

British Standard Specification for

# Fire hose couplings and ancillary equipment

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Raccords de tuyaux d'incendie et matériels connexes — Spécifications

Feuerlöschschläuche und Zubehör

## Foreword

This British Standard has been prepared under the direction of the Fire Standards Committee. It supersedes BS 336 : 1980 which is withdrawn.

Although dimensions are given in metric terms, screwed and instantaneous couplings and connectors manufactured in accordance with this specification will be interchangeable with existing couplings.

In this edition the figures are included in the main body of the specification, so that reference may be made readily to a requirement in the text, and to the relevant information in tables and figures. In the 1980 edition the figures were grouped after the main text. The number of drawings has been reduced by combination, so that information is presented more compactly.

Table 1, which specifies the various materials used for the different components is presented in a more compact arrangement, intended to improve ease of cross-reference where it is desired to use the minimum number of materials for a range of components.

A minimum bore for delivery hose couplings is now specified, which will assist users in specifying hose repair tools, which have to pass through the couplings. A third method of hose fixing is specified. Requirements for a suction hose wrench and controllable branchpipes are included, and some changes have been made to dimensions and tolerances to correct inconsistencies. More precise definitions of blank caps and plugs have been incorporated.

The possibility of introducing an alternative design (the so-called drop-through type) of suction hose coupling was considered. However, these designs necessarily have smaller tail diameters not suitable for use with hose of the standard dimensions of BS 3165. It was therefore decided not to include these alternatives in this revision.

Delivery hose components are suitable for use with hose complying with BS 6391 and suction hose components are suitable for use with hose complying with BS 3165.

As with previous issues, most of the products dealt with in this revision may be made of aluminium alloy, or copper alloy. Zinc-aluminium alloys have been introduced for some applications. Certain of the zinc-aluminium alloys specified are suitable for use in hazardous locations where other aluminium alloys, because they can produce a spark when struck with other materials, cannot be used. Copper, copper alloy and plastics components also are spark resistant.

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

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## Section one. General

### 1 Scope

This British Standard specifies requirements for couplings, connectors and other components for use with delivery hose complying with BS 6391 and with suction hose complying with BS 3165, and suitable for firefighting purposes. It also applies to other items of equipment associated with the use of firefighting hose.

The pressure retaining components are suitable for use at working pressures not exceeding 15 bar\*.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

### 2 Definitions

For the purpose of this specification, the definitions given in BS 4422 apply, together with the following:

**2.1 blank cap.** A component that fits on to a male delivery hose connector or suction connection and complies with the pressure retention and other appropriate requirements of this specification.

**2.2 blank plug.** A component that fits into a female delivery hose connector or suction connection and complies with the pressure retention and other appropriate requirements of this specification.

NOTE. Dust covers, sometimes used to cover connectors, may not be capable of complying with the pressure retention requirements.

### 3 Materials

The material for each component shall be chosen from the list of permitted materials given either in table 1 or in the relevant clause.

NOTE 1. The choice of materials should be made with due regard to possible corrosion, particularly bi-metallic corrosion where different metals are in contact. Temporary, occasional contact of different metals in two components connected during use is not a problem, but where different metals are used in the same component severe corrosion may occur. In particular aluminium and its alloys are liable to corrode when in contact with copper or its alloys, and where there is such contact suitable measures should be taken to prevent corrosion.

Particular care should be exercised in the selection of materials for use in marine environments where the water to be used in the fire hose may be seawater. Attention is drawn to BS MA 18 and BS MA 60.

NOTE 2. Materials should be free from toxic substances and should not give rise to taste, odour, cloudiness or discolouration of the water or foster any micro-biological growth.

NOTE 3. It is acknowledged that materials other than those given in table 1 may be used for couplings and that these may otherwise conform to the standard, but the use of these other materials is outside the scope of the standard.

NOTE 4. The purchaser should be advised that as far as possible the coupling of copper or copper alloy components to aluminium alloy or zinc-aluminium alloys should be avoided, particularly where contact is for long periods, as electrolytic action and consequent corrosion may result. He should also be advised that it is preferable to wash all products with fresh water after use or contact with sea water or brackish water.

