

Specification for

Hose couplings (air and water)

($\frac{1}{8}$ in. to $1\frac{1}{4}$ in. nominal sizes)

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British Compressed Air Society*	Institution of Mechanical Engineers (Automobile Division)
British Electrical and Allied Manufacturers’ Association	Institution of Production Engineers
British Electricity Authority and Area Boards	Locomotive Manufacturers’ Association
British Engineers Association*	Machine Tool Trades’ Association
British Internal Combustion Engine Manufacturers’ Association	Ministry of Fuel and Power*
British Iron and Steel Federation	Ministry of Labour and National Service (Factory Department)
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Association of Mining Electrical and Mechanical Engineers	Federation of Civil Engineering Contractors
British Wrapped Rubber Hose Manufacturers’ Association	Federation of Manufacturers of Contractors Plant
Council of Underground Machinery Manufacturers	Federation of Painting Contractors
Cut Thread Screwing Tool Manufacturers’ Association	Institution of Municipal Engineers
Federation of British Rubber Manufacturers’ Associations	Institution of Water Engineers
	National Association of Colliery Managers
	National Coal Board
	Individual Manufacturers of Couplings

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Foreword

This standard makes reference to the following British Standards:

BS 21, *Pipe threads. Part 1: Basic sizes and tolerances.*

BS 218, *Leaded brass (58 per cent copper, 2 per cent lead) forging stock and forgings.*

BS 249, *Leaded brass (58 per cent copper, 3 per cent lead) rods and sections (other than forging stock).*

BS 250, *High tensile brass bars and sections (Grades A and B).*

BS 310, *Blackheart malleable iron castings.*

BS 369, *5 per cent phosphor bronze (copper-tin-phosphorous) rods and sections (other than forging stock).*

BS 970, *Wrought steels.*

BS 1083, *Precision hexagon bolts, screws and nuts.*

BS 1400, *Copper alloy ingots and castings.*

BS 1580, *Unified screw threads.*

BS 1768, *Unified precision hexagon bolts, screws and nuts (UNC and UNF threads). Normal series.*

BS 2779, *Fastening threads of B.S.P. sizes.*

The need for a British Standard for hose couplings for air and water has been apparent for some considerable time and in response to a request from the British Compressed Air Society, the Mechanical Engineering Industry Standards Committee authorized the setting up of a representative committee to prepare such a standard.

This standard has been divided into three parts; for quick reference, tabulated details of the couplings specified in each part are given below:—

Part 1. “Light” series of couplings: Coned type

(all sizes in inches)

Nominal size (hose bore)	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Screw threads B.S.P. (parallel) complying with BS 2779 ^a (see Clause 5)	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
NOTE These couplings are intended primarily for use with paint spray equipment and other small appliances. ^a BS 2779 “Fastening threads of B.S.P. sizes.”						

Part 2. “Medium” series of couplings: Flat and coned types

(all sizes in inches)

Nominal size (hose bore)		$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Screw threads B.S.P. (parallel) complying with BS 2779 ^a (see Clause 17)	Flat type	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
	Coned type	—	—	—	$\frac{3}{4}$	1	—
NOTE These couplings are intended primarily for use on light pneumatic tools in general engineering and allied industries. ^a BS 2779 “Fastening threads of B.S.P. sizes.”							

Part 3. “Heavy” series of couplings: Flat and coned types

Nominal size (hose bore)		$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	1 in.	$1\frac{1}{4}$ in.
Unified screw threads complying with BS 1580 ^a class 1A and 1B (see Clause 29)	Flat type	—	$1\frac{1}{2}$ in.—6UNC	$1\frac{3}{4}$ in.—6UN	$2\frac{1}{4}$ in.—6UN
	Coned type	$1\frac{1}{4}$ in.—7UNC	$1\frac{1}{2}$ in.—6UNC	$1\frac{3}{4}$ in.—6UN	$2\frac{1}{4}$ in.—6UN
NOTE These couplings are intended primarily for use on the heavy type of pneumatic tools, such as rock drills and kindred equipment in the mining and quarrying industries, and in civil engineering. The “coned knock-on” type of coupling has been introduced primarily to meet the needs of H.M. Forces. ^a BS 1580, “Unified screw threads.”					

For the “Heavy” series of hose couplings the Unified form of screw thread, which has recently been the subject of agreement between the United Kingdom, Canada and the United States of America, has been adopted.

The couplings specified in this British Standard may be secured to the hose by clamps, clips, or other approved methods. The clamps or clips are to be located between the ridges on the bulbous ended tail-pieces. Tail-ends of special design which employ external sleeves, ferrules or other clamping devices may also be used, subject to agreement between the purchaser and the manufacturer.

The complementary British Standard for hose couplings — BS 1782, “Hose couplings ($1\frac{1}{2}$ in. to 8 in. nominal sizes) other than fire hose couplings” — has been published.

The following appendices have been included:—

- A. Limits and tolerances for BS pipe (parallel) threads. Male threads — *free fit*.
- B. Limits and tolerances for BS pipe (parallel) threads. Female threads — *free fit*.
- C. Limits and tolerances for unified screw threads. Male thread.
- D. Limits and tolerances for unified screw threads. Female thread.

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 to vi, pages 1 to 50, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Part 1. "Light" series, coned type (B.S.P. Threads)

1 Scope

Part 1 of this standard specifies requirements for hose couplings of $\frac{1}{8}$ in., $\frac{3}{16}$ in., $\frac{1}{4}$ in., $\frac{5}{16}$ in., $\frac{3}{8}$ in. and $\frac{1}{2}$ in. nominal sizes, for use at pressures not exceeding 150 lb/sq. in.

