[This document is just explanation translated from the original Japanese certificate and some information is omitted from it.]

独立行政法人 産業技術総合研究所

計量標準総合センター 標準物質認証書

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan, Certificate

認証標準物質

NMIJ CRM 8116 - a(02)

National Institute of Advanced Industrial Science and Technology
AIST

重金属分析用 ABS 樹脂ディスク (Cd, Cr, Hg, Pb; 高濃度)

Heavy Metals (Cd, Cr, Hg, Pb) in ABS Resin - High Concentration Disk

This certified reference material (CRM) was produced on the basis of NMIJ's management system under JIS Q 0034 (ISO GUIDE 34), and can be used to control the precision of analysis or to confirm the validity of analytical methods or instruments during the X-ray fluorescence analysis of Cd, Cr, Hg and Pb in ABS resin or similar polymers.

Certified Values

The certified values of Cd, Cr and Pb in this CRM are given in the following Table. This CRM should be used without any drying. Each expanded uncertainty was determined with the coverage factor $k = 2$; it defines an interval estimated to have a level of confidence of approximately 95%.

	Certified value, mass fraction (mg/kg)	Expanded uncertainty, (mg/kg)
Cd	90.8	6.5
Cr	912	46
Pb	916	33

Determination of Certified Values

Each certified value was determined by the following analytical method:
(1) Microwave digestion using sulfuric acid and nitric acid / isotope dilution – inductively coupled plasma mass spectrometry.

Metrological Traceability

Each certified value was determined by isotope dilution – mass spectrometry as a primary method of measurement with NMIJ primary standard solutions of Cd, Cr, Hg and Pb and is traceable to the International System of Units (SI).

Information Values

The information value of Hg in this CRM is given in the following Table, which was determined by the same analytical method as for the certified values.

	Information value, mass fraction (mg/kg)
Hg	903 ± 109

The value following ± in the column of the information value is the expanded uncertainty determined with the coverage factor $k = 2$; it defines an interval estimated to have a level of confidence of approximately 95%.

Mutual Recognition Arrangement (CIPM MRA)

The measurement capabilities used for this CRM are covered in the Calibration and Measurement Capabilities registered in the BIPM database (http://kcdb.bipm.org/AppendixC/default.asp) under the Metre Convention on the basis of the Mutual Recognition Arrangement (CIPM MRA) for national measurement standards and for calibration and measurement certificates issued by NMIs.

Expiration of Certification

The certification of this CRM is valid until March 31, 2016, provided that the CRM is unopened and stored in accordance with the instructions given in this certificate.

Sample Form

The form of this CRM is a disk with diameter 30 mm and thickness 2 mm, kept in a plastic case.

Homogeneity

The homogeneity of the CRM was determined by analysing 9 disks (8 disks for Hg). The elements (Cd, Cr, Hg and Pb) were determined by microwave digestion using sulfuric acid and nitric acid / isotope dilution – inductively coupled plasma mass spectrometry. The homogeneity of each element is reflected to the uncertainty of the certified value or the information value.

Notice for Storage

This CRM should be kept at room temperature (15 degree C - 35 degree C) and should not be shined directly upon.

Notice for Use

From the homogeneity, the certified values of this CRM represent the sample concentrations of the surface area more than 20.0 mm^2 (an area corresponding to a circle with diameter 5.0 mm). In measuring X-ray fluorescence, X-ray should be irradiated from the opposite side to the side on which there are 7 circles with diameter 6 mm formed during the injection-molding process. Please note that this sample contains tens mg/kg of Br.

Preparation Method

This CRM was produced by carrying out a new homogeneity test and new assignment of property values for the remaining disks of NMIJ CRM 8116-a which was disseminated until March 2011. The NMIJ CRM 8116-a was originally prepared as follows:

Commercial ABS resin and powders of CdO, and $PbCrO_4$, chromium(III) acetylacetonate and HgS were mixed and then pellets were produced from extruding the mixture. The extruding process was repeated two more times. From the obtained pellets, the disks with thickness 2 mm and diameter 30 mm were produced by the injection-molding method.

NMIJ Analysts

[This document is just explanation translated from the original Japanese certificate and some information is omitted from it.]

The technical and production manager was A. Hioki and the analyst was M. Ohata.

Technical Information

If important changes on this CRM including any change of certified values happen, it will be informed to the customers, who can easily obtain such information by "CRM user registration" through the home page. Technical information on this CRM will be obtained from the home page and the other contact routes (*vide infra*).

Reproduction of Certificate

In case of producing a duplicate of this certificate, the fact of reproduction should be clearly indicated on it.

March **, 2011

Tamotsu Nomakuchi
President,
National Institute of Advanced Industrial Science and Technology

If you have any questions about this CRM, please contact
National Institute of Advanced Industrial Science and Technology,
National Metrology Institute of Japan,
Metrology Management Centre, Reference Materials Office,
1-1-1, Umezono, Tsukuba, Ibaraki 305-8563, Japan
Phone: +81-29-861-4059, Fax: +81-29-861-4009, URL: http://www.nmij.jp/

Revision history
August 10, 2012 The expiration of certification was extended from March 31, 2013 to March 31, 2016.

[Note: This document is a translation of the original Japanese certificate and is not an official one.]