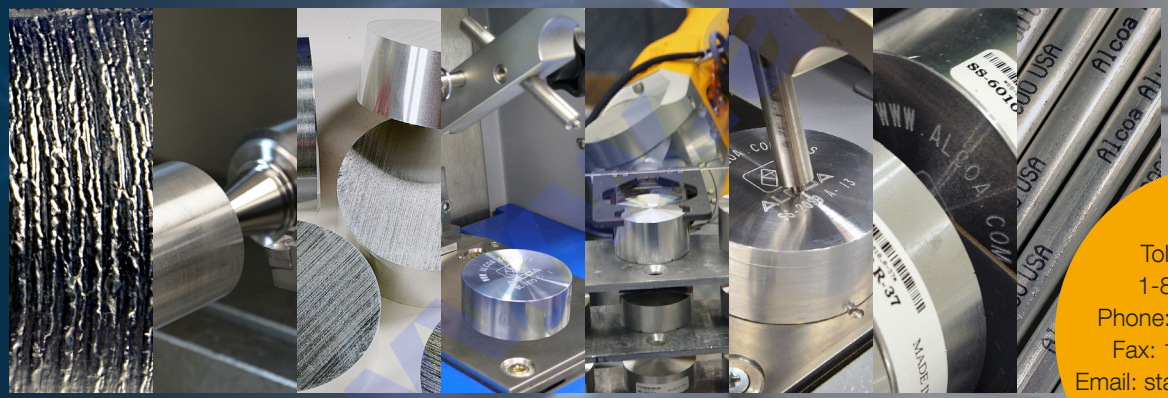
Product Catalog

ALCOA

Spectrochemical Standards

Certified Reference Materials for the Analysis of Aluminum and Aluminum Alloys



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— Quality Accreditations —

- **Guide 34 Certification** (by ANAB)
- **ISO 17025 Certification** (by A2LA)
- **ISO 9001 Certification** (by BSI)

Revision 14 - October 2015

ALCOA SPECTROCHEMICAL STANDARDS

CERTIFIED REFERENCE MATERIALS (CRMs)
FOR THE ANALYSIS OF ALUMINUM
AND ALUMINUM ALLOYS

ALCOA INC.
ALCOA TECHNICAL CENTER
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Registered to ISO 9001:2008
by BSI Management Systems

Accredited to ISO/IEC 17025:2005 by A2LA

Accredited to ISO Guide 34:2009 by ANAB

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GENERAL INFORMATION

An Introduction to Alcoa

A global leader in lightweight metals engineering and manufacturing, Alcoa innovates multi-material solutions that advance our world. Our technologies enhance transportation, from automotive and commercial transport to air and space travel, and improve industrial and consumer electronics products.

We enable smart buildings, sustainable food and beverage packaging, high-performance defense vehicles across air, land and sea, deeper oil and gas drilling and more efficient power generation.

We pioneered the aluminum industry over 125 years ago, and today, our 60,000 people in 30 countries deliver value-add products made of titanium, nickel and aluminum, and produce best-in-class bauxite, alumina and primary aluminum products.

An integral and invaluable supplement to the capabilities of Alcoa's worldwide operations is the detailed experience of Alcoa's CRM business personnel in the production and use of aluminum CRMs.

Alcoa Spectrochemical Standards

Alcoa has been producing reference materials for the aluminum industry for more than 70 years. Alcoa CRMs are widely recognized for their uniformity and certification accuracy. Because many laboratories depend on Alcoa CRMs, a quantity and variety of CRMsare maintained to meet customer demands. Should the CRMs listed in the catalog not meet specific customer requirements, Alcoa experts may suggest alternative CRMs or the purchase of specialty CRMs made to the customer's own specifications. This catalog lists the CRMs available at the time of printing. However, Alcoa reserves the right to discontinue any CRM, to limit the quantity supplied to any customer, to modify compositions within registered alloy limits and to change prices at any time.

Intended Use of Alcoa Spectrochemical Standards

Alcoa CRMs and RMs in disc form are intended for use with Spark-AES instruments for analysis of chill cast disks as described in ASTM methods E607, E716, and E1251. Samples in any form other than chill cast discs (ingot, billet, sheet, plate, extrusion, forging, castings, etc.) should be remelted and cast in disk form, as described in ASTM B985, prior to comparison to alloy standards due to the effects of macro and micro segregation and metallurgical structure on spectral response. CRMs may be used for calibration, type standardizing, control standards and method validation for Spark-AES methods. RMs, typically designated as "SQ", are intended for drift correction of Spark-AES instruments. The CRMs may also be used for calibration, control and method validation for other methods including but not limited to classical wet chemical approaches, ICP-AES, ICP-MS, GD-AES, GD-MS, and XRF. To support these methods, all CRMs included in the catalog are available as lathe turnings in 100 gram bottles. Regardless of the methods employed, it is recommended that the zone lying within a 12 mm radius of the center of the specimen be avoided because of the slight radial segregation that may occur in that zone.

Form, Preparation, and Certification

CRMs are prepared in the form of 64mm diameter, circular disks. Thickness is approximately 25mm, with the few exceptions indicated in the catalog listings. All CRMs are stenciled to show catalog number, production lot and section number. Metallurgical structure is controlled to produce spectral behaviors matching that of chill-cast disks when used according to the methods cited. Most of the CRMs for hypoeutectic aluminum-silicon alloys such as 356 are modified by the addition of strontium to the melts. Compositions are determined using two or more independent analytical methods which may include wet chemical analysis, ICP-AES, XRF , Spark-AES, glow discharge mass spectrometry or other approaches deemed appropriate for a specific application. All CRMs are evaluated for uniformity both within and among specimens by extensive Spark-AES testing. Extensive statistical analysis is used to ensure the accuracy of the final composition certification, the chemical and physical uniformity, and the performance of the CRMs in use.

Traceability to National Institute of Standards and Technology

During the certification process NIST traceable CRMs, both solid and liquid, are employed, as well as NIST traceable weights for the calibration of balances used both in the CRMs production and the analytical methods used for certification. All standard certification documentation contain the following statement of traceability: "These certified reference materials (CRMs) are prepared and certified for the spectrochemical analyses of aluminum alloys using methodology similar to that described in ASTM methods E716 and E1251. All certifications are

produced using at least two independent methods and detailed statistical analysis to assure homogeneity. Traceability to the National Institute of Standards and Technology (NIST) is maintained through the use of NIST Standard Reference Materials® (SRM) or reference materials directly traceable to NIST SRMs. Balances used during production and analyses are calibrated with and traceable to NIST standard weight sets."

Limits of Uncertainty

The certified values reported on the certificate of analysis are generally weighted mean values from analysis of representative samples, using at least two independent analytical methods. The given limits of uncertainty represent a combined uncertainty and seek to estimate, with a 95% confidence level, a range in which the true value may be expected to lie. While the homogeneity of the ingots and the mean values given as the certified compositions are determined using rigorous statistical techniques, the cited uncertainties represent not only this statistical treatment but also estimates of bias based on extensive historical data and technical judgment. The uncertainties cited represent an expanded uncertainty given by $U=ku_c$ where u_c represents the combined standard uncertainty and k is a coverage factor chosen to represent a desired level of confidence. For this application k=2 and U expresses an estimate of a 95% confidence level. The use of this expression is consistent with guidelines given in the ISO document "Guide to The Expression of Uncertainty in Measurement" and NIST Technical Note 1297 "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results". In some cases no uncertainty is given because of limited data or the lack of a second independent measure. Uncertainties are not provided for estimated compositions (i.e. bracketed numbers).

Selection of CRMs

Tables 1 through 16 list CRMs classified by alloy using Aluminum Association designations, when available, and Alcoa designations in other cases. Under each alloy are listed those CRMs specifically prepared for that alloy. Among them, one will have a catalog number consisting of "SS" followed by the alloy designation. This SS standard has a composition typical of the alloy and is used both in the preparation of analytical curves and for the periodic adjustment of these curves. When only an SS standard is listed, it is to be assumed that the analytical curves can be established by this SS standard and a combination of CRMs of other alloys for which CRMs are listed or from the CRMs listed for single elements in Table 18. Range CRMs for wrought alloys are identified with a two letter prefix beginning with W (WA, WB, etc.). Range CRMs for casting alloys have a two letter prefix beginning with K (KA, KB, etc.). Table 16 includes CRMs for use in preparing calibration curves and for a number of elements not adequately covered by the alloy CRMs in Tables 1 through 15. Compositions listed in this catalog are only approximate since successive lots under a given catalog number vary to some degree. The composition specifically applying to a given standard section is furnished when the standard is shipped. Certified compositions are usually reported utilizing the Aluminum Association rules for reporting compositions. Concentrations listed in parentheses are considered reference values only and are not certified.

Trace Metal CRMs

Alcoa Trace Metal CRMs supplement our regular alloy CRMs and are made with pure aluminum. A unique method for trace metal additions allows alloys to be produced with highly controlled trace metal concentrations. Trace metal concentrations have been picked to provide both low end calibration points (<0.0001%) and points that are typical for trace metal content and that can be measured with good precision and accuracy by today's instrumentation. Table 16 provides a list of trace metal CRMs along with typical concentrations. Actual concentrations may vary from those shown but will always be certified using a combination of analytical techniques including Optical Emission Spectrometry, Inductively Coupled Plasma Spectrometry, Glow Discharge Mass Spectrometry, and other appropriate techniques.

For some of the most sought after aluminum CRMs, our nominal alloy standard has been modified to include trace metals of interest. CRMs designated by the prefix "ST" have been made to be similar to a specific alloy family which is indicated by the number following the "ST" designation, e.g. ST1-1050. Note: Values given as less than, denoted by "<", indicate that those elements are typically below this value. No attempt is made to modify the base metal composition for these elements; however, these elements will be certified to the actual composition observed. Actual compositions may vary either above or below those indicated.

Drift Correction RMs

Table 17 shows a series of RMs used for ongoing drift correction when instruments are kept in continuous calibration for a variety of alloys. These "SQ" RMs do not correspond to any particular alloy matrix, and their structures may not match that of chill cast disks. Their recommended use is to provide reproducible spectral intensities for drift correction and their relationship to analytical curves must be determined by the user under the particular conditions of use. The compositions are designed to provide convenient check points on a large number of analytical curves with a minimum of tests. They are checked carefully for reproducibility of spectral response but are not certified with respect to true composition. Only approximate values such as given in Table 17 will be issued with these RMs.

