Specification for

Hydraulic port and stud coupling using "O"-ring sealing and "G" series fastening threads

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Mechanical Engineering Standards Committee (MEE/-) to Technical Committee MEE/186 upon which the following bodies were represented:

Association of British Mining Equipment Companies
Association of Hydraulic Equipment Manufacturers
British Compressed Air Society
British Hydromechanics Research Association
British Steel Corporation
British Telecommunications
Department of Trade and Industry (National Engineering Laboratory)
Electricity Supply Industry in England and Wales
Engineering Equipment and Materials Users' Association
Federation of Manufacturers of Construction Equipment and Cranes
Health and Safety Executive
Institution of Mechanical Engineers
Machine Tool Industry Research Association
Ministry of Defence
National Coal Board

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

British Industrial Truck Association
British Rubber Manufacturers' Association
British Steel Industry
Hydraulic Press Manufacturers' Association

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Board of BSI and comes into effect on
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The following BSI references relate to the work on this standard:
Committee reference MEE/186
Draft for comment 83/73148 DC

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Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

Foreword

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee and is a revision of BS 5380 published in 1976 which is now withdrawn.

Features of the standard are substantially in conformity with the relevant parts of ISO 228/1 and ISO 1179.

The sealing systems detailed in the standard have been developed and proved in an extensive series of pressure and impulse tests.

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 4, 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.

1 Scope

This British Standard specifies the requirements for port and stud couplings, incorporating a toroidal sealing ring, for use with hydraulic components operating at pressures up to 400 bar[1)] and a temperature range of – 10 °C to + 120 °C.

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

2 Coupling material

The coupling shall be made from steel of grade 220M07 as specified in BS 970-1.

NOTE 1 The above material is not suitable for couplings required for use at temperatures below – 10 °C or above + 120 °C.
NOTE 2 Where the hydraulic fluid being used is other than mineral oil, the compatibility of the materials of the coupling with the fluid should be checked.

3 Dimensions

The basic dimensions of the stud coupling and of the port connection after plating shall be as given in Figure 1.

NOTE The stud coupling dimensions are such that they can be used with couplings complying with the requirements of BS 4368-1 and BS 4368-3 or with adaptors complying with the requirements of BS 5200.

Specific details of the thread undercut and seal recesses shall be as given in Figure 2.

The dimensions of the male stud for adjustable elbows and tees shall be as given in Figure 3.

4 Toroidal sealing ring

The appropriate toroidal sealing rings shall be as given in Figure 2 and shall comply with the requirements of BS 4518.

NOTE The material and the hardness rating of the sealing ring should be selected to suit service conditions.

5 Screw threads

The thread of the stud end and in the port of the component body shall be "G" series fastening threads in accordance with BS 2779, the external threads on the stud end being to class A tolerances. The dimensions shall be as given in Figure 1.

External and internal threads shall be chamfered to an included angle of 90°. The diameter of the chamfer shall commence at the minor or major diameter of the thread, as appropriate.

6 Surface texture of sealing faces

The surface texture of the port and stud coupling sealing faces shall not exceed the values given in Figure 2 and Figure 3 when measured in accordance with BS 1134-1.

