



CERTIFIED REFERENCE MATERIALS

Master Products Catalog **(Non-Aluminum)**

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September 2011





Registration Certificate

This document certifies that the administration systems of

Analytical Reference Materials International Corporation
Colorado, USA

*have been assessed and approved by QAS International
to the following management systems, standards and guidelines:*

ISO 9001:2008

*With the permitted exclusion of clause 7.3 Design and Development
and clause 7.6 Control of Monitoring and Measuring Equipment*

The approved administration systems apply to the following:

**Supply of Certified Reference Materials and Related Services to the
Metals and Hydrocarbon Markets.**

Original Approval **21st July 2003**

Current Certificate **31st July 2011**

Certificate Expiry **31st July 2012**

Certificate Number **A1553US**

Ubyao

On behalf of QAS International

www.qas-international.com

*This certificate remains valid while the holder maintains their quality administration systems in accordance
with the standards and guidelines stated above, which will be audited annually by QAS International.
The holder is entitled to display the above registration mark for the duration of this certificate.*

This certificate must be returned to QAS International on reasonable request.

Issuing Office: 400 Continental Blvd, 6th Floor, El Segundo, CA90245, USA

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Introduction	1
Carbon, Low Alloy & Tool Steels	2-13
Carbon and Low Alloy	2-9
Special Low Alloy Steel	10
Tool Steels	11-12
Statistical Process Control Standards	13
Cast Iron	14-17
CKD Cast Iron	15
MBH Cast Iron	16-17
Stainless & High Temperature Steels	18-26
Nickel Based Alloys	27-35
Cobalt Based Alloys	36-38
Copper, Brass & Bronze Alloys	39-49
Titanium Alloys	50-52
Magnesium Alloys	53-54
Tin Alloys	55-57

When Ordering IARMS, please use the "IARM-xxx" prefix followed by the appropriate suffix: "/X" for XRF, "/G" for General Purpose OES, or "/C" for Chips.

Lead Alloys	58-59
Solder Alloys	60
Zinc Alloys	61-64
Zirconium Alloys	64
Set-up Standards (SUSs)	65-67
Cast Irons	65
LAS	65
Aluminum	65
MBH	66-67
Heavy Metals in Plastic	68
<u>Pre-Selected Calibration Sets</u>	
Pre-selected, matrix specific calibration sets are available, see our website for details. Please contact us for additional information, pricing and availability. Custom sets are also available. We can develop custom sets for your specific needs. Please contact us regarding specific alloy availability and pricing.	
Laboratory Proficiency Testing	69-70
90/10 Share Program	71
Sample Preparation Equipment	72-78

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Introduction

Analytical Reference Materials International (ARMI) was founded in 1984 for the purpose of producing Certified Reference Materials (CRMs) for the Metals Industry. Since that time, ARMI has expanded its metals inventory to include CRMs for the following matrices:

Carbon & Low Alloy Steels

Stainless Steels

Nickel Alloys

Titanium Alloys

Tool Steels

High Temperature Steels

Cobalt Alloys

Copper, Brass & Bronze Alloys

ARMI's CRMs are produced from commercially available material analyzed by participating laboratories that are members of ARMI's Inter-Laboratory Analysis Program (ILAP). The ILAP Laboratories utilize ASTM Standards to produce the analytical and statistical data used by ARMI to calculate the certified values and 95% confidence intervals of the CRMs. The result is a true CRM of the highest quality yielding consistent, reproducible results and reliability for Industry. Furthermore, ARMI's Certificates of Analysis contain all of the required and necessary informational disclosures and evidence that the CRMs are traceable to NIST.

ARMI is the worldwide distributor for Alcan Aluminum CRMs. Please see our Aluminum producers catalog for additional information.

ARMI now offers Heavy Metals in Plastic RMs. We have Br, Hg, Cr, Pb, and Cd in PE and PVC. These RMs are available in sets only.

ARMI also carries Set-up Standards (SUSs) for Low Alloy, Cast Iron, and Aluminum. In addition to its internally produced SUSs, ARMI also carries the full line of Alcoa Aluminum SUSs and MBH's lines of SUSs.

ARMI has expanded its inventory to include Hydrocarbon CRMs for Industry. The new CRMs are produced following ASTM Standards and like ARMI's metal CRMs, they have full informational disclosures and are traceable to NIST. The Hydrocarbon CRMs include standards for Sulfur in Oil and Coal. The Oil CRMs cover various Sulfur levels in:

#2 Diesel Fuel CRMs & RMs

Residual Fuel Oil

White Mineral Oil

Green & Calcined Petroleum Coke

Coal CRMs are available to cover a wide range of values for:

Sulfur

BTU

Ash

Chlorine

Fixed Carbon

Volatile Matter

Mercury

Gases (CHON)

In addition to these cataloged CRMs, ARMI has access to additional standards from its affiliates and associates throughout the world. We have an arrangement with MBH Analytical Limited of England and TechLab of France to distribute their products in the United States. Let ARMI's staff help fill your standards needs.

Thank you for considering ARMI's products and we look forward to supplying your Certified Reference Material needs. If you have any questions, need technical assistance, require additional information, or need assistance in locating a special CRM, please contact us. We will be happy to assist you in whatever way we can.

Best Regards,



William D. Britt
President & General Manager

Carbon & Low-Alloy Steels

Please call for availability and current pricing - (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	Bi Pb	C S	Ca Sb	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
27E <i>Provisional</i>	Pure Iron K00095	[0.001] [0.005]	[(0.001)] [0.007]	[0.0005] [0.001]	--- [(0.001)]	[0.0023] [0.0008]	--- ---	[0.002] [0.003]	[(0.001)] [(0.0005)]	[0.001] [0.0005]	[0.001] [0.0005]	[(0.001)] [(0.001)]	[0.0001] [(0.0003)]	[0.001]
28A Chips Only	AISI 1018 G10180	0.003 0.099	(0.006) (0.0106)	(0.0001) 0.011	--- (<0.005)	0.20 0.023	(0.0004) <0.01	0.010 0.22	0.15 0.011	0.247 0.002	0.69 0.006	0.031 (0.012)	0.0113 0.002	0.002
28B Chips Only	AISI 1018 G10180	0.003 0.13	0.008 0.0070	0.0002 0.010	--- (<0.01)	0.18 0.029	(0.002) ---	0.011 0.23	0.13 0.014	0.36 0.002	0.75 0.002	0.029 (<0.001)	0.0094 <0.001	0.002
28C Chips Only	AISI 1018 G10180	0.010 0.24	0.004 0.0074	0.0002 0.011	--- ---	0.16 0.011	--- ---	0.008 0.25	0.073 0.016	0.23 0.001	0.76 0.024	0.042 (0.004)	0.0084	0.0014
28D Chips Only	AISI 1018 G10180	0.0110 0.09	0.0039 0.006	0.0002 0.010	--- ---	0.1700 0.016	--- ---	0.009 0.27	0.081 0.008	0.11 0.001	0.80 0.019	0.025 (0.003)	0.0079 ---	0.002
28E Chips Only	AISI 1018 G10180	0.011 0.145	0.007 0.0052	0.0001 0.009	--- <0.001	0.169 0.0026	(0.0003) <0.001	0.008 0.171	0.079 0.010	0.120 0.001	0.68 0.019	0.033 0.002	0.0088 <0.002	0.001
28F Chips Only	AISI 1018 G10180	0.012 0.25	0.004 0.0061	0.0002 0.012	--- (0.0005)	0.150 0.011	0.0011 <0.002	0.007 0.27	0.077 0.015	0.254 0.0012	0.76 0.023	0.042 (0.004)	0.0089 -0.002	0.002
28G X-Ray only	AISI 1018 G10180	0.002 0.044	0.0031 0.003	0.0001 0.021	--- <0.001	0.189 0.023	0.0012 0.002	0.003 0.252	0.049 0.016	0.178 0.0011	0.79 0.0014	0.009 0.0032	0.0089 0.001	0.0013
28H X-Ray only	AISI 1018 G10180	0.027 0.070	0.0071 0.0015	0.0002 0.015	--- <0.001	0.175 0.031	0.0005 0.002	0.0051 0.26	0.129 0.0059	0.120 0.0023	0.82 0.0015	0.034 0.003	0.0076 0.001	0.0015
28I <i>Provisional</i>	AISI 1018 G10180	[0.003] [0.049]	[0.004] [0.004]	[0.0002] [0.019]	--- [(0.001)]	[0.18] [0.024]	[0.0016] [(0.001)]	[0.006] [0.244]	[0.068] [0.0113]	[0.167] [0.0014]	[0.76] [0.002]	[0.012] [(0.002)]	[0.0054] [(0.002)]	[0.001]
209B Chips Only	AISI 1030 G10300	0.003 0.064	0.0076 0.0039	0.0002 0.008	--- ---	0.321 0.031	(0.001) 0.003	0.007 0.25	0.08 0.008	0.17 0.001	0.66 0.024	0.011 (0.002)	0.0083 ---	(0.002)
209C Final	AISI 1030 G10300	0.003 0.071	0.007 0.004	0.0002 0.008	--- 0.001	0.31 0.024	(0.001) 0.003	0.007 0.233	0.117 0.017	0.21 0.0018	0.70 0.032	0.016 0.004	0.0123 ---	0.0018
210A Chips Only	AISI 1040 G10400	0.003 0.11	0.007 (0.0033)	(<0.005) 0.015	--- ---	0.39 0.023	--- ---	0.008 0.22	0.11 0.011	0.27 (0.002)	0.82 0.052	0.022 ---	0.0124	(0.002)
210B Final	AISI 1040 G10400	0.029 0.028	0.0025 0.0012	(0.0002) 0.011	--- <0.002	0.40 0.005	--- ---	0.003 0.20	0.058 0.0013	0.020 0.002	0.67 0.0014	0.016 (0.003)	0.0059 ---	(0.001)
210C Chips Only	AISI 1040 G10400	0.005 0.097	0.008 0.009	0.0003 0.033	--- 0.002	0.443 0.025	--- 0.003	0.008 0.219	0.161 0.019	0.36 0.001	0.87 0.005	0.017 <0.005	0.090 ---	0.025
200A Chips Only	AISI 1045 G10450	0.003 0.048	--- (0.0031)	<0.0005 0.006	--- ---	0.45 0.014	--- ---	0.006 0.27	0.092 0.007	0.090 0.002	0.76 0.057	0.018 (<0.01)	0.0084 ---	0.001