CRMs for Chemical Analysis

With the proliferation of techniques such as inductively coupled plasma spectrometry and X-ray fluorescence spectrometry, Alcoa recognizes the need to supply its CRMs in a form more suitable for use with these and similar techniques. All CRMs in the catalog are available in lathe turnings for subsequent dissolution. Other sizes may be available upon special request.

Specialty CRMs

Every effort is made to supply our customers with a wide variety of alloy CRMs. However, in order to serve our customers' needs, CRMs can be made to customer specifications and target compositions. These specialty CRMs are made to the same exacting quality as our catalog CRMs. (Minimum order quantities are required.) Experts in the production and use of Alcoa Spectrochemical CRMs are available to discuss special needs at the phone numbers listed in the section on Purchase Procedures in this catalog.

ASTM References

Standard Test Method for Analysis of Aluminum and Aluminum Alloys by Spark Atomic Emission SpectrometryASTM Designation E1251.

"Standard Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis," ASTM Designation E716.

"Standard Practices for Sampling Aluminum Billets, Castings, and Finished or Semi-Finished Wrought Aluminum Products for Compositional Analysis," ASTM Designation B985

PURCHASE PROCEDURE

Where to Order

All orders can be placed through:
Alcoa Inc.
Alcoa Spectrochemical Standards
100 Technical Drive
Alcoa Center, PA 15069-0001 USA
Telephone: (724) 337-5816 or 1-800-858-4638
Fax: (724) 337-4090
Email: standards@alcoa.com

Wording of Orders

All orders for spectrochemical CRMs must include the following:

1. Customer order number and date
2. Address for invoicing
3. Address for shipping
4. Name and address of person to receive letter of standard composition
5. Description of required CRMs including catalog number
6. Additional Information:
   a. State whether partial shipments are permitted
   b. Indicate taxes, shipping date, etc. as required

Purchase orders must be mailed, Emailed or faxed prior to order processing. Verbal orders will not be accepted.

Pricing and Shipping

Prices are quoted by the sales office and are subject to change without notice. CRMs are shipped F.O.B. destination via U.P.S. (domestic sales only). Requests of special handling on domestic orders and for shipments outside the United States will be subject to the discretion of Alcoa. Permission for partial shipment will ensure prompt delivery of available CRMs in the event some are out of stock. This catalog lists the CRMs available at this printing, but Alcoa reserves the right to discontinue any standard, to limit the quantity supplied to any customer, to modify compositions within registered alloy limits and to change prices at any time.

American Express, VISA, and MasterCard Accepted

Inquiries and Technical Assistance

It is urged that inquiry be made before placing an order if the availability, description, and applicability of the CRMs are not clear. Experts in the production and application of CRMs are available to assist on technical questions concerning the use of Alcoa CRMs and the analysis of aluminum and its alloys. Inquiries for technical assistance can be placed to the following:

Phone: (724) 337-5816 or 1-800-858-4638
Fax: (724) 337-4090

Email: standards@alcoa.com

Visit us on the web at:
www.alcoa.com/scs

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ACCREDITATIONS

ISO/IEC 17025:2005

The testing methods used during the certification process have been accredited by the American Association of Laboratory Accreditation (A2LA) to the ISO 17025:2005 international standard for 'General Requirements for the Competence of Testing and Calibration Laboratories'. The accreditation also meets the requirements for the International Laboratory Accreditation Cooperation (ILAC) for ISO 17025:2005. As a consequence, the certificates of analysis for standards certified after August 2010 include the A2LA and ILAC logos. Our testing certificate number is **1019.01**

Scope

Spectrochemical Standards Analysis by Optical Emission Spectrometry (OES) by ASTM Test Methods E1251 and E716 performed by Alcoa Technical Center, Material Testing. Alcoa Technical Center is ISO/IEC 17025 Accredited by the American Association for Laboratory Accreditation (A2LA).

Spectrochemical Standards Analysis by Inductively Coupled Plasma (ICP) by AC&PT SOPs SCS ICP SSOP-SCS-ICP-1, -2, -3, -4, -5, and -6 performed by Alcoa Technical Center, Material Testing. Alcoa Technical Center is ISO/IEC 17025 Accredited by the American Association for Laboratory Accreditation (A2LA).

ilac-MRA A2LA ACCREDITED

Testing Certificate # 1019.01
17025:2005 Chemical Testing

ISO Guide 34:2009

Alcoa Spectrochemical Standards holds an accreditation to ISO Guide 34: 2009 international standard for "General Requirements for the Competence of Reference Material Producers". ISO Guide 34 Accreditation is the highest level of quality attainable by reference materials producers. It ensures that the production and certification of Alcoa RMs and CRMs are done in accordance with a rigorous set of internationally recognized requirements. ISO Guide 34 covers the process for making Certified Reference Materials from initial customer inquiry through the manufacturing, testing, certification and distribution of the Aluminum Spectrochemical Standards to our customers.

Scope

Alcoa Spectrochemical Standards holds certificate number **AR-1993** and operates a Quality Management System which complies with ISO Guide 34: 2009 for the manufacturing and certification of both Certified Reference Materials and Reference Materials (Aluminum Alloy Chemical Standards and High Purity Aluminum Chemical Standards).

ANAB ACCREDITED
ISO GUIDE 34
REFERENCE MATERIAL PRODUCER

Certificate Number: AR-1993

ISO 9001:2008

The scope of this ISO 9001:2008 quality system at the Alcoa Technical Center (ATC) includes administrative activities as well as the production and certification of Spectrochemical Standards. The operations process begins in the casting department where ingots are composed of various aluminum alloys. Then the process moves to the machine shop where the ingots are scalped, cut into sections, faced, and stenciled. After the sections are machined, they are then certified using Optical Emission Spectrometry and Inductively Coupled Plasma (ICP) analysis.

The quality system is designed with controls that assure that product quality meets or exceeds the requirements and expectations of our customers. It provides for the prevention of nonconforming product, early detection of discrepancies and corrective action to assure consistent delivery of quality product.

Scope

Alcoa Spectrochemical Standards holds certificate number **FM 535914** and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope: Manufacture and Supply of Spectrochemical Standards.

bsi. ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

FM 535914
ISO 9001:2008

Table 1 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
HIGH PURITY ALUMINUM

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
1000	SS-1000*	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001x	<0.0001	<0.0001
	WA-1000	0.10x	0.10x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	0.010x	<0.0005
	WB-1000	0.10x	0.10x	0.030x	0.030x	0.030x	0.030x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	0.030x	<0.0005
	WC-1000	0.10x	0.10x	0.080x	0.080x	0.080x	0.080x	0.080x	0.080x	0.080x	<0.0010	<0.0010	<0.0010	<0.0005x	0.080x	<0.0005
	WD-1000	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	<0.0010	<0.0010	<0.0010	<0.0005x	0.004x	<0.0005
	WE-1000	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	0.010x	<0.0005
	SS-1020	0.080x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.002x	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	SS-1050	0.12x	0.30x	0.040x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST1-1050	0.15x	0.33x	0.030x	0.040x	0.030x	0.020x	0.010x	0.040x	0.030x	<0.0010	0.0005	<0.0010	0.0002x	0.030x	0.002x
	SS-1075	0.070x	0.12x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
1000	SS-1000*	<0.0001	<0.0001	<0.0001	<0.0001x	<0.0001x	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	WA-1000	<0.0010	<0.0010	<0.0050	<0.0005x	<0.0005x	<0.0010	0.010x	<0.0010	<0.0010	0.010x	<0.0010	0.010x	<0.0030
	WB-1000	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.030x	<0.0010	<0.0010	0.030x	<0.0010	0.020x	<0.0030
	WC-1000	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.080x	<0.0010	<0.0010	0.080x	<0.0010	0.040x	<0.0030
	WD-1000	<0.0010	<0.0010	0.004x	<0.0005x	<0.0005x	<0.0010	0.004x	<0.0010	<0.0010	0.004x	<0.0010	0.004x	<0.0030
	WE-1000	<0.0010	<0.0010	0.010x	<0.0005x	<0.0005x	<0.0010	0.010x	<0.0010	<0.0010	0.010x	<0.0010	0.010x	<0.0030
	SS-1020	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.012x	<0.0030
	SS-1050	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.003x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	ST1-1050	0.0005	0.0005	0.025x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.025x	0.004x
	SS-1075	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.003x	<0.0010	<0.0010	<0.0010	<0.0010	0.030x	<0.0030

*SS-1000 is greater than 99.999% pure.

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 2 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
11XX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
1100	SS-1100	0.18x	0.50x	0.15x	0.040x	0.030x	<0.0050	<0.0050	0.080x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-1100	0.12x	0.30x	0.20x	0.080x	0.050x	<0.0050	<0.0050	0.020x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WB-1100	0.22x	0.60x	0.10x	0.020x	0.010x	<0.0050	<0.0050	0.040x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
1188	SS-1188	0.040x	0.060x	<0.0050	0.005x	0.010x	<0.0050	<0.0050	0.010x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
1199	WA-1199	0.002x	0.002x	0.001x	0.001x	0.001x	0.001x	0.001x	0.001x	0.001x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0005

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
1100	SS-1100	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WA-1100	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WB-1100	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
1188	SS-1188	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
1199	WA-1199	0.001x	0.001x	0.001x	<0.0005x	<0.0005x	<0.0010	0.003x	0.003x	<0.0010	0.001x	<0.0010	0.001x	0.001x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 3 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
2XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	**Catalog Number**	**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Ni**	**Zn**	**Ti**	**Ag**	**As**	**B**	**Be**	**Bi**	**Ca**
2011	SS-2011	0.30x	0.55x	5.5x	0.040x	0.040x	0.040x	0.040x	0.10x	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	0.50x	<0.0005
	WA-2011	0.20x	0.70x	4.9x	0.060x	0.020x	0.060x	0.020x	0.15x	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	0.60x	<0.0005
	WB-2011	0.40x	0.25x	6.0x	0.020x	0.060x	0.020x	0.060x	0.050x	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	0.40x	<0.0005
2014	SS-2014	1.0x	0.50x	4.5x	0.80x	0.55x	0.040x	0.040x	0.12x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
2017	SS-2017	0.60x	0.45x	4.0x	0.60x	0.60x	0.050x	0.030x	0.070x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-2017	0.75x	0.65x	3.5x	0.40x	0.75x	0.020x	0.060x	0.030x	0.050x						
2018	SS-2018	0.70x	0.40x	4.2x	0.050x	0.65x	0.050x	2.1x	0.12x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	0.050x	<0.0005
2024	SS-2024	0.20x	0.35x	4.6x	0.65x	1.6x	0.060x	0.040x	0.10x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-2024	0.30x	0.30x	4.0x	0.70x	1.6x	0.060x	0.040x	0.060x	0.030x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
	WB-2024	0.30x	0.30x	5.0x	0.70x	1.6x	0.060x	0.040x	0.25x	0.030x				<0.0005x		
	WE-2024	0.45x	0.20x	4.6x	0.45x	1.6x	0.10x	0.020x	0.25x	0.010x				0.007x		
	WF-2024	0.15x	0.45x	4.6x	0.80x	1.6x	0.020x	0.070x	0.030x	0.060x				0.002x		

