PD ISO/TR 25901-3:2016



BSI Standards Publication

Welding and allied processes — Vocabulary

Part 3: Welding processes

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National foreword

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Welding and allied processes — Vocabulary —

Part 3: Welding processes

Soudage et techniques connexes — Vocabulaire —

Partie 3: Procédés de soudage

Reference number
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Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 44, *Welding and allied processes*, Subcommittee SC 7, *Representation and terms*, in collaboration with Commission VI, *Terminology, of the International Institute of Welding* (*IIW*).

This first edition of ISO/TR 25901-3, together with the other parts of ISO/TR 25901, cancels and replaces ISO 857-1:1998 and ISO/TR 25901:2007, of which it constitutes a revision.

ISO/TR 25901 consists of the following parts, under the general title *Welding and allied processes — Vocabulary*:

— *Part 1: General terms [Technical Report]*

— *Part 3: Welding processes [Technical Report]*

— *Part 4: Arc welding [Technical Report]*

The following parts are under preparation:

— *Part 2: Safety and health [Technical Report]*

Friction welding is to form the subject of a future part 5.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 7 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

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Welding and allied processes — Vocabulary —

Part 3: Welding processes

1 Scope

This part of ISO/TR 25901 contains terms and definitions for welding processes, classified in accordance with their physical characteristics and to the relevant energy carrier.

It does not contain terms and definitions related to specific processes or particular aspects of welding and allied processes that are covered in other parts of this Technical Report (see Foreword) or in other ISO standards.

In the main body of this part of ISO/TR 25901, terms are arranged in a systematic order. Annex A provides an index in which all terms are listed alphabetically with reference to the appropriate subclause. In addition, it provides French translations, covering two of the three official ISO languages (English, French and Russian). German translations are also provided; these are published under the responsibility of the member body for Germany (DIN) and are given for information only.

NOTE 1 Only the terms given in the official languages (English, French and Russian) are to be considered as ISO terms and definitions.

NOTE 2 All these terms and definitions are also available on the ISO Online Browsing Platform (OBP): https://www.iso.org/obp/ui/

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 Basic terms and definitions

2.1.1
metal welding
operation which unifies metal(s) by means of heat or pressure, or both, in such a way that there is continuity in the nature of the metal(s) which has (have) been joined

Note 1 to entry: A filler metal, the melting temperature of which is of the same order as that of the parent metal(s), can be used and the result of welding is the weld.

Note 2 to entry: This definition also includes surfacing.

2.1.2
welding with pressure
welding in which sufficient external force is applied to cause a greater or lesser degree of plastic deformation of both the faying surfaces, generally without the addition of filler metal

Note 1 to entry: Usually, but not necessarily, the faying surfaces are heated in order to permit or to facilitate unifying.

2.1.3
fusion welding
welding without application of external force in which the faying surface(s) has (have) to be molten

Note 1 to entry: Usually, but not necessarily, molten filler metal is added.

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2.1.4
energy carrier
physical phenomenon which provides the energy required for welding either by transmission to or by transformation within the workpiece(s)

Note 1 to entry: The following energy carriers with their respective sequential numbers are used in 2.2:

1) solid body;

2) liquid;

3) gas;

4) electrical discharge;

5) radiation;

6) movement of a mass;

7) electric current;

8) unspecified.

Note 2 to entry: When welding using a solid body, a liquid, a gas or an electrical discharge, the heat required for welding should be applied to the workpiece(s), while when welding by means of a beam of radiant energy, movement of mass or electric current, the heat (or the mechanical energy in cold welding with pressure) is generated by energy transformation within the workpiece itself.

For a solid body, liquid and gas, the decisive factor is their enthalpy. Electrical discharge and current passage are mechanisms guiding the energy of moving charged particles to the welding zone. In the case of an electrical discharge, this is done by plasma or sparks and in the case of electric current, by resistance heat where the current is produced by induction or transmitted by conduction.

Radiation is propagation of energy in the sense of dissemination of waves by light or charged particle beams. For movement of a mass, the characteristic factors are force and displacement in time. Different kinds of movement are translational motion, rotation and oscillation.

2.2 Terms related to welding processes

2.2.1 Welding with pressure

2.2.1.1 Energy carrier: solid body

2.2.1.1.1
heated element welding
welding with pressure (2.1.2) where the workpieces are heated by the heating tool in the area where the joint will be made

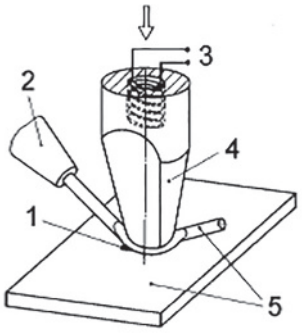
Note 1 to entry: Heating can be constant or pulsating and the weld is made by the application of force without the addition of a filler material. The force is applied by either a wedge shaped tool or through a nozzle through which one of the workpieces is fed.