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Page 2

Carbon & Low-Alloy Steels

Please call for availability and current pricing - (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	Bi Pb	C S	Ca Sb	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
200B	AISI 1045	0.003	0.005	0.0001	---	0.452	0.0012	0.007	0.132	0.228	0.755	0.018	0.0097	0.001
X-Ray only	G10450	0.089	0.004	0.013	0.0004	0.026	0.003	0.219	0.009	0.002	0.024	0.002	0.0010	
200C	AISI 1045	[0.004]	[0.006]	[0.0004]	---	[0.45]	[0.0019]	[0.008]	[0.099]	[0.24]	[0.78]	[0.023]	[0.0079]	[0.001]
Provisional	G10450	[0.095]	[0.0035]	[0.007]	---	[0.020]	0.002	[0.24]	[0.0090]	[0.0011]	[0.024]	[(0.003)]	---	
254A	AISI 1050	0.025	0.005	0.0002	---	0.500	0.001	0.006	0.050	0.091	0.78	0.013	0.0096	0.001
Final	G10500	0.044	(0.003)	0.010	(0.0003)	0.024	0.004	0.211	0.005	0.001	0.002	(0.001)	0.001	
29C	AISI 1117	0.003	0.009	(0.003)	---	0.18	---	(0.01)	0.076	0.15	1.20	0.016	0.010	(0.003)
Final	G11170	0.075	0.005	0.011	<0.001	0.13	---	0.28	0.008	0.0015	0.003	(0.002)	---	
29D	AISI 1117	0.0033	0.0046	(0.0003)	---	0.17	---	(0.023)	0.076	0.085	1.07	0.016	0.0057	(0.0027)
Final	G11170	0.042	(0.0082)	0.018	---	0.1153	---	0.050	0.0072	0.0014	0.0018	(0.0030)	---	
199A	AISI 1144	(0.002)	---	---	---	0.44	---	0.007	0.10	0.11	1.47	0.031	0.0071	0.003
Chips Only	G11440	0.10	0.0021	0.008	---	0.27	---	0.16	0.007	0.001	0.003	---	---	
199B	AISI 1144	0.003	0.005	0.002	---	0.45	---	0.007	0.048	0.089	1.45	0.008	0.0059	(0.002)
Final	G11440	0.035	(0.0048)	0.009	(<0.01)	0.29	---	0.18	0.005	0.002	0.003	0		
183C	AISI 12L14	0.0021	0.003	0.0011	---	0.079	---	(0.002)	0.055	0.016	1.06	0.010	0.0049	0.0010
Final	G12144	0.019	0.016	0.078	0.18	0.31	0.001	0.004	0.003	0.0009	0.002	(0.002)	0.001	
206A	AISI 1215	0.003	0.008	0.0006	---	0.068	---	0.009	0.041	0.098	0.90	0.012	0.0119	(0.002)
Final	G12150	0.044	(0.019)	0.069	---	0.26	---	(0.019)	0.005	0.0015	0.002	---		
233A	AISI 1215 Bi	0.002	0.004	0.001	0.14	0.082	0.001	0.0046	0.045	0.096	0.80	0.011	0.0057	(0.001)
Final	G12150	0.038	0.013	0.072	0.003	0.30	0.002	0.010	0.011	0.001	0.002	0.002	---	
143B	AISI 4130	0.018	---	0.0001	---	0.29	---	0.009	0.93	0.13	0.48	0.20	0.0080	(0.002)
Chips Only	G41300	0.14	0.0023	0.009	---	0.009	---	0.28	0.012	(0.001)	0.004	---	0.002	
143D	AISI 4130	[0.025]	[0.005]	[0.0002]	---	[0.31]	[0.001]	[0.008]	[1.00]	[0.14]	[0.55]	[0.20]	[0.008]	[0.001]
Provisional	G41300	[0.14]	[(0.001)]	[0.011]	---	[0.011]	0.003	[0.24]	[0.008]	[0.002]	[0.004]	[0.004]		
30B	AISI 4140	0.024	0.007	0.0001	---	0.42	0.0008	0.009	0.95	0.31	0.87	0.17	0.0094	0.002
Chips Only	G41400	0.066	0.0008	0.014	<0.01	0.025	---	0.25	0.010	0.002	0.006	<0.01	<0.005	
30C	AISI 4140	0.027	---	(0.0001)	---	0.39	0.003	0.009	0.94	0.16	0.84	0.16	0.0108	(0.002)
Chips Only	G41400	0.18	0.0025	0.021	---	0.016	---	0.28	0.014	0.003	0.004	---	0.003	
30D	AISI 4140	0.035	0.008	0.0004	---	0.391	(0.0006)	0.013	0.978	0.241	0.83	0.22	0.0097	0.002
Chips Only	G41400	0.159	0.0014	0.013	0.0003	0.02	---	0.244	0.017	0.002	0.003	0.004		
30E	AISI 4140	0.014	0.015	0.0002	---	0.408	(0.001)	0.012	1.06	0.301	0.92	0.209	0.0063	0.002
Chips Only	G41400	0.180	0.0014	0.011	<0.001	0.0071	---	0.264	0.017	0.003	0.005	0.005	---	

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Page 3

Carbon & Low-Alloy Steels

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IARM Status	Grade UNS#	Al Ni	As O	B P	Bi Pb	C S	Ca Sb	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
30G	AISI 4140	[0.026]	[0.0020]	[(0.0002)]	---	[0.41]	[0.0011]	[0.003]	[1.06]	[0.041]	[0.82]	[0.18]	[0.0052]	[0.002]
<i>Provisional</i>	G41400	[0.025]	[(0.001)]	[0.018]	[(0.0001)]	[0.026]	---	[0.27]	[0.003]	[0.001]	[0.003]	[0.002]	---	
31A	AISI 4340	0.036	(0.006)	(0.0002)	---	0.41	(0.0012)	0.011	0.85	0.19	0.75	0.22	0.0114	0.003
<i>Chips Only</i>	G43400	1.66	(0.0015)	0.012	---	0.028	0.002	0.22	0.008	0.003	0.004	---	0.003	
31B	AISI 4340	0.027	0.006	0.0002	---	0.41	0.0005	0.010	0.87	0.23	0.71	0.26	0.0081	0.002
<i>Chips Only</i>	G43400	1.81	0.0008	0.013	<0.01	0.022	---	0.25	0.01	0.003	0.006	(0.009)	0.002	
31C	AISI 4340	0.019	0.0056	(0.0003)	---	0.413	---	0.012	0.84	0.178	0.78	0.28	0.0076	0.0042
<i>Chips Only</i>	G43400	1.75	0.0018	0.013	0.0003	0.0072	---	0.24	0.010	0.003	0.005	0.008	---	
31D	AISI 4340	0.023	0.006	(0.0002)	---	0.4120	(0.0003)	0.012	0.830	0.171	0.79	0.238	0.0084	0.006
<i>Chips Only</i>	G43400	1.71	0.0013	0.009	<0.005	0.0053	---	0.264	0.010	0.003	0.005	0.009	---	
31E	AISI 4340	0.031	0.003	0.0003	---	0.417	0.0002	0.005	0.81	0.050	0.74	0.264	0.0042	0.002
<i>X-Ray only</i>	G43400	1.69	<0.005	0.008	(0.001)	0.002	0.001	0.027	0.0031	0.0030	0.0038	<0.01	0.0004	
31F	AISI 4340	[0.026]	[0.005]	[0.0003]	---	[0.69]	[(0.001)]	[0.007]	[0.83]	[0.181]	[0.70]	[0.21]	[0.006]	[0.002]
<i>Provisional</i>	G43400	[1.78]	[(0.001)]	[0.012]	[(0.002)]	[0.018]	---	[0.26]	[0.014]	[0.002]	[0.003]	[0.006]	---	
33B	AISI 4620	0.022	0.005	0.0002	---	0.19	0.0002	0.010	0.17	0.15	0.54	0.22	0.0070	0.003
<i>X-Ray & Chips Only</i>	G46200	1.68	0.0020	0.010	(<0.01)	0.014	---	0.22	0.010	0.002	0.002	(<0.01)	<0.005	
33C	AISI 4620	0.025	(0.005)	(0.0002)	---	0.184	(0.0003)	0.008	0.133	0.223	0.562	0.236	0.0078	0.002
<i>Final</i>	G46200	1.71	0.0021	0.009	<0.002	0.017	---	0.25	0.009	0.0014	0.0021	0.0026	---	
33D	AISI 4620	0.026	0.0035	0.0002	---	0.209	(0.0003)	0.008	0.139	0.072	0.593	0.229	0.0053	0.002
<i>Final</i>	G46200	1.78	0.0013	0.009	<0.001	0.023	0.002	0.207	0.005	0.003	0.002	<0.005	<0.002	
155A	AISI 4820	0.030	0.004	0.0003	---	0.20	0.002	0.010	0.13	0.12	0.54	0.25	0.0096	0.003
<i>Chips Only</i>	G48200	3.34	0.0016	0.009	(<0.01)	0.024	---	0.28	0.006	0.002	0.001	(<0.01)	<0.005	
155B	AISI 4820	0.027	0.0038	0.0002	---	0.207	0.0026	0.011	0.149	0.152	0.635	0.2390	0.0080	0.0024
<i>Chips Only</i>	G48200	3.57	0.0017	0.009	0.0005	0.028	0.001	0.313	0.008	0.003	0.003	(0.01)	0.002	
155C	AISI 4820	0.027	0.004	0.0002	---	0.204	(0.0004)	0.011	0.099	0.130	0.55	0.265	0.002	0.002
<i>X-Ray only</i>	G48200	3.36	0.0018	0.009	(0.001)	0.025	0.002	0.286	0.007	0.0019	0.002	<0.01	0.001	
155D	AISI 4820	0.024	0.0036	0.0002	---	0.210	0.0007	0.005	0.091	0.105	0.58	0.2440	0.0075	0.0017
<i>X-Ray only</i>	G48200	3.50	0.0018	0.010	(0.0003)	0.025	0.0010	0.206	0.0054	0.0018	0.002	0.004	0.002	
49C	AISI E52100	0.016	0.004	(0.0001)	---	1.04	---	0.007	1.35	0.082	0.31	0.015	0.0078	0.001
<i>X-Ray only</i>	G52986	0.064	(0.0012)	0.009	(<0.001)	0.013	---	0.26	0.005	0.003	0.008	(<0.005)	---	
49D	AISI E52100	[0.018]	[0.004]	---	---	[1.00]	---	[0.007]	[1.53]	[0.120]	[0.39]	[0.017]	[0.0105]	[0.0010]
<i>Provisional</i>	G52986	[0.060]	[0.0009]	[0.017]	[(0.0003)]	[0.006]	[(0.002)]	[0.24]	[0.008]	[0.002]	[0.003]	[(0.003)]	[(0.002)]	

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Page 4

Carbon & Low-Alloy Steels

Please call for availability and current pricing - (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	Bi Pb	C S	Ca Sb	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
34A	AISI E6150	0.014	(0.006)	(0.0002)	---	0.51	(0.0002)	0.009	0.99	0.18	0.78	0.044	0.0076	0.003
Final	G61500	0.14	(0.0014)	0.01	---	0.010	---	0.22	0.009	0.003	0.17	(0.02)	0.002	
34B	AISI E6150	0.024	0.006	0.0002	---	0.48	(0.0002)	0.009	0.94	0.21	0.81	0.053	0.0089	0.002
X-Ray & Chips Only	G61500	0.14	0.0018	0.021	(<0.01)	0.021	---	0.29	0.012	0.002	0.16	(<0.01)	0.005	
32A	AISI 8620	0.003	(0.005)	(0.0002)	---	0.20	0.0002	0.007	0.45	0.12	0.8	0.18	0.0093	0.003
X-Ray & Chips Only	G86200	0.49	(0.0037)	0.011	---	0.024	---	0.23	0.006	0.002	0.068	---	0.002	
32B	AISI 8620	0.038	0.005	0.0002	---	0.20	0.003	0.009	0.54	0.14	0.81	0.15	0.0078	0.003
X-Ray Only	G86200	0.005	0.0030	0.016	(<0.01)	0.024	---	0.25	0.011	0.001	0.004	(<0.01)	0.005	
32C	AISI 8620	0.026	0.004	0.0001	---	0.188	0.0008	0.006	0.49	0.119	0.81	0.169	0.0081	0.002
X-Ray & Chips Only	G86200	0.447	0.0018	0.009	(0.001)	0.024	---	0.220	0.006	0.002	0.003	0.004	0.001	
32D	AISI 8620	[0.025]	[0.0053]	[0.0003]	---	[0.197]	[0.0009]	[0.0064]	[0.54]	[0.173]	[0.80]	[0.20]	[0.0072]	[0.002]
Provisional	G86200	0.58	[0.0019]	[0.013]	[(0.001)]	[0.026]	---	[0.24]	[0.010]	[0.0021]	[0.003]	[(0.005)]	0.001	
182A	Alloy 86L20	0.020	0.008	0.0003	---	0.20	0.002	0.011	0.56	0.23	0.90	0.18	0.0067	0.003
Chips Only	N/A	0.5	0.0014	0.028	0.14	0.023	---	0.25	0.012	0.005	0.005	(0.01)	0.003	
182B	Alloy 86L20	0.038	0.003	0.0003	---	0.210	(0.0005)	0.006	0.49	0.017	0.81	0.172	0.0040	0.003
Final	N/A	0.47	0.003	0.016	0.19	0.037	0.003	0.27	0.0019	0.003	0.004	(0.01)	0.001	
252A	AISI 8740	0.017	0.005	0.0002	---	0.419	(0.0004)	0.008	0.501	0.107	0.91	0.206	0.0085	0.002
X-Ray Only	G87400	0.507	(0.001)	0.024	0.0007	0.009	0.005	0.248	0.007	0.001	0.005	0.004	0.001	
252B	AISI 8740	0.028	0.005	0.0002	---	0.419	0.0002	0.005	0.486	0.084	0.91	0.223	0.0081	0.002
X-Ray Only	G87400	0.486	0.0016	0.007	0.0004	0.019	0.002	0.236	0.021	0.002	0.004	0.002	0.001	
252C	AISI 8740	0.017	0.004	(0.0001)	---	0.416	(0.0003)	0.008	0.501	0.109	0.92	0.205	0.0083	0.002
Final	G87400	0.505	(0.002)	0.025	0.001	0.008	0.005	0.248	0.007	0.001	0.005	<0.005	0.002	
156B	AISI E9310	0.065	0.004	0.0011	---	0.117	---	0.010	1.31	0.116	0.59	0.105	0.0019	0.004
Final	G93106	3.24	<0.003	0.008	---	0.001	0.001	0.32	0.006	0.005	0.005	<0.01	0.002	
156C	AISI E9310	[0.028]	[0.0006]	[0.0002]	---	[0.107]	[0.0010]	[0.009]	[1.18]	[0.077]	[0.46]	[0.113]	[0.0026]	[0.003]
Provisional	G93106	[3.25]	[0.002]	[0.007]	[<0.001]	[0.0010]		[0.25]	[0.012]	[0.0024]	[0.005]	[0.006]	[0.0017]	
213A	A36	0.0018	0.007	0.0003	---	0.16	---	0.008	0.15	0.41	0.66	0.048	0.0082	0.002
X-Ray & Chips Only	K02600	0.15	0.011	0.015	0.0025	0.034	---	0.15	0.018	0.001	0.002	(0.007)	---	
213B	A36	[0.0010]	[0.006]	[0.0003]	---	[0.15]	[0.007]	[0.14]	[0.28]	[0.78]	[0.035]	[0.009]	[(0.001)]	[0.15]
Provisional	K02600	---	[0.009]	[0.009]	[(0.001)]	[0.040]	---	[0.21]	[0.009]	[0.001]	[0.016]	[0.004]	---	
35A	1¼Cr ½Mo	0.028	(0.003)	(0.0002)	---	0.12	(0.0002)	0.008	1.23	0.078	0.52	0.49	0.0081	0.003
Chips Only	K11572	0.088	(0.0014)	0.005	(<0.005)	0.006	---	0.61	0.004	0.002	0.020	---	0.002	

() and < > Indicate a non-certified value.

