



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 30f

Cr-V Steel (SAE 6150)

(In Cooperation with the American Society for Testing and Materials)

Constituent	C	Mn	P	S	Si	Cu	Ni	Cr	V	N
Certified ¹ Value, % by wt.	0.490	0.79	0.011	0.009*	0.283	0.074	0.070	0.945	0.182	0.010
Estimated ² Uncertainty	0.004	0.01	0.001	0.001	0.004	0.002	0.004	0.002	0.002	0.003
Method ³										
Labs	Direct Combustion	Peroxy-disulfate Arsenite	Photometric	Combustion- iodate Titration	Perchloric Acid Dehydration	Photometric	Photometric	FeSO ₄ ·KMnO ₄ Titration		Distillation- titration
A	0.490	0.78	^a 0.012 0.011	0.011	0.280	^b 0.075	^c 0.064 ^d 0.074	0.946	^e 0.181	0.013
B	0.488	0.788	^f 0.012	0.010	0.283	0.074	^c 0.068	0.942	^h 0.182	0.012
C	0.495	0.785	ⁱ 0.012	0.010	0.28	0.075	^c 0.070	0.946	0.184	0.007
D	0.489	^j 0.78	^f 0.011	0.009	0.287	^k 0.072	0.070	0.944	0.189	—
E	0.490	^j 0.790 ^l 0.798	^f 0.010	0.009	^l 0.284	^m 0.076	0.071	ⁿ 0.946	^o 0.182	0.009

*Combustion-infrared results for sulfur = 0.0085 ± 0.0003 wt. %.

¹The certified value listed for a constituent is the present best estimate of the "true" value based on the results of the cooperative analytical program for certification.

²The estimated uncertainty listed for a constituent is based on judgement and represents an evaluation of the combined effects of method imprecision, possible systematic errors among methods, and material variability for samples of 0.5 g or more. (No attempt was made to derive exact statistical measures of imprecision because several methods were involved in the determination of most constituents.)

³A detailed description of many of the methods of analysis employed in the certification program for this SRM may be found in Part 12, Annual Book of ASTM Standards.

^aAlkali-molybdate.

^bAlpha benzoinoxime gravimetric.

^cDimethylglyoxime precipitate titrated with cyanide.

^dGravimetric as NiO.

^eMercury cathode-FeSO₄·KMnO₄.

^fMolybdenum-blue spectrophotometric.

^gDiethylthiocarbamate spectrophotometric.

^hPotentiometric titration with FeSO₄·K₂Cr₂O₇.

ⁱAmmonium phosphovanadate spectrophotometric.

^jPeriodate spectrophotometric.

^kFinished by electrolysis.

^lSulfuric acid dehydration.

^mAtomic absorption spectrometry.

ⁿChromium oxidized with peroxydisulfate and titrated potentiometrically with ferrous ammonium sulfate.

^oVanadium oxidized with HNO₃ and titrated potentiometrically with ferrous ammonium sulfate.

This Certificate of Analysis has undergone editorial revision to reflect program and organizational changes at NIST and at the Department of Commerce. No attempt was made to reevaluate the certificate value or any technical data presented in this certificate.

Gaithersburg, MD 20899

March 31, 1992

(Revision of Certificate dated 6-5-79)

(over)

William P. Reed, Chief
Standard Reference Materials Program

PLANNING, PREPARATION, TESTING, AND ANALYSIS:

The material for this SRM was provided by the Timken Roller Bearing Company, Canton, Ohio, through the courtesy of E.R. Vance.

Chemical analyses for certification were performed in the following laboratories:

-Latrobe Steel Co., Latrobe, Pennsylvania, J.M. Henderson.

-Lukens Steel Co., Coatesville, Pennsylvania, J.H. Scott.

-National Institute of Standards and Technology, Center for Analytical Chemistry, Gaithersburg, Maryland, J.R. Baldwin, R.K. Bell, B.B. Bendigo, E.R. Deardorff, E.J. Maienthal, T.C. Rains, and S.A. Wicks.

-Timken Roller Bearing Co., Canton, Ohio, E.R. Vance.

-Universal Cyclops Specialty Steel Division, Bridgeville Plant, Bridgeville, Pennsylvania, R.C. Host.

The overall direction and coordination of the technical measurements leading to the certification was performed by J.K. Taylor, formerly of the NIST Inorganic Analytical Research Division, and J.I. Shultz, ASTM/NIST Research Associate.

The technical and support aspects involved in the original preparation, certification, and issuance of this Standard Reference Material were coordinated through the Standard Reference Materials Program by R.E. Michaelis. Revision of the Certificate was coordinated through the Standard Reference Materials Program by P.A. Lundberg.