7 Workmanship

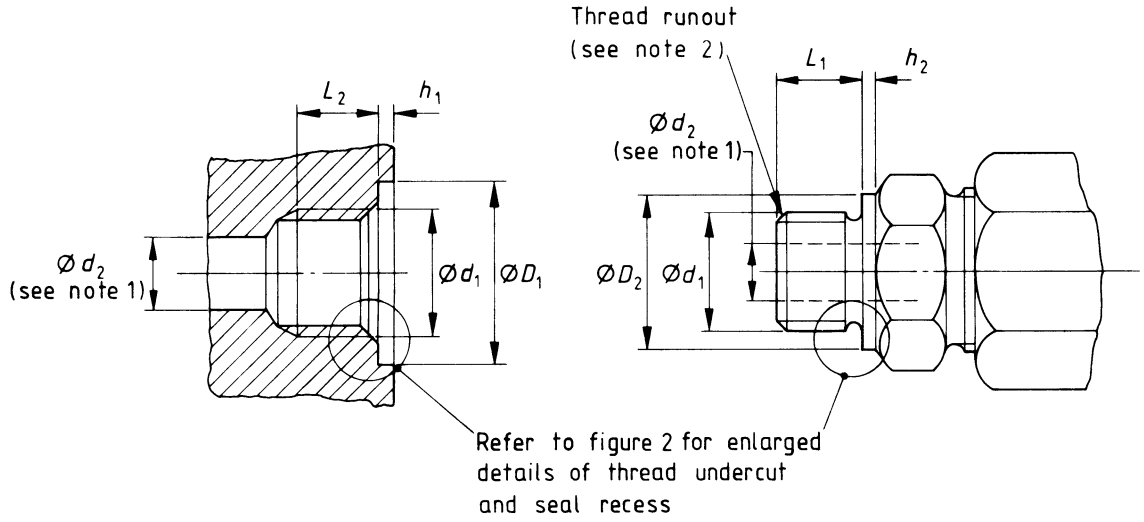
The stud end and port shall be cleanly and neatly finished, free from burrs, fins, sharp edges and other defects.

8 Protective treatment

The stud end shall be given a protective coating, i.e. cadmium, phosphate or zinc, in accordance with BS 3189 or BS 3382-1 or BS 3382-2 as applicable or a superior treatment.

NOTE 1 Severe service conditions may require this superior treatment.
NOTE 2 WARNING. The use of cadmium for plating purposes may be injurious to health; it is essential that adequate precautions be taken in its use.

[1)] 1 bar = 10^5 N/m^2 = 100 kPa.

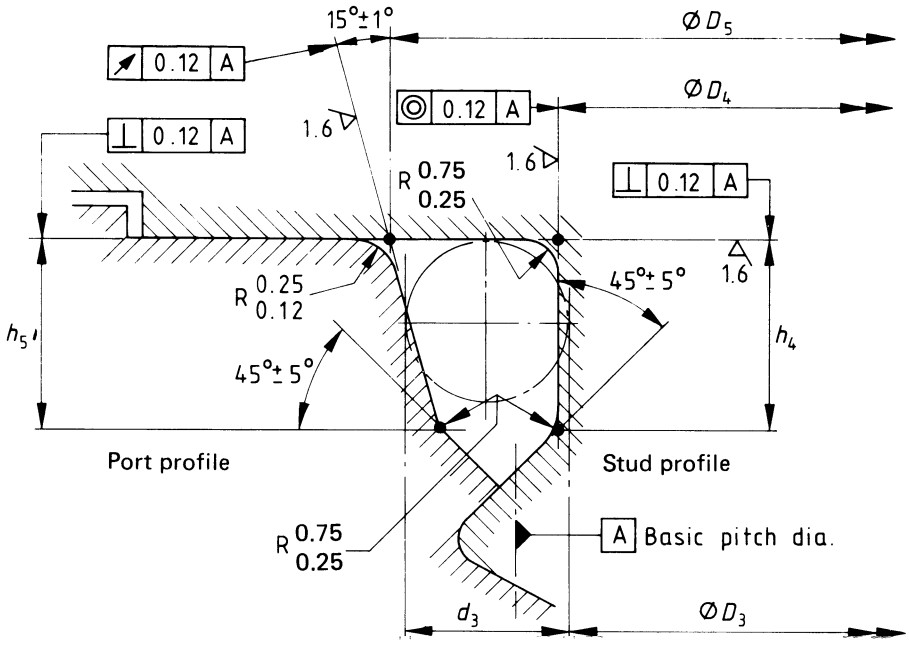


All dimensions are in millimetres

Thread designation (see clause **5**) d_1	**Thread length** L_1 **(stud) max.** L_2 **(port) min.**	**Counterbore** ϕD_1 min.	h_1 **max.** (see note 3)	h_2 **min.**	**Spigot** ϕD_2 max.
$G^1/_8$	10.5	15	0.6	1.0	14
$G^1/_4$	11.0	19	0.6	1.5	18
$G^3/_8$	12.5	23	0.6	2.0	22
$G^1/_2$	15.0	27	0.8	2.5	26
$G^5/_8$ (see note 4)	16.3	31	0.8	2.5	30
$G^3/_4$	16.3	33	1.1	2.5	32
G1	19.1	40	1.1	2.5	39
$G1^1/_4$	21.4	50	1.1	2.5	49
$G1^1/_2$	22.5	56	1.1	2.5	55
G2	25.7	69	1.1	3.0	68

