

# Brammer Standard Company, Inc.

## Certificate of Analysis

### BS PM15A

Certified Reference Material for CPM 15V Tool Steel

	Certified Value <sup>1</sup>	Estimate of Uncertainty <sup>2</sup>	<b>Certified Values<sup>3</sup></b>	Certified Value <sup>1</sup>	Estimate of Uncertainty <sup>2</sup>
<b>As</b>	<b>0.0037</b>	0.0009		<b>Nb</b>	0.002
<b>B</b>	<b>0.0005</b>	0.0003		<b>Ni</b>	0.009
<b>C</b>	<b>3.35</b>	0.05		<b>O</b>	0.002
<b>Co</b>	<b>0.028</b>	0.002		<b>P</b>	0.002
<b>Cr</b>	<b>5.4</b>	0.2		<b>S</b>	0.003
<b>Cu</b>	<b>0.094</b>	0.006		<b>Si</b>	0.07
<b>Fe</b>	<b>72.9</b>	0.5		<b>Sn</b>	0.0004
<b>H</b>	<b>0.0004</b>	0.0002		<b>Ti</b>	0.0004
<b>Mn</b>	<b>0.39</b>	0.03		<b>V</b>	0.3
<b>Mo</b>	<b>1.28</b>	0.08		<b>W</b>	0.005
<b>N</b>	<b>0.12</b>	0.02		<b>Zr</b>	0.0003

	Reference Value <sup>1</sup>	Estimate of Uncertainty <sup>2</sup>	<b>Reference Values<sup>3,4</sup></b>	Reference Value <sup>1</sup>	Estimate of Uncertainty <sup>2</sup>
<b>Al</b>	<b>0.004</b>	0.002		<b>Sb</b>	<b>&lt;0.005</b>
<b>Ca</b>	<b>&lt;0.005</b>			<b>Zn</b>	<b>&lt;0.005</b>
<b>Mg</b>	<b>&lt;0.005</b>				

<sup>1</sup> For each element, the certified value listed is the present best estimate of the true value based on the mean of the weighted results of an interlaboratory testing program. See page 4 for more information on its calculation.

<sup>2</sup> For each element, the uncertainty listed is based on a statistical evaluation of the contributions of homogeneity and the interlaboratory testing program. See page 4 for more information on its calculation.

<sup>3</sup> Values are given in weight percent. Values in brackets are reported by difference.

<sup>4</sup> Reference values are not certified and are provided for information only.

Trace element information values for Cl, Ga, Ge, Ir, Na, Os, Re, and Se are shown on page 4.

The requirements of ISO Guides 30, and Standards 33401 and 33405 were followed for the preparation of this Certified Reference Material and certificate of analysis.

