



INSTITUTE OF NON-FERROUS METALS

Analytical Chemistry Department

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CERTIFICATE OF ANALYSIS

BK-331 silicon bronze

The average results of chemical analyses in wt %

Element ^{No.}	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6
Zn	2,03	2,99	3,84	4,91	5,58	6,27
Si	4,77	4,14	3,07	2,29	1,45	1,51
Sn	0,044	0,21	0,37	0,55	0,69	0,32
Al	0,027	0,079	0,14	0,22	0,29	0,32
Ni	0,96	0,74	0,53	0,28	0,047	0,39
S	0,012	0,0092	0,0062	0,0064	0,0055	0,016
Sb	0,066	0,042	0,026	0,016	0,0054	0,056
P	0,0047	0,023	0,039	0,059	0,073	0,078
As	0,0047	0,015	0,022	0,054	0,071	0,078
Mg	0,0065	0,0066	0,0075	0,0057	0,0024	0,01
Bi	0,018	0,014	0,0091	0,006	0,0019	0,018
Pb	0,74	0,57	0,40	0,24	0,015	0,017
Fe	1,67	1,28	0,96	0,55	0,093	0,35
Mn	0,25	0,54	1,00	1,46	1,80	0,80
Cu	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

Element No.	BH 1	BH 2	BH 3	BH 4	BH 5	BH 6
Zn	0,023	0,03	0,039	0,066	0,05	0,074
Fe	0,026	0,023	0,014	0,019	0,0037	0,0062
Mn	0,064	0,003	0,014	0,033	0,042	0,013
Si	0,055	0,049	0,044	0,039	0,026	0,030
Sn	0,0024	0,0092	0,0049	0,0087	0,012	0,0082
Pb	0,012	0,011	0,0081	0,0068	0,00086	0,0012
Al	0,0019	0,0036	0,0051	0,0073	0,011	0,02
P	---	0,00018	0,0015	0,0024	0,0026	0,0032
Sb	0,0022	---	0,0025	0,0015	---	0,0024
Bi	0,0017	0,00065	0,00038	---	---	0,0011
As	---	0,0012	0,0031	0,0025	0,003	0,0019
Mg	0,00024	0,00044	0,00043	0,00022	0,000047	---
Ni	0,019	0,014	0,0086	0,01	0,0014	0,011
S	---	0,00017	---	---	0,00057	0,0016

Analytical methods applied:

Zn - atomic absorption, titration

Fe - atomic absorption

Mn - atomic absorption

Si - gravimetric

Sn - atomic absorption

P - titration, spectrophotometric as a complex V-Mo

Al - atomic absorption

Pb - atomic absorption

Sb - atomic absorption

Bi - atomic absorption

As - atomic absorption

Mg - atomic absorption

Ni - atomic absorption

S - method of combusting and infrared determination of CO₂

The chemical analyses have been carried out in four industrial laboratories and at the Institute of Non-Ferrous Metals.

The BK-331 Silicon Bronze SRMs were made by melting of all components in the coreless induction furnace and by casting into special cast iron moulds preventing elimination of segregation of the components during solidification. The set consists of 6 reference materials in form of discs 40 mm in diameter and 25 mm in height.