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BSI Standards Publication

Welding and allied processes — Vocabulary

Part 1: General terms

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National foreword

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Welding and allied processes — Vocabulary —

Part 1: General terms

Soudage et techniques connexes — Vocabulaire —

Partie 1: Termes généraux

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Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
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Contents

Page

Foreword ... **iv**

1 Scope ... **1**

2 Terms and definitions ... **1**
2.1 Terms related to welding and allied processes ... 1
2.1.1 General terms ... 1
2.1.2 Characterization of welds ... 3
2.1.3 Imperfections ... 4
2.1.4 Type of joints ... 5
2.1.5 Joint preparations ... 6
2.1.6 Types of welds ... 7
2.1.7 Weld details ... 9
2.1.8 Welding execution ... 11
2.1.9 Surfacing ... 15
2.1.10 Welding consumables ... 16
2.1.11 Welding materials ... 17
2.2 Terms related to testing ... 18
2.2.1 General tests ... 18
2.2.2 Weldability tests ... 19
2.2.3 Mechanical tests ... 19
2.2.4 Non-destructive tests ... 20
2.3 Terms related to welding equipment ... 20
2.4 Terms related to welding parameters ... 21
2.5 Terms related to welding management, personnel and organization ... 23

Annex A (informative) **Alphabetical index of English terms with French and German translations** ... **26**

Annex B (informative) **Alphabetical index of general terms defined in ISO 857-1:1998 or ISO/TR 25901:2007 that were not included in this part of ISO/TR 25901** ... **35**

Bibliography ... **41**

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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—1, 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 1: General terms

1 Scope

This part of ISO/TR 25901 contains general terms and definitions applicable to welding and allied processes.

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 Terms related to welding and allied processes

2.1.1 General terms

2.1.1.1
welding
joining process in which two or more parts are united producing a continuity in the nature of the workpiece material(s) by means of heat or pressure or both, and with or without the use of *filler material* (2.1.10.4)

Note 1 to entry: Welding processes may be used also for *surfacing* (2.1.9.1) and remelting.

2.1.1.2
fusion welding
welding (2.1.1.1) involving localized melting without the application of external force in which the fusion surface(s) has (have) to be melted with or without addition of *filler material* (2.1.10.4)

2.1.1.3
weld
result of *welding* (2.1.1.1)

Note 1 to entry: The weld includes the *weld metal* (2.1.2.1) and the *heat-affected zone* (2.1.2.2).

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2.1.1.4
weldment
assembly incorporating one or more *welded joint(s)* (2.1.4.2)

2.1.1.5
parent material
base material
material to be joined, or surfaced, by *welding* (2.1.1.1), braze welding or brazing

2.1.1.6
parent material thickness
material thickness
nominal thickness (2.1.7.7) of the materials to be welded

2.1.1.7
parent metal
base metal
metallic *parent material* (2.1.1.5)

2.1.1.8
manual welding
welding (2.1.1.1) in which the *electrode* (2.3.8) holder, gun, *torch* (2.3.9) or blowpipe is manipulated by hand

2.1.1.9
partly mechanized welding
semiautomatic welding
manual welding (2.1.1.8) where wire feed is mechanized

2.1.1.10
mechanized welding
fully mechanized welding
welding (2.1.1.1) where the required *welding parameters* (2.4.1) are maintained by mechanical or electronic means

Note 1 to entry: Manual adjustment of welding parameters by the *welding operator* (2.5.25) during welding is possible.

2.1.1.11
automatic welding
welding (2.1.1.1) in which all operations are performed without *welding operator* (2.5.25) intervention during the process

Note 1 to entry: Manual adjustment of *welding parameters* (2.4.1) by the welding operator during welding is not possible.

2.1.1.12
robotic welding
welding (2.1.1.1) that is performed and controlled by robotic equipment

2.1.1.13
gouging
thermal cutting process variation that forms a groove by melting or burning

2.1.1.14
arc gouging
gouging (2.1.1.13) using an arc cutting process variation

2.1.1.15
air-arc gouging
gouging (2.1.1.13) using a carbon *electrode* (2.3.8) and compressed air

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2.1.2 Characterization of welds

2.1.2.1
weld metal
all metal melted during *welding* (2.1.1.1) and retained in the *weld* (2.1.1.3)

2.1.2.2
heat-affected zone
HAZ
portion of non-melted *parent metal* (2.1.1.7) whose microstructure has been affected

2.1.2.3
weld zone
zone containing the *weld metal* (2.1.2.1) and the *heat-affected zones* (2.1.2.2)

2.1.2.4
deposited metal
filler metal that has been added during *welding* (2.1.1.1)

