



SLOVENSKI STANDARD
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**Uporovno varjenje - Slovar - 1. del: Točkovno, bradavično in kolutno varjenje
(ISO/DIS 17677-1:2017)**

Resistance welding - Vocabulary - Part 1: Spot, projection and seam welding (ISO/DIS 17677-1:2017)

Widerstandsschweißen - Begriffe - Teil 1: Punkt-, Buckel- und Rollennahtschweißen (ISO/DIS 17677-1:2017)

Soudage par résistance - Vocabulaire - Partie 1: Soudage par points, par bossages et à la molette (ISO/DIS 17677-1:2017)

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Resistance welding — Vocabulary —

Part 1: Spot, projection and seam welding

*Soudage par résistance — Vocabulaire —**Partie 1: Soudage par points, par bossages et à la molette*

ICS: 25.160.10; 01.040.25

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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 — Vocabulary — Part 1: Spot, projection and seam welding

1 Scope

This part of ISO 17677 establishes a vocabulary of terms and definitions for resistance spot welding, projection welding and seam welding.

NOTE In addition to terms used in English and French, two of the three official ISO languages, this part of ISO 17677 gives the equivalent terms in German; these are published under the responsibility of the member body for Germany (DIN). However, only the terms and definitions given in the official languages can be considered as ISO terms and definitions.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 Procedures

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3.1.1

chisel test

test in which a chisel is driven between the sheets near to adjacent welds until either fracture occurs or until the material near the weld yields or bends

3.1.2

cross tension test

tensile test of a resistance welded specimen to determine the mechanical properties and failure mode of the weld

3.1.3

cross-wire welding

projection welding (3.1.11) of crossed wires or rods

3.1.4

direct welding

resistance welding secondary circuit variant in which welding current and *electrode force* (3.3.6) are applied to the workpieces by directly opposed *electrodes* (3.2.1) and only one weld is made by one welding operation

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Note 1 to entry: See Figure 13 for typical arrangements.

3.1.5**indirect spot welding**

resistance welding secondary circuit variant in which the welding current flows through the workpieces in locations away from, as well as at, the welds

Note 1 to entry: See Figure 14 for typical arrangements.

3.1.6**multiple impulse welding**

welding with more than one impulse

Note 1 to entry: See Figures 4 to 8 for related time and *electrode force* (3.3.6) diagrams.

3.1.7**multiple spot welding**

spot welding in which two or more welds are made simultaneously in one welding operation

3.1.8**parallel spot welding**

resistance welding secondary circuit variant in which the secondary current is divided in parallel electrical paths to make two or more welds simultaneously

Note 1 to entry: See Figure 12a).

3.1.9**peel test**

destructive test in which a resistance-welded lap joint is tested by applying a peel force which results in stresses mainly in the thickness direction of the weld

3.1.10**pillow test**

destructive test in which internal pressure is applied in order to test for leaks and the strength of a seam weld

3.1.11**projection welding**

resistance welding in which the resulting welds are localized at predetermined points by projections, embossments or intersections, concentrating force and current by their geometry

Note 1 to entry: The projections are raised on, or formed from, one or more of the *faying surfaces* (3.3.13) and collapse during welding.

3.1.12**resistance spot welding**

resistance welding process that produces a weld at the *faying surfaces* (3.3.13) between overlapping parts by the heat obtained from resistance to the flow of welding current through the workpieces from *electrodes* (3.2.1) that serve to concentrate the welding current and pressure at the weld area

3.1.13**resistance welding electrode**

part of a resistance welding machine through which the welding current and, in most cases, a force are applied directly to the workpiece

cf. *electrode* (3.2.1)

EXAMPLE Rotating wheel, rotating roll, bar, cylinder, plate, clamp, chuck, variations thereof.

3.1.14

seam welding

resistance welding in which force is applied continuously and current is applied continuously or intermittently to produce a linear weld, the workpieces being between two *electrode wheels* (3.2.5) or an electrode wheel and an electrode bar

3.1.15

series spot welding

resistance welding secondary circuit variant in which the secondary current is conducted through the workpieces and *electrodes* (3.2.1) in a series electrical path to simultaneously form multiple resistance spot, seam or projection welds

Note 1 to entry: See Figures 1 and 12.

3.1.16

shunt weld

first weld on a series of spot welds, which acts as a shunt

3.1.17

tensile shear test

test in which a lap-welded specimen is subjected to a tensile force with the aim of determining the mechanical properties of the specimen

3.1.18

stitch welding

spot welding in which successive welds overlap

3.2 Hardware and tools

3.2.1

electrode

component of the electrical circuit that supplies electrical power and applies *electrode force* (3.3.6) to the workpiece

3.2.1.1

angled electrode

bent electrode

electrode for spot or *stitch welding* (3.1.18) whose electrode *working face* (3.2.6) is not normal to the mounting axis

3.2.1.2

contact electrode

resistance welding electrode designed to conduct secondary current through a workpiece without making a weld

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3.2.1.3

**offset electrode
eccentric electrode**

electrode for spot or *stitch welding* (3.1.18) whose *electrode working face* (3.2.6) is not concentric with the axis of the *electrode adaptor* (3.2.2)

3.2.2

**electrode adaptor
shank (deprecated)**

device attaching an *electrode cap* (3.2.3) by means of male or female taper

3.2.3

electrode cap

replaceable *electrode* (3.2.1) tip used in *resistance spot welding* (3.1.12)

3.2.4

electrode holder

device holding a welding *electrode* (3.2.1)

3.2.5

**electrode wheel
seam welding wheel**

rotating *resistance welding electrode* (3.1.13) of ring or disc shape

3.2.6

electrode working face

(resistance spot welding and projection welding) end of a *resistance welding electrode* (3.1.13) in contact with the workpiece

3.2.7

welding head

device comprising the force generation and guiding system, carrying an *electrode holder* (3.2.4), platen or *electrode wheel* (3.2.5) head

3.3 Welding process and parameters

3.3.1

chill time**quench time**

period of time between the end of the weld current and the start of post-heat current during which no current flows and the weld is cooled by the *electrodes* (3.2.1)

See Figure 5.

3.3.2

cool time**pause time (deprecated)**

time interval between successive heat times in *multiple impulse welding* (3.1.6) or *seam welding* (3.1.14)

See Figures 4, 7 and 8.

3.3.3**current delay time**

time interval between reaching set force and initiation of current flow

See Figure 3.

3.3.4**current-off time**

period of time between the cessation of current in one welding cycle and the beginning of current in the next one

3.3.5**roll spot welding**

resistance welding process variant that makes intermittent spot welds using one or more rotating circular electrodes

Note 1 to entry: The rotation of the *electrodes* (3.2.1) might or might not be stopped during the making of a weld.

3.3.6**electrode force**

force applied by the electrodes to the workpieces

cf. *welding force* (3.3.41)

3.3.6.0.1**welding electrode force**

electrode force applied during *weld time* (3.3.37)

3.3.6.0.2**forging electrode force****forge force**

electrode force applied in the *forge force time* (3.3.38)

3.3.6.1**dynamic electrode force**

electrode force applied during the actual welding cycle

3.3.6.2**static electrode force**

electrode force with no current flowing and no movement in the welding machine

3.3.6.3**theoretical electrode force**

force, neglecting friction and inertia, available at the electrodes of a resistance welding machine by virtue of the initial force and the theoretical mechanical properties of the system

3.3.7**electrode force programme**

predetermined sequence of changes of force during welding