

Specification for

The tapping of holes to receive wire thread inserts (UNC and UNF threads) —

Part 2: Diameters below $\frac{1}{4}$ in

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices' Technical Committee	Institution of Heating and Ventilating Engineers
Association of Consulting Engineers	Institution of Mechanical Engineers
Association of Mining Electrical and Mechanical Engineers	Institution of Mechanical Engineers (Automobile Division)
Board of Trade	Institution of Production Engineers
British Chemical Plant Manufacturers' Association	Locomotive and Allied Manufacturers' Association of Great Britain
British Compressed Air Society	London Transport Board
British Electrical and Allied Manufacturers' Association*	Machine Tool Trades Association
British Gear Manufacturers' Association	Ministry of Defence, Army Department*
British Internal Combustion Engine Manufacturers' Association	Ministry of Defence, Navy Department*
British Iron and Steel Federation	Ministry of Labour (H.M. Factory Inspectorate)
British Mechanical Engineering Federation	Ministry of Power
British Railways Board	Ministry of Public Building and Works
Crown Agents for Oversea Governments and Administrations	Ministry of Technology — National Engineering Laboratory
Electricity Council, the Generating Board and the Area Boards in England and Wales	Ministry of Transport
Engineering Equipment Users' Association	National Coal Board
Gas Council	National Physical Laboratory (Ministry of Technology)
Institute of Marine Engineers	Radio Industry Council
Institution of Civil Engineers	Royal Institute of British Architects
Institution of Gas Engineers	

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the Committee entrusted with the preparation of this standard:

British Plastics Federation	Society of British Aerospace Companies Limited
Gauge and Tool Makers' Association	Society of Motor Manufacturers and Traders Limited
Institute of the Motor Industry (Incorporated)	Individual manufacturers
Ministry of Aviation	
Screw Thread Tool Manufacturers' Association	

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Foreword

This standard makes reference to the following British Standards:

BS 919, *Screw gauge limits and tolerances — Part 1: Gauges for screw threads of Unified form.*

BS 949, *Screwing taps — Part 2: Taps for Unified threads.*

BS 1044, *Gauge blanks — Part 1: Plug, ring and calliper gauges.*

BS 1580, *Unified screw threads — Part 3: Diameters below $\frac{1}{4}$ in.*

When BS 3409 was issued in 1961 it made provision for Unified tapped holes in sizes $\frac{1}{4}$ in and over as recognition of Unified threads below $\frac{1}{4}$ in was restricted to five selected sizes.

Since that time, not only has the use of what are commonly known as the “numbered sizes” increased considerably, but the complete series with UNC and UNF threads has been incorporated in ISO Recommendation 263 — where it forms part of the international system of screw threads in inch units — and is now covered by a British Standard, namely, BS 1580, Part 3.

It therefore seemed desirable to extend the range of BS 3409 to provide tapped holes for wire thread inserts in these sizes and Part 2 has accordingly been prepared. As in the earlier standard, now known as Part 1, this part does not standardize the inserts themselves, but specifies limits of sizes for tapped holes which, when assembled with an insert, will give the required nominal size and class of tolerance of the internal thread in question.

Unlike Part 1, this standard provides only for Class 2B holes as there are no Class 1B tolerances for Unified threads in sizes below $\frac{1}{4}$ in. It should also be noted that, in the case of the minor diameter, the committee responsible for this specification have felt obliged to depart from the principle of adhering strictly to the Unified tolerance formulae. This has been necessary because the formula in question contains a constant which results in a large tolerance and consequent risk of too great a reduction in the possible depth of engagement on the smaller sizes. Tolerances which are two thirds of the values obtained by the standard formula have therefore been adopted for this element; it should be noted that they are based on the minimum major diameter of the hole for the insert and not on the nominal major diameter of the thread in question.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 9 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.

Section 1. Tapped holes

1 Scope

This British Standard comprises three sections:
 Section 1, which specifies limits of size for tapped holes to accommodate wire thread inserts to provide thread sizes from No. 2 to No. 12 UNC and UNF;
 Section 2, which recommends screwing taps intended to produce holes to the limits of size specified in Section 1;
 Section 3, which gives a recommended gauging system for checking the tapped holes.

2 Form of thread and limits of size

Holes shall be threaded to provide Class 2B limits in accordance with BS 1580, Part 3¹⁾ when fitted with the wire thread inserts and shall be of ISO/Unified form as illustrated in Figure 1.

Holes for inserts for UNC threads shall be tapped to the limits specified in Table 1 and those for inserts for UNF threads shall be tapped to the limits specified in Table 2.

NOTE The limits given in Table 1 and Table 2 are designed to permit the production, under normal conditions, of holes to suit the class of thread stated. Under ideal conditions it may be possible to achieve a closer class of fit on the final installation than that indicated in the table.

3 Identification

In order to distinguish requirements for holes intended to receive inserts from those intended to receive threaded components it is recommended that the former be clearly identified on drawings and specifications. This may be done by specifying the actual major, effective and minor diameters of the holes and their limits or by the addition of the words “wire insert” and number of this British Standard to the designation of the thread, e.g. 6-32 UNC-2B, Wire inset, BS 3409, Part 2.

Table 1 — Limits and tolerances suitable for tapped holes for inserts for UNC threads, Class 2B^a

1	2	3	4	5	6	7	8
Designation	Major diameter	Effective diameter			Minor diameter		
	Min.	Max.	Tol.	Min.	Max.	Tol.	Min.
	in	in	in	in	in	in	in
2-56 UNC	0.109 2	0.098 9	0.001 3	0.097 6	0.094 1	0.004 2	0.089 9
3-48 UNC	0.126 1	0.113 9	0.001 4	0.112 5	0.108 0	0.004 5	0.103 5
4-40 UNC	0.144 5	0.129 8	0.001 6	0.128 2	0.122 4	0.005 0	0.117 4
5-40 UNC	0.157 5	0.142 9	0.001 7	0.141 2	0.135 1	0.004 7	0.130 4
6-32 UNC	0.178 6	0.160 1	0.001 8	0.158 3	0.150 3	0.005 5	0.144 8
8-32 UNC	0.204 6	0.186 2	0.001 9	0.184 3	0.175 8	0.005 0	0.170 8
10-24 UNC	0.244 1	0.219 3	0.002 2	0.217 1	0.205 1	0.006 1	0.199 0
12-24 UNC	0.270 1	0.245 4	0.002 3	0.243 1	0.230 8	0.005 8	0.225 0

^a See note to Clause 2.

¹⁾ BS 1580, “Unified screw threads”, Part 3, “Diameters below $\frac{1}{4}$ in”.