2.1.2.5
fusion line
interface between the *weld metal* (2.1.2.1) and the non-melted *parent metal* (2.1.1.7) as determined on the cross section of a *weld* (2.1.1.3)

2.1.2.6
fusion zone
in the *weld metal* (2.1.2.1), part of the *parent metal* (2.1.1.7) that has been melted, as determined on the cross section of a *weld* (2.1.1.3)

2.1.2.7
all-weld metal
weld metal (2.1.2.1) consisting of *deposited metal* (2.1.2.4) without *dilution* (2.1.2.12)

2.1.2.8
weld pool
molten pool
pool of liquid metal formed during *fusion welding* (2.1.1.2)

Note 1 to entry: In electroslag welding, the term includes the *slag* (2.1.10.9) bath.

2.1.2.9
as welded
condition of the *weld* (2.1.1.3) after *welding* (2.1.1.1), prior to any subsequent thermal, mechanical, or chemical treatments

Note 1 to entry: For alloys that may undergo natural ageing (e.g. some aluminium alloys), the as welded condition lasts only for a limited period of time.

2.1.2.10
ferrite number
FN
arbitrary standardized value designating the ferrite content of nominally austenitic or austenitic-ferritic (duplex) type stainless steel *weld metal* (2.1.2.1) based on its magnetic properties

2.1.2.11
metallurgical deviation
<*welding*> changes in the mechanical properties and/or metallurgical structure of the *weld metal* (2.1.2.1) or *heat-affected zone* (2.1.2.2) compared to the properties of the *parent metal* (2.1.1.7)

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2.1.2.12
dilution
mixing of melted *parent metal* (2.1.1.7) and *deposited metal* (2.1.2.4) expressed as a ratio of the melted parent metal to the total melted mass

2.1.2.13
dilution rate
dilution (2.1.2.12) expressed as a percentage

2.1.2.14
residual welding stress
stress remaining in a metal part or structure as a result of *welding* (2.1.1.1)

2.1.2.15
strength weld
weld (2.1.1.3) designed to withstand stress

2.1.2.16
joint efficiency
ratio of strength of a *joint* (2.1.4.1) to the strength of the *parent metal* (2.1.1.7), expressed as a percentage

2.1.3 Imperfections

2.1.3.1
imperfection
discontinuity in the *weld* (2.1.1.3) or a deviation from the intended geometry

Note 1 to entry: Imperfections are cracks, lack of penetration, porosity, *slag* (2.1.10.9) inclusions.

2.1.3.2
internal imperfection
imperfection (2.1.3.1) that is not open to a surface or not directly accessible

2.1.3.3
systematic imperfection
imperfections (2.1.3.1) that are repeatedly distributed in the *weld* (2.1.1.3) over the weld lengths to be examined

2.1.3.4
projected area
area where *imperfections* (2.1.3.1) distributed along the volume of the *weld* (2.1.1.3) under consideration are imaged two-dimensionally

2.1.3.5
hot crack(s)
material separations occurring at high temperatures along the grain boundaries (dendrite boundaries) when the level of strain and the strain rate exceed a certain level

Note 1 to entry: Small cracks visible only at magnifications greater than 50×, are often described as microcracks.

2.1.3.6
solidification crack
hot crack (2.1.3.5) formed during solidification from the liquid phase of *weld metals* (2.1.2.1)

Note 1 to entry: It usually extends up to the surface of the weld metal, but sometimes can be subsurface.

2.1.3.7
liquation crack
hot crack (2.1.3.5) formed by liquation in the *heat-affected zone* (2.1.2.2) of the *parent material* (2.1.1.5) or in multirun welds where *weld metal* (2.1.2.1) is reheated by subsequent *runs* (2.1.8.4)

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2.1.3.8
ductility dip crack
hot crack (2.1.3.5) formed during *welding* (2.1.1.1) by a reduction in hot ductility

Note 1 to entry: As with a *liquation crack* (2.1.3.7), it can occur in the *heat-affected zone* (2.1.2.2) of the *parent material* (2.1.1.5) or in multirun welds.

2.1.3.9
cold crack(s)
local rupture (intergranular or transgranular) appearing in a *weld* (2.1.1.3) as a result of a critical combination of microstructure, stress and hydrogen content

2.1.4 Type of joints

2.1.4.1
joint
junction of workpieces or the edges of workpieces that are to be joined or have been joined

2.1.4.2
welded joint
assembly that is produced by *welding* (2.1.1.1) together two or more parts

2.1.4.3
multiple joint
type of *joint* (2.1.4.1) where three or more parts meet at any required angles to each other

2.1.4.4
parallel joint
type of *joint* (2.1.4.1) where the parts lie parallel to each other

EXAMPLE In explosive cladding.

