

\*\*\*\*\*  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
NASA-09510 (June 2004)  
NASA  
Superseding NASA-09510  
(December 2003)  
\*\*\*\*\*

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09510

ACOUSTICAL CEILINGS

06/04

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 PERFORMANCE REQUIREMENTS
  - 1.2.1 Noise Reduction Coefficient Grade
  - 1.2.2 Ceiling Sound Transmission Classification
- 1.3 SUBMITTALS
- 1.4 ACOUSTICAL CEILING INFORMATION

PART 2 PRODUCTS

- 2.1 FIRE-RATED CEILING SYSTEMS
- 2.2 ACOUSTIC MATERIALS
- 2.3 SUSPENSION SYSTEM MATERIALS
  - 2.3.1 Exposed, Direct-Hung Main Runners
  - 2.3.2 Cross Runners and Accessories
  - 2.3.3 Wall Moldings
  - 2.3.4 Hanger Wire

PART 3 EXECUTION

- 3.1 GENERAL
- 3.2 ARRANGEMENT OF ACOUSTIC CEILINGS
- 3.3 PLACING SUSPENSION SYSTEM MEMBERS
- 3.4 SETTING ANCHORAGE DEVICES
- 3.5 FIRE-RATED ACOUSTIC CEILINGS

-- End of Section Table of Contents --

\*\*\*\*\*  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
NASA-09510 (June 2004)  
NASA  
Superseding NASA-09510  
(December 2003)  
\*\*\*\*\*

SECTION 09510

ACOUSTICAL CEILINGS  
06/04

\*\*\*\*\*  
NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.  
\*\*\*\*\*

This broadscope section covers fire-rated and non-rated acoustic exposed grid lay-in panels for ceilings.

\*\*\*\*\*

PART 1 GENERAL

1.1 REFERENCES

\*\*\*\*\*  
NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically be deleted from this section of the project specification.  
\*\*\*\*\*

The publications listed below form a part of this section to the extent referenced:

ASTM INTERNATIONAL (ASTM)

- |            |  |
|------------|--|
| ASTM C 423 | (2002a) Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method                                 |
| ASTM C 635 | (2000) Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings |
| ASTM C 636 | (2003) Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels                                  |
| ASTM E 119 | (2000a) Standard Test Methods for Fire Tests of Building Construction and Materials  |

- ASTM E 1264 (1998) Standard Classification for Acoustical Ceiling Products
- ASTM E 84 (2003) Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E 90 (2002) Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions

UNDERWRITERS LABORATORIES (UL)

- UL Bld Mat Dir (2003) Building Materials Directory

1.2 PERFORMANCE REQUIREMENTS

1.2.1 Noise Reduction Coefficient Grade

Noise reduction coefficient (NRC) grade of acoustic ceilings shall be certified in accordance with ASTM C 423, and shall be as follows:

<u>MOUNTING TYPE</u>	<u>NRC GRADE</u>
[Type E	0.50 to 0.60]
[Type E	0.60 to 0.70]
[_____]	[_____]

1.2.2 Ceiling Sound Transmission Classification

Sound Transmission Classification (STC) of the indicated acoustic ceilings shall be an 11-frequency test method conforming to ASTM E 90 and shall be as follows:

<u>CONDITION AT PARTITIONS</u>	<u>CEILING STC</u>
Continuous	[35 to 39]
	[40 to 44]
	[_____]

1.3 SUBMITTALS

\*\*\*\*\*  
**NOTE: Review submittal description (SD) definitions in Section 01330, "Submittal Procedures," and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.**  
 \*\*\*\*\*

The following shall be submitted in accordance with Section 01330, "Submittal Procedures," in sufficient detail to show full compliance with

the specification:

SD-02 Shop Drawings

Installation Drawings shall be submitted for Acoustical Ceilings showing intermediate framing of hanger supports that fall between framing members; fastening of suspension system to top plate of nonbearing partitions; hanger fastenings at roof framing members and at main runners; acoustic unit support at ceiling fixtures; the splicing method for main and cross runners; positioning of splines; and the suspension system structural classification in accordance with ASTM C 635.

SD-03 Product Data

Manufacturer's catalog data shall be submitted for the following items showing UL classification of fire-rated ceilings giving materials, construction details, and UL design number and fire protection time rating for each acoustic ceiling assembly, and showing conformance to the referenced standards contained in this section.

Fire-Rated Ceiling Systems  
Acoustic Materials  
Suspension System Materials

SD-04 Samples

Samples of the following shall be submitted in accordance with paragraph entitled, "Acoustical Ceiling Information," of this section.

Acoustic Units  
Suspension System Members  
Anchorage Devices  
Fasteners

After approval, samples may be used in the construction provided each sample is clearly identified and its location recorded.

SD-08 Manufacturer's Instructions

Manufacturer's instructions shall be submitted showing printed instructions covering installation of Acoustic Materials and Suspension Systems.

