

# ANSI/AMCA Standard 540-13

## Test Method for Louvers Impacted by Wind Borne Debris

An American National Standard  
Approved by ANSI on June 14, 2013



**AIR MOVEMENT AND CONTROL  
ASSOCIATION INTERNATIONAL, INC.**

The International Authority on Air System Components

# ANSI/AMCA Standard 540-13

## Test Method for Louvers Impacted by Wind Borne Debris

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## AMCA Publications

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## Related AMCA Documents

### Related Publications

ANSI/AMCA Standard 500-L	<i>Laboratory Methods of Testing Louvers for Rating</i>
AMCA Publication 501	<i>Application Manual for Louvers</i>
AMCA Publication 511	<i>Certified Ratings Program - Product Rating Manual for Air Control Devices</i>
AMCA Publication 512	<i>AMCA Listing Label Program</i>
ANSI/AMCA Standard 550	<i>Test Method for High Velocity Wind Driven Rain Resistant Louvers</i>

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# Test Method for Louvers Impacted by Wind Borne Debris

## 1. Purpose

The purpose of this standard is to establish uniform methods for laboratory testing of louvers that are impact tested with the large missile described in ASTM E 1996-04 [1] and E 1886-05 [2].

## 2. Scope

The scope of this standard is for impact testing of louvers used on the outside of buildings as required by the ICC International Building Code [3] and the ICC International Residential Code [4].

The following precautionary statement pertains only to the test method portion, Section 5, of this specification: This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of the regulatory limitations prior to use.

## 3. Definitions

### 3.1 Enhanced protection (Essential Facilities)

Buildings and other structures designated as essential facilities, including, but not limited to, hospitals; other health care facilities having emergency treatment facilities; jails and detention facilities; fire, rescue and police stations, and emergency vehicle garages; designated emergency shelters; communication centers and other facilities required for emergency response; power generating stations; other public utility facilities required in an emergency; and buildings and other structures having critical national defense functions.

### 3.2 Basic protection

Any building or structure that is not an Essential Facility as described in Section 3.1.

### 3.3 Horizontal/vertical-bladed louver

Louvers shall be designated horizontal or vertical-bladed based on the orientation of the blades on the front or exterior side of the louver.

### 3.4 Specimen

A louver assembly for testing consisting of one or more louver sections.

### 3.5 Louver Section

A single louver panel. Panels can (but are not required to)

be connected to each other to make up larger assemblies for testing purposes. For example, a 2-section wide louver assembly is two panels wide.

## 4. Test Specimens

### 4.1 Number of specimens

#### 4.1.1

Per ASTM E 1996-04 and ASTM E 1886-05, a minimum of three sections shall be impacted. This requirement may be satisfied by testing one single-section and one multi-section unit or by testing three identical single-section units.

#### 4.1.2

One additional specimen may be submitted for testing should any original submitted specimen described in Section 4.1 fail any portion of the AMCA Standard 540 testing. This is described in Section 9.2. If all specimens pass the AMCA Standard 540, and then some or all of the same specimens are then subjected to Cyclic testing as described in Section 8, and any one specimen fails any portion of the subsequent test(s), then one additional specimen may be submitted to re-test to the subsequent tests as long as the additional specimen first passes the AMCA Standard 540 tests.

### 4.2 Size of specimens

The test specimen selected is intended to evaluate the critical failure area of the louver and provide guidance for blade support requirements. The critical failure area for louvers is the connection between the louver blade end and the perimeter louver frame. Failures in this area result in loose material that can result in projectiles in high wind events. The most stringent test specimen for this connection is a section where the blade has no additional support between these end connections. Energy from the impact is transferred to the connection with little absorption by blade flexure. This test specimen also provides guidance regarding the maximum unsupported blade length that will not allow the projectile to pass through the louver blades. Louvers manufactured with blade spans greater than that of the test specimen shall have blade supports at a spacing that matches the tested specimen blade length. These supports are typically located behind the blade running perpendicular to the axis of the blade and are attached to the perimeter frame of the louver or to the surrounding building structure. Due to the fact that the test specimen is used to qualify support locations in this way, the manufacturer may wish to test an additional specimen with a width narrower than desirable support spacing to establish a smaller minimum section width.