Brammer Standard Company, Inc.

Certificate of Analysis

B.S. 82E

AISI Grade 309 Stainless Steel

Carbon	0.062	Aluminum	0.006
Manganese	1.61	Arsenic	0.004
Phosphorus	0.027	Boron	0.0024
Sulfur	0.001	Cobalt	0.12
Silicon	0.58	Nitrogen	0.072
Copper	0.26	Niobium	0.062
Nickel	12.49	Titanium	0.003
Chromium	22.38	Calcium	0.0014
Molybdenum	0.31	Antimony	(0.003)
Vanadium	0.064	Tin	0.006
		Tungsten	0.041

(analysis listed as percent by weight)

Some of the co-operating laboratories were:

Allegheny Ludlum Steel Corp., Brackenridge, Pennsylvania
Allegheny Ludlum Steel Corp., Lockport, New York
Brammer Standard Co., Inc., Houston, Texas
Crucible Specialty Steel, Syracuse, New York
J. Dirats and Co., Inc., Westfield, Massachusetts
Hoesch Stahl AG, Dortmund, Germany
VHG Laboratories, Inc., Manchester, New Hampshire

CAUTION: Because this Reference Material contains a high percent of chromium and nickel, care must be taken in its application. Make certain that corrections are made for possible element interference and dilution effects.

See reverse side for more information. Certificate Number 82E-122391

Brammer Standard Company, Inc., 14603 Benfer Road, Houston, TX 77069
Telephone (281) 440-9396 Fax (281) 440-4432

BS 82E Certificate Number 82E-122391

Analysis	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	W
1	0.061	1.58	0.026	0.0005	0.56	0.25	12.44	22.27	0.296	0.037
2	0.0615	1.59	0.027	0.0010	0.57	0.26	12.44	22.28	0.30	0.039
3	0.062	1.60	0.0278	0.0010	0.577	0.261	12.47	22.34	0.30	0.0394
4	0.062	1.61	0.028	0.0010	0.58	0.268	12.47	22.35	0.31	0.041
5	0.0624	1.61	0.028	0.001	0.58	0.27	12.53	22.41	0.31	0.043
6	0.0624	1.62			0.604	0.271	12.57	22.41	0.31	0.045
7		1.624						22.47	0.311	
8		1.63						22.47	0.324	
Average	0.0619	1.608	0.0274	0.0009	0.579	0.263	12.487	22.375	0.308	0.0407
Std Dev	0.0005	0.017	0.0009	0.0002	0.015	0.008	0.052	0.078	0.009	0.0029
Certified	0.062	1.61	0.027	0.001	0.58	0.26	12.49	22.38	0.31	0.041

Analysis	V	Co	Sn	Al	Nb	Ti	B	Ca	N	As	Sb
1	0.061	0.117	0.0047	0.0043	0.057	0.002	0.0021	0.0012	0.0698	0.0029	0.001
2	0.0634	0.12	0.005	0.0056	0.0593	0.0022	0.0022	0.0014	0.0706	0.003	0.0043
3	0.064	0.12	0.0053	0.0058	0.061	0.0024	0.0023	0.0016	0.071	0.004	
4	0.064	0.122	0.0059	0.006	0.063	0.003	0.0024		0.071	0.0055	
5	0.064	0.122	0.006	0.006	0.064	0.003	0.0025		0.0736		
6	0.065	0.127	0.006	0.007	0.065	0.003	0.0026		0.0736		
7	0.068		0.006	0.007		0.004	0.0027				
Average	0.0642	0.121	0.0056	0.0060	0.0616	0.0028	0.0024	0.0014	0.0716	0.0039	0.0027
Std Dev	0.0021	0.003	0.0006	0.0009	0.0030	0.0007	0.0002	0.0002	0.0016	0.0012	0.0023
Certified	0.064	0.12	0.006	0.006	0.062	0.003	0.0024	0.0014	0.072	0.004	(0.003)

Data in parentheses is not certified but provided for information only.

Chemical analyses were made on millings from cross-sections of the bars. The individual values listed above are the average of each analyst's analytical results.

Methods of analysis used were a combination of ASTM Standard Methods E 350, E 353, E 572, E 1019, E 1086, plus additional ICP, and AA spectrometric methods. The following Certified Reference Materials were used to validate the analytical data listed above: NIST SRM 73c, 101g, 121d, 160b, 344, 345, 348a; BCS 466/1, 467/1, 475; ECRM 284-1, 286-1; IMZ 127/3; JK 37.

This Reference Material was tested for homogeneity using ASTM Standard Method E 826 and found acceptable. It was also examined by optical emission spectrometry and found to be compatible with the following NIST Certified Reference Materials: SRM C1151 - C1154, 1155, and C1287

The bar stock used for this material was produced by hot-rolling billets. The entire depth of the disc may be used.

A Material Safety Data Sheet (MSDS) is not required for this material. This material will not release or otherwise result in exposure to a hazardous chemical, under normal conditions of use. Inquiries concerning this Reference

Material should be directed to:

Brammer Standard Co., Inc.
14603 Benfer Road
Houston, Texas 77069-2895 USA

Phone: (281) 440-9396
Fax: (281) 440-4432

Certified by: _____ on December 23, 1991.
G. R. Brammer