



SAE J1453

THE NEW CAST ORFS FITTING
A DRY AS THE DUST SEAL
EASY TO ASSEMBLE
A KNOWN PRODUCT, SAFE AND RELIABLE

AVAILABLE IN CARBON AND STAINLESS STEEL

THEORY OF OPERATION – FLARED TUBE

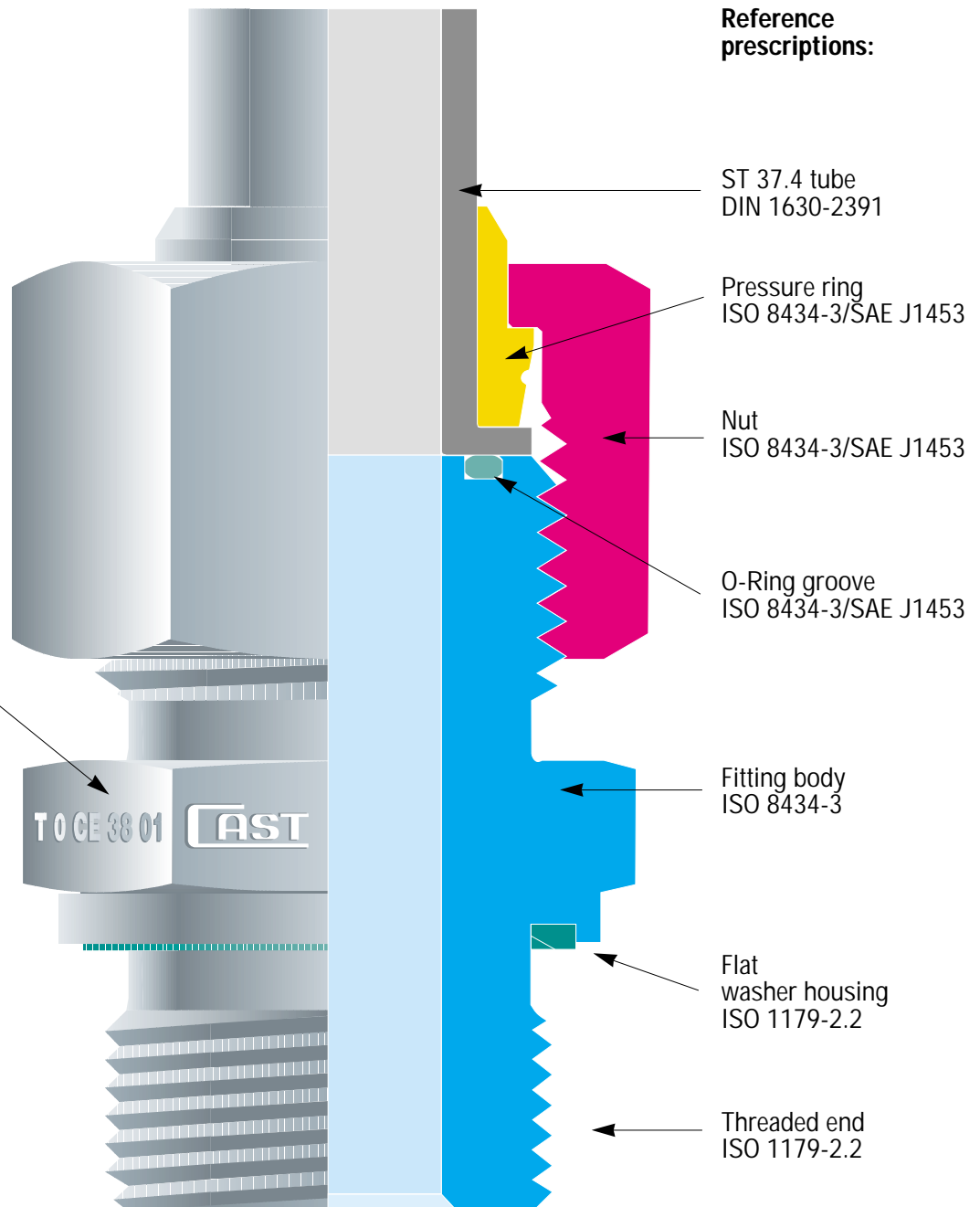
The CAST S.p.A. fitting according to the norms ISO 8434-3 / SAE J1453, is a mechanical fitting traditionally used for high pressure oleo-dynamic systems.

