

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 54B

TIN-BASE BEARING METAL

ANALYST*	Sn	Sb	Cu	Pb	ARSENIC	BISMUTH	IRON	SILVER Internal electrolysis	ALUMINUM Colorimetric
	SnCl ₄ -Iodine		Electrolytic						
1.....	^a 87.46	^b 7.37	^c 3.20	^d 1.81	^e 0.049	^f 0.031	^g 0.029	0.027	^h < 0.001
2.....	ⁱ 87.39	^j 7.42	^k 3.20	^l 1.79	^m 0.054	ⁿ 0.027	^o 0.026		
3.....	^p 87.46	^q 7.40	^r 3.21	^s 1.80	^t 0.056	^u 0.026	^v 0.032		
4.....	^w 87.57	^x 7.37	^y 3.16	^z 1.80	^{aa} 0.053	^{ab} 0.026	^{ac} 0.03		
5.....	^{ad} 87.49	^{ae} 7.41	^{af} 3.18	^{ag} 1.81	^{ah} 0.053	^{ai} 0.029	^{aj} 0.028		
6.....	^{ak} 87.58	^{al} 7.35	^{am} 3.21	^{an} 1.84	^{ao} 0.05	^{ap} 0.024	^{aq} 0.03	^{ar} 0.032	
7.....	^{as} 87.45	^{at} 7.41	^{au} 3.19	^{av} 1.81	^{aw} 0.053	^{ax} 0.027	^{ay} 0.025	0.026	^{az} < 0.001
.....	^{ba} 87.47	^{bb} 7.41	^{bc} 3.18	^{bd} 1.80	0.048	0.027	0.03	0.03	
.....	87.42	7.39	3.21	1.83	0.051	0.028	0.022		
Averages.....	87.48	7.39	3.19	1.81	0.052	0.027	0.028	0.029	< 0.001
Recommended values.....	87.48	7.39	3.19	1.81	0.052	0.029	0.028	0.029	< 0.001

^a Tin separated by distillation from a 0.25-g sample, precipitated with cupferron, and ignited to SnO₂ as described in J. Research NBS (1944) RP.....

^b Antimony separated by distillation from a 1-g sample as described in J. Research NBS 21, 95 (1935) RP1116. Distillate treated with H₂S. Antimonous sulfide dissolved and titrated with KMnO₄.

^c Sample dissolved in aqua regia, and double KOH-Na₂S separation made. Sulfides dissolved in HNO₃, and solution evaporated to fumes of H₂SO₄. Copper determined by electrolysis after removal of lead, bismuth, and silver.

^d The H₂SO₄ solution containing PbSO₄ (footnote c) treated with HF in a platinum dish and evaporated twice to fumes of H₂SO₄. Solution digested overnight and lead determined as PbSO₄.

^e Arsenic separated by double distillation from a 10-g sample as described in J. Research NBS 21, 95 (1935) RP1116. Distillate titrated with 0.01 N iodine.

^f Bismuth separated from a 10-g sample by in-

ternal electrolysis. See Ind. Eng. Chem., Anal. Ed. 8, 411 (1936). Deposit dissolved and bismuth determined as BiOCl.

^g SnCl₄-K₂Cr₂O₇ method.

^h Aurin tricarboxylic acid method.

ⁱ Tin reduced with nickel.

^j Antimony reduced with H₂SO₄, and SbCl₃ titrated with KBrO₃.

^k Copper separated as CuCNS, and determined by electrolysis.

^l Determined as PbCrO₄.

^m Arsenic separated by distillation, and AsCl₃ titrated with KBrO₃.

ⁿ Ten-gram sample treated by fire assay method. Bismuth separated as bismuth formate and, determined as BiOCl.

^o KCNS colorimetric method.

^p Tin reduced with iron and SnCl₄ titrated with KIO₃.

^q Titrated with Ce(SO₄)₂.

^r Lead deposited electrolytically as PbO₂.

^s Distillation-As₂S₃ method.

^t Determined as Fe₂O₃.

^u Arsenic volatilized as AsCl₃, and antimony determined by KI-Na₂S₂O₃ titration.

^v Determined as BiOCl.

^w Tin reduced with iron.

^x Arsenic separated by use of H₂PO₂, dissolved, and AsCl₃ titrated with KBrO₃.

^y Thiourea colorimetric method.

^z FeCl₃ colorimetric method.

^{aa} Determined by spectrographic analysis.

^{ab} Determined as AgCl.

^{ac} Same as footnote p except reduced with iron and nickel.

^{ad} Lead determined as PbSO₄ and as PbO₂ after removal of interfering elements by volatilization with HBr-HClO₄ solution.

^{ae} Bismuth separated by internal electrolysis, and determined photometrically by both the thiourea and potassium iodide methods.

^{af} Interfering elements removed as in footnote 24. Iron determined by the orthophenanthroline colorimetric method.

^{ag} Determined by electrolysis from a HNO₃-HF solution in the presence of (NH₄)₂S₂O₈.

* LIST OF ANALYSTS

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The metal for the preparation of this standard was furnished by the National Lead Co., and atomized by the Metals Disintegrating Co.

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