1.4 ACOUSTICAL CEILING INFORMATION

Installation Drawings shall be submitted for acoustical ceilings showing intermediate framing of hanger supports that fall between framing members; fastening of suspension system to top plate of nonbearing partitions; hanger fastenings at roof framing members and at main runners; acoustic unit support at ceiling fixtures; the splicing method for main and cross runners; positioning of splines; and the suspension system structural classification in accordance with ASTM C 635.

Samples of the following shall be submitted accordingly:

Acoustic Units: Three 6 by 6 inch 150 by 150 millimeter samples of

each type and pattern to illustrate the manufacturer's standard color chart and appearance range.

Suspension System Members: Three 1-foot 300 millimeter samples of each type.

Anchorage Devices: Three full-size samples of each type.

Fasteners: Three full-size samples of each type.

## PART 2 PRODUCTS

### 2.1 FIRE-RATED CEILING SYSTEMS

Materials and methods used for fire-rated ceiling systems shall meet the minimum requirements of ASTM C 635, ASTM C 636, and ASTM E 119.

### 2.2 ACOUSTIC MATERIALS

Units shall be prefabricated, mineral base conforming to ASTM E 1264, Type III. Exposed to view surfaces of the units shall be a factory-applied, [white] [\_\_\_\_\_] finish.

Flame spread index shall not be more than 25, and shall conform to ASTM E 84, Class A.

Light reflectance coefficient Grade (LR), shall conform to ASTM E 1264, and be 0.75 or more.

Panels shall be nominal [24 by 48] [24 by 24] inches [600 by 1200] [600 by 600] millimeter by not less than [5/8] [3/4] inch [16] [19] millimeter [\_\_\_\_\_] thick, with [square] [bevel] [rabbeted] edges.

Pattern shall be [fissured] [\_\_\_\_\_].

### 2.3 SUSPENSION SYSTEM MATERIALS

Suspension system materials shall conform to ASTM C 635.

#### 2.3.1 Exposed, Direct-Hung Main Runners

Main runners shall be cold-formed bulb-tee sections, double-web type, fabricated from steel sheets. Web height shall be not less than 1-1/2 inches 38 millimeter with the bottom flange width not less than 15/16 inch. 24 millimeter. Webs shall be drilled or grooved to receive cross runner end tabs and main runner splices. Structural classification shall be [intermediate] [heavy] duty in accordance with ASTM C 635.

Fire-rated exposed runners for fire-rated acoustic ceilings shall be as approved for use and listed in the UL Bld Mat Dir. Cartons shall bear UL listing.

Finish of the exposed-to-view surface of main runners shall be [\_\_\_\_\_] [baked-on white enamel]. Finish shall pass the high-humidity test specified in ASTM C 635.

#### 2.3.2 Cross Runners and Accessories

Cross runners shall be designed for use with the type and structural

classification of the main runners used. Bottom flange shall be the same width as the main runner listed.

Finish of the exposed-to-view surface of the cross runners shall be the same as main runners.

Antibreather splines, hold-down clips, main runner connectors and other accessories required to complete the ceiling installation shall be provided. Such accessories shall be designed for use with the type of main runner used.

### 2.3.3 Wall Moldings

Moldings shall be cold-formed [angle] [U-shape] sections fabricated from steel sheets.

Finish of exposed-to-view surfaces of moldings and corner caps shall be the same as the runners.

Moldings for fire-rated ceilings shall be as approved for use in the UL fire classification design number(s) approved for the work.

### 2.3.4 Hanger Wire

Hanger wire shall be 12-gage 2 millimeter galvanized, soft annealed, mild steel wire in accordance with ASTM C 636.

## PART 3 EXECUTION

### 3.1 GENERAL

Metal ceiling suspension systems and acoustic material shall be installed in accordance with the manufacturer's recommendations and ASTM C 636.

### 3.2 ARRANGEMENT OF ACOUSTIC CEILINGS

Suspension system shall be so arranged that acoustic units less than one-half width do not occur. Tile joint or centerline shall not center on ceiling fixtures.

Runners and acoustic units shall be so arranged that joints are parallel with room axes in both directions.

### 3.3 PLACING SUSPENSION SYSTEM MEMBERS

Hanger wires shall be vertical and suspended from structural supporting members as follows:

[Wires shall be secured by wire-tying to inserts embedded in concrete.]

[Wires shall be secured to the bottom chord of joists or structural members by wire-tying or by metal clips designed for the purpose.]

Moldings shall be installed at walls and other vertical surfaces, except for demountable metal partitions having caps designed to receive suspension system members.

#### 3.4 SETTING ANCHORAGE DEVICES

Anchorage devices shall be set in masonry, concrete or other material in accordance with the anchorage device manufacturer's printed instructions. Drilled holes shall be left rough, not reamed, and free from drill dust.

#### 3.5 FIRE-RATED ACOUSTIC CEILINGS

Fire-rated ceiling assembly shall be in accordance with UL Bld Mat Dir.

Ceiling openings for lighting and air distribution shall be in accordance with UL Bld Mat Dir.

-- End of Section --