The sealing is made by the contact between two metal surfaces, with no deformation of the single components, plus an elastomeric sealing (O-Ring) placed into a groove on the front part of the fitting.

The coupling between the body of the fitting and the flared tube is guaranteed by the tightening nut and by the pressure sleeve on the inside. This allow to realize a fast assembling-disassembling tube making the easiest realization of complex oleo-dynamic systems.

**COUPLING SYSTEM
SAE J1453**

Reference prescriptions:



Traceability Decoding:

CAST =
Manufacturer

- T =
Production plant
- 0 =
Year manufactured
- CE =
Made in EEC
- 38 =
Type of steel used
- 01 =
Heat number of the steel used

T 0 CE 38 01 **CAST**

TECHNICAL CHARACTERISTICS

The CAST S.p.A. ORFS fitting grants a perfect sealing of the system independently from the used fluid, as long as corrosive fluids are not used and all the specific prescription for this type of fitting are complied with.

These fittings are manufactured in a single series defined "UNIVERSAL" since the body and the nut of the fitting remain the same even when switching from a inches sized tube to a metric tube, and since there are no doubles of diameters with different working pressures.

Vibrations, in the norm, do not alter the functionality of this type of fitting, also at the top level of the quoted values, and therefore keeps the best characteristics of absolute guarantee, safety and reliability. For these specific reasons this fitting may be used in hard working conditions.

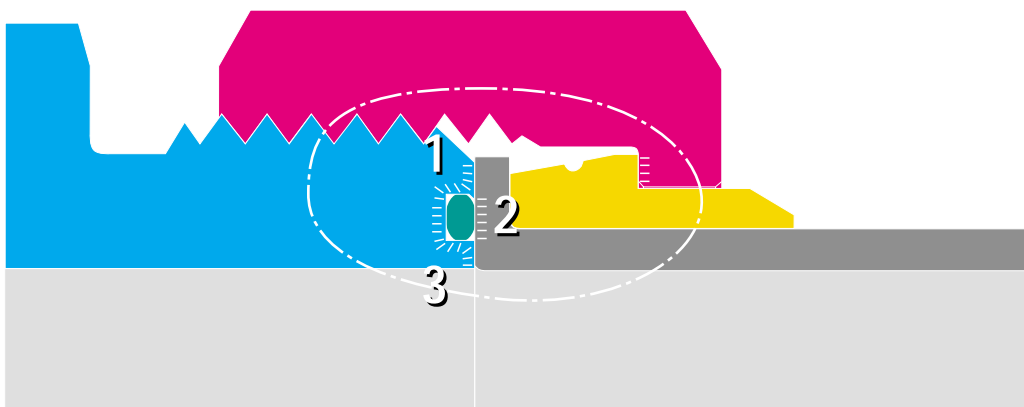
Under the mechanical strength given by the tightening of the nut on the fitting body, the flared part of the tube couples with the flat part of the fitting body giving birth to a metal to metal seal supported by the elastomeric seal as well.

The pressure sleeve hosted in the inside part of the nut assures the correct alignment of the system diminishing the vibrations and avoiding any possible trouble or damaging of the tube during the assembly phase.

