



Designation: B603 – 07 (Reapproved 2013)

# Standard Specification for Drawn or Rolled Iron-Chromium-Aluminum Alloys for Electrical Heating Elements<sup>1</sup>

This standard is issued under the fixed designation B603; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers annealed, drawn, or rolled shapes for electrical heating and resistance purposes of alloys consisting mainly of iron, chromium, and aluminum as detailed in **Table 1**.

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.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

**A751** Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

**B63** Test Method for Resistivity of Metallically Conducting Resistance and Contact Materials

**B70** Test Method for Change of Resistance With Temperature of Metallic Materials for Electrical Heating

**B78** Test Method of Accelerated Life of Iron-Chromium-Aluminum Alloys for Electrical Heating

## 3. Terminology

3.1 *Definitions:*

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.10 on Thermostat Metals and Electrical Resistance Heating Materials.

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<sup>2</sup> 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.

3.1.1 *lot size, n*—the lot size for determining compliance with the requirements of this specification shall be one heat.

## 4. Significance and Use

4.1 This specification on iron-chromium-aluminum alloys contains the requirements for chemistry, electrical resistance, mechanical properties, resistance change with temperature, and packaging.

4.2 Determination of properties is not required for routine acceptance of material unless specified by the purchaser.

## 5. Chemical Requirements

5.1 The alloys shall conform to the requirements as to chemical composition prescribed in **Table 1**.

5.2 *Samples for Chemical Analysis*—Specimens for chemical analysis may be taken either from the melt or from a sample of finished material that is representative of the lot.

5.3 *Chemical Analysis*—The chemical analysis shall be made in accordance with accepted practices. See Test Methods **A751**.

## 6. Physical Requirements

6.1 The material shall be thoroughly and uniformly annealed.

6.2 Wire shall conform to the following elongation requirements:

Size	Elongation in 10-in. (250-mm) minimum, %
0.0035 in. (No. 39 Awg)(0.089 mm) and larger	12
0.0031 to 0.0020 in. (Nos. 40 to 44 Awg) (0.079 to 0.015 mm)	6

## 7. Nominal Resistivity

7.1 The nominal resistivity shall be the resistivity of the wire as quenched from a temperature above 1450°F (788°C). The numerical values of the resistivity range at 77°F (25°C) shall be as shown in **Table 1**.

## 8. Test for Resistivity

8.1 The resistivity shall be determined in accordance with Test Method **B63**.