TECHNICAL REPORT

ISO/TR 25901-4

First edition

Welding and allied processes — Vocabulary —

Part 4: Arc welding

Soudage et techniques connexes — Vocabulaire —

Partie 4: Soudage à l'arc

PROOF/ÉPREUVE

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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).

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 4:
Arc welding

1 Scope

This part of ISO/TR 25901 contains terms and definitions applicable to arc welding. 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.

2 Terms and definitions

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

2.1 Terms related to welding procedures

2.1.1
pulsed MAG welding
metal active gas (MAG) welding using a pulsed current

Note 1 to entry: Metal active gas (MAG) is a shielding gas that typically consists of a mixture containing 0,5 % or more of oxygen or carbon dioxide.

2.1.2
pulsed MIG welding
metal inert gas (MIG) welding using a pulsed current

Note 1 to entry: Metal inert gas is a shielding gas that typically consists of argon, helium or a mixture of both.

2.1.3
pulsed TIG welding
tungsten inert gas (TIG) welding using a pulsed current

Note 1 to entry: Tungsten inert gas is a shielding gas that typically consists of argon, helium or a mixture of both.

2.1.4
arc spot welding
arc welding in which the overlapping parts are joined by fusing through one part into the other and so producing a fusion weld at the faying surfaces

2.1.5
MIG spot welding
arc spot welding (2.1.4) by MIG process

Note 1 to entry: Metal inert gas is a shielding gas that typically consists of argon, helium or a mixture of both.

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2.1.6
TIG spot welding
arc spot welding (2.1.4) by TIG welding

Note 1 to entry: Tungsten inert gas is a shielding gas that typically consists of argon, helium or a mixture of both.

2.1.7
microplasma arc welding
plasma arc welding at *welding currents* (2.2.8) generally below 10 A

2.1.8
narrow gap welding
arc welding in which the distance or angle between the faces of the parent materials is so small that particular welding equipment has to be used

Note 1 to entry: Generally employed to join high thickness workpieces in order to reduce the amount of filler material to use.

2.2 Terms related to welding execution

2.2.1
push technique
forehand welding
welding technique in which the electrode is pushed in the welding direction

Note 1 to entry: The *electrode angle* (2.2.10) is greater than 90°.

2.2.2
pull technique
backhand welding
welding technique in which the electrode is pulled in the welding direction

Note 1 to entry: The *electrode angle* (2.2.10) is less than or equal to 90°.

2.2.3
weaving
welding technique where the run is produced by oscillating the electrode transversely to the direction of welding

2.2.4
weaving width
transverse extent of *weaving* (2.2.3)

2.2.5
weaving amplitude
half of the *weaving width* (2.2.4)

2.2.6
weaving frequency
number of oscillatory movements per unit time

2.2.7
weave bead
run formed using *weaving* (2.2.3)

2.2.8
welding current
current delivered by a welding power source during welding

2.2.9
work angle
angle between the electrode axis and the surface of the parts, measured in a plane perpendicular to the weld

2.2.10
electrode angle
torch angle
angle between the electrode axis and the longitudinal axis in the direction of welding

2.2.11
travel angle
angle complementary to the *electrode angle* (2.2.10)

2.2.12
wire feed rate
wire feed speed
length of wire consumed per unit time

2.2.13
contact electrode
covered electrode (2.4.1) with a special covering that enables it to be kept in contact with the parent material during welding to facilitate control of *arc length* (2.3.12)

2.3 Terms related to welding process characteristics

2.3.1
metal transfer
droplet transfer
transfer of molten metal across the arc from a consumable electrode to the weld pool

2.3.2
globular transfer
metal transfer (2.3.1) in which droplets of diameter larger than that of the *wire electrode* (2.4.9) are transferred

2.3.3
spray transfer
metal transfer (2.3.1) in which rapidly accelerated droplets of diameter smaller than that of the *wire electrode* (2.4.9) are transferred

2.3.4
dip transfer
short circuiting transfer
metal transfer (2.3.1) in which a short circuiting current enhances the detachment of the molten wire tip during bridging by the electromagnetic pinch effect

2.3.5
particle transfer frequency
droplet transfer frequency
frequency with which metal globules or droplets are transferred across the arc from the end of a consumable electrode

2.3.6
main arc
in plasma arc welding, arc that supplies the welding heat

2.3.7
pilot arc
low current arc between the electrode and the constricting nozzle of the plasma arc welding torch to ionize the gas and facilitate the start of the welding arc

2.3.8
transferred arc
arc established between the electrode of the *plasma torch* (2.6.6) and the workpiece

2.3.9
non-transferred arc
arc established between the electrode and the constricting nozzle of the *plasma torch* (2.6.6) or thermal spraying gun

Note 1 to entry: The workpiece does not form part of the electrical circuit.

2.3.10
arc voltage
electrical potential between the electrode and the workpiece

2.3.11
striking voltage
minimum voltage at which any specific arc may be initiated

2.3.12
arc length
distance from the tip of the welding electrode to the surface of the weld pool

Note 1 to entry: During welding with consumable electrode processes, the actual length may vary depending on the *metal transfer* (2.3.1) process as metal droplets form and transfer to the weld pool.