2.1.4.5
butt joint
type of *joint* (2.1.4.1) where the parts lie in the same plane and against one another at an angle of 135° to 180°

2.1.4.6
T-joint
angle joint (2.1.4.8) where the parts meet each other forming a T-shape

2.1.4.7
lap joint
type of *joint* (2.1.4.1) where the parts lie parallel to each other (0° to 5°) and overlap each other

2.1.4.8
angle joint
type of *joint* (2.1.4.1) where one part meets the other at an acute angle greater than 5° but not more than 90°

Note 1 to entry: For a *fillet weld* (2.1.6.11), the angle is over 5° and less than 45°.

Note 2 to entry: For a *butt weld* (2.1.6.3), the angle is between 45° to 90° inclusive.

2.1.4.9
corner joint
type of *joint* (2.1.4.1) where two parts meet at their edges at an angle between 30° and 135° to each other

2.1.4.10
edge joint
type of *joint* (2.1.4.1) where two parts meet at their edges at an angle of 0° to 30°

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2.1.4.11
cross joint
type of *joint* (2.1.4.1) where two parts lie crossing over each other

EXAMPLE Wires that cross over each other.

2.1.4.12
cruciform joint
type of *joint* (2.1.4.1) where two parts lying in the same plane each meet, at right angles, a third part lying between them

2.1.4.13
homogeneous joint
welded joint (2.1.4.2) in which the *weld metal* (2.1.2.1) and *parent material* (2.1.1.5) have no significant differences in mechanical properties and/or chemical composition

Note 1 to entry: A *welded joint* (2.1.4.2) made of similar *parent materials* (2.1.1.5) without filler metal is considered homogeneous.

2.1.4.14
heterogeneous joint
welded joint (2.1.4.2) in which the *weld metal* (2.1.2.1) and *parent material* (2.1.1.5) have significant differences in mechanical properties and/or chemical composition

2.1.4.15
dissimilar material joint
welded joint (2.1.4.2) in which the *parent materials* (2.1.1.5) have significant differences in mechanical properties and/or chemical composition

2.1.5 Joint preparations

2.1.5.1
edge preparation
surface prepared on the edges of a part to be welded

2.1.5.2
joint preparation
weld preparation
configuration of the workpieces to be joined after each individual part has been suitably prepared and assembled

2.1.5.3
fusion face
surface of the *parent metal* (2.1.1.7) to be melted during *welding* (2.1.1.1)

2.1.5.4
feather edge
complete absence of a *root face* (2.1.5.10)

2.1.5.5
gap
air gap
distance at any cross section between edges, ends or surfaces to be joined

2.1.5.6
edge distance
distance between the centre of a *weld* (2.1.1.3) and the nearest edge of the workpiece

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2.1.5.7
root
DEPRECATED: root of weld
zone on the opposite side from where the *welding* (2.1.1.1) was performed

2.1.5.8
root gap
gap (2.1.5.5) between the *root faces* (2.1.5.10)

2.1.5.9
root radius
radius of the curved portion of the *fusion face* (2.1.5.3) in a part prepared for a single-J, single-U, double-J or double-U weld

2.1.5.10
root face
portion of a *fusion face* (2.1.5.3) that is not beveled or grooved

2.1.5.11
land
part of a *fusion face* (2.1.5.3) that supports the *weld pool* (2.1.2.8)

Note 1 to entry: An example is the horizontal area between the *root face* (2.1.5.10) and the curved part of a J or U preparation.

2.1.5.12
bevel angle
angle between the bevel of a *joint* (2.1.4.1) member and a plane perpendicular to the surface of the member

2.1.5.13
included angle
groove angle
angle between the planes of the *fusion faces* (2.1.5.3) of parts to be welded

2.1.6 Types of welds

2.1.6.1
full penetration weld
weld (2.1.1.3) with a complete *fusion penetration* (2.1.7.3)

2.1.6.2
partial penetration weld
weld (2.1.1.3) in which the *fusion penetration* (2.1.7.3) is intentionally less than full penetration

2.1.6.3
butt weld
groove weld
weld (2.1.1.3) other than a *fillet weld* (2.1.6.11) made in a groove or in a square preparation

2.1.6.4
single-J butt weld
butt weld (2.1.6.3) in a single-J preparation

2.1.6.5
double-J butt weld
butt weld (2.1.6.3) in a double-J preparation

2.1.6.6
single-U butt weld
butt weld (2.1.6.3) in a single-U preparation

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2.1.6.7
double-U butt weld
butt weld (2.1.6.3) in a double-U preparation

