



# Certificate of Analyses

## Standard Reference Materials

### High Temperature Alloys

1193 - 1194 - 1195

NBS No. <sup>a</sup>	1193 W 545	1194 A 286	1195 Discaloy 24
<i>Element</i>			
Carbon -----	0.004	0.081	0.006
Manganese -----	.65	.67	.38
Phosphorus -----	.003	.011	.016
Sulfur -----	.03%	.008	.008
Silicon -----	.110	.71	1.11
Copper -----	.103	.047	0.016
Nickel -----	28.35	24.06	26.07
Chromium -----	11.95	16.35	13.83
Vanadium -----	0.051	0.32	0.45
Molybdenum -----	1.47	1.27	2.97
Titanium -----	3.0	1.45	1.28
Aluminum -----	0.21	0.39	0.074
Zirconium -----	.006	.026	.004
Boron -----	.0023	.009	.0043
Cobalt -----	-----	27.	-----
Iron -----	54.2	51.3	54.0

<sup>a</sup> Size: Disks 1¼ in. in diameter and ¼ in. thick.

The material for each standard was vacuum melted and cast into ingot form, and processed at Allvac Metals Co., Monroe, N. C. Each ingot was processed by forging to a slab having one dimension of the cross section about four times that of the other dimension. After cropping top and bottom, one-fourth of the slab at the center was cut lengthwise to discard (corresponding to the center of the original ingot). The two retained slab portions were hot-rolled to oversize rods and centerless ground to size.

Homogeneity of the standards was investigated by optical emission, x-ray fluorescence and chemical analyses at the National Bureau of Standards, both in slab form and in finished sample form and was found satisfactory for the elements certified.

Samples for chemical analysis were prepared by milling the cross section of the finished rods. Chemical analyses were made by the National Bureau of Standards; Allegheny Ludlum Steel Corp., Brackenridge, Pa.; The Carpenter Steel Co., Reading, Pa., and Ledoux and Company, Teaneck, N. J.