Brammer Standard Company, Inc.

Certificate of Analysis

B.S. 75F

Reference Material for Leaded Steel Grade 11L17

	Certified Value[1]	Estimate of Uncertainty[2]
	Analysis listed as percent by weight	
C	**0.165**	0.007
Mn	**1.05**	0.02
P	**0.009**	0.002
S	**0.116**	0.005
Si	**0.004**	0.002
Cu	**0.030**	0.003
Ni	**0.044**	0.004
Cr	**0.080**	0.008
Mo	**0.018**	0.002
Pb	**0.202**	0.010
Al	**0.002**	0.001

[1] The certified value listed is the present best estimate of the true value based on the results of an interlaboratory testing program.

[2] The uncertainties listed are based on value judgments of the material inhomogeneity and the 95% confidence interval. The half-width confidence interval C(95%) is shown on page 2.

This Reference Material is primarily intended for use in x-ray spectrometric methods of analysis due to the high lead content.

See the following pages for more information.

Replaces Certificate Number 75F-053087
New Certificate Number REV75F-020910

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

BS 75F analysis listed as percent by weight Certificate Number REV75F-020910

Analysis	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Pb	Al
1	0.155	1.025	0.0075	0.110	0.001	0.025	0.040	0.067	0.015	0.19	0.001
2	0.16	1.04	0.0075	0.110	0.002	0.030	0.040	0.075	0.016	0.195	0.001
3	0.16	1.04	0.008	0.115	0.004	0.030	0.040	0.075	0.018	0.199	0.0015
4	0.165	1.05	0.009	0.116	0.005	0.030	0.043	0.078	0.018	0.200	0.002
5	0.167	1.05	0.009	0.117	0.005	0.030	0.043	0.080	0.018	0.201	0.002
6	0.167	1.05	0.010	0.118	0.0055	0.030	0.045	0.080	0.018	0.202	0.002
7	0.17	1.06	0.010	0.119		0.030	0.045	0.080	0.020	0.204	0.003
8	0.17	1.06	0.011	0.120		0.030	0.046	0.080	0.022	0.205	
9	0.174	1.07	0.012	0.120		0.0305	0.050	0.090		0.222	
10						0.035	0.050	0.090			
Average	0.1653	1.049	0.0093	0.1161	0.0038	0.0301	0.0442	0.0795	0.0181	0.202	0.0018
Std Dev	0.006	0.013	0.0016	0.0039	0.0018	0.0024	0.0038	0.0068	0.0022	0.0088	0.0007
Certified	0.165	1.05	0.009	0.116	0.004	0.030	0.044	0.080	0.018	0.202	0.002
t	2.31	2.31	2.31	2.31	2.57	2.26	2.26	2.26	2.36	2.31	2.45
C(95%)	0.0046	0.010	0.0012	0.0030	0.0019	0.0017	0.0027	0.0049	0.0018	0.0068	0.0006

$C(95\%) = (t \times sd)/\sqrt{n}$ The half-width confidence interval, where t is the appropriate Student's t value, sd is the interlaboratory standard deviation, and n is the number of acceptable mean values. For further information regarding the confidence interval for the certified value see ISO Guide 35:2006 section 6.

Analysis: Chemical analyses were made on millings from the cross-section of the bars. The values listed above are the individual laboratory analytical results.

Co-operating Laboratories: Some of the co-operating laboratories were:

Analytical Process Laboratories, Milwaukee, WI
Anderson Laboratories, Milwaukee, WI
Bowser-Morner Testing Labs., Inc., Dayton, OH
Chicago Spectro Service Labs., Inc. Chicago, IL
Copperweld Steel Co., Warren, MI
Crucible Inc./Specialty Metals Div., Syracuse, NY
Midstates Analytical Laboratories, Tulsa, OK
Spectrochemical Laboratories, Inc., Pittsburgh, PA

Homogeneity: This Reference Material was tested for homogeneity and found acceptable.

This Reference Material was produced by cold-rolling and annealing. This Reference Material should be used and compared with material of similar metallurgical history as it may not plot well with chill-cast materials on some instruments.

Available Form: This Reference Material is available in the form of a disc, approximately 40 mm in diameter and 12 mm thick.

Use: This Reference Material is primarily intended for use in x-ray spectrometric methods of analysis. The entire depth of the disc may be used.

Caution: As with any bar material, avoid spark atomic emission spectrometric burns in the center of the disc (5 mm radius), as some segregation may be present.

Because this Reference Material contains a high percentage of lead, care must be taken in its application. Poor results will be obtained on a spark atomic emission spectrometer if the instrument is not specifically configured for high lead solid test specimens.

Certificate Number: The unique identification number for this certificate of analysis is REV-75F-020910. This BS 75F Certificate of Analysis was revised to show the estimate of uncertainty for the certified values. After reviewing the analytical data, a third decimal place was certified for nickel and chromium. The aluminum value was changed from uncertified to certified. The original certificate of analysis was dated May 30, 1987.

Refer to the "Certificates" section of the Brammer Standard Company website for any revision to this or other Brammer Standard Company's Certificates of Analysis.

Sample Preparation: For best analytical results, use the same method for preparing the analytical surface on all reference materials as you use for production specimens. It is important to use a surfacing method which will give the reference materials a coarse surface. A sanding belt no finer that 40 grit is recommended. Grinding the surface with a finer grit will produce a lead-smear effect. Avoid overheating the disc during surface preparation.

Safety Notice: 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.
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Houston, Texas 77069-2895 USA

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

website: brammerstandard.com
email: contact@brammerstandard.com

Certified by: _____ on February 9, 2010.
Beau R. Brammer

Brammer Standard Company, Inc., is accredited to ISO Guide 34 as a Reference Material Producer for the production of Certified Reference Materials and Reference Materials by A2LA (Certificate Number 656.02)
The scope of accreditation is listed on the website: www.brammerstandard.com

Brammer Standard Company's Chemical Laboratory is accredited to ISO Standard 17025 by A2LA.
(Certificate Number 656.01)

By Certificate Number 10539, the Quality System of Brammer Standard Company, Inc., is registered to ISO 9001:2008 by National Quality Assurance, U.S.A.

Referenced Documents

ISO Guides and Standards available from Global Engineering - www.global.ihs.com

ISO Guide 35 Reference Materials - General and statistical principles for certification

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