

---

---

**Welding and allied processes —  
Vocabulary —**

**Part 4:  
Arc welding**

*Soudage et techniques connexes — Vocabulaire —*

*Partie 4: Soudage à l'arc*  
**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO/TR 25901-4:2016

<https://standards.iteh.ai/catalog/standards/sist/c2a9c217-1095-46f9-aa1a-b143cdd917cb/iso-tr-25901-4-2016>



**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO/TR 25901-4:2016

<https://standards.iteh.ai/catalog/standards/sist/c2a9c217-1095-46f9-aa1a-b143cdd917cb/iso-tr-25901-4-2016>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
www.iso.org

**Contents**

Page

<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Terms and definitions</b> .....	<b>1</b>
2.1 Terms related to welding procedures.....	1
2.2 Terms related to welding execution.....	2
2.3 Terms related to welding process characteristics.....	3
2.4 Terms related to welding consumables.....	6
2.5 Terms related to characteristics of welding power source.....	8
2.6 Terms related to welding equipment.....	8
<b>Annex A (informative) Alphabetical index of English terms with French and German translations</b> .....	<b>10</b>
<b>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</b> .....	<b>14</b>
<b>Bibliography</b> .....	<b>18</b>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO/TR 25901-4:2016

<https://standards.iteh.ai/catalog/standards/sist/c2a9c217-1095-46f9-aa1a-b143cdd917cb/iso-tr-25901-4-2016>

## 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](http://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](http://www.iso.org/patents)).

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](http://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/>

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

### 2 Terms and definitions ISO/TR 25901-4:2016

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)

(standards.iteh.ai)

**2.3 Terms related to welding process characteristics**

ISO/TR 25901-4:2016

**2.3.1****metal transfer****droplet transfer**

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

<https://standards.iteh.ai/catalog/standards/sist/c2a9c217-1095-46f9-aa1a-b143cdd917cb/iso-tr-25901-4-2016>

**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.

ISO/TR 25901-4:2016

<https://standards.iteh.ai/catalog/standards/sist/c2a9c217-1095-46f9-aa1a-b143cdd917cb/iso-tr-25901-4-2016>

**2.3.13**

**arc time**

**arc 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**

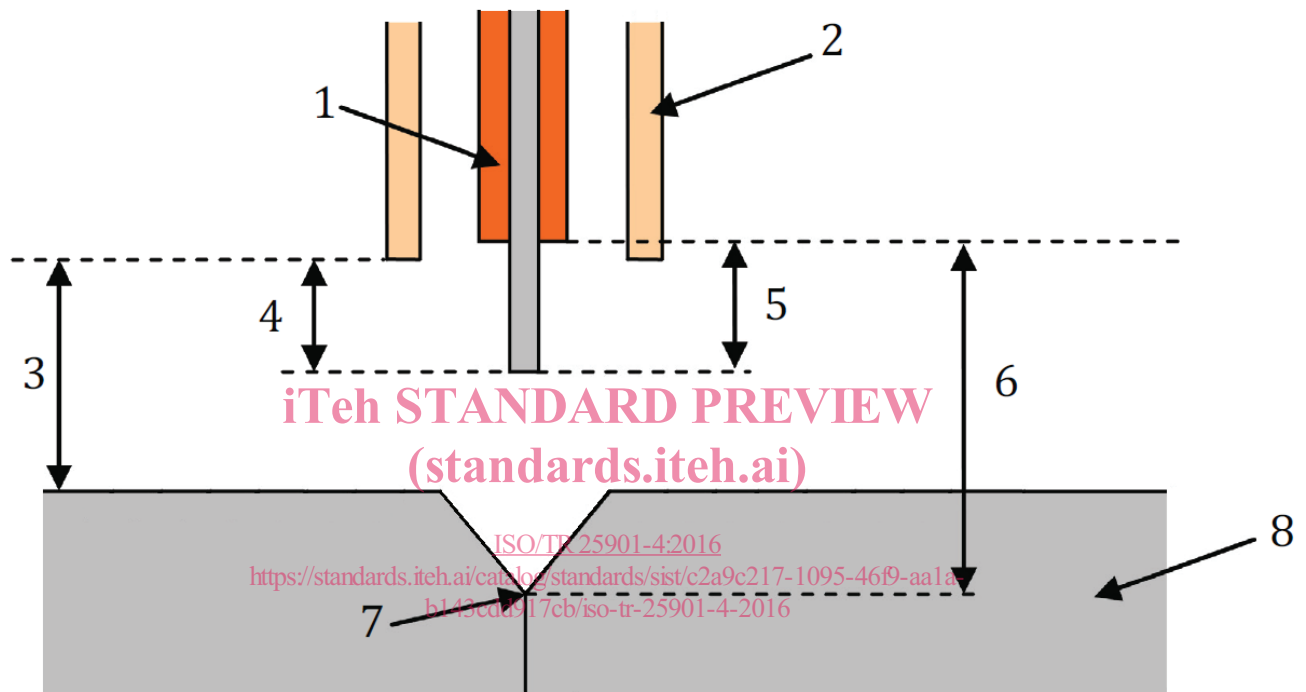
distance between the *contact tip* (2.6.2) or *collet* (2.6.1) and end of the *wire electrode* (2.4.9)

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**

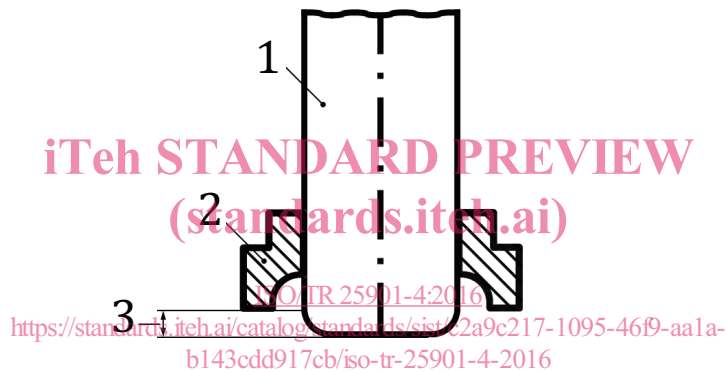
contamination of a *non-consumable electrode* (2.4.20) by metal or scale during welding

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