

**DOCUMENT NUMBER:** UL1795

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Subject 1795

1655 Scott Blvd.  
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 September 15, 1995

**TO:** Electrical Council of Underwriters Laboratories Inc.,  
 Subscribers to UL's Listing Service for Hydromassage Bathtubs,  
 Subscribers to UL's Standards Service for Hydromassage Bathtubs

**SUBJECT:** Classification and Follow-Up Services for Hydromassage Bathtubs Using the American National Standard for Whirlpool Bathtub Appliances, ANSI/ASME A112.19.7M-1987;  
 Announcement of Listing and Follow-Up Services for Plastic Bathing Units Using the American National Standard for Plastic Bathtub Units, Z124.1, and Plastic Shower Receptors and Shower Stalls, ANSI Z124.2, in Conjunction with Applicable Requirements as Determined by UL.

UL is prepared to accept product submittals for Classification and Follow-Up Services for hydromassage bathtubs using the American National Standard for Whirlpool Bathtub Appliances, ANSI/ASME A112.19.7M-1987, in its entirety or specifically to the requirements for water retention.

This service is optional and supplements the requirements presently used during a Listing evaluation to the Standard for Hydromassage Bathtubs, UL 1795. The attached Appendix A is a copy of the guide information for hydromassage bathtubs, (NCHX).

Manufacturers wishing to submit hydromassage bathtubs for investigation under this program should contact the UL office that normally handles their submittals (see Appendix C).

Additionally, UL announces that it is prepared to accept product submittals for Listing and Follow-Up Services for plastic bathing units (including hydromassage bathtub shells) using the requirements of ANSI Z124.1 (Plastic Bathtub Units) and ANSI Z124.2 (Plastic Shower Receptors and Shower Stalls). These requirements will be used in conjunction with other requirements that are determined appropriate by UL. This additional service is optional and separate from those covered by a typical hydromassage bathtub investigation using UL 1795. However, manufacturers are encouraged to submit their bathtub shells for evaluation when requesting a hydromassage bathtub investigation.

The attached Appendix B is a copy of the guide information for Plastic Bathing Units (QNRB).

Manufacturers wishing to submit plastic bathtub shells for investigation under this program should contact the UL office that normally handles their submittals (see Appendix C).

This bulletin should be kept with your copy of the standard.

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Subject 1795

-2-

September 15, 1995

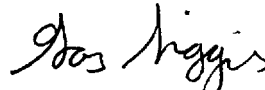
Questions regarding interpretation of requirements should be directed to the responsible UL Staff. Please see Appendix C of this bulletin regarding designated responsibility for the subject product category.

UNDERWRITERS LABORATORIES INC.

REVIEWED BY:



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SR:RM

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APPENDIX AGUIDE INFORMATION FOR  
HYDROMASSAGE BATHTUBSHydromassage Bathtubs  
(NCHX)

This listing covers indoor hydromassage bathtubs rated 250 volts or less, for residential and commercial use, for permanent connection to the building plumbing, and intended for installation and use in accordance with Article 680 of the National Electrical Code, NFPA 70. They are intended for either permanent connection to the electrical supply or are provided from the factory with a maximum 3-foot type SJ or equivalent service cord terminating in a grounding-type attachment plug.

A hydromassage bathtub consists of a drainable tub, a recirculating pump and optional equipment such as lights, a heater, a control, and an air blower. A bathtub may also be provided with an air blower and no recirculating pump.

A hydromassage bathtub may have provision for a maximum of two supply sources.

Hydromassage bathtubs are intended for connection to circuits protected by ground-fault circuit-interrupters.

The physiological effect of using this equipment has not been determined.

Hydromassage bathtubs have been evaluated with respect to hair entrapment in accordance with ASME/ANSI A112.19.7M-1987.

Portable hydromassage equipment is covered under the category of "Personal Hygiene and Health Care Appliances," QGRZ. This listing does not cover hydrotherapy tubs used in health care facilities. For listings of professional equipment, refer to "Medical and Dental Equipment, Professional," KFBQ under "Health Care Facilities Equipment," KEVO. Self-contained spas and hot tubs are covered under a category of that title, WCZW, in the Electrical Construction Materials Directory.

The basic standard used to investigate products in this category is UL 1795, "Hydromassage Bathtubs."

Underwriters Laboratories Inc. (UL) provides a service for the Classification of hydromassage bathtubs that not only meets the appropriate requirements of UL but also has been investigated in accordance with standards or parts detailed below from standards of the American National Standards Institute (ANSI):

1. A112.19.7M-+ Requirements for Whirlpool Bathtub Appliances.
2. Water retention test requirement from A112.19.7M-+.

+ Issue date of standard or latest addendum.

The Listing Mark of Underwriters Laboratories Inc. on the product is the only method provided by UL to identify products manufactured under its Listing and Follow-Up Service. The Listing

Mark for these products includes the name and/or symbol of Underwriters Laboratories Inc. (as illustrated in the introduction of this directory) together with the word "Listed," a control number, and the following product name: "Hydromassage Bathtub."

