

# Brammer Standard Company, Inc.

## Provisional Certificate of Analysis

### BS CoCrNi

Certified Reference Material for High Alloyed Metal

Analysis listed as percent by weight

	Estimated Analysis <sup>1</sup>		Estimated Analysis <sup>1</sup>
Al	0.027	Nb	1.39
As	0.002	Ni	20.7
B	0.001	O	0.012
C	0.17	P	(0.022)
Co	22.1	S	0.008
Cr	21.8	Si	0.89
Cu	(0.095)	Sn	0.005
Fe	24.7	Ta	<0.5
H	<0.05	Ti	0.072
Mn	2.21	V	0.059
Mo	3.1	W	2.50
N	0.18	Zr	<0.05

<sup>1</sup> 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 36mm in diameter and 25mm thick by Brammer Standard Company, Inc.

**A detailed final certificate of analysis will be supplied by April 10, 2026**

CoCrNi	Al	As	B	Be	Bi	C	Ca	Ce	Co	Cr	Cu	Fe	H	Mg
CSONH						0.158							0.001300	
BSC SAES 3/6	0.03	0.0011	0.0017			0.168			22.12	21.71	0.0834	24.83		
SC SAES 12/14	0.0258	0.0019	0.0014			0.173			21.86	21.85	0.0844	25.04		
BSC GDS 3/6	0.0288		0.0013			0.18			22.62	22.06	0.106	24.3		
BSC GDS 12/14	0.0254		0.0013			0.177			22.2	21.85	0.105	24.61		
SAES Depth	0.0258	0.0018	0.0014			0.179			21.83	21.87	0.0852	25.04		
GDS Depth	0.0251		0.0014			0.18			22.23	21.75	0.105	24.65		
MTR														
Average	0.02682	0.0016	0.00142			0.17357			22.1433	21.8483	0.09483	24.745	0.0013	
Certificate	0.027	0.002	0.001			0.17			22.1	21.8	(0.095)	24.7	<0.05	
CoCrNi	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Si	Sn	Ta	Ti
CSONH			0.177			0.0123			0.0205					
BSC SAES 3/6	2.25	3.1		1.38	20.86		0.026		0.0014		0.842	0.0056	0.0043	0.0764
SC SAES 12/14	2.26	3.26		1.41	20.59		0.0125		0.0014		0.869	0.004		0.0763
BSC GDS 3/6	2.15	3.1		1.32	20.35		0.0337		0.0175		0.897		0.146	0.0631
BSC GDS 12/14	2.18	2.93		1.41	20.83		0.0222		0.0082		0.927			0.0701
SAES Depth	2.26	3.26		1.41	20.61		0.0124		0.0014		0.87	0.004		0.0764
GDS Depth	2.18	2.92		1.41	20.87		0.0225		0.0083		0.928			0.0705
MTR														
Average	2.21333	3.095	0.177	1.39	20.685	0.0123	0.02155		0.00839		0.88883	0.00453	0.07515	0.07213
Certificate	2.21	3.1	0.18	1.39	20.7	0.012	(0.022)		0.008		0.89	0.005	<0.5	0.072
CoCrNi	V	W	Zn	Zr										
CSONH														
BSC SAES 3/6	0.0584	2.44		0.0003										
SC SAES 12/14	0.0572	2.42												
BSC GDS 3/6	0.0582	2.56		0.0022										
BSC GDS 12/14	0.0624	2.59												
SAES Depth	0.0572	2.42												
GDS Depth	0.063	2.59												
MTR														
Average	0.0594	2.50333		0.00125										
Certificate	0.059	2.50		<0.05										

**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 H-4, H-4B, H-8, 162, 189A, 197, 197A; HRT Ni 2013; IARM CoE118, SRM 1247.

**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 CoCrNi 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 cast stock for this CRM was produced by SPL-LABMAT s.r.o; Bohumin, CZ.

**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:

**Brammer Standard Co., Inc.**  
14603 Benfer Road  
Houston, Texas 77069-2895 USA

**Phone: (281) 440-9396**

**Web: [www.brammerstandard.com](http://www.brammerstandard.com)**

**Fax: (281) 440-4432**

**Email: [contact@brammerstandard.com](mailto:contact@brammerstandard.com)**

**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 (our current Certificate Number 656.02 expires 01/31/2025)**

**Brammer Standard Company's Chemical Laboratory is accredited by A2LA to ISO Standard 17025. (Our current Certificate Number 656.01 expires 01/31/2025)**

**By current Certificate Number 10539 expiring 01/01/2027 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](http://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](http://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 April 10, 2024.

Beau R. Brammer  
President