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INSTITUTE OF NON-FERROUS METALS

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CERTIFICATE OF ANALYSIS

Cartridge brasses M 68, M 70

The average results of chemical analyses in wt %

| Element | No. | MJ 1 | MJ 2 | MJ 3 | MJ 4 | MJ 5 |
|---------|-----|----------|----------|----------|----------|----------|
| Cr | | 0,0120 | 0,00440 | 0,00158 | 0,00374 | 0,00065 |
| Se | | 0,00062 | 0,00037 | 0,00035 | 0,0124 | 0,00288 |
| Cd | | 0,00355 | 0,00377 | 0,00165 | 0,00130 | 0,000360 |
| Cu | | 67,77 | 66,40 | 67,39 | 68,06 | 67,82 |
| Zn | | 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

| Element | No. | MJ 1 | MJ2 | MJ 3 | MJ 4 | MJ 5 |
|---------|-----|----------|---------|---------|---------|---------|
| Cr | | 0,0024 | 0,00082 | 0,00005 | 0,00018 | 0,00012 |
| Se | | 0,000067 | 0,00012 | 0,00022 | 0,0014 | 0,00019 |
| Cd | | 0,00036 | 0,00079 | 0,00041 | 0,00040 | 0,00012 |
| Cu | | 0,23 | 0,14 | 0,20 | 0,08 | - |

Analytical methods applied:

*Cr - atomic emission spectrometry wit ICP, atomic absorption spectrometry,
Se - atomoc emission spectrometry with ICP, atomic absorption spectrometry,
Cd - atomic emission spectrometry with ICP, atomic absorption spectrometry,
Cu - electrolysis. jodometric.*

The chemical analyses have been carried out in four specialistic laboratories, (using minimal two diddeterent methods) . Cartridge brasses SRMs were made by melting of all components in the coreless induction furnace and by casting into special cast iron moulds. Final product of CRMs has been obtained after extrusion in form of discs 40 mm in diameter and ~28 mm height.