A Listing Mark combined with a Classification Marking is provided on products that have additionally been investigated in accordance with standards or parts detailed below from standards of the American National Standards Institute (ANSI). The combined Listing Mark/Classification Marking would consist of the Listing Mark elements detailed above and the following marking:

"Also Classified by Underwriters Laboratories Inc. in accordance with \*\*," where "\*\*" is one of the texts detailed below:

1. ANSI A112.19.7M-+
2. WATER RETENTION TEST REQUIREMENT FROM ANSI "A112.19.7M-+."

+ Issue date of standard or latest addendum.

A P P E N D I X BGUIDE INFORMATION FOR  
PLASTIC BATHING UNITSPlastic Bathing Units  
(QNRB)

This category covers plastic bathing units for indoor residential or institutional use. These devices are intended to be installed so as to be secured through at least one side to the building structure, and they may be provided with integral or multi-pieced walls.

The basic standards used to investigate products in this category are ANSI Z124.1, Plastic Bathtub Units; ANSI Z124.2, Plastic Shower Receptors and Shower Stalls; ANSI Z124.3, Plastic Lavatories; ANSI Z124.4, Plastic Water Closet Bowls and Tanks; ANSI Z124.5, Plastic Toilet (Water Closet) Seats; ANSI Z124.6, Plastic Sinks; or ANSI Z124.8, Plastic Bathtub Liners together with applicable additional requirements as determined by Underwriters Laboratories Inc.

The Listing Mark of Underwriters Laboratories Inc. on the product is the only method provided by UL to identify products manufactured under its Listing and Follow-Up Service. The Listing Mark for these products includes the name and/or symbol of Underwriters Laboratories Inc. (as illustrated in the introduction of this directory) together with the word "Listed," a control number, and the product identification such as: "Bathtub," "Shower Stall," "Shower Receptor," "Plastic Lavatory," "Plastic Sink," or "Plastic Bathing Unit." Where the evaluation of a product has included a specific nationally recognized standard, the Listing Mark may additionally include reference to conformance with that standard.

## APPENDIX C

### DESIGNATED RESPONSIBILITY FOR UL PRODUCT CATEGORIES NCHZ, HYDROMASSAGE BATHTUBS QNRB, PLASTIC BATHING UNITS

The individuals shown in the following tables are involved with the investigation of products covered under the subject categories. The Primary Designated Engineers (**shown in UPPERCASE letters**) coordinate the establishment and uniform interpretation of UL requirements applicable to the product categories. The Designated Engineers (**shown in lowercase letters**) work with the Primary Designated Engineers to interpret requirements and maintain standards.

Should you have questions regarding any adopted requirements that affect your product, you are encouraged to contact the individual at the office to which you normally submit your products.

The Industry Advisory Group (IAG) Chairman for Hydromassage Bathtubs is Joe Kubisz at UL's Santa Clara office. The responsible department manager for Plastic Bathing Units is John Hawley at UL's Northbrook office. The IAG Chairman and responsible department manager oversee the significant interpretations made by the Primary Designated Engineers and arbitrate any differences regarding interpretation of UL requirements.

| CCN  | Office/Subsidiary | Responsible Engineer | Extension |
|------|-------------------|----------------------|-----------|
| NCHX | Camas             | Larry Copley         | 55612     |
|      | Melville          | Roland Riegel        | 22421     |
|      | Northbrook        | Judy Duresa          | 42592     |
|      | RTP               | Isaac Clark          | 1608      |
|      | Santa Clara       | GARY SIGGINS         | 32290     |

| CCN  | Office/Subsidiary | Responsible Engineer | Extension |
|------|-------------------|----------------------|-----------|
| QNRB | Camas             | Gene Wirth           | 55606     |
|      | Melville          | Charles Driscoll     | 22974     |
|      | Northbrook        | Marshall Issen       | 43146     |
|      | RTP               | Isaac Clark          | 1608      |
|      | Santa Clara       | MAGGIE CARROLL       | 32131     |



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**August 17, 1995**

**Revision pages for**

**Standard for**

**Hydromassage Bathtubs**

**UL 1795, Second Edition**

Attached to this transmittal notice is a revision of the second edition of UL 1795.

A CHANGE ON A PAGE DATED AUGUST 17, 1995 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS ARE NOW IN EFFECT.

The new and revised requirements are substantially in accordance with UL's bulletin on this subject dated February 10, 1995. The bulletin is now obsolete and may be discarded.

Revised and/or additional pages may be issued from time to time.

