

UL 1659

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Attachment Plug Blades for Use in Cord Sets and Power-Supply Cords

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UL Standard for Safety
for
Attachment Plug Blades for Use in Cord Sets and Power-Supply Cords, UL 1659

Second Edition, Dated September 30, 1997

Revisions: This Standard contains revisions through and including August 19, 1998. UL is in the process of converting its Standards for Safety to the Standard Generalized Markup Language (SGML). SGML -- an international standard (ISO 8879-1986) -- is a descriptive markup language that describes a document's structure and purpose, rather than its physical appearance on the page. Significant benefits that will result from UL's use of SGML are increased productivity, reduced turnaround times, and data and information consistency, reusability, shareability, and portability. The changes noted in these revised pages are needed to modify the format and layout of this Standard to allow it to be converted to SGML. These editorial changes are now in effect.

A change is indicated by a note following the affected item. The note is preceded and followed by an asterisk.

The revisions dated August 19, 1998 include a reprinted title page (page 1) for this Standard.

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New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Recognition and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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UL 1659

Standard for

**Attachment Plug Blades for Use in Cord Sets
and Power-Supply Cords**

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Second Edition

September 30, 1997

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

1 Scope

1.1 General

1.1.1 These requirements cover the blades of attachment plugs and current taps intended to be connected to the conductors of flexible cords using crimped connections, for use on cord sets and power-supply cords complying with the Standard for Cord Sets and Power-Supply Cords, UL 817, within the limits set forth in 1.2.1 for type of blades and 1.3.1 for size of conductors.

1.1.2 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this Standard, and that involves a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable level of safety as originally anticipated by the intent of this Standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this Standard cannot be judged to comply with this Standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this Standard.

1.2 Type of blades

1.2.1 These requirements apply to blades, solid and folded, of attachment plugs and current taps rated 15 or 20 A, for general purpose use. These requirements do not apply to the grounding blade (pin) of grounding type attachment plugs or current taps.

1.3 Conductor sizes

1.3.1 These requirements apply to blades intended to be attached to Nos. 18 AWG (0.82 mm^2) – 10 AWG (5.3 mm^2) conductors.

2 Glossary

2.1 For the purpose of this Standard the following definitions apply.

2.2 **BLADE** – The part of an attachment plug or current tap intended to be inserted into the contacts of an outlet device of matching configuration and the integral extension of this part, located within the attachment plug or current tap, to which the conductor of a flexible cord is connected.

2.3 **CONTACT SURFACE AREA** – The area on each side of a blade that is intended to make electrical contact with the contacts of an outlet device.

2.4 **CRIMPED CONNECTION** – An electro-mechanical connection made between a blade and a conductor by compressing the portion of the blade, termed "the integral extension" in 2.2, against the conductor.

3 Units of Measurement

3.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

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.

CONSTRUCTION

5 General

5.1 The construction of a blade shall be such that all strands of the intended conductor will be contained within the crimp terminal.

6 Materials

6.1 A blade shall be plated or unplated 70/30 cartridge brass (Alloy #260 of the Copper Development Association).

6.2 Copper alloy parts of other than 70/30 cartridge brass (Alloy #260 of the Copper Development Association) shall be resistant to corrosion cracking, as determined by the 10 Day Moist Ammonia Air Test, Section 17.

7 Dimensions

7.1 General

7.1.1 Blade dimensions shall be in accordance with Figure 7.1 or 7.2, as applicable.

7.2 Contact surface area

7.2.1 A contact surface area shall be located on each side of a folded blade. The location and minimum size of the areas shall be as specified in Figure 7.3 except as modified in 7.2.2. A solid blade which complies with the thickness requirement in 7.3.1 is considered to have the required surface area. See 7.2.4.

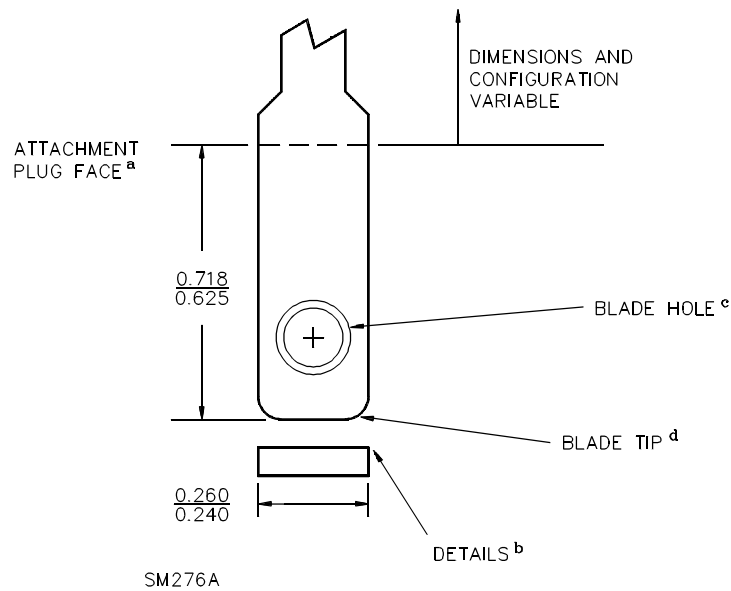
7.2.2 A contact surface area of a non-polarized folded blade shall extend into the tapered portion at the tip of the blade profiles as shown in Figure 7.4. See Compression Force Test, Section 16.

7.2.3 A contact surface area of a folded blade shall be flat and continuous except for

- a) The hole shown in Figure 7.5, if provided,
- b) A close fitting seam (without gaps) that is formed by folding a blade and butting two edges together in the contact surface area, rather than along the edge of the blade, or
- c) A die-stamped manufacturer's identification marking that is no deeper than needed for legibility.

7.2.4 A blade surface area, with or without the optional blade hole, and with or without the hole chamfer, that is totally flat (without embossing or other raised sections) is considered to have the required contact surface area for that side of the blade.

Figure 7.1
Non-polarized blade



NOTES –

- a) The location of the attachment plug face is shown above solely to provide a frame of reference.
- b) See Figure 7.3 for details.
- c) If used, locate as shown in Figure 7.5.
- d) See Figure 7.4 for typical blade tip and stem dimensions.

All dimensions in inches

inch	mm	inch	mm
0.240	6.10	0.625	15.9
0.260	6.60	0.718	18.2