\* 1 bar =  $10^5$  N/m<sup>2</sup> =  $10^5$  Pa.

### 4 Manufacture

#### 4.1 Castings and mouldings

Castings shall be clean, sound and free from gross porosity, cracks and other surface imperfections. No filling or similar after-treatment of castings shall be carried out without the approval of the purchaser.

NOTE. On diecast fittings and plastic injection mouldings where a bore is shown as parallel, a reasonable taper should be allowed to facilitate core withdrawal, but this taper should be kept to the minimum required for this purpose.

#### 4.2 Welding

Welds shall be free from lack of fusion, cracks, non-metallic inclusions, porosity and cavities.

Welding of aluminium shall be in accordance with the requirements of either BS 3019 : Part 1 or BS 3571 : Part 1, according to the method of welding employed.

#### 4.3 Finish

Machined surfaces, unless otherwise specified, shall be of grade N7 assessed in accordance with BS 1134.

NOTE 1. Assessment may be made using roughness comparison specimens calibrated in accordance with BS 1134 with the agreement of the purchaser.

When aluminium is used for exposed surfaces they shall have a sealed anodized finish, of thickness not less than grade AA 15, specified in accordance with the methods described in BS 1615 or BS 5599. Where chrome plating is used it shall be in accordance with BS 1224.

Parts not machined shall be finished clean as cast.

NOTE 2. All burrs and sharp edges should be removed. Waterways, particularly the bores of branch pipes and nozzles, should have a smooth finish. The exterior of all components should be sufficiently rounded and smooth to avoid injury during handling. Surfaces in contact with hoses should be particularly smooth so as to avoid damage to the hose. All assembled threads of aluminium alloy and zinc-aluminium alloy should be coated with suitable grease before assembly.

#### 4.4 Permissible deviations

Unless otherwise specified, the deviations on all work sizes of machined parts shall be  $\pm 0.25$  mm.

NOTE. Permissible deviations have been specified where necessary to enable components to be interchangeable, but it does not necessarily follow that every work size and permissible deviation has been specified. Where these are omitted the manufacturer should use experience in determining what these should be and, if necessary, should consult the purchaser.

### 5 Pressure retention

The pressure retaining parts of delivery hose couplings, suction hose couplings, delivery hose connectors, dividing and collecting breechings, branchpipes, nozzles, standpipes, blank caps and plugs, suction collecting heads and foam inlet adaptors shall withstand without leakage or permanent deformation a hydrostatic test pressure of 22.5 bar for 2 min when tested by the method described in appendix B.



