

Specification for

Resistance spot welding of uncoated and coated low carbon steel

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The preparation of this British Standard was entrusted by the Welding Standards Policy Committee (WEE/-) to Technical Committee WEE/29, upon which the following bodies were represented:

- British Steel Industry
- Railway Industry Association of Great Britain
- Society of Motor Manufacturers and Traders Ltd.
- Welding Institute
- Welding Manufacturers' Association (BEAMA Ltd.)
- Coopted members

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Foreword

This revision of BS 1140 has been prepared under the direction of the Welding Standards Policy Committee. BS 1140 was first published in 1943, being subsequently revised in 1946, 1957 and 1980. It forms one of a series of standards on resistance processes.

The applications of the spot welding process are so wide that it is not practicable to give specific welding conditions. However, a series of annexes gives information designed to assist the choice of welding conditions where these are not specified in a relevant application standard.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 16, 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 procedures for resistance spot welding in the fabrication of assemblies of uncoated and coated low carbon steel comprising two or three thicknesses of metal, where the single sheet thickness of the components to be welded is within the following ranges:

- a) uncoated sheets: 0.4 mm to 3.0 mm (see 5.1);
- b) uncoated plates: 3.0 mm to 12.0 mm (see 5.1);
- c) hot-dip zinc coated sheets: 0.4 mm to 3.0 mm (see 5.2);
- d) hot-dip iron-zinc alloy coated sheets (galvaneal): 0.4 mm to 3.0 mm (see 5.2);
- e) electrolytic zinc coated sheets: 0.4 mm to 3.0 mm (see 5.3);
- f) electrolytic zinc-nickel coated sheets: 0.4 mm to 3.0 mm (see 5.4);
- g) terne coated sheets: 0.4 mm to 3.0 mm (see 5.5);
- h) aluminium coated sheets: 0.4 mm to 3.0 mm (see 5.6);
- i) hot-dip zinc-55 % aluminium coated sheets 0.4 mm to 3.0 mm (see 5.7);
- j) hot-dip zinc-5 % aluminium coated sheets 0.4 mm to 3.0 mm (see 5.8).

Guidance on the choice of appropriate welding equipment and approximate spot welding conditions is given in annexes A and B respectively.

This procedure does not apply to the welding of sheets or plates of dissimilar thickness where the thickness ratio is greater than 3 to 1.

In addition to the definitive requirements, this standard also requires the items detailed in clause 4 to be documented. For compliance with this standard, both the definitive requirements and the documented items have to be satisfied.

2 References

2.1 Normative references

This British Standard incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this British Standard only when incorporated in it by updating or revision.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this British Standard, the following definitions apply. For other technical terms applicable to this British Standard, the definitions given in BS 499-1:1991 apply.

3.1 weld size

the average weld diameter

3.2 weld nugget

a zone in a resistance weld where the metal has been melted

3.3 nominal weld diameter

the diameter of the plug (slug) measured at the base of the nugget (see Figure 1)

3.4 cross-tension test

a test to determine the tensile force that the weld can sustain

3.5 shear test

a test to determine the shear force that the weld can sustain

3.6 corona bond

the area of the weld at the faying surfaces, in which solid phase bonding has occurred [see Figure 1b)]

3.7 interface failure

the fracture through the weld between the sheets at the plane of the interface

3.8 plug (slug) failure

the fracture of a weld through the sheet thickness at the edge of the weld [see Figure 1a)]

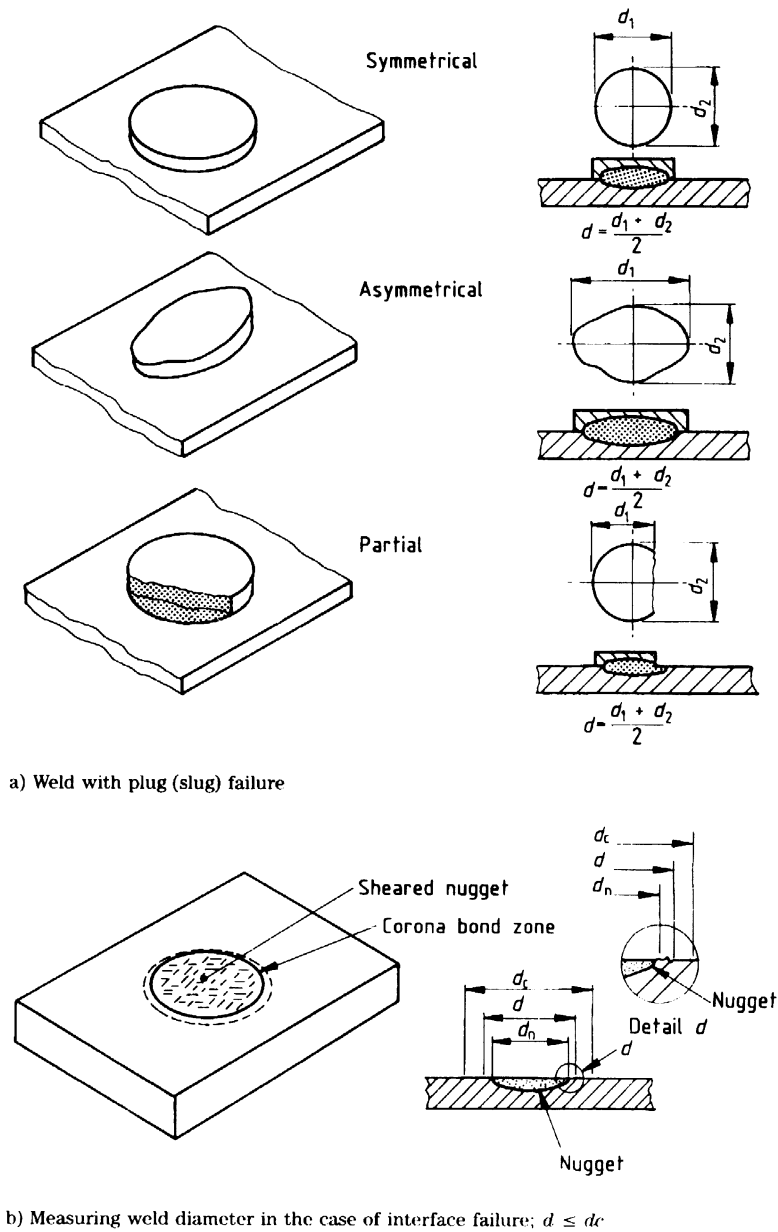


Figure 1 — Measurement of weld size