

DEPARTMENT OF COMMERCE

Bureau of Standards

Certificate of Analyses

OF

STANDARD SAMPLE No. 31

CHROME-TUNGSTEN STEEL

FORGING FURNISHED BY CARPENTER STEEL CO., READING, PA.

ANALYST.	CARBON—DIRECT COMBUSTION.	SILICON. <sup>1</sup>	PHOSPHORUS.				SULPHUR.			MANGANESE.			CHROMIUM.	TUNGSTEN.	VANADIUM.	NICKEL.	MOLYBDENUM.
			ALKALI MOLYBDATE.	MOLYBDATE REDUCTION.	WEIGHING PHOSPHO-MOLYBDATE.	AS Mg <sub>2</sub> P <sub>2</sub> O <sub>7</sub> AFTER ACETATE SEPARATION.	OXIDATION.	EVOLUTION (CdS-Iodine).	OTHER METHODS.	FORD (Weighing as Mn <sub>2</sub> P <sub>2</sub> O <sub>7</sub> ).	BISMUTHATE.	OTHER METHODS. <sup>2</sup>					
1	.600	.12	.012				.019		.010 <sup>3</sup>			.14	3.49	19.56	Tr. <sup>4</sup>		
2	.598	.13				.015	.020		.009 <sup>3</sup>		.14	.14	3.47	19.59		Tr.	Tr.
3	.590	.11		.011			.020					.14	3.51	19.57			
4	.610	.10	.016				.008 <sup>5</sup>	.007			.17	.17	3.52 <sup>6</sup>	19.54			
5	.597	.11	.013			.014					.16	.16	3.49	19.58			
6	.600	.11			.015		.018					.15	3.50	19.50			
7	.601	.10			.012		.019			.13			3.55	19.54			
8	.585	.10	.014				.018 <sup>7</sup>					.17	3.54	19.46			
9	{ .607 <sup>8</sup> .603 }	.14										.16	3.49	19.60			
AVERAGE	.599*	.11	.014	.011	.013	.014	.019			.13	.15	.156	3.51	19.55			
GENERAL AVERAGE			.0135								.154						

<sup>1</sup> See next page, under "Tungsten."

<sup>2</sup> For particulars, see next page.

<sup>3</sup> Evolution—H<sub>2</sub>O<sub>2</sub>—BaSO<sub>4</sub>.

<sup>4</sup> J. C. Hostetter.

<sup>5</sup> Omitted from average.

<sup>6</sup> Mean by three methods.

<sup>7</sup> Last traces of WO<sub>3</sub> removed by cinchonine before precipitating with BaCl<sub>2</sub>.

<sup>8</sup> With red lead.

\*In view of the results of certain chemists, especially those of the Midvale Steel Co., supported by tests made at the Bureau of Standards, it seems not improbable that even the highest results reported for carbon in this steel are slightly below the truth. The matter is under investigation.

INDEX TO ANALYSTS

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