



UL 551

STANDARD FOR SAFETY

**Transformer-Type Arc-Welding
Machines**

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UL Standard for Safety for Transformer-Type Arc-Welding Machines, UL 551

Eighth Edition, Dated April 24, 2009

Summary of Topics

This revision to UL 551 is being issued to reaffirm the Eighth Edition of the Standard for Safety for Transformer-Type Arc-Welding Machines, UL 551, as an American National Standard and to incorporate an editorial correction to the Table of Contents.

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The most recent designation of ANSI/UL 551 as a Reaffirmed American National Standard (ANS) occurred on January 8, 2018. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements cover limited duty welding and cutting power sources, wire feeders, torches, and electrode holders that are intended for use by a layperson in a nonindustrial setting in accordance with the National Electrical Code, NFPA 70. Products covered by these requirements include only those welding products rated 600 volts or less, and are commonly known as hobby welders.

1.1 effective July 15, 2009

1.2 These requirements do not cover motor-generator sets or rectifier- or resistance-type welding machines. These requirements do not cover industrial or professional use welders.

1.2 effective July 15, 2009

2 Components

2.1 Except as indicated in this clause, a component of a product covered by this standard shall comply with the requirements for that component. See the Standards for Components appendix for a list of standards covering components generally used in the products covered by this standard.

2.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 References

4.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Terminology

5.1 In the following text, a requirement that applies only to a particular type of product is so identified by a specific reference in that requirement to the type or types of products involved. Absence of such specific reference or use of the term product indicates that the requirement applies to all types of products unless the context indicates otherwise.

CONSTRUCTION

6 General

6.1 An enclosure, an opening, a frame, a guard, a knob, a handle, or the like shall not be sufficiently sharp to cause a risk of injury to persons during normal maintenance or use.

Exception: A sharp edge that must be exposed to enable the product to perform its intended function.

6.2 A welding lead or electrode holder that is attached to a product shall be acceptable for the purpose.

7 Frame and Enclosure

7.1 A product shall be formed and assembled so that it will have the strength and rigidity necessary to resist the abuses to which it may be subjected, without increasing the risk of fire, electric shock, or injury to persons due to total or partial collapse with resulting reduction of spacings, loosening or displacement of parts, or other serious defects.

7.2 A product shall be provided with a case or cabinet that encloses all live parts.

Exception No. 1: A flexible supply cord or cable and welding leads need not be enclosed.

Exception No. 2: Ungrounded secondary output terminals for the connection of welding leads, tap jacks, or similar parts connected to the secondary circuit need not be enclosed if they are:

- a) Limited in voltage as specified in 27.1.1; and
- b) Protected so as to reduce the risk of unintentional contact.

7.3 The protection referred to in Exception No. 2 to 7.2 will usually be afforded if:

- a) Jacks are of the dead-front type,
- b) An uninsulated live part is recessed for a distance not less than half the minimum dimension of the opening behind which the live part is located,
- c) A hinged cover is provided over the terminals with smooth-edged slots or openings for the cable, or

d) In a product with a marked duty cycle more than 20 percent, an uninsulated live part, including the secondary terminals in the case of stud connections, is recessed beyond the plane of the opening.

7.4 An enclosure shall be made of cast metal, iron, steel, aluminum, copper, or brass.

Exception: Other material that has been investigated and found to be acceptable for the purpose may be used.

7.5 Among the factors to consider in determining the acceptability of an enclosure are its:

- a) Mechanical strength,
- b) Resistance to impact,
- c) Moisture-absorptive properties,
- d) Combustibility,
- e) Resistance to corrosion,
- f) Resistance to distortion at temperatures to which the enclosure may be subjected under conditions of normal or abnormal use, and
- g) Resistance to ignition from electrical sources.

For a nonmetallic enclosure, all of these factors are considered with respect to thermal aging.

7.6 The thickness of a cast-metal enclosure shall be as specified in Table 7.1.

Table 7.1
Thickness of cast-metal for enclosures

Dimensions of location of area involved	Minimum thickness, Inch (mm)	
	Cast metal other than die-cast	Die-cast metal
Area of 24 square inches (154.8 cm ²) or less and having no dimension greater than 6 inches (152.4 mm)	1/8 (3.2)	1/16 ^a (1.6)
Area greater than 24 square inches (154.8 cm ²) or having any dimension greater than 6 inches (152.4 mm)	1/8 (3.2)	3/32 (2.4)
At a threaded conduit hole	1/4 (6.4)	1/4 (6.4)
At an unthreaded conduit hole	1/8 (3.2)	1/8 (3.2)

^a The area limitation for metal 1/16 inch (1.6 mm) thick may be obtained by the provision of acceptable reinforcing ribs subdividing a larger area.