



INSTITUTE OF NON-FERROUS METALS

Analytical Chemistry Department

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CERTIFICATE OF ANALYSIS

Bearing alloy – LA series

The average results of chemical analyses in wt %

Element No.	LA1	LA2	LA3	LA4	LA5
Pb	3,18	2,17	1,19	0,41	0,070
Cd	1,41	0,88	0,50	0,096	0,011
Ni	0,011	0,094	0,28	0,45	0,53
As	0,012	0,092	0,24	0,43	0,54
Bi	0,014	0,033	0,059	0,085	0,099
Fe	0,012	0,018	0,059	0,080	0,096
Zn	0,0016	-	0,0095	-	0,020
Cu	2,45	3,84	8,13	6,95	5,45
Sb	6,79	7,81	10,22	11,66	13,58
Sn	the rest	the rest	the rest	the rest	the rest

Director of the Institute

Prof. Ph.D. Zbigniew Śmieszek

The uncertainty in wt % at the probability level of 0,05

Element No.	LA1	LA2	LA3	LA4	LA5
Pb	0,020	0,040	0,029	0,0092	0,0016
Cd	0,056	0,015	0,0080	0,0021	0,00080
Ni	0,00080	0,0044	0,0065	0,011	0,011
As	0,00046	0,0011	0,0065	0,0046	0,0065
Bi	0,0011	0,0010	0,0042	0,0049	0,0051
Fe	0,00065	0,0011	0,0027	0,0023	0,0049
Zn	0,00020	-	0,00033	-	0,010
Cu	0,053	0,029	0,12	0,14	0,064
Sb	0,058	0,17	0,17	0,11	0,092

Analytical methods applied:

Pb - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

Cd - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

Ni - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

As - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

Bi - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

Fe - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

Zn - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

Cu - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

titration

Sb - Atomic emission spectrometry with ICP, Atomic absorption spectrometry

titration

The chemical analyses have been carried out in four laboratories including laboratory of the Institute of Non-Ferrous Metals using different methods. Bearing alloy CRMs were made by melting of all components in the core less induction furnace and by casting into special cast iron moulds.

Homogeneity investigations were made taking account 30 % 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 CRMs is in form of discs 40 mm in diameter and 20 mm in height.

Application of CRMs - AES