With the inclusion of the accompanying material, the standard consists of pages dated as shown in the following checklist:

| <b>Page</b>           | <b>Date</b>                                   |
|-----------------------|-----------------------------------------------|
| 1 . . . . .           | November 29, 1993 (Reprinted August 17, 1995) |
| 2 . . . . .           | August 17, 1995                               |
| 3, 4 . . . . .        | November 29, 1993                             |
| 5, 6 . . . . .        | August 17, 1995                               |
| 7 – 24 . . . . .      | November 29, 1993                             |
| 25, 26, 26A . . . . . | August 17, 1995                               |
| 27 – 29 . . . . .     | November 29, 1993                             |
| 30, 30A . . . . .     | August 17, 1995                               |
| 31 – 59 . . . . .     | November 29, 1993                             |
| 60, 60A . . . . .     | August 17, 1995                               |
| 61 – 64 . . . . .     | November 29, 1993                             |
| A1 . . . . .          | August 17, 1995                               |

**NOVEMBER 29, 1993**

(Title Page Reprinted: August 17, 1995)

**1**

**UL 1795**

**Standard for**

**Hydromassage Bathtubs**

Prior to the first edition, the requirements for the products covered by this standard were included in the Standard for Electric Medical and Dental Equipment, UL 544.

First Edition – February, 1988

**Second Edition**

**November 29, 1993**

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 published set of revision pages.

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## CONTENTS

### FOREWORD

### INTRODUCTION

|                     |   |
|---------------------|---|
| 1 Scope .....       | 5 |
| 2 General .....     | 5 |
| 3 Glossary .....    | 6 |
| 4 Accessories ..... | 7 |

### CONSTRUCTION

|                                                                                     |     |
|-------------------------------------------------------------------------------------|-----|
| 5 General .....                                                                     | 8   |
| 6 Frame and Enclosure .....                                                         | 8   |
| 7 Mechanical Assembly .....                                                         | 11  |
| 8 Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts ..... | 13  |
| 9 Provisions for Servicing .....                                                    | 18  |
| 10 Resistance to Corrosion .....                                                    | 18  |
| 11 Power Supply Connections .....                                                   | 20  |
| 12 Live Parts .....                                                                 | 23  |
| 13 Internal Wiring .....                                                            | 23  |
| 14 Separation of Circuits .....                                                     | 24  |
| 15 Grounding .....                                                                  | 25  |
| 16 Bonding .....                                                                    | 26A |
| 17 Circuits .....                                                                   | 27  |
| 18 Insulation .....                                                                 | 28  |
| 19 Printed Wiring Boards .....                                                      | 28  |
| 20 Spacings .....                                                                   | 29  |
| 21 Ground-Fault Circuit-Interrupters .....                                          | 30  |
| 22 Electric Heaters .....                                                           | 30  |
| 23 Heater Protection .....                                                          | 30  |
| 24 Motors .....                                                                     | 30  |
| 25 Air Blowers .....                                                                | 31  |
| 26 Overload Protection .....                                                        | 31  |
| 27 Leakage Current Collectors .....                                                 | 32  |
| 28 Gaskets .....                                                                    | 33  |
| 29 Lighting Fixtures .....                                                          | 33  |
| 30 Capacitors .....                                                                 | 33  |
| 31 Transformers .....                                                               | 34  |
| 32 Switches, Receptacles, and Controls .....                                        | 34  |
| 33 Sharp Edges .....                                                                | 36  |
| 34 Temperature-Regulating Controls .....                                            | 36  |
| 35 Temperature-Limiting Controls .....                                              | 37  |
| 36 Parts Subject to Pressure .....                                                  | 38  |
| 37 Protection Against Entrapment .....                                              | 38  |

### PERFORMANCE

|                                     |    |
|-------------------------------------|----|
| 38 General .....                    | 38 |
| 39 Insulation Resistance Test ..... | 39 |
| 40 Starting Current Test .....      | 39 |

## INTRODUCTION

### 1 Scope

1.1 These requirements cover indoor hydromassage bathtubs, rated 250 volts or less, for household and commercial use, for permanent connection to the plumbing of the building. They are intended for either permanent connection to the electrical supply or are factory-provided with a cord terminating in an attachment plug, and are intended for installation and use in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements do not cover portable cord-connected hydromassage equipment, which is covered by the Standard for Personal Hygiene and Health Care Appliances, UL 1431, or hydrotherapy tubs, which are covered by the requirements for medical and dental equipment, UL 544.

1.3 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 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.

\*1.3 revised August 17, 1995\*

### 2 General

#### 2.1 Components

2.1.1 Except as indicated in 2.1.2, 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.

2.1.2 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.

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

2.1.4 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.

#### 2.2 Units of measurement

2.2.1 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.

2.2.2 Unless otherwise indicated, all voltage and current values mentioned in this standard are root-mean-square (rms).

### 2.3 Undated references

2.3.1 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.

### 3 Glossary

3.1 For the purpose of this standard, the following definitions apply.

3.2 **ACCESSIBLE PART** — A part located so that it can be contacted by a person, either directly or by means of a tool during user servicing, or that is not recessed the required distance behind an opening.

3.3 **ACCESSIBLE TO THE OCCUPANT** — Any surface or component within a 5-foot (1.52-m) reach path of the bathtub occupant.

