

Brammer Standard Company, Inc.

# Certificate of Analysis

## Reference Material for Carbon, Sulfur and Nitrogen in Steel

### B.S. CSN-A

	<b>Certified Value</b>	Standard Deviation
<b>Carbon</b>	<b>0.068</b>	0.002
<b>Sulfur</b>	<b>0.305</b>	0.003
<b>Nitrogen</b>	<b>0.0081</b>	0.0004

*Certified Values expressed as weight percent*

#### Some of the participating laboratories were:

Allegheny Ludlum Steel Corp., Brackenridge, Pennsylvania  
Allegheny Ludlum Steel Corp., Lockport, New York  
Analytical Associates, Detroit, Michigan  
Anderson Laboratories, Greendale, Wisconsin  
Brammer Standard Company, Houston, Texas  
Crucible Specialty Metals, Syracuse, New York  
Cytemp Specialty Steel/Cyclops, Titusville, Pennsylvania  
J. Dirats and Company, Westfield, Massachusetts  
Jessop Steel Company, Washington, Pennsylvania  
Charles C. Kawin Company, Broadview, Illinois  
Midstates Analytical Labs, Tulsa, Oklahoma  
Republic Engineered Steels, Canton, Ohio  
The Timken Company, Canton, Ohio  
Vac Air Alloys Corporation, Frewsburg, New York

See reverse side for more information.

Certificate Number CSNA-122791

**Brammer Standard Company, Inc., 14603 Benfer Road, Houston, TX 77069-2895**  
**Telephone (281) 440-9396 Fax (281) 440-4432**

Analysis	Carbon	Sulfur	Nitrogen
1	0.0641	0.2970	0.0075
2	0.0642	0.3019	0.0078
3	0.0645	0.3020	0.0078
4	0.0668	0.3027	0.0078
5	0.0670	0.3030	0.0079
6	0.0673	0.3031	0.0081
7	0.0678	0.3055	0.0082
8	0.0680	0.3059	0.0085
9	0.0680	0.3060	0.0086
10	0.0684	0.3075	0.0086
11	0.0685	0.3075	
12	0.0689	0.3080	
13	0.0693	0.3088	
14	0.0703	0.3088	
15	0.0703		
16	0.0710		
Average	0.0678	0.3048	0.00808
Standard Deviation	0.0021	0.0034	0.00039

**Caution:** Combustion instrument analysis of sulfur in steel at levels above 0.20% will likely require a different procedure than used steels with sulfur below 0.20%. The normal procedure for higher sulfur materials is to use 1/2 the normal sample weight for analysis. Most analysts add iron powder to make up the weight difference.

### Material Composition

The material used for making the BS CSN-A is modified AISI grade 1213 steel. The estimated composition in percent by weight is:

Mn 1.0 P 0.14 Si 0.05 Ni 0.05 Cr 0.06 Cu 0.06 Fe 98.2

Chemical analyses were made on the chips during two inter-laboratory testing programs. The individual values listed above are the average of each analyst's results. This Reference Material was tested for homogeneity and found acceptable.

Analysts used a variation of the ASTM Standard Method E 1019. The following Certified Reference Materials were used to validate the analytical data listed above: NIST SRM 129b, 129c, 133b; BAM 039-2; ECRM 085-1; IPT 43; JSS 243-3

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 USA

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Certified by: G. R. Brammer \_\_\_\_\_ on December 27, 1991.