2 Designation of size of coupling

The size by which the coupling is designated shall be the nominal bore of the hose with which it is to be used.

3 Material

The quality of the material used in the manufacture of the couplings shall be at least equivalent to the following:—

- a) Bronze or phosphor bronze complying with BS 369.¹⁾
- b) Brass complying with BS 249.²⁾
- c) Steel complying with Specification En3 of BS 970.³⁾

4 Dimensions

The dimensions of the couplings shall be in accordance with those shown in Figure 3, Figure 4 and Figure 5 and Table 1, Table 2 and Table 3.

5 Screw threads

Screw threads, male and female, shall be BS Pipe threads (parallel) complying with the requirements for "FREE FIT" specified in BS 2779⁴⁾ (see Appendix A and Appendix B).

The first male and female threads shall be chamfered to 45° to the core diameter.

6 Hexagons

The dimensions of hexagons on connectors and nuts shall conform to those specified in BS 1083.⁵⁾ (See Figure 4 and Figure 5).

7 Tail-ends

Tail-ends to which the hose is to be attached may be either serrated or bulbous, but they shall comply with the requirements of Table 1.

Tail-ends of special design, which employ external sleeves, ferrules, or other damping devices, may also be used subject to agreement between the purchaser and the manufacturer.

The ends of these special fittings shall, however, be so designed that they can be attached to standard connectors. In addition, these tail-ends, when assembled with hose, shall withstand the hydraulic pressure specified in Clause 9.

8 Interchangeability

All corresponding parts shall be interchangeable. (See Clause 7).

9 Hydraulic test

When required, assembled couplings, without hose, shall be given a pressure test in the presence of the purchaser or his representative.

The hydraulic test pressure shall be 300 lb/sq. in. When assembling the couplings for hydraulic test, the force applied to the coupling nut to ensure a watertight joint shall not be excessive. Couplings, showing signs of leakage during this test, by reason of either defective joint or porosity of metal, shall be liable to rejection.

10 Workmanship

Workmanship and finish shall be of good quality. All burrs and sharp edges shall be removed.

11 Inspection

The purchaser or his representative shall have access, at all reasonable times, to those portions of the works in which the couplings ordered are being manufactured, and in which the testing is taking place.

12 Test facilities

The manufacturer shall supply, at his own cost, labour and appliances for making the tests on his premises in accordance with this standard. Failing the existence of facilities for making the prescribed tests at his own works, the manufacturer shall be responsible for having the tests made elsewhere.

¹⁾ BS 369, "5 per cent phosphor bronze (copper-tin-phosphorous) rods and sections (other than forging stock)."