Typical Analysis - Weight Percent														
Alloy	**Catalog Number**	**Cd**	**Co**	**Ga**	**Li**	**Na**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**	**V**	**Zr**	
2011	SS-2011	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.50x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-2011	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.40x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WB-2011	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.60x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
2014	SS-2014	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
2017	SS-2017	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-2017			0.020x									0.010x		
2018	SS-2018	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.050x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
2024	SS-2024	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	**See Also SS-2324**
	WA-2024	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WB-2024														
	WE-2024														
	WF-2024														

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 3 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
2XXX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
2025	SS-2025	0.80x	0.55x	4.6x	0.80x	0.050x	0.040x	0.040x	0.10x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
2117	SS-2117	0.50x	0.40x	2.6x	0.050x	0.30x	0.030x	0.030x	0.050x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
2xxx	ST2-2000	0.50x	0.45x	2.5x	0.50x	0.50x	0.050x	0.010x	0.15x	0.030x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
2219	SS-2219	0.15x	0.20x	6.3x	0.28x	0.020x	0.010x	0.010x	0.030x	0.060x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
2324	SS-2324	0.050x	0.050x	4.2x	0.50x	1.5x	0.010x	0.010x	0.010x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
2618	SS-2618	0.20x	1.2x	2.2x	0.050x	1.6x	<0.0050	1.1x	0.050x	0.070x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
2724	***SS-2724***	***0.035x***	***0.050x***	***4.3x***	***0.60x***	***1.5x***	***<0.0050***	***<0.0050***	***0.065x***	***0.020x***	***<0.0010***	***<0.0010***	***<0.0010***	***<0.0005x***	***<0.0010***	***<0.0005***

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr	
2025	SS-2025	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
2117	SS-2117	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
2xxx	ST2-2000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x	
2219	SS-2219	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.12x	0.16x	
2324	SS-2324	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	**See Also SS-2024**
2618	SS-2618	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
2724	***SS-2724***	***<0.0010***	***<0.0010***	***0.010x***	***<0.0005x***	***<0.0005x***	***<0.0010***	***<0.0030***	***<0.0010***	***<0.0010***	***<0.0010***	***<0.0010***	***0.010x***	***0.10x***	***Call for availability***

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 4 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
3XXX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
3003	SS-3003	0.20x	0.50x	0.15x	1.2x	0.030x	<0.0050	<0.0050	0.080x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-3003	0.40x	0.65x	0.090x	0.95x	0.010x	0.030x	0.030x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
	WB-3003	0.15x	0.30x	0.20x	1.5x	0.050x	<0.0050	<0.0050	0.020x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST1-3003	0.30x	0.33x	0.15x	1.2x	<0.0010	<0.0005	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST2-3003	0.30x	0.65x	0.15x	1.2x	0.010x	0.015x	0.020x	0.020x	0.020x	<0.0010	0.0005	<0.0010	0.0002x	0.020x	0.002x
	ST2-3000	0.20x	0.50x	0.15x	1.2x	0.030x	0.010x	0.010x	0.050x	0.020x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
3004	SS-3004	0.18x	0.50x	0.15x	1.2x	1.1x	<0.0050	<0.0050	0.050x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-3004	0.22x	0.60x	0.10x	1.0x	1.3x	0.010x	0.010x	0.15x	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	0.005x	<0.0005
	WB-3004	0.10x	0.40x	0.20x	1.4x	0.90x	0.020x	0.020x	0.10x	0.050x					0.002x	
	ST1-3000	0.20x	0.50x	0.15x	1.2x	1.0x	0.010x	0.010x	0.050x	0.020x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
3003	SS-3003	<0.0005	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WA-3003	0.001x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.006x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WB-3003	0.003x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	ST1-3003	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	ST2-3003	0.0005	0.0005	0.020x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.015x	0.004x
	ST2-3000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
3004	SS-3004	<0.0005	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WA-3004	0.001x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.006x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WB-3004	0.003x		0.020x				0.020x					0.010x	
	ST1-3000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 4 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
3XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
3005	SS-3005	0.22x	0.60x	0.15x	1.2x	0.40x	0.020x	0.010x	0.030x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
3102	SS-3102	0.25x	0.45x	0.070x	0.18x	0.020x	0.020x	0.020x	0.10x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
3104	***SS-3104***	***0.25x***	***0.42x***	***0.20x***	***1.0x***	***1.2x***	***0.015x***	***0.005x***	***0.01x***	***0.020x***	***<0.0010***	***<0.0010***	***<0.0005***	***<0.0005x***	***<0.0010***	***<0.0005***
	ST2-3104	0.20x	0.40x	0.20x	1.0x	1.2x	0.015x	0.030x	0.060x	0.020x	<0.0010	<0.0010	<0.0005	0.001x	0.008x	0.003x
3105	SS-3105	0.20x	0.50x	0.15x	0.40x	0.50x	0.050x	0.020x	0.20x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
3005	SS-3005	<0.0005	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
3102	SS-3102	<0.0005	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
3104	***SS-3104***	***<0.0010***	***<0.0010***	***0.015x***	***<0.0005x***	***<0.0005x***	***<0.0010***	***<0.0030***	***<0.0010***	***<0.0010***	***0.001x***	***<0.0010***	***0.015x***	***<0.0030***
	ST2-3104	0.001x	<0.0010	0.020x	0.003x	0.003x	0.002x	0.004x	0.002x	<0.0010	0.015x	0.002x	0.020x	0.002x
3105	SS-3105	<0.0005	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Call for availability

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

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Table 5 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
4XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
4032	SS-4032	12.2	0.30x	0.90x	0.030x	1.1x	0.050x	0.90x	0.10x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
4043	SS-4043	5.2x	0.30x	0.050x	0.020x	0.020x	0.025x	0.035x	0.030x	0.045x	<0.0010	<0.0010	<0.0010	<0.0005x	0.010x	<0.0030

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
4032	SS-4032	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	0.020x	0.010x	<0.0030
4043	SS-4043	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.010x	<0.0010	<0.0010	0.010x	0.005x	0.015x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 6 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
5XXX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
5005	SS-5005	0.15x	0.50x	0.060x	0.030x	0.85x	0.020x	0.020x	0.060x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-5005	0.12x	0.55x	0.030x	0.010x	0.35x	0.010x	0.010x	0.030x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	0.030x	<0.0005
	WB-5005	***0.010x***	***0.010x***	***<0.0050***	***<0.0050***	***0.80x***	***<0.0050***	***<0.0050***	***<0.0050***	***<0.0050***	***<0.0010***	***<0.0010***	***<0.0010***	***<0.0005x***	***<0.0010***	***<0.0005***
5042	SS-5042	0.10x	0.23x	0.030x	0.30x	3.5x	<0.0050	<0.0050	0.010x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5050	SS-5050	0.18x	0.45x	0.050x	0.040x	1.4x	0.030x	0.030x	0.040x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST1-5000	0.15x	0.30x	0.050x	0.050x	1.8x	0.15x	0.030x	0.040x	0.020x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
5052	SS-5052	0.15x	0.20x	0.060x	0.050x	2.6x	0.25x	0.050x	0.080x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-5052	0.25x	0.10x	0.10x	0.020x	2.2x	0.30x	0.010x	0.12x	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WB-5052	0.080x	0.30x	0.020x	0.10x	2.8x	0.15x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST1-5052	0.15x	0.30x	0.10x	<0.0010	2.7x	0.25x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST2-5052	0.15x	0.30x	0.10x	0.050x	2.7x	0.25x	0.020x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	0.0002x	0.020x	0.002x

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr	
5005	SS-5005	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-5005	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	0.030x	<0.0010	<0.0010	0.010x	<0.0010	0.010x	<0.0030	
	WB-5005	***<0.0010***	***<0.0010***	***0.015x***	***<0.0005x***	***<0.0005x***	***<0.0010***	***<0.0030***	***<0.0010***	***<0.0010***	***<0.0010***	***<0.0010***	***0.010x***	***<0.0030***	***Call for availability***
5042	SS-5042	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
5050	SS-5050	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	ST1-5000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	0.001x	0.001x	0.001x	0.010x	0.001x	
5052	SS-5052	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-5052	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015	<0.0030	
	WB-5052	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	ST1-5052	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	ST2-5052	0.0005	0.0005	0.025x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.015x	0.004x	