3.4 **ACCESSORY** — An optional electrical component that is intended to be attached to the main equipment in the field or that may be shipped separately from the main equipment.

3.5 **CLASS 2 CIRCUIT** — A secondary circuit with an open circuit potential of no more than 30 volts rms (42.4 volts peak) supplied by either an inherently limited Class 2 transformer or by a transformer and fixed impedance that together comply with all performance requirements for inherently limited Class 2 transformers in the Standard for Class 2 and Class 3 Transformers, UL 1585.

3.6 **CONFORMAL COATING** — An insulating coating that conforms to the configuration of the object that is coated. The coating is used as a covering to protect against environmental conditions.

3.7 **CONTROLLED ENVIRONMENT** — An environment that is relatively free from conductive contaminants, such as dust and carbon particles, and that is protected against humidity and the formation of condensation. A controlled environment may be provided by a hermetically sealed enclosure, encapsulation, or a conformal coating.

3.8 **DEAD METAL** — A metal part not connected to electrical circuitry and not intended to conduct current. Does not include an isolated metal name plate, cabinet trim, screws, or small metal hardware fastened to a nonconductive enclosure.

3.8.1 **DOUBLE INSULATION** — An insulation system comprised of basic insulation and supplementary insulation, with the two insulations physically separated and arranged so that they are not simultaneously subjected to the same deteriorating influences (temperature, contaminants, or the like) to the same degree.

\*3.8.1 added August 17, 1995\*

3.9 **DRY-FIRE PROTECTION** — A device or circuit that de-energizes the heater whenever water circulation through the heater is interrupted.

3.10 **ENCLOSURE** — That part of a unit that:

- a) Renders inaccessible any part that may present a risk of electric shock,
- b) Prevents emission of flame or molten material, or
- c) Prevents unintentional contact with internal parts that may involve a risk of injury.

Some examples are tub materials, skirting materials, service access covers, electrical boxes, and barriers.

3.11 **FIELD-WIRING TERMINAL** — A terminal or terminals to which the electrical supply is to be connected during installation of the unit.

14.3 Field-installed conductors of any circuit shall be segregated by barriers from:

- a) Field-installed conductors connected to any other circuit,
- b) Factory-installed conductors connected to another circuit unless the field-connected circuit has the highest voltage rating and the factory-installed conductors are insulated for the maximum voltage of the field-connected circuit, and
- c) Uninsulated live parts of any other circuit.

14.4 With respect to 14.3(a), a removable barrier or one having openings for the passage of conductors may be used if instructions for the use of the barrier are provided as a permanent part of the unit. If complete instructions, in conjunction with a wiring diagram, will provide for the separation of the line voltage and low voltage circuits, the barrier may, upon investigation, be omitted.

14.5 Separate compartments for field connection to circuits of line and low voltage shall be provided.

14.6 A barrier used to provide separation between the wiring of different circuits shall be of metal or insulating material of the necessary physical strength if exposed or otherwise likely to be subjected to mechanical damage and shall be securely held in place. Unclosed openings in a barrier for the passage of conductors shall be not larger than 1/4 inch (6.4 mm) in diameter and shall not exceed in number, on the basis of one opening per conductor, the number of wires that will need to pass through the barrier. The closure for any other opening shall present a smooth surface wherever an insulated wire may be in contact with the closure, and the area of any such opening (with the closure removed) shall be not larger than required for the passage of the necessary wires.

14.7 A metal barrier shall have a thickness at least as great as the required thickness of the enclosure metal. A barrier of insulating material shall be no less than 0.028 inch (0.71 mm) thick and shall be of greater thickness if its deformation may be readily accomplished so as to defeat its purpose.

## 15 Grounding

15.1 Each permanently connected unit shall be provided with a separate terminal or lead within the terminal compartment specified in 11.2.1 intended solely for the connection of the equipment grounding conductor.

*Exception: Double-insulated pumps are not required to have provision to terminate an equipment grounding conductor. If provision to terminate an equipment grounding conductor is provided, it shall only bond to internal and inaccessible noncurrent-carrying metal parts or to non-connected insulating material.*

\*15.1 revised August 17, 1995\*

15.1.1 Each cord-connected unit shall have provisions for grounding in accordance with 15.2 and 15.3.

*Exception: Double-insulated pumps are not required to have provision for grounding in accordance with 15.2 and 15.3. If the flexible cord is provided with an equipment grounding conductor, the conductor shall only bond to internal and inaccessible noncurrent-carrying metal parts or to non-connected insulating material.*

\*15.1.1 added August 17, 1995\*

15.2 The surface of an insulated grounding conductor of a flexible cord shall be green with or without one or more yellow stripes and no other lead shall be so identified.

15.3 The grounding conductor of a power-supply cord shall be attached to the grounding blade of an attachment plug and shall be connected within the frame or enclosure by means of a screw not likely to be removed during ordinary servicing not involving the power-supply cord.