BS PM15A

\* Code for method

Certified values listed as weight percent

Analysis	*	As	*	B	*	C	*	Co	*	Cr	*	Cu	*	Fe	*	H	*	Mn	*	Mo
1	5	0.002767	11	0.0002	1	3.227	11	0.0261	4	5.205	4	0.088133	16	[2.435833]	2	0.00016	3	0.367	4	1.203567
2	12	0.003	3	0.0002	1	3.30	3	0.026667	4	5.205	10	0.088533	16	[72.63]	2	0.0002625	4	0.368	4	1.207
3	5	0.003237	4	0.0002333	11	3.3	8	0.027	10	5.22	4	0.089	16	[72.65]	2	0.0002967	3	0.368	4	1.24
4	3	0.0039	5	0.0003667	1	3.302333333	5	0.027333	4	5.226	4	0.089	4	72.7321	2	0.0003333	10	0.36933333	4	1.246
5	5	0.004033	4	0.0004	3	3.31	4	0.027333	4	5.243	5	0.091433	16	[72.754667]	2	0.0003367	4	0.379	4	1.272333
6	4	0.004033	5	0.0005	1	3.32	5	0.0276	4	5.3953333	5	0.091433	16	[72.763733]	2	0.0003533	11	0.38	4	1.2750
7	9	0.004033	5	0.00058	1	3.328	5	0.028033	4	5.4096667	3	0.0915	14	72.766667	2	0.00039	4	0.381	4	1.278767
8	4	0.0041			1	3.328	5	0.028033	3	5.42	3	0.091867	10	72.856667	2	0.0005	4	0.38303333	4	1.279667
9	4	0.0041			1	3.331	4	0.0281	10	5.42	5	0.092	16	[73.0334]	2	0.0005667	4	0.38333333	4	1.279667
10					1	3.33175	4	0.0282	4	5.4352	10	0.0920	4	73.063333	2	0.0005667	4	0.3850	11	1.28
11					1	3.342	3	0.0283	4	5.4384667	4	0.093933	16	[73.155]	2	0.0005733	4	0.3858	4	1.2812
12					1	3.346666667	4	0.028567	10	5.4633333	4	0.094133	16	[73.207]			3	0.38666667	4	1.281333
13					1	3.353333333	3	0.028667	4	5.4696667	8	0.095	16	[73.207]			7	0.387	3	1.283333
14					1	3.373333333	4	0.0288	14	5.48	4	0.0956					4	0.38833333	10	1.29
15					3	3.38	4	0.0293	4	5.4833333	4	0.0962					3	0.39	4	1.296
16					1	3.3849	4	0.029433	4	5.4869	4	0.096933					8	0.39	4	1.303333
17					1	3.397	4	0.030567	11	5.51	4	0.097333					4	0.39166667	14	1.306667
18					1	3.4	12	0.031	3	5.52	3	0.097667					4	0.3935	3	1.31
19					1	3.4202			13	5.5673333	11	0.0977					14	0.39633333	10	1.333333
20					1	3.45216			13	5.5896667	14	0.098967					10	0.40	3	1.356667
21											12	0.1					5	0.422		
22																	5	0.422		
23																	5	0.424		
Average		0.00369		0.000510		3.346		0.02829		5.41		0.0937		72.888		0.00039		0.389		1.280
Std Dev		0.00053		0.000041		0.051		0.00098		0.12		0.0036		0.043		0.00014		0.016		0.036
H		0.00071		0.00033		0.022		0.0017		0.029		0.0031		0.16		0.00031		0.0064		0.012
U <sub>1</sub>		0.00072		0.00034		0.022		0.0020		0.029		0.0031		0.16		0.00032		0.0064		0.012
t-statistic		2.31		2.45		2.09		2.11		2.09		2.09		2.18		2.23		2.07		2.09
U <sub>2</sub>		0.0017		0.00082		0.046		0.0042		0.061		0.0064		0.35		0.00071		0.013		0.026
U <sub>3</sub>		0.00055		0.00031		0.010		0.0010		0.014		0.0014		0.10		0.00021		0.0028		0.0058
Certified		<b>0.0037</b>		<b>0.0005</b>		<b>3.35</b>		<b>0.028</b>		<b>5.4</b>		<b>0.094</b>		<b>72.9</b>		<b>0.0004</b>		<b>0.39</b>		<b>1.28</b>
Uncertainty		0.0009		0.0003		0.05		0.002		0.2		0.006		0.5		0.0002		0.03		0.08
Tolerance		0.0027		0.0004		0.15		0.006		0.6		0.018		1.5		0.0003		0.09		0.24