**Table 1. Choice of materials**

| Product                                         |                     |                     | Material and relevant British Standard number |                  |                       |                 |            |                     |             |            |
|-------------------------------------------------|---------------------|---------------------|-----------------------------------------------|------------------|-----------------------|-----------------|------------|---------------------|-------------|------------|
|                                                 |                     |                     | Aluminium alloys                              |                  |                       |                 |            |                     |             |            |
|                                                 |                     |                     | 6082<br>T6                                    | 6082<br>TF       | LM6<br>M              | LM16<br>TF      | LM25<br>TF | 5056A<br>O or<br>HZ | 5154A<br>H2 | 5251<br>H4 |
|                                                 |                     |                     | 1474                                          | 1471             | 1490                  | 1490            | 1490       | 1473                | 1473        | 1470       |
|                                                 | Clause<br>reference | Figure<br>reference | See<br>Note<br>3                              | See<br>Note<br>3 |                       |                 |            |                     |             |            |
| Delivery hose couplings                         | 7                   | 1 to 5              | X                                             |                  | X<br>See<br>Note<br>4 | X               | X          |                     |             |            |
| Delivery hose connectors                        | 8                   | 6                   |                                               |                  |                       |                 |            |                     |             |            |
| Breechings                                      | 9                   | 7                   |                                               |                  | X<br>See<br>Note<br>4 | X               | X          |                     |             |            |
| Branchpipes, metal                              | 10, 11              | 8                   |                                               |                  |                       |                 |            |                     |             |            |
| Nozzles for branchpipes                         | 10                  | 9                   |                                               |                  |                       |                 |            |                     |             |            |
| Branchpipes (plastics)                          | 11                  | 10                  |                                               |                  |                       |                 |            |                     |             |            |
| Spanners for nozzles                            | 12                  | 11                  |                                               |                  |                       | X               | X          |                     |             |            |
| Blank caps and plugs<br>Chains and 'S' hooks    | 13                  | —                   |                                               |                  | X                     | X               | X          |                     |             |            |
| Standpipe shaft<br>Standpipe base and head      | 14                  | 12                  | X                                             | X                |                       | X               | X          |                     |             |            |
| Hydrant keys and bars                           | 15                  | 13                  | X                                             | X                |                       | X               | X          |                     |             |            |
| Suction hose couplings                          | 16                  | 14, 15              |                                               |                  |                       | X               | X          |                     |             |            |
| Suction collecting heads                        | 17                  | 16                  | X                                             |                  |                       | X               | X          | X                   | X           | X          |
| Suction strainer<br>Strainer and ends<br>Rivets | 18.1                | 17                  |                                               |                  |                       | X               | X          | X                   | X           | X          |
| Basket strainer                                 | 18.2                | 18                  |                                               |                  |                       |                 |            |                     |             |            |
| Suction hose wrenches                           | 19                  | 19                  |                                               |                  |                       |                 |            |                     |             |            |
| Foam inlet adaptor                              | 20                  | 20                  |                                               |                  |                       | X<br>See Note 9 | X          |                     |             |            |
| Springs and circlips                            |                     |                     |                                               |                  |                       |                 |            |                     |             |            |
| Washers                                         |                     |                     |                                               |                  |                       |                 |            |                     |             |            |

NOTE 1. See 7.4, 8.4, 10.1, 14.2, 16.2 or 18.1.4.

NOTE 2. Should not be used with aluminium products.

NOTE 3. Of a gauge suitable for welding.

NOTE 4. For coupling release housings only.

NOTE 5. Any plastics material complying with 7.1.4 or 11.3 may be used for the body, but the release plunger is always made of metal (see 7.1.5 and 11.4).

NOTE 6. Steel (chrome or cadmium plated).

NOTE 7. Coupling parts of aluminium alloy collecting heads are types LM16-TF or LM25-TF. Combinations of these alloys with the specified copper alloys are permissible.

NOTE 8. Expansion rings only.

NOTE 9. Anodized. See 4.3.

| Copper and copper alloys |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       | Zinc alloys<br>ZA12 | Plastics         | Other            |                          |
|--------------------------|------|------|------------------|-------|------------------|-------|-------|------|----------------|------|------|------|------|-------|---------------------|------------------|------------------|--------------------------|
| C106                     |      |      |                  | CZ107 |                  | CZ108 | CZ112 |      | CZ121<br>CZ122 |      | DCB1 | DCB3 | LG2  | PB102 |                     |                  |                  | PB103                    |
| 2870                     | 2871 | 2873 | 6017             | 2870  | 2873             | 2870  | 2872  | 2874 | 2872           | 2874 | 1400 | 1400 | 1400 | 2873  |                     | DD139            |                  |                          |
|                          |      |      |                  |       | See<br>Note<br>2 |       |       |      |                |      |      |      |      |       | See<br>Note<br>2    | See<br>Note<br>2 |                  |                          |
|                          |      |      | See<br>Note<br>8 |       |                  |       | X     | X    | X              | X    | X    | X    | X    |       |                     |                  | X                | See<br>Note 5            |
|                          |      |      |                  |       |                  |       | X     | X    | X              | X    | X    | X    | X    |       |                     |                  | X                |                          |
|                          |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       |                     |                  | See<br>Note<br>5 |                          |
|                          |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       |                     |                  |                  | Steel                    |
|                          |      |      |                  |       | X                |       |       |      | X              |      |      |      | X    |       | X                   | X                | X                | See<br>Notes 4<br>and 6  |
|                          | X    |      |                  |       |                  |       | X     | X    | X              | X    | X    | X    | X    |       |                     |                  |                  |                          |
|                          |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       |                     |                  |                  | See<br>clause 15         |
|                          |      |      |                  |       |                  |       | X     | X    | X              | X    | X    | X    | X    |       |                     |                  | X                |                          |
|                          |      |      |                  | X     |                  | X     | X     | X    | X              | X    | X    | X    | X    |       |                     |                  |                  | See Note 7               |
| X                        |      |      |                  |       |                  |       | X     |      | X              |      | X    | X    | X    |       |                     |                  |                  |                          |
|                          |      | X    | X                |       |                  |       |       |      |                |      |      |      |      |       |                     |                  |                  | See 18.2                 |
|                          |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       |                     |                  |                  | Galvanized<br>mild steel |
|                          |      |      |                  |       |                  |       | X     |      | X              |      | X    | X    | X    |       |                     |                  |                  |                          |
|                          |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       | X                   | X                |                  | Steel                    |
|                          |      |      |                  |       |                  |       |       |      |                |      |      |      |      |       |                     |                  |                  | See Note 1               |