Before assembly on the metal tube



After assembly on the metal tube



Field of force after assembly



Pressure surfaces after assembly



Sealing points

1 - 2 - 3

THEORY OF OPERATION – BRAZED FERRULE

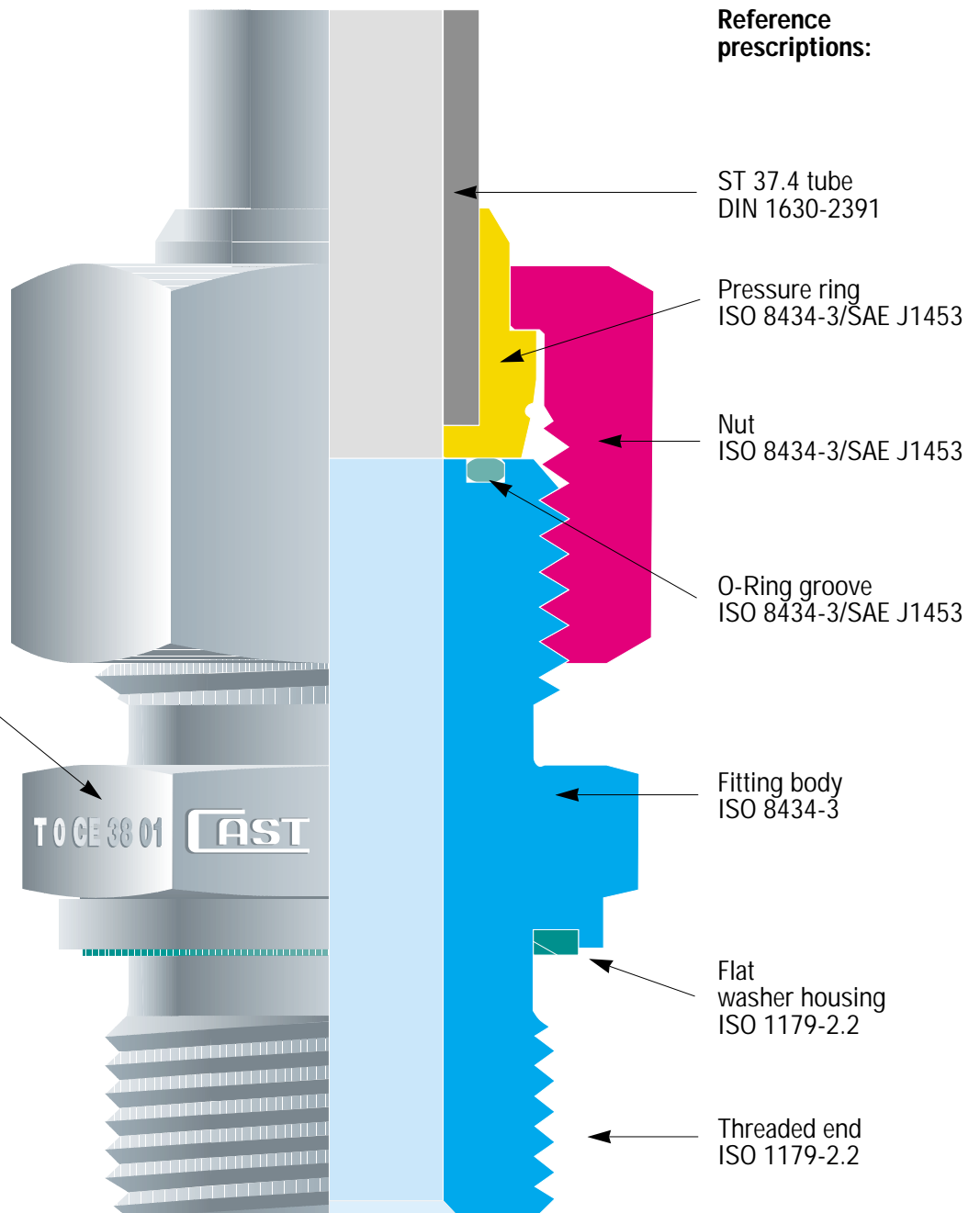
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The coupling between the body of the fitting and the brazed ferrule is guaranteed by the tightening nut on the inside. This allow to realize a fast assembling-disassembling tube making the easiest realization of complex oleo-dynamic systems.

COUPLING SYSTEM SAE J1453

Reference prescriptions:



ST 37.4 tube
DIN 1630-2391

Pressure ring
ISO 8434-3/SAE J1453

Nut
ISO 8434-3/SAE J1453

O-Ring groove
ISO 8434-3/SAE J1453

Fitting body
ISO 8434-3

Flat washer housing
ISO 1179-2.2

Threaded end
ISO 1179-2.2

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TECHNICAL CHARACTERISTICS

The CAST S.p.A. ORFS fitting grants a perfect sealing of the system independently from the used fluid, as long as corrosive fluids are not used and all the specific prescription for this type of fitting are complied with.