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2.2.1.1.2
heated wedge welding
heated element welding (2.2.1.1.1) by means of a heated wedge

Note 1 to entry: Heated wedge welding can also be carried out by *energy carrier* (2.1.4) movement of mass (*ultrasonic welding* (2.2.1.6.1)) or as a combination of both.

Note 2 to entry: Heated wedge welding is illustrated in Figure 1.



Key

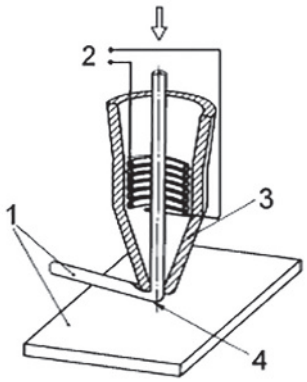
1	weld	3	power source	5	workpiece
2	workpiece feed	4	wedge-shaped tool		

Figure 1 — Heated wedge welding

2.2.1.1.3
heated nozzle welding
heated element welding (2.2.1.1.1) by means of a heated nozzle

Note 1 to entry: Heated nozzle welding can also be carried out by *energy carrier* (2.1.4) movement of mass (*ultrasonic welding* (2.2.1.6.1)) or as a combination of both.

Note 2 to entry: Heated nozzle welding is illustrated in Figure 2.



Key

1	workpiece	3	nozzle
2	power source	4	weld

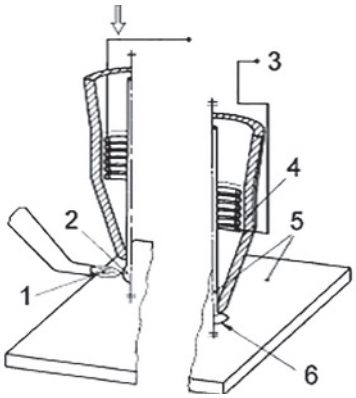
Figure 2 — Heated nozzle welding

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2.2.1.1.4
nail head welding
heated nozzle welding (2.2.1.1.3) in which the end of one or two wires which has been fed through the nozzle and heated by a flame or electric discharge, forms a small globule, which under the effect of the applied force is flattened into the shape of a nail head

Note 1 to entry: Nail head welding can also be carried out by *energy carrier* (2.1.4) movement of mass (*ultrasonic welding* (2.2.1.6.1)) or as a combination of both.

Note 2 to entry: Nail head welding is illustrated in Figure 3.



Key

1	flame	3	power source	5	workpiece
2	molten metal globule	4	nozzle	6	weld

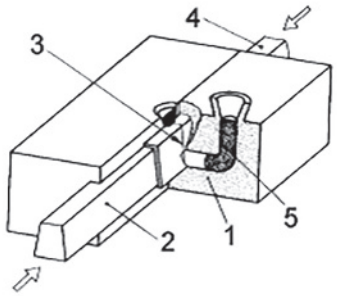
Figure 3 — Nail head welding

2.2.1.2 Energy carrier: liquid

2.2.1.2.1
flow welding with pressure
welding with pressure (2.1.2) where the joint assembly is in a mould and molten metal is poured over the surfaces to be welded until the joint is made

Note 1 to entry: The molten metal is often produced by an aluminothermic reaction (see 2.2.2.2.2).

Note 2 to entry: Flow welding with pressure is illustrated in Figure 4.



Key

1	mould	3	weld	5	molten metal
2	workpiece	4	workpiece		

Figure 4 — Flow welding with pressure

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2.2.1.3 Energy carrier: gas

2.2.1.3.1
oxyfuel gas pressure welding
welding with pressure (2.1.2) in which the workpieces are heated at the faying surfaces by an oxyfuel gas flame and the weld is made by applying a force without addition of filler metal

Note 1 to entry: The assembly may be of the open or closed type.

Note 2 to entry: Oxyfuel gas pressure welding is illustrated in Figure 5.



a) Closed assembly **b) Opened assembly**

Key

1	upset	3	welding blowpipe	5	workpiece
2	weld	4	gas flame		

Figure 5 — Oxyfuel gas pressure welding

2.2.1.4 Energy carrier: electric discharge

2.2.1.4.1
magnetically impelled arc welding
DEPRECATED: magnetically impelled arc butt welding
arc welding (2.2.2.4.1) with pressure in which an arc, impelled by a magnetic field, moves along the joint, heating the faying surfaces which are then brought together by a force and welded

2.2.1.4.2
percussion welding
welding with pressure (2.1.2) employing the heat from an arc produced by a rapid discharge of electrical energy

Note 1 to entry: Pressure is applied percussively during or immediately following the electrical discharge. It can be accompanied by additional resistance heating.

Note 2 to entry: This process is mainly used for the welding of studs.