2.1.6.8
single-V butt weld
butt weld (2.1.6.3) in a single-V preparation

2.1.6.9
double-V butt weld
butt weld (2.1.6.3) in a double-V preparation

2.1.6.10
square butt weld
butt weld (2.1.6.3) in a square preparation

2.1.6.11
fillet weld
triangular *weld* (2.1.1.3) between two or more parts for joining a *T-joint* (2.1.4.6), *corner joint* (2.1.4.9) or *lap joint* (2.1.4.7)

2.1.6.12
plug weld
weld (2.1.1.3) made by filling a circular or elongated hole in one part of a workpiece with filler metal so as to join it to the surface of an overlapping part exposed through the hole

2.1.6.13
seal weld
weld (2.1.1.3) intended primarily to provide tightness against leakage of gas or fluid

2.1.6.14
slot weld
weld (2.1.1.3) between two overlapping parts made by depositing a *fillet weld* (2.1.6.11) round the periphery of a hole in one part so as to join it to the surface of the other part exposed through the hole

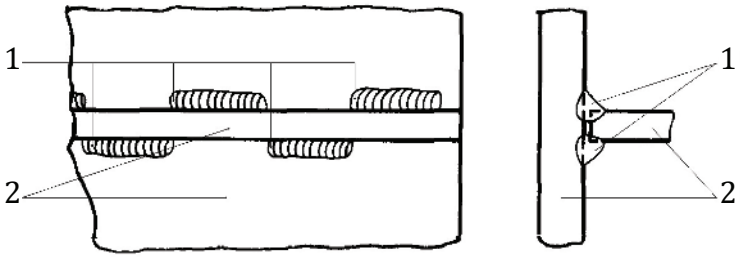
2.1.6.15
intermittent weld
series of weld elements made at intervals along a *joint* (2.1.4.1)

2.1.6.16
staggered intermittent weld
intermittent weld (2.1.6.15) on each side of a *joint* (2.1.4.1) arranged so that the welds on one side lie opposite to the spaces on the other side along the joint

Note 1 to entry: These are usually *fillet welds* (2.1.6.11) in *T-joints* (2.1.4.8) and *lap joints* (2.1.4.7).

Note 2 to entry: A staggered intermittent weld is illustrated in Figure 1.

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Key

1 weld

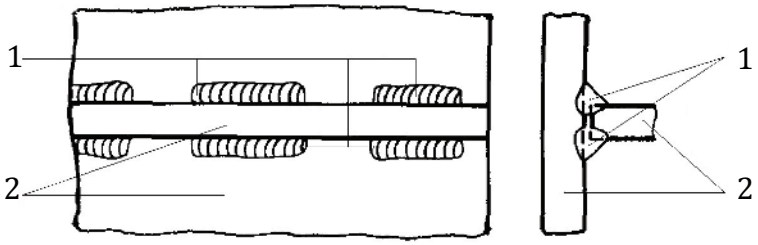
2 workpiece

Figure 1 — Staggered intermittent weld

2.1.6.17
chain intermittent weld
intermittent weld (2.1.6.15) on each side of a *joint* (2.1.4.1) arranged so that the welds lie opposite to one another along the joint

Note 1 to entry: These are usually *fillet welds* (2.1.6.11) in *T-joints* (2.1.4.8) and *lap joints* (2.1.4.7).

Note 2 to entry: A chain intermittent weld is illustrated in Figure 2.



Key

1 weld

2 workpiece

Figure 2 — Chain intermittent weld

2.1.6.18
flare-bevel weld
butt weld (2.1.6.3) between a joint member with a curved surface and another with a planar surface

2.1.6.19
flare-V weld
butt weld (2.1.6.3) between two members with curved surfaces

2.1.7 Weld details

2.1.7.1
weld width
shortest distance between the outer toes of the surface of a *weld* (2.1.1.3)

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2.1.7.2
weld thickness
thickness of the *weld metal* (2.1.2.1), including any reinforcements

2.1.7.3
fusion penetration
depth to which the *fusion face* (2.1.5.3) of the *parent metal* (2.1.1.7) has been fused

2.1.7.4
penetration depth
deposit thickness
DEPRECATED: weld metal thickness
thickness of the *weld metal* (2.1.2.1), excluding any reinforcement

