



UL 2162

STANDARD FOR SAFETY

Commercial Wood-Fired Baking Ovens – Refractory Type

*UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL*



Documents
Document Sharing Hub

UL Standard for Safety for Commercial Wood-Fired Baking Ovens – Refractory Type, UL 2162

First Edition, Dated May 23, 2014

Summary of Topics

This First Edition of ANSI/UL 2162 includes a first time ANSI approval.

The requirements are substantially in accordance with Proposal(s) on this subject dated January 24, 2014.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

No Text on This Page

**UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL**



Documents

Document Sharing Hub

MAY 23, 2014



1

ANSI/UL 2162-2014

UL 2162

Standard for Commercial Wood-Fired Baking Ovens – Refractory Type

Prior to the first edition, the requirements for the products covered by this standard were included in the Outline of Investigation for Commercial Wood-Fired Baking Ovens – Refractory Type, UL 2162.

First Edition

May 23, 2014

This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 2162 as an American National Standard (ANSI) occurred on May 23, 2014. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

COPYRIGHT © 2014 UNDERWRITERS LABORATORIES INC.

**UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL**



Documents
Document Sharing Hub

No Text on This Page

*UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL*



Documents

Document Sharing Hub

CONTENTS

INTRODUCTION

1 Scope	5
2 Components	5
3 Units of Measurement	6
4 Undated References	6
5 Glossary	6
6 Terminology	6

CONSTRUCTION

7 Materials	6
8 Assembly	8
9 Joints	9
10 Support Assembly	9
11 Ventilation Openings	9

PERFORMANCE

12 General	10
13 Test Installations	11
13.1 General	11
13.2 Enclosure	11
13.3 Exhaust hood	11
13.4 Wood storage	12
14 Temperature Measurement	13
15 Fire Tests	18
16 Rapid Fire Test	23
17 Normal Operation Fire Test	24
18 Abnormal Operation Fire Test	25
19 Flame Spillage Fire Test	25
20 Glazing Test	26
20.1 General	26
20.2 Impact test	26
20.3 Water shock test	27
21 Thermal Conductivity Test	28
22 Refractory Material Strength Test	29
23 Fire Chamber Strength Test	30

MARKINGS

24 General	31
25 Marking Permanence Tests	32
25.1 General	32
25.2 Air oven – aging test	33
25.3 Humidity test	33
25.4 Unusual condition exposure test	33

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

INSTRUCTIONS

26 Installation and Operating Instructions	33
26.1 General	33
26.2 Installation instructions	34
26.3 Operating instructions	35



INTRODUCTION

1 Scope

1.1 These requirements apply to commercial wood-fired ovens intended for use by commercial establishments for the purpose of cooking or baking food products utilizing solid wood fuel. These ovens utilize as their primary enclosure, refractory materials.

1.2 For the purposes of this standard:

- a) It is anticipated the ovens described in 1.1 will be vented by an exhaust hood as covered by the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96, or an exhaust hood tested for compliance with the requirements in the Standard for Exhaust Hoods for Commercial Cooking Equipment, UL 710.
- b) Minimum exhaust hood size including minimum height, depth, and length of the hood as well as minimum hood overhangs, minimum exhaust air flows, and maximum hood height above the oven shall be established as part of the investigation.
- c) The seismic stability of the oven and support system is not anticipated in this document.

1.3 The wood-fired baking ovens as covered by these requirements are intended for installation in accordance with the National Electrical Code, NFPA 70, and other codes such as the International Mechanical Code and the Uniform Mechanical Code. The exhaust hoods referenced in these requirements are intended for installation in accordance with the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96.

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 is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not 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 rating established for the intended conditions of use.

2.4 Specific components are 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.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

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

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.

5 Glossary

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

5.2 COMBUSTIBLE MATERIAL, NONCOMBUSTIBLE MATERIAL – The terms used in this standard are defined in the Standard Glossary of Terms Relating to Chimneys, Vents, and Heat-Producing Appliances, NFPA 97.

5.3 WOOD-FIRED OVEN – A factory- or field-assembled oven intended to cook products utilizing solid wood fuels only.

6 Terminology

6.1 Use of the term "product" in these requirements refers to all wood-fired ovens or any part thereof covered by these requirements unless specifically noted otherwise.