2.2.1.4.3
arc stud welding
arc welding (2.2.2.4.1)with pressure that uses an arc between a metal stud, or similar part, and the workpiece

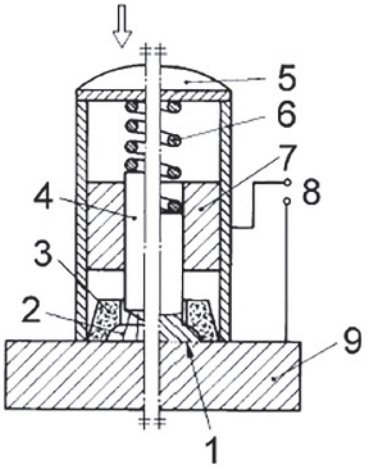
Note 1 to entry: Ceramic ferrule, shielding gas or both may be used.

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2.2.1.4.4
drawn arc stud welding
drawn arc stud welding with ceramic ferrule or shielding gas
arc stud welding (2.2.1.4.3) where a discharge is ignited by lifting the stud and the weld pools are shielded by a ceramic ferrule, shielding gas or both

Note 1 to entry: The welding time is usually more than 100 ms.

Note 2 to entry: Drawn arc stud welding is illustrated in Figure 6.



Key

1	weld	4	stud (workpiece)	7	lifting magnet
2	arc	5	welding gun	8	power source
3	ceramic ferrule	6	spring	9	workpiece

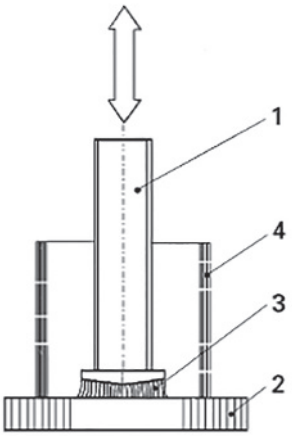
Figure 6 — Drawn arc stud welding with ceramic ferrule

2.2.1.4.5
short-cycle drawn arc stud welding
drawn arc stud welding (2.2.1.4.4) where the welding time is between 10 ms and 100 ms

2.2.1.4.6
capacitor discharge drawn arc stud welding
drawn arc stud welding (2.2.1.4.4) in which the electrical energy is provided by the discharge of a capacitor and the welding time is between 1 ms and 10 ms

Note 1 to entry: Capacitor discharge drawn arc stud welding is illustrated in Figure 7.

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Key

1	stud	3	arc
2	workpiece	4	support tube

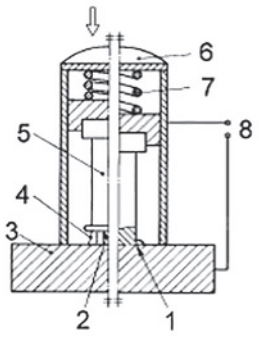
Figure 7 — Capacitor discharge drawn arc stud welding

2.2.1.4.7
capacitor discharge stud welding with tip ignition
arc stud welding (2.2.1.4.3) where the arc is ignited by explosively melting and partially vaporizing a specially formed tip of the stud

Note 1 to entry: The workpieces are pressed together before the capacitor is totally discharged.

Note 2 to entry: Welding time is usually between 0,5 ms and 5 ms.

Note 3 to entry: Capacitor discharge stud welding with tip ignition is illustrated in Figure 8.



Key

1	weld	4	arc	7	spring
2	stud tip	5	stud (workpiece)	8	power source
3	workpiece	6	welding gun		

Figure 8 — Capacitor discharge stud welding with tip ignition

2.2.1.4.8
drawn arc stud welding with fusible collar
drawn arc stud welding (2.2.1.4.4) where a discharge is ignited by lifting the stud which has a fusible collar

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2.2.1.5 Energy carrier: radiation

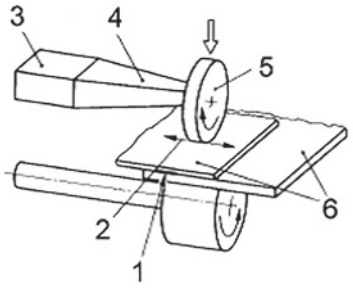
(No processes known so far)

2.2.1.6 Energy carrier: movement of a mass

2.2.1.6.1
ultrasonic welding
welding with pressure (2.1.2) in which mechanical vibrations of high frequencies and of low amplitude, superimposed on a static force, make a weld between the two workpieces to be joined at a temperature well below the melting point of the material

Note 1 to entry: Additional heat can be applied.

Note 2 to entry: Ultrasonic welding is illustrated in Figure 9.