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Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 6 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
5XXX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
5056	SS-5056	0.15x	0.20x	0.080x	0.10x	5.3x	0.11x	0.050x	0.050x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-5056	0.15x	0.20x	0.080x	0.10x	4.7x	0.11x	0.050x	0.050x	<0.0050				0.0001x		
	WB-5056	0.15x	0.20x	0.080x	0.10x	5.8x	0.11x	0.050x	0.050x	<0.0050				0.003x		
5056	WC-5056	0.25x	0.40x	0.010x	0.050x	5.3x	0.20x	0.020x	0.020x	<0.0050	<0.0010	<0.0010	<0.0010	0.008x	<0.0010	<0.0005
5082	SS-5082	0.12x	0.25x	0.040x	0.040x	4.5x	0.040x	0.010x	0.040x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5083	SS-5083	0.15x	0.20x	0.050x	0.80x	4.5x	0.10x	0.010x	0.050x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5086	SS-5086	0.15x	0.25x	0.050x	0.50x	4.0x	0.12x	0.030x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5154	SS-5154	0.15x	0.25x	0.050x	0.030x	3.6x	0.25x	0.030x	0.050x	0.080x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5182	SS-5182	0.15x	0.20x	0.050x	0.35x	4.6x	0.030x	0.020x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-5182	0.20x	0.30x	0.010x	0.30x	4.8x	0.050x	0.010x	0.020x	0.040x	<0.0010	<0.0010	<0.0010	0.0005x	<0.0010	<0.0005
	WB-5182	0.080x	0.10x	0.070x	0.45x	4.4x	0.010x	0.040x	0.10x	0.010x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
5056	SS-5056	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WA-5056			0.020x									0.010x	
	WB-5056			0.020x									0.010x	
5056	WC-5056	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.080x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
5082	SS-5082	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
5083	SS-5083	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
5086	SS-5086	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
5154	SS-5154	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
5182	SS-5182	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WA-5182	0.003x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WB-5182	0.001x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.006x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 6 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
5XXX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
5252	SS-5252	0.030x	0.050x	0.040x	0.010x	2.5x	<0.0050	<0.0050	0.010x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5357	SS-5357	0.050x	0.080x	0.080x	0.25x	1.1x	0.010x	0.010x	0.020x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5454	SS-5454	0.15x	0.20x	0.070x	0.80x	2.8x	0.10x	0.010x	0.050x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-5454	0.080x	0.10x	0.020x	0.50x	2.5x	0.050x	0.030x	0.15x	0.020x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
5456	SS-5456	0.15x	0.020x	0.060x	0.80x	5.2x	0.10x	0.010x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-5456	0.10x	0.25x	0.10x	0.50x	5.5x	0.15x	0.010x	0.25x	0.050x				0.001x		
5657	SS-5657	0.040x	0.060x	0.040x	0.020x	0.80x	0.010x	0.010x	0.020x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
5754	SS-5754	0.11x	0.21x	0.055x	0.35x	3.3x	0.080x	<0.0050	0.015x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr	
5252	SS-5252	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0030	
5357	SS-5357	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	**See Also SS-5657**
5454	SS-5454	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-5454	<0.0010	<0.0010	0.020x	0.001x	0.001x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
5456	SS-5456	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-5456			0.020x									0.010x		
5657	SS-5657	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	**See Also SS-5357**
5754	SS-5754	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 7 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
6000 ALLOYS RANGE STANDARDS

Typical Analysis - Weight Percent																
Alloy	**Catalog Number**	**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Ni**	**Zn**	**Ti**	**Ag**	**As**	**B**	**Be**	**Bi**	**Ca**
6000 Range Standards	WA-6000	0.60x	0.30x	0.10x	0.030x	0.45x	0.030x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WB-6000	0.60x	0.30x	0.10x	0.030x	0.60x	0.030x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WC-6000	0.60x	0.30x	0.10x	0.030x	0.75x	0.030x	0.030x	0.030x	0.030x						
	ST1-6000	0.55x	0.30x	0.15x	0.050x	0.80x	0.15x	0.050x	0.080x	0.040x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
	WD-6000	0.60x	0.30x	0.10x	0.030x	0.95x	0.030x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WF-6000	0.60x	0.30x	0.10x	0.030x	1.2x	0.030x	0.030x	0.030x	0.030x						
	WG-6000	0.60x	0.30x	0.10x	0.030x	1.4x	0.030x	0.030x	0.030x	0.030x						
	WH-6000	0.25x	0.30x	0.10x	0.030x	0.90x	0.030x	0.030x	0.030x	0.030x						
	WJ-6000	0.35x	0.30x	0.10x	0.030x	0.90x	0.030x	0.030x	0.030x	0.030x						
	WK-6000	0.50x	0.30x	0.10x	0.030x	0.90x	0.030x	0.030x	0.030x	0.030x						
	WL-6000	0.70x	0.30x	0.10x	0.030x	0.90x	0.030x	0.030x	0.030x	0.030x						

Typical Analysis - Weight Percent														
Alloy	**Catalog Number**	**Cd**	**Co**	**Ga**	**Li**	**Na**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**	**V**	**Zr**
6000 Range Standards	WA-6000	<0.0010	<0.0010	<0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015x	<0.0030
	WB-6000	<0.0010	<0.0010	<0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015x	<0.0030
	WC-6000													
	ST1-6000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
	WD-6000	<0.0010	<0.0010	<0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015x	<0.0030
	WF-6000													
	WG-6000													
	WH-6000													
	WJ-6000													
	WK-6000													
	WL-6000													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 7 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
6000 ALLOYS RANGE STANDARDS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
6000 Range Standards	WM-6000	0.90x	0.30x	0.10x	0.030x	0.90x	0.030x	0.030x	0.030x	0.030x						
	WP-6000	1.3x	0.30x	0.10x	0.030x	0.90x	0.030x	0.030x	0.030x	0.030x						
	WR-6000	0.60x	0.25x	0.020x	0.080x	0.90x	0.010x	0.050x	0.080x	0.030x						
	WS-6000	0.60x	0.35x	0.050x	0.020x	0.90x	0.030x	0.010x	0.040x	0.080x						
	WT-6000	0.60x	0.15x	0.10x	0.040x	0.90x	0.08x	0.030x	0.020x	0.010x						
	WU-6000	0.60x	0.65x	0.18x	0.040x	0.90x	0.35x	0.030x	0.15x	0.020x						
	WV6000	0.60x	0.80x	0.30x	0.15x	0.90x	0.13x	0.010x	0.080x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WW-6000	0.60x	0.50x	0.45x	0.080x	0.90x	0.25x	0.050x	0.040x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WX-6000	0.42x	0.20x	0.030x	0.020x	0.65x	0.32x	0.010x	0.020x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WZ-6000	0.40x	0.15x	0.030x	0.010x	0.70x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
6000 Range Standards	WM-6000													
	WP-6000													
	WR-6000													
	WS-6000													
	WT-6000													
	WU-6000													
	WV6000	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015	<0.0030
	WW-6000	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015	<0.0030
	WX-6000	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.015	<0.0030
	WZ-6000	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.005x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 7 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
6XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	**Catalog Number**	**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Ni**	**Zn**	**Ti**	**Ag**	**As**	**B**	**Be**	**Bi**	**Ca**
6005	SS-6005	0.75x	0.15x	0.010x	0.010x	0.50x	0.060x	<0.0050	0.030x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6010	SS-6010	1.0x	0.25x	0.32x	0.32x	0.80x	0.040x	0.030x	0.12x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6014	SS-6014	0.62x	0.25x	0.10x	0.13x	0.65x	0.020x	<0.0050	0.080x	0.070x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-6014	0.90x	0.17x	0.060x	0.060x	0.55x	0.030x	<0.0050	0.12x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WB-6014	0.50x	0.20x	0.15x	0.10x	0.60x	0.040x	<0.0050	0.060x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6022	SS-6022	0.90x	0.13x	0.070x	0.070x	0.60x	0.030x	<0.0050	0.10x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6053	SS-6053	0.70x	0.30x	0.050x	0.020x	1.2x	0.25x	0.030x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6061	SS-6061	0.65x	0.35x	0.30x	0.050x	1.0x	0.23x	0.050x	0.080x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-6061	0.60x	0.35x	0.30x	0.050x	1.0x	0.050x	0.050x	0.12x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6063	SS-6063	0.48x	0.25x	0.060x	0.020x	0.65x	0.020x	0.020x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-6063	0.45x	0.17x	0.010x	0.030x	0.48x	<0.0050	<0.0050	<0.0050	0.013x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST1-6063	0.45x	0.22x	<0.0010	<0.0010	0.55x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010

Typical Analysis - Weight Percent														
Alloy	**Catalog Number**	**Cd**	**Co**	**Ga**	**Li**	**Na**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**	**V**	**Zr**	
6005	SS-6005	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.015x	<0.0030	
6010	SS-6010	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6014	SS-6014	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.18x	<0.0030	
	WA-6014	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.050x	<0.0030	
	WB-6014	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.060x	<0.0030	
6022	SS-6022	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.011x	<0.0030	
6053	SS-6053	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	**See Also SS-6253**
6061	SS-6061	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-6061	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6063	SS-6063	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
	WA-6063	<0.0010	<0.0010	0.014x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	0.001x	
	ST1-6063	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	

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Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 7 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
6XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	**Catalog Number**	**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Ni**	**Zn**	**Ti**	**Ag**	**As**	**B**	**Be**	**Bi**	**Ca**
6063	ST2-6063	0.45x	0.22x	0.050x	0.050x	0.55x	0.015x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	0.0002x	0.020x	0.002x
6066	SS-6066	1.5x	0.35x	1.0x	0.90x	1.2x	0.030x	0.030x	0.10x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6070	SS-6070	1.3x	0.25x	0.30x	0.70x	0.80x	0.060x	0.020x	0.15x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6101	WZ-6000	0.40x	0.15x	0.030x	0.010x	0.70x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005x	<0.0010	<0.0005
6111	SS-6111	0.80x	0.25x	0.70x	0.25x	0.60x	0.030x	<0.0050	0.10x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6151	SS-6151	1.0x	0.45x	0.25x	0.060x	0.65x	0.22x	0.040x	0.080x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6201	SS-6201	0.75x	0.25x	0.030x	0.010x	0.75x	<0.0050	<0.0050	0.020x	<0.0050	<0.0010	<0.0010	0.020x	<0.0005x	<0.0010	<0.0005
6253	SS-6253	0.70x	0.25x	0.050x	0.020x	1.3x	0.22x	0.010x	2.0x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6262	SS-6262	0.60x	0.35x	0.30x	0.050x	1.0x	0.040x	0.030x	0.050x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	0.58x	<0.0005
6351	SS-6351	1.0x	0.30x	0.050x	0.70x	0.65x	0.030x	0.020x	0.030x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
6951	SS-6951	0.40x	0.40x	0.30x	0.030x	0.70x	0.020x	0.020x	0.10x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent														
Alloy	**Catalog Number**	**Cd**	**Co**	**Ga**	**Li**	**Na**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**	**V**	**Zr**	
6063	ST2-6063	0.0005	0.0005	0.025x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.010x	0.004x	
6066	SS-6066	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6070	SS-6070	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6101	WZ-6000	<0.0010	<0.0010	<0.020	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.005x	<0.0030	
6111	SS-6111	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	0.003x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6151	SS-6151	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6201	SS-6201	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0030	
6253	SS-6253	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	**See Also SS-6053**
6262	SS-6262	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.58x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6351	SS-6351	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	
6951	SS-6951	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030	