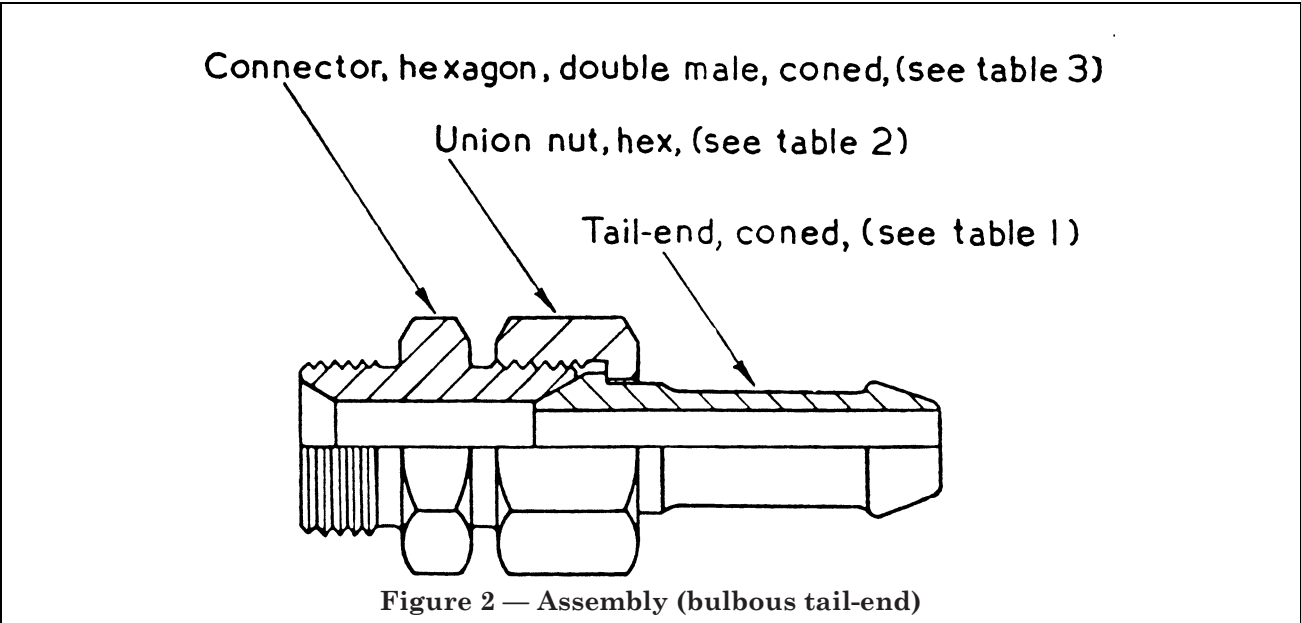
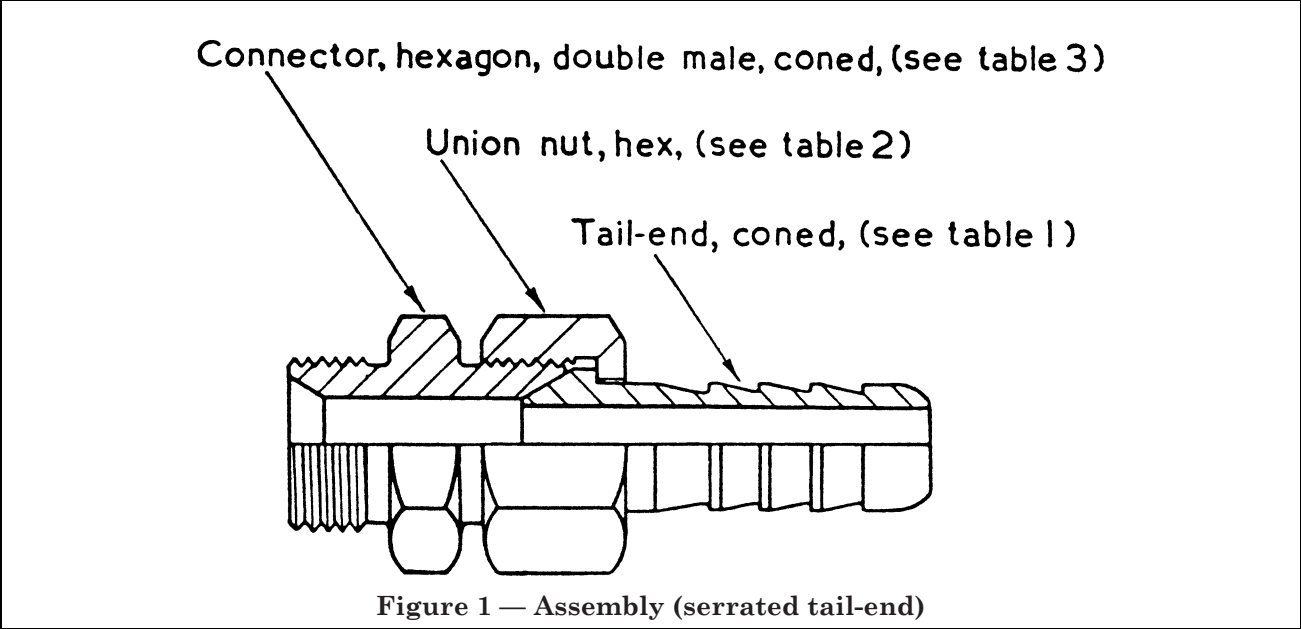
²⁾ BS 249, "Leaded brass (58 per cent copper, 3 per cent lead) rods and sections (other than forging stock)."

³⁾ BS 970, "Wrought steel."

⁴⁾ BS 2779, "Fastening threads of B.S.P. sizes."

⁵⁾ BS 1083, "Precision hexagon bolts, screws and nuts."

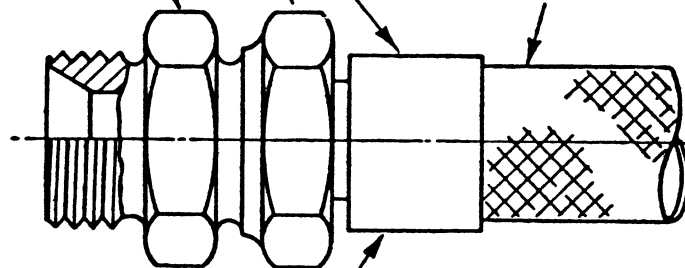
Hose couplings: Light series (B.S.P. threads)



Connector hexagon, double male, coned (see table 3)

Union nut and tail-end of special design (see clause 7)

Hose



This is diagrammatic only
and it does not purport to
represent any particular
design of end

Figure 2a — Assembly (special design tail-end)