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Page 5

Carbon & Low-Alloy Steels

Please call for availability and current pricing - (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	Bi Pb	C S	Ca Sb	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
35B	1¼Cr ½Mo	0.016	0.006	0.0005	---	0.13	(0.0001)	0.008	1.12	0.11	0.45	0.46	0.0079	0.003
Chips Only	K11572	0.084	0.0016	0.006	(<0.01)	0.015	---	0.58	0.006	0.003	0.005	(<0.01)	0.005	
35C	1¼Cr ½Mo	0.029	0.003	0.0002	---	0.124	(0.0004)	0.006	1.20	0.061	0.51	0.46	0.047	0.003
Chips Only	K11572	0.047	(0.001)	0.008	<0.0005	0.017	0.005	0.57	0.005	0.002	0.004	0.004	0.002	
35F	1¼Cr ½Mo	0.036	<0.01	0.0003	---	0.126	---	0.004	1.160	0.030	0.50	0.48	0.0060	0.003
Chips Only	K11572	0.047	0.0016	0.009	<0.003	0.020	0.002	0.57	0.002	0.0027	0.004	0.004	0.0014	
35H	1¼Cr ½Mo	0.028	0.003	0.0003	---	0.135	(0.0003)	0.004	1.11	0.033	0.56	0.47	0.0075	0.002
Chips Only	K11572	0.071	0.002	0.005	0.0009	0.028	0.002	0.56	0.002	0.0016	0.004	0.004	0.001	
35I	1¼Cr ½Mo	[0.029]	[0.004]	[0.0003]	---	[0.133]	[(0.001)]	[0.013]	[1.13]	[0.17]	[0.54]	[0.47]	[0.0075]	[(0.002)]
Provisional	K11572	[0.122]	[<0.001]	[0.008]	[<0.001]	[0.022]	[0.0015]	[0.59]	[0.009]	[0.002]	[0.004]	[0.003]	[0.002]	
35J	1¼Cr ½Mo	[0.029]	[0.004]	[0.0003]	---	[0.129]	[0.0006]	[0.006]	[1.18]	[0.087]	[0.55]	[0.45]	[0.009]	[0.002]
Provisional	K11572	[0.086]	[(0.001)]	[0.006]	[(0.001)]	[0.025]	[0.0018]	[0.60]	[0.005]	[0.0020]	[0.004]	[(0.003)]	---	
229A	C ½Mo	0.027	(0.002)	0.0002	---	0.218	---	0.011	0.015	0.014	0.86	0.493	0.0071	0.002
Final	K12822	0.029	0.0013	0.008	(0.001)	0.010	0.002	0.331	0.002	0.002	0.006	(0.003)	0.002	
36A	2¼Cr 1Mo	0.024	(0.005)	(0.0002)	---	0.099	(0.0002)	0.012	2.08	0.17	0.55	0.93	0.0105	0.004
Chips Only	K21590	0.16	(0.0027)	0.006	(<0.005)	0.013	---	0.22	0.009	0.003	0.008	---	0.003	
36B	2¼Cr 1Mo	0.030	0.009	(0.0002)	---	0.14	0.0002	0.012	2.18	0.13	0.49	0.95	0.0102	0.004
Final	K21590	0.18	0.0018	0.010	(0.003)	0.038	---	0.21	0.008	0.003	0.006	(<0.01)	0.005	
305A	NIT 135M	[1.09]	[0.005]	[0.0004]	---	[0.40]	[0.001]	[0.034]	[1.61]	[0.0981]	[0.62]	[0.41]	[0.0044]	[0.003]
Provisional	K24065	[0.143]	[0.002]	[0.006]	---	[0.001]	0.005	[0.38]	[0.005]	[0.003]	[0.013]	[0.01]	0.0014	
299A	D6-AC	0.092	0.003	0.0003	---	0.469	0.0054	1.03	0.100	0.70	0.99	0.0028	0.006	0.57
Final	K24728		(0.002)	0.008	(0.001)	0.002	---	0.22	0.0055	0.0038	0.120	0.010	---	
37A	5Cr ½Mo	0.03	(0.007)	(0.0003)	---	0.13	(0.0002)	0.015	4.27	0.13	0.46	0.4600	0.019	0.00
Chips Only	K42544	0.10	(0.0034)	0.017	(<0.005)	0.018	0.001	0.25	0.008	0.004	0.012	---	0.003	
37B	5Cr ½Mo	0.025	0.006	0.0002	---	0.119	(0.0004)	0.017	4.82	0.137	0.431	0.47	0.0155	0.005
Final	K42544	0.11	0.0024	0.011	(0.0003)	0.016	0.006	0.235	0.008	0.0021	0.012	0.013	0.002	
38A	9Cr 1Mo	0.009	(0.023)	(0.0003)	---	0.130	(0.0005)	0.029	8.67	0.15	0.41	0.96	0.0190	0.008
Chips Only	K90941	0.24	(0.0050)	0.008	---	0.018	---	0.38	0.014	0.003	0.020	(0.023)	0.003	
38B	9Cr 1Mo	0.032	0.01	0.0004	---	0.130	0.0005	0.017	8384	0.119	0.427	0.94	0.0192	0.007
Final	K90941	0.15	0.0030	0.023	<0.001	0.013	0.01	0.78	0.010	0.004	0.014	(0.01)	0.003	
238A	F91	0.03	0.012	0.0004	---	0.110	---	0.026	8.23	0.17	0.40	0.94	0.047	0.086
Final	K91560	0.256	0.003	0.007	---	0.010	---	0.31	0.013	0.003	0.22	<0.03	0.002	

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Page 6

Carbon & Low-Alloy Steels

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IARM Status	Grade UNS#	Al Ni	As O	B P	Bi Pb	C S	Ca Sb	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
268B	STA 361	0.002	<0.005	0.0011	---	0.087	---	0.003	0.094	0.31	0.58	0.033	0.0015	0.006
Final	N/A	0.127	(0.015)	0.011	<0.003	0.035	---	0.21	0.010	<0.001	0.047	0.01	0.001	
321A	722	0.004	0.0052	0.0008	---	0.53	0.0016	0.007	0.24	0.212	1.53	0.026	0.010	0.0017
Final	N/A	0.47	0.005	0.012	(0.001)	0.017	0.002	0.65	0.019	0.0036	0.089	0.005	0.001	
322A	75S	0.002	0.005	0.0009	---	0.32	0.0019	0.006	0.159	0.33	1.4	0.021	0.023	0.001
Final	N/A	0.28	0.006	0.009	(0.001)	0.021	0.0027	0.42	0.016	0.0016	0.124	0.003	0.001	
323A	420/60	0.003	0.006	0.0003	---	0.41	0.0008	0.007	0.15	0.30	1.14	0.023	0.0105	0.0012
Final	N/A	0.084	0.010	0.0178	(0.001)	0.061	0.002	0.19	0.011	0.0012	0.020	0.004	0.001	
324A	M10	0.002	0.006	0.0004	---	0.99	0.0009	0.007	0.43	0.22	1.01	0.022	0.0082	0.014
Final	N/A	0.081	0.003	0.009	---	0.028	0.002	0.163	0.011	0.0016	0.0017	0.003	0.001	

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CKD Low-Alloy Steel CRMs

(Low-Alloy Calibration - Set of Ten)

CKD Number	Al t Ni	Al s P	As Pb	B S	Bi Sb	C Se	Co Si	Cr Sn	Cu Ta	Fe Te	Mn Ti	Mo V	N W	Nb Zr
180B	(0.001) 0.018	--- 0.004	0.001 (0.0002)	--- 0.0038	(0.0000) 0.0004	(0.003) (<0.001)	0.003 0.001	0.013 0.0011	0.006 (<0.0001)	(99.90) (<0.001)	0.047 ---	0.001 ---	(0.0028) (0.0001)	(0.0001) ---
181A	0.016 0.725	0.014 0.039	0.027 0.0005	0.0069 0.007	--- 0.016	0.225 ---	0.050 0.435	0.660 0.113	0.093 0.039	(95.48) ---	0.971 0.149	0.385 0.302	(0.005) 0.188	0.058 0.001
182A	0.023 2.82	0.017 0.008	0.005 (0.000)	0.0003 0.006	--- 0.001	1.38 ---	0.171 0.123	0.122 0.004	0.293 0.000	(94.60) ---	0.370 0.004	0.011 0.027	0.0049 0.016	0.001 0.003
182B	0.023 2.82	0.017 0.008	0.005 (0.000)	0.0003 0.006	--- 0.003	1.39 ---	0.171 0.126	0.122 0.004	0.293 ---	(94.59) ---	0.370 0.004	0.011 0.027	0.0049 0.016	0.001 0.001
183A	0.150 1.09	0.141 0.009	0.005 (0.000)	0.0005 0.012	0.0000 0.003	0.047 ---	0.119 1.02	0.204 0.051	0.568 (0.000)	(94.49) ---	1.74 0.003	0.036 0.004	0.0036 0.354	0.006 0.001
183B	0.150 1.10	0.141 0.010	0.004 (0.000)	0.0005 0.012	0.0000 0.002	0.050 ---	0.119 1.03	0.204 0.0054	0.575 (0.000)	(94.44) ---	1.76 0.003	0.036 0.004	0.0036 0.347	0.006 0.001
184A	0.022 0.250	0.016 0.028	0.006 (0.000)	0.0005 (0.01)	--- 0.27	1.013 (0.008)	0.007 0.348	2.33 0.008	0.089 0.000	(93.58) ---	2.23 0.010	0.016 0.017	0.0104 (0.001)	0.013 (0.002)
185A	0.060 3.84	0.054 0.024	0.022 0.002	0.0116 (0.02)	--- 0.011	0.566 ---	0.032 0.230	0.032 0.003	0.179 0.085	(93.63) (0.005)	0.715 0.022	0.123 0.178	0.0051 (0.001)	0.20 0.002
186B	0.042 1.57	0.038 0.012	0.007 (0.000)	0.0009 0.007	--- 0.002	0.382 ---	0.006 1.41	1.50 0.018	0.227 0.009	(93.12) ---	1.299 0.044	0.251 0.020	(0.005) 0.054	0.004 (0.002)
187A	0.019 0.085	0.017 0.035	(0.007) 0.003	0.0006 0.018	0.003 0.023	0.119 (0.004)	0.071 0.567	3.51 0.013	0.036 0.015	(93.01) ---	0.525 0.087	0.565 0.558	0.0122 0.67	0.028 0.013
188A	0.093 0.445	0.083 0.006	(0.005) 0.001	0.0047 0.033	--- 0.006	0.332 ---	0.006 0.775	5.11 0.005	0.057 0.022	(90.53) (0.001)	0.169 0.034	1.28 0.802	0.0076 0.091	0.122 0.052
189A	0.041 5.34	0.039 0.032	0.080 0.002	0.0030 0.051	--- (0.003)	0.175 ---	0.007 0.286	1.065 0.029	0.060 (0.005)	(90.01) ---	0.262 0.326	0.837 0.054	(0.004) 1.30	0.017 0.005