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 8 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
7XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
7001	SS-7001	0.10x	0.15x	2.1x	0.040x	3.1x	0.21x	0.010x	7.6x	0.030x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
7005	SS-7005	0.15x	0.20x	0.10x	0.50x	1.3x	0.10x	0.020x	4.5x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST2-7000	0.15x	0.25x	0.15x	0.20x	1.3x	0.10x	0.020x	3.5x	0.040x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
7010	SS-7010	0.060x	0.080x	1.7x	0.040x	2.3x	0.015x	0.030x	6.2x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
7021	SS-7021	0.12x	0.30x	0.080x	0.050x	1.5x	0.030x	<0.0050	5.4x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
7029	SS-7029	0.10x	0.10x	0.75x	0.020x	1.7x	<0.0050	<0.0050	4.8x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
7039	SS-7039	0.15x	0.20x	0.080x	0.25x	3.0x	0.20x	0.020x	4.0x	0.050x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
7046	SS-7046	0.12x	0.14x	0.15x	0.20x	1.3x	0.10x	<0.0050	7.1x	0.040x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
7047	SS-7047	0.040x	0.050x	0.020x	0.020x	1.5x	0.010x	<0.0050	7.5x	0.030x	0.37x	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
7050	SS-7050	0.080x	0.15x	2.4x	0.030x	2.3x	0.020x	0.020x	6.2x	0.040x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
7055	SS-7055	0.070x	0.10x	2.3x	0.010x	2.0x	0.010x	<0.0050	8.0x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
7065	SS-7065	0.020x	0.040x	2.1x	0.015x	1.6x	0.005x	<0.0050	7.7x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
7001	SS-7001	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
7005	SS-7005	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	0.14x
	ST2-7000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
7010	SS-7010	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	0.13x
7021	SS-7021	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	0.13x
7029	SS-7029	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.020x	<0.0030
7039	SS-7039	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
7046	SS-7046	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	0.12x
7047	SS-7047	<0.0010	<0.0010	0.010x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	0.10x
7050	SS-7050	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	0.12x
7055	SS-7055	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.018x	0.15x
7065	SS-7065	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.007x	0.11x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 8 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
7XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
7072	SS-7072	0.14x	0.28x	0.030x	0.040x	0.030x	0.030x	0.030x	1.1x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
7075	SS-7075	0.16x	0.15x	1.6x	0.080x	2.6x	0.20x	<0.0050	5.8x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WA-7075	0.15x	0.25x	1.2x	0.10x	2.6x	0.25x	<0.0050	5.8x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	WB-7075	0.15x	0.25x	2.0x	0.10x	2.6x	0.25x	<0.0050	5.8x	0.050x				0.001x		
	WC-7075	0.15x	0.25x	1.6x	0.10x	2.2x	0.25x	<0.0050	5.8x	0.050x	<0.0010	<0.0010	<0.0010	0.002x	<0.0010	<0.0005
	WD-7075	0.15x	0.25x	1.6x	0.10x	2.9x	0.25x	<0.0050	5.8x	0.050x				0.001x		
	WE-7075	0.15x	0.25x	1.6x	0.10x	2.6x	0.25x	<0.0050	5.3x	0.050x				<0.0005x		
	WF-7075	0.15x	0.25x	1.6x	0.10x	2.6x	0.25x	<0.0050	6.2x	0.050x				<0.0005x		
	WG-7075	0.30x	0.15x	1.6x	0.20x	2.6x	0.18x	<0.0050	5.8x	0.080x				<0.0005x		
	WH-7075	0.10x	0.35x	1.6x	0.030x	2.6x	0.30x	<0.0050	5.8x	0.010x				0.002x		
	ST1-7000	0.15x	0.25x	1.5x	0.25x	2.5x	0.15x	0.020x	6.5x	0.040x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
7072	SS-7072	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
7075	SS-7075	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.007x	<0.0030
	WA-7075	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WB-7075													
	WC-7075	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	WD-7075													
	WE-7075													
	WF-7075													
	WG-7075													
	WH-7075													
	ST1-7000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 8 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
7XXX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
7076	SS-7076	0.15x	0.35x	0.65x	0.55x	1.7x	0.020x	0.020x	7.6x	0.050x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
7079	SS-7079	0.15x	0.22x	0.65x	0.20x	3.5x	0.16x	<0.0050	4.6x	0.030x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
7178	SS-7178	0.15x	0.20x	2.0x	0.080x	2.9x	0.25x	0.020x	6.8x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
7076	SS-7076	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
7079	SS-7079	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
7178	SS-7178	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 9 - CERTIFIED REFERENCE MATERIALS FOR WROUGHT ALLOYS
8XXX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
8011	SS-8011	0.55x	0.70x	0.020x	0.020x	0.002x	<0.0050	<0.0050	0.020x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
8079	ST1-8079	0.13x	1.2x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010
	ST2-8079	0.13x	1.2x	0.030x	0.003x	0.003x	0.003x	0.004x	0.015x	0.004x	<0.0010	0.0005	<0.0010	0.0002x	0.004x	0.002x
	ST3-8079	0.10x	1.0x	0.010x	0.020x	0.005x	0.010x	0.010x	0.010x	0.010x	<0.0010	<0.0010	<0.0005	0.0005x	0.080x	0.001x

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
8011	SS-8011	<0.0010	<0.0010	0.015x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.012x	<0.0030
8079	ST1-8079	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	ST2-8079	0.0005	0.0005	0.016x	0.0005x	0.001x	0.0005	0.004x	<0.0010	<0.0010	0.005x	0.001x	0.002x	0.004x
	ST3-8079	0.001x	<0.0010	0.020x	0.001x	0.001x	0.0015	0.004x	0.003x	<0.0010	0.020x	0.0015	0.020x	0.002x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 10 - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
2XX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
201	SS-201	0.040x	0.060x	4.5x	0.30x	0.25x	<0.0050	0.005x	0.005x	0.25x	0.55x	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
206	SS-206	0.060x	0.080x	4.6x	0.35x	0.28x	0.010x	0.010x	0.030x	0.20x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
208	SS-208	3.0x	0.60x	4.0x	0.15x	0.050x	<0.0050	0.080x	0.15x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
213	KA-213	2.0x	1.0x	7.0x	0.30x	0.050x	<0.0050	0.20x	1.0x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-213	3.5x	1.0x	7.0x	0.35x	0.15x	<0.0050	0.30x	1.2x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
222	KA-222	0.75x	1.0x	10.0	0.15x	0.30x	<0.0050	0.15x	0.25x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
224	REFER TO ALLOY 2219															
238	SS-238	4.0x	1.0x	10.2	0.20x	0.30x	<0.0050	0.20x	0.20x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
242	SS-242	0.50x	0.55x	4.0x	0.080x	1.5x	0.030x	2.0x	0.10x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-242	0.25x	0.40x	3.6x	0.020x	1.8x	<0.0050	2.2x	0.030x	0.060x					0.020x	
	KB-242	0.40x	0.20x	4.4x	0.050x	1.2x	<0.0050	1.8x	0.050x	0.15x					0.050x	

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
201	SS-201	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.005x	<0.0010	0.010x	<0.0030
206	SS-206	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.020x	<0.0010	0.010x	<0.0030
208	SS-208	<0.0010	<0.0010	0.012x	<0.0010	<0.0010	<0.0010	0.10x	<0.0010	<0.0010	0.10x	<0.0010	0.010x	0.040x
213	KA-213	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.55x	<0.0010	<0.020	<0.0030
	KB-213	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.020	<0.0030
222	KA-222	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.20x	<0.0010	<0.0010	0.12x	<0.0010	<0.020	<0.0030
224	REFER TO ALLOY 2219													
238	SS-238	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
242	SS-242	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
	KA-242							0.020x			0.020x			
	KB-242							0.050x			0.050x			