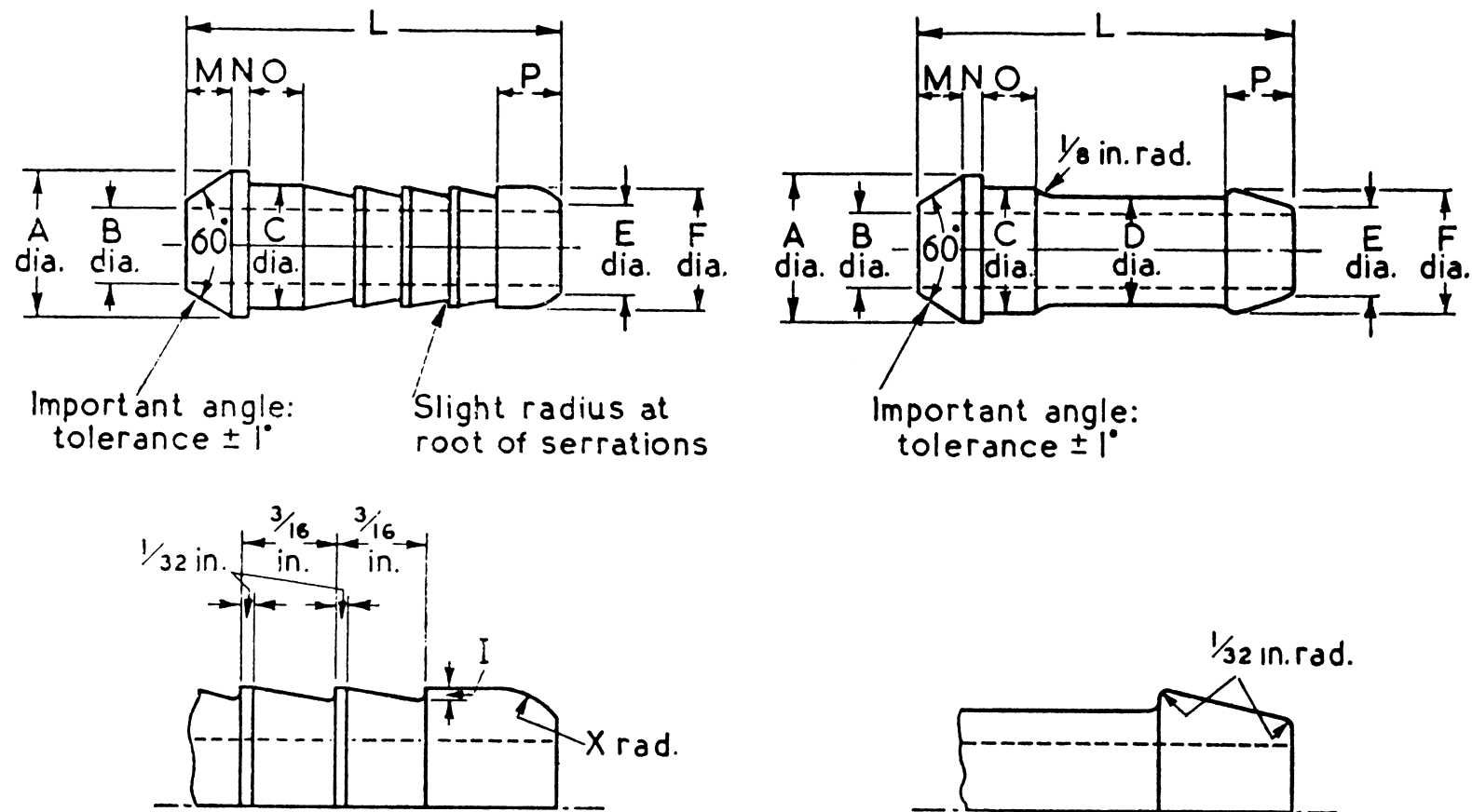


Figure 3 — Tail-end (coned)

Table 1

Size of fitting, i.e. nominal hose bore	Thread on union nut (BS 2779 ^a)	A dia.	B dia.	C dia.	D dia.	E dia.	F dia.	I	L	M	N	O	P	X rad.
		Limits of tolerance + 0.000 – 0.005		Limits of tolerance + 0.000 – 0.005	Limits of tolerance ± 0.005		Limits of tolerance + 0.000 – 0.005	Limits of tolerance + 0.005 – 0.000						
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1/8	1/8 B.S.P.	0.325	0.078	0.242	0.157	0.105	0.187	0.015	1.187	0.109	0.047	0.125	0.156	0.062
3/16	1/8 B.S.P.	0.325	0.125	0.242	0.212	0.156	0.242	0.015	1.187	0.109	0.047	0.156	0.156	0.078
1/4	1/4 B.S.P.	0.435	0.171	0.370	0.268	0.218	0.308	0.020	1.312	0.125	0.062	0.187	0.187	0.093
5/16	1/4 B.S.P.	0.435	0.234	0.370	0.330	0.281	0.370	0.020	1.312	0.125	0.062	0.218	0.187	0.125
3/8	3/8 B.S.P.	0.573	0.281	0.490	0.435	0.343	0.485	0.025	1.500	0.187	0.062	0.218	0.250	0.156
1/2	1/2 B.S.P.	0.719	0.375	0.625	0.531	0.500	0.625	0.025	2.031	0.250	0.093	0.312	0.375	0.250
Unless otherwise specified, limits of tolerance of ± 0.010 in. shall apply. ^a BS 2779, "Fastening threads of BSP. sizes."														

