

Arc welding equipment —

Part 7: Torches

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Summary of pages

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Foreword

The text of document 26/174/FDIS, future edition 1 of IEC60974-7, prepared by IEC TC 26, Electric welding, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60974-7 on 1999-12-01.

This European Standard, together with EN 60974-1:1998/A1:2000, replaces EN 50078:1993 and EN 50192:1995.

The following dates were fixed:

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- latest date by which the national standards conflicting
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Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes B and ZA are normative and annexes A, C, D, E and F are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60974-7:2000 was approved by CENELEC as a European Standard without any modification.

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ARC WELDING EQUIPMENT –

Part 7: Torches

1 Scope

This part of IEC 60974 specifies safety and construction requirements for torches for arc welding and allied processes.

In this standard, a torch consists of the torch body, the cable-hose assembly and other components.

This standard is not applicable to electrode holders for manual metal arc welding or torches for air-arc cutting/gouging.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60974. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60974 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(151):1978, *International Electrotechnical Vocabulary – Chapter 151: Electrical and magnetic devices*

IEC 60050(851):1991, *International Electrotechnical Vocabulary – Chapter 851: Electric welding*

IEC 60051-2:1984, *Direct acting indicating analogue electrical measuring instruments and their accessories – Part 2: Special requirements for ammeters and voltmeters*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60974-1:1998, *Arc welding equipment – Part 1: Welding power sources*

IEC 61558-1:1997, *Safety of power transformers, power supply units and similar – Part 1: General requirements and tests*

3 Definitions

For the purposes of this part of IEC 60974, the following definitions apply, together with those in IEC 60050(151), IEC 60050(851), and IEC 60664-1.

NOTE Additional terminology is given in annex A.

3.1

torch

device that conveys all services necessary to the arc for welding, cutting or allied processes (for example, current, gas, coolant, wire electrode)

3.2

gun

torch with a handle substantially perpendicular to the torch body

3.3

torch body

main component to which the cable-hose assembly and other components are connected

3.4

handle

part designed to be held in the operator's hand

3.5

gas nozzle

component at the exit end of the torch directing the shielding gas around the arc and over the weld pool

3.6

non-consumable electrode

arc welding electrode which does not provide filler metal

3.7

wire electrode

solid or tubular filler wire which conducts welding current

3.8

contact tip

replaceable metal component fixed at the front end of the torch, which transfers the welding current to, and guides, the wire electrode

3.9

cable-hose assembly

flexible assembly of cables and hoses, and their connecting elements, that delivers all necessary supplies to the torch body

3.10

manual torch

torch held and guided by the operator's hand during its operation

3.11

mechanically guided torch

torch fixed to, and guided by, a mechanical device during its operation

3.12

air-cooled torch

torch cooled by the ambient air and, where appropriate, by the shielding gas

3.13

liquid-cooled torch

torch cooled by the circulation of a cooling liquid

3.14

motorized torch

torch incorporating means to supply motion to the wire electrode

3.15

spool-on torch

motorized torch incorporating a filler wire supply

3.16

arc striking and stabilizing voltage

voltage superimposed on the welding circuit to initiate or maintain the arc or both

3.17

filler metal

metal added during welding or allied processes [IEV 851-04-24]

3.18

filler wire

filler metal in solid or tubular wire form which may or may not be part of the welding circuit

3.19

plasma tip

component that provides the constricting orifice through which the plasma arc passes

3.20

general visual inspection

inspection by eye to verify that there are no apparent discrepancies with respect to the provisions of the standard concerned [IEC 60974-1, 3.7]

3.21

plasma cutting system

combination of power source, torch, and associated safety devices for plasma cutting/gouging

3.22

plasma cutting power source

equipment for supplying current and voltage and having the required characteristics suitable for plasma cutting/gouging and which may supply gas and cooling liquid

NOTE 1 A plasma cutting power source may also supply services to other equipment and auxiliaries, for example auxiliary power, cooling liquid, and gas.

NOTE 2 In the following text, the term "cutting power source" is used.

[IEC 60974-1, 3.1 modified]

3.23**SELV**

voltage which does not exceed 50 V a.c. or 120 V ripple-free d.c. between conductors, or between any conductor and earth, in a circuit which is isolated from the supply mains by such means as a safety isolating transformer

NOTE 1 Maximum voltage lower than 50 V a.c. or 120 V ripple-free d.c. may be specified in particular requirements, especially when direct contact with live parts is allowed.

NOTE 2 The voltage limit should not be exceeded at any load between full load and no-load when the source is a safety isolating transformer.

NOTE 3 "Ripple-free" is conventionally an r.m.s. ripple voltage not more than 10 % of the d.c. component; the maximum peak value does not exceed 140 V for a nominal 120 V ripple-free d.c. system and 70 V for a nominal 60 V ripple-free d.c. system.

[IEC 61558-1, 3.7.16]

4 Environmental conditions**a) Ambient air temperature**

- during welding: –10 °C to +40 °C;
- during transport and storage: –25 °C to +55 °C;

b) Relative humidity of the air: up to 90 % at 20 °C.**5 Classification**

Torches shall be classified in accordance with

- a) the process for which they are designed, see 5.1;
- b) the method by which they are guided, see 5.2;
- c) the type of cooling, see 5.3;
- d) the method of striking the main arc for plasma processes, see 5.4.

5.1 Process

Torches can be designed for

- a) MIG/MAG welding;
- b) self-shielded flux-cored arc welding;
- c) TIG welding;
- d) plasma welding;
- e) submerged arc welding;
- f) plasma cutting/gouging.

5.2 Method of guidance

- a) Manually.
- b) Mechanically.

5.3 Type of cooling

- a) Ambient air or shielding gas, see 3.12.
- b) Liquid, see 3.13.