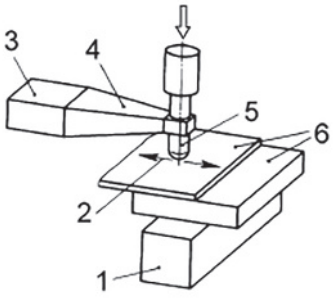
Key

1	weld	3	transducer	5	vibrating tool
2	ultrasonic vibration	4	sonotrode	6	workpiece

Figure 9 — Ultrasonic welding

2.2.1.6.2
ultrasonic hot welding
ultrasonic welding (2.2.1.6.1) in which the anvil is heated separately during the welding operation

Note 1 to entry: Ultrasonic hot welding is illustrated in Figure 10.



Key

1	electrically heated support (anvil)	3	transducer	5	vibrating tool
2	ultrasonic vibration	4	sonotrode	6	workpiece

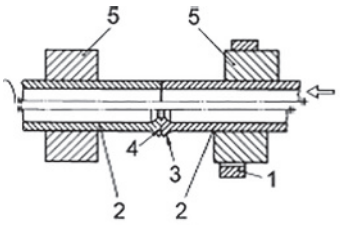
Figure 10 — Ultrasonic hot welding

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2.2.1.6.3
friction welding
welding with pressure (2.1.2) in which the interfaces are heated by friction normally by rotating one or both workpieces in contact with each other or by means of a separate rotating friction element

Note 1 to entry: The weld is completed by an upset force, generally after rotation has ceased.

Note 2 to entry: Friction welding is illustrated in Figure 11.



Key

1	brake	3	flash	5	clamp
2	workpiece	4	weld		

Figure 11 — Friction welding

2.2.1.6.4
direct drive friction welding
DEPRECATED: continuous drive friction welding
friction welding (2.2.1.6.3) using constant speed rotation

2.2.1.6.5
inertia friction welding
friction welding (2.2.1.6.3) where the rotational energy is stored in a fly wheel; thus the rotational speed decreases continuously

Note 1 to entry: Inertia friction welding is illustrated in Figure 12.

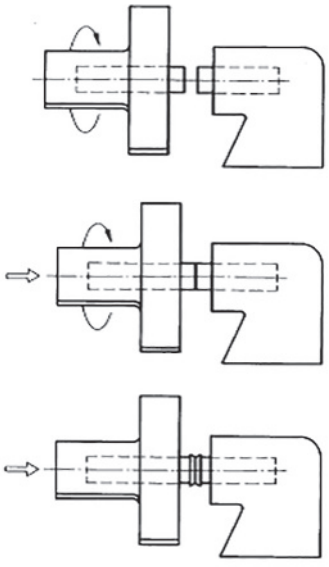


Figure 12 — Inertia friction welding

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2.2.1.6.6
orbital friction welding
friction welding (2.2.1.6.3) in which an orbital motion is produced at the weld interface by rotating both the workpieces at the same speed in the same direction but displacing the axis of rotation of one workpiece slightly with respect to the other

Note 1 to entry: At the end of the displaced cycle, the workpieces are aligned again and are welded.

Note 2 to entry: Orbital friction welding is illustrated in Figure 13.

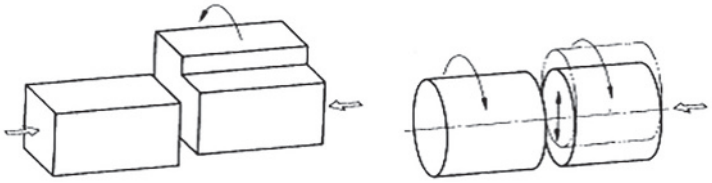
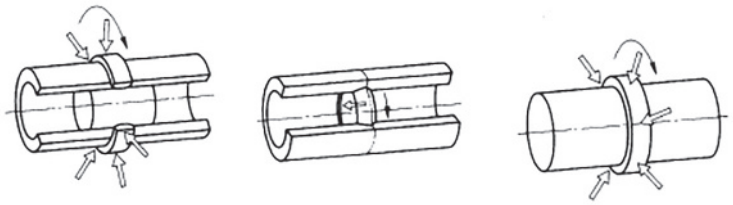


Figure 13 — Orbital friction welding

2.2.1.6.7
radial friction welding
friction welding (2.2.1.6.3) in which a shaped ring is rotated and radially compressed onto two circular hollow sections in such a manner that a joint is formed

Note 1 to entry: Conventional radial friction welding is illustrated in Figure 14 a). The technique can also be used to expand a ring inside hollow sections to form a joint; see Figure 14 b). In a third embodiment, it is possible to weld a ring usually of a dissimilar material to the outside of a solid bar; see Figure 14 c).



a) **b)** **c)**

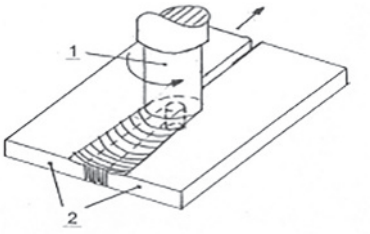
Figure 14 — Radial friction welding

2.2.1.6.8
friction stud welding
friction welding (2.2.1.6.3) of studs

2.2.1.6.9
friction stir welding
joining process producing a weld by the friction heating and mixing of material in the plastic state caused by a rotating tool that traverses along the weld

Note 1 to entry: Friction stir welding is illustrated in Figure 15.

