

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1158

High-Nickel Steel (36%Ni)

This material is available in solid form primarily for application in optical emission and x-ray spectrometric methods of analysis. A companion material, SRM 126c, is available in chip form primarily for use in checking chemical methods of analysis.

Analyst	C	Mn	P	S	Si	Cu	Ni	Cr	V	Mo	Co
	Combustion-Chromatographic	Persulfate-Arsenite	Photometric	Combustion-Iodate Titration	Perchloric Acid dehydration		Gravimetric			Photometric	
1	0.026	^a 0.461	—	^b 0.007	^c 0.193	—	^d 36.01	—	—	—	—
2	.025	^e .470	^f 0.003	^g .006	.185	^e 0.040	^h 36.05	^e 0.063	ⁱ 0.001	0.013	^e 0.007
3	.026	.467	^f .004	^j .004	.193	^k .04	^l 36.05	^m .06	ⁿ .001	.012	^e .009
4	.025	^o .468	.003	.004	^c .200	^p .035	36.06	^m .060	^q .001	.010	^r .006
5	.025	^o .472	.004	.005	^c .198	^e .039 ^s .041	36.00	^t .067 ^e .061	—	^e .010 .007	^e .009
Average	0.025	0.468	0.004	0.005	0.194	0.039	36.03	0.062	0.001	0.010	0.008

^aPotentiometric titration

^b1-g sample burned in oxygen at 1450 °C and sulfur dioxide absorbed in starch-iodide solution. Iodine is liberated from iodide by titration, during the combustion, with standard KIO₃ solution.

^cDouble dehydration with intervening filtration.

^d0.25-g sample and double precipitation. Precipitate dried at 150 °C.

^eAtomic absorption.

^fAmmonium phosphovanadate photometric method.

^gCombustion-spectrophotometric using parosanaline.

^hFinished by electrolysis.

ⁱMercury cathode separation-3,3'-diaminobenzidine hydrochloride photometric method.

^j1-g sample burned in oxygen and sulfur dioxide measured by infrared detector system.

^kDiethyldithiocarbamate photometric method.

^lDimethylglyoxime precipitate titrated with cyanide.

^mDiphenylcarbazide photometric method.

ⁿNitric acid oxidation, potentiometric titration with standard ferrous ammonium sulfate.

^oPeriodate spectrophotometric method.

^pNeo-cuproine spectrophotometric method.

^q3,3'-dimethylnaphthidine spectrophotometric method.

^rIon-exchange-nitroso R spectrophotometric method.

^s2-2' biquinoline spectrophotometric method.

^tPersulfate oxidation, potentiometric titration with standard ferrous ammonium sulfate solution.

Washington, D.C. 20234
 December 30, 1977
 (Revision of Prov. Cert.
 dated 12-13-72)

J. Paul Cali, Chief
 Office of Standard Reference Materials

(over)

SIZE AND METALLURGICAL CONDITION: Annealed disks, 32 mm (1 1/4 in) in diameter and 19 mm (3/4 in) thick.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of O. Menis and J. I. Shultz.

The technical and support aspects involved in the preparation, certification and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R. E. Michaelis.

PLANNING, PREPARATION, TESTING, ANALYSIS: For many metal SRM's, it is desirable to make the material available in the form of chips primarily for chemical methods of analysis, and solids primarily for optical emission and x-ray spectrochemical methods of analysis. Prior to the preparation of SRM 126c (chip form) plans were also made to provide this material as SRM 1158 (solid form).

The material for this standard was vacuum melted and cast at the Carpenter Technology Corporation, Reading, Pa. Selected sections were rolled to rounds approximately 130 mm (5 1/4 in) in diameter. At NBS these were lathe cut to a diameter of about 85 mm (3 1/4 in) to provide chips for SRM 126c. The remaining cores were processed at Carpenter Technology Corporation to the final solid size by rolling, annealing, and centerless grinding for SRM 1158.

Homogeneity testing was performed at NBS by J. L. Weber, Jr., and was found to be satisfactory.

List of Analysts

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3. R. C. Host and J. Kosek, Universal-Cyclops Specialty Steel Division, Bridgeville, Pennsylvania.
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5. A. L. Sloan, Carpenter Technology Corporation, Research and Development Center, Reading, Pennsylvania.

The material for this standard was prepared by the Carpenter Technology Corporation, Reading, Pennsylvania.