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Underwriters Laboratories Inc.®

A not-for-profit organization dedicated to public safety
and committed to quality service

August 19, 1996

Revision pages for

Standard for

Commercial Dry-Cleaning Machines (Type IV)

UL 664, Fourth Edition

Attached to this distribution notice is a revision of the Fourth edition of UL 664.

A CHANGE ON A PAGE DATED AUGUST 19, 1996 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS IN THIS STANDARD ARE NOW IN EFFECT EXCEPT FOR THOSE PARAGRAPHS, SECTIONS, TABLES, FIGURES, AND OTHER ELEMENTS OF THE STANDARD HAVING FUTURE EFFECTIVE DATES AS INDICATED IN THE NOTE FOLLOWING THE AFFECTED ITEM. TO RETAIN THE REQUIREMENTS IN EFFECT UNTIL THESE FUTURE EFFECTIVE DATES, DO NOT DISCARD THE PAGES REPLACED BY THOSE HAVING FUTURE EFFECTIVE DATES UNTIL THOSE DATES.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this standard unless the applicant specifically requests that the product be judged under the current requirements. However, should the applicant elect 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.

The revised requirements are substantially in accordance with UL's Bulletin on this subject dated May 9, 1996. The bulletin is now obsolete and may be discarded.

As indicated on the title page (page 1), this UL Standard for Safety has been approved by the Department of Defense.

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:

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5	December 6, 1995
6 – 35	July 7, 1993
36	August 19, 1996
37 – 44	July 7, 1993

JULY 7, 1993

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Standard for

Commercial Dry-Cleaning Machines (Type IV)

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Fourth Edition

July 7, 1993

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

The Department of Defense (DoD) has adopted UL 664 on February 10, 1976. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

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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40.5 Rubber barriers, diaphragms, seals, or the like throughout the machine are not to be removed when the test is being conducted to simulate the failure of a timer switch, or of a float- or pressure-operated switch.

40.6 For other than a boot or other flexed part, or if the machine involves a construction that does not lend itself to the foregoing test, the part (gasket, seal, hose, diaphragm, boot, or the like) is to be removed completely and the machine operated through 1 cycle of operation. The machine is considered to be acceptable if no wetting of electrical parts by the cleaning solvent discharged through the openings left by the removal of the part results from this test. See 40.9.

40.7 Ordinarily, determination of whether parts have become wet or contaminated as a result of the overflow conditions is to be by means of visual inspection, but this may be supplemented by a Dielectric Voltage-Withstand Test, Section 34, an Insulation Resistance Test, Section 35, or both if deemed appropriate.

40.8 Failure of a gasket, seal, boot, diaphragm, or the like shall not permit the escape of vapors:

- a) That might cause deterioration of the electrical insulation from within the closed system or
- b) Where excessive concentration can result in a risk of fire, electric shock, or injury to persons.

An area within the machine enclosure adequately exhausted or ventilated is considered to prevent excessive vapor concentrations. An area not subjected to a positive air flow is considered to be without ventilation.

40.9 Some or all of the tests or requirements in 40.1 – 40.8 may not be required if it can be shown by other tests that the materials used are acceptable for the application. See Section 41, Test on Physical Properties of a Gasket, Hose, and the Like.

41 Tests on Physical Properties of a Gasket, Hose, and the Like

41.1 In 41.2 – 41.10 the term component signifies a gasket, hose, seal, or the like that is exposed to the solvent (either liquid or vapor) employed in the machine.

41.2 The requirements in 41.4 – 41.10 do not apply to a component unless failure of that component might introduce a risk of fire, electric shock, or injury to persons – for example, escape of solvent (liquid or vapor) into the machine operator areas, wetting of electrical components, or the like.

41.3 The numerical values in Table 41.1 and 41.4 and 41.6 are based on perchloroethylene as the solvent. These values may be modified if it is intended that some other solvent be employed in the machine.

Table 41.1
Tensile strength and elongation

Material of component	Maximum temperature to which component is exposed during normal operation of machine,		Procedure for conditioning	Minimum average value of property in percent of as received condition	
	°C	°F		Strength	Elongation
Thermoplastic	40	(104)	Air oven at $87 \pm 2^{\circ}\text{C}$ ($189 \pm 3.6^{\circ}\text{F}$) ^{a,c}	60	60
	60	(140)	Air oven at $100 \pm 2^{\circ}\text{C}$ ($212 \pm 3.6^{\circ}\text{F}$) ^{a,c}		
	80	(176)	Air oven at $113 \pm 2^{\circ}\text{C}$ ($235 \pm 3.6^{\circ}\text{F}$) ^{a,c}		
Rubber or Thermoplastic	90	(194)	Air oven at $121 \pm 2^{\circ}\text{C}$ ($250 \pm 3.6^{\circ}\text{F}$) ^{a,c}	60	60
	105	(221)	Air oven at $136 \pm 2^{\circ}\text{C}$ ($277 \pm 3.6^{\circ}\text{F}$) ^{a,c}		
Rubber	60	(140)	Air oven at $100 \pm 2^{\circ}\text{C}$ ($212 \pm 3.6^{\circ}\text{F}$) ^{b,c}	60	60
	75	(167)	Air oven at $100 \pm 2^{\circ}\text{C}$ ($212 \pm 3.6^{\circ}\text{F}$) ^{a,c}	50	50
^a For 168 hours ^b For 70 hours ^c At atmospheric pressure					

Table 41.1 revised August 19, 1996

41.4 Except as indicated in 41.2, after samples have been conditioned in accordance with Table 41.1 the average tensile strength and the average elongation shall be as indicated in that table.

