PD ISO/TR 25901-4:2016

BSI Standards Publication

Welding and allied processes — Vocabulary

Part 4: Arc welding

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National foreword

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Welding and allied processes — Vocabulary —

Part 4: **Arc welding**

Soudage et techniques connexes — Vocabulaire —

Partie 4: Soudage à l'arc

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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).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

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.

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 procedures

2.1.1
pulsed MAG welding
MAG welding using a pulsed current

Note 1 to entry: Acronym MAG stands for Metal Active Gas; the shielding gas used typically consists of a mixture containing 0,5 % or more of oxygen or carbon dioxide.

2.1.2
pulsed MIG welding
MIG welding using a pulsed current

Note 1 to entry: Acronym MIG stands for Metal Inert Gas; the shielding gas used typically consists of argon, helium or a mixture of both.

2.1.3
pulsed TIG welding
TIG welding using a pulsed current

Note 1 to entry: Acronym TIG stands for Tungsten Inert Gas; the shielding gas used 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: Acronym MIG stands for Metal Inert Gas; the shielding gas used typically consists of argon, helium or a mixture of both.

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

Note 1 to entry: Acronym TIG stands for Tungsten Inert Gas; the shielding gas used 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 torch* (2.6.6) to ionize the gas and facilitate the start of the *main arc* (2.3.6)

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)

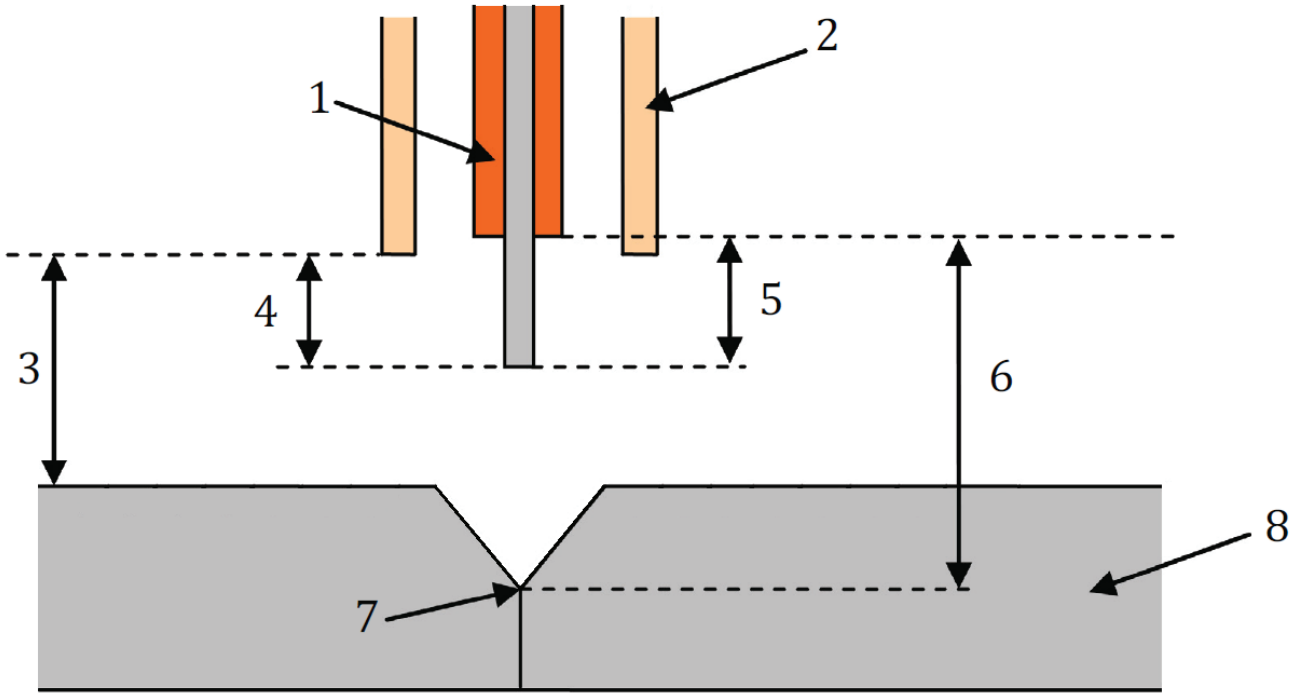
Note 1 to entry: Stickout is illustrated in Figure 1 as item 4.