2.3.13
arc time
arcing time
time during which the arc is maintained

2.3.14
pulse time
pulse duration
duration of a single pulse

2.3.15
duty cycle
duty factor
ratio, for a given time interval, of the uninterrupted on-load duration to the total time

2.3.16
arc blow
magnetic arc blow
magnetic deflection of the arc from its intended direction

2.3.17
stand-off distance
distance between the gas nozzle and the workpiece

Note 1 to entry: Stand-off distance is illustrated in Figure 1 as item 3.

2.3.18
stickout
distance between the gas nozzle and end of the *wire electrode* (2.4.9)

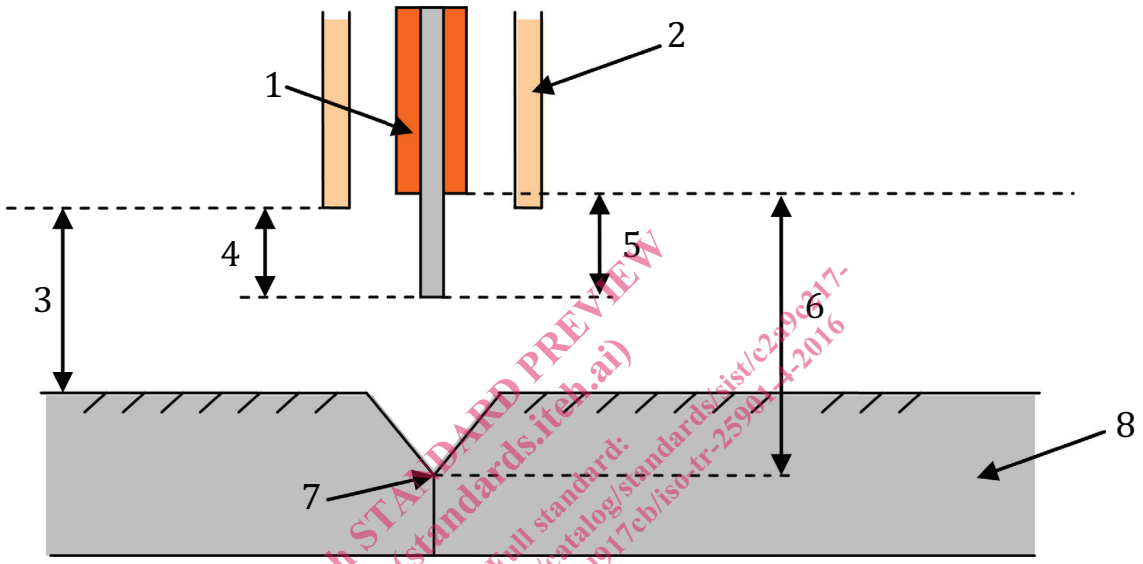
Note 1 to entry: Stickout is illustrated in Figure 1 as item 4.

2.3.19
electrode extension
distance between the *contact tip* (2.6.2) or *collet* (2.6.1) and end of the *wire electrode* (2.4.9)

Note 1 to entry: Electrode extension is illustrated in Figure 1 as item 5.

2.3.20
contact tip distance
contact tube distance
distance between the *contact tip* (2.6.2) and the welding point

Note 1 to entry: Contact tip distance is illustrated in Figure 1 as item 6.



Key

1 contact tip
2 gas nozzle
3 stand-off distance
4 stickout
5 electrode extension
6 contact tip distance
7 welding point
8 workpiece

Figure 1 — Distances

2.3.21
deposition coefficient
for a given electrode, the mass of weld metal deposited under standard conditions per ampere-minute expressed in mass/(current × time)

2.3.22
deposition efficiency
for a *covered electrode* (2.4.1), ratio of the mass of weld metal deposited under standard conditions to the total mass consumed, excluding the *stub end* (2.4.21)

2.3.23
effective electrode efficiency
for a *covered electrode* (2.4.1), the ratio of the mass of weld metal deposited under standard conditions to the mass of core wire consumed

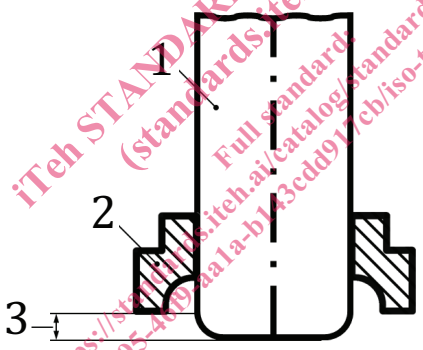
2.3.24
nominal electrode efficiency
for a *covered electrode* (2.4.1), the ratio of the mass of weld metal deposited under standard conditions to the mass of nominal diameter core wire consumed

2.3.25
overall weld metal recovery
for a *covered electrode* (2.4.1), the ratio of the mass of weld metal deposited under standard conditions to the total mass of the electrode tested, including covering and *stub end* (2.4.21)

2.3.26
electrode pick-up
contamination of a *non-consumable electrode* (2.4.20) by metal or scale during welding

2.3.27
protrusion
in stud welding, distance between the tip of the stud and the face of the support device in their initial position

Note 1 to entry: Protrusion is illustrated in Figure 2 as item 3.



Key
1 stud
2 support device
3 protrusion

Figure 2 — Protrusion example

2.4 Terms related to welding consumables

2.4.1
covered electrode
stick electrode
consumable electrode in the form of a rod consisting of a metallic core to which a covering has been applied