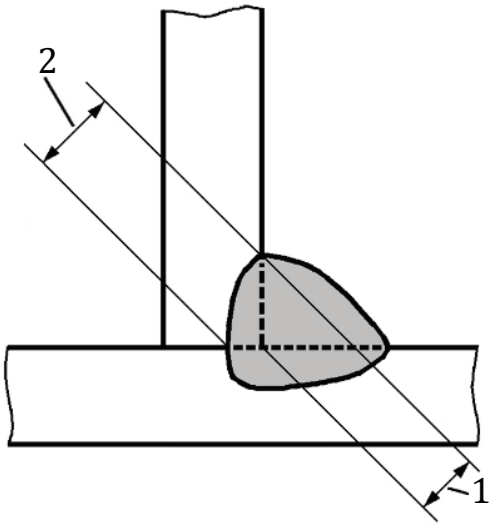
2.1.7.5
leg length
distance from the actual or projected intersection of the *fusion faces* (2.1.5.3) and the toe of a *fillet weld* (2.1.6.11), measured across the fusion face

2.1.7.6
throat thickness
thickness of a *fillet weld* (2.1.6.11)

2.1.7.7
nominal thickness
thickness specified in material standards without tolerances

2.1.7.8
nominal throat thickness
design value of the height of the largest isosceles triangle that can be inscribed in the section of a *fillet weld* (2.1.6.11)

Note 1 to entry: Nominal throat thickness is illustrated in Figure 3 as item 1.



Key
1 nominal throat thickness
2 deep penetration throat thickness

Figure 3 — Nominal throat thickness

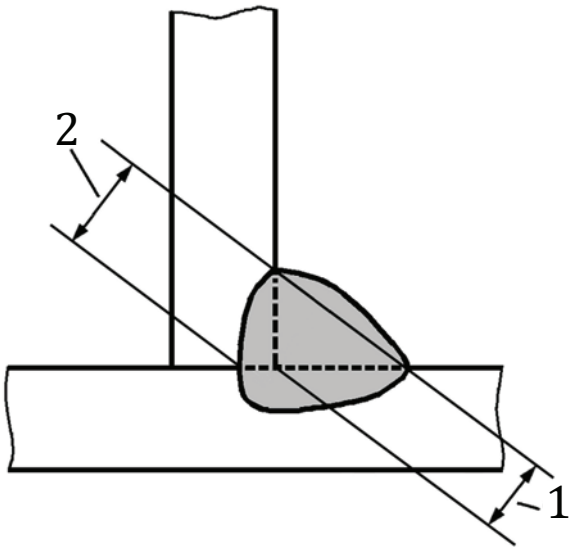
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2.1.7.9
deep penetration throat thickness
nominal throat thickness (2.1.7.8) or *effective throat thickness* (2.1.7.10) to which a certain amount of *fusion penetration* (2.1.7.3) is added

Note 1 to entry: Deep penetration throat thickness is illustrated in Figures 3 and 4 as item 2.

2.1.7.10
effective throat thickness
design value of the height of the largest triangle that can be inscribed in the section of a *fillet weld* (2.1.6.11)

Note 1 to entry: Effective throat thickness is illustrated in Figure 4 as item 1.



Key
1 effective throat thickness
2 deep penetration throat thickness

Figure 4 — Effective throat thickness

2.1.7.11
actual throat thickness
throat thickness (2.1.7.6) of the finalized *weld* (2.1.1.3)

Note 1 to entry: Actual throat thickness depends on the chosen *design throat thickness* (2.1.7.12).

2.1.7.12
design throat thickness
throat thickness (2.1.7.6) specified by the designer

2.1.8 Welding execution

2.1.8.1
welding process
particular method of *welding* (2.1.1.1) involving the application of certain metallurgical, electrical, physical, chemical or mechanical principles

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2.1.8.2
welding technique
manner in which an *electrode* (2.3.8), a blowpipe or a similar appliance is manipulated

2.1.8.3
keyhole technique
welding technique (2.1.8.2) in which concentrated heat source penetrates through a workpiece, forming a hole (keyhole) at the leading edge of the *weld pool* (2.1.2.8)

Note 1 to entry: As the heat source progresses, the hole moves with it.

2.1.8.4
run
pass
bead
metal melted or deposited during one passage of an *electrode* (2.3.8), *torch* (2.3.9) or blowpipe

Note 1 to entry: The term pass is commonly used in beam welding.

2.1.8.5
stringer bead
run (2.1.8.4) formed without appreciable weaving

2.1.8.6
temper bead
<*multirun welding*> run which normalizes the *runs* (2.1.8.4) below and provides *preheating* (2.4.13) for the successive runs

2.1.8.7
bead on plate
single *run* (2.1.8.4) made with *filler material* (2.1.10.4) on the surface of a *parent material* (2.1.1.5)

2.1.8.8
melt run
line of *parent material* (2.1.1.5) that has been melted by passing a welding heat source such as a flame, arc, electron or laser beam along the surface of the material

Note 1 to entry: No *filler material* (2.1.10.4) is used.

