

Metallic tube connectors for fluid power and general use —

Part 1: Split collet compression fittings

ICS 23.040.60

Committees responsible for this British Standard

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- Association of British Mining Equipment Companies
- British Compressed Air Society
- British Fluid Power Association
- British Hydromechanics Research Group
- National Engineering Laboratory
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Foreword

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution and came into effect on 15 April 1998.

BS 4368-1:1998+A1:2014 supersedes BS 4368-1:1998, which is withdrawn.

A1 The principal change introduced by Amendment No.1 is that because BS 4368-4 has been withdrawn, subclause **5.6** which specified type testing has been replaced by a new Clause 6 which specifies performance and qualification requirements and calls up test methods given in BS EN ISO 19879:2010. **A1**

Text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged.

A1 Fluid power system couplings types A and B which were previously covered by BS 4368-1 and BS 4368-3 are now covered by:

BS EN ISO 8434-1, *Metallic tube connections for fluid power and general use – Part 1: 24° cone connectors*

BS ISO 8434-2, *Metallic tube connections for fluid power and general use – Part 2: 37° flared connectors*

BS ISO 8434-3, *Metallic tube connections for fluid power and general use – Part 3: O-ring face seal connectors* **A1**

These standards do not cover couplings type C (split collet compression fittings). Consequently BS 4368-1 has been revised to cover this type of fitting only.

A1 BS 4368-3 and BS 4368-4 have been withdrawn. **A1**

Annex A of this standard is informative.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

1 Scope

This part of BS 4368 specifies general and dimensional requirements for the design and performance of collet compression fittings which are suitable for use with ferrous and non-ferrous tubes with outside diameters from 6 mm to 50 mm inclusive. They are intended for the connection of plain end tubes and hose fittings to ports in accordance with BS EN ISO 6149-1, BS EN ISO 1179-1 and BS EN ISO 9974-1. The limits of pressure and temperature of use are also specified.

Requirements for tubes are included together with marking and designation requirements for the fittings.

Annex A is informative and provides a list of procurement information required from a purchaser of the components specified in this standard.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

[A1] BS 5200, *Specification for dimensions of hydraulic connectors and adaptors*

BS EN 12449, *Copper and copper alloys — Seamless, round tubes for general purposes*

BS EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

BS EN ISO 1127, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length*

BS EN ISO 1179-1, *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 1: Threaded ports*

BS EN ISO 1179-2, *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing. Part 2: Heavy-duty (S series) and light-duty (L series) stud ends with elastomeric sealing (type E)*

BS EN ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

BS EN ISO 6149-1, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 1: Ports with truncated housing for O-ring seal*

BS EN ISO 6149-2, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 2: Dimensions, design, test methods and requirements for heavy-duty (S series) stud ends*

BS EN ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

BS EN ISO 9974-1, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads with elastomeric or metal-to-metal sealing — Part 1: Threaded ports*

BS EN ISO 19879:2010, *Metallic tube connections for fluid power and general use — Test methods for hydraulic fluid power connections*

BS ISO 261, *ISO general purpose metric screw threads — General plan*

BS ISO 725, *ISO inch screw threads — Basic dimensions*

BS ISO 5598:2008, *Fluid power systems and components — Vocabulary*

ISO 263, *ISO inch screw threads — General plan and selection for screws, bolts and nuts — Diameter range 0.06 to 6 inches*

ISO 3304, *Plain end seamless precision steel tubes — Technical conditions for delivery*

ISO 3305, *Plain end welded precision steel tubes — Technical conditions for delivery* **[A1]**

3 Terms and definitions

For the purposes of this part of BS 4368, the terms and definitions given in **[A1]** BS ISO 5598:2008 **[A1]** and the following apply.

3.1

fluid power

means whereby energy is transmitted, controlled and distributed using a pressurized fluid as the medium **[A1]** *Text deleted* **[A1]**

3.2

connection; fitting

leak-proof device to connect pipelines (conductors) to one another, or to equipment

3.3**fastening thread**

terminal thread of a complete fitting

3.4**run**

two principal, axially aligned outlets of a tee or cross

3.5**branch**

side outlet(s) of a tee or cross

3.6**chamfer**

removal of a conical portion at the entrance of a thread to assist assembly and prevent damage to the start of the thread

3.7**face-to-face dimension**

distance between the two parallel faces of axially aligned outlets of a fitting

3.8**face-to-centre dimension**

distance from the face of an outlet to the central axis of an angularly disposed outlet

3.9**assembly torque**

the torque to be applied in order to achieve a satisfactory final assembly

3.10**working pressure**

pressure at which the apparatus is being operated in a given application

4 Requirements for materials**4.1 Components**

Figure 1 shows the cross section and component parts of a typical split collet compression fitting.

4.2 Fitting bodies

Bodies shall be manufactured from carbon steel, stainless steels or high duty non-ferrous alloys which shall provide the minimum requirements for the pressure/temperature ratings specified in clause 5. They shall have properties (e.g. strength, corrosion resistance) which make them compatible with the fluid to be conveyed and to provide an effective joint. Weld fitting types shall be made of materials classified as suitable for welding.

