



CERTIFICATE OF ANALYSIS

Zinc alloy ZK series

The assigned values¹ and uncertainties² in % w/w

Element	No.	ZK1	ZK2	ZK3	ZK4	ZK5
Al		11.789 ±0.073	10.572 ±0.073	9.767 ±0.039	8.371 ±0.046	6.476 ±0.032
Cu		1.538 ±0.059	3.119 ±0.088	3.996 ±0.046	5.487 ±0.063	6.663 ±0.054
Pb		0.0031 ±0.0004	0.0121 ±0.0018	0.0226 ±0.0019	0.0334 ±0.0023	0.0507 ±0.0018
Cd		0.0021 ±0.0006	0.0031 ±0.0004	0.0071 ±0.0004	0.0121 ±0.0006	0.0207 ±0.0011
Sn		0.00085 ±0.00016	0.0015 ±0.0003	0.00267 ±0.00037	0.00491 ±0.00053	0.0065 ±0.0003
Mg		0.0009 ±0.0003	0.0040 ±0.0004	0.0307 ±0.0036	0.0640 ±0.0034	0.0410 ±0.0038
Bi		0.200 ±0.020	0.169 ±0.014	0.102 ±0.007	0.0188 ±0.0023	0.0020 ±0.0004
Sb		0.127 ±0.016	0.102 ±0.012	0.0674 ±0.0055	0.0121 ±0.0018	0.0025 ±0.0005
Mn		-	0.0137 ±0.0012	-	-	0.589 ±0.033
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 uncertainty 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 2015



Description of the material:

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

Analytical methods applied:

- Pb, Cd, Sn, Mg, Bi, Sb, Mn – Inductively coupled plasma optical emission spectrometry (ICP OES),
Flame atomic absorption spectrometry (FAAS)
- Al – Inductively coupled plasma optical emission spectrometry (ICP OES),
Flame atomic absorption spectrometry (FAAS),
Complexometric method
- Cu – Inductively coupled plasma optical emission spectrometry (ICP OES),
Flame atomic absorption spectrometry (FAAS),
Iodometric method
- Sn – Inductively coupled plasma optical emission spectrometry (ICP OES),
Flame atomic absorption spectrometry (FAAS),
Spectrophotometric method

Participants:

Institute of Non-Ferrous Metals, Analytical Chemistry Department, Gliwice, Poland

- Optical Emission Spectrometry Laboratory
- Atomic Absorption Spectrometry Laboratory
- Classical Analytical Methods Laboratory

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

Intended use:

The CRM 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 must be prepared by milling or turning on a lathe. Samples should be prepared in the same way as the CRM.

Brief description of the production and certification process:

The CRM_s – ZK 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 ZK series is valid indefinitely, within the measurement uncertainties specified, provided the CRM is handled in accordance with the instructions given in this certificate.