



INSTITUTE OF NON-FERROUS METALS

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CERTIFICATE OF ANALYSIS

Hard Lead

The average results of chemical analysis in weight %

Element ^{No.}	PKK1	PKK2	PKK3
Sb	0,41	1,19	0,75
As	0,070	0,014	0,0064
Se	0,0071	-	0,027
Pb	the rest	the rest	the rest

Director of the Institute

Prof. Ph.D. Zbigniew Śmieszek

Gliwice, December 2002

The uncertainty in weight \pm [%] at the probability level of 0,05

Element No.	PKK1	PKK2	PKK3
Sb	0,019	0,027	0,019
As	0,0045	0,0015	0,0006
Se	0,0002	-	0,0016

Analytical methods applied:

Sb - atomic emission spectrometry with ICP and low voltage spark,
atomic absorption spectrometry

As - atomic emission spectrometry with ICP and low voltage spark,
atomic absorption spectrometry

Se - atomic emission spectrometry with ICP and low voltage spark,
atomic absorption spectrometry

The chemical analysis have been carried out in three specialistic industrial laboratories from Poland and in the laboratory of the Institute of Non-Ferrous Metals, using three different methods.

Melts have been performed using induction furnace.

Hard Lead CRMs are in form of discs 40 mm in diameter and 25 mm height. Homogeneity investigations 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.

Application of CRMs – Atomic emission spectrometry

X-Ray spectrometry

CRMs are stable in time.