Analysis	*	N	*	Nb	*	Ni	*	O	*	P	*	S	*	Si	*	Sn	*	Ti	*	V
1	2	0.110667	5	0.0114	4	0.096666667	2	0.013	5	0.0166	11	0.0139	3	0.855	3	0.0024667	4	0.00286667	4	14.593
2	2	0.111	5	0.0114333	4	0.104	2	0.013067	4	0.0166667	4	0.015433	4	0.8796667	12	0.0027667	11	0.0029	3	14.73
3	2	0.112733	5	0.0114333	4	0.1050	2	0.016727	4	0.0169667	1	0.0163	4	0.8803667	3	0.0030	4	0.0031	13	14.92067
4	2	0.114	5	0.0121	14	0.107	2	0.0170	3	0.017	1	0.0169	4	0.900	4	0.0030667	4	0.00313333	4	15.00333
5	2	0.114	4	0.0125	3	0.107	2	0.0170	4	0.0172333	1	0.0185	3	0.90	5	0.0031	14	0.00316667	4	15.118
6	2	0.116	14	0.0140	4	0.108666667	2	0.017	4	0.0174	1	0.0186	3	0.9066667	4	0.0032	4	0.0033	4	15.14667
7	2	0.118	11	0.0141	3	0.113333333	2	0.0170	5	0.0176	1	0.019	6	0.91	5	0.0032	12	0.00333333	4	15.151
8	2	0.118133	4	0.0145	4	0.116666667	2	0.01785	5	0.0176	1	0.0195	10	0.91	5	0.0032	5	0.0035	4	15.15367
9	2	0.11895	3	0.0149	4	0.119666667	2	0.018333	3	0.0181	1	0.019675	4	0.9106667	5	0.0032	5	0.00353333	4	15.15367
10	2	0.12	4	0.0149	8	0.12	2	0.018567	5	0.0183	1	0.0197	14	0.9116667	4	0.0033	5	0.00353333	4	15.169
11	2	0.120133	4	0.0151	5	0.120666667	2	0.018667	4	0.0190667	1	0.0203	4	0.9122	5	0.00332	3	0.0036	4	15.17467
12	2	0.120667	4	0.0151333	5	0.120666667	2	0.02	3	0.0207667	1	0.0203	4	0.9136	3	0.0034	5	0.00363	4	15.22097
13	2	0.135	12	0.0206667	5	0.121			3	0.021	1	0.020367	11	0.915	9	0.0034333	3	0.00366667	4	15.2412
14	2	0.135333			10	0.121			4	0.0212	1	0.0208	3	0.916	5	0.0036	5	0.00366667	4	15.25067
15	2	0.135333			4	0.122633333			11	0.0212	3	0.021	4	0.921	4	0.0036	3	0.0039	10	15.32
16					4	0.123333333			4	0.0212333	1	0.021667	4	0.9420667	4	0.0038	4	0.0041	14	15.33333
17					4	0.1236			14	0.0215667	1	0.021967	4	0.9513333			4	0.00433333	10	15.34667
18					11	0.124			4	0.0219	1	0.022447	4	0.9513333					3	15.39
19					4	0.125			4	0.0230	4	0.0230	4	0.9586667					4	15.4373
20					3	0.148			4	0.9586667			4	0.9586667					11	15.54
21									10	0.966333										
22									4	0.972										
Average		0.1200		0.0140		0.1165		0.01697		0.0190		0.01939		0.920		0.003294		0.00351		15.17
Std Dev		0.0085		0.0025		0.0024		0.00066		0.0020		0.00059		0.030		0.000097		0.00011		0.23
H		0.0035		0.0013		0.0034		0.0014		0.0014		0.0015		0.010		0.00068		0.00070		0.055
U <sub>1</sub>		0.0035		0.0013		0.0042		0.0015		0.0014		0.0016		0.010		0.00068		0.00070		0.055
t-statistic		2.14		2.18		2.09		2.20		2.11		2.10		2.08		2.13		2.12		2.09
U <sub>2</sub>		0.0075		0.0027		0.0088		0.0033		0.0030		0.0033		0.021		0.0015		0.0015		0.12
U <sub>3</sub>		0.0019		0.00076		0.0020		0.0010		0.00072		0.00076		0.0046		0.00036		0.00036		0.026
Certified		<b>0.12</b>		<b>0.014</b>		<b>0.116</b>		<b>0.017</b>		<b>0.019</b>		<b>0.019</b>		<b>0.92</b>		<b>0.0033</b>		<b>0.0035</b>		<b>15.2</b>
Uncertainty		0.02		0.002		0.009		0.002		0.002		0.003		0.07		0.0004		0.0004		0.3
Tolerance		0.06		0.006		0.027		0.006		0.006		0.009		0.21		0.0015		0.0015		0.9

**BS PM15A**

\* Code for method

Certified values listed as weight percent

Analysis	*	W	*	Zr
1	14	0.122	5	0.0001833
2	11	0.124	5	0.0002
3	4	0.140	5	0.00027
4	4	0.141667	12	0.00027
5	4	0.1423	3	0.0006
6	4	0.1423	4	0.0008
7	5	0.143	11	0.0011
8	3	0.143333	4	0.0013
9	4	0.143667		
10	5	0.144333		
11	5	0.144333		
12	4	0.1446		
13	4	0.144667		
14	4	0.147333		
15	4	0.148033		
16	4	0.149667		
17	3	0.158667		
18	3	0.16		
19	10	0.164667		
<b>Average</b>		0.145		0.00059
<b>Std Dev</b>		0.010		0.00011
<b>H</b>		0.0038		0.0038
<b>U<sub>1</sub></b>		0.0038		0.0038
<b>t-statistic</b>		2.10		2.36
<b>U<sub>2</sub></b>		0.0080		0.0091
<b>U<sub>3</sub></b>		0.0018		0.0032
<b>Certified</b>		<b>0.145</b>		<b>0.0005</b>
<b>Uncertainty</b>		0.005		0.0003
<b>Tolerance</b>		0.015		0.0004