15.4 A terminal for connection of an equipment grounding conductor shall be located so that removal during servicing is unlikely, and sized in accordance with Table 15.1.

**Table 15.1**  
**Minimum size of equipment grounding conductor**

| Rating of branch circuit protective device, amperes | Copper wire, AWG No. | Aluminum or copper-clad aluminum, AWG No. |
|-----------------------------------------------------|----------------------|-------------------------------------------|
| 15                                                  | 14                   | 12                                        |
| 20                                                  | 12                   | 10                                        |
| 30                                                  | 10                   | 8                                         |
| 40                                                  | 10                   | 8                                         |
| 60                                                  | 10                   | 8                                         |
| 100                                                 | 8                    | 6                                         |

15.5 A wire binding screw may be used to terminate a conductor that is no larger than No. 10 AWG (5.3 mm<sup>2</sup>). The screw shall have a green-colored head that is hexagonal, slotted, or both.

15.6 A pressure wire connector intended for connection of a field-installed equipment grounding conductor shall be plainly identified, such as being marked "G," "GR," "GRD," "Ground," "Grounding," or the like. The following symbol:



UL0005

(IEC Publication 417, Symbol 5019) may be used, but, if used alone, the symbol shall be defined in the installation instructions provided with the equipment.

15.7 A lead intended for connection to an equipment grounding conductor shall be of the size specified in Table 15.1 and shall have a free length of not less than 6 inches (152 mm).

15.8 The surface of an insulated lead intended solely to connect an equipment grounding conductor shall be green with or without one or more yellow stripes. No other lead that is located in a field wiring compartment and that is visible to the installer shall be so identified.

## 16 Bonding

16.1 The metal enclosure of each electrical component, current collector, if provided, and all other metal that could become energized in the event of a fault shall be bonded to the equipment grounding means. This may be accomplished by metal-to-metal mounting on a common metal frame or by individual bonding conductors. Bonding conductors, if used, shall be not smaller than the supply conductors and shall be routed close to the contour of the equipment frame and terminated using suitable pressure wire connectors.

*Exception: Metal enclosures that contain only Class 2 circuits need not be bonded to the equipment grounding means.*

16.2 In addition to the bonding required in 16.1, each unit shall be provided with an external pressure wire connector, located on the terminal compartment specified in 11.2.1, to accommodate a No. 8 AWG (8.4 mm<sup>2</sup>) solid copper bonding conductor.

*Exception: Double-insulated units shall not be provided with nor have provision for an external pressure wire connector for a bonding conductor.*

\*16.2 revised August 17, 1995\*

19.2 Printed wiring boards used in primary, secondary, and safety circuits shall be rated for direct support applications in accordance with the Standard for Printed-Wiring Boards, UL 796.

*Exception: Printed wiring boards containing only Class 2 circuitry need not comply with this requirement.*

19.3 Components shall be secured and mounted to a printed wiring assembly such that any force that may be exerted on the components or board during assembly, shipping, or handling of the equipment, or during use or servicing will not displace the components or deflect the board so as to produce a risk of fire or electric shock.

## 20 Spacings

### 20.1 General

20.1.1 All uninsulated live parts connected to different circuits shall be spaced as though the parts were of opposite polarity and shall be judged on the basis of the highest voltage involved.

20.1.2 Spacing requirements do not apply to the internal spacings of a component. The acceptability of a component shall be determined in accordance with 2.1.1.

### 20.2 Class 2 circuits

20.2.1 The spacings in a Class 2 circuit are to be investigated on the basis of the Dielectric Voltage-Withstand Test, Section 43. Spacings between a Class 2 circuit and another circuit shall comply with 20.4.1.

### 20.3 Field wiring terminals

20.3.1 The spacing between field wiring terminals of opposite polarity, and a wiring terminal and any uninsulated metal part not at the same polarity shall be at least 1/4 inch (6.4 mm).

### 20.4 Other than field wiring terminals

20.4.1 Spacings other than at a field wiring terminal shall be 1/8 inch (3.2 mm) for live parts and 1/16 inch (1.6 mm) for grounded or dead metal parts when measured between all three of the following: parts of opposite polarity, accessible metal, and the enclosure.

### 20.5 Safety circuits

20.5.1 Spacings safety circuitry and all other circuitry or grounded metal shall be not less than the spacing specified in 20.4.1

### 20.6 Printed wiring boards

20.6.1 Spacings on printed wiring boards shall comply with the requirements specified in 17.1.3.

20.6.2 Spacings within safety circuitry shall be not less than 1/64 inch (0.4 mm) and spacings between safety circuits and other circuits shall be not less than 1/32 inch (0.8 mm).

20.6.3 Spacings within circuits accessible to the bathtub occupant or in contact with the water and between these circuits and other circuits shall be not less than 1/16 inch (1.6 mm) and not less than 1/32 inch (0.8 mm) if provided with a conformal coating. These spacings shall apply to those parts of a

circuit from any point accessible to the occupant of the bathtub or in contact with the water up to a reliable means of isolation, such as a transformer or optical isolator. The isolating means shall provide minimum 1500 VAC isolation from input to output.