CONSTRUCTION

7 Materials

7.1 An oven part shall be made of noncombustible corrosion-resistant materials. Metals shall not be used in combinations at any location within the assembly that may cause galvanic action.

7.2 The minimum thickness of sheet metal including any coatings and of other materials shall comply with Table 7.1.

Table 7.1
Minimum metal thickness

Material	inch	(mm)
Aluminum-coated steel Type T1-40 regular [0.40 oz per sq ft (0.12 kg/m ²)]	0.018	(0.46)
Aluminum alloys	0.016	(0.41)
Cast iron	0.125	(3.18)
Galvanized steel (G60 coating class)	0.018	(0.46)
Porcelain-enameled steel	0.032	(0.81)
Stainless steel	0.012	(0.30)
Steel (uncoated or painted)	0.042	(1.07)

7.3 Aluminum alloys containing more than 1 percent magnesium shall not be used when the reflectivity of the material is used to reduce the risk of fire.

7.4 The fire chamber of the oven and other parts in contact with flue gases that are visible after installation shall be of material having the durability and resistance to fire and heat equivalent to fire refractories, Series 300 or 400 stainless steel, aluminum-coated steel, cast iron, or 0.042 inch (1.07 mm) thick unprotected or painted steel.

7.5 Cast iron and unprotected and painted sheet steel complying with the requirements of notes (k) and (l) in Table 15.1 comply with the requirements of 7.4.

7.6 Parts that are in contact with flue gases and that are not visible after installation shall be of a material having the durability and resistance to corrosion, fire, and heat equivalent to fireclay tile or Series 300 or 400 stainless steel.

7.7 Thermal insulation material shall be of metal or of a mineral base.

7.8 Thermal insulation shall comply with the following conditions when the oven is tested in accordance with these requirements:

- a) The insulation shall not show evidence of softening, melting, or deterioration.
- b) Except for binder materials, thermal insulation material shall be noncombustible.
- c) Thermal insulation shall not come into contact with the products of combustion.
- d) Thermal insulation that is not self-supporting shall be applied to solid surfaces so that the insulation does not sag. An adhesive or cement used to attach such material shall retain its adhesive qualities at any temperature the adhesive may attain when tested in accordance with these requirements and at 0°F (minus 18°C).
- e) Adhesives or cements used in the installation of insulating materials shall have a flame spread rating of 25 or less when tested in accordance with the Standard for Test for Surface Burning Characteristics of Building Materials, UL 723.
- f) A water-absorbing insulating material shall not be subject to wetting by condensation when installed as intended.
- g) Asbestos material shall not be used.

7.9 A device shall be provided to indicate the oven operating temperature. This device shall measure either the oven air temperature or the temperature of the refractory material or both. An electrically operated temperature-indicating device shall comply with the applicable requirements in the Standard for Temperature-Indicating and -Regulating Equipment, UL 873, or it shall be evaluated as an operating control with class A control functions to the Standard for Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements, UL 60730-1 in addition to the Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Temperature Sensing Controls, ANSI/UL 60730-2-9.

8 Assembly

8.1 An oven shall consist of all the essential parts necessary for the intended installation of the complete oven assembly. Each part of the assembly shall be constructed for ready attachment to the other without requiring alteration by the installer, such as cutting, threading, drilling, welding, or similar tasks.

Exception: An assembly or component part intended to be cut to length or to be fitted by the installer may be provided when means are furnished for joining any altered part to a companion part or assembly. All fasteners required to complete the assembly shall be provided with the product by the manufacturer. Drilling is not prohibited when:

- a) The drilling operation does not weaken the assembly or penetrate into the flue liner; and*
- b) The size of the required drill bit is specified and the instructions clearly describe the locations to be drilled, such as by the use of drawings, descriptions, templates, or the like.*

8.2 Two or more parts or subassemblies that bear a definite relationship to each other in the intended application shall be:

- a) Arranged and constructed to permit them to be incorporated into the complete assembly without need for alteration or alignment and only in the intended relationship with each other; or
- b) Assembled and shipped from the factory as one unit.

8.3 Each part, such as an oven flue section or support element, shall be completely assembled by the manufacturer at the factory.

8.4 When an oven flue assembly incorporates elbows, no part of the oven flue shall be at an angle of more than 30 degrees from the vertical at any point in the assembly, and the oven connector shall not include more than one offset (two elbows).