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Electric Radiant Heating Panels and Heating Panel Sets

Underwriters Laboratories Inc. (UL)
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UL Standard for Safety for Electric Radiant Heating Panels and Heating Panel Sets, UL 1693

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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 Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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Standard for Electric Radiant Heating Panels and Heating Panel Sets

First Edition

May 18, 1995

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated May 18, 1995 and May 27, 1999. These pages should not be discarded when revised or additional pages are issued if it is desired to retain the ANSI approved text.

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

Approved as ANSI/UL 1693-1998, August 3, 1998

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 which conflict with specific requirements of the Standard cannot be judged to comply with the Standard. A product employing materials or having forms of construction not addressed by this Standard may be examined and tested according to the intent of the requirements and, if found to meet the intent of this Standard, 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

Section 1 effective August 18, 1995 for ceiling installed radiant heating products and February 16, 1996 for all other radiant heating products

1.1 These requirements cover radiant heating panels and heating panel sets, for use on ac supply system voltages not exceeding 600 V, designed for installation indoors in nonhazardous locations in household, commercial, and industrial applications, in accordance with Article 424, Part J, of the National Electrical Code, ANSI/NFPA 70.

1.2 These requirements cover products designed to be permanently connected to a supply circuit, and that are intended to form an integral part of the building construction after on-site assembly, installation, and connection.

1.3 These requirements do not cover the following:

- a) Radiant heating panels intended to be installed in a dropped or suspended ceiling which are covered by the Standard for Fixed and Location-Dedicated Electric Room Heaters, UL 2021;
- b) Heating panels, panel sets, and systems mounted under a floor covering in accordance with Article 424-99 of the National Electrical Code, ANSI/NFPA 70;
- c) Heating cables and cable sets, which are covered by the Standard for Electric Space Heating Cables, UL 1673;
- d) Cord connected and movable heating equipment;
- e) Heating products containing an integral means of producing air flow;
- f) Heating products containing a regulating thermostat as an integral part of the product construction.

1.4 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.

2 Glossary

Section 2 effective August 18, 1995 for ceiling installed radiant heating products and February 16, 1996 for all other radiant heating products

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

2.2 **ACTIVE AREA** – That part of a heating product forming a plane area bounded by the perimeter of the heating element and its non-heating components.

2.3 **ASSOCIATE PART** – A nonintegral part of a heating product essential for the correct operation, installation, or both, of the product.

2.4 **FLEXIBLE HEATING PRODUCT** – A heating product of nonrigid construction, composed of thin flexible sheets of electrical insulating material enclosing a heating element, which is intended for installation in contact with normal building construction materials.

2.5 **HEATING ELEMENT** – That portion of a heating panel or heating panel set that is the actual electrical conducting medium, including a continuously applied or patterned conductive film, intended to be heated by an electric current.

2.6 **HEATING PANEL** – A complete assembly provided with a junction box or a length of flexible conduit for connection to a branch circuit.

2.7 **HEATING PANEL SET** – An assembly provided with nonheating leads or a terminal junction assembly identified as being suitable for connection to a wiring system. It may be of fixed dimension, or of continuous form where the final product dimension is determined during installation.

2.8 **HEATING PRODUCT** – A collective term used to refer to heating panels and heating panel sets.

2.9 **NONHEATING COMPONENT** – A component of a heating product that carries current or is conductively coupled to a supply circuit, and that is not primarily intended to produce heat.

2.10 **NONHEATING LEADS** – Lead wires provided to facilitate connection of a heating product directly to branch circuit conductors. Also known as "cold leads."

2.11 **RIGID HEATING PRODUCT** – A heating product of fixed construction designed to be mounted on or above a ceiling, forming all or part of a ceiling, or mounted below a subfloor.

2.12 **TERMINAL BOX** – A box or enclosure, inside which connections between branch circuit conductors and cold leads or terminals are made.

3 Components

Section 3 effective August 18, 1995 for ceiling installed radiant heating products and February 16, 1996 for all other radiant heating products

3.1 Except as indicated in 3.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of Standards covering components generally used in the products covered by this Standard.

A component need not comply with a specific requirement that:

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

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

3.4 Specific components are recognized as being 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 for which they have been recognized.

4 Units of Measurement

Section 4 effective August 18, 1995 for ceiling installed radiant heating products and February 16, 1996 for all other radiant heating products

4.1 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.

5 References

Section 5 effective August 18, 1995 for ceiling installed radiant heating products and February 16, 1996 for all other radiant heating products

5.1 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.