National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 1742

Zinc-Aluminum Alloy

(In cooperation with the American Society for Testing and Materials)

This Standard Reference Material (SRM) is in the form of a disk, approximately 50.8 mm (2 in) in diameter and 12.7 mm (0.5 in) thick intended for use with optical emission and X-ray spectrometric methods of analysis. This material is one in a series of seven zinc base alloys prepared to cover a range of aluminum and lead compositions of interest to the zinc and galvanizing industries. The other zinc alloys in this series are SRMs 1736, 1737, 1738, 1739, 1740, and 1741, all in disk form; SRM 2139 is the same material as SRM 1739 but supplied in chip form.

The certified value for aluminum is given below. The analytical methods used for the characterization of this SRM were flame atomic absorption spectrometry (FAAS) and inductively coupled plasma optical emission spectrometry (ICP-OES). The value is reported as a mass fraction [1].

Certified Value of Aluminum: 0.7917 % ± 0.0326 %

Certified Value and Uncertainty: The certified value is the mean of the laboratory means. The uncertainty in the certified value is expressed as the expanded uncertainty, U, at the 95 % level of confidence, and is calculated according to the method described in the ISO Guide [2]. The expanded uncertainty is calculated as $U = ku_c$, where u_c is intended to represent, at the level of one standard deviation, the combined effects of material inhomogeneity, and between-laboratory and within-laboratory components of uncertainty. The coverage factor k = 2.37 for aluminum is determined from the Student's t-distribution corresponding to 7 degrees of freedom and 95 % confidence.

Information Value: The lead content of SRM 1742 has been assigned a value of 0.0029 % *for information only* and with no uncertainty assessed.

Information Value of Lead: 0.0029 %

Expiration of Certification: The certification of **SRM 1742** is valid, within the measurement uncertainties specified until **01 September 2008**, provided the SRM is handled in accordance with instructions given in this certificate (see "Instructions for Use"). This certification is nullified if the SRM is damaged, contaminated, or modified.

Analytical consultation was provided by J.R. Sieber of the NIST Analytical Chemistry Division.

Statistical analysis of the homogeneity and certification data were provided by S.B. Schiller and N.F. Zhang of the NIST Statistical Engineering Division.

Willie E. May, Chief
Analytical Chemistry Division

Gaithersburg, MD 20899
Certificate Issue Date: 02 December 2003
See Certificate Revision History on Last Page

John Rumble, Jr., Chief
Measurement Services Division

The original support aspects involved in the preparation, certification, and issuance of the SRM were coordinated through the NIST Standard Reference Materials Program by N.M. Trahey of the NIST Measurement Services Division. Revision of this certificate was coordinated through the NIST Standard Reference Materials Program by B.S. MacDonald of the NIST Measurement Services Division.

Overall coordination of the material preparation, development of the analytical procedures to be used to produce certification data, and identification of the laboratories to participate in this study were provided by S. Bélisle of the Centre de Technologie Noranda, Pointe-Claire, Quebec, Canada and T. Beckwith of the Zinc Corporation of America, Monaca, PA, USA. The material was cast, under contract, by Zincaloy Inc.[1], Mississauga, Ontario, Canada. Homogeneity testing of each cast material was performed under the direction of T. Beckwith by the Zinc Corporation of America, Monaca, PA, USA.

Alloy Preparation: Each alloy, using Special High Grade (SHG) zinc ingots as the base material, was continuously cast (concast) into bars ten feet in length, then cut into 5 foot sections for shipment. At NIST, samples for homogeneity testing were cut from the Start (S) and Finish (F) ends of each rod. Following NIST evaluation of the homogeneity data, all the rods for SRMs 1736, 1737, 1738, 1740, 1741, and 1742 were cut into disks; for SRM 1739, half of the rods were made into disks while the remaining rods were milled to produce chips and designated SRM 2139. Disks from each SRM were then selected in accordance with the NIST statistical plan, milled into chips, and samples sent to the laboratories participating in the study.

Technical Contacts and Participating Laboratories:

T. Beckwith and M. Shiring; Zinc Corporation of America, Monaca, PA, USA
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T. Witting and J. Urpinen; Outokumpu Zinc Oy, Kokkola, Finland

REFERENCES

[1] Taylor, B.N.; *Guide for the Use of the International System of Units (SI)*; NIST Special Publication 811, 1995 Ed.; U.S. Government Printing Office: Washington, DC (1995).

[2] *Guide to the Expression of Uncertainty in Measurement*; ISBN 92-67-10188-9, 1st Ed.; ISO, Geneva, Switzerland (1993): see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297; U.S. Government Printing Office: Washington, DC (1994); available at http://physics.nist.gov/Pubs/.

Certificate Revision History: 02 December 2003 (Information value for lead was corrected); 01 September 1999 (Certified value for lead revised to information value status); 10 October 1998 (Original certificate date).

Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet http://www.nist.gov/srm.

[1]Certain commercial equipment, instrumentation, or materials are identified in this certificate to specify adequately the experimental procedure. Such identification does not imply recommendation or endorsement by the NIST, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.