

CERTIFICATE OF REFERENCE MATERIAL

LA
Bearing alloy

The assigned certified values¹ and uncertainties²

	Pb	Cd	Ni	As	Bi	Fe	Zn	Cu	Sb	Sn
LA1	%		mg/kg		%	mg/kg		%		The rest
	3.176	1.414	111.9	115.0	0.0138	118.1	16.3	2.449	6.79	
	±0.046	±0.088	±9.5	±9.5	±0.0014	±7.4	±5.2	±0.093	±0.53	
LA2	%							%		
	2.166	0.879	0.0943	0.0916	0.0330	0.0180	-	3.836	7.81	
	±0.053	±0.022	±0.0066	±0.0014	±0.0013	±0.0013	-	±0.084	±0.27	
LA3	%						mg/kg	%		
	1.191	0.498	0.2763	0.2419	0.0587	0.0588	95	8.13	10.22	
	±0.099	±0.020	±0.0098	±0.0096	±0.0054	±0.0035	15	±0.26	±0.30	
LA4	%							%		
	0.414	0.096	0.449	0.434	0.0848	0.0799	-	6.95	11.66	
	±0.030	±0.011	±0.031	±0.017	±0.0066	±0.0044	-	±0.25	±0.24	
LA5	%									
	0.0699	0.0113	0.528	0.539	0.0994	0.096	0.0201	5.45	13.58	
	±0.0040	±0.0013	±0.028	±0.013	±0.0042	±0.015	±0.0024	±0.12	±0.32	

¹ Unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory and/or with a different method of determination.

² The certified uncertainty is the expanded uncertainty with a coverage factor $k=2$, corresponding to a level of confidence of about 95%.

Signature

SIEĆ BADAWCZA ŁUKASIEWICZ-
INSTYTUT METALI NIEŻELAZNYCH
DYREKTOR

dr inż. Barbara Juszczak, MBA

Description of the material:

The certified reference materials are available in the form of 40 mm diameter and 20 mm height discs.

Traceability:

The certified values are traceable to the SI via calibration using pure metals, certified monoelement standard solutions and certified reference materials i.e. 73X SC12 (batch B), 73X SC7 (batch B), produced by MBH Analytical LTD. All values were confirmed in an inter-laboratory comparison using independent analytical methods.

Analytical methods applied for characterization:

Pb, Cd, Ni, As, Bi, Fe, Zn – Inductively coupled plasma optical emission spectrometry (ICP-OES), Atomic absorption spectrometry (AAS)

Cu, Sb – Inductively coupled plasma optical emission spectrometry (ICP-OES), Atomic absorption spectrometry (AAS), Titration

Participating laboratories:

1. Łukasiewicz Research Network - Institute of Non-Ferrous Metals, Analytical Chemistry Department, Emission Spectrometry Laboratory, Gliwice, Poland
2. Łukasiewicz Research Network - Institute of Non-Ferrous Metals, Analytical Chemistry Department, Atomic Spectrometry Laboratory, Gliwice, Poland
3. Walcownia Metali Nieżelaznych „Łabędy” S.A., Gliwice, Poland
4. Walcowania Metali „Dziedzice” S.A., Czechowice – Dziedzice, Poland
5. Huta Metali Nieżelaznych „Szopienice” S.A., Katowice, Poland

Intended use:

The CRM is intended for establishing or checking the calibration of chemical analysis methods, for validation and to demonstrate results traceability of samples with similar matrix composition (not verified for micro-analysis).

Minimum sample size:

Minimum 0.5 g of the CRM is required.

Instructions for storage and use:

Storage the material in a dry and clean environment at room temperature.

Transport at normal conditions.

Overheating of the material during preparation should be avoided. Samples should be prepared in the same way as the CRM. Such preparation does not result in change of certified values.

Brief description of the production and certification process:

The material was produced by Łukasiewicz - IMN. Homogeneity investigations were made taking into account about 30% of the material produced. Investigations were carried out using optical emission spectrometry with low voltage spark excitation source (spark-OES). Homogeneity was estimated statistically with analysis of variance (ANOVA).

The certification of LA is valid 50 years, within the measurement uncertainties specified, provided the CRM is handled in accordance with the instructions given in this certificate.

Expired date:

50 years

Certificate Revision History: December 2001 (original certificate date); 30th of November 2024 (additional information about: expanded uncertainties, traceability, participating laboratories, methods used for certification, minimum sample size, instruction for storage and use and expire date was added, change of graphic design)

Since 2018 our production of the certified reference materials is carried out in accordance with requirements of the ISO 17034 standard.

The Łukasiewicz Research Network —Institute of Non-Ferrous Metals holds an accreditation of the Polish Centre for Accreditation as a reference material producer according to ISO/IEC 17034 with certificate number RM 006.

Contact:

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