



# SLOVENSKI STANDARD

## SIST EN ISO 669:2016

01-julij-2016

---

**Uporovno varjenje - Oprema za uporovno varjenje - Mehanske in električne zahteve (ISO 669:2016)**

Resistance welding - Resistance welding equipment - Mechanical and electrical requirements (ISO 669:2016)

Widerstandsschweißen - Widerstandsschweißeinrichtungen - Mechanische und elektrische Anforderungen (ISO 669:2016)

Soudage par résistance - Matériel de soudage par résistance - Exigences mécaniques et électriques (ISO 669:2016)

[SIST EN ISO 669:2016](https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016)

[https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-](https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016)

[a3c29ec72a88/sist-en-iso-669-2016](https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016)

**Ta slovenski standard je istoveten z: EN ISO 669:2016**

---

**ICS:**

25.160.30

Varilna oprema

Welding equipment

**SIST EN ISO 669:2016**

**en,fr,de**

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

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 669**

March 2016

ICS 25.160.30

English Version

**Resistance welding - Resistance welding equipment -  
Mechanical and electrical requirements (ISO 669:2016)**

Soudage par résistance - Matériel de soudage par  
résistance - Exigences mécaniques et électriques (ISO  
669:2016)

Widerstandsschweißen -  
Widerstandsschweißeinrichtungen - Mechanische und  
elektrische Anforderungen (ISO 669:2016)

This European Standard was approved by CEN on 2 January 2016.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents

Page

European foreword.....	3
------------------------	---

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

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>

## European foreword

This document (EN ISO 669:2016) has been prepared by Technical Committee ISO/TC 44 “Welding and allied processes” in collaboration with Technical Committee CEN/TC 121 “Welding and allied processes” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **iTeh STANDARD PREVIEW** **Endorsement notice** **(standards.iteh.ai)**

The text of ISO 669:2016 has been approved by CEN as EN ISO 669:2016 without any modification.

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>

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

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>

# INTERNATIONAL STANDARD

**ISO  
669**

Third edition  
2016-02-15

---

---

## **Resistance welding — Resistance welding equipment — Mechanical and electrical requirements**

*Soudage par résistance — Matériel de soudage par résistance —  
Exigences mécaniques et électriques*

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

[SIST EN ISO 669:2016](https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016)

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>



Reference number  
ISO 669:2016(E)

© ISO 2016

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

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>



### **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](mailto:copyright@iso.org)  
[www.iso.org](http://www.iso.org)



# Contents

Page

<b>Foreword</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>2</b>
3.1 Mechanical parts of spot, projection, and seam welding equipment	2
3.2 Mechanical parts of upset and flash welding equipment	8
3.3 Static mechanical characteristics	11
3.4 Electrical and thermal characteristics	14
3.5 Pneumatic and hydraulic characteristics	16
<b>4 Symbols and abbreviated terms</b>	<b>16</b>
<b>5 Physical environment and operating conditions</b>	<b>18</b>
5.1 General	18
5.2 Ambient air temperature	18
5.3 Liquid cooling medium	18
5.4 Humidity	18
5.5 Altitude	19
5.6 Transportation and storage	19
<b>6 Test conditions</b>	<b>19</b>
6.1 General	19
6.2 Environmental conditions	19
6.3 Measuring instruments	19
<b>7 Rated no load voltage at the output</b>	<b>20</b>
7.1 General	20
7.2 a.c. no load voltage ( $U_{20}$ )	20
7.3 d.c. no load voltage ( $U_{2d}$ )	20
<b>8 Maximum short circuit current</b>	<b>20</b>
8.1 General	20
8.2 Spot and seam welding equipment	21
8.3 Projection welding equipment	21
8.4 Upset and flash welding equipment	22
<b>9 Thermal rating</b>	<b>23</b>
9.1 General	23
9.2 Thermal test	23
<b>10 Cooling liquid circuit (liquid cooled welding equipment)</b>	<b>23</b>
<b>11 Static mechanical characteristics</b>	<b>24</b>
11.1 General	24
11.2 Spot and projection welding equipment	24
11.2.1 General	24
11.2.2 Eccentricity	25
11.2.3 Angular deflection	26
11.2.4 Radial deflection	26
11.2.5 Axial deflection	27
11.2.6 Machine stiffness	27
11.2.7 Parallelism of top and bottom platen	27
11.2.8 Perpendicularity in platen movement, $\delta_4$	28
11.3 Seam welding equipment	29
11.3.1 General	29
11.3.2 Eccentricity	29
11.3.3 Angular deflection	30
11.4 Upset welding equipment	30

## ISO 669:2016(E)

11.4.1	General.....	30
11.4.2	Angular deflection.....	31
<b>12</b>	<b>Rating plate.....</b>	<b>31</b>
12.1	General.....	31
12.2	Description.....	32
12.3	Tolerances.....	34
<b>13</b>	<b>Instruction manual.....</b>	<b>34</b>
<b>Annex A (informative) Examples of rating plates.....</b>		<b>36</b>
<b>Bibliography.....</b>		<b>38</b>

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

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>

## 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 6, *Resistance welding and allied mechanical joining*.

This third edition ~~cancels and replaces the second edition (ISO 669:2000)~~, which has been technically revised.

