

# UL 1604

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## Electrical Equipment for Use in Class I and II, Division 2, and Class III Hazardous (Classified) Locations

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UL Standard for Safety for Electrical Equipment for Use in Class I and II, Division 2, and Class III Hazardous (Classified) Locations, UL 1604

Third Edition, Dated April 28, 1994

Revisions: This Standard contains revisions through and including February 3, 2004.

### ***Summary of Topics***

***This revision to UL 1604 is issued to clarify Temperature Test procedures.***

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The revisions dated February 3, 2004 include a reprinted title page (page1) 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 Listing, Recognition, and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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| Page         | Date               |
|--------------|--------------------|
| 1-3.....     | February 3, 2004   |
| 4 .....      | April 28, 1994     |
| 5-6B .....   | October 6, 1995    |
| 7.....       | September 28, 1995 |
| 8-8B .....   | October 6, 1995    |
| 9 .....      | April 28, 1994     |
| 10-17.....   | September 28, 1995 |
| 18-19 .....  | April 28, 1994     |
| 20-20B ..... | February 3, 2004   |
| 21-22 .....  | April 28, 1994     |
| 23 .....     | September 28, 1995 |
| 24 .....     | April 28, 1994     |
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**1**

**UL 1604**

**Standard for Electrical Equipment For Use In Class I and II, Division 2,  
And Class III Hazardous (Classified) Locations**

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**Third Edition**

**April 28, 1994**

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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**CONTENTS**

|                       |   |
|-----------------------|---|
| <b>FOREWORD</b> ..... | 4 |
|-----------------------|---|

**INTRODUCTION**

|                                                 |   |
|-------------------------------------------------|---|
| 1 Scope .....                                   | 5 |
| 2 Glossary .....                                | 6 |
| 3 General .....                                 | 7 |
| 3.1 General .....                               | 7 |
| 3.2 Undated references .....                    | 7 |
| 3.3 Units of measurement .....                  | 7 |
| 3.4 Components .....                            | 7 |
| 3A Class I, Zone 2, and Group Equivalency ..... | 8 |
| 3A.1 Class I, Zone 2, Group IIA .....           | 8 |
| 3A.2 Class I, Zone 2, Group IIB .....           | 8 |
| 3A.3 Class I, Zone 2, Group IIC .....           | 8 |

**CONSTRUCTION, CLASS I, DIVISION 2 EQUIPMENT**

|                                       |    |
|---------------------------------------|----|
| 4 General .....                       | 8  |
| 5 Normally Nonarcing Components ..... | 8A |
| 6 Nonincendive Circuits .....         | 9  |

**CONSTRUCTION, CLASS II, DIVISION 2, AND CLASS III, DIVISIONS 1 AND 2 EQUIPMENT**

|                   |    |
|-------------------|----|
| 7 General .....   | 18 |
| 8 Enclosure ..... | 19 |

**PERFORMANCE**

|                                                 |     |
|-------------------------------------------------|-----|
| 9 Temperature Test .....                        | 20  |
| 10 Spark-Ignition Test .....                    | 20A |
| 10.1 General .....                              | 20A |
| 10.2 Test apparatus .....                       | 21  |
| 10.3 Test mixture .....                         | 21  |
| 10.4 Verification of spark test apparatus ..... | 22  |
| 11 Nonincendive Component Tests .....           | 22  |
| 12 Drop Tests .....                             | 23  |
| 13 Aging Tests of Gaskets .....                 | 23  |
| 14 Dusttight-Enclosure Tests .....              | 23  |
| 14.1 General .....                              | 23  |
| 14.2 Dust-blast method .....                    | 24  |
| 14.3 Atomized-water method .....                | 24  |
| 15 Chemical-Resistance Tests .....              | 24  |
| 15A Sealed Device Tests .....                   | 25  |

**MARKING**

|                  |    |
|------------------|----|
| 16 General ..... | 25 |
|------------------|----|

## 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

1.1 These requirements apply to equipment, circuits, or components intended for use in Class I, Groups A, B, C, and D, Division 2, hazardous (classified) locations; Class II, Groups F and G, Division 2, hazardous (classified) locations; and Class III, Divisions 1 and 2, hazardous (classified) locations as defined in Article 500 of the National Electrical Code, NFPA 70.

1.2 The equipment shall be capable of being installed in accordance with the requirements in the National Electrical Code, NFPA 70.

*Exception: Battery-powered portable equipment need not comply with this requirement*

1.3 The requirements cover Class I, Division 2 electrical equipment, or parts of such equipment, in which the circuits and components under intended operating conditions are incapable of causing ignition of the specified flammable gas- or vapor-air mixture.

1.4 These requirements cover Class II, Division 2, and Class III, Division 1 and Division 2 equipment that is constructed to reduce or exclude the entrance of dust.

1.5 These requirements apply only to equipment for use under the following atmospheric conditions.

- a) An ambient temperature of 5 to 40°C (41 to 104°F),
- b) An oxygen concentration not greater than 21 percent, and
- c) A nominal barometric pressure of one atmosphere.

1.6 These requirements cover portable battery-powered equipment, other than flashlights and lanterns, for Class I and Class II, Division 2, and Class III, Divisions 1 and 2 hazardous (classified) locations.

1.6.1 These requirements also cover equipment, circuits, or components intended for installation and use in Class I, Zone 2, Groups IIA, IIB, and IIC hazardous (classified) locations.

1.6.1 added October 6, 1995

1.7 These requirements do not cover electric lighting fixtures for use in Division 2 hazardous (classified) locations which are covered in the Standard for Electric Lighting Fixtures for Use in Hazardous (Classified) Locations, UL 844.

1.8 These requirements do not cover electric motors, electric heaters, heat tracing cables and similar heat-producing devices, or equipment with cathode ray tubes, for use in Division 2 locations. Such products are covered under separate requirements.

1.9 These requirements do not cover explosion-proof, dust-ignition-proof, or intrinsically-safe methods of protection for electrical equipment or parts thereof. Such methods of protection are considered acceptable for Division 2 hazardous locations. The requirements are covered in other standards.

1.10 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 or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the 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 does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

1.10 revised September 28, 1995

## 2 Glossary

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

2.2 **HERMETICALLY SEALED COMPONENT** – A component that is sealed against entrance of an external atmosphere and in which the seal is made by fusion, such as soldering, brazing, welding, or the fusion of glass to metal.

2.3 **INTENDED OPERATING CONDITIONS** – Equipment operation that conforms electrically and mechanically with the manufacturer's specifications and that is used within the limits specified by the manufacturer. This includes:

- a) Supply voltage and frequency;
- b) Environmental conditions – including process temperature;
- c) Tolerances associated with the components of the equipment;
- d) All tool-removable parts, such as covers, in place;
- e) All operator-accessible adjustments at any possible setting; and
- f) Opening, shorting, or grounding of a nonincendive field circuit.

2.4 **MAINTENANCE, OPERATIONAL** – Any maintenance activity, other than corrective maintenance, intended to be performed by the operator and that is required in order for the equipment to serve its intended purpose. Such activities include the correcting of zero on a panel instrument, changing charts, marking records, adding ink, or the like.

2.5 **MAKE/BREAK COMPONENT** – A component having mechanical contacts that can interrupt a circuit even if the interruption is transient in nature. Examples of make/break components are relays, circuit breakers, servo potentiometers, adjustable resistors, switches, connectors, and motor brushes.

2.6 **NONINCENDIVE CIRCUIT** – A circuit in which any arc or thermal effect produced under intended operating conditions of the equipment is not capable, under the test conditions specified, of igniting the specified flammable gas- or vapor-air mixture.