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 10 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
2XX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
A242	SS-A242	0.30x	0.45x	4.1x	0.050x	1.6x	0.20x	2.0x	0.10x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
295	SS-295	0.90x	0.70x	4.5x	0.12x	0.050x	<0.0050	0.050x	0.10x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-295	0.55x	1.0x	4.1x	0.10x	0.010x	<0.0050	0.020x	0.15x	0.070x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-295	1.3x	0.35x	4.9x	0.030x	0.010x	<0.0050	0.080x	0.050x	0.17x						
296	SS-296	2.8x	0.60x	4.5x	0.20x	0.060x	<0.0050	0.15x	0.25x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
A242	SS-A242	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
295	SS-295	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.003x	<0.0010	0.010x	<0.0030
	KA-295	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.004x	<0.0010	<0.020	<0.0030
	KB-295							0.050x			0.010x			
296	SS-296	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.010x	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 11 - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
3XX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
305	REFER TO KC-355															
308	SS-308	5.5x	0.65x	4.5x	0.10x	0.080x	<0.0050	0.10x	0.25x	0.060x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
319	SS-319	6.2x	0.85x	3.8x	0.50x	0.10x	<0.0050	0.20x	0.35x	0.15x	<0.0010	<0.0010	<0.0010	<0.0005x	0.050x	<0.0030
332	SS-332	9.2x	0.70x	3.2x	0.25x	1.0x	<0.0050	0.50x	0.25x	0.14x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-A332	12.4	0.50x	1.0x	0.060x	<0.0050	<0.0050	2.7x	<0.0050	0.060x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
336	SS-336	12.0	0.65x	1.0x	0.060x	1.2x	<0.0050	2.5x	0.050x	0.040x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
339	SS-339	11.5	0.40x	2.0x	0.20x	0.90x	<0.0050	0.80x	0.60x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
354	SS-354	9.0x	0.15x	1.8x	0.050x	0.55x	0.010x	0.010x	0.050x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-354	9.0x	0.10x	1.8x	0.010x	0.35x	<0.0050	<0.0050	<0.0050	0.060x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-354	9.0x	0.12x	1.8x	0.050x	0.35x	0.010x	0.010x	0.050x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KC-354	9.0x	0.12x	1.8x	0.15x	0.35x	0.010x	0.010x	0.050x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
355	SS-355	5.1x	0.35x	1.3x	0.080x	0.54x	0.025x	0.050x	0.10x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
305	REFER TO KC-355													
308	SS-308	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
319	SS-319	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	0.090x	<0.0010	<0.0010	0.20x	<0.0030	0.020x	<0.0030
332	SS-332	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	0.10x	<0.0010	<0.0010	0.10x	0.020x	0.020x	<0.0030
	KA-A332	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.005x	<0.0030	0.003x	<0.0010	<0.0030	0.020x	0.010x	<0.0030
336	SS-336	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	0.003x	<0.0030	0.003x	<0.0010	<0.0030	0.020x	0.010x	<0.0030
339	SS-339	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.015x	<0.0030
354	SS-354	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.020x	0.020x	0.010x	<0.0030
	KA-354	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	KB-354	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.012x	<0.015	<0.0030
	KC-354	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.012x	0.10x	0.10x
355	SS-355	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 11 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
3XX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
355	KA-355	4.5x	0.65x	1.0x	0.050x	0.63x	<0.0050	0.030x	0.050x	0.18x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-355	5.5x	0.15x	1.5x	0.15x	0.40x	0.050x	0.010x	0.15x	0.080x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
355	KC-355	5.0x	0.15x	1.3x	0.080x	0.030x	0.030x	0.050x	0.030x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
356	SS-356	7.1x	0.35x	0.12x	0.050x	0.35x	<0.0050	0.030x	0.10x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-356	6.5x	0.50x	0.20x	0.030x	0.22x	<0.0050	<0.0050	0.18x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-356	7.5x	0.15x	0.050x	0.12x	0.45x	<0.0050	<0.0050	0.040x	0.16x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KC-356	7.0x	0.080x	0.040x	0.020x	0.35x	<0.0050	0.010x	0.030x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	ST1-300	7.5x	0.60x	0.80x	0.15x	0.30x	<0.0050	0.10x	0.10x	0.10x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0030
A357	SS-A357	7.1x	0.10x	0.050x	0.020x	0.60x	0.015x	0.020x	0.030x	0.12x	<0.0010	<0.0010	<0.0010	0.060x	<0.0010	<0.0030
358	KA-358	8.0x	0.20x	0.080x	0.050x	0.65x	0.020x	0.020x	0.060x	0.12x	<0.0010	<0.0010	<0.0010	0.22x	<0.0010	<0.0030
360	SS-360	9.6x	0.60x	0.25x	0.15x	0.55x	<0.0050	0.17x	0.17x	0.060x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-360	10.0	0.35x	0.40x	0.10x	0.45x	<0.0050	0.25x	0.25x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
355	KA-355	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	<0.020	<0.0030
	KB-355	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
355	KC-355	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
356	SS-356	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	KA-356	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.003x	<0.0030	0.003x	<0.0010	<0.0030	0.050x	0.010x	<0.0030
	KB-356	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.060x	<0.0010	<0.0010	0.060x	0.020x	0.010x	<0.0030
	KC-356	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	ST1-300	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.020x	0.01x	0.001x
A357	SS-A357	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
358	KA358	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
360	SS-360	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.050x	<0.0010	<0.0010	0.070x	0.020x	0.010x	<0.0030
	KA-360	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.20x	<0.0010	<0.0010	0.030x	0.020x	<0.020	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 11 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
3XX ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
360	KB-360	9.0x	1.0x	0.10x	0.25x	0.65x	<0.0050	0.10x	0.10x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KC-360	9.6x	1.1x	0.30x	0.15x	0.58x	<0.0050	0.20x	0.25x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KD-360	9.0x	0.10x	0.75x	0.050x	0.52x	0.010x	0.020x	0.030x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
364	SS-364	8.8x	0.90x	0.15x	0.060x	0.35x	0.40x	0.050x	0.050x	<0.0050	<0.0010	<0.0010	<0.0010	0.030x	<0.0010	<0.0030
365	SS-365	10.5	0.090x	0.015x	0.65x	0.32x	<0.0050	<0.0050	0.020x	0.095x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
380	SS-380	8.9x	0.90x	3.6x	0.40x	0.20x	<0.0050	0.30x	0.35x	0.080x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-380	9.4x	1.1x	3.1x	0.15x	0.45x	<0.010	0.45x	0.15x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-380	7.6x	0.65x	4.1x	0.60x	0.050x	0.030x	0.10x	0.90x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	0.10x	<0.0030
	KC-380	9.0x	1.2x	3.6x	0.30x	0.20x	0.060x	0.20x	0.60x	0.070x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KD-380	9.2x	1.1x	3.6x	0.30x	0.20x	0.060x	0.20x	2.7x	0.060x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KE-380	9.6x	1.1x	3.6x	0.20x	<0.0050	0.020x	0.030x	<0.0050	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KF-380	8.4x	0.70x	2.6x	0.45x	0.30x	0.020x	0.10x	3.5x	0.11x	<0.0010	<0.0010	<0.0010	<0.0005x	0.10x	<0.0030

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
360	KB-360	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.10x	<0.0010	<0.0010	0.10x	0.020x	0.010x	<0.0030
	KC-360	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.12x	0.020x	<0.020	<0.0030
	KD-360	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.003x	<0.0030	0.10x	<0.0010	<0.0030	<0.0050	0.010x	<0.0030
364	SS-364	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.050x	0.020x	0.010x	<0.0030
365	SS-365	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.015x	<0.020	<0.0030
380	SS-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	KA-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.10x	<0.0010	<0.0010	0.20x	0.020x	0.010x	<0.0030
	KB-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.20x	<0.0010	<0.0010	0.10x	0.020x	0.010x	<0.0030
	KC-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.050x	<0.0010	<0.0010	0.060x	0.020x	0.010x	<0.0030
	KD-380	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.050x	<0.0010	<0.0010	0.060x	0.020x	<0.020	<0.0030
	KE-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	KF-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.10x	<0.0010	<0.0010	0.15x	<0.0050	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 11 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
3XX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
380	KG-380	9.2x	0.90x	3.2x	0.30x	0.10x	0.010x	0.30x	3.0x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	0.050x	<0.0030
	KH-380	9.6x	1.2x	3.8x	0.15x	0.050x	<0.0050	0.40x	2.2x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	0.15x	<0.0030
	KJ-380	8.0x	0.60x	3.5x	0.10x	0.10x	0.035x	0.10x	0.10x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	ST2-300	9.0x	1.1x	3.5x	0.50x	0.20x	0.030x	0.10x	2.5x	0.10x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0030
383	SS-383	11.0	1.0x	2.5x	0.35x	0.25x	0.060x	0.10x	2.5x	0.080x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-383	10.8	0.75x	3.0x	0.40x	0.25x	<0.0050	0.30x	0.80x	0.15x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
384	SS-384	11.5	1.0x	3.5x	0.30x	0.10x	0.020x	0.25x	0.60x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
390	SS-390	16.5	0.90x	4.5x	0.25x	0.60x	0.050x	0.10x	0.50x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
390	KA-390	16.0	1.0x	4.1x	0.35x	0.70x	0.050x	0.20x	1.0x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
380	KG-380	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.20x	<0.0010		0.10x	0.020x	<0.020	<0.0030
	KH-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.050x	<0.0010	<0.0010	0.050x	<0.0050	0.010x	<0.0030
	KJ-380	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.015x	0.010x	<0.0030
	ST2-300	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.020x	0.01x	0.001x
383	SS-383	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.20x	<0.0010	<0.0010	0.15x	0.030x	0.010x	<0.0030
	KA-383	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.10x	<0.0010	<0.0010	0.20x	0.015x	<0.020	<0.0030
384	SS-384	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.12x	<0.0010	<0.0010	0.12x	0.020x	0.010x	<0.0030
390	SS-390	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.010x	0.080x	<0.0010	<0.0010	0.080x	<0.0050	0.010x	<0.0030
390	KA-390	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.006x	0.16x	<0.0010	<0.0010	0.050x	<0.0050	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 12 - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
4XX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
413	SS-413	12.0	0.60x	0.12x	0.080x	0.050x	<0.0050	0.10x	0.15x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-413	11.0	0.75x	0.080x	0.15x	0.020x	<0.0050	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KB-413	12.6	0.30x	0.050x	0.050x	0.030x	<0.0050	0.050x	0.080x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KC-413	11.8	1.2x	0.20x	0.10x	0.050x	<0.0050	0.15x	0.15x	0.050x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
443	SS-443	5.5x	0.50x	0.080x	0.10x	0.050x	<0.0050	0.050x	0.10x	0.11x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030
	KA-443	4.5x	0.65x	0.050x	0.15x	0.080x	<0.0050	0.080x	0.15x	0.040x						
	KB-443	6.0x	0.30x	0.15x	0.050x	0.030x	<0.0050	0.030x	0.050x	0.15x						
	KC-443	5.1x	1.1x	0.15x	0.10x	0.050x	<0.0050	0.10x	0.15x	0.10x						
444	SS-A444	7.1x	0.15x	0.12x	0.050x	<0.0050	<0.0050	0.030x	<0.0050	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
413	SS-413	<0.0010	<0.0010	0.012x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	KA-413	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.040x	<0.0010	<0.0010	0.040x	0.020x	0.010x	<0.0030
	KB-413	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.12x	<0.0010	<0.0010	0.12x	0.020x	<0.020	<0.0030
	KC-413	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	0.080x	0.020x	0.010x	<0.0030
443	SS-443	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030
	KA-443							0.020x			0.020x	0.020x		
	KB-443							0.050x			0.050x	0.020x		
	KC-443							0.20x			0.15x	0.020x		
444	SS-A444	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	0.020x	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 13 - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
5XX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
513	SS-513	0.20x	0.30x	0.050x	0.080x	4.0x	0.030x	0.030x	1.8x	0.030x	<0.0010	<0.0010	<0.0010	0.0001x	<0.0010	<0.0010
514	SS-514	0.15x	0.25x	0.050x	0.12x	4.1x	0.030x	0.030x	0.080x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010
	KA-514	0.080x	0.35x	0.10x	0.050x	3.5x	<0.0050	<0.0050	<0.0050	0.16x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0010
	KB-514	0.25x	0.10x	0.020x	0.20x	4.5x	<0.0050	<0.0050	<0.0050	0.050x	<0.0010	<0.0010	<0.0010	0.003x	<0.0010	<0.0010
518	KA-518	0.20x	1.0x	0.080x	0.050x	8.1x	<0.0050	0.050x	0.10x	0.010x				0.004x		
520	SS-520	0.15x	0.20x	0.12x	0.050x	10.2	<0.0050	<0.0050	0.040x	0.10x	<0.0010	<0.0010	<0.0010	0.0001x	<0.0010	<0.0010
	KA-520	0.20x	0.10x	0.17x	0.020x	9.5x	<0.0050	<0.0050	0.080x	0.050x				0.002x		
	KB-520	0.080x	0.30x	0.080x	0.080x	10.6	<0.0050	<0.0050	0.020x	0.010x	<0.0010	<0.0010	<0.0010	0.005x	<0.0010	<0.0010
535	SS-535	0.10x	0.10x	0.030x	0.18x	7.0x	<0.0050	0.020x	0.030x	0.15x	<0.0010	<0.0010	<0.0010	0.003x	<0.0010	<0.0010