4.3 Nuts

Nuts shall be of a similar material to those of the bodies.

4.4 Collets

The material of the split collets shall be selected by the manufacturer to suit the design and application. The final material surface hardness shall be sufficient to allow the collet to fully perform its gripping function upon the selected tubing.

4.5 Sealing ring

The material of the sealing ring shall be selected to suit the medium to be carried and the temperature of the application.

4.6 Compatibility of components

In all cases the materials of metallic components of a fitting assembly shall be similar, so as to prevent electrolytic corrosion, particularly in marine environments.

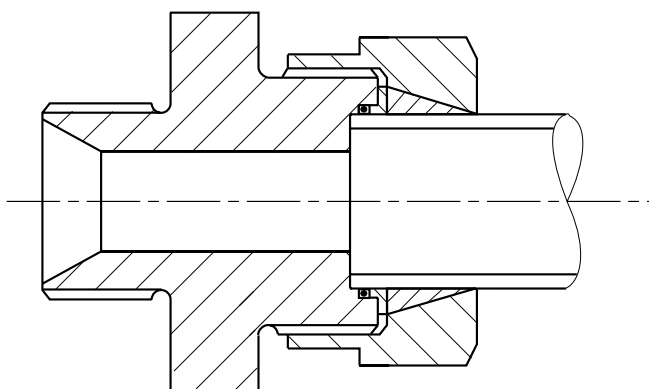


Figure 1 — Cross section of a typical split collet compression fitting

5 Pressure/temperature requirements

5.1 Fittings made of carbon steel shall have sufficient mechanical strength for use at the working pressures given in Table 1 when used at fluid temperatures between -40°C and $+120^{\circ}\text{C}$.

Table 1 — Working pressure ratings for split collet compression fittings

Tube o.d.	Working		Proof pressures	
	MPa	bar	MPa	bar
6 to 22	51	510	76.5	765
25 to 50	37.5	375	56.3	563

NOTE Purchasers should consult the manufacturer for applications under conditions outside the pressure and/or temperature limits given in Table 1 and in 5.1 to 5.3.

5.2 Fittings made of stainless steel shall have sufficient mechanical strength for use at the working pressures given in Table 1 when used at temperatures between -40°C and $+150^{\circ}\text{C}$.

5.3 Copper alloy fittings shall have sufficient mechanical strength for use at the working pressures given in Table 1 when used at temperatures between -40°C and $+120^{\circ}\text{C}$.

5.4 The fitting assembly shall not leak or fail mechanically when hydrostatically tested at four times the applicable recommended working pressure specified in Table 1. Testing shall be conducted at room temperature.

5.5 For port and stud end pressure/temperature requirements, the values specified in the respective port and stud end standards shall be used.

NOTE The pressure/temperature requirements given in Table 1 and in 5.1 to 5.3 are for tube and hose connections and fitting bodies only.

5.6 Fittings shall be type tested in accordance with Clause 6 and shall conform to the requirements specified in Clause 6.

6 Performance and qualification requirements

6.1 General

The connectors shall pass the tests specified in 6.2 to 6.7 at test pressures calculated in accordance with BS EN ISO 19879:2010 using the relevant working pressure given in Table 1.

6.2 Repeated assembly test

The connectors shall pass a repeated assembly test in accordance with BS EN ISO 19879:2010, Clause 5.

6.3 Proof test

The connectors shall pass a proof test in accordance with BS EN ISO 19879:2010, Clause 7.

6.4 Burst test

The connectors shall pass a burst test in accordance with BS EN ISO 19879:2010, Clause 8.

6.5 Cyclic endurance (impulse) test with vibration

The connectors shall pass a cyclic endurance (impulse) test with vibration in accordance with BS EN ISO 19879:2010, Clause 13.

6.6 Leakage test

The connectors shall pass a leakage test in accordance with BS EN ISO 19879:2010, Clause 6.

6.7 Over-tightening test

The connectors shall pass an over-tightening test in accordance with BS EN ISO 19879:2010, Clause 11.

For each size of connector, three samples of each end of the connector shall be subjected to the following test:

- The connector shall be tightened to the assembly torque recommended by the manufacturer. The connector shall then be over-tightened by a 90° turn.
- After the test there shall be no indication of the following failures:
 - the nut cannot be removed and swivels freely after breakaway; and
 - visible cracks or severe deformation have appeared that would render the connector component unusable. 

7 Designation of fittings

7.1 Fittings shall be designated by an alphanumeric code to facilitate ordering. The code shall commence with the number of this British Standard i.e. BS 4368-1, and shall be followed by a spaced hyphen, then the fitting style designation letter symbols (see clauses 7.2 and 7.3), then a spaced hyphen, then for the ends the outside diameter of the tube (in mm) to which they are to be connected. For stud ends (connector ends), a multiplication sign followed by the thread designation of the stud end and the sealing type shall be added (see Table 8 and Table 9, and Figure 11 and Figure 12).

7.2 The fitting style designation shall have two parts, the connection end type, immediately followed by the shape of the fitting.