

Brammer Standard Company, Inc.

Provisional Certificate of Analysis

BS LF2C

Certified Reference Material for ASTM A350 (LF2) Carbon Steel - UNS Number K03011

Analysis listed as percent by weight

	Estimated Analysis ¹		Estimated Analysis ¹
Al	0.029	Ni	0.10
As	0.004	O	<0.05
B	0.0002	P	0.012
C	0.20	Pb	0.0005
Ca	0.0002	S	0.018
Co	0.010	Sb	<0.05
Cr	0.15	Si	0.26
Cu	0.15	Sn	0.010
Fe	97.98	Ta	<0.05
Mg	<0.005	Ti	0.002
Mn	1.02	V	0.001
Mo	0.030	W	0.002
N	<0.05	Zr	0.0007
Nb	0.0009		

¹ The estimated value listed is the present best estimate of the true value. Values are given in weight percent.

Form: This CRM is machined in the form of a disc, approximately 44mm in diameter and 19mm thick by Brammer Standard Company, Inc.

A detailed final certificate of analysis will be supplied by September 29, 2025

Brammer Standard Company, Inc., 14603 Benfer Road, Houston, TX 77069-2895 USA
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LF2C	Al	As	B	Be	Bi	C	Ca	Ce	Co	Cr	Cu	Fe	La	Mg
CSONH						0.207								
BSC SAES	0.0287	0.0047	0.00029			0.194	0.00006		0.0103	0.149	0.155	97.95		
BSC SAES	0.0314	0.0035	0.0002			0.203	0.0002		0.0108	0.152	0.154	97.99		0.0003
BSC GDS	0.0281		0.0002			0.204	0.0002		0.0091	0.154	0.155	98		
MTR	0.028					0.19				0.16	0.14			
Average	0.02905	0.0041	0.00023			0.1996	0.00015		0.01007	0.15375	0.151	97.98		0.0003
Certificate	0.029	0.004	0.0002			0.20	0.0002		0.010	0.15	0.15	97.98		<0.005
LF2C	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Si	Sn	Ta	Ti
CSONH			0.0099			0.0016			0.0181					
BSC SAES	1.05	0.0292		0.0009	0.0994		0.0119		0.0181	0.0096	0.263	0.0117	0.0084	0.0019
BSC SAES	1.01	0.0326		0.0007	0.0989		0.0111	0.0005	0.018	0.0005	0.255	0.0108	0.0007	0.0016
BSC GDS	1.01	0.0282			0.0974		0.0112	0.0004	0.0175	0.0008	0.26	0.0084		0.0014
MTR	1.01	0.03		0.0010	0.10		0.013		0.017		0.25	0.011		
Average	1.02	0.03	0.0099	0.00087	0.09893	0.0016	0.0118	0.00045	0.01774	0.00363	0.257	0.01048	0.00455	0.00163
Certificate	1.02	0.030	<0.05	0.0009	0.10	<0.05	0.012	0.0005	0.018	<0.05	0.26	0.010	<0.05	0.002
LF2C	V	W	Zn	Zr										
CSONH														
BSC SAES	0.0014	0.0022		0.0002										
BSC SAES	0.0016	0.002		0.0011										
BSC GDS	0.0018	0.0025		0.0009										
MTR	0.001													
Average	0.00145	0.00223		0.00073										
Certificate	0.001	0.002		0.0007										

Homogeneity: This Certified Reference Material (CRM) 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 433/1, 454/1; BS LF2B, 13B, 50D, 52D, 61D, 1932, 2931A, 2932, 3011, 3981, 8620A; CKD 165D, 181A; JSS 170-6; 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 certifying body. The certification of BS LF2B is valid indefinitely. The certification is nullified if this CRM is damaged, contaminated, or otherwise modified.

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

Source: The bar stock for this CRM was produced by CSC; Warren, OH.

Certified Area: The entire depth of the CRM may be used.

Caution: As with any bar material, avoid spark atomic emission spectrometric burns in the center of the CRM (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: CRM 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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Certified by: _____ on September 29, 2023.

Beau R. Brammer
President