## 6 Marking

**6.1** Each product shall bear legible and permanent marking to identify the manufacturer and year of manufacture.

NOTE. This may be by the use of a symbol or letter code, with a number to indicate the year, for example 'A/88'. 'A' being the manufacturers code letter and 88 indicating that the product was made in 1988.

**6.2** The manufacturer shall either:

- (a) mark the product 'BS 336 : 1989' or
- (b) alternatively indicate by certificate, packaging or literature that the product conforms to BS 336 : 1989.

NOTE. Each of the options (a) or (b) carries the same degree of responsibility.\*

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\*Marking BS 336 : 1989 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

## Section two. Specific requirements

### 7 Delivery hose couplings

#### 7.1 General

**7.1.1** Delivery hose couplings shall be of instantaneous pattern as shown in figure 1 and shall be in accordance with the relevant figures specified in **7.1.2**, **7.1.3** or **7.1.4**, except that the release mechanism may be of the twist-release type instead of the pull-release type shown in the figures. Work sizes for the lettered dimensions in figure 4 shall be in accordance with table 2, and sizes for the lettered dimensions in figure 5 shall be in accordance with table 3, according to the size of hose to be accommodated.

NOTE. These figures are drawn with tailpieces for 70 mm hose. Although tailpieces will vary as shown in table 2, all other dimensions remain the same for all sizes of hose. When tailpieces are above or below 70 mm the change of bore should be gradual to prevent unnecessary pressure losses and the design should be at the manufacturer's discretion.

**7.1.2** Multi-serrated type couplings shall be in accordance with the following figures:

- (a) Figure 1(a) for overall general arrangements.
- (b) Figures 2, 4(b), 4(d) for female half-couplings and washers.
- (c) Figures 3, 4(b), 4(d) for male half-couplings.

**7.1.3** Ribbed type couplings shall be in accordance with the following figures:

- (a) Figure 1(b) for overall general arrangements.
- (b) Figures 2, 4(a), 4(c) for female half-couplings and washers.
- (c) Figures 3, 4(a), 4(c) for male half-couplings.

**7.1.4** Expansion ring type couplings shall be in accordance with the following figures:

- (a) Figure 1(c) for overall general arrangements.
- (b) Figures 2 and 5 for female half-couplings and washers.
- (c) Figures 3 and 5 for male half-couplings.

**7.1.5** Where a coupling is manufactured from a plastics material it shall show no visible damage nor permanent deformation when tested as described in appendix A.

**7.1.6** The release plunger shall always be made of metal.

#### 7.2 Locking of plungers

Nuts on plungers shall be of the self-locking type.

