

DEPARTMENT OF COMMERCE

Bureau of Standards
Certificate of Analyses

OF

STANDARD SAMPLE No. 34a

ACID OPEN-HEARTH STEEL, 0.8% CARBON

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	ARSENIC
	CARBON Direct combustion	MANGANESE 1. Bismuthate (FeSO ₄ -KMnO ₄) 2. Persulphate-Arsenite	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 Evolution with HCl (1:1) ZnS-Iodine (theoretical sulphur titre) ^b	SILICON Sulphuric acid dehydro-								
1	0.764	0.501		0.029	0.028	0.025	0.026	0.279	0.223 ^g	0.223	0.277 ^d	0.006 ^d	0.002 ^e	.009
2	.764	.497	.498	.030		.029	.027	.276	.227 ^g	.227 ^f	.266 ^h	.007	.003 ^e	
3	.760	.495	.509	.029		.028	.028	.277	.228 ^g	.233	.271		.004	
4	.765		.504	.030 ^h	.029	.027	.028	.278 ⁱ	.214					
	.760		.490	.028		.026	.026	.27						
6	.761		.51	.029			.026	.27	.21	.23	.29			
7	.765		.496	.030			.026	.280 ⁱ	.217	.238				
8	.762	.504	.500 ^j	.029	.030	.025	.025	.280	.231 ^k	.240	.271			
9	.763	.509		.029	.029	.024	.021	.279	.224 ^g					
10	.758	.502		.026	.026	.027	.026	.274 ⁱ						
Averages	.762	.501	.500	.029	.028	.026	.026	.276	.222	.232	.275	.007	.003	.009
General														
Averages	0.762	0.501		0.028		0.026		.276	.222	.232	.275	.007	.003	.009

^a Precipitated at 40° C., washed with 1 per cent solution of KNO₃ and titrated with alkali standardized by means of B. S. acid potassium phthalate and the 23 to 1 ratio.

^b Value obtained by standardization of titrating solution against sodium oxalate through KMnO₄ and Na₂S₂O₃.

^c Finished electrolytically.

^d Electrometric titration.

^e Colorimetric by developing color with KSCN and SnCl₂.

^f Dimethylglyoxime-KCN titration.

^g Perchloric acid oxidation.

^h Titrating solution standardized against standard steel.

ⁱ Nitrosulphuric.

^j PbO₂-arsenite.

^k Thiosulphate separation, weighed as CuO.

* LIST OF ANALYSTS

1. Ferrous Laboratory, Bureau of Standards, H. A. Bright in charge; analysis by C. P. Larrabee and R. M. Fowler.
2. John L. Harvey, Carnegie Steel Co., Munhall, Pa.
3. C. E. Nesbitt, Carnegie Steel Co., Edgar Thompson Works, Braddock, Pa.
4. A. D. Beers, Illinois Steel Co., Gary, Ind.
5. I. C. Dillon, Timken Roller Bearing Co., Canton, Ohio.
6. F. M. Portz, Central Alloy Steel Corporation, Massillon, Ohio.

7. Karl Pitschner, The American Chain Co., research department, Bridgeport, Conn.
8. James A. Kelly, The Phoenix Iron Co., Phoenixville, Pa.
9. Dr. M. E. McDonnell, The Pennsylvania Railroad System, Altoona, Pa.
10. Theo. Greenfield, Chicago, Burlington & Quincy Railroad, Aurora, Ill.

This standard is not recommended for colorimetric carbon determinations, because of uncertainty as to the condition of the iron.

Washington, D. C.

November 15, 1928

George K. Burgess

Director.