**BS PM15A**

\* Code for method

Reference values listed as weight percent

Analysis	*	Al	*	Ca	*	Mg	*	Sb	*	Zn
1	12	0.0018	3	0.0001	3	0.0000080	12	0.00054	12	0.0000303
2	5	0.0019	4	0.0001333	12	0.000011				
3	5	0.001933	4	0.0004	5	0.000027				
4	5	0.001933			5	0.00005				
5	5	0.002793								
6	5	0.0029								
7	11	0.0046								
8	4	0.004867								
9	4	0.005033								
10	14	0.0052								
11	4	0.0052								
12	4	0.0054								
13	3	0.0055								
<b>Average</b>		0.003774		0.000244		0.00002970		0.000540		0.0000303
<b>Std Dev</b>		0.000088		0.000069		0.00000090		0.000017		0.0000016
<b>H</b>		0.00072		0.00026		0.00014		0.00034		0.0038
<b>U<sub>1</sub></b>		0.00072		0.00027		0.00014		0.00034		0.0038
<b>t-statistic</b>		2.18		4.30		3.18		12.71		12.71
<b>U<sub>2</sub></b>		0.0016		0.0012		0.00043		0.0043		0.049
<b>U<sub>3</sub></b>		0.00044		0.00067		0.00022		0.0043		0.049
<b>Reference</b>		<b>0.004</b>		<b>&lt;0.005</b>		<b>&lt;0.005</b>		<b>&lt;0.005</b>		<b>&lt;0.005</b>
<b>Uncertainty</b>		0.002								
<b>Tolerance</b>		0.003								

For each element, in accordance with the requirements of ISO 17034 and 33405, an effort must be made to account for the effects on the certified value of the uncertainty estimate from homogeneity testing (H) and the uncertainties of the contributing laboratories. The average (A) is calculated using a weighted mean where the reciprocal of the square of each laboratory's combined uncertainty (C<sub>L</sub>), calculated from its standard deviation (S<sub>L</sub>) and its uncertainty estimate (U<sub>L</sub>), is used as the weight (W<sub>L</sub>) for its mean (M<sub>L</sub>). The standard deviation (S) is calculated as the square root of the reciprocal of the sum of the weights. U<sub>1</sub> is the combined uncertainty from homogeneity and labs. U<sub>2</sub> is U<sub>1</sub> multiplied by the coverage factor (95 % t-statistic). U<sub>3</sub> is U<sub>2</sub> divided by the square root of the number of determinations (n). Thus:

$$C_L = \sqrt{S_L^2 + U_L^2} \quad W_L = \frac{1}{C_L^2} \quad A = \frac{\sum_{i=1}^n W_L M_L}{\sum_{i=1}^n W_L} \quad S = \frac{1}{\sqrt{\sum_{i=1}^n W_L}} \quad U_1 = \sqrt{H^2 + S^2} \quad U_2 = t \times U_1 \quad U_3 = \frac{U_2}{\sqrt{n}}$$

All but the final reported values are taken to two significant figures as determined by each quantity's uncertainty estimate. The final reported Uncertainty is U<sub>3</sub> rounded to one significant figure and represents the half width of the 95 % confidence interval for the **Certified** value. The final reported **Certified** value is A rounded to the same decimal place as the Uncertainty. The Uncertainty is a measure of the quality of the **Certified** value.

The Tolerance is a measure of the expected performance of an analysis. This involves further expanding the sample uncertainty to include instrument and operator uncertainty, for those without access to such calculations.

For further information regarding the confidence interval for the certified value see ISO Standard 33405:2024 section 10.

**BS PM15A** \* Code for analytical method Trace analysis listed as mg/kg (ppm)

Analysis	*	Cl	*	Ga	*	Ge	*	Ir	*	Na	*	Os	*	Re	*	Se						
1	12	0.01	12	23	12	10	12	0.01	12	0.02	12	0.01	12	1.3	12	13						
2	12	0.01	12	24	12	10	12	0.02	12	0.02	12	0.01	12	1.3	12	13						
3	12	0.02	12	24	12	11	12	0.02	12	0.02	12	0.02	12	1.3	12	13						

### Analytical Method Codes:

- |   |                         |    |                         |    |                        |
|---|-------------------------|----|-------------------------|----|------------------------|
| 1 | Combustion (ASTM E1019) | 7  | Photometric             | 13 | Titrimetric            |
| 2 | Fusion (ASTM E1019)     | 8  | Flame Atomic Absorption | 14 | DCP Atomic Emission    |
| 3 | Spark Atomic Emission   | 9  | GF Atomic Absorption    | 15 | HG Atomic Fluorescence |
| 4 | ICP Atomic Emission     | 10 | X-Ray Fluorescence      | 16 | Difference             |
| 5 | ICP Mass Spectrometry   | 11 | GD Atomic Emission      |    |                        |
| 6 | Gravimetric             | 12 | GD Mass Spectrometry    |    |                        |

ICP = Inductively Coupled Plasma      GF = Graphite Furnace      GD = Glow Discharge  
DCP = Direct Current Plasma      HG = Hydride Generation

