

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE 37c

SHEET BRASS

Analyst*	Copper (electrolytic)	Zinc (sulfide-oxide)	Lead (electrolytic)	Tin	Nickel (dimethylglyoxime)	Iron	
1.....	^a 70. 08	27. 21	0. 96 ₄	^b 0. 96 ₅	0. 57 ₇	^c 0. 16 ₄	
2.....	^d 70. 08	27. 21	. 97	^e . 95	^f . 59	^g . 17	
3.....	^h 70. 07	27. 22	$\left. \begin{array}{l} . 98 \\ . 98 \end{array} \right\}$	ⁱ . 96	. 58	^k . 17	
4.....	ⁿ 70. 07	27. 24	. 98	^l . 95	^m . 57	ⁿ . 18	
5.....	^h 70. 05	27. 20	. 96	^o . 95	. 57	^p . 18	
6.....	70. 11	27. 19	^q . 98	. 92	. 58	. 18	
7.....	^h 70. 05	27. 24	. 98	^r . 97	. 57	ⁿ . 17	
8.....	^u 70. 08	27. 26	. 96	^t . 95	. 56	^u . 16	
	^v 70. 06		. 98	^w . 96	. 59	ⁿ . 18	
Averages.....	70. 07	27. 22	0. 97	0. 95	0. 58	0. 17	
Recommended values.....	70. 07	27. 22	0. 97	0. 96	0. 58	0. 17	

* Five-g sample. Copper, lead, and iron in the metastannic acid recovered by ammonium iodide treatment (Caley and Burford, Ind. Eng. Chem., Anal. Ed. 8, 114 (1936)), and added to the nitric acid filtrate.

^b Sample dissolved in dilute nitric acid. An excess of ammonium hydroxide added. Precipitate separated and digested in $H_2SO_4-HNO_3$. Tin distilled with $HBr-HCl$, essentially as directed in J. Research NBS 21, 95 (1938) RP1116. Tin distillate diluted, chilled, and tin precipitated with cupferron, and ignited to SnO_2 in a porcelain crucible.

^c Weighed as Fe_2O_3 .

^d Copper deposited in the presence of tin from an HNO_3-HF solution.

^e Tin precipitated with NH_4OH . Solution filtered and the precipitate digested in $H_2SO_4-(NH_4)_2S_2O_8$. Solution diluted, tin reduced with iron, and $SnCl_2$ titrated with KIO_3 .

^f Nickel dimethylglyoxime dissolved and nickel determined by electrolysis.

^g Iron reduced with H_2S and titrated with $KMnO_4$.
^h Copper, lead, and the like in the metastannic acid precipitate recovered by the alkaline sodium-sulfide method.

ⁱ Determined as $PbSO_4$.

^j Copper and lead removed electrolytically from an HNO_3-HF solution. Sulfuric acid added to the electrolyte and the solution evaporated to copious fumes of sulfuric acid. Tin reduced with iron and antimony in a hydrochloric acid solution. $SnCl_2$ titrated with iodine standardized with high-purity tin.

^k Reduction in a Jones reductor and titration with $KMnO_4$.

^l Metastannic acid and ammonium hydroxide precipitates digested in $H_2SO_4-HNO_3$ and fumed. Solution diluted, tin reduced with test lead, and $SnCl_2$ titrated with KIO_3-KI solution.

^m Nickel dimethylglyoxime ignited to NiO .

ⁿ Iron reduced with $SnCl_2$ and titrated with $KMnO_4$.

^o As in (e), but tin reduced with nickel, and $SnCl_2$ titrated with KIO_3-KI solution.

^p Iron reduced with H_2S and titrated with $Ce(SO_4)_2$, using orthophenanthroline indicator.

^q Weighed as $PbCrO_4$.

^r As in (l) but $SnCl_2$ titrated with iodine.

^s Two g dissolved in 20 ml of HNO_3 (sp gr 1.42). Solution diluted to 200 ml and copper deposited, using a current density of 3 amperes and a rotating cathode.

^t Metastannic acid precipitate separated and digested in $H_2SO_4-HNO_3$. Solution diluted, tin reduced with Swedish iron, and $SnCl_2$ titrated with iodine solution.

^u Iron reduced with $SnCl_2$ and titrated with $K_2Cr_2O_7$.

^v As in (a) but 3-g sample used.

^w Tin separated by double precipitation with NH_4OH . Tin reduced with iron and antimony and $SnCl_2$ titrated with iodine solution.

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The metal for the preparation of this standard was furnished by the Bridgeport Brass Co.

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LYMAN J. BRIGGS,
Director.