



Designation: F1367 – 98 (Reapproved 2011)

# Standard Specification for Chromium Sputtering Targets for Thin Film Applications<sup>1</sup>

This standard is issued under the fixed designation F1367; 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 sputtering targets fabricated from chromium metal.

1.2 This specification sets purity grade levels, physical attributes, analytical methods and packaging requirements.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

## 2. Referenced Documents

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

E112 Test Methods for Determining Average Grain Size

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *raw material lot*—original material lot from which a number of targets is fabricated.

3.1.2 *relative density, n*—actual target density divided by the theoretical density of chromium, 7.21 g/cm<sup>2</sup>.

## 4. Classification

4.1 Grades of chromium are defined in Table 1.

4.2 Grade, as defined in Table 1, is based on the total metallic impurity content of the metallic elements listed in Table 2. Elements not detected shall be counted and reported as present at the detection limit.

## 5. Ordering Information

5.1 Orders for these targets shall include the following:

5.1.1 Grade,

5.1.2 Configuration, (see 8.1 and 8.2),

5.1.3 Whether certification is required, (see 12.1), and

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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.

5.1.4 Whether a sample representative of the finished product is required to be provided by the supplier to the purchaser.

## 6. Chemical Composition

6.1 The metallic elements listed in Table 2 shall be assayed and reported.

6.2 Gaseous elements to be assayed and reported are C, O, N and S.

6.3 Other elements may be assayed and reported as agreed upon between the purchaser and the supplier, but these shall not be counted in determining the grade designation.

6.3.1 Acceptable limits and analytical techniques for additional elements shall be agreed upon between the purchaser and the supplier.

## 7. Physical Properties

7.1 Minimum relative density shall be agreed upon by the purchaser and the supplier.

7.2 Actual target density shall be determined by Archimedes principle or other acceptable techniques.

7.3 Grain size shall be agreed upon between the purchaser and the supplier, and reported in accordance with Test Method E112.

## 8. Dimensions, Mass, and Permissible Variations

8.1 Each target shall conform to an appropriate engineering drawing.

8.2 Nominal dimensions, tolerances and other attributes shall be agreed upon between purchaser and supplier.

## 9. Workmanship, Finish and Appearance

9.1 Workmanship, finish and appearance shall be agreed upon between the purchaser and the supplier.

## 10. Sampling

10.1 Analyses for impurities shall be performed on a sample that is representative of the finished product.

10.2 Reporting analytical results of the unprocessed raw material lot is not acceptable.

## 11. Analytical Methods

11.1 Analysis for impurities in Table 2 and 6.2 shall be performed as follows: