



UL 181

Underwriters Laboratories Inc. Standard for Safety

Factory-Made Air Ducts and Air Connectors



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UL Standard for Safety for Factory-Made Air Ducts and Connectors, UL 181

Tenth Edition, Dated May 24, 2005

Revisions: This Standard contains revisions through and including October 27, 2008.

Summary of Topics

This revision of ANSI/UL 181 includes the following changes in requirements:

Corrects temperature conversion for 10.4.2.

Additions to the Scope of the Standard.

Text that has been changed in any manner is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

The revised requirements are substantially in accordance with UL's Proposal(s) on this subject dated July 4, 2008 and September 12, 2008.

The revisions dated October 27, 2008 include a reprinted title page (page1) for this Standard.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

As indicated on the title page (page1), this UL Standard for Safety has been adopted by the Department of Defense.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ulforeword.html>

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

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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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if

the applicant elects this option, it should be noted that compliance with all the requirements in this Standard will be required as a condition of continued Listing and Follow-Up Services after the effective date, and understanding of this should be signified in writing.

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Page	Date
1	October 27, 2008
2-5	May 24, 2005
6	October 27, 2008
7-16	May 24, 2005
17	October 27, 2008
18-38	May 24, 2005

No Text on This Page



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1

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Standard for Factory-Made Air Ducts and Air Connectors

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The most recent designation of ANSI/UL 181 as an American National Standard (ANSI) occurred on October 20, 2008. The ANSI approval for this standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

This ANSI/UL Standard for Safety consists of the Tenth Edition includes revisions through October 27, 2008.

The Department of Defense (DoD) has adopted UL 181 on July 20, 1994. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

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>.

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CONTENTS

INTRODUCTION

1 Scope	6
2 Components	6
3 Units of Measurement	7
4 Undated References	7

CONSTRUCTION

5 Materials	7
-------------------	---

PERFORMANCE

6 General	7
7 Tests for Surface Burning Characteristics	8
8 Flame Resistance Test	9
9 Bending Test	9
10 Flame Penetration Test	11
10.1 General	11
10.2 Test equipment	11
10.3 Sample preparation	14
10.4 Pre-heat and stabilization	16
10.5 Test method	18
11 Burning Test	18
12 Corrosion Resistance	23
12.1 Test for zinc-coated steel	23
12.2 Tests for coated steel (other than zinc-coated steel)	23
13 Mold Growth and Humidity Test	24
14 Temperature Test	25
14.1 General	25
14.2 Low temperature	25
14.3 High temperature	25
15 Puncture Test	26
16 Static Load Test	27
16.1 General	27
16.2 Tests for rigid air ducts	27
16.3 Tests for flexible air ducts and air connectors.	29
17 Impact test	29
18 Erosion Test	32
18.1 General	32
18.2 Test installation	32
18.3 Test method	34
19 Pressure Test	34
20 Collapse Test	35
21 Tension Test	35
22 Torsion Test	36
23 Leakage Test	36

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Documents

Document Sharing Hub

MANUFACTURING AND PRODUCTION TESTS

24 General	37
------------------	----

MARKING

25 Content	37
------------------	----

INSTRUCTIONS

26 Installation Instructions	38
------------------------------------	----



No Text on This Page

INTRODUCTION

1 Scope

1.1 These requirements apply to materials for the fabrication of air duct and air connector systems for use in accordance with the International Mechanical Code (IMC), International Residential Code (IRC), and Uniform Mechanical Code (IMC), Standards of the National Fire Protection Association for the Installation of Air-Conditioning and Ventilating Systems, NFPA No. 90A, and the Installation of Warm Air Heating and Air-Conditioning Systems, NFPA No. 90B.

1.1 revised October 27, 2008

1.2 The air ducts and air connectors covered by these requirements include preformed lengths of flexible or rigid ducts, materials in the form of boards for field fabrication of lengths of rigid ducts, and preformed flexible air connectors.

1.3 For the purpose of these requirements, air ducts and air connectors are classified as follows:

Class 0 – Air ducts and air connectors having surface burning characteristics of zero.

Class 1 – Air ducts and air connectors having a flame-spread index of not over 25 without evidence of continued progressive combustion and a smoke-developed index of not over 50.

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 required 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.

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 Materials

5.1 Metals used in the assembly of air ducts and air connectors shall be resistant to atmospheric corrosion and shall not be used in combinations that results in galvanic action which deteriorates any part of the system formed from such material.

5.2 To comply with 5.1 with respect to resistance to atmospheric corrosion, metals which are not inherently corrosion resistant, such as sheet steel, or steel wire, are to have a corrosion-resistant coating.

5.3 The corrosion-resistant coating shall provide protection against atmospheric corrosion as determined by 12.1.1 at least equivalent to steel having a uniform coating of zinc of not less than 0.3 ounce per square foot (91.6 g/m²) of surface area.

5.4 Materials which have their protective coating damaged or the effectiveness reduced by the manufacturing process are to be tested after being subjected to such process.

PERFORMANCE

6 General

6.1 Table 6.1 indicates the tests applicable to the specific forms of air ducts, air connectors, and joining materials. Additionally, joining materials intended for factory installation are to be evaluated in conjunction with the air duct and air connector tests when specified in the individual sections of this Standard.

Exception: Joining materials which comply with the requirements in the Standard for Closure Systems for Use With Rigid Air Ducts and Air Connectors, UL 181A or the Standard for Closure Systems for Use With Flexible Air Ducts and Air Connectors, UL 181B are not required to be evaluated.

Table 6.1
Test program

Tests	Air ducts		Air connectors	Joining materials
	Rigid	Flexible		
Surface Burning Characteristics	X	X	X	—
Flame Resistance	—	—	—	X
Flame Penetration	X	X	—	—
Burning	X	X	X	—
Corrosion ^a	X	X	X	X
Mold Growth and Humidity	X	X	X	X
Temperature	X	X	X	—
Puncture	X	X	—	—
Static Load	X	X ^b	X ^b	—
Impact	X	X	—	—
Erosion	X	X	X	—
Pressure	X	X	X	—
Collapse	X	X	X	—
Tension	—	X	X	—
Torsion	—	X	X	—
Bending	—	X	X	—
Leakage	X	X	X	—
NOTES X Test applicable. — Test not applicable. ^a Applicable to parts of metals not inherently corrosion resistant. ^b Test applicable for flexible air ducts and air connectors that incorporate vapor barriers supported by grommets or other means of field support.				

7 Tests for Surface Burning Characteristics

7.1 Representative samples of air ducts and air connectors shall be evaluated for surface burning characteristics and classified according to the requirements in 7.2 and 7.3.

7.2 Class 0 material shall have surface burning characteristics of zero (flame spread and smoke developed).

7.3 Class 1 material shall have a flame-spread index of not over 25 without evidence of continued progressive combustion and a smoke-developed index of not over 50.

7.4 Tests for surface burning characteristics are to be conducted as specified in the Standard for Test for Surface Burning Characteristics of Building Materials, UL 723. For the purpose of establishing the flame spread and smoke developed indices, typically a minimum of three tests are to be conducted.