Lab Name	Location	Registrar	Accreditation
Brammer Standard Company, Inc.	Houston, TX	A2LA	17025, 17034
NSL Analytical	Cleveland, OH	ANAB	17025
Anderson Laboratories, Inc.	Greendale, WI	A2LA	17025
Elemental Analysis, Inc.	Lexington, KY	A2LA	17025
Elemental Analysis, Inc.	Lexington, KY	A2LA	17025
TUV Rheinland Pvt Ltd	Bangalore, India	NABL	17025
Element Materials Technology	Glendale Heights, IL	A2LA	17025
Dirats Laboratories	Westfield, MA	ANAB	17025
Laboratory Testing, Inc.	Hatfield, PA	A2LA	17025
Vitkovic Testing Center	Hulvaky, Ostrava	Czech Accreditation Institute	17025
APL, Inc	Milwaukee, WI	A2LA	17025
Luvak Inc.	Boylston, MA	PRI	17025
Eurofins EAG Materials Science, LLC	Liverpool, NY	A2LA	17025
Instytut Metalurgii Zelaza	Gliwice, Poland	PCA	17025
Raghavendra Spectro Metallurgical Laboratory	Karnataka, India	NABL	17025
National Analysis Center For Iron And Steel	Beijing, China	CNAS	17025

A2LA = American Association for Laboratory Accreditation

ANAB = ANSI-ASQ National Accreditation Board

CNAS = China National Accreditation Service

NABL = National Accreditation Board for Testing and Calibration Laboratories

PCA = Polish Center For Accreditation

PRI = Performance Review Institute

**Analysis:** Chemical analyses were made on solid pieces and chips prepared by an end mill from representative samples for the certified portion of the lot in accordance with ASTM Standard Practice E1806. The laboratories participating in the testing followed the requirements of ISO Standard 17025.

**Traceability:** The following Certified Reference Materials were used to validate the analytical data: 12X3500; AR 303, 307, 310, 315, 319, 510, 555, 556, 644, 645, 647, 657, 673, 675, 676, 870, 871, 881, 882, 1650, 1652, 1653, 1657; BAS 335, 464/1, 535; BS A-11, CSN 2-1, H-13, M-50, PM15, XCCS-2, 10V, 34B, 35A, 36A, 43A, 188B, 300A, 347C, 1045, 2023, 4952; DSZU CA02; ECRM 274-1F; IARM Fe15V-15, 42B, 42C, 152B, 199C, 251A, 259A; IPT 24-6, 28-6; JSS GS-1d; LECO 501-024, 501-503, 502-016, 502-060, 502-413, 502-856, 502-874, 502-887, 502-899, 502-903, 502-913, 502-918, 502-919, 502-935, 503-537, 503-542, 762-747; NCS NS 11043; SPL CM-10B, CZ 2019A, CZ 2022B; SRM C2400, 14D, 33D, 122G, 122I, 132A, 361, 362, 364, 3107, 3109A, 3131A.

**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 A-11, H-13, M-50, 10V, 34B; ECRM 274-1D; IARM FeV15V-8.

**Validity statement:** ISO Standard 33401 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 PM15A 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 Latrobe Specialty Steel Co.; Vienna, OH.

**Form:** This CRM is machined in the form of a disc, approximately 51mm in diameter and 19mm thick by Brammer Standard Company, Inc.

**Use:** This CRM is intended for use in spark atomic emission, glow discharge, and x-ray spectrometric methods of analysis. Refer to ISO Standard 33403 for information about the use of Certified Reference Materials.

**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.

**Certificate Number:** The unique identification number for this certificate of analysis is PM15A-030926. You may obtain information on revisions of certificates from the internet at [www.brammerstandard.com](http://www.brammerstandard.com).

**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 17034:2016 as a Reference Material Producer for the production of Certified Reference Materials and Reference Materials (our current Certificate Number 656.02 expires 01/31/2027)**

**Brammer Standard Company's Chemical Laboratory is accredited by A2LA to ISO Standard 17025:2017. (Our current Certificate Number 656.01 expires 01/31/2027)**

**By current Certificate Number 10539 expiring 01/01/2027, the Quality System of Brammer Standard Company, Inc., is registered to ISO 9001:2015 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 Standard 33401:2024 Reference materials - Contents of certificates, labels and accompanying documentation

ISO Standard 33403:2024 Reference materials – Requirements and recommendations for use

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

ISO Standard 33405:2024 Reference Materials – Approaches for characterization and assessment of homogeneity and stability

*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 March 09, 2026.

Beau R. Brammer

President