41.5 Except as indicated in 41.2, after a component has been immersed for 168 hours in liquid solvent at 70°C (158°F) its volume shall be 75 – 190 percent of the volume prior to immersion.

41.6 Except as indicated in 41.2, a hose, tube, or similar container of rubber, thermoplastic, or similar material employed to conduct or contain liquid solvent shall be sufficiently impervious that during the test described in 41.7 it will be necessary to add not more than a total of:

- a) Fifty percent of the original volume of solvent if the hose or the like contains the solvent more or less continuously; and
- b) Two hundred percent of the original volume of solvent if the hose or the like serves only to transfer the solvent or otherwise contains it intermittently and for brief periods.

41.7 After one end has been thoroughly sealed, the hose is to be filled to a marked level with the solvent. The other end is to be sealed to be airtight, and the hose is to stand for 14 days at room temperature. Periodically during and at the conclusion of this interval, sufficient solvent is to be added to bring the liquid back to the marked level. Except at the end of the interval, the tube is to be resealed after the addition of solvent. The total volume of solvent added during the interval is divided by the volume originally included in the tube to determine whether the material is acceptable.

41.8 Except as noted in 41.2 and 41.10, the tensile strength of a component shall not be less than 50 percent of its as-received tensile strength after the conditioning described in 41.9.



December 6, 1995

Revision pages for

Standard for

Commercial Dry-Cleaning Machines (Type IV)

UL 664, Fourth Edition

Attached to this transmittal notice is a revision of the Fourth edition of UL 664.

A CHANGE ON A PAGE DATED DECEMBER 6, 1995 IS INDICATED BY A SMALL PRINT NOTE FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE REVISED REQUIREMENTS ARE NOW IN EFFECT.

Attention is directed to the note on the title page of this standard identifying that the Department of Defense has adopted the text of UL 664.

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:

Page	Date
1	July 7, 1993 (Reprinted: December 6, 1995)
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1

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INTRODUCTION

1 Scope

1.1 These requirements cover dry-cleaning machines for use as or with Type IV systems utilizing Class IV solvents as defined in the Standard for Dry-Cleaning Plants, NFPA 32. The machines investigated under these requirements are intended for use with solvents or liquids classed as nonflammable or as having a maximum numerical fire hazard rating of 5, in accordance with the Standard for Tests for Comparative Flammability of Liquids, UL 340. These requirements cover dry-cleaning machines that are rated 600 volts or less and that employ no universal motor rated more than 250 volts. These machines are for use in ordinary locations in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements cover machines intended for use in commercial cleaning establishments, in which the machine or system ordinarily is not accessible to the general public while in operation.

1.3 These requirements do not cover machines intended for use in Type V operations, in which the machine or system is accessible to or used by the general public.

1.4 In these requirements, a dry-cleaning machine is considered to be a unit (usually not including any associated equipment) intended to clean fabrics only, or to clean and damp-dry fabrics. If a unit is designated as a dry-cleaning system, all the elements for the cleaning and complete drying process are considered as a whole. In either case, all elements of a machine or system and commercially used accessories and associated equipment, such as cleaning-liquid transfer pumps, reclaimers, air compressors, drying tumblers, and the like, are investigated under these requirements and under such additional requirements as are applicable to the element or accessory under consideration. An accessory is covered either as an integral part of a dry-cleaning system or as an individually installed, but associated, component.

1.5 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.

1.5 revised December 6, 1995

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.2 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.

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

2.4 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.

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 Undated 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 A machine shall employ materials that are acceptable for the use.

6 Frame and Enclosure

6.1 A machine shall be formed and assembled so that it will have the strength and rigidity necessary to resist the stresses to which it is ordinarily subjected, without resulting in a 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.

6.2 A machine shall be provided with an enclosure of material acceptable for the application that shall house all parts that may present a risk of fire, electric shock, or injury to persons under any condition of use.

Exception: A portion of an overall enclosure may be omitted if the machine is intended to be installed:

- a) In conjunction with other equipment that will complete the enclosure, and*
- b) Instructions for proper installation are provided. See 45.5, 45.12, and 45.22.*

6.3 Enclosures of individual electrical components, outer cabinets, and combinations of the two are taken into consideration in applying the requirement in 6.2.

6.4 Among the factors that shall be taken into consideration when the acceptability of an enclosure is being judged are its:

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

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

Standard for Safety

UL 664



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Standard



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UL Standards for Safety are developed under a procedure which provides for participation and comment from the affected public as well as industry. The procedure takes into consideration a survey of known existing standards and the needs and opinions of a wide variety of interests concerned with the subject matter of the standard. Thus manufacturers, consumers, individuals associated with consumer-oriented organizations, academicians, government officials, industrial and commercial users, inspection authorities, insurance interests and others provide input to UL in the formulating of UL Standards for Safety, to keep them consonant with social and technological advances.

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An independent, not-for-profit organization testing for public safety

July 7, 1993

Standard for

Commercial Dry-Cleaning Machines (Type IV)

UL 664, Fourth Edition

Accompanying this transmittal notice is a copy of the Fourth edition of UL 664.

THIS EDITION OF THE STANDARD IS NOW IN EFFECT.

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JULY 7, 1993

1

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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.