTTING RING

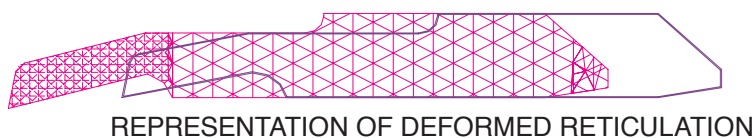
This new ring (working pressure as per DIN 2353 / ISO 8434-1), due to its particular geometric configuration with acute corner cutting, allows the cabling onboard the machine in complete absence of losses, leakages or sweating. It may be assembled on all the fittings with opening DIN 3861.

FINISHED ELEMENTS METHOD

The design in the field of mechanical engineering and construction is becoming more and more sophisticated, requiring for the related calculations to be made by using more advanced tools.

The “Finished elements method” is one of the numeric techniques used to solve the problems of structural calculation, quickly providing an idea of the strain and deformation distribution of the element.

The main concept underlying this methodology is to subdivide the model subject to analysis into triangles and therefore approximate the solution by using polynomial interpolation.



Deformation
Max X:2.0500mm
Max Y:-0.480mm

