Designation: A481 – 05 (Reapproved 2015)

Standard Specification for Chromium Metal[1]

This standard is issued under the fixed designation A481; 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 several grades of chromium metal.

1.2 The values stated in inch-pound units are to be regarded as the standard.

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

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 various grades shall conform to the requirements as to chemical composition specified in Tables 1 and 2.

4.2 The manufacturer shall furnish an analysis of each shipment showing the elements specified in Table 1.

4.3 The values shown in Table 2 are expected maximums. 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 between the manufacturer and the purchaser.

5. Size

5.1 The various grades 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 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 each product type is shown in the last column of Table 3. Definitions applicable to these code numbers are given in Specification A1025.

6. Chemical Analysis

6.1 The chemical analysis of the material shall be made in accordance with the procedure for the ferroalloys as described in Test Methods E363 or alternative methods, agreed upon by the purchaser and supplier, that will yield equivalent results.

6.2 If alternative methods of analysis are used, in case of discrepancy, Test Methods E363 shall be used for referee.

6.3 Where no method is given in Test Methods E363 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 chromium; chromium metal

[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.

TABLE 1 Chemical Requirements

Element	Composition, %	
	Grade A	Grade B
Chromium, min	99.0	99.4
Carbon, max	0.050	0.050
Silicon, max	0.15	0.10
Sulfur, max	0.030	0.010
Phosphorus, max	0.010	0.010

TABLE 2 Supplementary Chemical Requirements

Element	Composition, %	
	Grade A	Grade B
Nitrogen, max	0.050	0.020
Iron, max	0.35	0.35
Manganese, max	0.01	0.01
Hydrogen, max	0.01	0.003
Oxygen, max	0.50	0.10
Vanadium, max	0.050	0.050
Copper, max	0.01	0.01
Molybdenum, max	0.050	0.01
Columbium, max	0.050	0.050
Tantalum, max	0.050	0.003
Cobalt, max	0.003	0.001
Aluminum, max	0.30	0.10
Titanium, max	0.050	0.003
Zirconium, max	0.050	0.003
Arsenic, max	0.005	0.003
Lead, max	0.003	0.001
Tin, max	0.001	0.001
Zinc, max	0.005	0.003
Boron, max	0.005	0.003
Antimony, max	0.005	0.003
Silver, max	0.003	0.001
Bismuth, max	0.003	0.001

TABLE 3 Standard Sizes and Tolerances

Product	Grade	Standard Sizes	Tolerances[A]	Friability Rating
Chromium Metal	A	Plate 2 in. by down	10 %, max retained on 2-in. (50-mm) sieve 10 %, max passing U.S. No. 8 (2.36-mm) sieve	2
	A and B	1 in. by down	15 %, max retained on 1-in. (25.0-mm) sieve 15 %, max passing U.S. No. 8 (2.36-mm) sieve	
		¼ in. by down	5 %, max retained on ¼-in. (6.3-mm) sieve	
		8 mesh by down	5 %, max retained on U.S. No. 8 (2.36-mm) sieve	
		20 mesh by down	5 %, max retained on U.S. No. 20 (850 µm) sieve	
	B	Pellets 1½ in. by 1 in. by 1 in.	Designated by manufacturer	

[A] Specifications of sieve sizes used to define tolerances herein are as listed in Specification E11.