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
513	SS-513	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	<0.0010	0.010x	<0.0030
514	SS-514	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	<0.0010	0.010x	<0.0030
	KA-514	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	0.030x	<0.0010	<0.0010	0.030x	<0.0010	0.010x	<0.0030
	KB-514	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	0.060x	<0.0010	<0.0010	0.060x	<0.0010	<0.020	0.060x
518	KA-518										0.050x			
520	SS-520	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	<0.0010	0.010x	<0.0030
	KA-520													
	KB-520	<0.0010	<0.0010	<0.020	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	<0.0010	<0.020	<0.0030
535	SS-535	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0030	<0.0010	<0.020	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 14 - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
7XX ALLOYS

Typical Analysis - Weight Percent																
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
711	SS-711	0.15x	0.90x	0.50x	0.030x	0.40x	0.030x	0.030x	6.5x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010
712	SS-712	0.20x	0.50x	0.15x	0.10x	0.65x	0.50x	<0.0050	5.9x	0.15x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010
713	SS-713	0.12x	0.55x	0.80x	0.20x	0.40x	0.060x	0.050x	7.6x	0.20x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
711	SS-711	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
712	SS-712	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
713	SS-713	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 15 - CERTIFIED REFERENCE MATERIALS FOR CASTING ALLOYS
8XX ALLOYS

Typical Analysis - Weight Percent															
Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
850	SS-850	0.50x	0.40x	1.1x	0.050x	<0.0050	<0.0050	1.1x	<0.0050	0.12x	<0.0010		<0.0010	<0.0005x	<0.0010	<0.0010
851	SS-851	2.5x	0.45x	1.0x	0.050x	0.030x	<0.0050	0.50x	0.030x	0.080x	<0.0010		<0.0010	<0.0005x	<0.0010	<0.0010
852	SS-852	0.22x	0.35x	2.0x	0.050x	0.84x	<0.0050	1.2x	0.050x	0.040x	<0.0010		<0.0010	<0.0005x	<0.0010	<0.0010

Typical Analysis - Weight Percent														
Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
850	SS-850	<0.0010	<0.0010	0.012x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	6.3x	<0.0010	0.010x	<0.0030
851	SS-851	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	6.3x	<0.0010	0.010x	<0.0030
852	SS-852	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	6.3x	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 16 - CERTIFIED REFERENCE MATERIALS FOR TRACE METALS
TRACE METALS

Typical Analysis - Weight Percent																
Alloy	**Catalog Number**	**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Ni**	**Zn**	**Ti**	**Ag**	**As**	**B**	**Be**	**Bi**	**Ca**
1000	SS-1000	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001x	<0.0001	<0.0001
1050	ST1-1050	0.15x	0.33x	0.030x	0.040x	0.030x	0.020x	0.010x	0.040x	0.030x	<0.0010	0.0005	<0.0010	0.0002x	0.030x	0.002x
2XXX	ST2-2000	0.50x	0.45x	2.5x	0.50x	0.50x	0.050x	0.010x	0.15x	0.030x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
3XXX	ST1-3000	0.20x	0.50x	0.15x	1.2x	1.0x	0.010x	0.010x	0.050x	0.020x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
	ST2-3000	0.20x	0.50x	0.15x	1.2x	0.030x	0.010x	0.010x	0.050x	0.020x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
3003	ST1-3003	0.30x	0.33x	0.15x	1.2x	<0.0010	<0.0005	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST2-3003	0.30x	0.65x	0.15x	1.2x	0.010x	0.015x	0.020x	0.020x	0.020x	<0.0010	0.0005	<0.0010	0.0002x	0.020x	0.002x
3104	ST2-3104	0.20x	0.40x	0.20x	1.0x	1.2x	0.015x	0.030x	0.060x	0.020x	<0.0010	<0.0010	<0.0005	0.001x	0.008x	0.003x
5XXX	ST1-5000	0.15x	0.30x	0.050x	0.050x	1.8x	0.15x	0.030x	0.040x	0.020x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
5052	ST1-5052	0.15x	0.30x	0.10x	<0.0010	2.7x	0.25x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
	ST2-5052	0.15x	0.30x	0.10x	0.050x	2.7x	0.25x	0.020x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	0.0002x	0.020x	0.002x

Typical Analysis - Weight Percent														
Alloy	**Catalog Number**	**Cd**	**Co**	**Ga**	**Li**	**Na**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**	**V**	**Zr**
1000	SS-1000	<0.0001	<0.0001	<0.0001	<0.0001x	<0.0001x	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1050	ST1-1050	0.0005	0.0005	0.025x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.025x	0.004x
2XXX	ST2-2000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
3XXX	ST1-3000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
	ST2-3000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
3003	ST1-3003	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	ST2-3003	0.0005	0.0005	0.020x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.015x	0.004x
3104	ST2-3104	0.001x	<0.0010	0.020x	0.003x	0.003x	0.002x	0.004x	0.002x	<0.0010	0.015x	0.002x	0.020x	0.002x
5XXX	ST1-5000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	0.001x	0.001x	0.001x	0.010x	0.001x
5052	ST1-5052	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	ST2-5052	0.0005	0.0005	0.025x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.015x	0.004x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 16 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR TRACE METALS
TRACE METALS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
6XXX	ST1-6000	0.55x	0.30x	0.15x	0.050x	0.80x	0.15x	0.050x	0.080x	0.040x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
6063	ST1-6063	0.45x	0.22x	<0.0010	<0.0010	0.55x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010
	ST2-6063	0.45x	0.22x	0.050x	0.050x	0.55x	0.015x	0.030x	0.030x	0.030x	<0.0010	<0.0010	<0.0010	0.0002x	0.020x	0.002x
7XXX	ST1-7000	0.15x	0.25x	1.5x	0.25x	2.5x	0.15x	0.020x	6.5x	0.040x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
	ST2-7000	0.15x	0.25x	0.15x	0.20x	1.3x	0.10x	0.020x	3.5x	0.040x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0010
8079	ST1-8079	0.13x	1.2x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0010
	ST2-8079	0.13x	1.2x	0.030x	0.003x	0.003x	0.003x	0.004x	0.015x	0.004x	<0.0010	0.0005	<0.0010	0.0002x	0.004x	0.002x
	ST3-8079	0.10x	1.0x	0.010x	0.020x	0.005x	0.010x	0.010x	0.010x	0.010x	<0.0010	<0.0010	<0.0005	0.0005x	0.080x	0.001x
3XX	ST1-300	7.5x	0.60x	0.80x	0.15x	0.30x	<0.0050	0.10x	0.10x	0.10x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0030
	ST2-300	9.0x	1.1x	3.5x	0.50x	0.20x	0.030x	0.10x	2.5x	0.10x	0.001x	<0.0010	<0.0010	0.0005x	0.001x	<0.0030

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
6XXX	ST1-6000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
6063	ST1-6063	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	ST2-6063	0.0005	0.0005	0.025x	0.001x	0.001x	0.0005	0.020x	0.003x	<0.0010	0.020x	0.001x	0.010x	0.004x
7XXX	ST1-7000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
	ST2-7000	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.001x	0.010x	0.001x
8079	ST1-8079	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0005x	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	ST2-8079	0.0005	0.0005	0.016x	0.0005x	0.001x	0.0005	0.004x	<0.0010	<0.0010	0.005x	0.001x	0.002x	0.004x
	ST3-8079	0.001x	<0.0010	0.020x	0.001x	0.001x	0.0015	0.004x	0.003x	<0.0010	0.020x	0.0015	0.020x	0.002x
3XX	ST1-300	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.020x	0.01x	0.001x
	ST2-300	0.001x	0.001x	0.020x	<0.0005x	<0.0005x	<0.0010	0.003x	0.001x	<0.0010	0.001x	0.020x	0.01x	0.001x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 17 - REFERENCE MATERIALS FOR DRIFT CORRECTION AND NORMALIZATION
SQ STANDARD ALLOYS

Typical Analysis - Weight Percent

Alloy	Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
CALIBRATION	SQ-10															
	SQ-11	(0.2)	(0.2)	(0.5)	(0.38)	(3.0)	(0.12)		(6.6)	(0.08)				(0.005)		(0.02)
	SQ-12	(1.1)	(0.6)	(4.8)	(1.1)	(0.15)		(0.25)	(0.2)		(0.05)			(0.005)	(0.06)	
	SQ-13	(0.5)	(0.6)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)				(0.005)	(0.04)	
	SQ-14	(0.1)	(0.1)	(0.5)	(0.4)	(0.9)		(0.4)	(1.2)	(0.1)				(0.002)	(0.5)	
	SQ-15	(12.0)	(0.7)	(0.5)	(0.05)	(1.2)	(0.05)	(2.5)		(0.1)						
	SQ-16	(4.0)	(1.0)	(10.0)	(0.2)	(0.3)		(0.2)	(0.2)							
	SQ-17	(0.7)	(0.4)	(0.35)	(0.12)	(1.6)	(0.25)	(0.12)	(0.12)	(0.08)				(0.005)	(0.08)	
	SQ-18												(0.02)			
	SQ-19	(0.6)	(0.15)	(0.6)		(1.0)	(0.1)		(0.4)			(0.03)				

Typical Analysis - Weight Percent

Alloy	Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
CALIBRATION	SQ-10													
	SQ-11		(0.01)	(0.03)										
	SQ-12	(0.2)	(0.01)	(0.03)				(0.06)			(0.06)		(0.1)	(0.15)
	SQ-13	(0.04)	(0.01)	(0.03)				(0.04)			(0.04)		(0.04)	(0.04)
	SQ-14							(0.5)			(0.1)			
	SQ-15											(0.02)		
	SQ-16													
	SQ-17			(0.03)				(0.1)			(0.1)		(0.03)	
	SQ-18				(0.02)	(0.02)								
	SQ-19			(0.01)			(0.01)		(0.02)	(0.2)			(0.1)	(0.005)

Note: SQ Standards are 64mm diameter, 37mm thick except SQ-18 which is 25mm thick. These standards are to used for reproducibility of spectral response, but are not certified with respect to true composition. Only approximate values are issued for these standards.