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Key

1 rotating tool 2 workpiece

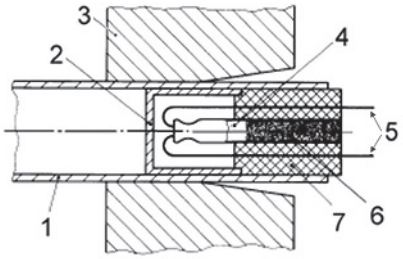
Figure 15 — Friction stir welding

2.2.1.6.10
shock welding
welding with pressure (2.1.2) in which the workpieces are welded by the application of a striking force

Note 1 to entry: The heat generated by the sudden collision contributes to the welding.

2.2.1.6.11
explosion welding
DEPRECATED: explosive welding
shock welding (2.2.1.6.10) in which the workpieces are welded when impacted together by the detonation of an explosive charge

Note 1 to entry: Explosion welding is illustrated in Figure 16.



Key

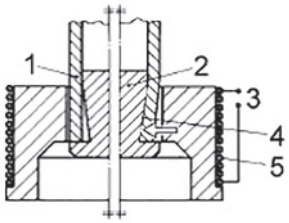
1 tube
2 protective sheath
3 tube plate
4 detonator
5 detonation wires
6 main explosive charge
7 plastic transmission medium

Figure 16 — Explosion welding of tube to plate

2.2.1.6.12
magnetic pulse welding
DEPRECATED: magnetic impulse welding
shock welding (2.2.1.6.10) in which a high current impulse passing through a coil surrounding the workpieces produces a magnetic field which exerts the welding force

Note 1 to entry: Magnetic pulse welding is illustrated in Figure 17.

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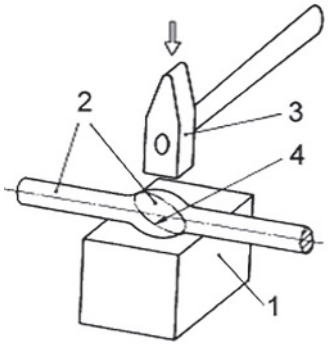
Key

1	tube (workpiece)	3	power source	5	magnetic coil
2	plug (workpiece)	4	weld		

Figure 17 — Magnetic pulse welding

2.2.1.6.13
forge welding
welding with pressure (2.1.2) in which the workpieces are heated in air in a forge and the weld is made by applying blows or some other impulsive force sufficient to cause permanent deformation at the interfaces

Note 1 to entry: Forge welding is illustrated in Figure 18.



Key

1	anvil	3	hammer
2	workpiece	4	weld

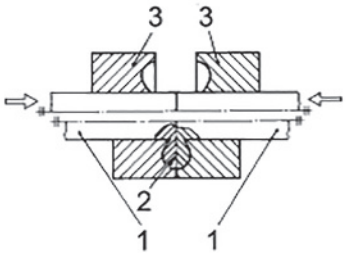
Figure 18 — Forge welding

2.2.1.6.14
cold pressure welding
welding with pressure (2.1.2) in which continuous pressure alone is used, producing considerable plastic deformation

2.2.1.6.15
cold upset welding
cold pressure welding (2.2.1.6.14) in which dies are used as jaws to provide the required deformation and flow

Note 1 to entry: Cold upset welding is illustrated in Figure 19.

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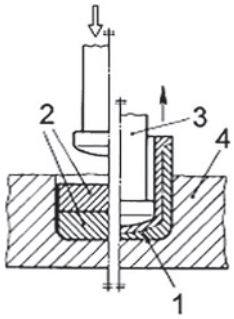
Key

1	workpiece	2	weld	3	clamps

Figure 19 — Cold upset welding

2.2.1.6.16
cold pressure extrusion welding
cold pressure welding (2.2.1.6.14) using a special extrusion die

Note 1 to entry: Cold pressure extrusion welding is illustrated in Figure 20.



