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Standard Specification for Calcium-Silicon Alloys¹

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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.

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

A1025/A1025M Specification for Ferrous Alloys 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/A1025M, including

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.

any supplementary requirements that are indicated in the purchase order. Failure to comply with the general requirements of Specification A1025/A1025M constitutes nonconformance with this specification. In case of conflict between the requirements of this specification and Specification A1025/A1025M, this specification shall prevail.

4. Chemical Requirements

4.1 The material shall conform to the requirements as to chemical composition specified in Tables 1 and 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.

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 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	...	...	...

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	...

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	
Calcium-manganese-silicon and	30 × 325 mesh (0.59 mm × 0.044 mm) sieve	5 % max, retained on 30 mesh	10 % max, passing 325 mesh (0.044 mm)
	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
Calcium-silicon-barium	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 325 mesh (0.044 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. (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 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	

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