

BS 746:2014



BSI Standards Publication

# Specification for gas meter unions and adaptors

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### Summary of pages

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## Foreword

### Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 November 2014. It was prepared by Technical Committee GSE/25, *Gas meters*. A list of organizations represented on this committee can be obtained on request to its secretary.

### Supersession

BS 746:2014 supersedes BS 746:2005+A1:2009, which is withdrawn.

### Relationship with other publications

This standard specifies fittings to be used in conjunction with gas meters such as those specified by BS EN 1359 and BS EN 14236.

### Information about this document

This is a full revision of the standard, and introduces the following principal changes.

- Dimensional changes have been made to ensure that the flat parts of the nuts engage directly on the flat parts of the liners such that even pressure is applied to the surfaces of the washers.
- The properties of the sealing washer have been redefined.
- Additional tests for fittings and washer performance have been added.
- Hexagonal nuts are now permitted as an alternative to octagonal nuts.

This document may be used in the procurement of fittings.

### Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

## 1 Scope

This British Standard specifies requirements and test methods for unions and adaptors for the installation of low pressure gas meters. It is applicable to unions and adaptors for gas meters for use with 1st, 2nd and 3rd family gases at temperatures between  $-20\text{ }^{\circ}\text{C}$  and  $+60\text{ }^{\circ}\text{C}$ , up to a maximum operating pressure of 75 mbar<sup>1)</sup> and a maximum incidental pressure of 200 mbar. The gas tightness of the gas meter unions and adaptors is also specified.

*NOTE The tests specified in this standard are type tests, except for that specified in 4.2.3.*

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 1936-1, *Undercuts and runouts for screw threads – Part 1: Inch screw threads*

BS 7371-6, *Coatings on metal fasteners – Part 6: Specification for hot dipped galvanized coatings*

BS EN 549, *Specification for rubber materials for gas appliances and gas equipment*

BS EN 1562, *Founding – Malleable cast irons*

BS EN 1652, *Copper and copper alloys – Plate, sheet, strip and circles for general purposes*

BS EN 1976, *Copper and copper alloys – Cast unwrought copper products*

BS EN 1982, *Copper and copper alloys – Ingots and castings*

BS EN 10088-3:2005, *Stainless steels – Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*

BS EN 10242, *Threaded pipe fittings in malleable cast iron*

BS EN 12164, *Copper and copper alloys – Rod for free machining purposes*

BS EN 12165, *Copper and copper alloys – Wrought and unwrought forging stock*

BS EN 12167, *Copper and copper alloys – Profiles and rectangular bar for general purposes*

BS EN 12168, *Copper and copper alloys – Hollow rod for free machining purposes*

BS EN 12329:2000, *Corrosion protection of metals – Electrodeposited coatings of zinc with supplementary treatment on iron or steel*

BS EN 12420, *Copper and copper alloys – Forgings*

BS EN ISO 27830, *Metallic and other inorganic coatings – Guidelines for specifying metallic and inorganic coatings*

PD 970, *Wrought steels for mechanical and allied engineering purposes – Requirements for carbon, carbon manganese and alloy hot worked or cold finished steels*

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<sup>1)</sup> 1 bar = 105 N/m<sup>2</sup> = 100 kPa.

### 3 Terms and definitions

For the purposes of this British Standard the following terms and definitions apply.

- 3.1 adaptor**  
metal fitting for connecting a nut and liner to a boss of a different size
- 3.2 apparatus**  
construction of pipes, fittings, test points, etc., that is leak tight
- 3.3 boss**  
part of a fitting with an external screw thread
- 3.4 adaptor washer**  
elastomeric seal between a boss and an adaptor
- 3.5 liner**  
metal fitting with a flanged end to take union washer
- 3.6 nut**  
metal fitting with an internal screw thread
- 3.7 sealing disc**  
metal fitting fitted between a boss and a nut, with or without a liner, designed to close off the gasway
- 3.8 union**  
metal fitting comprising a boss and a liner using a washer and nut for gas tightness
- 3.9 union washer**  
elastomeric seal between a boss and a liner

### 4 Materials

#### 4.1 Metal fittings

Metal fittings shall be made from one of the following materials:

- a) brass for hot pressing, grade CW602N or CW617N to BS EN 12165 or BS EN 12420;
- b) brass for casting, grade CC490K, CC491K, CC750S, CC754S or CC760S to BS EN 1982;
- c) brass rod, grade CW602N, CW614N or CW617N to BS EN 12164, BS EN 12167 or BS EN 12168;
- d) brass sheet and strip, grade CW508L to BS EN 1652;
- e) copper, grade CR004A to BS EN 1976;
- f) malleable cast iron to BS EN 1562;
- g) carbon steel of any grade, with a content not exceeding 0.01% for lead, 0.06% for sulfur and 0.06% for phosphorous and which is suitable for welding, and forming or machining, as appropriate, to PD 970; or
- h) austenitic stainless steel to BS EN 10088-3:2005, grades 1.4404 and 1.4541.

## 4.2 Elastomeric washers

### 4.2.1 General

Elastomeric washers shall be tested in accordance with BS EN 549. When tested in accordance with BS EN 549, the material from which elastomeric washers are made shall:

- a) be of a hardness  $91 \pm 3$  IRHD <sup>2)</sup>;
- b) otherwise conform to BS EN 549, grade H3, A2.

### 4.2.2 Leak rate at low pressure

#### 4.2.2.1 Leak rate

Each size of washer (see Table 8 and Table 9) shall be tested separately in accordance with 4.2.2.2. When tested in accordance with 4.2.2.2, the total leak rate of the assembly shall not exceed 0.2 L/h and the release torque of any union nut shall be not less than given in Table 1.

Table 1 Initial and release torques

| Nominal size<br>in | Initial torque | Release torque |
|--------------------|----------------|----------------|
| $\frac{1}{2}$      | —              | —              |
| $\frac{3}{4}$      | 25             | 8              |
| 1                  | 25             | 14             |
| $1\frac{1}{4}$     | 35             | 20             |
| $1\frac{1}{2}$     | 45             | 28             |
| 2                  | 100            | 37             |

#### 4.2.2.2 Test method

**4.2.2.2.1** Select 60 washers and divide these into four groups of 15. Erect four separate assemblies, each:

- a) comprising 15 washers, nuts, liners and bosses, together with suitable apparatus that includes means of allowing the internal pressure of each assembly to be changed and measured; and
- b) having an internal volume not exceeding 0.035 m<sup>3</sup>.

Calculate the internal volume of each assembly.

**4.2.2.2.2** Allow the apparatus, washers, nuts, liners and bosses to stabilize at  $(20 \pm 3)$  °C for a period of 1 h. Assemble the washers, nuts, liners and bosses and tighten each nut to the applicable torque given in Table 1.

<sup>2)</sup> International Rubber Hardness Degrees