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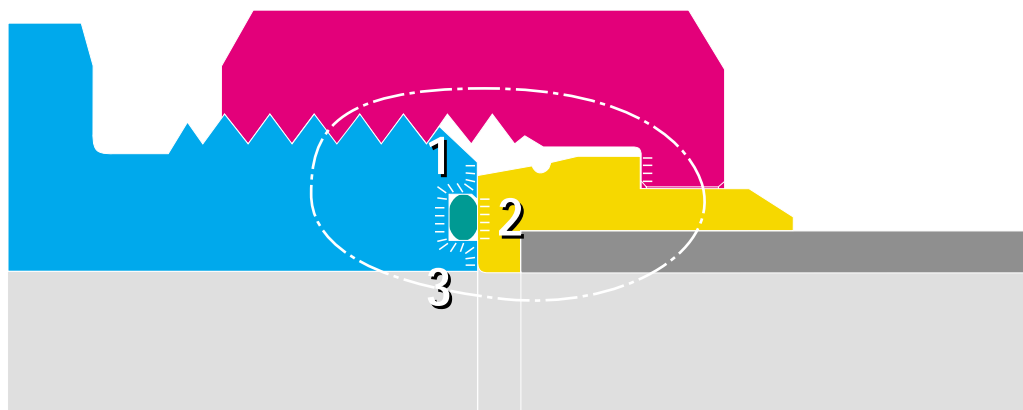
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Before assembly on the metal tube



After assembly on the metal tube



Field of force after assembly



Pressure surfaces after assembly



Sealing points

1 - 2 - 3

PRODUCT MATURITY

For many years now, there has been an increasing imperative market demand for fluid system components able to guarantee three main factors: safety, easy assembly, leakage-free tightness.

These elements, now considered essential for safety of the working environment (Law 626/94), product liability (Presidential Decree 224-EEC 85/374) and for the entire environmental protection system make the ORFS fitting an effective response to all the above-mentioned problems.

SEALING

The new fitting solve the total sealing problem in the following way:

- On the flat front face of the fitting has been realized a groove as insert place for an O-ring. This elastomeric seal guarantees a perfect sealing at all times.
- The realization of the groove according the the ISO 8434-3 and SAE J1453 norms guarantees the placement of the o-ring in the correct position without the use of additional chemical glues.
- The realization of the groove allows us to improve the sealing characteristics of the fitting also on the metal to metal sealing, dividing in two different sealing points the metal surface. The ORFS fitting avoids therefore small leakages and sweatings.
- Strenuous tests carried out in our technical laboratory in Volpiano (TO) have made clear, beyond any doubt the reliability of the sealing with or without the O-ring itself.

GENERAL INSTRUCTIONS

- Before start the flaring of the tubes please check that all the tools to be used in the process are conforming to the standards. Check the tools every 30-50 flarings.
- Before start the brazing of the tubes please check that all the tools to be used in the process are conforming to the standards. Always check the correctness of the brazing.
- Before fastening the pre-assembled tube to the machine on-board system, check alignment between the tube and the fitting. Fittings must not be used to correct any misalignment or to support tubes. Long tubes or those liable to high stress must be clamped to avoid excessive vibrations. Misalignment may impair system functioning.
- Correct lubrication of the components to be tightened is indispensable for correct functioning of the system: mineral oil for carbon steel fittings, nickel-based anti-seizing compound for stainless steel fittings.
- All the fittings contained in this catalogue may be used for oleo-dynamic systems only.
- Is not allowed the mixing of different materials.
- The indicated pressures are intended for steel tubes only.

UTILIZATION STANDARDS

CARBON STEEL FITTINGS

- High quality tubes must be employed to assure correct use and related technical performances of carbon steel fittings. Use of tubes without the aforementioned characteristics may seriously impair the efficiency of the fitting. We recommend to use the following tubes only: seamless cold drawn steel tubes as per ST 37.4 complying with DIN 1630, with maximum permissible hardness, measured on the outer diameter of the tube of 75HRB.
- The flaring of the tube must be made with the flaring machine model 400000 and not with hand tools. It is important that the flaring is concentrical and perpendicular to the tube and ferrule.
- The brazing must be made with suitable materials. It is important that the flaring is concentrical and perpendicular to the tube and ferrule.
- In order to obtain a curve of the tube as close to the tightening point as possible (Fitting body) the structural constructing ties typical of the ORFS fittings must be considered. This product forces the user to leave a part of the ending section of the tube perfectly parallel. This part must be used during the flaring operation to block the tube. Please refer to the "C" quote.

