Brammer Standard Company, Inc.

Data Sheet for Setting-up Sample

BS SU LF-2B

Certified Reference Material for ASTM A350 (LF2) Carbon Steel - UNS Number G03011

Analysis listed as percent by weight

	Estimated Analysis[1]		Estimated Analysis[1]
Al	**0.022**	**Nb**	**<0.005**
As	**0.003**	**Ni**	**0.088**
B	**0.0002**	**O**	**0.002**
Bi	**<0.05**	**P**	**0.007**
C	**0.21**	**Pb**	**<0.005**
Ca	**0.0008**	**S**	**0.010**
Co	**0.006**	**Sb**	**0.001**
Cr	**0.16**	**Si**	**0.23**
Cu	**0.19**	**Sn**	**0.007**
Fe	**97.98**	**Ta**	**0.004**
H	**<0.005**	**Ti**	**0.0004**
Mg	**<0.005**	**V**	**0.003**
Mn	**1.05**	**W**	**<0.05**
Mo	**0.029**	**Zr**	**0.001**
N	**0.008**		

[1] The above chemistry is supplied as an approximate guide to the composition of this setup sample and must not be regarded as a certified analysis. The analysis is based on the results of the homogeneity testing performed on the sample lot. This sample was found to be suitable for use as a setting-up sample and may be used for instrument drift control. It must not be used for instrument calibration.

The requirements of ISO Guides 30, 31, and 35 were followed for the preparation of this Setting-up Sample Material and data sheet.

Form: This SUS is machined in the form of a disc, approximately 19mm in diameter and 40mm thick by Brammer Standard Company, Inc.

BS SU LF-2B	Al	As	B	Be	Bi	C	Ca	Ce	Co	Cr	Cu	Fe	H	Mg
CSONH						0.215							0.000058	
BSC SAES	0.0216	0.0041	0.0002			0.218	0.0007		0.0066	0.153	0.191	97.98		0.0001
BSC GDS	0.0221	0.001	0.0002			0.216	0.0007		0.0063	0.154	0.198	97.97		
MTR	0.023	0.004	0.0002		0.001	0.19	0.0010		0.005	0.16	0.19		0.000023	
Average	0.02223	0.00303	0.0002		0.001	0.20975	0.0008		0.00597	0.15567	0.193	97.975	0.000041	0.0001
Certificate	**0.022**	**0.003**	**0.0002**		**<0.05**	**0.21**	**0.0008**		**0.006**	**0.16**	**0.19**	**97.98**	**<0.005**	**<0.005**

BS SU LF-2B	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Si	Sn	Ta	Ti
CSONH			0.0086			0.0017			0.0109					
BSC SAES	1.04	0.0298		0.0007	0.0862		0.0079	0.0004	0.0121	0.0011	0.226	0.0075	0.0037	0.0005
BSC GDS	1.05	0.026			0.0871		0.008		0.0115		0.23			0.0002
MTR	1.06	0.03	0.0076		0.09		0.006		0.007	0.001	0.23	0.006		
Average	1.05	0.0286	0.0081	0.0007	0.08777	0.0017	0.0073	0.0004	0.01038	0.00105	0.22867	0.00675	0.0037	0.00035
Certificate	**1.05**	**0.029**	**0.008**	**<0.005**	**0.088**	**0.002**	**0.007**	**<0.005**	**0.010**	**0.001**	**0.23**	**0.007**	**0.004**	**0.0004**

BS SU LF-2B	V	W	Zn	Zr
CSONH				
BSC SAES	0.0031	0.0002		0.0011
BSC GDS	0.0039	0.0038		
MTR	0.003			
Average	0.00333	0.002		0.0011
Certificate	**0.003**	**<0.05**		**0.001**

Homogeneity: This Setting-up Sample (SUS) was tested for homogeneity using ASTM Standard Method E826 and found acceptable. It was also examined by spark atomic emission spectrometry and found to be compatible with the following Reference Materials: BAS 454/1; BS LF2B, 52D, 1932, 2931A, 2932, 3011, 3981, 8620A; SRM 1163.

Validity statement: ISO Guide 31 states that the certification should contain an expiration date for all materials where instability has been demonstrated or is considered possible, after which the certified value is no longer guaranteed by the producing body. The stated values of BS SU LF-2B are valid indefinitely. The certification is nullified if this SUS is damaged, contaminated, or otherwise modified.

Storage: This SUS must be stored in a cool, dry, non-corrosive environment.

Source: The bar stock for this SUS was produced by Steel Dynamics, Inc.; Pittsboro, In.

Analytical Area: The entire depth of the SUS may be used.

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

Sample Preparation: For best analytical results, use the same method for preparing the analytical surface on all reference materials as used for production specimens. Avoid overheating the sample during surface preparation.

Caution: SUS contains significant insoluble soft metal inclusions. Surface smearing may occur. Spark atomic emission spectrometers may require extended preburns to compensate.

Safety Notice: A Safety Data Sheet (SDS) 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:

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Brammer Standard Company, Inc., is accredited by the American Association For Laboratory Accreditation (A2LA) to ISO Standard 17034 as a Reference Material Producer for the production of Certified Reference Materials and Reference Materials (Certificate Number 656.02)

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

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

The scopes of accreditation are listed on the website: www.brammerstandard.com

References:

Versions used were those available at the time of testing and characterization

E826 Standard Practice for Testing Homogeneity of a Metal Lot or Batch in Solid Form by Spark Atomic Emission Spectrometry

E1019 Standard Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various Combustion and Fusion Techniques

E1806 Standard Practice for Sampling Steel and Iron for Determination of Chemical Composition

ISO Standard 17025:2017 General requirements for the competence of testing and calibration laboratories

ISO Standard 9001:2015 Quality Management Systems - Requirements

ISO Guide 30:2015 Terms and definitions used in connection with reference materials + 2008 amendment

ISO Guide 31:2015 Reference materials - Contents of certificates and labels

ISO Guide 33:2015 Uses of certified reference materials

ISO Standard 17034:2016 General requirements for the competence of reference material producers

ISO Guide 35:2017 Reference Materials - General and statistical principles for certification

ASTM documents available from ASTM, 100 Barr Harbor Dr., West Conshohocken, PA 19428.

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

Other useful documents available from NIST, U.S. Department of Commerce, Gaithersburg, MD 20899.

NIST Special Publication 260-100, Handbook for SRM Users

NIST Special Publication 829, Use of NIST Standard Reference Materials for Decisions on Performance of Analytical Chemical Methods and Laboratories

Certified by: _____ on November 1, 2023.

Beau R. Brammer

President