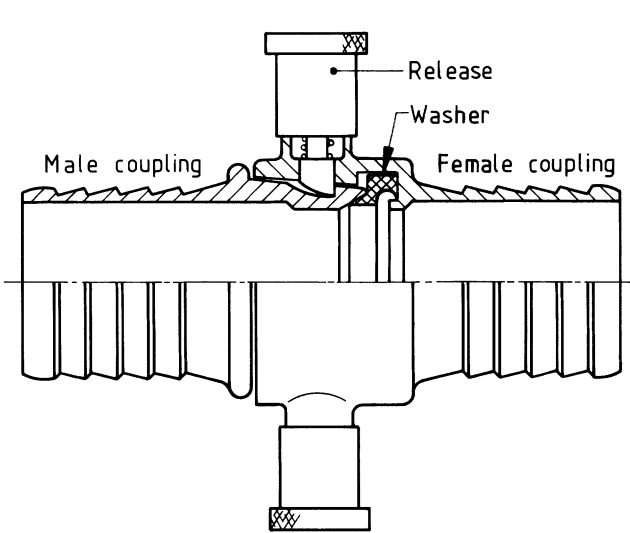
NOTE. 'Peening' over the end of the shank is not regarded as an efficient means of locking the plunger.

#### 7.3 Plunger springs

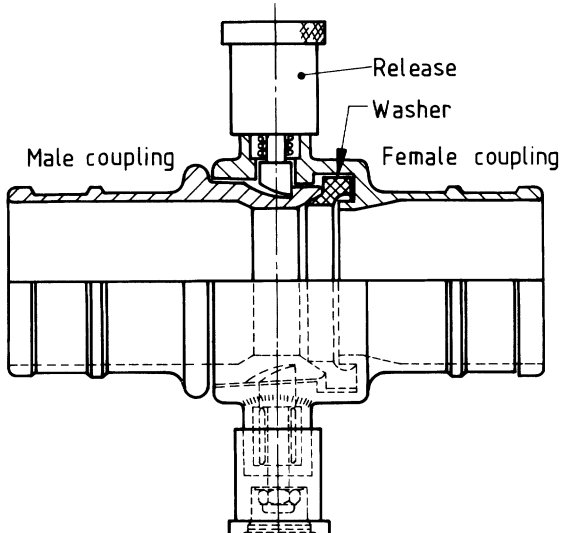
Plunger springs shall be of such strength that they can be compressed to a length sufficient to free the plunger from engagement by a force of not less than 45 N and not more than 65 N.

#### 7.4 Washers

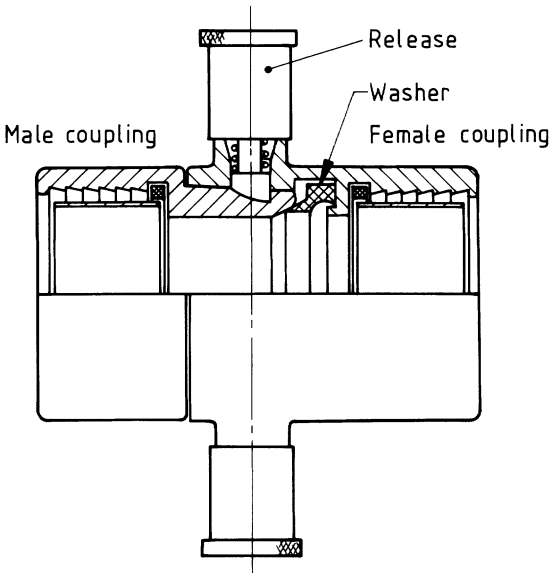
Coupling washers shall have the dimensions given in figure 2(a) and shall be of natural rubber (grades Y40, Z40) to BS 1154 or chloroprene (grade C40) to BS 2752. Expansion ring washers shall be of an elastomer of maximum shore hardness 70. The tolerances on the stated dimensions shall be in accordance with class M3 of BS 3734.



(a) Serrated tail type



(b) Ribbed tail type



(c) Expansion ring type

**Figure 1. Delivery hose couplings — general arrangement**