Key

1	weld	3	plunger
2	workpiece	4	die

Figure 20 — Cold pressure extrusion welding

2.2.1.7 Energy carrier: electric current

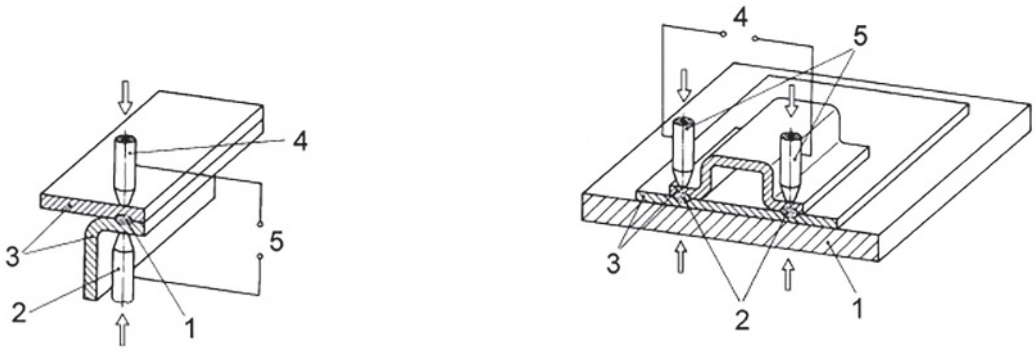
2.2.1.7.1
resistance welding
welding with pressure (2.1.2) in which the heat necessary for welding is produced by resistance to an electrical current flowing through the welding zone

2.2.1.7.2
resistance spot welding
resistance welding (2.2.1.7.1) in which the weld is produced at a spot in the workpieces between spot welding electrodes, the weld being of approximately the same area as the electrode tips

Note 1 to entry: During the process, force is applied to the spot by the electrodes.

Note 2 to entry: Resistance spot welding is illustrated in Figure 21.

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a) Direct spot welding **b) Indirect spot welding**

Key

1	weld spot	1	conductive base plate
2	spot-welding electrode	2	weld spot
3	workpiece	3	workpiece
4	spot-welding electrode	4	power source
5	power source	5	spot-welding electrode

Figure 21 — Resistance spot welding

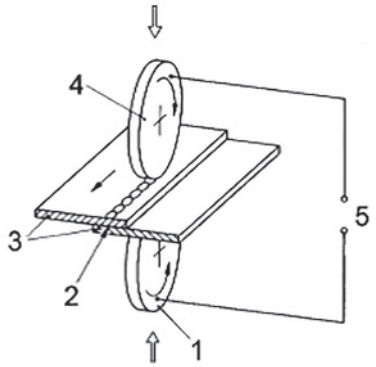
2.2.1.7.3
resistance seam welding
resistance welding (2.2.1.7.1) in which force is applied continuously and current continuously or intermittently to produce a linear weld, the workpieces being placed between two electrode wheels or an electrode wheel and an electrode bar

Note 1 to entry: The wheels apply the force and current and rotate continuously during the making of the seam weld.

2.2.1.7.4
lap seam welding
resistance seam welding (2.2.1.7.3) to produce an overlap joint

Note 1 to entry: Lap seam welding is illustrated in Figure 22.

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Key

1	electrode wheel	3	workpiece	5	power source
2	weld	4	electrode wheel		

Figure 22 — Lap seam welding

2.2.1.7.5
mash seam welding
resistance seam welding (2.2.1.7.3) of two workpieces of similar thickness, where the overlap determines the width of the weld so that the ultimate thickness of the workpiece at the weld approximates to that of one component

Note 1 to entry: Mash seam welding is illustrated in Figure 23.



a) Before welding **b) After welding**

Key

1	workpieces	2	weld

Figure 23 — Mash seam welding

2.2.1.7.6
prep-lap seam welding
lap seam welding (2.2.1.7.4) with prior preparation of the sheet edges

Note 1 to entry: Prep-lap seam welding is illustrated in Figure 24.

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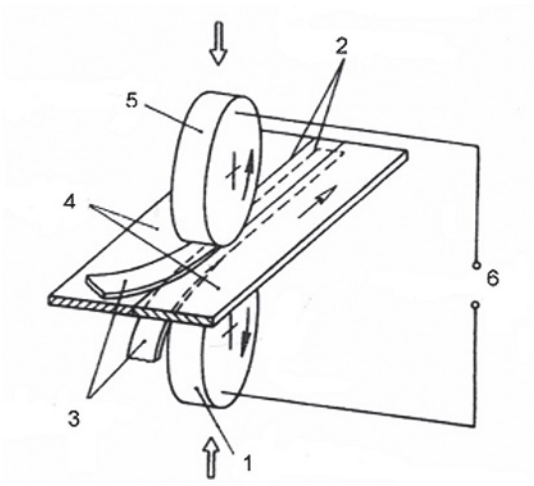
a) Before welding **b) After welding**

Figure 24 — Prep-lap seam welding

2.2.1.7.7
wire seam welding
resistance seam welding (2.2.1.7.3) of two overlapped coated components with copper or copper alloy wires between the electrode wheels and the surfaces of the components

2.2.1.7.8
foil butt-seam welding
resistance seam welding (2.2.1.7.3) of two close square butted workpieces with metal tape placed or fed centrally to bridge both sides of the joint

Note 1 to entry: Foil butt seam-welding is illustrated in Figure 25.



