

KAARKEEVITUSSEADMED. OSA 7: PÕLETID

Arc welding equipment - Part 7: Torches

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60974-7:2019 sisaldab Euroopa standardi EN IEC 60974-7:2019 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60974-7:2019 consists of the English text of the European standard EN IEC 60974-7:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 08.11.2019.	Date of Availability of the European standard is 08.11.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 25.160.30

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Arc welding equipment - Part 7: Torches
(IEC 60974-7:2019)**

Matériel de soudage à l'arc - Partie 7: Torches
(IEC 60974-7:2019)

Lichtbogenschweißeinrichtungen - Teil 7: Brenner
(IEC 60974-7:2019)

This European Standard was approved by CENELEC on 2019-03-06. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 26/673/FDIS, future edition 4 of IEC 60974-7, prepared by IEC/TC 26 "Electric welding" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60974-7:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-05-08
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-11-08

This document supersedes EN 60974-7:2013 and all of its amendments and corrigenda (if any).

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

Endorsement notice

The text of the International Standard IEC 60974-7:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60974-2 NOTE Harmonized as EN 60974-2

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60695-11-10-		Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10-	
IEC 60974-1	2017	Arc welding equipment - Part 1: Welding power sources	EN IEC 60974-1	2018
ISO 21904-3	2018	Health and safety in welding and allied processes - Requirements, testing and marking of equipment for air filtration - Part 3: Determination of the capture efficiency of on-torch welding fume extraction devices	EN ISO 21904-3	2018

Annex ZZ (informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZ.1 – Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1(a)	Clauses 12, 13	
1(b)	Clause 13	
1(c)		Testing during periodic maintenance or after repair is covered in separate standards
2(a)	Clauses 7, 13 k) and p)	
2(b)	Clauses 7, 8	Hazards arising from electric, magnetic, and electromagnetic fields, other ionizing and non-ionizing radiation are covered in separate standards
2(c)	Clauses 6.3 b), 9, 10, 11.3, 13 i) 2) and n)	Acoustic noise is covered in separate standards
2(d)	Clause 7.2, 7.3, 10	
3(a)	Clause 9, 10, 11	
3(b)	Clauses 4, 11.3, 13 l) and n),	Functional safety is covered in separate standards Safety-related security is covered in separate standards
3(c)	not applicable	For this product type, there are no overload conditions.

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Environmental conditions.....	9
5 Classification.....	10
5.1 General.....	10
5.2 Process	10
5.3 Guidance	10
5.4 Cooling.....	10
5.5 Main arc striking for plasma processes	10
6 Test conditions	10
6.1 General.....	10
6.2 Type tests.....	11
6.3 Routine tests.....	11
7 Protection against electric shock	11
7.1 Voltage rating	11
7.2 Insulation resistance	12
7.3 Dielectric strength.....	13
7.3.1 General requirement.....	13
7.3.2 Additional requirements for plasma cutting TORCHES.....	13
7.4 Protection against electric shock in normal service (direct contact)	13
7.4.1 Degree of protection requirements.....	13
7.4.2 Additional requirements for plasma cutting TORCHES.....	13
7.5 Requirements for ARC STRIKING AND STABILIZING VOLTAGE rating	14
7.5.1 General requirement.....	14
7.5.2 ARC STRIKING AND STABILIZING VOLTAGE test	14
8 Thermal rating	15
8.1 General.....	15
8.2 Temperature rise	15
8.3 Heating test	15
8.3.1 General	15
8.3.2 Metal inert/active gas (MIG/MAG) or self-shielded flux-cored arc welding TORCH	16
8.3.3 Tungsten inert gas (TIG) and plasma arc welding TORCH	18
8.3.4 Plasma cutting TORCH	19
8.3.5 Submerged arc welding TORCH	19
9 Pressure of the liquid cooling system.....	20
10 Resistance to hot objects.....	20
11 Mechanical provisions	21
11.1 Impact resistance.....	21
11.2 Accessible parts.....	22
11.3 HANDLE material.....	22
12 Marking	22
13 Instructions for use	22

Annex A (informative) Additional terminology	24
Annex B (normative) Position of the welding TORCHES for the heating test.....	27
Annex C (informative) Cooled copper block	28
Annex D (informative) Copper block with a hole	29
Annex E (informative) Copper bars with a slot.....	30
Bibliography.....	31
Figure 1 – Device for testing the resistance to hot objects	20
Figure 2 – Device for the impact test.....	21
Figure A.1 – TORCH for metal inert/active gas (MIG/MAG) or self-shielded flux-cored arc welding	25
Figure A.2 – GUN for metal inert/active gas (MIG/MAG) or self-shielded flux-cored arc welding	25
Figure A.3 – TORCH for tungsten inert gas arc welding	25
Figure A.4 – TORCH for plasma arc welding.....	25
Figure A.5 – TORCH for plasma cutting	26
Figure A.6 – Supply unit.....	26
Figure A.7 – MECHANICALLY GUIDED plasma TORCH	26
Figure B.1 – MIG/MAG TORCHES	27
Figure B.2 – TIG TORCHES.....	27
Figure B.3 – Plasma welding TORCHES	27
Figure C.1 – Water-cooled copper block – Example	28
Figure D.1 – Water-cooled copper block with a hole – Example	29
Figure E.1 – Water-cooled copper bars with a slot – Example	30
Table 1 – Voltage rating of TORCHES	12
Table 2 – Test values for metal inert gas arc welding (MIG) of aluminium alloys	16
Table 3 – Test values for metal active gas arc welding (MAG) of mild steel.....	17
Table 4 – Test values for metal active gas arc welding (MAG) with flux-cored wire	17
Table 5 – Test values for self-shielded flux-cored arc welding of mild steel.....	18
Table 6 – Test values for tungsten inert gas arc welding (TIG).....	18
Table 7 – Test values for plasma arc welding.....	19
Table A.1 – List of terms	24

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ARC WELDING EQUIPMENT –

Part 7: Torches

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60974-7 has been prepared by IEC technical committee 26: Electric welding.

This fourth edition cancels and replaces the third edition published in 2013 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) definitions 3.11 and 3.20 were revised;
- b) requirements for ARC STRIKING AND STABILIZING VOLTAGE rating have been added to the sequence of type tests (see 6.2);
- c) the AC test voltage requirement for TORCHES that utilize ARC STRIKING AND STABILIZING VOLTAGES has been revised (see 7.5.2);