NOTE 1 The maximum bore d_2 is that bore specified in the relevant Part of BS 4368 or BS 5200.
NOTE 2 Details of thread runouts are given in BS 1936.
NOTE 3 Counterbore ϕD_1 may be a spotface if desired.
NOTE 4 Non-preferred size.

Figure 1 — Basic dimensions for port connection and stud coupling

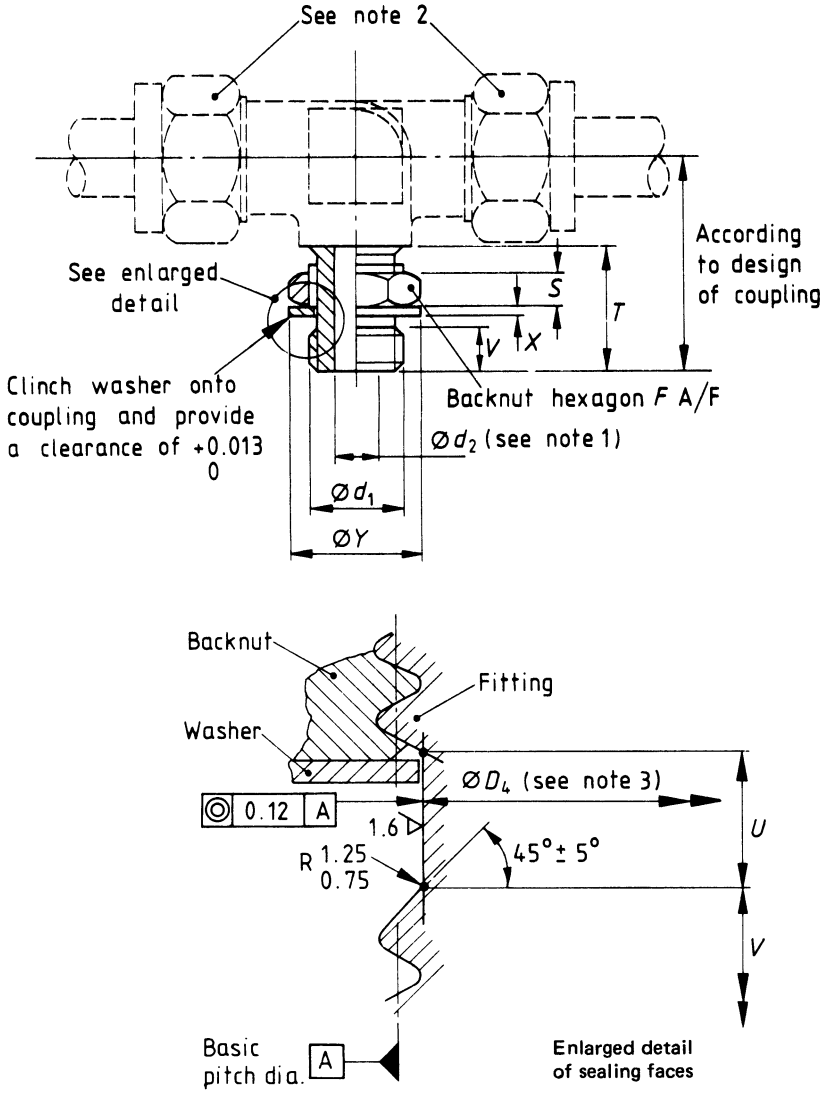


All dimensions are in millimetres

Thread designation	D_4 +0.12 0	h_4 +0.4 0	D_5 +0.12 0	h_5 +0.4 0	Toroidal sealing ring (see note 1)		
					D_3 nom.	d_3 nom.	Ref. no.
$G^1/_8$	8.00	2.1	11.24	1.3	8.1	1.6	0081-16
$G^1/_4$	11.00	2.0	14.16	1.2	10.1	1.6	0101-16
$G^3/_8$	14.28	3.1	18.86	1.9	13.6	2.4	0136-24
$G^1/_2$	17.72	3.1	22.40	1.9	17.6	2.4	0176-24
$G^5/_8$ (see note 2)	20.18	3.9	26.00	2.4	19.5	3.0	0195-30
$G^3/_4$	23.20	3.9	28.92	2.4	22.5	3.0	0225-30
G1	29.78	3.9	35.50	2.4	29.5	3.0	0295-30
$G1^1/_4$	37.84	3.9	43.56	2.4	36.5	3.0	0365-30
$G1^1/_2$	43.70	3.9	49.42	2.4	42.5	3.0	0425-30
G2	55.70	3.9	61.42	2.4	54.5	3.0	0545-30

NOTE 1 Toroidal sealing rings in accordance with BS 4518.
NOTE 2 Non-preferred size.
NOTE 3 The methods of indicating surface texture and geometrical tolerances are in accordance with BS 308-2 and BS 308-3.

Figure 2 — Undercut, recess and seal dimensions



All dimensions are in millimetres

Thread designation d_1	F nom.	S + 0.12	T ± 0.4	U + 0.4 0	V max.	X ± 0.1	Y nom. (see note 4)
$G^1/_8$	14	5.5	14.99	3.54	5.30	0.75	14
$G^1/_4$	19	6.5	19.99	4.84	7.90	0.75	18
$G^3/_8$	22	7.0	20.99	4.84	8.30	0.75	22
$G^1/_2$	27	9.0	27.60	5.40	11.9	1.00	26
$G^5/_8$ (see note 5)	30	9.0	27.60	5.40	12.0	1.00	30
$G^3/_4$	32	10.5	30.60	6.45	12.4	1.25	32
G1	41	10.5	33.89	6.94	15.2	1.25	39
$G1^1/_4$	50	10.5	36.19	6.94	17.5	1.25	49
$G1^1/_2$	55	10.5	36.19	6.94	17.5	1.25	55
G2	70	10.5	40.49	6.94	21.8	1.25	68

NOTE 1 The maximum bore d_2 is that bore specified in the relevant Part of BS 4368 or BS 5200.
