

JIS

JAPANESE INDUSTRIAL STANDARD

**Method of Inspection
for Spot Weld**

JIS Z 3140—1989

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Method of Inspection for Spot Weld

Z 3140-1989

1. Scope

This Japanese Industrial Standard specifies the test method and testing criteria for spot weld, hereinafter referred to as the "weld", of the low carbon steel, low alloy steel, stainless steel, aluminium and aluminium alloy 0.4 mm or over up to and including 5.0 mm in sheet thickness. However, the hardenable material, surface-treated material, clad material and a combination of different materials of which tensile strength of weld is within 25 % of tensile shear strength shall be excepted.

Remark: The units and numerical values given in { } in this Standard are based on the International System of Units (SI) and are appended for informative reference.

Further, the traditional units and numerical values shall be replaced by the accompanying SI units and numerical values given in { } or by those given in the Appendix on Jan. 1, 1991.

2. Grade of Weld

The weld grade shall be classified as shown in Table 1 according to the mechanical properties and the evenness of one side outer surface of the weld.

Table 1. Grade of Weld

Grade of weld	Mechanical properties and evenness
Grade A	Weld requiring exceptional strength
Grade B	Weld requiring strength
Grade C	Weld other than Grade A and Grade B
Grade AF	Weld requiring properties of Grade A together with even surface
Grade BF	Weld requiring properties of Grade B together with even surface
Grade CF	Weld requiring properties of Grade C together with even surface

Applicable Standards:

JIS Z 3136-Method of Tension Shear Test for Spot Welded Joint

JIS Z 3139-Method of Macro Test for Section of Spot Welded Joint

3. Test Item

The test shall be carried out on No. 1 test piece or No. 2 test piece (refer to 4.2), and the test items shall be as given in Table 2 according to the grade of weld. When the relation between the tensile shear load and the nugget dimension is known for No. 1 test piece, either the section test or the tensile shear test may be omitted subject to agreement between the parties concerned with acceptance.

Table 2. Test Item

Grade of weld	In the case of No. 1 test piece	In the case of No. 2 test piece
Grade A Grade B	Appearance test Section test Tensile shear test	Appearance test Section test
Grade C	Section test	Section test
Grade AF Grade BF	Appearance test Section test Tensile shear test Evenness test	Appearance test Section test Evenness test
Grade CF	Appearance test Section test Evenness test	Appearance test Section test Evenness test

4. Spot Weld Test Piece

4.1 Conditions of Test Piece Preparation

4.1.1 Classification of Test Piece The test piece shall be classified into No. 1 test piece to be formed out of a continuous spot weld specimen and No. 2 test piece to be formed out of a product specimen or a specimen of material equal to the product.

4.1.2 Material The material to be formed into test piece shall be of the same material, sheet thickness, heat treatment, surface condition, etc. as those for actual use.

4.1.3 Welding Equipment Welding equipment for test piece preparation, such as power source equipment and welder, shall be one actually used.

4.1.4 Electrode Tip Electrode tips for test piece preparation shall be the same as those for actual use.

4.2 Preparation of Test Piece

4.2.1 No. 1 Test Piece No. 1 test piece shall be used for the test of weld of a continuous spot weld specimen, and preparation of the test piece shall be in accordance with JIS Z 3136.

4.2.2 No. 2 Test Piece No. 2 test piece shall be used for the test of weld of a product specimen or a specimen of the material equal to the product, and the test piece shall be machined out of either of the test specimens.