*Exception No. 1: A conformal coating need not be provided if the printed wiring board is used in a controlled environment.*

*Exception No. 2: A protective coating may be used in lieu of a conformal coating if the protective coating, when tested on the printed wiring board, complies with the requirements specified in the Standard for Polymeric Materials — Use in Electrical Equipment Evaluations, UL 746C.*

## 21 Ground-Fault Circuit-Interrupters

21.1 Each unit shall be marked to require connection to a supply circuit that is protected by a ground-fault circuit-interrupter in accordance with 59.5 and shall be provided with the instructions in 63.1.

## 22 Electric Heaters

22.1 Electric heaters, if provided, shall comply with the requirements for sheathed heating elements, UL 1030.

## 23 Heater Protection

23.1 A unit with a heater shall be provided with dry-fire protection to reduce the risk of damage to the heater or adjacent parts when there is no water flow through the heater. The dry fire device or circuit shall comply with the low water tests described in 52.1.1 – 52.1.3.

23.2 A water-sensing device, if used as the dry-fire protection specified in 23.1, shall be installed such that the likelihood of contamination due to hair, dirt, debris, or calcium deposits is minimized.

23.3 A control device or circuit used to comply with the requirements in 23.1 shall have an electrical rating that corresponds to the electrical load controlled and shall be capable of interrupting the load for 100,000 cycles of operation.

## 24 Motors

24.1 A motor shall be provided with both locked rotor and running overload protection that consists of one of the following:

- a) Thermal protection complying with the Standard for Thermal Protectors for Motors, UL 547.
- b) Impedance protection complying with the Standard for Impedance-Protected Motors, UL 519.
- c) Other protection that is shown by test to be equivalent to the protection specified in (a).

*Exception: The motor of an air blower that complies with the requirements for locked rotor protection need not be provided with running overload protection.*

\*24.1 revised August 17, 1995\*

24.2 A thermal or overcurrent protective device shall not open the circuit during the Temperature Test, Section 42.

24.3 Fuses used for motor-running overcurrent protection shall be located in each ungrounded conductor.

24.4 Motors shall comply with the construction requirements specified in the Standard for Electric Motors, UL 1004.

\*24.4 added August 17, 1995\*

24.5 Double-insulated pumps and blowers shall comply with requirements specified in the Standard for Double Insulation Systems for Use in Electrical Equipment, UL 1097.

\*24.5 added August 17, 1995\*

24.6 On a double-insulated pump a noncurrent-carrying part that either serves to enclose any live part such as the enclosure of a motor, or is likely to become energized in the event of a fault, shall be insulated or spaced away from accessible noncurrent-carrying metal of the pump and from the water being pumped.

\*24.6 added August 17, 1995\*

- d) The electrical ratings as described in Ratings, General, Section 58.

The marking shall be located so as to be visible after installation.

*Exception No. 1: The manufacturer's identification may be in a traceable code if the unit is identified by the brand or trademark owned by a private labeler.*

*Exception No. 2: The date of manufacture may be abbreviated; or may be in a nationally accepted conventional code, or in a code affirmed by the manufacturer.*

59.2 The repetition time cycle of a date code shall be no less than 10 years. The date code shall not require reference to the manufacturer's records to determine when the equipment was manufactured.

59.3 A marking that is required to be legible and permanent shall be in letters at least 1/8 inch (3.2 mm) high and shall be molded, die-stamped, paint-stenciled, stamped or etched on metal, or indelibly stamped on pressure sensitive labels secured by adhesive. Pressure sensitive labels secured by adhesive shall comply with the applicable portions of the Standard for Marking and Labeling Systems, UL 969.

59.4 If a unit is manufactured at more than one factory, each finished unit shall have a distinctive marking, which may be in code, by which it can be identified as the product of a particular factory.

59.5 Each unit shall be plainly marked with the following or the equivalent: "Connect only to a circuit that is protected by a ground-fault circuit-interrupter (GFCI)."

59.6 A wiring diagram shall be attached to the unit unless field wiring connections are obvious.

59.7 A paper sticker glued or shellacked or both to an accessible cover is considered to be attached to the unit in accordance with the requirement in 59.6.

59.8 A unit intended to be protected by a branch circuit fuse less than the maximum rating of the branch circuit fuse to which the unit may be connected shall be marked to indicate the maximum current rating of the branch circuit fuse for which the unit has been investigated and found acceptable.

59.9 The following marking or the equivalent, as applicable, shall appear in the field wiring compartment next to the supply conductor terminals of a unit intended for permanent electrical connection: "Use copper conductors only," "Use aluminum conductors only," or "Use aluminum or copper conductors." This marking shall be independent of any marking on the terminal connectors, and it shall be visible during and after installation of the unit. This marking does not apply to terminals intended for the connection of grounding or bonding conductors.