2.1.8.9
melting rate
burn-off rate
mass or length of *electrode* (2.3.8) consumed per unit of time

2.1.8.10
deposition rate
mass of metal deposited per unit of productive weld time

2.1.8.11
capping run
<*multilayer welding*> *run(s)* (2.1.8.4) visible on the weld face(s) after completion of *welding* (2.1.1.1)

2.1.8.12
cosmetic run
cosmetic pass
run (2.1.8.4) for superficial remelting of the *weld* (2.1.1.3) in order to enhance appearance

2.1.8.13
layer
stratum of *weld metal* (2.1.2.1) consisting of one or more *runs* (2.1.8.4)

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2.1.8.14
finishing welding
production welding (2.5.15) carried out in order to remove casting defects and core openings to ensure the agreed quality of castings

2.1.8.15
overlap
<*lap joint*> minimum distance between the edges of overlap plates

Note 1 to entry: The term "overlap" also represents the concept defined in 2.1.8.16.

2.1.8.16
overlap
<*multirun welding*> portion of the welding *run* (2.1.8.4) remelted by the adjoining run

Note 1 to entry: The term "overlap" also represents the concept defined in 2.1.8.15.

2.1.8.17
bead toe
longitudinal boundary line between the *runs* (2.1.8.4), or between a run and the *parent material* (2.1.1.5)

2.1.8.18
weld toe
boundary between the surface of the *weld* (2.1.1.3) and the *parent metal* (2.1.1.7)

2.1.8.19
root run
root pass
first *run* (2.1.8.4) deposited in the *root* (2.1.5.7) of a multirun *weld* (2.1.1.3)

2.1.8.20
filling run
<multilayer welding> *run*(s) (2.1.8.4) deposited after the *root run*(s) (2.1.8.19) and before the *capping run*(s) (2.1.8.11)

2.1.8.21
back run
DEPRECATED: sealing run
final *run* (2.1.8.4) deposited on the *root* (2.1.5.7) side of a fusion *weld* (2.1.1.3)

2.1.8.22
continuous weld
weld (2.1.1.3) extending along the entire length of a *joint* (2.1.4.1)

2.1.8.23
single-run welding
welding (2.1.1.1) in which the *weld* (2.1.1.3) is made in one *run* (2.1.8.4)

2.1.8.24
single-side welding
one side welding
welding (2.1.1.1) in which the *weld* (2.1.1.3) is made from one side of the workpiece

2.1.8.25
both-side welding
double-side welding
two side welding
welding (2.1.1.1) in which the *weld* (2.1.1.3) is made from both sides of the workpiece

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2.1.8.26
both-side single-run welding
both-side welding (2.1.8.25) in which the *weld* (2.1.1.3) is made by single *runs* (2.1.8.4) from each side

2.1.8.27
both-side multirun welding
multirun welding from both sides
both-side welding (2.1.8.25) in which the *weld* (2.1.1.3) is made by multiruns from each side

2.1.8.28
multirun welding
welding (2.1.1.1) in which the *run* (2.1.8.4) is made on a previous run

2.1.8.29
back-step sequence
weld sequence (2.1.8.36) in which short lengths of *run* (2.1.8.4) are deposited in a direction opposite to the general progress of *welding* (2.1.1.1) the *joint* (2.1.4.1)

Note 1 to entry: The short lengths eventually produce a *continuous weld* (2.1.8.22) or an *intermittent weld* (2.1.6.15).

2.1.8.30
back-step welding
welding technique (2.1.8.2) in which short lengths of *weld* (2.1.1.3) are deposited in a direction opposite to the general progress of *welding* (2.1.1.1) the *joint* (2.1.4.1), in such a way that the end of one length overlaps the beginning of the previous length

2.1.8.31
tack weld
weld (2.1.1.3) used to fix the workpieces or assemblies to be joined in their proper position for *welding* (2.1.1.1)

2.1.8.32
tack welding
making of a *tack weld* (2.1.8.31)

2.1.8.33
tacking run
tacking pass
run (2.1.8.4) made to hold the parts to be welded in proper alignment until the final *welds* (2.1.1.3) are made

2.1.8.34
welding cycle
complete series of events involved in the making of a weld

2.1.8.35
workplace
area(s) in which the worker's activities are carried out

2.1.8.36
weld sequence
order in which *welds* (2.1.1.3) are made on a workpiece

2.1.8.37
weld run sequence
order in which the *runs* (2.1.8.4) of a *weld* (2.1.1.3) are made

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2.1.8.38
temporary weld
weld (2.1.1.3) made to attach a piece(s) to a *weldment* (2.1.1.4) for temporary use in handling, shipping or working on the weldment

2.1.8.39
stud welding
joining of a metal stud or similar part to a workpiece

Note 1 to entry: *Welding* (2.1.1.1) may be accomplished by arc, resistance, friction or other suitable process with or without external gas shielding.