Table 18 - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

SILICON SERIES IN UNALLOYED ALUMINUM

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
SI-1	0.50x	(0.5)													
SI-2	1.0x	(0.5)													
SI-3	1.6x	(0.5)													
SI-4	2.2x	(0.5)													
SI-5	3.0x	(0.5)													
SI-6	5.0x	(0.5)													
SI-7	7.0x	(0.5)													
SI-8	10.0	(0.5)													
SI-9	12.5	(0.5)													
SS-390	16.5	0.90x	4.5x	0.25x	0.60x	0.050x	0.10x	0.50x	0.10x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
SI-1													
SI-2													
SI-3													
SI-4													
SI-5													
SI-6													
SI-7													
SI-8													
SI-9													
SS-390	<0.0010	<0.0010	0.020x	<0.0010	<0.0010	0.010x	0.080x	<0.0010	<0.0010	0.080x	<0.0050	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

IRON SERIES IN UNALLOYED ALUMINUM

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
FE-4	(0.1)	0.25x	(0.01)												
FE-6	(0.1)	0.60x	(0.01)												
FE-7	(0.1)	0.80x	(0.01)												
FE-8	0.10x	1.0x	0.010x	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						
FE-9	0.10x	1.2x	0.010x	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						
FE-10	0.10x	1.5x	0.010x	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						
FE-11	0.10x	2.0x	0.010x	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						
FE-12	(0.1)	2.5x	(0.01)												
SS-A2800	0.25x	3.0x	0.030x	<0.010	<0.010	<0.0050	0.030x	<0.010	<0.010						

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
FE-4													
FE-6													
FE-7													
FE-8													
FE-9													
FE-10													
FE-11													
FE-12													
SS-A2800													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

COPPER SERIES IN UNALLOYED ALUMINUM

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
CU-1	0.15x	0.25x	1.0x	<0.0050											
CU-2	0.15x	0.25x	2.5x	<0.0050											
CU-3	0.15x	0.25x	4.5x	<0.0050											
CU-7	0.15x	0.25x	20.0	<0.0050											

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
CU-1													
CU-2													
CU-3													
CU-7													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

MANGANESE SERIES IN 3000 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
MN-3				0.70x											
WA-3003	0.40x	0.65x	0.090x	0.95x	0.010x	0.030x	0.030x	0.050x	0.030x	<0.0010	<0.0010	<0.0010	0.001x	<0.0010	<0.0005
SS-3003	0.20x	0.50x	0.15x	1.2x	0.030x	<0.0050	<0.0050	0.080x	0.020x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
WB-3003	0.15x	0.30x	0.20x	1.5x	0.050x	<0.0050	<0.0050	0.020x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
MN-3													
WA-3003	0.001x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.006x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
SS-3003	<0.0005	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.001x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
WB-3003	0.003x	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.020x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

NICKEL SERIES IN 242 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
NI-4							1.0x								
NI-5							1.5x								
SS-242	0.50x	0.55x	4.0x	0.080x	1.5x	0.030x	2.0x	0.10x	0.12x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0030

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
NI-4													
NI-5													
SS-242	<0.0010	<0.0010	0.015x	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

ZINC SERIES IN 7072 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
ZN-1								0.25x							
ZN-2								0.60x							
SS-7072	0.14x	0.28x	0.030x	0.040x	0.030x	0.030x	0.030x	1.1x	0.030x	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005
ZN-4								2.6x							
ZN-5								4.0x							
ZN-6								7.0x							
ZN-7								10.0							

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
ZN-1													
ZN-2													
SS-7072	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030
ZN-4													
ZN-5													
ZN-6													
ZN-7													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

TITANIUM SERIES IN UNALLOYED ALUMINUM

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
WC-1000	0.10x	0.10x	0.080x	0.080x	0.080x	0.080x	0.080x	0.080x	0.080x	<0.0010	<0.0010	<0.0010	<0.0005x	0.080x	<0.0005
TI-2									0.15x						
TI-3									0.30x						

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
WC-1000	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	0.080x	<0.0010	<0.0010	0.080x	<0.0010	0.040x	<0.0030
TI-2													
TI-3													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

BORON SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
BN-1	0.080x	0.12x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			0.0005-0.0034			
BN-2	0.080x	0.12x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			0.0035-0.0074			
BN-3												0.0075-0.014x			
BN-4												0.015x-0.025x			
BN-5	0.080x	0.12x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			0.026x-0.034x			

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
BN-1													
BN-2													
BN-3													
BN-4													
BN-5													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

BORON SERIES IN 7.5% SILICON ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
BN-11												0.0005-0.0034			
BN-12	7.5x	0.40x	0.10x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050			0.0035-0.0074			
BN-13												0.0075-0.014x			
BN-14												0.015x-0.025x			

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
BN-11													
BN-12													
BN-13													
BN-14													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

BERYLLIUM SERIES IN 1100 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
BE-1													0.0005x-0.0025		
BE-2													0.0035-0.0065		

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
BE-1													
BE-2													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

CALCIUM SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
CA-1															0.0005-0.0034
CA-2															0.0035-0.0084
CA-3															0.0085-0.024
CA-4															0.025-0.060

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
CA-1													
CA-2													
CA-3													
CA-4													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

CALCIUM SERIES IN 7.5% SILICON ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
CA-11															0.0005-0.0024
CA-12	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						0.0025-0.0064
CA-13	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						0.0065-0.012
CA-14	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						0.013-0.020
CA-15	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.010						0.021-0.040

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
CA-11													
CA-12													
CA-13													
CA-14													
CA-15													

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

CADMIUM SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
CD-1															
CD-2	0.050x	0.15x	<0.010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050						
CD-3	0.050x	0.15x	<0.010	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050						
CD-4															

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
CD-1	0.0005-0.0044												
CD-2	0.0045-0.014x												
CD-3	0.015x-0.034x												
CD-4	0.035x-0.060x												

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

COBALT SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
CO-1															
CO-2															

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
CO-1		0.001x											
CO-2		0.007x											

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

GALLIUM SERIES IN 1000 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
WD-1000	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	0.004x	<0.0010	<0.0010	<0.0010	<0.0005x	0.004x	<0.0005
WE-1000	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	0.010x	<0.0010	<0.0010	<0.0010	<0.0005x	0.010x	<0.0005
SS-1050	0.12x	0.30x	0.040x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	<0.0010	<0.0005x	<0.0010	<0.0005

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
WD-1000	<0.0010	<0.0010	0.004x	<0.0005x	<0.0005x	<0.0010	0.004x	<0.0010	<0.0010	0.004x	<0.0010	0.004x	<0.0030
WE-1000	<0.0010	<0.0010	0.010x	<0.0005x	<0.0005x	<0.0010	0.010x	<0.0010	<0.0010	0.010x	<0.0010	0.010x	<0.0030
SS-1050	<0.0010	<0.0010	0.020x	<0.0005x	<0.0005x	<0.0010	<0.003x	<0.0010	<0.0010	<0.0010	<0.0010	0.010x	<0.0030

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

LITHIUM SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
LI-1															
LI-2															
LI-3															
LI-4															
LI-5															
LI-6															

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
LI-1				0.0002-0.0009									
LI-2				0.0010-0.0024									
LI-3				0.0025-0.0064									
LI-4				0.0065-0.010									
LI-5				0.011-0.020									
LI-6				0.021-0.030									

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

SODIUM SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
NA-1	0.050x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
NA-2	0.050x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
NA-3															
NA-4															
NA-5	0.050x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
NA-1					0.0005-0.0024								
NA-2					0.0025-0.0064								
NA-3					0.0065-0.012								
NA-4					0.013-0.020								
NA-5					0.021-0.030								

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

SODIUM SERIES IN 7.5% SILICON ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
NA-11															
NA-12	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
NA-13	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
NA-14	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
NA-15	7.5x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
NA-11					0.0005-0.0024								
NA-12					0.0025-0.0064								
NA-13					0.0065-0.012								
NA-14					0.013-0.020								
NA-15					0.021-0.030								

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

PHOSPHORUS SERIES IN 10.5% SILICON ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
P-1															

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
P-1						0.005x							

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

ANTIMONY SERIES IN 1075 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
AN-1	0.05x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
AN-2	0.05x	0.15x	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050						
AN-3															
AN-4	0.05x	0.15x													

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
AN-1								0.005x					
AN-2								0.015x					
AN-3								0.040x					
AN-4								0.090x					

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

ANTIMONY SERIES IN 356 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
AN-11															
AN-12	7.1x	0.35x	0.12x	0.050x	0.35x	<0.0050	0.030x	0.10x	0.12x						

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
AN-11								0.050x					
AN-12								0.10x					

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

ZIRCONIUM SERIES IN 1050 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
ZR-1															
ZR-2															
ZR-3															

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
ZR-1													0.0035-0.014x
ZR-2													0.015x-0.044x
ZR-3													0.045x-0.070x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.

Table 18 (cont'd) - CERTIFIED REFERENCE MATERIALS FOR SINGLE ELEMENTS

ZIRCONIUM SERIES IN 6151 ALLOY

Typical Analysis - Weight Percent

Catalog Number	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag	As	B	Be	Bi	Ca
ZR-11															
ZR-13															
ZR-14															
ZR-15															

Typical Analysis - Weight Percent

Catalog Number	Cd	Co	Ga	Li	Na	P	Pb	Sb	Sc	Sn	Sr	V	Zr
ZR-11													0.010x
ZR-13													0.080x
ZR-14													0.16x
ZR-15													0.26x

Note: The 'x' shown as part of the typical analysis concentration is used as a decimal place holder. Actual certified values are reported to the number of digits shown if possible, with a numerical value in place of the 'x'. Actual certified values may vary both above and below those indicated and may have more or less significant figures.

Values given as less than, denoted by "<", indicate that those elements are typically below this value. No intentional addition is made for these elements, however these elements will be certified to the actual composition observed.