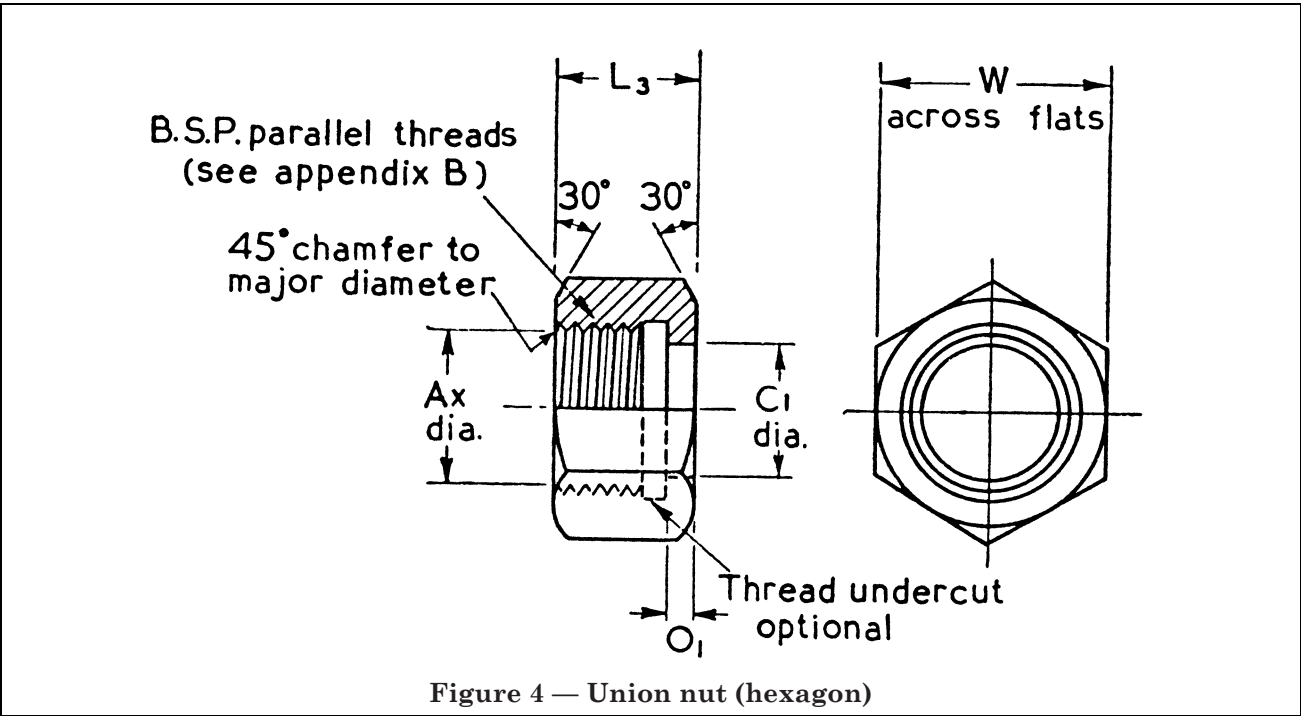


Table 2

Size of fitting, i.e. nominal hose bore	Thread on union nut (BS 2779 ^a)	Ax dia.	C1 dia.	L3	O1	W	
		Minor dia. of thread (min.)	Limits of tolerance + 0.010 – 0.000			Max.	Min.
in.	in.	in.	in.	in.	in.	in.	in.
1/8	1/8 B.S.P.	0.337	0.252	0.406	0.062	0.525	0.518
3/16	1/8 B.S.P.	0.337	0.252	0.406	0.062	0.525	0.518
1/4	1/4 B.S.P.	0.451	0.380	0.468	0.109	0.710	0.702
5/16	1/4 B.S.P.	0.451	0.380	0.468	0.109	0.710	0.702
3/8	3/8 B.S.P.	0.589	0.505	0.531	0.109	0.820	0.812
1/2	1/2 B.S.P.	0.734	0.641	0.687	0.187	1.010	1.000

Unless otherwise specified, limits of tolerance of ± 0.010 in. shall apply.

^a BS 2779, "Fastening threads of BSP. sizes."

