



Designation: C 752 – 88 (Reapproved 1997)

Standard Specification for Nuclear-Grade Silver-Indium-Cadmium Alloy¹

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1. Scope

1.1 This specification covers silver-indium-cadmium alloy for use as a control material in light-water nuclear reactors.

1.2 The scope of this specification excludes the use of this material in applications where material strength of this alloy is a prime requisite. Also, this material must be protected from the primary water by a corrosion and wear resistant cladding.

2. Referenced Documents

2.1 ASTM Standards:

C 760 Test Methods for Chemical and Spectrochemical Analysis of Nuclear-Grade Silver-Indium-Cadmium Alloys²

C 859 Terminology Relating to Nuclear Materials²

E 105 Practice for Probability Sampling of Materials³

2.2 ANSI Standard:

B46.1 Surface Roughness⁴

ANSI/ASME NQA-1 Quality Assurance Program Requirements for Nuclear Facilities⁴

2.3 U.S. Government Standard:

Title 10 Code of Federal Regulations, Energy Part 50 (10CFR50) Domestic Licensing of Production and Utilization Facilities⁵

3. Terminology

3.1 Terms shall be defined in accordance with the terminology in Terminology C 859, except for the following:

3.1.1 The term “buyer” shall refer to the organization issuing the purchase order.

3.1.2 The term “seller” shall refer to the silver-indium-cadmium supplier.

3.1.3 A lot shall be defined as all parts produced from the same melt by the same process.

¹ This specification is under the jurisdiction of ASTM Committee C-26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.03 on Neutron Absorber Materials Specifications.

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² Annual Book of ASTM Standards, Vol 12.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁵ Available from U.S. Government Printing Office, North Capital and H Streets NW, Washington, DC 20401.

4. Ordering Information

4.1 The buyer shall specify the following information on the order:

4.1.1 Quantity,

4.1.2 Lot size, and

4.1.3 Dimensions and tolerances.

5. Materials and Manufacture

5.1 The identity of each lot by melt number shall be maintained at all stages of manufacture.

5.2 Parts produced to this specification shall be made from billets by hot working and cold finishing to size.

5.3 The cold-finished parts shall be produced to the finish condition and dimensions as specified in the purchase order.

6. Chemical Composition

6.1 The parts shall conform to the following chemical composition:

Element	Weight %
Indium	15.00 ± 0.25
Cadmium	5.00 ± 0.25
Total impurities, max	0.50 max
Silver	remainder
Lead	0.03 max
Bismuth	0.03 max

7. Workmanship, Finish, and Appearance

7.1 The surface of the cold-finished part shall be free of oxides, grease, oil, residual lubricants, inclusions, and other extraneous materials.

7.2 Surface defects such as folds, cracks, seams, slivers, and blisters shall be cause for rejection.

7.3 Surface roughness shall not exceed 0.813 μm rms (32 $\mu\text{in.}$ rms).

8. Sampling

8.1 A sampling plan to meet the acceptance criteria shall be agreed to between the buyer and the seller. Samples for chemical analysis shall be taken after completion of all hot-working operations. Recommended Practice E 105 is referenced as a guide.

8.2 The sample shall be sufficient to perform the following:

8.2.1 Quality control tests at the seller’s plant,

8.2.2 Acceptance tests at the buyer’s plant, and