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Standard Specification for Calcium-Silicon Alloys[1]

This standard is issued under the fixed designation A495; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification covers a standard grade of calcium-silicon, a standard grade of calcium-manganese-silicon, a standard grade of calcium-silicon-barium and a standard grade of ferro-calcium-silicon.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A1025 Specification for Ferroalloys and Other Alloying Materials, General Requirements

3. General Conditions for Delivery

3.1 Material furnished to this specification shall conform to the requirements of Specification A1025, including any supplementary requirements that are indicated in the purchase order. Failure to comply with the general requirements of Specification A1025 constitutes nonconformance with this specification. In case of conflict between the requirements of this specification and Specification A1025, this specification shall prevail.

4. Chemical Requirements

4.1 The material shall conform to the requirements as to chemical composition specified in Table 1 and Table 2. The manufacturer shall furnish an analysis of each shipment showing the percentage of each element specified in Table 1.

4.2 For the elements specified in Table 2 an analysis of each lot is not required. Upon request of the purchaser the manufacturer shall supply the results of an analysis for the elements in Table 2 on a cumulative basis over a period mutually agreed upon by the manufacturer and the purchaser.

TABLE 1 Chemical Requirements

Element	Composition, %			
	CaSi	CaSiMn	CaSiBa	FeCaSi
Calcium	28.0 to 32.0	16.0 to 20.0	14.0 to 20.0	14.0 to 18.0
Silicon	60.0 to 65.0	53.0 to 59.0	55.0 to 60.0	53.0 to 59.0
Manganese	. . .	14.0 to 18.0	. . .	. . .
Barium	. . .	. . .	14.0 to 18.0	. . .
Iron	. . .	. . .	. . .	14.0 to 18.0
Aluminum	1.5 max	. . .	. . .	. . .

5. Size

5.1 Calcium-silicon alloys are available in sizes as listed in Table 3.

5.2 The sizes listed in Table 3 are typical as shipped from the manufacturer's plant. These alloys are friable and some attrition can be expected in transit, storage, and handling. The friability rating for these alloys is Code No. 6, the most friable rating on the scale.

6. Sampling

6.1 Methods of sampling may be agreed upon by the manufacturer and the purchaser.

TABLE 2 Supplemental Chemical Requirements

Element	Composition, Max %			
	CaSi	CaSiMn	CaSiBa	FeCaSi
Carbon	1.00	1.00	1.0	1.0
Sulfur	0.070	0.025	0.050	0.050
Phosphorus	0.050	0.035	0.050	0.050
Titanium	0.20	0.20	0.20	0.20
Aluminum	. . .	1.5	1.5	1.5
Iron	5.0 max	10.0 max	5.0 max	. . .

[1] This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.18 on Castings.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard.

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TABLE 3 Standard Sizes and Tolerances

Product	Standard Size	Tolerance	
Calcium-silicon	6 × 2 in. (152 × 50.8 mm)	25 lb lump max	10 % max, passing 2 in. (50 mm) sieve
	3 in. (76.2 mm) × down	10 % max, retained on 3 in. (75 mm) sieve	15 % max, passing ¼ in. (6.3 mm) sieve
	2 in. (50.8 mm) × down	10 % max, retained on 2 in. (50 mm) sieve	15 % max, passing No. 8 (2.36 mm) sieve
	1 in. (25.4 mm) × down	5 % max, retained on 1 in. (25.0 mm) sieve	25 % max, passing No. 8 (2.36 mm) sieve
	8 × 100 mesh (2.38 × 150 mm) sieve	5 % max, retained on No. 8 (2.36 mm) sieve	3 % max, passing No. 100 (150 µm) sieve
	8 mesh (2.38 mm) × down	5 % max, retained on No. 8 (2.36 mm) sieve	
	30 × 325 mesh (0.59 mm × 0.044 mm) sieve	5 % max, retained on 30 mesh	10 % max, passing 325 mesh (0.044 mm)
Calcium-manganese-silicon and Calcium-silicon-barium	6 × 2 in. (152 × 50.8 mm)	25 lb lump max	10 % max, passing 2 in. (50 mm) sieve
	2 in. (50.8 mm) × down	10 % max, retained on 2 in. (50 mm) sieve	25 % max, passing No. 8 (2.36 mm) sieve
	1 in. (25.4 mm) × down	5 % max,, retained on 1 in. (25.0 mm) sieve	25 % max, passing No. 8 (2.36 mm) sieve
	8 mesh (2.38 mm) × down	5 % max, retained on No. 8 (2.36 mm) sieve	
	30 × 325 mesh (0.59 mm × 0.044 mm) sieve	5 % max, retained on 30 mesh (0.59 mm) sieve	10 % max, passing 326 mesh (60.044 mm) sieve
Calcium-silicon-iron	6 × 2 in. (152 × 50.8 mm)	25 lb lump max	10 % max, passing 2 in. (50 mm) sieve
	3 in. (26.2 mm) × down	10 % max, retained on 2 in. (50 mm) sieve	15 % max, passing ¼ in. (6.3 mm) sieve
	2 in. (50.8 mm) × down	10 % max, retained on 2 in. (50 mm) sieve	15 % max, passing No. 8 (2.36 mm) sieve
	1 in. (25.4 mm) × down	5 % max, retained on No. 8 (2.36 mm) sieve	3 % max, passing No. 100 (0.149 mm) sieve
	8 mesh (2.38 mm) sieve × down	5 % max, retained on No. 8 (2.36 mm) sieve	

SUMMARY OF CHANGES

Committee A01 has identified the location of selected changes to this standard since the last issue A495 – 94 (2000) that may impact the use of this standard. (Approved July 1, 2006.)

(*1*) Deleted existing references in paragraph 2.1 and added A1025.
(*2*) Reference to A1025 included and ordering information deleted in Section 3.
(*3*) Revised statement regarding Tables 1 and 2 in paragraph 4.1.
(*4*) Deleted paragraphs 4.2, 4.3, 4.4, 4.5, 4.6, 6.1.
(*5*) Revised paragraph 6.2 to delete reference to E32.
(*6*) Deleted Sections 7—10.
(*7*) Revised Tables 1 and 2.

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