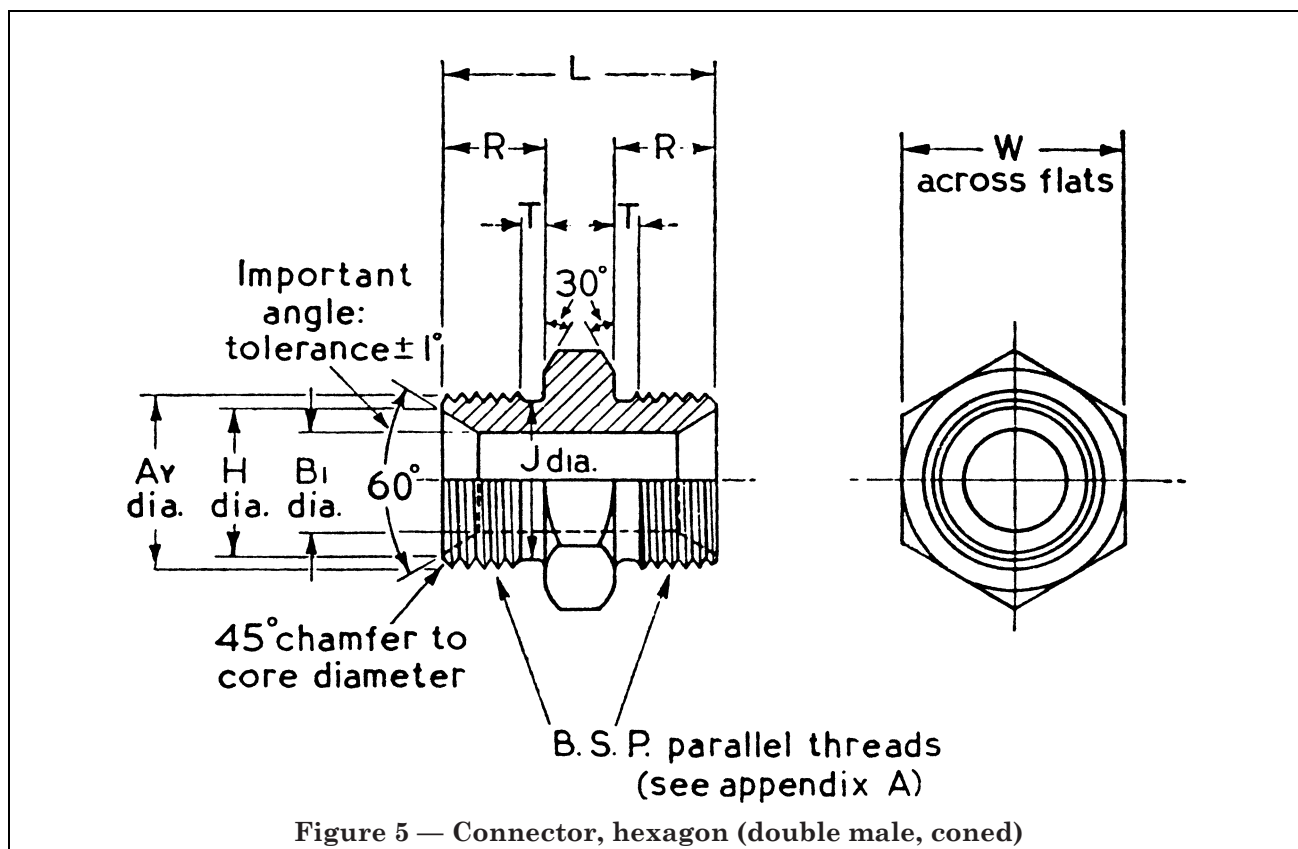


Table 3

Size of fitting, i.e. nominal hose bore	Thread on connector (BS 2779 ^a)	Ay dia.	B1.	H.	J.	L	R	T	W	
		Major dia. of thread (max.)		Limits of tolerance + 0.010 - 0.000	Limits of tolerance + 0.000 - 0.010				Max.	Min.
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1/8	1/8 B.S.P.	0.383	0.156	0.285	0.332	0.812	0.312	0.093	0.525	0.518
3/16	1/8 B.S.P.	0.383	0.156	0.285	0.332	0.812	0.312	0.093	0.525	0.518
1/4	1/4 B.S.P.	0.518	0.250	0.405	0.446	0.937	0.375	0.093	0.710	0.702
5/16	1/4 B.S.P.	0.518	0.250	0.405	0.446	0.937	0.375	0.093	0.710	0.702
3/8	3/8 B.S.P.	0.656	0.375	0.545	0.584	1	0.375	0.093	0.820	0.812
1/2	1/2 B.S.P.	0.825	0.437	0.609	0.720	1.375	0.500	0.125	1.010	1.000

Unless otherwise specified, limits of tolerance of ± 0.010 in. shall apply.

^a BS 2779, "Fastening threads of BSP. sizes."

Part 2. “Medium” series, flat and coned types (B.S.P. threads)

13 Scope

Par 2 of this standard specifies requirements for air hose couplings of $\frac{3}{16}$, $\frac{5}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and 1 in. nominal sizes for use at pressures not exceeding 150 lb/sq. in. Requirements for connector-reducers are also specified.

14 Designation of size of coupling

The size by which the coupling is designated shall be the nominal bore of the hose with which it is to be used.

15 Material

a) *Couplings*. The quality of the material used in the manufacture of the couplings shall be at least equivalent to the following:—

- i) Bronze or phosphor bronze complying with BS 369.⁶⁾
- ii) Brass complying with BS 249.⁷⁾
- iii) Steel complying with Specification En3 of BS 970.⁸⁾
- iv) Malleable cast iron complying with BS 310.⁹⁾

b) *Washers*. The washers shall be of specially selected leather, rubber, rubber asbestos compound, or other suitable approved material. The purchaser shall be given prior notification by the manufacturer of the type of washer he intends to supply.

16 Dimensions

The dimensions of the couplings shall be in accordance with those shown in Figure 11 to Figure 17 and Table 4 to Table 10 inclusive.

The minimum thickness of washers shall be $\frac{1}{8}$ in. (See Table 6).

17 Screw threads

Screw threads, male and female, shall be BS Pipe threads (parallel) complying with the requirements for “FREE FIT” specified in BS 2779.¹⁰⁾ (See Appendix A and Appendix B).

The first male and female threads shall be chamfered to 45° to core diameter.

18 Hexagons

The dimensions of hexagons on connectors and nuts shall conform to those specified in BS 1083.¹¹⁾ (See Figure 13 to Figure 17).

19 Tail-ends

Except when otherwise agreed between the purchaser and the manufacturer, tail-ends to which the hose is to be attached shall be bulbous and shall comply with the requirements of Table 4 or Table 5. Tail-ends of special design which employ external sleeves, ferrules or other clamping devices may also be used subject to agreement between the purchaser and the manufacturer. The ends of these special fittings shall, however, be so designed that they can be attached to standard connectors. In addition, these tail-ends, when assembled with hose, shall withstand the hydraulic pressure specified in Clause 21.

20 Interchangeability

All corresponding parts shall be interchangeable. (See Clause 19).

21 Hydraulic test

All couplings made from castings shall, when assembled, be subjected to a hydraulic test of 300 lb/sq. in. Couplings other than castings shall, when required, be subjected to the same test in the presence of the purchaser or his representative.

When assembling the couplings for hydraulic test, the force applied to the coupling nut to ensure a watertight joint shall not be excessive. Couplings showing signs of leakage during this test, by reason of either defective joint or porosity of metal, shall be liable to rejection.

22 Workmanship

Workmanship and finish shall be of good quality. All burrs and sharp edges shall be removed.

23 Inspection

The purchaser or his representative shall have access at all reasonable times to those portions of the works in which the couplings ordered are being manufactured, and in which the testing is taking place.

⁶⁾ BS 369, “5 per cent phosphor bronze (copper-tin-phosphorous) rods and sections (other than forging stock).”