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

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

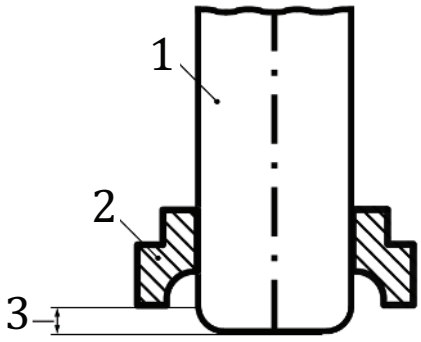
2.3.24
nominal electrode efficiency
for a *covered electrode* (2.4.1), the ratio of the mass of weld metal deposited under standard conditions to the mass of nominal diameter core wire consumed

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

2.4.2
acid electrode
covered electrode (2.4.1) in which the covering contains a high proportion of acid material

2.4.3
basic electrode
covered electrode (2.4.1) in which the covering contains a high proportion of calcium carbonate and fluoride

2.4.4
cellulosic electrode
covered electrode (2.4.1) in which the covering contains a high proportion of cellulose

2.4.5
hydrogen controlled electrode
covered electrode (2.4.1) that, when used correctly, produces less than a specific amount of diffusible hydrogen in the deposit

2.4.6
rutile electrode
covered electrode (2.4.1) in which the covering contains a high proportion of titanium dioxide

2.4.7
iron powder electrode
covered electrode (2.4.1) in which the covering contains a high proportion of iron powder giving a *deposition efficiency* (2.3.22) of at least 100 %

2.4.8
high efficiency electrode
iron powder electrode (2.4.7) giving a *deposition efficiency* (2.3.22) greater than 125 %

2.4.9
wire electrode
consumable electrode in the form of a wire

2.4.10
solid wire electrode
wire electrode (2.4.9) that is solid

2.4.11
tubular cored electrode
wire electrode (2.4.9) in a tubular form

2.4.12
flux cored electrode
tubular cored electrode (2.4.11) containing flux

2.4.13
metal cored electrode
tubular cored electrode (2.4.11) containing metal powder

2.4.14
strip electrode
consumable electrode in the form of a strip

2.4.15
solid strip electrode
strip electrode (2.4.14) that is solid

2.4.16
cored strip electrode
strip electrode (2.4.14) that is cored

2.4.17
solid wire
filler wire that is solid, not being a part of the welding circuit

2.4.18
tubular cored rod
filler rod in a tubular form, not being a part of the welding circuit

2.4.19
tubular cored wire
filler wire in a tubular form, not being a part of the welding circuit

2.4.20
non-consumable electrode
electrode that is not consumed during welding

2.4.21
stub end
stub
discarded unusable part of an electrode or filler rod after welding

2.5 Terms related to characteristics of welding power source

2.5.1
static characteristic
relationship between the voltage and the current at the output terminals of a welding power source when connected to a conventional load

2.5.2
dynamic characteristic
relationship between the main parameters of a welding power source after a sudden change of one parameter

2.5.3
drooping characteristic
external *static characteristic* (2.5.1) of a welding power source which, in its normal welding range, is such that the negative slope is greater than or equal to 7 V/100 A

2.5.4
flat characteristic
constant voltage characteristic
external *static characteristic* (2.5.1) of a welding power source which, in its normal welding range, is such that, as the current increases, the voltage either decreases by less than 7 V/100 A or increases by less than 10 V/100 A

2.5.5
no-load voltage
open-circuit voltage
voltage, exclusive of any arc striking or arc stabilizing voltage, between the output terminals of a welding power source when the external welding circuit is open

2.6 Terms related to welding equipment

2.6.1
collet
device for retaining a *non-consumable electrode* (2.4.20) in an arc welding torch

2.6.2
contact tip
contact tube
replaceable component fixed at the front end of the torch, which transfers the *welding current* (2.2.8) to, and guides, the *wire electrode* (2.4.9)

2.6.3
welding gun
gun
torch with a handle substantially perpendicular to the torch body

2.6.4
electrode holder
device for clamping, guiding and connecting a *covered electrode* (2.4.1) to the welding circuit while electrically insulating the welder or the welding operator

2.6.5
welding head
part of a welding machine or robot in which a welding torch is incorporated

2.6.6
plasma torch
arc welding torch using a *non-consumable electrode* (2.4.20) and having a gas nozzle producing a constricted plasma arc

2.6.7
welding rectifier
arc welding power source (2.6.12) consisting of a static converter for supplying direct current for welding from an AC supply