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Page 8

MBH Low-Alloy Steels

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

1.2.2 Residuals in Mild Steel		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	Ti	V	W	As	Co	Zn	Nb	N	Bi	Se	Sb	Size (mm) Ø x H	Form
CRM	12X 10180 A	0.170	0.221	0.0336	0.0104	0.806	0.101	0.095	0.0220	0.176	0.0143	0.0243	.....	.....	.....	0.0058	.....	0.0031	.....	0.0106	.....	.....	.....	40 x 20	W
CRM	12X 12700 A	0.365	0.238	0.0116	0.0205	0.636	0.0197	0.070	0.0345	0.0342	.....	0.055	.....	0.0033	.....	0.0060	0.0047	0.0120	.....	0.0073	.....	.....	.....	50 x 20	C
CRM	12X 12701 A	0.330	0.308	0.0124	0.0218	0.636	0.0557	0.235	0.0163	0.0346	.....	0.0426	.....	0.0040	.....	0.0060	0.0058	0.0014	.....	0.0072	.....	.....	.....	50 x 20	C
CRM	12X 12746 U	0.0132	0.183	0.064	0.0247	1.70	0.161	0.182	0.654	0.368	0.202	0.021	0.0283	0.0160	0.101	0.049	0.115	.....	.....	.....	.....	.....	.....	40 x 15	W
CRM	12X 12747 U	0.149	0.337	0.041	0.029	2.02	0.391	0.443	0.500	0.437	0.167	0.015	0.072	0.0375	0.030	0.0114	0.200	.....	.....	.....	.....	.....	.....	42 x 15	W
CRM	12X 12748 T	0.135	0.122	0.052	0.053	0.494	0.454	0.755	0.300	0.543	0.074	0.009	(0.003)	0.0464	0.056	0.145	0.280	.....	.....	.....	.....	.....	.....	42 x 15	W
CRM	12X 12749 V	0.138	0.549	0.080	0.036	1.531	0.609	0.549	0.224	0.269	0.0240	0.026	0.0361	0.0419	0.035	0.074	0.484	.....	.....	.....	.....	.....	.....	42 x 15	W
CRM	12X 12750 T	0.202	0.383	0.0082	0.0106	0.248	1.012	0.853	0.119	0.0215	0.227	0.285	0.116	0.0961	0.105	.....	0.670	.....	0.120	.....	.....	.....	.....	40 x 15	W
CRM	12X 349 B	0.278	0.295	0.0326	0.0340	0.910	0.285	0.190	0.058	0.308	0.175	0.152	0.125	0.0158	0.053	0.0050	0.0211	.....	.....	.....	.....	.....	.....	42 x 15	W
CRM	12X 350 B	0.138	0.672	0.0363	0.029	0.706	0.162	0.392	0.149	0.150	0.0298	0.341	0.099	0.0286	0.275	0.053	0.0206	.....	.....	.....	.....	.....	.....	40 x 15	W
CRM	12X 352 C	0.257	0.498	0.131	0.074	0.533	0.380	0.348	0.242	0.162	0.124	0.090	0.246	0.042	0.140	0.030	0.031	.....	.....	.....	.....	.....	.....	42 x 15	W
CRM	12X 353 D	0.128	0.143	0.0049	0.0075	0.533	0.191	0.524	0.108	0.259	0.072	0.0490	0.066	0.0258	0.098	0.052	0.045	0.0185	0.058	0.0047	0.0104	0.018	0.088	40 x 15	W
		C	Si	S	P	Mn	Al	V	Co	Sb	B	Nb	Zr											Size (mm) Ø x H	Form
	12X 354 A	0.27	0.19	0.015	0.066	0.86	0.01	0.02	0.03	0.05	.....	0.07	0.03											38 x 15-20	W
	12X 355 A	0.20	0.48	0.024	0.028	0.62	<0.01	0.11	0.05	0.08	0.001	0.02	<0.01											38 x 15-20	W
	12X 356 A	0.36	0.37	0.031	0.049	0.44	0.05	0.09	0.12	0.02	0.007	0.02	0.01											38 x 15-20	W
	12X 357 A	0.45	0.23	0.062	0.016	0.24	0.06	0.19	0.21	<0.005	0.014	<0.001	<0.005											38 x 15-20	W
1.2.3 Low Alloy Steel		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	V	W	As	Co	Nb	Ti	Ta	N				Size (mm) Ø x H	Form
CRM	12X LA1 A	0.06	0.73	0.045	0.013	1.32	0.21	0.95	<0.01	0.034	.....	<0.01	0.41	.....	.....	.....	.....	.....	.....	.....				40 x 15	W
CRM	12X LA2 C	0.182	1.023	0.0424	0.0268	0.415	0.788	0.757	0.179	0.383	.....	1.60	0.0686	.....	.....	0.053	.....	.....	.....	0.0108				42 x 15	W
	12X LA3 A	0.48	0.13	0.040	0.032	1.50	0.31	0.37	0.30	0.20	.....	0.06	0.19	.....	.....	.....	.....	.....	.....	0.006				40 x 15	W
CRM	12X LA4 B	0.537	0.335	0.039	0.0363	0.303	0.521	0.499	0.489	0.334	.....	0.057	0.328	0.091	.....	0.105	.....	.....	.....	0.0222				42 x 15	W
	12X LA5 A	0.81	0.67	0.015	0.057	0.98	0.13	0.12	0.19	0.09	.....	0.19	0.58	.....	.....	.....	.....	.....	.....	.....				40 x 15	W
	12X LA6 A	0.04	0.06	0.006	0.005	0.40	0.03	0.03	<0.01	0.04	.....	<0.01	<0.01	.....	.....	.....	.....	.....	.....	.....	sold out - to be remade			40 x 15	W
CRM	12X 15217 Q	0.176	1.390	0.073	0.058	0.652	0.864	1.24	0.358	0.231	0.0737	(0.021)	0.662	0.121	.....	0.248	0.131	.....	.....	0.0253				40 x 15	W
CRM	12X 15251 T	1.17	2.27	0.0258	0.0284	1.003	1.035	0.792	0.205	0.110	0.0047	0.050	0.405	0.053	.....	0.259	0.29	.....	.....	0.0232				42 x 15	W
CRM	12X 15252 Q	0.0478	0.265	0.0580	0.0213	0.818	2.03	0.887	0.248	0.154	0.0448	0.074	0.330	.....	.....	0.154	0.10	.....	(0.054)	0.0218				40 x 15	W
CRM	12X 15253 R	0.240	0.387	0.054	0.066	1.162	0.527	1.492	0.538	0.431	0.216	0.187	0.248	0.332	.....	0.093	0.49	.....	.....	0.043				40 x 15	W
CRM	12X 15255 P	0.473	1.13	0.0225	0.111	1.170	0.405	1.99	0.111	0.395	0.100	0.13	0.541	0.209	.....	0.051	0.145	.....	.....	0.018				40 x 15	W
CRM	12X 15256 P	0.082	0.137	0.0134	0.0177	0.553	5.70	0.970	0.130	0.050	0.123	0.129	0.554	0.103	.....	0.546	0.101	.....	.....	0.0273				40 x 15	W
CRM	12X 15259 P	0.740	1.90	0.099	0.0401	0.314	4.01	0.554	0.434	0.161	0.070	0.192	0.165	1.04	.....	0.123	0.377	.....	.....	0.0132				40 x 15	CC
CRM	12X 15260 V	0.446	0.456	0.094	0.031	2.20	0.573	3.69	0.130	0.231	0.0130	0.378	0.351	.....	0.087	0.109	0.243	.....	0.026	.....				40 x 15	CC
CRM	12X 15266 T	0.454	0.667	0.0093	0.079	1.45	1.50	2.78	0.365	0.253	0.0160	0.453	0.089	.....	0.063	0.235	1.481	.....	0.20	.....				40 x 15	CC
CRM	12X 41400 A	0.418	0.221	0.0210	0.0138	0.795	0.127	1.003	0.211	0.238	0.0181	0.0195	.....	.....	0.0088	.....	.....	.....	.....	0.0101				38 x 20	W
CRM	12X 15254 Y	0.261	0.753	0.0476	0.043	1.19	0.886	2.09	0.788	0.130	0.047	1.136	0.296	0.358	.....	0.470	0.322	0.260	.....	.....				40 x 15	W
CRM	12X 15258 N	0.548	1.020	0.070	0.0439	1.434	0.327	0.465	0.215	0.0934	0.0453	0.032	0.218	0.102	.....	0.272	0.103	0.120	.....	.....				42 x 15	W
CRM	12X 15261 W	0.689	1.606	0.079	0.111	0.437	0.113	0.495	1.508	0.252	0.0157	1.013	0.114	0.256		0.363	0.691	0.397						40 x 15	CC

() Indicates non-certified value.

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Revised - 10/11/2011

Page 9

Special Carbon & Low-Alloy Steels

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Co Si	Cr Sn	Cu Ti	Mn V	Mo W	N Zr	Nb
164A	CLA1	0.72	(0.002)	(0.0001)	0.004	0.0002	0.006	0.032	0.88	1.57	0.009	0.0003	0.006
Final	N/A	1.29	0.0005	0.004	(0.004)	0.070	0.019	0.002	0.002	0.78	1.44	<0.005	
165A	CLA2	0.80	(0.003)	(0.001)	0.003	0.0002	0.006	0.036	1.40	1.65	0.009	0.0004	0.007
X-Ray & Chips Only	N/A	1.43	0.0004	0.005	(<0.01)	0.086	0.021	0.002	0.002	1.13	1.57	<0.005	
166A	CLA3	0.55	(0.004)	(0.0002)	0.003	0.0003	0.004	0.014	0.64	1.29	1.08	0.0002	0.006
Final	N/A	0.77	0.0006	0.005	(<0.01)	0.073	0.91	(0.003)	0.002	0.40	1.02	<0.01	
167A	CLA4	0.64	(0.004)	(0.0002)	0.003	0.0002	0.003	0.016	0.95	1.36	1.25	0.0005	0.006
X-Ray Only	N/A	1.00	0.0007	0.019	(0.002)	0.087	1.08	0.003	0.003	0.59	1.19	0.003	
168A	CLA5	0.19	(0.003)	0.0004	0.003	0.0002	0.003	0.004	0.009	0.12	0.69	0.0002	0.003
Final	N/A	2.32	0.0008	0.030	(<0.01)	0.064	0.46	0.003	0.004	0.004	0.52	0.003	
169A	CLA6	0.30	(0.009)	(0.001)	0.31	0.0003	0.005	2.19	0.31	0.21	0.95	0.0004	0.005
X-Ray Only	N/A	2.50	0.0006	0.033	(0.002)	0.065	0.79	0.003	0.005	0.006	0.65	<0.005	
170A	CLA7	0.032	(0.005)	(0.0002)	0.56	0.0001	0.004	2.55	0.005	0.019	1.57	0.0003	0.004
Final	N/A	1.51	0.0003	0.039	(<0.01)	0.025	0.010	0.002	0.006	0.006	(0.018)	0.003	
171A	CLA8	0.082	(<0.01)	(0.0006)	0.64	0.0001	0.005	2.88	0.49	0.020	1.91	0.0003	0.005
X-Ray Only	N/A	1.95	(0.0004)	0.043	(<0.01)	0.059	0.25	0.002	0.005	0.006	0.13	0.003	
172A	CLA9	0.39	(0.005)	0.0003	0.78	0.0001	0.006	3.52	0.40	0.010	0.014	0.0004	0.004
Final	N/A	0.025	0.0006	0.007	(<0.01)	0.004	1.29	0.003	0.003	0.003	0.038	<0.005	
173A	CLA10	0.48	(<0.01)	0.0004	0.85	0.0002	0.010	4.39	0.72	0.011	0.015	0.0006	0.006
X-Ray & Chips Only	N/A	0.024	0.0007	0.015	(<0.01)	0.004	1.70	0.003	0.004	0.28	0.041	<0.002	
180A	CLA11	0.76	(0.004)	0.0004	0.007	0.0001	0.004	0.037	0.89	0.41	0.006	0.0096	(0.005)
Final	N/A	1.29	0.0006	0.004	(0.002)	0.046	0.023	0.002	0.002	0.76	1.48	0.003	
181A	CLA12	0.87	(0.013)	(0.0002)	0.007	0.0002	(0.004)	0.044	1.45	1.76	0.009	0.0185	(0.007)
X-Ray & Chips Only	N/A	1.40	0.0006	0.004	(0.002)	0.095	0.026	0.002	0.003	1.12	1.65	<0.01	

