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Standard Specification for Ferrosilicon¹

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1. Scope*

1.1 This specification covers grades of ferrosilicon for steelmaking and foundry uses.

1.2 The values stated in inch-pound units are to be regarded as the standard. The metric equivalents of inch-pound units (SI units) given in parentheses may be approximate.

2. Referenced Documents

2.1 *ASTM Standards*:²

[A1025 Specification for Ferroalloys and Other Alloying Materials, General Requirements](#)

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

[E360 Test Methods for Chemical Analysis of Silicon and Ferrosilicon](#)³

3. General Conditions of Delivery

3.1 Materials 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.

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.

³ Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

4. Chemical Composition

4.1 The various grades shall conform to the requirements as to chemical composition prescribed in [Table 1](#).

4.2 The manufacturer shall furnish an analysis of each shipment showing the silicon content and when required, such of the other elements specified in [Table 1](#).

5. Size

5.1 The various grades are available in sizes as listed in [Table 2](#).

5.2 The sizes listed in [Table 2](#) are typical as shipped from the manufacturer's plant. These alloys exhibit varying degrees of friability; therefore, some attrition may be expected in transit, storage, and handling. A quantitative test is not available for rating relative friability of ferroalloys. A code system has been developed, therefore, for this purpose, and a number rating for each product type is shown in the last column of [Table 2](#). Definitions applicable to these code numbers are given in Specification [A1025](#).

6. Chemical Analysis

6.1 Unless otherwise agreed upon, the chemical analysis of the material shall be made in accordance with Test Methods [E360](#).

6.2 If alternative methods of analysis are used, Methods [E360](#) shall be used for referee.

6.3 Where a method is not given in Methods [E360](#) for the analysis for a particular element, the analysis shall be made in accordance with a procedure agreed upon between the manufacturer and the purchaser.

7. Keywords

7.1 ferroalloy; ferrosilicon

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

TABLE 1 Chemical Requirements

Element	Grade																
	C	CA	CB	C1	C2	D	DA	E	EA	E1	F	F1	F1A	G	GA	G1	G1A
Composition, % ^{A,B}																	
Silicon	74.0–79.0	74.0–79.0	74.0–79.0	74.0–79.0	74.0–79.0	65.0–70.0	65.0–70.0	47.0–51.0	47.0–51.0	47.0–51.0	20.0–24.0	20.0–24.0	20.0–24.0	14.0–17.0	14.0–17.0	14.0–17.0	14.0–17.0
Carbon	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.50	0.50	0.70	0.70	0.70	0.70
Sulfur	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Phosphorous	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.040	0.040	0.040	0.120	0.120	0.120	0.120	0.120	0.120	0.120
Aluminum	1.50	0.50	0.10	1.00–1.50	1.00–1.50	1.25	0.10	1.25	0.40	1.25	1.00	1.00	1.00	0.75	0.75	0.75	0.75
Manganese	0.40	0.40	0.40	0.40	0.40	0.50	0.50	0.75	0.75	0.75	1.00	1.00	1.00	1.25	—	1.25	—
Calcium ^C	—	—	—	0.50	1.50	—	—	—	—	—	—	—	—	—	—	—	—
Boron	—	—	—	—	—	—	—	—	—	0.04–0.10	—	0.04–0.10	0.04–0.10	—	—	0.04–0.10	0.04–0.10

^A A single value indicates a maximum, except for calcium.

^B When shipped in 3000 lb containers, the average boron content of a container shall not vary from the average reported for the entire shipment by more than 0.010 %.

^C Minimum.

TABLE 2 Standard Sizes and Tolerances

Grades	Standard Sizes	Tolerances and Sieve Sizes Defined by ASTM Specification E11		Friability Rating ⁴
C,D,E	8-in. (203-mm) by 4-in. (102-mm)	90-lb (40.8-kg) lump, max	10 %, max, passing 4-in. (102-mm) sieve	
	8-in. (203-mm) by 2-in. (50.8-mm)	90-lb (40.8-kg) lump, max	10 %, max, passing 2-in. (50.8-mm) sieve	
	5-in. (127-mm) by 2-in. (50.8-mm)	10 %, max, retained on 5-in. (127-mm) sieve	10 %, max, passing 2-in. (50.8-mm) sieve	
	4-in. (102-mm) by ½-in. (12.7-mm)	10 %, max, retained on 4-in. (102-mm) sieve	10 %, max, passing ½-in. (12.7-mm) sieve	
	4-in. (102-mm) by down	10 %, max, retained on 4-in. (102-mm) sieve	12 %, max, passing ¼-in. (6.35-mm) sieve	
	3-in. (76.2-mm) by ½-in. (12.7-mm)	10 %, max, retained on 3-in. (76.2-mm) sieve	15 %, max, passing ½-in. (12.7-mm) sieve	
	3-in. (76.2-mm) by down	10 %, max, retained on 3-in. (76.2-mm) sieve	15 %, max, passing No. 8 (2.38-mm) sieve	
	2-in. (50.8-mm) by ½ in. (12.7-mm)	10 %, max, retained on 2-in. (50.8-mm) sieve	15 %, max, passing ½-in. (12.7-mm) sieve	
	2-in. (50.8-mm) by down	10 %, max, retained on 2-in. (50.8-mm) sieve	15 %, max, passing No. 8 (2.38-mm) sieve	
	1-in. (25.4-mm) by No. 8 (2.38-mm)	5 %, max, retained on 1-in. (25.4-mm) sieve	10 %, max, passing No. 8 (2.38-mm) sieve	
	1-in. (25.4-mm) by down	5 %, max, retained on 1-in. (25.4-mm) sieve	20 %, max, passing No. 8 (2.38-mm) sieve	
	C,D,F	Lump or Pig	90-lb (40.8-kg) lump or pig, max	
C,D,E	½-in. (12.7-mm) by No. 8 (2.38-mm)	5 %, max, retained on ½-in. (12.7-mm) sieve	10 %, max, passing No. 8 (2.38-mm) sieve	
	¾-in. (9.51-mm) by No. 6 (3.36-mm)	5 %, max, retained on ¾-in. (9.51-mm) sieve	10 %, max, passing No. 6 (3.36-mm) sieve	
	¾-in. (9.51-mm) by No. 12 (1.68-mm)	5 %, max, retained on ¾-in. (9.51-mm) sieve	10 %, max, passing No. 14 (1.41-mm) sieve	
	¾-in. (9.51-mm) by down	5 %, max, retained on ¾-in. (9.51-mm) sieve	15 %, max, passing No. 70 (0.21-mm) sieve	
	¼-in. (6.35-mm) by down	5 %, max, retained on ¼-in. (6.35-mm) sieve		
	No. 8 (2.38-mm) by down	5 %, max, retained on No. 8 (2.38-mm) sieve		
	No. 28 (841-µm) by down	5 %, max, retained on No. 20 (841-µm) sieve		
G	pig	90-lb (40.8-kg) pig, max.		

⁴See Appendixes.

SUPPLEMENTARY REQUIREMENTS

The composition shall be further limited to the requirements of **Table S1.1**. Upon request of the purchaser, the manufacturer shall furnish an analysis of these elements on a schedule agreed between the manufacturer and purchaser.