

BRAMMER STANDARD COMPANY, INC.

Provisional Certificate of Analysis BS 291GF

Certified Reference Material for Chill Cast Iron

| | Estimated Analysis ¹ | | Estimated Analysis ¹ |
|--------------------------------------|---------------------------------|----|---------------------------------|
| Analysis listed as percent by weight | | | |
| Al | 0.040 | Nb | 0.004 |
| As | 0.005 | Ni | 0.098 |
| B | 0.016 | O | <0.005 |
| C | 3.34 | P | 0.034 |
| Ca | 0.001 | Pb | <0.005 |
| Co | 0.004 | S | 0.014 |
| Cr | 0.069 | Sb | 0.003 |
| Cu | 0.23 | Si | 2.31 |
| Fe | [93.1] | Sn | 0.048 |
| H | <0.005 | Ti | 0.027 |
| Mg | 0.041 | V | 0.033 |
| Mn | 0.50 | W | 0.004 |
| Mo | 0.030 | Zr | 0.002 |
| N | <0.05 | | |

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 33-35 mm in diameter and 28-32 mm thick by Brammer Standard Company, Inc.

A detailed final certificate of analysis will be supplied by October 28, 2023.

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 — BS 6A, CI4, 291CB, 291DG, 291FF; SPL 36A; SRM C2425A.

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 291GF 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.

Certified Area: The certified area of each disc is the portion extending several mm inward from each surface.

Note: Shrinkage cavities may appear in the horizontal center of some discs. These cavities are normal and will not affect the certified portions of the disc.

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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Houston, Texas 77069-2895 USA

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Web: www.brammerstandard.com
Email: contact@brammerstandard.com

Certified by: _____ on October 28, 2021.

Beau R. Brammer
President