

BS ISO 20168:2016



BSI Standards Publication

# Resistance welding — Locking tapers for electrode holders and electrode caps

**National foreword**

This British Standard is the UK implementation of ISO 20168:2016.

The UK participation in its preparation was entrusted to Technical Committee WEE/29, Resistance welding.

A list of organizations represented on this committee can be obtained on request to its secretary.

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© The British Standards Institution 2016.  
Published by BSI Standards Limited 2016

ISBN 978 0 580 92326 5

ICS 25.160.20

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2016.

**Amendments/corrigenda issued since publication**

Date	Text affected
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**Resistance welding — Locking tapers  
for electrode holders and electrode  
caps**

*Soudage par résistance — Cônes de serrage pour porte-électrodes et  
pointes d'électrodes*



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## Foreword

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The committee responsible for this document is ISO/TC 44, *Welding and allied processes*, Subcommittee SC 6, *Resistance welding and allied mechanical joining*.

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# Resistance welding — Locking tapers for electrode holders and electrode caps

## 1 Scope

This document specifies the dimensions and tolerances for electrode holders and of spot welding electrode caps, where a locking taper is used.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 5182, *Resistance welding — Materials for electrodes and ancillary equipment*

ISO 5821, *Resistance welding — Spot welding electrode caps*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17677-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 3.1

#### locking taper

taper allowing for a tight fit between an electrode holder and the electrode cap as their taper angles differ by  $0^{\circ} 2' 60''$ , ensuring the electrode cap engagement point is at the skirt of the cap and electrode holder

Note 1 to entry: See [Figure 1](#).

Note 2 to entry: Traditionally called “Fisher taper”.

Note 3 to entry: During welding, the electrode cap tightens further on the electrode holder.



Figure 1 — Principle of a locking taper

## 4 Dimensions and tolerances

### 4.1 General

Table 1 gives the dimensions for three typically used electrode cap and holder sizes: 13 mm, 16 mm and 20 mm.

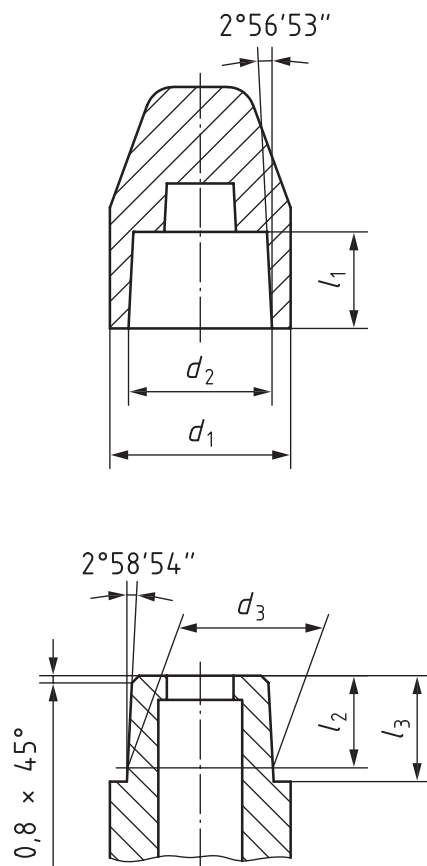
The taper angles of electrode caps and holders are to be verified by the use of certified ring gauges and plugs.

### 4.2 Electrode holders

The taper of the electrode holders shall be  $2^{\circ} 58' 54''$  in accordance with Figure 2.

### 4.3 Electrode caps

The taper of the electrode caps shall be  $2^{\circ} 56' 53''$  in accordance with Figure 2.



#### Key

$l_1$	electrode cap locking taper length	$d_1$	outside diameter of electrode cap
$l_2$	electrode holder locking taper length	$d_2$	inside diameter of electrode cap (at base of locking taper)
$l_3$	total length of electrode holder taper	$d_3$	diameter of electrode holder at base of locking taper

Figure 2 — Dimensions for electrode holder and electrode cap with locking taper



**Table 1 — Tolerances for the dimensions for electrode holders and electrode caps with locking tapers**

Dimensions in millimetres

$d_1$ Nominal size of electrode cap and holder	$d_2$ +0,05 0	$d_3$ 0 -0,05	$l_1$ +0,5 0	$l_2$ +0,5 0	$l_3$ +0,5 0
13	10,01	10,21	8,81	8,84	10,36
16	12,56	12,75	9,63	9,65	11,18
20	15,88	16,08	10,69	10,19	11,71

## 5 Designation

### 5.1 Electrode holders

Electrode holders shall be designated in accordance with this document and nominal diameter,  $d_1$ .

EXAMPLE A spot welding electrode holder, with nominal diameter 20 mm is designated as follows:

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### 5.2 Electrode caps

Electrode caps shall be designated in accordance with ISO 5821, except the number of this document shall be used to indicate that the cap has a locking taper.

EXAMPLE A spot welding electrode cap type B0, width  $d_1 = 16$  mm, length  $l_1 = 20$  mm,  $d_2 = 8$  mm and  $a = 45^\circ$ , is designated as follows:

**ISO 20168:2016-B0 - 16 - 20 - 8 - 45**

## 6 Material

The materials used shall be in accordance with ISO 5182.

## 7 Marking

The packaging shall be marked with the full designation and material used.

## Bibliography

- [1] ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*
- [2] ISO 1119, *Geometrical product specifications (GPS) — Series of conical tapers and taper angles*
- [3] ISO 5822, *Spot welding equipment — Taper plug gauges and taper ring gauges*
- [4] ISO 17677-1, *Resistance welding — Vocabulary — Part 1: Spot, projection and seam welding*







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