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Page 10

Tool Steels

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IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Co Sb	Cr Si	Cu Sn	Mn Ti	Mo V	N W	Nb Zr
304A <i>Provisional</i>	AISI M-1 T11301	[0.010] [0.132]	[0.01] [0.003]	[0.002] [0.018]	[0.86] [<0.002]	--- [0.002]	[0.28] 0.01	[3.6] [0.37]	[0.13] [0.006]	[0.257] [0.003]	[8.1] [1.22]	[0.034] [1.7]	[(0.01)] [(0.002)]
44A Chips Only	AISI M-2 T11302	0.027 0.20	(0.022) (0.0018)	(0.0022) 0.029	0.86 <0.005	--- 0.003	0.16 ---	4.26 0.39	0.14 0.011	0.31 0.005	5.08 1.86	0.0247 6.25	(0.009) (0.004)
44B Chips Only	AISI M-2 T11302	--- 0.18	--- 0.0028	--- 0.014	0.84 (0.0001)	--- 0.006	0.41 ---	3.86 0.39	0.072 (0.008)	0.27 0.004	4.79 1.83	0.0251 5.98	0.016 ---
44C <i>Provisional</i>	AISI M-2 T11302	[0.055] [0.13]	[0.01] [(0.003)]	[0.002] [0.027]	[0.83] ---	--- [0.004]	[0.25] ---	[4.06] [0.31]	[0.12] [0.010]	[0.30] [0.004]	[5.0] [1.92]	[0.033] [6.0]	[0.012] [(0.003)]
251A Final	AISI M-4 T11304	0.01 0.131	0.016 (0.01)	(0.002) 0.014	1.398 (0.002)	0.0005 0.058	0.129	4.1 0.58	0.13 0.011	0.33 0.003	5.16 3.9	0.044 5.5	0.016 (0.002)
306A <i>Provisional</i>	AISI M-50 T11350	[(0.005)] [0.12]	[(0.004)] [0.0010]	[(0.001)] [0.007]	[0.83] ---	--- [0.0035]	[0.010] ---	[4.1] [0.16]	[0.043] [0.005]	[0.21] [0.002]	[4.2] [.66]	[0.004] [(0.01)]	[0.008] [(0.001)]
48A Chips Only	AISI T-1 T12001	(0.016) 0.23	(0.051) (0.0107)	(0.0018) 0.036	0.79 ---	(0.0006) 0.021	0.13 ---	4.32 0.29	0.13 0.019	0.33 0.004	0.40 1.13	0.0221 17.99	(0.003) (0.006)
48B X-Ray & Chips Only	AISI T-1 T12001	(0.006) 0.080	--- (0.0125)	--- 0.020	0.74 ---	--- 0.023	(0.040) ---	4.14 0.28	0.070 (0.009)	0.28 (0.004)	0.093 1.12	0.0096 [17.26]	0.004 ---
48C <i>Provisional</i>	AISI T-1 T12001	[0.017] [0.204]	[0.012] [0.003]	[(0.001)] [0.030]	[0.77] ---	--- [0.018]	[0.22] [(0.002)]	[4.24] [0.45]	[0.13] [0.012]	[0.39] [0.006]	[0.17] [1.27]	[0.0165] [17.5]	[0.005] [(0.002)]
255A Final	AISI H-11 T20811	0.01 0.083	(0.002) 0.0011	0.0004 0.013	0.403 <0.001	(0.0004) 0.0012	0.009 ---	4.84 0.93	0.049 0.006	0.27 0.002	1.33 0.43	0.0067 0.007	0.004 <0.005
42A X-Ray only	AISI H-13 T20813	(0.024) 0.32	--- (0.0019)	(0.0007) 0.011	0.39 <0.005	--- 0.007	0.015 ---	(5.42) 1.04	0.070 0.005	0.35 0.005	1.29 1.02	0.0143 (0.014)	(0.001) ---
42B X-Ray & Chips Only	AISI H-13 T20813	0.013 0.18	--- 0.0026	(0.0005) 0.014	0.38 (0.0003)	--- 0.005	0.013 ---	5.10 0.99	0.089 0.005	0.36 0.003	1.23 0.94	0.0105 0.012	0.004 ---
42C <i>Provisional</i>	AISI H-13 T20813	[0.019] [0.05]	[(0.01)] [0.003]	[0.0010] [0.022]	[0.38] [(0.001)]	--- [0.004]	[0.022] ---	[4.87] [0.86]	[0.066] [0.007]	[0.40] [0.012]	[1.28] [0.84]	[0.019] [0.31]	[0.004] ---
39B Final	AISI A-2 T30102	0.006 0.14	--- ---	--- 0.017	0.99 ---	--- 0.003	0.014 ---	4.79 0.35	0.10 0.004	0.54 0.003	1.01 0.22	0.0096 (0.026)	0.006 ---
40A Chips Only	AISI A-6 T30106	0.009 0.14	(0.007) (0.0024)	(0.0003) 0.024	0.68 ---	--- 0.010	0.011 ---	1.04 0.25	0.092 0.006	2.15 0.003	1.05 0.007	0.0077 (0.013)	0.004 ---
40B Final	AISI A-6 T30106	(0.006) 0.096	--- (0.0014)	(0.0010) 0.012	0.68 ---	--- 0.003	0.015 ---	1.04 0.39	0.050 0.004	1.98 0.003	1.22 0.014	0.0107 0.013	0.005 ---

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Revised - 10/11/2011

Page 11

Tool Steels

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Co Sb	Cr Si	Cu Sn	Mn Ti	Mo V	N W	Nb Zr
41C	AISI D-2	0.012	<0.01	0.0002	1.55	---	0.019	11.7	0.034	0.28	0.81	0.0106	0.01
Final	T30402	0.102	0.0021	0.022	---	0.001	---	0.39	0.0041	0.0053	0.93	0.01	<0.005
45A	AISI O-6	0.011	(0.003)	(0.0001)	1.39	---	0.004	0.13	0.049	0.88	0.25	0.0079	0.002
Final	T31506	0.11	(0.0017)	0.014	<0.005	0.012	---	1.02	0.005	0.003	0.005	---	0.005
45B	AISI O-6	0.01	0.002	(0.0001)	1.42	---	0.004	0.061	0.018	0.90	0.24	0.0080	0.002
Final	T31506	0.11	0.0005	0.010	---	0.008	0.001	0.92	0.008	0.002	0.003	(0.004)	0.001
46A	AISI S-1	0.011	(0.009)	(0.0012)	0.49	---	0.015	1.31	0.083	0.48	0.16	0.0144	0.004
Final	T41901	0.30	(0.0027)	0.023	<0.005	0.012	---	0.94	0.024	0.004	0.16	1.84	0.005
46B	AISI S-1	0.011	(0.01)	0.0003	0.45	---	0.013	1.09	0.147	0.27	0.222	0.0069	0.003
Final	T41901	0.108	0.002	0.019	<0.002	0.0040	---	0.89	0.016	0.007	0.170	1.96	---
47A	AISI S-5	0.017	(0.014)	(0.0003)	0.58	---	0.009	0.29	0.25	0.80	0.41	0.0084	(0.004)
X-Ray & Chips Only	T41905	0.23	(0.0021)	0.015	<0.005	0.010	0.003	1.92	0.031	0.008	0.22	(0.016)	0.01
47B	AISI S-5	0.014	---	(<0.001)	0.59	---	0.007	0.23	0.17	0.79	0.20	0.0092	(0.002)
Final	T41905	0.090	(0.0014)	0.017	(0.0003)	0.006	---	1.96	0.008	0.010	0.17	(0.016)	---
259A	AISI S-7	0.016	0.006	0.0003	0.479	---	0.011	3.27	0.081	0.399	1.43	0.0077	0.003
Final	T41907	0.194	0.0014	0.020	<0.0005	0.0007	---	0.44	0.004	0.0026	0.256	0.035	0.001
43A	AISI L-6	0.030	(0.006)	(0.0002)	0.68	---	0.016	0.66	0.15	0.61	0.20	0.0089	0.003
Chips Only	T61206	1.34	(0.0026)	0.009	<0.005	0.034	0.002	0.24	0.008	0.003	0.008	(0.016)	0.01
43B	AISI L-6	0.021	0.005	0.0002	0.711	---	0.012	0.651	0.180	0.56	0.206	0.0093	0.004
Final	T61206	1.39	0.0016	0.008	<0.0005	0.013	0.002	0.251	0.013	0.0047	0.0035	<0.005	0.001

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Statistical Process Control (SPC) Standards

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Co Sb	Cr Si	Cu Sn	Mn Ti	Mo V	N W	Nb Zr
194A	SPC1	0.102	0.031	0.0058	0.517	0.0002	0.052	0.70	0.26	1.04	0.40	0.0055	0.056
Final	N/A	0.79	0.0012	0.039	0.0010	0.025	0.015	0.49	0.017	0.078	0.333	0.13	0.026
195A	SPC2	0.013	0.021	0.0040	0.255	0.0001	0.102	0.214	0.52	1.85	0.052	0.0078	0.007
Final	N/A	1.01	0.0017	0.018	0.0014	0.007	0.013	1.16	0.084	0.002	0.083	0.38	0.002
195B	SPC2	0.029	0.021	0.0039	0.255	0.0002	0.101	0.216	0.52	1.84	0.052	0.0070	0.007
Final	N/A	1.00	0.0017	0.018	0.002	0.005	0.011	1.16	0.084	0.002	0.082	0.38	0.002
196A	SPC3	0.015	0.025	0.0017	1.08	0.0002	0.013	2.35	0.25	2.40	0.129	0.0084	0.087
Final	N/A	0.61	0.0021	0.040	0.001	0.014	0.006	0.35	0.033	0.014	0.157	0.189	0.006

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CKD Low-Alloy Cast Iron CRMs for Solid Sample Spectrometry

(CRMs 241-249)

Designed for the calibration and validation of spectrochemical analysis methods using Atomic Emission Spectrometry (AES) - OE (spark emission), glow discharge or laser excitation, this set is also excellent for X-Ray Fluorescence Spectrometry.

The CRMs can be used as a set of nine or as individual samples. Each individual CRM can be purchased separately.

Manufacture and Technical Parameters

The samples were white chill-cast on a massive copper block with controlled speed at a controlled temperature of the molten metal. The samples are truncated pyramids with a base analytical surface (38x38 mm), a minimum total height of 20 mm and a side ledge 11-13 mm high. The samples can be used until 1 mm of the ledge height remains. The certified portion of a sample extends 10-12 mm from the original analytical surface.

Shrinkage cavities and porosity, which may appear in the uncertified portions of the samples, do not affect the analytical performance of the certified portions. The uncertified portions should not be used for calibration and/or validation.

Homogeneity was tested by Atomic Emission Spectrometry with an analytical area approximately 4 mm in diameter.

The CRMs were tested for random homogeneity and trend homogeneity along the height of the certified portion. Trend homogeneity of the casting sequence was also tested. The latter test was supported by Combustion-IR Molecular Absorption Spectrometry and Thermo-evolution.

Quality Management System ISO 9001 is in force with the producer. Production, testing, and certification were carried out in compliance with the ISO-REMCO Guide 34 (2000).

CKD Low-Alloy Cast Iron Spectrometric CRMs

(Cast Iron Calibration - Individual or Set of Nine)

CKD # Status	Al Nb	As Ni	B P	Bi Pb	C S	Ce Sb	Co Se	Cr Si	Cu Sn	Fe Te	La Ti	Mg V	Mn W	Mo Zn	N Zr
242A	0.004	---	0.008	---	0.24	---	13.5	3.0	0.007	---	---	---	0.018	1.21	0.0003
Final	0.004	11.1	0.002	---	0.0004	---	---	0.02	(0.001)	---	0.009	0.01	<0.01	---	---
242B	0.042	0.009	0.005	0.020	2.06	---	0.004	0.031	0.040	92.6	---	---	0.189	1.21	0.0092
Final	0.009	0.022	0.044	0.027	0.028	0.005	(0.002)	2.81	0.010	0.031	0.28	0.46	(0.002)	---	---
243A	0.013	0.087	0.009	0.001	2.32	---	0.026	0.398	0.187	93.0	---	---	0.422	0.262	0.0037
Used	0.019	0.085	0.173	0.055	0.082	0.086	0.055	2.39	0.114	---	0.023	0.154	0.029	0.018	---
244C	0.071	0.043	0.086	0.000	2.57	0.017	0.050	0.248	0.301	92.9	0.008	0.031	0.715	0.059	---
Final	0.006	0.344	0.027	0.003	0.012	0.004	---	2.15	0.175	---	0.034	0.002	0.052	0.027	0.037
245A	0.019	0.002	0.007	0.008	2.94	---	0.003	0.166	0.076	92.7	---	0.003	1.38	0.114	---
Used	0.001	0.161	0.41	0.015	0.039	0.050	---	1.58	0.076	0.018	0.087	0.073	0.021	---	0.003
245B	0.038	0.006	0.003	0.009	2.95	---	0.007	0.197	0.081	92.5	---	0.003	1.38	0.115	---
Final	0.029	0.194	0.42	0.020	0.035	0.052	(0.029)	1.59	0.076	0.017	0.110	0.055	0.020	---	0.004
246	0.006	0.005	---	---	2.82	0.01	0.008	1.20	1.38	92.92	0.003	0.010	0.302	0.005	---
Used	0.001	0.043	0.60	0.0003	0.022	0.003	---	0.62	0.002	---	0.001	0.002	0.007	---	---
246B	0.101	0.003	---	0.001	2.73	0.007	0.012	1.16	1.39	92.6	0.003	0.016	0.354	0.009	---
Final	(0.001)	0.065	0.66	(0.002)	0.020	0.004	---	0.76	0.002	---	0.014	0.013	0.011	---	---
247B	0.043	0.010	---	0.007	3.09	0.053	0.095	0.041	0.822	92.7	0.019	0.056	1.05	0.023	---
Used	0.052	0.437	0.098	0.002	0.0034	0.005	---	1.20	0.038	0.008	0.067	0.013	0.002	0.012	0.009
249A	0.047	0.014	0.015	0.007	4.10	0.027	0.020	0.083	0.497	92.3	0.007	0.067	0.197	0.010	---
Final	0.021	1.20	0.26	0.015	0.0130	0.002	0.005	0.91	0.002	---	0.084	0.032	0.01	0.004	0.028
249C	0.032	0.016	0.017	0.004	4.06	0.017	0.014	0.148	0.486	92.9	0.004	0.042	0.099	0.011	---
Final	0.011	1.21	0.27	0.009	0.0075	0.005	(0.002)	0.49	0.002	---	0.026	0.026	0.009	0.006	0.027