Key

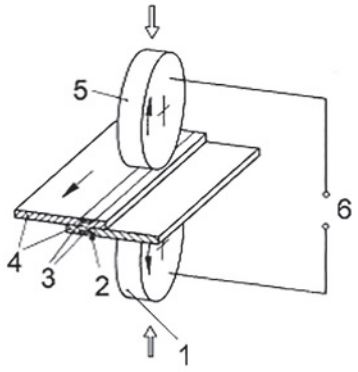
1	electrode wheel	3	contact strip	5	electrode wheel
2	weld	4	workpiece	6	power source

Figure 25 — Foil butt-seam welding

2.2.1.7.9
seam welding with strip
lap seam welding (2.2.1.7.4) using a contact strip on one side or both sides of the lapping workpieces

Note 1 to entry: Seam welding with strip is illustrated in Figure 26.

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Key

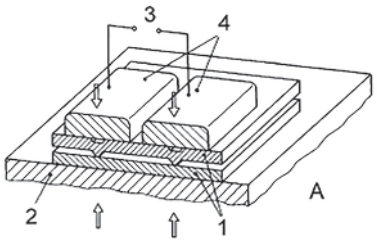
1	electrode wheel	3	contact strip	5	electrode wheel
2	weld	4	workpiece	6	power source

Figure 26 — Seam welding with strip

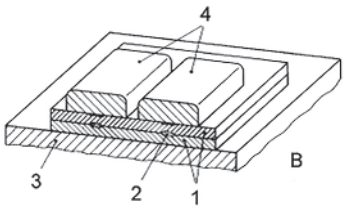
2.2.1.7.10
projection welding
resistance welding (2.2.1.7.1) in which the force and current are localized by the use of a projection or projections raised on or formed from one or more of the faying surfaces, the projections collapsing during welding

Note 1 to entry: Current and force are usually transmitted through platens, fixtures, jigs or clamps.

Note 2 to entry: Projection welding is illustrated in Figures 27 and 28.



a) Before welding



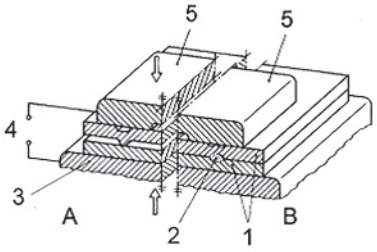
b) After welding

Key

A	before welding	B	after welding
1	workpiece	1	workpiece
2	base plate	2	weld
3	power source	3	base plate
4	projection welding electrode	4	projection welding electrode

Figure 27 — Indirect projection welding

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Key

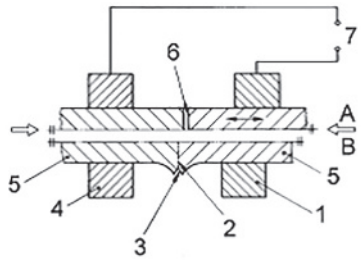
A	before welding	2	weld	4	power source
B	after welding	3	electrode	5	projection welding electrode
1	workpiece				

Figure 28 — Direct projection welding

2.2.1.7.11
flash welding
resistance welding (2.2.1.7.1) during which heating is obtained when the workpieces are progressively and repeatedly advanced towards each other, causing the current to flow through localized points, thus creating flashing and expulsion of molten metal

Note 1 to entry: When the welding temperature is reached, the rapid application of force produces upset metal and completes the weld. Flashing can be preceded with preheating (241) or without (242). Current and force are transmitted by clamps.

Note 2 to entry: Flash welding is illustrated in Figure 29.



Key

A	before welding	2	weld	5	workpiece
B	after welding	3	flash	6	flashing area
1	clamp	4	clamp	7	power source

Figure 29 — Flash welding

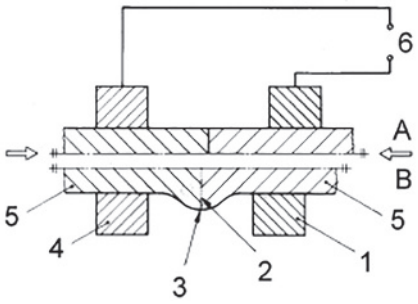
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2.2.1.7.12
resistance butt welding
resistance welding (2.2.1.7.1) in which the components are butted together under pressure before heating is started

Note 1 to entry: Pressure is maintained and current is allowed to flow until the welding temperature is reached at which point upset metal is produced.

Note 2 to entry: Current and force are transmitted through clamps.

Note 3 to entry: Resistance butt welding is illustrated in Figure 30.



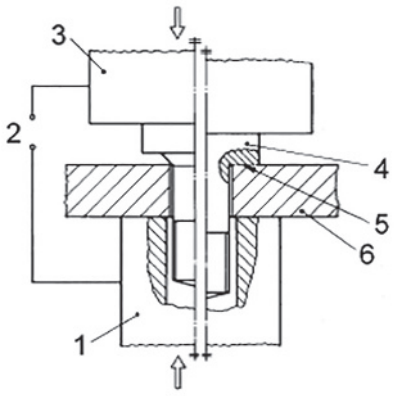
Key

A	before welding	2	weld	5	workpiece
B	after welding	3	upset	6	power source
1	clamp	4	clamp		

Figure 30 — Resistance butt welding

2.2.1.7.13
resistance stud welding
stud welding using *projection welding* (2.2.1.7.10)

Note 1 to entry: Resistance stud welding is illustrated in Figure 31.