59.10 A unit as specified in 40.1 that will not start and operate as intended when connected to a circuit protected by an ordinary (non-time-delay) fuse shall be plainly and permanently marked with the following or the equivalent: "Use only time-delay fuses."

59.11 Each connector intended for an optional accessory shall be marked to identify the intended accessory.

59.12 If more than one disconnect switch is required to disconnect all power to a unit, the unit shall be marked where readily visible to service personnel prior to disconnecting the main supply for the unit with the word "CAUTION" and the following or the equivalent: "Risk of Electric Shock – Two disconnect switches are required to de-energize the unit before servicing." If a unit has optional equipment that may be field installed and that may require a separate source, the unit shall be marked with the following or the

equivalent: "Risk of Electric Shock – Second supply source if provided with \_\_\_\_\_, model \_\_\_\_\_. Disconnect all sources before servicing." The blanks shall be filled in with the type of equipment that may be added in the field and the appropriate model number.

59.13 If any point within a terminal box or field wiring compartment of a permanently connected unit attains a temperature exceeding 60°C (140°F) during the Temperature Test, Section 42, the unit shall be permanently marked with the following or the equivalent: "For supply connection, use wires sized on the basis of 60°C ampacity and rated minimum \_\_\_\_\_°C (\_\_\_\_\_°F)." The temperature value shall be in accordance with the values specified in Table 59.1. This statement shall be located at or near the point where the supply connections are to be made, and shall be clearly visible both during and after installation of the unit.

**Table 59.1**  
**Terminal box marking**

| Maximum temperature attained in terminal box or compartment during temperature test |               | Temperature marking |
|-------------------------------------------------------------------------------------|---------------|---------------------|
| 61 – 75°C                                                                           | (142 – 167°F) | 75°C (167°F)        |
| 76 – 90°C                                                                           | (169 – 194°F) | 90°C (194°F)        |

59.14 A double-insulated pump shall be plainly and permanently marked with the words "Double Insulated" or "Double Insulation" and "CAUTION – For continued protection against possible electric shock use only identical replacement parts when servicing."

\*59.14 added August 17, 1995\*

## INSTRUCTIONS

### 60 General

60.1 Each unit shall be provided with legible installation, operating, and user-maintenance instructions, and instructions pertaining to a risk of fire, electric shock, or injury to persons associated with the use of the unit.

60.2 Installation and operating instructions shall be provided for each accessory provided with the unit.

60.3 The instructions described in 60.1 shall be:

- a) In separate manuals; or
- b) Combined in one or more manuals provided the instructions pertaining to a risk of fire, electric shock, or injury to persons are separated in format and emphasized to distinguish them from the remainder of the text.

60.4 An illustration may be used with a required instruction to clarify the intent but shall not replace the written instruction.

60.5 The height of the lettering in the text and illustrations of the important safety instructions shall be as follows:

- a) Upper case letters shall be not less than 1/12 inch (2.1 mm) high;

- b) Lower case letters shall be not less than 1/16 inch (1.6 mm) high, and;
- c) The phrases "IMPORTANT SAFETY INSTRUCTIONS," "READ AND FOLLOW ALL INSTRUCTIONS," and "SAVE THESE INSTRUCTIONS" shall be in letters not less than 3/16 inch (4.8 mm) high.

## APPENDIX A

### Standards for Components

Standards under which components of the products covered by this standard are judged include the following:

Title of Standard – UL Standard Designation

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Attachment Plugs and Receptacles – UL 498  
Capacitors – UL 810  
Controls, Limit – UL 353  
Cutoffs, Thermal, for Use in Electrical Appliances and Components – UL 1020  
Double Insulation Systems for Use in Electrical Equipment – UL 1097  
Flexible Cord and Fixture Wire – UL 62  
Fuseholders – UL 512  
Heating Elements, Sheathed – UL 1030  
Marking and Labeling Systems – UL 969  
Motors, Electric – UL 1004  
Motors, Impedance-Protected – UL 519  
Polymeric Materials – Use in Electrical Equipment Evaluations – UL 746C  
Protectors for Motors, Thermal – UL 547  
Pumps, Motor Operated Water – UL 778  
Quick-Connect Terminals, Electrical – UL 310  
Sharpness of Edges on Equipment, Determination of – UL 1439  
Switches, General-Use Snap – UL 20  
Switches, Special-Use – UL 1054  
Tape, Electrical Insulating – UL 510  
Temperature-Indicating and -Regulating Equipment – UL 873  
Terminal Blocks – UL 1059  
Transformers, Class 2 and Class 3 – UL 1585  
Wire Connectors and Soldering Lugs for Use With Copper Conductors – UL 486A  
Wire Connectors for Use With Aluminum Conductors – UL 486B

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**Underwriters Laboratories Inc.®**

Subjects 676 (1795)