MBH Cast Irons

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1.1.3 High Phosphorus																						Size (mm) Ø x H	Form	
		C	Si	S	P	Mn	Cr																	
CRM	11X HPC1 G	3.22	2.60	0.0311	0.75	0.499																40 x 15	OC	
CRM	11X HPC2 K	2.85	2.19	0.066	1.55	0.775	2.05															40 x 17	OC	
CRM	11X HPC3 H	3.77	1.58	0.0513	1.96	1.316	.....															40 x 15	OC	
CRM	11X HPC4 P	3.15	1.08	0.094	2.03	0.804	1.57															40 x 17	OC	
CRM	11X HPC5 A	3.68	1.175	0.223	0.246	1.028	1.42															40 x 17	OC	
1.1.7 Low Alloy																						Size (mm) Ø x H	Form	
		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	Ti	V	Nb	Co	W	As	Sb	Bi	Se	Zn		
CRM	11X CC21 A	3.12	2.19	0.083	0.0246	0.785	0.107	0.351	0.0357	0.153	0.0078	0.0024	0.0259	0.0083	.....	.....	.....	0.0101	.....	.....	.....	.....	45 x 6	2xOC
CRM	11X CC22 A	3.70	1.82	0.080	0.033	0.690	0.060	0.319	0.021	0.712	0.012	(0.002)	0.029	0.0087	.....	.....	.....	0.009	.....	.....	.....	.....	45 x 6	2xOC
CRM	11X C1 P	2.85	1.483	0.0383	0.105	1.262	0.696	0.538	0.075	0.164	0.032	0.0193	(0.14)	0.101	0.170	0.082	.....	0.018	0.064	0.0060	0.010	0.0208		
CRM	11X C2 S	3.54	1.281	0.086	0.200	0.961	1.006	0.794	0.096	0.133	0.065	0.049	0.042	0.289	0.084	0.113	0.098	0.029	0.068	0.007	(0.009)	0.0020		
CRM	11X C3 Z	3.27	0.944	0.152	0.387	0.797	4.14	2.43	0.235	0.431	0.236	(0.015)	0.071	0.796	0.186	0.376	(0.054)	0.120	0.264	(0.002)	0.0026	0.0111		
CRM	11X C4 Q	1.89	3.02	0.138	0.111	0.651	2.41	1.50	0.114	0.342	0.0207	0.032	0.091	0.0233	0.072	0.0175	0.122	0.0103	0.011	0.0050	(0.0030)	0.0112		
CRM	11X C5 U	2.49	1.78	0.103	0.097	0.791	2.05	1.15	0.497	2.71	0.021	0.006	0.079	0.0537	(0.088)	0.105	(0.083)	0.0225	0.037	0.006	0.0046	0.011	continued	
CRM	11X C6 V	3.76	0.487	0.0567	0.069	1.088	0.060	0.606	1.561	0.890	0.0585	(0.018)	0.049	0.0608	0.023	0.094	.....	0.0499	0.037	0.005	0.007	0.025		
CRM	11X C7 N	2.51	0.829	0.0101	0.0266	1.942	0.0303	0.507	0.071	0.075	0.0114	0.0127	0.022	0.036	0.051	0.0335	0.066	0.0159	0.025	0.0137	.....	0.0226		
CRM	11X C8 T	3.03	1.61	0.189	0.843	0.486	0.320	0.501	0.158	0.317	0.091	0.016	0.115	0.0637	(0.082)	0.174	0.0175	0.077	0.068	0.041	(0.073)	0.007		
CRM	11X C9 B	2.82	1.19	0.0306	0.032	1.88	2.58	1.31	0.158	0.299	0.052	0.005	0.054	0.475	0.062	0.132	0.286	0.046	0.152	(0.011)	0.0091	0.010		
CRM	11X C10 B **	3.60	1.685	0.144	0.112	0.632	0.240	0.253	0.327	0.659	0.035	0.018	0.031	0.027	.....	.....	0.340	0.014	0.0065	.....	.....	.....	** provisional values	
	Continuation from above		Pb	B	Zr	Te	Cd	N															Size (mm) Ø x H	Form
	11X C1 P		0.011	0.052	0.005	.....	.....	0.0044															40 x 15	OC
	11X C2 S		0.015	0.0072	.....	.....	.....	0.0057															40 x 15	OC
	11X C3 Z		(0.008)	(0.003)	.....	0.0024	.....	.....															40 x 17	OC
	11X C4 Q		0.0155	0.018	0.006	0.0010	0.0014	.....															40 x 17	OC
	11X C5 U		0.023	0.0172	(0.004)	0.005	.....	.....															40 x 17	OC
	11X C6 V		0.006	0.0053	0.005	.....	.....	0.0152															40 x 15	OC
	11X C7 N		0.0106	0.0097	(0.003)	.....	.....	0.025															40 x 15	OC
	11X C8 T		0.023	0.0409	.....	0.0043	.....	0.0075															40 x 15	OC
	11X C9 B		0.0044	0.0058	.....	0.015	.....	.....															40 x 17	OC
	11X C10 B **		0.007	.....	.....	.....	.....	0.0076															40 x 15	OC
1.1.8 Abrasion Resistant																						Size (mm) Ø x H	Form	
		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Al	Ti	V	Nb	Pb									
CRM	11X AR5 J	3.10	1.70	0.0316	0.0299	0.57	5.16	9.73	0.12	0.032	(0.018)	0.0147	0.0586	0.030	(0.003)								40 x 17	OC

() Indicates non-certified value.

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Revised - 10/11/2011

Page 16

MBH Cast Irons

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1.1.9 Corrosion Resistant		C	Si	S	P	Mn	Ni	Cr	Cu								Size (mm) Ø x H	Form	
CRM	11X S1Cr5 F	2.54	1.27	0.035	0.107	0.75	16.3	2.36	6.34	sold out - no remake planned							40 x 15	CC	
	11X S2Cr1 E	2.83	2.85	0.011	0.31	1.68	16.5	2.48	0.02								40 x 15	CC	
	11X S2Cr2 D	3.03	1.23	0.046	0.14	0.53	18.0	2.35	0.23								40 x 15	CC	
	11X S2Cr4 D	2.82	2.59	0.010	0.049	0.97	20.7	1.10	0.24								40 x 15	CC	
	11X S2Cr5 D	3.01	2.51	0.042	0.14	0.83	19.5	3.99	0.24								40 x 15	CC	
	11X S2Cr6 D	2.65	3.59	0.009	0.254	0.81	18.0	4.39	0.27								40 x 15	CC	
	11X S3Cr1 D	2.61	2.52	0.011	0.046	0.70	31.7	0.15	0.19								40 x 15	CC	
	11X S3Cr2 C	2.30	2.59	0.010	0.045	0.85	31.0	2.62	0.21								40 x 15	CC	
	11X S3Cr3 B	2.49	2.44	0.050	0.053	0.66	29.4	4.06	0.23								40 x 15	CC	
	11X S3Cr4 C	2.51	2.37	0.056	0.081	0.65	29.5	5.30	0.23								40 x 15	CC	
			C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Co	Sn	Al	Ti	V	Pb	Size (mm) Ø x H	Form
		11X 20001 J	2.90	1.01	0.143	0.005	0.58	21.4	1.50		0.01							40 x 15	C
	11X 20002 J	2.67	2.04	0.045	0.060	1.06	20.0	2.03	....	0.30	....	....	....	....	....	....	40 x 15	C	
	11X 20003 K	2.91	3.03	0.007	0.174	1.53	17.8	2.53	....	0.52	....	....	....	....	....	....	40 x 15	C	
Note: items that are cast - C - may contain some primary carbon.																			
CRM	11X 0331.1 H	2.831	2.10	0.137	0.111	1.353	13.75	2.022	0.111	7.68	0.154	0.048	(0.030)	0.094	....	0.030	40 x 13	CC	
CRM	11X 0331.2 H	2.54	2.78	0.126	0.062	1.32	15.61	1.50	0.085	7.42	....	0.0220	0.049	....	....	0.029	40 x 13	CC	
CRM	11X 0331.3 F	2.10	2.46	0.061	0.040	1.08	18.03	2.57	0.061	6.49	....	0.0091	0.055	....	....	0.0112	40 x 13	CC	
CRM	11X 0331.5 C	2.73	2.93	0.217	0.164	0.893	14.52	0.582	0.117	7.74	....	0.121	0.018	....	....	0.0056	40 x 13	CC	
CRM	11X 0331.6 A	2.71	2.05	0.0197	0.0473	1.144	14.03	1.13	0.011	6.57	....	(0.0020)	....	0.025	0.0106	(0.0006)	35 x 6	CC	
1.1.11 With Chromium																	Size (mm) Ø x H	Form	
		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	V	W	Co	Pb				
CRM	11X 15294 T	2.25	0.409	0.050	0.100	0.551	1.84	29.32	0.630	0.126	0.070	0.124	0.45	0.179	0.0067		40 x 15	CC	
CRM	11X 15295 P	2.285	1.057	0.094	0.085	1.01	0.350	24.87	0.518	0.238	(0.045)	0.144	(0.20)	0.542	(0.010)		40 x 17	CC	
CRM	11X 15309 R	3.273	0.562	0.0110	0.0340	1.196	2.05	23.30	0.982	1.142	....	0.096	(0.057)	0.068	....		40 x 15	CC	
CRM	11X 15310 A	2.71	0.892	0.0278	0.051	1.45	5.66	21.22	0.980	2.64		0.071	0.137	0.0709			40 x 15	CC	