2.6.8
welding converter
arc welding power source (2.6.12) consisting of an electric motor and a d.c. *welding generator* (2.6.10)

2.6.9
arc welding transformer
transformer designed to provide electrical energy for arc welding

2.6.10
welding generator
generator designed to provide electrical energy to one or more welding arcs

2.6.11
engine driven welding power source
arc welding power source (2.6.12) consisting of an engine and a d.c. *welding generator* (2.6.10)

2.6.12
arc welding power source
equipment for supplying current and voltage and having the required characteristics suitable for arc welding and allied processes

2.6.13
drooping characteristic welding power source
arc welding power source (2.6.12) with a *drooping characteristic* (2.5.3)

2.6.14
constant-voltage welding power source
arc welding power source (2.6.12) with a *flat characteristic* (2.5.4)

2.6.15
quiver
portable receptacle for keeping *covered electrodes* (2.4.1) dry

Annex A
(informative)

Alphabetical index of English terms with French and German translations

English term	Subclause	French translation	German translation
A			
acid electrode	2.4.2	électrode acide	sauerumhüllte Stabelektrode
arc blow	2.3.16	soufflage magnétique de l'arc	Blaswirkung
arc length	2.3.12	longueur de l'arc	Lichtbogenlänge
arc spot welding	2.1.4	soudage à l'arc par points	Lichtbogenpunktschweißen
arc time	2.3.13	temps d'arc	Lichtbogenbrennzeit
arc voltage	2.3.10	tension à l'arc	Lichtbogenspannung
arc welding power source	2.6.12	source de courant de soudage à l'arc	Lichtbogen-Schweißstromquelle
arc welding transformer	2.6.9	transformateur de soudage à l'arc	Schweißtransformator
arcing time	See: arc time (2.3.13)		
B			
backhand welding	See: pull technique (2.2.2)		
basic electrode	2.4.3	électrode basique	basischumhüllte Stabelektrode
C			
cellulosic electrode	2.4.4	électrode cellulosique	zelluloseumhüllte Stabelektrode
collet	2.6.1	pince porte-électrode	Elektrodenklemmhülse
constant voltage characteristic	See: flat characteristic (2.5.4)		
constant-voltage welding power source	2.6.14	source de courant de soudage à caractéristique plate; source de courant de soudage à tension constant	Konstantspan-nungs-Schweißstromquelle
contact electrode	2.2.13	électrode-contact	Kontaktelektrode
contact tip	2.6.2	tube-contact	Stromkontaktrohr
contact tip distance	2.3.20	distance tube-contact/point de soudage	Kontaktrohrabstand
contact tube	See: contact tip (2.6.2)		
contact tube distance	See: contact tip distance (2.3.20)		
cored strip electrode	2.4.16	électrode en feuillard fourrée	Füllbandelektrode
covered electrode	2.4.1	électrode enrobée	umhüllte Stabelektrode
D			
deposition coefficient	2.3.21	coefficient de depot	Abschmelzkoeffizient
deposition efficiency	2.3.22	rendement global effectif	Abschmelzfaktor
dip transfer	2.3.4	transfert par courts-circuits	Werkstoffübergang im Kurzschluss
drooping characteristic	2.5.3	caractéristique tombante	fallende Kennlinie
drooping characteristic welding power source	2.6.13	source de courant de soudage à caractéristique tombante	Schweißstromquelle mit fallender Kennlinie