2.1.8.40
field weld
site weld
weld (2.1.1.3) made outside workshops usually at the place of final installation

2.1.9 Surfacing

2.1.9.1
surfacing
deposition of material on a surface to obtain desired properties and/or dimensions

2.1.9.2
overlay welding
surfacing (2.1.9.1) by means of *welding* (2.1.1.1)

2.1.9.3
heat resistant overlay welding
overlay welding (2.1.9.2) in which the *cladding* (2.1.9.10) is used to obtain improved heat resistance

2.1.9.4
corrosion resistant overlay welding
overlay welding (2.1.9.2) in which the *cladding* (2.1.9.10) is used to obtain improved corrosion resistance

2.1.9.5
buttering
overlay welding (2.1.9.2) to provide a suitable transition between the *parent material* (2.1.1.5) and subsequent *welds* (2.1.1.3)

2.1.9.6
buffering
buttering (2.1.9.5) prior to *welding* (2.1.1.1) together of highly dissimilar materials

2.1.9.7
building up
build up
overlay welding (2.1.9.2) to obtain or restore required dimensions

2.1.9.8
hardfacing
overlay welding (2.1.9.2) to increase wear and/or impact resistance

2.1.9.9
strip surfacing
strip cladding
overlay welding (2.1.9.2) with a strip *electrode* (2.3.8)

2.1.9.10
cladding
material deposited on the *parent material* (2.1.1.5) in order to produce a clad material

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2.1.9.11
cladding process
surfacing (2.1.9.1) used for applying *cladding* (2.1.9.10)

Note 1 to entry: Cladding processes are *overlay welding* (2.1.9.2), hot rolling, explosive welding, etc.

2.1.10 Welding consumables

2.1.10.1
welding consumable
material consumed in the making of a *weld* (2.1.1.3)

Note 1 to entry: The term includes *filler material* (2.1.10.4) and *auxiliary material* (2.1.11.1).

2.1.10.2
consumable insert
fusible insert
filler material (2.1.10.4) that is placed at the *root* (2.1.5.7) of the *joint* (2.1.4.1) before *welding* (2.1.1.1) to be completely fused into the *weld metal* (2.1.2.1)

2.1.10.3
consumable electrode
electrode (2.3.8) that is consumed during *welding* (2.1.1.1) and forms a part of the weld (2.1.1.3)

2.1.10.4
filler material
welding consumable (2.1.10.1) added during *welding* (2.1.1.1) to form the *weld* (2.1.1.3)

2.1.10.5
filler rod
rod
welding rod
filler material (2.1.10.4) in the form of a rod which can be a part of the *welding* (2.1.1.1) circuit

2.1.10.6
solid rod
filler rod (2.1.10.5) that is solid, not being a part of the *welding* (2.1.1.1) circuit

2.1.10.7
filler wire
filler material (2.1.10.4) in the form of a wire which can be a part of the *welding* (2.1.1.1) circuit

2.1.10.8
flux
welding flux
substantially non-metallic *auxiliary material* (2.1.11.1) used to clean the surfaces of the *joint* (2.1.4.1) chemically, to prevent atmospheric oxidation, and to reduce impurities or float them to the surface in the form of *slag* (2.1.10.9)

2.1.10.9
slag
non-metallic substance that results from fusion of an *electrode* (2.3.8) covering or a *flux* (2.1.10.8), and which, after solidification, partly or totally covers the *weld metal* (2.1.2.1)

2.1.10.10
shielding gas
protective gas used to prevent or reduce atmospheric contamination

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2.1.10.11
clad steel
combination of two or more dissimilar metals bonded inseparably together by a *cladding process* (2.1.9.11)

Note 1 to entry: The *parent metal* (2.1.1.7) is always steel.

2.1.10.12
baking
heating of *welding consumables* (2.1.10.1) to produce a specific diffusible hydrogen level in the *weld metal* (2.1.2.1)

Note 1 to entry: Baking is usually carried out by the consumable manufacturer.

2.1.10.13
drying
<*welding*> heating of *welding consumables* (2.1.10.1) to remove moisture

2.1.10.14
drying oven
heated receptacle in which the *welding consumables* (2.1.10.1) are dried to remove or keep out all the moisture

2.1.11 Welding materials

2.1.11.1
auxiliary material
welding consumable (2.1.10.1) not part of the finished *weld* (2.1.1.3)

Note 1 to entry: Auxiliary materials are *shielding gases* (2.1.10.10), *fluxes* (2.1.10.8), etc.