⁷⁾ BS 249, “Leaded brass (58 per cent copper, 3 per cent lead) rods and sections (other than forging stock).”

⁸⁾ BS 970, “Wrought steels.”

⁹⁾ BS 310, “Blackheart malleable iron castings.”

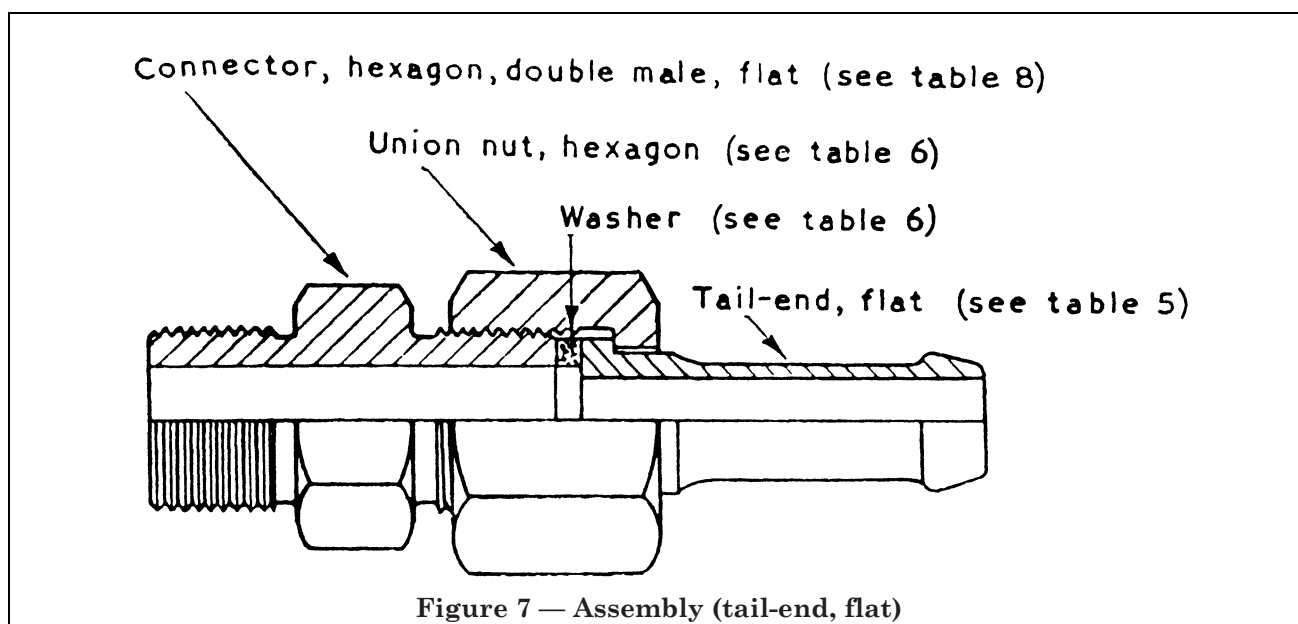
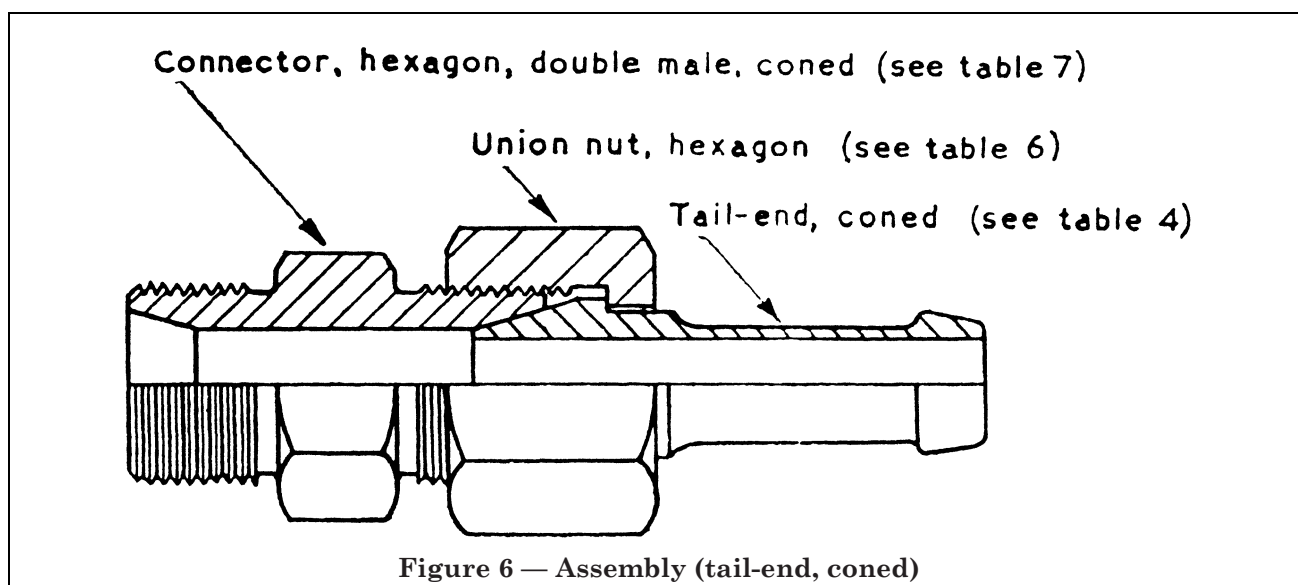
¹⁰⁾ BS 2779, “Fastening threads of BSP. sizes.”