STAINLESS STEEL FITTINGS

- High quality tubes must be employed to assure correct use and related technical performances of stainless steel fittings. Use of tubes without the aforementioned characteristics may seriously impair the efficiency of the fitting. We recommend to use the following tubes only: cold drawn seamless stainless steel tubes with no welding as per 1.4571 DIN 17458 or ASTM A 269, with maximum permissible hardness, measured on the outer diameter of the tube of 85 HRB.
- The flaring of the tube must be made with the flaring machine model 400000 and not with hand tools. It is important that the flaring is concentrical and perpendicular to the tube and ferrule.
- The brazing must be made with suitable materials. It is important that the flaring is concentrical and perpendicular to the tube and ferrule.
- In order to obtain a curve of the tube as close to the tightening point as possible (Fitting body) the structural constructing ties typical of the ORFS fittings must be considered. This product force the user to leave a part of the ending section of the tube perfectly parallel. This part must be used during the flaring operation to block the tube. Please refer to the "C" quote.

DETAIL ORFS SEALING POINTS

Tube: Ø20x2
 Assembly: as per tightening torque indicated on this catalogue (90Nm)
 Magnifying: Microscope x5
 Detail scale: 0,5



SEALING POINT 1 – 90°



CONE SEALING POINT 2 – O-RING



SEALING POINT 3 – 90°

QUALITY ASSURANCE ACCORDING TO UNI EN ISO 9001

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

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

Our Quality Experts are always ready to provide customers with advice, to guide them around our facilities as to provide documentation of the traceability system applied.

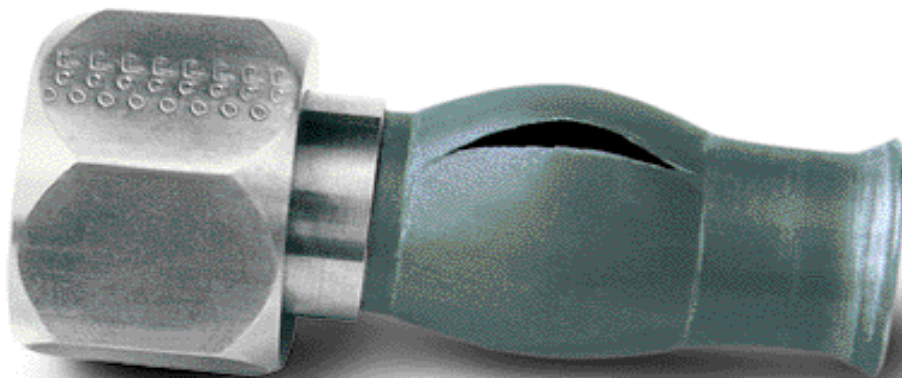
COMPONENT TESTING

In addition to the normal dimensional checks carried out during machining, percentage inspections of the finished product, practical tightness and fatigue tests, coupling tests between the various parts are also carried out on CAST fittings. At the customer's request, our Product Test and Inspection Service issues the certificate of the tests carried out: dimensional and geometrical tests, checking of static seal at low and high pressure, dynamic seal at high pressure (maximum operating pressure + 33% as per ISO 8434-5).

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

- The new ORFS fitting solves all the problems of safety since has been carefully designed for that purpose.
 - The use of high quality steel tubes in the right wall thickness, make this specific type of fitting particularly safe creating values of highest reliability between the sleeve, the fitting body and the tube, since is the flared part the strong point of this technology.
- CAST S.p.A. production is made in compliance with the reference norm.
- Nominal working pressures indicated in this catalogue are intended as maximums (including pressure peaks). To use this fitting at higher requirements test must be carried out in accordance with the manufacturer.
 - The safety factor 4:1 is intended as static test with the temperatures within the given range and complying with all the references contained in ISO 8434-3, as far as tube connection is concerned.
 - Same safety factor 4:1 for parallel stud ends with elastomeric seal. For studs with conical with metal to metal seal the safety factor is 2,5:1.
 - Is understood that the product is guaranteed only if the full connection is made entirely with CAST S.p.A. products and components.



*Destructive testing with 25x2 carbon steel tube
 The tube burst at 800 bar without any leaks or sweating from the seal points.*