Key

1	projection welding electrode	3	projection welding electrode	5	weld
2	power source	4	stud (workpiece)	6	workpiece

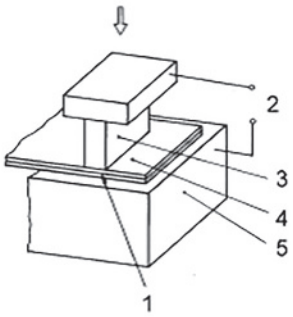
Figure 31 — Resistance stud welding

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2.2.1.7.14
HF resistance welding
high frequency resistance welding
resistance welding (2.2.1.7.1) in which alternating current of at least 10 kHz is fed through mechanical contacts or induced by an inductor in the workpiece

Note 1 to entry: The high frequency current is concentrated along adjacent surfaces to produce highly localized heat prior to the application of welding force.

Note 2 to entry: HF resistance welding is illustrated in Figure 32.



Key

1	weld	3	electrode	5	electrode
2	high-frequency power source	4	workpiece		

Figure 32 — HF resistance welding

2.2.1.7.15
induction welding
welding with pressure (2.1.2) in which the heat is obtained from the resistance of the workpieces to induced electric current

2.2.1.7.16
induction butt welding
induction welding (2.2.1.7.15) in which the components are butted together under pressure before or after heating is started

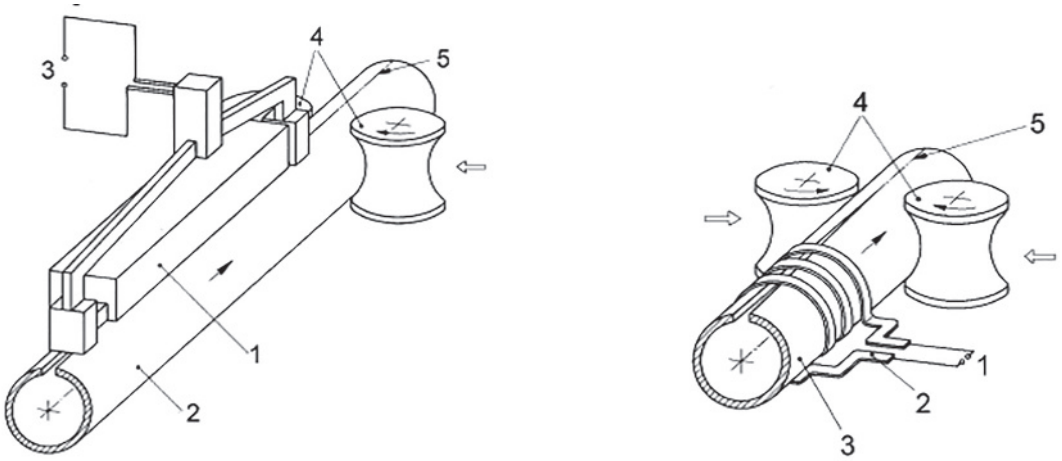
Note 1 to entry: When the welding temperature is reached, upset force is applied to produce a forge weld.

2.2.1.7.17
induction seam welding
induction welding (2.2.1.7.15) in which the force is applied by one or more forging wheel(s) to produce a linear forge weld

Note 1 to entry: It is generally used with a set of forging wheels to produce tubular components from strips, sheets or plates.

Note 2 to entry: Induction seam welding is illustrated in Figure 33.

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a) Welding using rod inductors **b) Welding using a surrounding inductor**

Key

1	inductor	1	power source
2	workpiece	2	induction coil
3	power source	3	workpiece
4	pressure roller	4	pressure roller
5	weld	5	weld

Figure 33 — Induction seam welding

2.2.1.7.18
HF induction welding
high frequency induction welding
induction welding (2.2.1.7.15) in which alternating current of high frequency is fed through mechanical contacts or induced by an inductor in the workpiece

2.2.1.8 Energy carrier: unspecified

2.2.1.8.1
diffusion welding
welding with pressure (2.1.2) whereby the workpieces are kept in contact under specified continual pressure and are heated either on their faying surfaces, or in their entirety at a defined temperature over a controlled time

Note 1 to entry: This results in local plastic deformation and thereby intimate contact of the surfaces and diffusion of the atoms through the interface. This produces complete continuity of the material. The operation can take place in a vacuum, under a gas shield or in a fluid, preferably without the addition of a filler metal.

Note 2 to entry: Diffusion welding is illustrated in Figure 34.

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