English term	Subclause	French translation	German translation
droplet transfer	See: metal transfer (2.3.1)		
droplet transfer frequency	See: particle transfer frequency (2.3.5)		
duty cycle	2.3.15	facteur de marche	Einschaltdauer
duty factor	See: duty cycle (2.3.15)		
dynamic characteristic	2.5.2	caractéristique dynamique	dynamische Kennlinie
E			
effective electrode efficiency	2.3.23	rendement effectif d'une électrode	effektive Ausbringung
electrode angle	2.2.10	angle d'inclinaison de l'électrode; angle d'inclinaison de la torche	Elektrodenanstellwinkel; Schweißbrenneranstelllwinkel
electrode extension	2.3.19	longueur de fil libre	freies Drahtelektrodenende
electrode holder	2.6.4	porte-électrode	Stabelektrodenhalter
electrode pick-up	2.3.26	encrassement de l'électrode	Anlegierung an der Elektrode
engine driven welding power source	2.6.11	groupe électrogène de soudage	Schweißumformer mit Antrieb durch Verbrennungsmotor; Schweißaggregat
F			
flat characteristic	2.5.4	caractéristique plate; caractéristique constante	flach fallende Stromquellenkennlinie
flux cored electrode	2.4.12	fil fourré de flux	pulvergefüllte Drahtelektrode
forehand welding	See: push technique (2.2.1)		
G			
globular transfer	2.3.2	transfert globulaire	großtropfiger Werkstoffübergang
gun	See: welding gun (2.6.3)		
H			
high efficiency electrode	2.4.8	électrode à haut rendement	Hochleistungselektrode
hydrogen controlled electrode	2.4.5	électrode à hydrogène contrôlé	wasserstoffkontrollierte Stabelektrode
I			
iron powder electrode	2.4.7	électrode à la poudre de fer	Eisenpulver-Stabelektrode
M			
magnetic arc blow	See: arc blow (2.3.16)		
main arc	2.3.6	arc principal	Hauptlichtbogen
metal cored electrode	2.4.13	fil fourré de métal	metallgefüllte Drahtelektrode
metal transfer	2.3.1	transfert de métal	Werkstoffübergang
microplasma arc welding	2.1.7	soudage microplasma	Mikroplasmaschweißen
MIG spot welding	2.1.5	soudage MIG par points	Metall-Inertgaspunktschweißen
N			
narrow gap welding	2.1.8	soudage sur chanfrein étroit; soudage narrow gap	Engspaltschweißen
no-load voltage	2.5.5	tension à vide	Leerlaufspannung
nominal electrode efficiency	2.3.24	rendement nominal d'une électrode	Nennausbringung
non-consumable electrode	2.4.20	électrode non consommable	nicht abschmelzende Elektrode
non-transferred arc	2.3.9	arc non transféré	nicht übertragener Lichtbogen

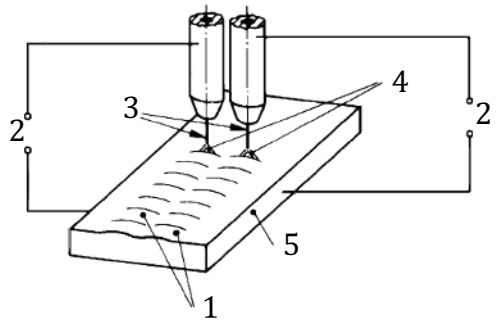
English term	Subclause	French translation	German translation
O			
open-circuit voltage	See: no-load voltage (2.5.5)		
overall weld metal recovery	2.3.25	rendement global	Gesamtausbringung
P			
particle transfer frequency	2.3.5	fréquence de transfert du métal	Tropfenübergangsfrequenz
pilot arc	2.3.7	arc pilote	Pilotlichtbogen; Hilfslichtbogen; Zündlichtbogen
plasma torch	2.6.6	torche plasma	Plasmaschweissbrenner
protrusion	2.3.27	Dépassement	Überstand
pull technique	2.2.2	soudage en tirant; soudage à droite	schleppendes Schweißen
pulse duration	See: pulse time (2.3.14)		
pulse time	2.3.14	durée de l'impulsion	Impulszeit
pulsed MAG welding	2.1.1	soudage MAG pulsé	Metall-Aktivgasschweißen mit Impulslichtbogen
pulsed MIG welding	2.1.2	soudage MIG pulsé	Metall-Inertgasschweißen mit Impulslichtbogen
pulsed TIG welding	2.1.3	soudage TIG pulsé	Wolfram-Inertgasschweißen mit Impulslichtbogen
push technique	2.2.1	soudage en poussant; soudage à gauche	stechendes Schweißen
Q			
quiver	2.6.15	carquois	Köcher
R			
rutile electrode	2.4.6	électrode au rutile	rutilumhüllte Stabelektrode
S			
short circuiting transfer	See: dip transfer (2.3.4)		
solid strip electrode	2.4.15	électrode en feuillard pleine	Massivbandelektrode
solid wire	2.4.17	fil plein	Massivdraht
solid wire electrode	2.4.10	fil-électrode plein	Massivdrahtelektrode
spray transfer	2.3.3	transfert par pulvérisation	feintropfiger Werkstoffübergang
stand-off distance	2.3.17	distance buse/pièce	Gasdüsenabstand
static characteristic	2.5.1	caractéristique statique	statische Kennlinie
stick electrode	See: covered electrode (2.4.1)		
Stickout	2.3.18	longueur terminale du fil; stickout	freie Drahtelektrodenlänge
striking voltage	2.3.11	tension d'amorçage	Zündspannung
strip electrode	2.4.14	électrode en feuillard; feuillard	Bandelektrode
Stub	See: stub end (2.4.21)		
stub end	2.4.21	chute d'électrode	Elektrodenrest
T			
TIG spot welding	2.1.6	soudage TIG par points	Wolfram-Inertgas-punktschweißen
torch angle	See: electrode angle (2.2.10)		
transferred arc	2.3.8	arc transféré	übertragener Lichtbogen