Stainless & High Temperature Steel Alloys

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IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Ce Se	Co Si	Cr Sn	Cu Ta	Mn Ti	Mo V	N W	Nb Zr
21C	13-8 PH Mo	1.07	---	0.0004	0.035	---	---	0.021	12.39	0.047	0.051	2.11	0.0045	0.007
Final	S13800	8.18	0.0004	0.007	---	0.0038	---	0.042	0.005	0.002	0.012	0.013	(0.01)	0.001
22B	15-5 PH	0.004	---	(0.0007)	0.045	---	---	0.08	14.29	3.25	0.53	0.35	0.012	0.301
Final	S15500	4.81	0.001	0.022	---	0.001	---	0.41	0.01	---	0.003	0.054	0.028	---
23A	17-4 PH	(0.002)	---	---	0.049	---	---	0.05	15.51	3.18	0.52	0.10	0.044	0.28
Chips Only	S17400	4.40	(0.013)	0.024	---	0.006	---	0.51	0.007	---	<0.01	0.054	(0.03)	---
23B	17-4 PH	0.003	---	0.0007	0.034	---	---	0.038	15.21	3.67	0.81	0.19	0.0334	0.22
Chips Only	S17400	4.10	0.0035	0.022	---	0.022	---	0.40	0.009	---	0.002	0.059	0.020	---
23C	17-4 PH	0.004	---	0.001	0.034	---	---	0.065	15.12	3.69	0.77	0.31	0.032	0.235
Final	S17400	4.33	0.007	0.024	---	0.026	---	0.45	0.0081	<.01	0.001	0.066	0.05	---
152B	17-7 PH	1.19	---	0.002	0.075	---	---	0.17	16.94	0.31	0.76	0.51	0.026	0.033
Chips Only	S17700	7.22	0.0011	0.0230	---	0.0019	---	0.361	0.0081	---	0.115	0.091	0.05	---
152C	17-7 PH	[0.95]	[(0.004)]	[0.003]	[0.072]	---	---	[0.113]	[16.99]	[0.315]	[0.74]	[0.36]	[0.0172]	[0.012]
Provisional	S17700	[7.29]	[0.001]	[0.024]	---	[0.0005]	---	[0.263]	[0.007]	[(0.01)]	[0.098]	[0.072]	[0.026]	---
17C	Nitronic 50	0.01	---	0.003	0.033	---	---	0.057	21.03	0.38	5.0	2.10	0.265	0.139
Final	S20910	11.99	0.0035	0.022	---	0.0042	---	0.47	0.006	<.01	<0.005	0.183	0.029	---
18A	Nitronic 60	<0.005	---	---	0.082	---	---	0.11	16.36	0.40	8.19	0.23	0.13	0.05
Chips Only	S21800	8.24	(0.017)	0.031	0.028	0.005	---	4.13	(0.003)	---	0.011	0.075	0.026	---
18C	Nitronic 60	0.0142	---	0.0014	0.087	0.002	---	0.060	16.19	0.285	7.69	0.354	0.152	0.090
Final	S21800	8.05	0.0018	0.027	---	0.0010	---	3.8	0.004	0.004	0.013	0.099	0.05	---
19B	Nitronic 40	0.01	---	(0.001)	0.021	---	---	0.098	19.98	0.174	9.31	0.275	0.25	0.057
X-Ray Only	S21900	6.83	0.0061	0.021	---	0.0020	---	0.48	0.005	---	0.006	0.102	0.022	---
19C	Nitronic 40	0.007	0.004	0.0011	0.012	---	---	0.087	19.51	0.45	9.02	0.40	0.32	0.028
Final	S21900	6.40	0.003	0.027	---	0.0007	---	0.31	0.0061	0.005	0.003	0.090	0.037	---
289A	AISI 301	0.01	---	0.0003	0.126	---	---	0.054	17.0	0.016	1.67	0.005	0.0032	0.008
Final	S30100	7.12	0.0104	0.006	---	0.0019	---	0.58	0.002	<.005	0.028	0.01	0.01	---
241A	AISI 302	0.004	---	0.0003	0.059	---	---	0.083	18.21	0.142	1.43	0.076	0.051	0.004
X-Ray & Chips Only	S30200	8.08	0.0050	0.025	---	0.020	---	0.43	0.005	---	0.002	0.065	0.014	---
241B	AISI 302	0.005	---	0.0007	0.023	---	---	0.121	18.46	0.389	1.76	0.369	0.065	0.007
X-Ray Only	S30200	8.12	0.008	0.025	---	0.022	---	0.53	0.022	---	0.042	0.057	0.037	---
241C	AISI 302	0.003	---	0.0005	0.069	---	---	0.058	17.80	0.52	1.50	0.117	0.0478	0.003
Final	S30200	8.05	0.007	0.043	---	0.030	---	0.630	0.0057	---	0.002	0.039	0.01	---

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Page 18

Stainless & High Temperature Steel Alloys

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IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Ce Se	Co Si	Cr Sn	Cu Ta	Mn Ti	Mo V	N W	Nb Zr
1D	AISI 303	---	---	<0.002	0.061	---	---	0.208	18.24	0.51	1.98	0.130	0.027	<0.005
Final	S30300	9.50	0.007	0.025	---	0.34	---	0.22	0.006	---	(0.002)	0.101	0.015	---
253A	AISI 303Se	0.003	---	0.0003	0.041	---	---	0.088	17.90	0.223	1.50	0.348	0.0373	0.016
Final	S30323	9.17	0.009	0.140	---	0.0089	0.21	0.50	0.01	---	0.002	0.106	0.10	---
2C	AISI 304	0.005	---	0.0021	0.017	---	---	0.10	18.44	0.42	1.73	0.45	0.083	0.0100
Chips Only	S30400	8.49	0.008	0.028	---	0.023	---	0.60	0.008	---	0.002	0.043	0.018	---
2D	AISI 304	(0.002)	---	(0.0004)	0.047	---	---	0.098	18.22	0.43	1.48	0.48	0.0506	0.003
Chips Only	S30400	8.86	0.0080	0.031	---	0.020	---	0.49	0.014	---	(0.002)	0.047	0.022	---
2G	AISI 304	[.003]	---	[0.0005]	[0.050]	---	---	[0.12]	[18.2]	[0.37]	[1.82]	[0.30]	[0.079]	[0.017]
Provisional	S30400	[8.3]	[0.004]	[0.029]	---	[0.026]	---	[0.29]	[0.011]	---	[0.0014]	[0.069]	[0.05]	---
162B	AISI 304L	0.003	---	0.003	0.022	---	---	0.30	18.35	0.81	1.76	0.482	0.0241	0.032
X-Ray & Chips Only	S30403	10.25	0.004	0.029	---	0.025	---	0.635	0.009	---	0.002	0.117	0.10	---
234A	AISI 302 HQ	0.36	---	0.0009	0.102	---	---	0.35	18.0	3.65	1.99	0.004	0.096	0.20
OES Only	S30430	8.06	0.0007	0.004	---	0.0026	---	1.02	0.003	---	0.002	0.003	0.02	---
234B	AISI 302 HQ	0.29	---	0.0005	0.103	---	---	0.20	17.99	3.01	1.35	0.004	0.067	0.094
Final	S30430	8.05	0.0005	0.004	---	0.0011	---	0.54	0.002	---	0.002	(0.003)	0.014	---
316A	Alloy 253MA	[0.006]	[(0.01)]	[(0.0003)]	[0.070]	[(0.002)]	---	[0.118]	[21.06]	[0.19]	[0.62]	[0.25]	[0.160]	[0.003]
Provisional	S30815	[10.82]	[0.006]	[0.023]	---	[0.0013]	---	[1.497]	[0.006]	[<0.005]	[0.002]	[0.043]	[0.023]	---
3A	AISI 309	(0.012)	---	(0.0002)	0.076	---	---	0.113	22.54	0.31	1.58	0.36	(0.089)	0.02
Chips Only	S30900	12.48	(0.020)	0.026	---	0.002	---	0.43	0.007	---	(0.002)	0.06	0.04	---
3B	AISI 309	0.009	---	(0.0004)	0.058	---	---	0.093	22.41	0.282	1.68	0.49	0.079	0.077
Chips Only	S30900	12.62	0.0044	0.027	---	0.0034	---	0.46	0.008	---	0.004	0.066	0.047	---
3D	AISI 309	[0.004]	[(0.004)]	[0.0003]	[0.059]	[(0.001)]	---	[0.084]	[22.52]	[0.25]	[1.66]	[0.32]	[0.071]	[0.007]
Provisional	S30900	[12.05]	[0.005]	[0.024]	---	[0.0009]	---	[0.32]	[0.008]	[(0.004)]	[0.002]	[0.13]	[0.020]	---
4B	AISI 310	(0.012)	---	---	0.059	---	---	0.23	24.33	0.15	1.50	0.11	0.037	0.029
Chips Only	S31000	20.00	0.0044	0.025	---	0.003	---	0.97	0.004	---	0.005	0.075	0.02	---
4D	AISI 310	[0.01]	---	[0.001]	[0.052]	---	---	[0.07]	[24.3]	[0.22]	[1.21]	[0.39]	[0.046]	[0.010]
Provisional	S31000	[20.2]	[0.004]	[0.021]	---	[0.001]	---	[0.49]	[0.007]	---	[0.004]	[0.073]	[(0.003)]	---
302A	Alloy 254SMO	0.015	---	0.0027	0.024	---	---	0.069	20.3	0.70	0.92	6.15	0.183	(0.01)
Final	S31254	17.7	0.003	0.024	---	0.0008	---	0.54	0.009	---	0.003	0.052	0.024	---
5D	AISI 316	0.005	---	(0.0005)	0.021	---	---	0.143	16.56	0.168	1.78	2.11	0.056	(0.004)
Chips Only	S31600	10.38	0.0097	0.040	---	0.020	---	0.458	0.004	---	0.008	0.029	0.016	---

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Page 19

Stainless & High Temperature Steel Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Ce Se	Co Si	Cr Sn	Cu Ta	Mn Ti	Mo V	N W	Nb Zr
5F <i>Provisional</i>	AISI 316 S31600	[0.003] [10.5]	[(0.006)] [0.005]	[0.001] [0.028]	[0.044] ---	[(0.001)] [0.025]	--- ---	[0.33] [0.27]	[17.5] [0.010]	[0.37] [(0.003)]	[1.65] [0.002]	[2.03] [0.081]	[0.031] [0.05]	[0.008] ---
163A Chips Only	AISI 316L S31603	(0.005) 10.19	--- 0.0041	--- 0.025	0.014 ---	--- 0.024	--- ---	0.16 0.49	16.62 0.006	0.36 ---	1.37 0.003	2.05 0.067	0.067 0.052	0.018 ---
163D <i>Provisional</i>	AISI 316L S31603	[0.004] [10.04]	[0.008] [0.005]	[0.0006] [0.033]	[0.024] ---	[(0.002)] [0.027]	--- ---	[0.20] [0.48]	[16.36] [0.011]	[0.38] [(0.01)]	[1.71] [(0.001)]	[2.03] [0.060]	[0.058] [0.06]	[0.019] ---
153B Final	AISI 317L S31703	0.006 13.19	--- 0.0052	0.0022 0.031	0.015 ---	--- 0.0082	--- ---	0.115 0.28	18.13 0.014	0.408 ---	1.58 0.002	3.12 0.031	0.0158 0.020	0.008 ---
6F Final	AISI 321 S32100	0.033 9.15	--- 0.0010	0.0003 0.029	0.041 ---	--- 0.0006	--- ---	0.150 0.37	17.13 0.014	0.41 ---	1.38 0.45	0.331 0.090	0.011 0.034	0.013 ---
6G Final	AISI 321 S32100	0.030 9.14	--- 0.0017	0.0004 0.030	0.040 ---	--- 0.0006	--- ---	0.150 0.37	17.15 0.014	0.41 ---	1.39 0.440	0.330 0.089	0.011 0.033	0.013 ---
292A Final	Alloy 2101 S32101	0.010 1.47	--- 0.0024	0.0011 0.018	0.030 ---	--- 0.001	--- ---	0.031 0.75	21.35 0.004	0.29 ---	5.0 0.005	0.097 0.084	0.245 0.01	0.009 ---
212C <i>Provisional</i>	Alloy 2205 S32205	[0.006] [5.22]	--- [0.005]	[0.0028] [0.025]	[0.025] ---	--- [0.0032]	--- ---	[0.083] [0.43]	[22.2] [0.004]	[0.22] ---	[1.25] [(0.003)]	[3.03] [0.11]	[0.153] [0.043]	[0.025] ---
317A <i>Provisional</i>	Alloy 2304 S32304	[0.006] [4.19]	--- [0.004]	[0.002] [0.027]	[0.025] ---	--- [0.0007]	--- ---	[0.063] [0.39]	[22.5] [0.008]	[0.21] [(0.003)]	[1.26] [0.002]	[0.25] [0.060]	[0.122] [0.014]	[0.004] ---
239B <i>Provisional</i>	Ferralium 255 S32550	[0.009] [5.76]	[(0.003)] [0.003]	[0.001] [0.024]	[0.013] [(0.001)]	--- [0.0007]	--- ---	[0.047] [0.39]	[25.9] [0.003]	[1.48] [(0.004)]	[0.86] [0.002]	[3.42] [0.10]	[0.25] [0.10]	[0.024] [0.002]
301A <i>Provisional</i>	Alloy 2507 S32750	[0.021] [6.95]	--- [0.004]	[0.0020] [0.020]	[0.016] ---	[(0.002)] [0.0006]	--- ---	[0.038] [0.27]	[24.9] [0.003]	[0.108] [(0.003)]	[0.81] [0.003]	[3.85] [0.048]	[0.281] [0.017]	[0.007] ---
319A <i>Provisional</i>	Zeron 100 S32760	[0.011] [6.9]	[(0.005)] [0.003]	[0.002] [0.023]	[0.015] ---	--- [0.0006]	--- ---	[0.050] [0.23]	[25.1] [0.005]	[0.51] [(0.003)]	[0.53] [0.003]	[3.56] [0.077]	[0.239] [0.53]	[0.006] ---
8C Chips Only	AISI 347 S34700	(0.003) 9.15	--- 0.0054	(0.0008) 0.030	0.060 ---	--- 0.027	--- ---	0.146 0.43	17.53 0.011	0.46 ---	1.50 0.002	0.70 0.047	0.054 0.140	0.67 ---
8E X-Ray Only	AISI 347 S34700	0.003 9.46	--- 0.007	0.0024 0.027	0.054 ---	--- 0.024	--- ---	0.143 0.62	17.63 0.008	0.267 (0.001)	1.67 0.002	0.29 0.071	0.041 0.055	0.64 (0.001)
8F <i>Provisional</i>	AISI 347 S34700	[0.004] [9.02]	[(0.01)] [0.003]	[0.0005] [0.033]	[0.048] ---	[(0.0004)] [0.011]	--- ---	[0.155] [0.47]	[17.32] [0.011]	[0.452] [(0.01)]	[1.53] [0.003]	[0.42] [0.08]	[0.042] [0.03]	[0.64] ---
9A Chips Only	AISI 410 S41000	[0.002] 0.39	--- (0.028)	--- 0.029	0.14 ---	--- 0.011	--- ---	0.025 0.29	11.84 (0.007)	0.07 ---	0.54 (0.004)	0.07 0.05	0.016 0.014	--- ---

