



Certificate of Analysis

Standard Reference Materials 442, 443, 444

Spectrographic Stainless Steel Standards

(Group I)

No. ^a	Type	Mn	Cu	Ni	Cr	V	Mo	Sn	Ti	B	Co	Pb	Nb
		Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
442	16 Cr-10 Ni	2.88	0.11	9.9	16.1	0.032	0.12	0.003 ₅	0.002	0.0005	0.13	0.001 ₇	0.03 ₂
443	18.5 Cr-9.5 Ni.....	3.38	.14	9.4	18.5	.064	.12	.006	.003	.0012	.12	.002 ₅	.05 ₈
444	20.5 Cr-10 Ni.....	4.02	.24	10.1	20.5	.12	.23	.014	.019	.0033	.22	.003 ₇	.20

^a Size: Rods $\frac{1}{8}$ in. in diameter and 4 in. long. By difference, the approximate iron contents of the standards are: 442-70.5 percent; 443-68.1 percent; 444-62.9 percent. The metallurgical structure of the standards is that resulting from hot-rolling and annealing.

CAUTION: These standards are intended for the analyses of stainless steel samples with similar metallurgical history and dimensions.

HOMOGENEITY of the standards was examined spectrochemically at the National Bureau of Standards and was found satisfactory for the elements certified.

CHEMICAL ANALYSES and spectrographic analyses were made on millings cut from the cross section of the rods. The certified values for Mn, Ni, Cr, and B are based on chemical analyses; for the other certified elements on both chemical and spectrographic analyses. Chemical analyses were made by the National Bureau of Standards, the Knolls Atomic Power Laboratory of the General Electric Company, the Philadelphia Navy Yard, and the U.S. Steel Corporation. Spectrochemical analyses were made by the National Bureau of Standards and the A. O. Smith Corporation.

WASHINGTON, D.C. 20234
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W. Wayne Meinke, Chief
 Office of Standard Reference Materials.

(This certificate supersedes certificate of 2-24-58. Editorial revision only)

(Over)

Supplementary Information

OTHER ELEMENTS: In addition to the certified elements, the following are present at the approximate concentrations listed:

No.	Type	Si	W	Zn	Zr	Ta
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
442	16 Cr-10 Ni.....	0.09	0.08	0.003	0.004	0.000 ₆
443	18.5 Cr-9.5 Ni.....	.15	.09	.005000 ₈
444	20.5 Cr-10 Ni.....	.65	.17	.004	.011	.004

For the elements *not* certified, Si and Ta values were obtained by chemical determinations; Zn by spectrographic determinations; W and Zr by both chemical and spectrographic determinations. Because of minor irregularities in the samples observed in homogeneity testing and because of the limited amount of analytical data, these elements have not been certified; however, the indicated results are given for additional information on the composition of the steels.

MATERIAL in rod form for the standards was prepared at the American Steel and Wire Division of the U.S. Steel Corporation and supplied to the National Bureau of Standards by the Philadelphia Navy Yard.