¹¹⁾ BS 1083, “Precision hexagon bolts, screws and nuts.”

24 Test facilities

The manufacturer shall supply, at his own cost, labour and appliances for making the tests on his premises in accordance with this standard. Failing the existence of facilities for making the prescribed tests at his own works, the manufacturer shall be responsible for having the tests made elsewhere.

Hose couplings: Medium series (B.S.P. threads)



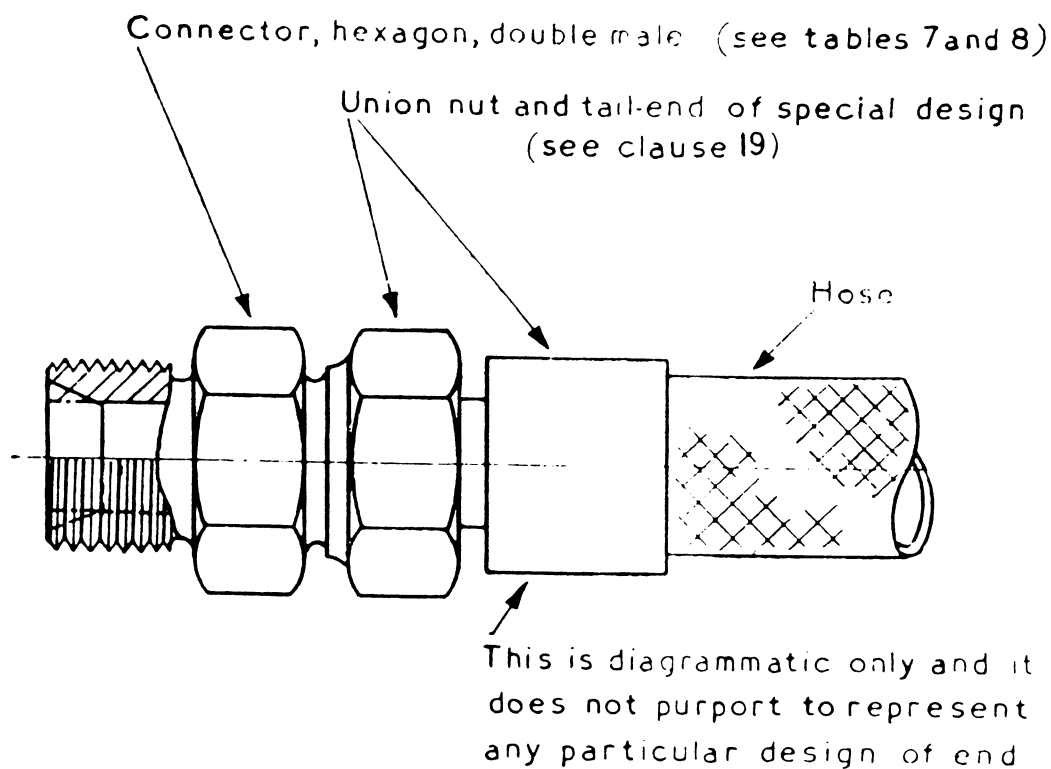


Figure 8a — Assembly (special design tail-end)

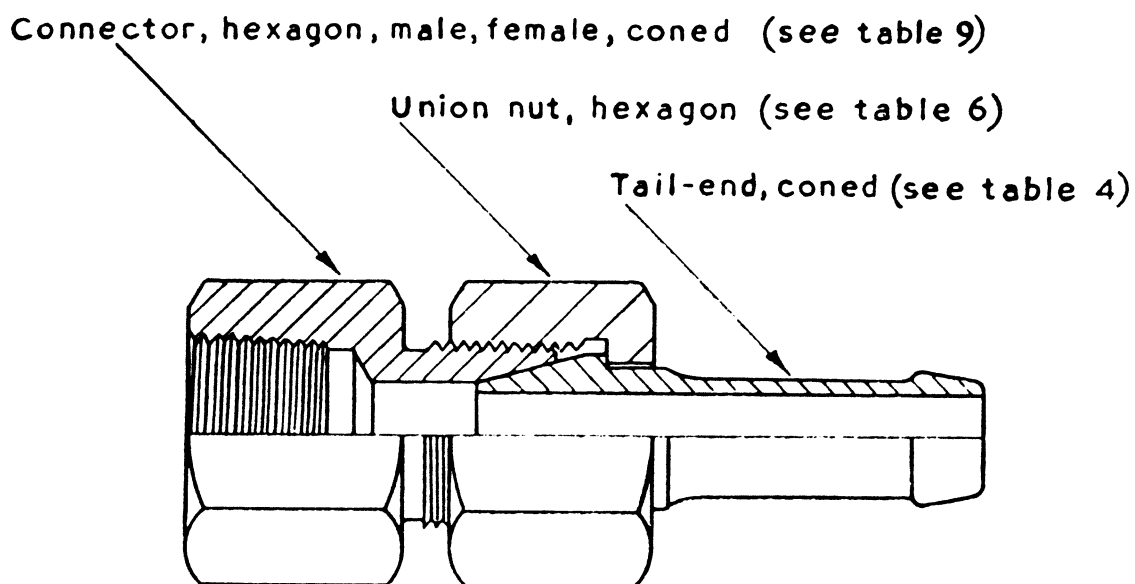


Figure 9a — Assembly (tail-end, coned)