



Designation: D 1863 – 93 (Reapproved 2003)

Standard Specification for Mineral Aggregate Used on Built-Up Roofs¹

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

1. Scope

1.1 This specification covers the quality and grading of crushed stone, crushed slag, and water-worn gravel suitable for use as coarse mineral aggregate on built-up roofs.

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

2. Referenced Documents

2.1 ASTM Standards:

C 29/C 29M Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate²

C 33 Specification for Concrete Aggregates²

C 117 Test Method for Materials Finer Than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing²

C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates²

D 75 Practice for Sampling Aggregates³

D 448 Classification for Sizes of Aggregate for Road and Bridge Construction³

D 1864 Test Method for Moisture in Mineral Aggregate Used on Built-Up Roofs⁴

D 1865 Test Method for Hardness of Mineral Aggregate Used on Built-Up Roofs⁴

E 11 Specification for Wire Cloth and Sieves for Testing Purposes⁵

3. Materials and Manufacture

3.1 *Crushed Stone and Gravel*—The crushed stone and gravel at the time of application shall be hard, durable, opaque, and free of clay, loam, sand, or other foreign substances.

¹ This specification is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.03 on Surfacing and Bituminous Materials for Membrane Waterproofing and Built-up Roofing.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.03.

⁴ *Annual Book of ASTM Standards*, Vol 04.04.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

3.2 *Crushed Slag*—Crushed slag shall be hard, air-cooled, blast-furnace slag, or electric furnace phosphate slag that is free of sand, clay, or other foreign substances at the time of application.

4. Requirements

4.1 The aggregate shall conform to the gradation requirements specified in Table 1.

TABLE 1 Gradation Requirements

Sieve (Specification E 11)	Amounts Finer than Sieve Specified, mass %		
	Size 6 ^A 19.0 to 9.5 mm ($\frac{3}{4}$ in. to $\frac{3}{8}$ in.)	Size No. 67 ^A 19.0 to 4.75 mm ($\frac{3}{4}$ in. to No. 4)	Size No. 7 ^A 12.5 to 4.75 mm ($\frac{1}{2}$ in. to No. 4)
25 mm (1 in.)	100	100	...
19 mm ($\frac{3}{4}$ in.)	90 to 100	90 to 100	100
12.5 mm ($\frac{1}{2}$ in.)	20 to 55	...	90 to 100
9.5 mm ($\frac{3}{8}$ in.)	0 to 15	20 to 55	40 to 70
4.75 mm (No. 4)	0 to 5	0 to 10	0 to 15
2.36 mm (No. 8)	...	0 to 5	0 to 5

^A Size number and requirements data are from Specification C 33 and Classification D 448.

4.2 The aggregate shall conform to the physical properties specified in Table 2.

TABLE 2 Physical Properties

Moisture, max, %:	
Crushed stone and gravel	2.0
Crushed roofing slag	5.0 ^A
Unit mass (loose), min, kg/m ³ (lb/ft ³)	960 (59.9)
Dust, max, %	2.0
Hardness, max, percentage passing a 3.35-mm (No. 6) sieve	20


^A A higher moisture content is permitted for slag because of moisture entrapment in the internal pores of the pieces of slag.

4.3 Suggested Field Checks:

4.3.1 Aggregate shall be free of ice and snow.

4.3.2 A handful of aggregate shall not drip water.

4.3.3 The aggregate shall be dry and clean enough to adhere to the hot bitumen flood coat when installed.

 **D 1863 – 93 (2003)**

5. Sampling

5.1 Sample aggregates received in bulk in accordance with Practice D 75.

5.2 For aggregates received in bags or small containers, select a number of bags or small containers at random equivalent to the cube root of the total number in the shipment.

6. Test Methods

6.1 *Gradation*—Test Method C 136.

6.2 *Moisture*—Test Method D 1864.

6.3 *Unit Mass (Loose)*—Test Method C 29/C 29M, utilizing the shoveling procedure.

6.4 *Dust*—Test Method C 117.

6.5 *Hardness*—Test Method D 1865.

7. Inspection

7.1 Inspection of the material shall be as agreed upon between the purchaser and the supplier.

8. Rejection and Rehearing

8.1 Rejection and rehearing shall be as agreed upon between the purchaser and the supplier.

9. Certification

9.1 Certification of material shall be as agreed upon between the purchaser and the supplier.

10. Keywords

10.1 built-up roofs; crushed slag; crushed stone; gravel; mineral aggregate

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