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

SIST EN ISO 669:2016

<https://standards.iteh.ai/catalog/standards/sist/7418bc53-a8d0-499c-9ea2-a3c29ec72a88/sist-en-iso-669-2016>

# Resistance welding — Resistance welding equipment — Mechanical and electrical requirements

## 1 Scope

This International Standard defines and specifies certain identified electrical and mechanical characteristics of equipment used for

- resistance spot welding,
- projection welding,
- resistance seam welding,
- upset welding<sup>1)</sup>, and
- flash welding<sup>2)</sup>.

This International Standard specifies the information to be given in equipment specifications and the test methods to be used for measuring those characteristics.

Not all requirements apply to all types of equipment.

The following types of power sources are included:

- single phase with alternating welding current;
- single phase with rectified welding current by rectification of the output of the welding transformer;
- single phase with inverter welding transformer;
- three phase with rectified welding current by rectification of the output of the welding transformer;
- three phase with a current rectification in the input of the welding transformer (sometimes called frequency convertor);
- three phase with inverter welding transformers.

This International Standard does not apply to welding transformers that are separate from the equipment.

NOTE Safety requirements for resistance welding equipment are covered by IEC 62135-1.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5826:2014, *Resistance welding equipment — Transformers — General specifications applicable to all transformers*

ISO 17657-2, *Resistance welding — Welding current measurement for resistance welding — Part 2: Welding current meter with current sensing coil*

1) Often referred to by the non-preferred term, butt welding.

2) Often referred to by the non-preferred term, flash butt welding.

## ISO 669:2016(E)

ISO 17657-5, *Resistance welding — Welding current measurement for resistance welding — Part 5: Verification of welding current measuring system*

ISO 17677-1, *Resistance welding — Vocabulary — Part 1: Spot, projection and seam welding*

IEC 62135-1, *Resistance welding equipment — Part 1: Safety requirements for design, manufacture and installation*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17677-1 and the following apply.

#### 3.1 Mechanical parts of spot, projection, and seam welding equipment

##### 3.1.1

##### **arm**

device for transmitting the *electrode force* (3.1.16) which can also conduct the welding current or support a separate conductor

Note 1 to entry: See [Figure 1](#) and [Figure 3](#).

##### 3.1.2

##### **welding head**

device comprising the force generation and guiding system carrying an *electrode holder* (3.1.3), *platen* (3.1.5), or *seam welding head* (3.1.6) mounted to the upper arm or directly to the machine body

Note 1 to entry: See [Figure 1](#).

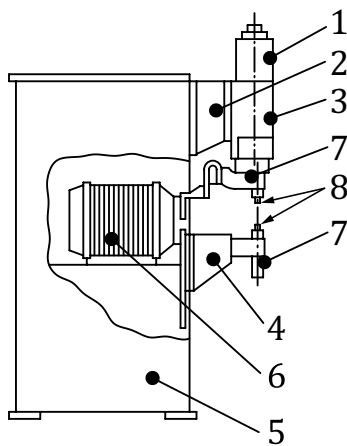
##### 3.1.3

##### **electrode holder**

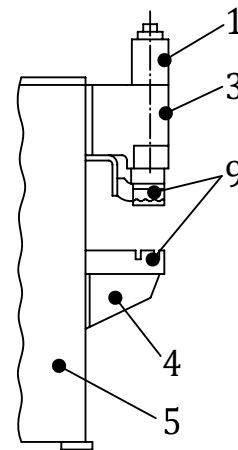
device holding a *spot welding electrode* (3.1.4) or an *electrode adaptor*

[SOURCE: ISO 8430-1, ISO 8430-2, and ISO 8430-3]

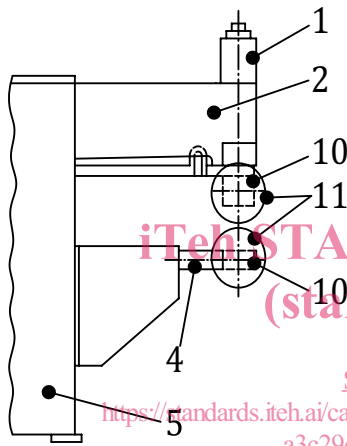
Note 1 to entry: See [Figure 1](#).



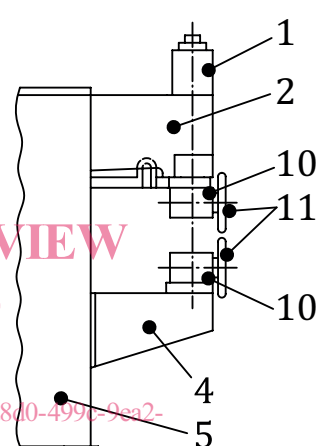
a) Spot welding equipment



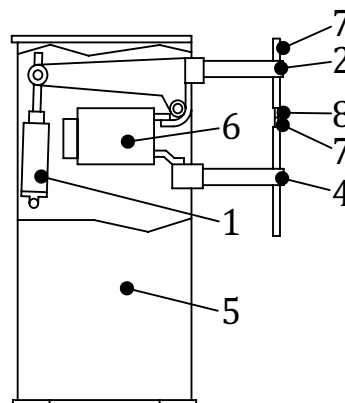
b) Projection welding equipment



c) Longitudinal seam welding equipment



d) Transverse seam welding equipment



e) Rocker arm welding equipment