2.1.11.2
gas shield
shroud of gas surrounding the *weld zone* (2.1.2.3) to protect the *weld pool* (2.1.2.8) from chemical reaction with the surrounding atmosphere

2.1.11.3
trailing gas shield
additional supply of *shielding gas* (2.1.10.10) protecting the *weld* (2.1.1.3) and the weld area during cooling

2.1.11.4
carrier gas
gas used to transport metal powder to the *weld pool* (2.1.2.8)

Note 1 to entry: Typical carrier gases are nitrogen, helium and argon.

2.1.11.5
backing
material, *flux* (2.1.10.8) or gas in contact with the reverse side of a *joint preparation* (2.1.5.2)

2.1.11.6
backing gas
root gas
gas used for *gas backing* (2.1.11.7)

2.1.11.7
gas backing
backing (2.1.11.5) using gas primarily for the purpose of preventing atmospheric reaction

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2.1.11.8
purging gas
gas used for the purpose of replacing the atmosphere in a hollow section and subsequently for *gas backing* (2.1.11.7)

2.1.11.9
backing flux
flux (2.1.10.8) used for *flux backing* (2.1.11.10)

2.1.11.10
flux backing
backing (2.1.11.5) using *flux* (2.1.10.8) primarily for the purpose of preventing atmospheric reaction

Note 1 to entry: In submerged arc welding flux backing may also reduce the risk of a *weld pool* (2.1.2.8) collapse.

2.1.11.11
material backing
backing (2.1.11.5) using material for the purpose of supporting molten *weld metal* (2.1.2.1)

2.1.11.12
permanent backing
material backing (2.1.11.11) that is not intended to be removed from the workpiece after *welding* (2.1.1.1)

Note 1 to entry: It may be partially fused or remain unfused.

2.1.11.13
temporary backing
material backing (2.1.11.11) intended to be removed from the workpiece after *welding* (2.1.1.1)

2.1.11.14
run-on plate
piece of material that extends beyond the beginning of the *joint* (2.1.4.1), enabling the full section of *weld* (2.1.1.3) to be obtained at the beginning of a joint

2.1.11.15
run-off plate
piece of material that extends beyond the end of the *joint* (2.1.4.1), enabling the full section of *weld* (2.1.1.3) to be maintained up to the end of a joint

2.2 Terms related to testing

2.2.1 General tests

2.2.1.1
macroscopic examination
examination of a *test specimen* (2.2.1.6) by the naked eye, or under low magnification (generally less than 50×), with or without etching

2.2.1.2
microscopic examination
examination of a *test specimen* (2.2.1.6) by a microscope with a magnification of generally 50× to 500×, with or without etching

2.2.1.3
all-weld metal test
test to determine the properties of *all-weld metal* (2.1.2.7)

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2.2.1.4
all-weld metal test specimen
test specimen (2.2.1.6) that is composed of *all-weld metal* (2.1.2.7) over the portion to be tested

2.2.1.5
test piece
welded assembly which is used for testing purposes

2.2.1.6
test specimen
part or portion cut from the *test piece* (2.2.1.5) in order to perform specified *destructive testing* (2.2.3.1)

2.2.1.7
testing organization
internal or external organization carrying out *destructive testing* (2.2.3.1) or *non-destructive testing* (2.2.4.1)

2.2.2 Weldability tests

2.2.2.1
cracking test
test to determine the susceptibility to cracking of the *weld metal* (2.1.2.1) or *parent metal* (2.1.1.7)

2.2.2.2
cold cracking test
cracking test (2.2.2.1) to determine the susceptibility to cold cracking of *a welded joint* (2.1.4.2)

2.2.2.3
hot cracking test
cracking test (2.2.2.1) to determine the susceptibility to hot cracking of a *welded joint* (2.1.4.2)

2.2.2.4
tested welding consumable
welding consumable (2.1.10.1) or consumable combination tested in accordance with appropriate standards for the testing of welding consumables

2.2.3 Mechanical tests

2.2.3.1
destructive testing
testing to detect internal or external *imperfections* (2.1.3.1), or assess mechanical or metallurgical properties by mechanical means, which generally result in the destruction of the material

2.2.3.2
face bend test
bend test where the surface of the *weld* (2.1.1.3) is in tension

2.2.3.3
face bend test specimen
test specimen (2.2.1.6) used in a *face bend test* (2.2.3.2)

2.2.3.4
root bend test
bend test where the *root* (2.1.5.7) of the *weld* (2.1.1.3) is in tension

2.2.3.5
root bend test specimen
test specimen (2.2.1.6) used in a *root bend test* (2.2.3.4)

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