



Designation: D 3161 – 06

## Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method)<sup>1</sup>

This standard is issued under the fixed designation D 3161; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 This test method covers the procedure for testing the wind resistance of asphalt shingles when applied to a test deck on low slopes in accordance with the manufacturer's instructions at the most susceptible slope for wind damage of 2 in. in 12 in. permitted by those instructions. It is used to benchmark the blow-off resistance of sealed and interlocked shingles at a given wind velocity, but may be used to test unsealed or sealed shingles at other wind velocities as is applicable.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 regulatory limitations prior to use.*

### 2. Type and Classes of Shingles

2.1 Shingles are of two types:

2.1.1 *Type I*—Shingles with a factory-applied adhesive (self-sealing shingles).

2.1.2 *Type II*—Shingles of the lock type, with mechanically interlocking tabs or ears.

2.2 Shingles are of three classes:

2.2.1 *Class A*—Pass at a test velocity of 97 km/h (60 mph).

2.2.2 *Class D*—Pass at a test velocity of 145 km/h (90 mph).

2.2.3 *Class F*—Pass at a test velocity of 177 km/h (110 mph).

### 3. Significance and Use

3.1 Most asphalt shingles that have demonstrated wind resistance by this test have also performed well in use. Natural wind conditions differ with respect to intensity, duration, and

turbulence; these conditions are beyond the means of this test to simulate. The results of this test do not directly correlate to wind speeds experienced in service, and no accommodation is made in this test method for building height, building exposure category, or building importance factor.

3.2 Many factors influence the sealing characteristics of shingles in the field; for example, temperature, time, roof slope, contamination by dirt and debris, and fasteners that are misaligned or under-driven and interfere with sealing. It is beyond the scope of this test method to address all of these influences. When testing shingles with sealant, this test method is designed to determine the wind resistance when representative samples of shingles are sealed under defined conditions before testing.

### 4. Apparatus

4.1 *Test Machine*, capable of delivering a horizontal stream of air through a rectangular opening 914 mm (36 in.) wide and 305 mm (12 in.) high at a velocity not less than 97 km/h (60 mph). At a velocity of not less than 177 km/h (110 mph), it is permissible to add a duct section to the equipment to lower the height of the rectangular opening to 152 mm (6 in.). The test velocity shall not vary more than  $\pm 5$  mph as measured at a minimum of three evenly spaced locations across the orifice. The machine shall be equipped with an adjustable stand to receive a test panel and be adapted to setting the test panel at any desired slope, at any horizontal distance from the lower edge of the duct opening, and at various angles incident to the wind direction.

4.2 *Timer*, capable of reading to the nearest minute.

4.3 *Mechanical Circulation Conditioning Cell or Room*, for self-sealing shingles, having forced circulation of air capable of receiving a 1.27-m (50-in.) wide by 1.68-m (66-in.) long, or larger test panel on a slope of 2 in. rise per foot (17 % slope) and of maintaining a uniform temperature of 57 to 60°C (135 to 140°F).

### 5. Test Samples

5.1 The test panels shall be of plywood, tightly matched sheathing boards, or other suitable decking material and not less than 1.27 by 1.68 m (50 by 66 in.) in size. They are to be

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.02 on Prepared Roofings, Shingles, and Siding Materials.

Current edition approved Aug. 1, 2006. Published August 2006. Originally approved in 1972. Last previous edition approved in 2005 as D 3161 – 05.