1655 Scott Blvd.  
Santa Clara, CA 95050  
December 29, 1993

**TO:** Electrical Council of Underwriters Laboratories Inc.,  
Subscribers to UL's Standard Services for  
Underwater Lighting Fixtures and  
Hydromassage Bathtubs,  
and  
Others Interested

**SUBJECT:** Announcement of UL's Acceptance of Underwater Lighting  
Fixtures with Standard Blade-and-Pin-Type Attachment  
Plugs for Investigation under the Standard for  
Underwater Lighting Fixtures, UL 676

Underwriters Laboratories Inc. announces that it is prepared to receive submittals of underwater lighting fixtures with standard blade-and-pin-type attachment plugs intended for use in hydromassage bathtubs for Recognition and Follow-Up Service under the category Component - Fixtures, Lighting and Fixtures Housing (WBBDT2). Previously, underwater lighting fixtures in this category were not permitted to include power supply cords with a 15-ampere, parallel-blade, grounding-type attachment plug or a 20-ampere, perpendicular-blade, grounding-type attachment plug. This was to reduce the likelihood of the lighting fixture being field-installed and the increased risk of electric shock and fire that could result from such field installation.

In accordance with paragraph 13.1E of the Standard for Hydromassage Bathtubs, UL 1795, hydromassage bathtubs may have provision for two power supply cords having 15- or 20-ampere attachment plugs. The typical low amount of power drawn by the lighting fixture often makes it possible to supply it from the same 15- or 20-ampere circuit as the pump or heater. The lighting fixture may therefore be connected to the same duplex receptacle that is provided at the hydromassage bathtub installation for the supply of the entire hydromassage bathtub.

As current practice, hydromassage bathtub manufacturers obtain the lighting fixture with its flexible cord and then factory-install the attachment plug. The lighting fixture power supply cord serves as one of two power supply cords accommodated by

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paragraph 13.1E of UL 1795. UL has been asked by hydromassage bathtub and lighting fixture industry representatives to permit lighting fixture manufacturers to provide power supply cords with the attachment plug.

UL has determined that these situations warrant the acceptance of Recognized underwater lighting fixtures employing power supply cords with the 15- and 20-ampere attachment plugs as part of the category Component - Fixtures, Lighting and Fixtures Housings (WB DT2). To address field-installation concerns of underwater lighting fixtures equipped with these attachment plugs, UL proposes the carton or other container in which such a lighting fixture is packaged be marked with the following or the equivalent: "For factory installation only." UL will include this requirement among the requirements for these lighting fixtures in a set of proposals currently being developed for the Standard for Underwater Lighting Fixtures, UL 676.

Manufacturers wishing to submit underwater lighting fixtures having the 15- or 20-ampere attachment plug for Recognition under the category Component - Fixtures, Lighting and Fixture Housings should contact one of the following individuals who are involved with the investigation of products covered under the subject category. The Primary Designated Engineer (**shown in UPPERCASE letters**) coordinates the establishment and uniform interpretation of UL requirements applicable to the product category. The Designated Engineers (**shown in lowercase letters**) at each UL office work with the Primary Designated Engineer to interpret requirements and maintain standards.

Should you have any questions regarding UL Recognition and Follow-Up Service for underwater lighting fixtures, or any adopted requirements that affect your product, you are encouraged to contact the individual at the office to which you normally submit your products.

**Bruce Bohren** - at UL's Northbrook Office (Ext. 42017)

**STEVEN HOLMES** - at UL's Santa Clara Office (Ext. 2521)

**Peter Manfredonia** - at UL's Melville Office (Ext. 22448)

**David Belt** - at UL's RTP Office (Ext. 1628)

The Responsible Department Manager for the subject category is Joe Kubisz at UL's Santa Clara Office. The Responsible Department Manager oversees the significant interpretations made by the Primary Designated Engineer and arbitrates any differences regarding interpretation of UL requirements.

Subjects 676 (1795)

-3-

December 29, 1993

This bulletin should be kept with your copy of the standard for reference.

UNDERWRITERS LABORATORIES INC.

REVIEWED BY:

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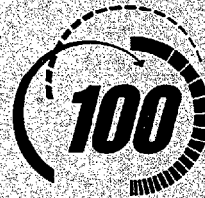
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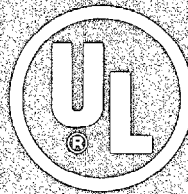
UL 1795

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**November 29, 1993**

**Standard for**

**Hydromassage Bathtubs**

**UL 1795, Second Edition**

Accompanying this transmittal notice is a copy of the second edition of UL 1795.

THIS EDITION OF THE STANDARD IS NOW IN EFFECT.

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**UL 1795**

**Standard for**

**Hydromassage Bathtubs**

Prior to this edition, the requirements for the products covered by this standard were included in the Standard for Electric Medical and Dental Equipment, UL 544.

First Edition – February 2, 1988

**Second Edition**

**November 29, 1993**

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 published set of revision pages.

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(1 – 11/29/93 – 11/29/93)