INSTITUTE OF NON-FERROUS METALS

Analytical Chemistry Department
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CERTIFICATE OF ANALYSIS

Red brass M90, M95

The average results of chemical analyses in wt %

No. / Element	MG 1	MG 2	MG 3	MG 4	MG 5	MG 6
Fe	0,0081	0,0067	0,062	0,091	0,149	0,028
Pb	0,049	0,0048	0,015	0,0080	0,0054	0,031
Sb	0,00077	(0,00084)	0,0026	0,0045	0,0061	0,0015
Bi	0,00058	0,00039	0,0014	0,0017	0,0026	0,00088
P	(0,0019)	0,0012	0,018	0,012	0,0069	0,0026
Ni	0,048	0,0022	0,013	0,0042	0,0021	0,030
Sn	0,0062	0,018	0,033	0,023	0,013	0,053
Al	0,040	(0,0026)	0,020	----	0,0011	0,0067
Mn	0,0013	0,00070	0,0096	0,024	0,0036	0,045
Cu	91,14	90,08	93,19	94,00	95,09	92,27
Zn	the rest	the rest	the rest	the rest	the rest	the rest

Director of the Institute

Prof. Ph.D. Zbigniew Śmieszek

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

No. / Element	MG 1	MG 2	MG 3	MG 4	MG 5	MG 6
Fe	0,00031	0,00019	0,0023	0,0030	0,012	0,0015
Pb	0,0020	0,00020	0,00086	0,00036	0,00038	0,018
Sb	0,000092	---	0,00011	0,00024	0,00012	0,00014
Bi	0,000047	0,000056	0,00016	0,000064	0,00010	0,000013
P	---	0,00032	0,00067	0,0011	0,00055	0,00012
Ni	0,0020	0,00029	0,00047	0,00021	0,00014	0,0013
Sn	0,00038	0,0029	0,0019	0,0016	0,0011	0,0015
Al	0,0040	---	0,0026	---	0,00011	0,0022
Mn	0,00016	0,000027	0,00042	0,00082	0,00020	0,0025
Cu	0,089	0,068	0,064	0,043	0,091	0,12

Analytical methods applied:

Fe - atomic absorption with precipitation on $La(OH)_3$

Pb - atomic absorption with precipitation on $Fe(OH)_3$

Sb - atomic absorption with precipitation on $Fe(OH)_3$

Bi - atomic absorption with precipitation on $Fe(OH)_3$

P - extraction-photometry, spectrophotometric

Ni - atomic absorption, spectrophotometric with dimethylglyoxime

Sn - spectrophotometric with phenylfluoran

Al - spectrophotometric with eriochromocyanin

Mn - atomic absorption, spectrophotometric with sodium perjodate

Cu - titration, electrolytic

The set consists of 6 reference materials in form of discs 35 mm in diameter and 30 mm in height. The chemical analyses have been carried out in three industrial laboratories and at the Institute of Non-Ferrous Metals (Gliwice) and Institute of Non-Ferrous Metals (Freiberg - GDR).