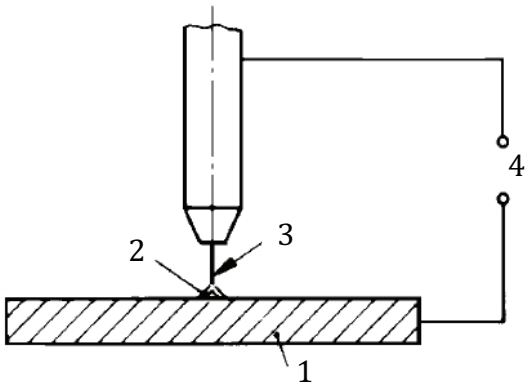
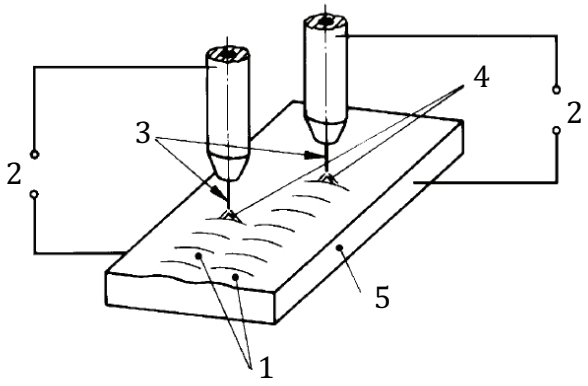
English term	Subclause	French translation	German translation
travel angle	2.2.11	angle de traîne	(no German term) (pas de terme allemand) (kein deutscher Begriff)
tubular cored electrode	2.4.11	fil fourré; fil-électrode fourré	Fülldrahtelektrode
tubular cored rod	2.4.18	baguette tubulaire fourrée	Füllstab; Rohrstab
tubular cored wire	2.4.19	fil tubulaire fourré	Fülldraht
W			
weave bead	2.2.7	passe large	Pendelraupe
weaving	2.2.3	balayage	Pendeln; pendelndes Schweißen
weaving amplitude	2.2.5	amplitude de balayage	Pendelausschlag
weaving frequency	2.2.6	fréquence de balayage	Pendelfrequenz
weaving width	2.2.4	largeur de balayage	Pendelbreite
welding converter	2.6.8	convertisseur de soudage	Schweißumformer (mit Antrieb durch Elektromotor)
welding current	2.2.8	intensité de soudage	Schweißstrom
welding generator	2.6.10	générateur de soudage	Schweißgenerator
welding gun	2.6.3	pistolet	Schweißbrenner; Schweißpistole
welding head	2.6.5	tête de soudage	Schweißkopf
welding rectifier	2.6.7	redresseur de soudage	Schweißgleichrichter
wire electrode	2.4.9	fil-électrode	Drahtelekrode
wire feed rate	2.2.12	vitesse de dévidage du fil	Drahtvorschubgeschwindigkeit
wire feed speed	See: wire feed rate (2.2.12)		
work angle	2.2.9	angle d'inclinaison	Schweißbrennerneigungswinkel

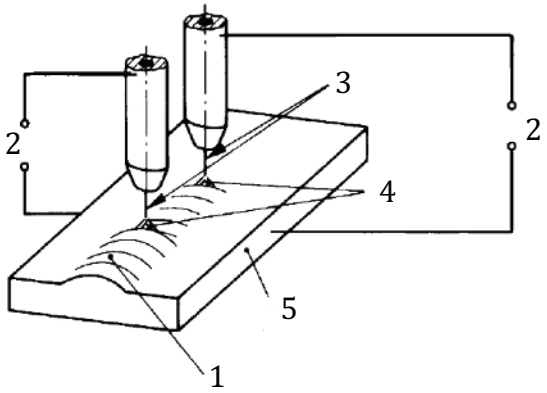
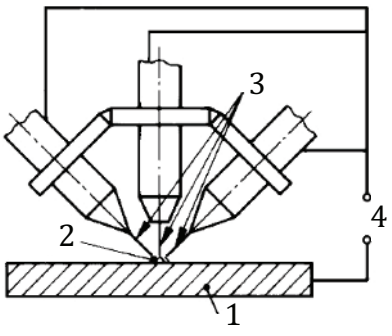
Annex B
(informative)

