Institute
of Non-Ferrous Metals
Poland

CERTIFICATE OF ANALYSIS

Zinc ZL series

The assigned values[1] and uncertainties[2] in % w/w

No. / Element	ZL1		ZL2		ZL3		ZL4		ZL5	
Cu	**0.342**	±0.018	**0.573**	±0.028	**0.201**	±0.008	**0.114**	±0.004	**0.0115**	±0.0004
Ti	**0.00745**	±0.00034	**0.114**	±0.006	**0.238**	±0.015	**0.394**	±0.023	**0.598**	±0.028
Al	**0.0190**	±0.0010	**0.0119**	±0.0008	**0.00388**	±0.00019	**0.0497**	±0.0015	**0.0518**	±0.0024
Fe	**0.00072**	±0.00011	**0.0174**	±0.0013	**0.00496**	±0.00021	**0.00879**	±0.00043	**0.0299**	±0.0012
Pb	**0.00498**	±0.00031	**0.00923**	±0.0004	**0.0247**	±0.0007	**0.0351**	±0.0008	**0.0363**	±0.0013
Sn	**0.0364**	±0.0017	**0.0420**	±0.0025	**0.00788**	±0.00040	**0.0114**	±0.0013	**0.0011**	±0.0004
Cd	**0.0365**	±0.0017	**0.0241**	±0.0007	**0.00492**	±0.00019	**0.0115**	±0.0008	**0.00085**	±0.00005
Zn	the rest		the rest		the rest		the rest		the rest	

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

Prof. Zbigniew Śmieszek
Director of the Institute

Certified on November 2017

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Description of the material:

The certified reference materials are available in the form of discs (40 mm diameter and 25 mm height).

Traceability:

Most of the analytical work performed to asses this material has been carried out by laboratories with proven competence, often indicated by the national authority. CRM_s ZL series is in accordance with CRM_s ZI series produced by IMN.

Analytical methods applied:

Cu, Fe, Pb, Cd – Inductively coupled plasma optical emission spectrometry (ICP OES),
Inductively coupled plasma mass spectrometry (ICP MS),
Flame atomic absorption spectrometry (FAAS)

Ti, Al, Sn – Inductively coupled plasma optical emission spectrometry (ICP OES),
Inductively coupled plasma mass spectrometry (ICP MS)

Participants:

Institute of Non-Ferrous Metals, Analytical Chemistry Department, Gliwice, Poland
- Emission Spectrometry Laboratory
- Atomic Absorption Spectrometry Laboratory

Zakłady Górniczo – Hutnicze „Bolesław" S.A., Bukowno, Poland

Universal Scientific Laboratory Pty Ltd, Milperra, Australia

Exova Ltd, Middlesbrough, England

Intended use:

The CRM_s is intended for establishing or checking the calibration of optical emission and X-ray spectrometers for analysis of samples of similar matrix composition (for micro-analysis is not verified).

Instructions for use:

Before every use, the surface of CRM_s must be prepared by milling or turning on a lathe. Samples should be prepared in the same way as the CRM_s.

Brief description of the production and certification process:

The CRM_s – ZL series were made by melting of all components in the inductive, of crucible furnace and by casting into special moulds protecting elimination of segregation of the components during solidification. Homogeneity testing were made taking into account over 50% of the material produced. Investigations were carried out using atomic emission spectrometry method with low voltage spark. Homogeneity was estimated statistically with application of the test F.

The set consists of 5 certified reference materials in form of discs 40 mm in diameter and 25 mm height.

The certification of ZL series is valid indefinitely, within the measurement uncertainties specified, provided the CRM is handled in accordance with the instructions given in this certificate.