

Standard Specification for Ferrochromium¹

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 ϵ^1 NOTE—Editorial changes were made to Table 2 in April 2016.

1. Scope

1.1 This specification covers two types of ferrochromium designated as high carbon and low carbon, the latter including nitrogen-bearing and vacuum grades.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

2. Referenced Documents

2.1 ASTM Standards:²

A1025 Specification for Ferroalloys and Other Alloying Materials, General Requirements

E363 Test Methods for Chemical Analysis of Chromium and Ferrochromium

3. General Conditions for 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.

4. Chemical Composition

4.1 The grades shall conform to the requirements as to chemical composition specified in Table 1. The manufacturer shall furnish an analysis of each shipment showing the 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 The chemical analysis method shall be agreed upon by the purchaser and supplier.

6.2 In cases of discrepancy, Test Methods E363 shall be used for referee purposes.

7. Keywords

7.1 ferroalloys; ferrochromium; high carbon; low carbon; nitrogen-bearing; vacuum low carbon

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.

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TABLE 1 Chemical Requirements

	Composition, %							
Type Ferrochromium	Grade	Chromium	Carbon	Silicon	Sulfur, max	Phosphorus, max	Nitrogen	
High carbon	A	51.0–56.0	6.0–8.0	6.0 max	0.040	0.030		
	В	56.0-62.0	6.0-8.0	8.0-14.0	0.050	0.030		
	С	62.0 min	6.0-8.0	3.0 max	0.050	0.030		
Low carbon	A	60.0-67.0	0.025 max	1.0-8.0	0.025	0.030		
	В	67.0-75.0	0.025 max	1.0 max	0.025	0.030		
	С	67.0-75.0	0.050 max	1.0 max	0.025	0.030		
	D	67.0-75.0	0.75 max	1.0 max	0.025	0.030		
Vacuum low carbon	E	66.0-70.0	0.015 max	2.0 max	0.030	0.030		
	G	63.0-68.0	0.050 max	2.0 max	0.030	0.030	5.0-6.5	
Nitrogen bearing		62.0–70.0	0.10 max	1.0 max	0.025	0.030	1.0–5.0	

TABLE 2 Standard Sizes and Tolerances

Product Standard Sizes		Tolerances			
Ferrochromium:					
High-carbon	8 in. (200 mm) by 4 in. (100 mm)	10 in. (250 mm), max	10 %, max, passing 4-in. (100-mm) sieve	4	
	6 in. (150 mm) by down	10 %, max, retained on 6-in. (150-mm) sieve			
	5 in. (125 mm) by 2 in. (50 mm)	10 %, max, retained on 5-in. (125-mm) sieve	10 %, max, passing 2-in. (50-mm) sieve		
	4 in. (100 mm) by ½ in. (12.5 mm)†	10 %, max, retained on 4-in. (100-mm) sieve	10 %, max, passing 1/2-in. (12.5-mm) sieve		
	3 in. (75 mm) by 1 in. (25 mm)	10 %, max, retained on 3-in. (75-mm) sieve	10 %, max, passing 1-in. (25-mm) sieve		
	3 in. (75 mm) by ¼ in. (6.3 mm)	10 %, max, retained on 3-in. (75-mm) sieve	10 %, max, passing 1/4-in. (6.3-mm) sieve		
	1/4 in. (6.3 mm) by down	5 %, max, retained on 1/4-in. (6.3-mm) sieve			
	8 mesh (2.36 mm) by down	5 %, max, retained on U.S. No. 8 (2.36-mm)			
		sieve			
Low-carbon	8 in. (200 mm) by down	10 in. (250 mm), max		1	
	8 in. (200 mm) by 4 in. (100 mm)	10 %, max, retained on 8-in. (200-mm) sieve	5 %, max, passing 4-in. (100-mm) sieve		
4 in. (1 3 in. (7 8 mesh	4 in. (100 mm) by down	10 %, max, retained on 4-in. (100-mm) sieve			
	3 in. (75 mm) by 1 in. (25 mm)	10 %, max, retained on 3-in. (75-mm) sieve	10 %, max, passing 1-in. (25-mm) sieve		
	8 mesh (2.36 mm) by down	5 %, max, retained on U.S. No. 8 (2.36-mm) sieve			
Vacuum low	brick or pellet	designated by manufacturer			
carbon					
ditorially corrected.					

SUPPLEMENTARY REQUIREMENTS

The composition shall be limited to the requirements of Table S1.1 in addition to those in Table 1. Upon request of the purchaser, the manufacturer shall furnish an analysis for any of these elements on a cumulative basis over a period mutually agreed upon by the manufacturer and the purchaser.

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TABLE S1.1 Supplementary Chemical Requirements

Туре —	Composition, max, %						
	High Carbon		Low Carbon	Vacuum Low Carbon ^A		Nitrogen Bearing	
Grade	А, В	С	All Grades	E	G	—	
Nitrogen	0.050	0.050	0.12	0.050			
Manganese	0.75	0.75	0.75	0.75	0.75	0.75	
Nickel	0.50	0.50	0.50	0.50	0.50	0.50	
Vanadium	0.50	0.50	0.50	0.50	0.50	0.50	
Copper	0.050	0.050	0.050	0.050	0.050	0.050	
Molybdenum	0.050	0.050	0.050	0.050	0.050	0.050	
Columbium	0.050	0.050	0.050	0.050	0.050	0.050	
Tantalum	0.050	0.050	0.050	0.050	0.050	0.050	
Cobalt	0.10	0.10	0.10	0.10	0.10	0.10	
Aluminum	0.25	0.25	0.10	0.10	0.10	0.10	
Titanium	0.50	0.30	0.050	0.050	0.050	0.050	
Zirconium	0.050	0.050	0.01	0.01	0.01	0.01	
Antimony	0.01	0.01	0.01	0.01	0.01	0.01	
Arsenic	0.005	0.005	0.005	0.005	0.005	0.005	
Lead	0.005	0.005	0.005	0.005	0.005	0.005	
Tin	0.005	0.005	0.005	0.005	0.005	0.005	
Zinc	0.005	0.005	0.005	0.005	0.005	0.005	
Boron	0.005	0.005	0.005	0.005	0.005	0.005	
Silver	0.005	0.005	0.005	0.005	0.005	0.005	
Bismuth	0.005	0.005	0.005	0.005	0.005	0.005	

^AThe inert oxide (SiO₂ + CaO + MgO + AI_2O_3) content of vacuum low-carbon ferrochromium shall be specified as 3.50 % max.

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