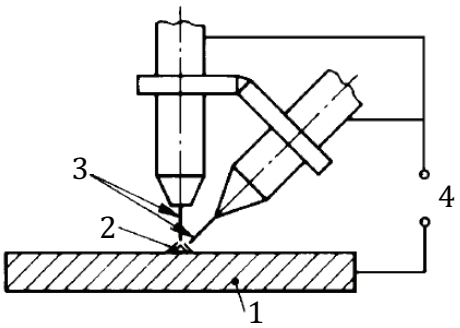
Alphabetical index of arc welding related terms defined in ISO 857-1:1998 that were not included in this part of ISO/TR 25901

The terms from ISO 857-1:1998 that are not included in the body of this first edition of this part of ISO/TR 25901 are either listed below when they have become obsolete or redundant, or are covered in another part of this Technical Report.

Term	Definition	Origin	Subclause
	E		
energy input per unit length	E_l electrical energy consumed during deposition of a unit length of weld metal and calculated from the following formula $E_l = IU / v$ where U is the welding voltage; I is the welding current; v is the welding speed.	ISO 857-1:1998	5.2.21
	M		
multiple-electrode welding	See: ISO 857-1:1998, Table 3 (Number of arc carrying electrodes: more than three)	ISO 857-1:1998	8.4
	P		
parallel welding	See: ISO 857-1:1998, Table 4 (Arrangement of the filler metals or of the non-consumable electrodes: side by side, at right angles to the direction of welding)  **Key** 1 weld 2 power source 3 electrode 4 arc 5 workpiece	ISO 857-1:1998	9.1

Term	Definition	Origin	Subclause
	S		
serially arranged welding	See: ISO 857-1:1998, Table 4 (Arrangement of the filler metals or of the non-consumable electrodes: More than two, arranged one behind the other in the direction of welding)	ISO 857-1:1998	9.4
single-electrode welding	See: ISO 857-1:1998, Table 3 (Number of arc carrying electrodes: one)  **Key** 1 workpiece 2 arc 3 electrode 4 power source	ISO 857-1:1998	8.1
staggered welding	See: ISO 857-1:1998, Table 4 (Arrangement of the filler metals or of the non-consumable electrodes: Side by side, staggered in the direction of welding)  **Key** 1 weld 2 power source 3 electrode 4 arc 5 workpiece	ISO 857-1:1998	9.2
	T		

Term	Definition	Origin	Subclause
tandem welding	See: ISO 857-1:1998, Table 4 (Arrangement of the filler metals or of the non-consumable electrodes: Two, arranged one behind the other in the direction of welding)  **Key** 1 weld 2 power source 3 electrode 4 arc 5 workpiece	ISO 857-1:1998	9.3
thermal efficiency	η ratio of heat input to energy input per unit length $\eta = Q_I / E_I$	ISO 857-1:1998	5.2.23
three-electrode welding	See: ISO 857-1:1998, Table 3 (Number of arc carrying electrodes: three)  **Key** 1 workpiece 2 filler metal 3 welding head 4 power source	ISO 857-1:1998	8.3

Term	Definition	Origin	Subclause
two-electrode welding	See: ISO 857-1:1998, Table 3 (Number of arc carrying electrodes: two)  **Key** 1 workpiece 2 arc 3 electrode 4 power source	ISO 857-1:1998	8.2

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[2] ISO 6520-2, *Welding and allied processes — Classification of geometric imperfections in metallic materials — Part 2: Welding with pressure*

[3] ISO 14917, *Thermal spraying — Terminology, classification*

[4] ISO 15296, *Gas welding equipment — Vocabulary — Terms used for gas welding equipment*

[5] ISO 17658, *Welding — Imperfections in oxyfuel flame cuts, laser beam cuts and plasma cuts — Terminology*

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[7] ISO 25239-1, *Friction stir welding — Aluminium — Part 1: Vocabulary*

[8] IEC 60050-851, *International electrotechnical vocabulary — Part 851: Electric welding*

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