NOTE 2 Profile to suit elbow, tee or coupling fitting, e.g. BS 4368-1 or BS 4368-3 and BS 5200.
NOTE 3 Refer to Figure 2 for this dimension.
NOTE 4 ϕ Y is outside of washer after clinching.
NOTE 5 Non-preferred size.
NOTE 6 The methods of indicating surface texture and geometrical tolerances are in accordance with BS 308-2 and BS 308-3.

Figure 3 — Dimensions of male adjustable elbows and tees

Publications referred to

BS 308, *Engineering drawing practice.*

BS 308-2, *Dimensioning and tolerancing of size.*

BS 308-3, *Geometrical tolerancing.*

BS 970, *Specification for wrought steels for mechanical and allied engineering purposes.*

BS 970-1, *General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels.*

BS 1134, *Method for the assessment of surface texture.*

BS 1134-1, *Method and instrumentation.*

BS 1936, *Undercuts and runouts for screw threads.*

BS 2779, *Pipe threads where pressure-tight joints are not made on the threads.*

BS 3189, *Phosphate treatment of iron and steel.*

BS 3382, *Electroplated coatings on threaded components.*

BS 3382-1, *Cadmium on steel components — published together.*

BS 3382-2, *Zinc on steel components — published together.*

BS 4368, *Carbon and stainless steel compression couplings for tubes.*

BS 4368-1, *Heavy series (metric series).*

BS 4368-3, *Light series (metric).*

BS 4518, *Specification for metric dimensions of toroidal sealing rings ("O"-rings) and their housings.*

BS 5200, *Dimensions of hydraulic connectors and adaptors.*

ISO 228/1, *Pipe threads where pressure-tight joints are not made on the threads*[2)].

ISO 228/1-1, *Designation, dimensions and tolerances.*

ISO 1179, *Pipe connections, threaded to ISO 228/1, for plain end steel and other metal tubes in industrial applications*[2)].

[2)] Referred to in the foreword only.

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