

U. S. DEPARTMENT OF COMMERCE

National Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE No. 5g

CAST IRON

ANALYST *	C			Mn	P		S		Si	COPPER H ₂ S-CuS-CuO	NICKEL Weighed as nickel dimethylglyoxime	CHROMIUM FeSO ₄ -KMnO ₄ titration	VANADIUM	MOLYBDENUM	TITANIUM Determined colorimetrically in residue after HCl (sp gr 1.10) attack	ARSENIC
	CARBON 1. Total	2. Graphite	3. Combined	MANGANESE 1. Bismuthate (FeSO ₄ -KMnO ₄)	PHOSPHORUS 1. Alkali-Molybdate ^a	2. Gravimetric (Weighed as Mg ₂ P ₂ O ₇ after removal of arsenic)	1. SULPHUR Gravimetric (Direct oxidation and final precipitation in reduced solution)	2. SULPHUR ^b Evolution with HCl, ZnS-Iodine (theoretical sulphur titre ^c)	SILICON Sulphuric acid dehydration							
1.....	2. 86	2. 15	0. 71	0. 611	0. 261	0. 260	0. 122	0. 122	1. 85	1. 44 ^d	0. 133	0. 018 •	0. 020 •	0. 001	0. 068	0. 031
2.....	2. 86	2. 16	. 70	. 60	. 262	. 261 ^e	. 123	. 121	1. 82	1. 45 ^d	. 12	. 016				
3.....	2. 85	2. 15	. 70	. 61 ^a	. 268	. 264	. 125	. 120 ^h	1. 85	1. 42	. 137	. 019				
4.....	2. 86	2. 18	. 68	. 62	. 263	. 259	. 122	. 118 ^h	1. 86	1. 46 ^d					. 07	
5.....	2. 89	2. 13	. 76	. 61	. 253		. 119	. 118	1. 84	1. 43	. 13	. 02	. 025		. 068	. 04
6.....	2. 84	2. 13	. 71	. 615	. 267	. 262	. 120	. 119 ^h	1. 85	1. 43 ^d	. 12 ⁱ	. 019	. 017		. 060	. 026
7.....	2. 84	2. 13	. 71	. 612	. 262	. 259	. 123	. 122	1. 84	1. 43 ^d	. 125 ⁱ				. 065	
8.....	2. 87	2. 13	. 74	. 604	. 257		. 120	. 118	1. 84	1. 44 ^d	. 128 ^d					
Averages....	2. 86	2. 15	. 71	. 610	. 262	. 261	. 122	. 120	1. 84	1. 44	. 128	. 018	. 021			
Recommended values....	2. 86	2. 15	. 71	. 610	. 261		. 122		1. 84	1. 44	. 128	. 018	. 021	. 001	. 066	. 032

^a Precipitated at 40° C, washed with a 1 percent solution of KNO₃ and titrated with alkali standardized by the use of National Bureau of Standards acid potassium phthalate and the 23:1 ratio.

^b Sample annealed by covering with graphite, and heating for 20 minutes at 685° C. Sulphur evolved with concentrated HCl.

^c Value obtained by standardization of titrating solution against sodium oxalate through KMnO₄ and Na₂S₂O₄.

^d Finished by electrolysis.

^e Potentiometric titration.

^f Weighed as (NH₄)₂PO₄·12MoO₃.

^g Bismuthate-arsenite method.

^h Sample annealed by wrapping it in filter paper and heating for 20 minutes in a porcelain crucible at bright red heat. Dissolved in HCl (1+1).

ⁱ Weighed as NiO.

* LIST OF ANALYSTS

1. Ferrous Laboratory, National Bureau of Standards, H. A. Bright in charge; analysis by R. M. Fowler and J. C. Redmond.
2. H. E. Slocum, Jones & Laughlin Steel Corp., Pittsburgh, Pa.
3. G. A. England and W. A. Eddie, American Car & Foundry Co., St. Louis, Mo.
C. Gorham, The Colorado Fuel & Iron Co., Pueblo, Colo.

5. R. H. Elder and R. Deas, The American Cast Iron Pipe Co., Birmingham, Ala.
6. M. H. Steinmetz, General Electric Co., Schenectady, N. Y.
7. E. C. Raysor, Bethlehem Steel Co., Coatesville Plant, Coatesville, Pa.
8. C. K. Mitchell, W. B. Coleman Co., Philadelphia, Pa.

Lyman J. Briggs,
Director, National Bureau of Standards.

WASHINGTON, October 10, 1934.