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Revised - 10/11/2011

Page 20

Stainless & High Temperature Steel Alloys

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IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Ce Se	Co Si	Cr Sn	Cu Ta	Mn Ti	Mo V	N W	Nb Zr
9B	AISI 410	0.024	---	---	0.13	---	---	0.016	11.97	0.29	0.54	0.064	0.0468	0.005
Chips Only	S41000	0.30	0.0019	0.019	---	0.006	---	0.29	0.004	---	0.005	0.048	0.01	---
9D	AISI 410	[0.004]	---	[0.001]	[0.142]	---	---	[0.022]	[12.52]	[0.11]	[0.58]	[0.037]	[0.022]	[0.003]
Provisional	S41000	[0.20]	[0.006]	[0.034]	---	[0.028]	---	[0.38]	[0.005]	---	[0.002]	[0.022]	[(0.005)]	---
327A	AISI 415	[0.002]	---	[0.0010]	[0.018]	---	---	[0.019]	[12.73]	[0.080]	[0.55]	[0.53]	[0.016]	[0.007]
Provisional	S41500	[3.82]	[0.005]	[0.018]	---	[0.0012]	---	[0.43]	[0.006]	---	[0.003]	[0.035]	[0.010]	---
10C	AISI 416	0.003	---	<0.0005	0.128	---	---	0.022	12.25	0.155	0.35	0.08	0.015	0.003
Final	S41600	0.24	0.008	0.026	---	0.29	---	0.37	0.009	---	0.002	0.024	0.011	0.001
20A	Greek Ascology	(0.04)	---	---	0.18	---	---	0.034	12.78	0.05	0.41	0.21	(0.04)	0.01
Chips Only	S41800	2.02	(0.029)	0.015	---	0.011	---	0.35	(0.003)	---	<0.01	0.10	2.84	---
20B	Greek Ascology	0.006	---	---	0.18	---	---	0.030	12.42	0.069	0.35	0.32	0.0434	0.010
Final	S41800	1.94	0.0056	0.019	---	0.004	---	0.40	0.005	---	0.004	0.17	3.52	---
20C	Greek Ascology	(0.004)	---	---	0.18	---	---	0.031	12.15	0.060	0.30	0.12	0.0222	0.010
Final	S41800	1.93	0.0068	0.018	---	0.007	---	0.35	0.004	---	(0.003)	0.086	2.59	---
154A	AISI 420	0.008	---	---	0.39	---	---	0.021	12.82	0.044	0.47	0.052	0.0294	0.004
Chips Only	S42000	0.19	(0.0068)	0.018	---	0.003	---	0.35	0.004	---	0.002	0.045	0.011	---
154B	AISI 420	0.002	---	(0.001)	0.35	---	---	0.020	12.20	0.087	0.405	0.079	0.020	0.003
Final	S42000	0.223	0.0016	0.017	---	0.0004	---	0.45	0.006	---	0.002	0.067	0.010	---
205A	AISI 422	0.005	---	0.0003	0.23	---	---	0.018	11.48	0.033	0.73	0.98	0.046	0.006
Chips Only	S42200	0.92	0.0019	0.014	---	0.003	---	0.28	0.003	---	0.002	0.24	1.01	0.003
205C	AISI 422	0.003	---	0.0003	0.231	---	---	0.058	12.14	0.109	0.74	1.00	0.040	0.010
Final	S42200	0.68	0.0041	0.017	---	0.0034	---	0.39	0.004	---	0.002	0.21	1.03	0.002
11A	AISI 430	(<0.02)	---	---	0.042	---	---	0.02	16.8	0.13	0.40	0.02	(0.045)	(0.015)
Chips Only	S43000	0.22	(0.019)	0.021	---	0.003	---	0.51	(0.009)	---	(0.006)	0.04	0.01	---
11B	AISI 430	(0.003)	---	---	0.077	---	---	0.023	17.59	0.05	0.50	0.03	0.083	(0.007)
Chips Only	S43000	0.26	---	0.019	---	0.009	---	0.59	(0.010)	---	(<0.01)	0.055	---	---
11C	AISI 430	0.010	---	<0.0005	0.055	---	---	0.017	17.66	0.070	0.52	0.055	0.029	0.005
X-Ray Only	S43000	0.219	0.004	0.018	---	0.0030	---	0.51	0.010	---	<0.003	0.031	<0.005	0.0005
12A	AISI 431	(0.076)	---	---	0.14	---	---	0.03	16.03	0.10	0.61	0.07	(0.057)	0.04
Chips Only	S43100	2.27	(0.020)	0.024	---	0.006	---	0.37	(0.007)	---	0.004	0.07	0.024	---
12B	AISI 431	(0.003)	---	(0.0003)	0.174	---	---	0.018	16.02	0.143	0.6	0.057	0.061	0.011
Final	S43100	2.15	0.0101	0.016	---	0.003	---	0.56	0.006	---	0.003	0.037	0.014	---

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Page 21

Stainless & High Temperature Steel Alloys

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IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Ce Se	Co Si	Cr Sn	Cu Ta	Mn Ti	Mo V	N W	Nb Zr
13B	AISI 440C	0.004	---	---	1.02	---	---	0.016	16.78	0.030	0.39	0.48	0.0290	0.003
Final	S44004	0.14	0.0053	0.015	---	0.001	---	0.72	0.004	---	0.002	0.041	(0.003)	---
13C	AISI 440C	0.003	---	<0.0005	1.02	---	---	0.021	16.84	0.031	0.43	0.455	0.0188	0.004
Final	S44004	0.108	0.0029	0.017	---	0.001	---	0.69	(0.004)	---	0.005	0.10	<0.005	0.002
14A	AISI 446	(<0.01)	---	---	0.089	---	---	0.038	23.84	0.06	0.46	0.05	[0.17]	(<0.01)
Chips Only	S44600	0.31	[0.021]	0.023	---	0.004	---	0.37	[0.013]	---	(<0.01)	0.045	0.014	---
14B	AISI 446	0.004	---	(0.0004)	0.016	---	---	0.030	23.60	0.071	0.426	0.095	0.043	0.006
Final	S44600	0.29	0.0054	0.022	---	0.0015	---	0.51	0.005	---	0.0024	0.11	0.011	---
15A	Custom 450	0.029	---	---	0.033	---	---	0.11	14.9	1.59	0.38	0.77	(0.015)	0.62
Chips Only	S45000	6.54	(0.022)	0.021	---	0.003	---	0.41	0.005	---	(<0.01)	0.09	0.026	---
15B	Custom 450	0.006	---	---	0.047	---	---	0.24	14.53	1.53	0.39	0.82	0.0355	0.65
Final	S45000	6.94	0.0039	0.013	---	0.001	---	0.33	0.009	---	0.005	0.033	0.12	---
16B	Custom 455	0.062	---	(0.0018)	0.0067	---	---	0.027	11.44	2.23	0.026	0.016	0.0022	0.25
Final	S45500	8.28	0.0011	0.007	---	0.0025	---	0.039	0.004	---	1.11	0.067	0.011	---
16C	Custom 455	0.072	---	0.0011	0.003	---	---	0.017	11.34	2.08	0.024	0.009	0.0030	0.248
Final	S45500	8.23	0.0014	0.007	---	0.0046	---	0.03	0.003	---	1.16	0.070	0.008	---
291A	M-152	(0.004)	---	0.001	0.11	---	---	0.021	11.3	0.060	0.71	1.61	0.035	0.022
Final	S64152	2.62	0.014	0.016	---	0.009	---	0.230	0.004	---	0.0011	0.29	(0.01)	0.005
26C	A286	0.12	---	0.0074	0.028	---	---	0.052	13.7	0.144	(0.0003)	1.09	0.0045	0.002
Final	S66286	25.05	0.002	0.017	---	0.0004	---	0.08	0.011	---	1.87	0.238	0.01	0.001
242A	Aermet 100	0.004	---	(0.0005)	0.24	---	---	13.5	3.00	0.007	0.018	1.21	0.0003	0.004
Final	K92580	11.1	0.0006	0.002	---	0.0004	---	0.02	(0.001)	---	0.009	0.01	<0.01	---
308A	Alloy C-250	0.097	---	0.0029	0.003	---	---	7.80	0.023	0.018	0.019	4.78	0.0013	0.003
Final	K92890	18.53	0.0005	0.004	---	0.0005	---	0.014	0.001	---	0.46	0.01	0.01	0.01
99B	Maraging 300	0.095	---	0.0026	0.005	---	---	9.24	0.081	0.094	0.036	4.88	0.0011	(0.005)
Final	K93120	18.46	0.0015	0.005	---	0.0005	---	0.022	(0.003)	---	0.74	0.012	0.016	---
309A	Alloy C-350	0.11	---	0.0032	0.0059	---	---	12.3	0.053	0.023	0.018	4.71	0.0010	0.00
Final	K93540	18.4	0.001	0.004	---	0.0006	---	0.020	(0.001)	---	1.47	0.01	0.01	0.008
24A	Invar-36	(0.002)	---	---	0.055	---	---	0.056	0.17	0.08	0.76	0.01	(0.0026)	(0.01)
X-Ray & Chips Only	K93601	36.07	(0.009)	0.01	---	0.001	---	0.27	(0.002)	---	<0.005	0.024	(0.035)	---
24B	Invar-36	0.002	---	(0.001)	0.053	---	---	0.036	0.121	0.052	0.82	0.011	0.0017	<0.01
Final	K93601	35.86	0.003	0.009	---	0.0010	0.19	0.28	0.0018	---	0.002	<0.005	<0.04	0.005

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Page 22

Stainless & High Temperature Steel Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	As O	B P	C Pb	Ca S	Ce Se	Co Si	Cr Sn	Cu Ta	Mn Ti	Mo V	N W	Nb Zr
214A	NMS-100	(0.002)	---	(0.001)	0.018	---	---	0.021	12.36	0.36	18.3	0.44	0.27	0.23
Final	N/A	2.33	0.0026	0.033	---	0.002	---	1.00	0.008	---	0.002	0.04	0.02	---
294A	NMS J38	(0.01)	---	(0.003)	0.017	---	---	0.21	19.7	0.34	21.6	1.8	0.78	0.03
Final	N/A	2.9	0.003	0.026	---	0.0028	---	0.43	(0.006)	---	(0.002)	0.046	0.01	0.002
295A	NMS 140	(0.01)	---	0.002	0.021	---	---	0.021	18.0	0.113	19.7	0.97	0.62	0.018
Final	N/A	1.84	0.003	0.028	---	0.0041	---	0.36	0.004	---	0.0019	0.046	0.016	0.001
296A	NMS MDC	(0.005)	---	(0.001)	0.074	---	---	0.018	11.2	0.12	10.6	0.60	0.23	0.043
Final	N/A	1.71	0.003	0.027	---	0.002	---	0.38	0.007	---	0.002	0.056	0.01	---
100A	Haynes 556	(0.29)	---	(0.0015)	0.11	---	---	17.66	21.82	0.09	1.00	2.87	(0.16)	0.11
X-Ray Only	R30556	(20.17)	---	(0.012)	---	0.001	---	0.45	---	---	(0.023)	0.04	2.42	0.02
100C	Haynes 556	0.35	---	(0.002)	0.104	---	---	17.9	21.9	0.105	0.97	3.06	0.126	0.172
Final	R30556	20.5	0.001	0.013	---	0.0005	---	0.441	0.003	---	0.013	0.039	2.49	0.006

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MBH Stainless & High-Alloy Steel Solids

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

1.3.2 Austenitic Stainless Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	Co	Nb	N	B	Bi	Ta	V	Sb	Ti	W	Zr	Size (mm) Ø x H	Form	
CRM	13X 17001 B	0.114	0.34	0.016	0.080	1.73	6.05	14.89	0.12	0.037	0.030	0.01	0.15	0.76	0.040	0.008									40 x 15	C
	13X 17002 D	0.117	0.664	0.050	0.056	1.38	7.84	17.62	0.222	0.085	(0.0024)	(0.0046)	0.103	0.487	0.047										42 x 15	W
	13X 17003 A	0.10	0.78	0.035	0.037	0.85	11.90	11.89	0.27	0.08			0.07	0.34											40 x 15	C
CRM	13X 17004 A	0.06	1.32	0.048	0.024	0.62	16.06	21.78	0.31	0.11			0.05	0.23											40 x 15	C
	13X 17005 C	0.128	2.03	0.090	0.0166	0.446	20.19	24.96	0.472	0.283			0.033	0.125	0.118	0.0035		(0.11)							40 x 15	CC
CRM	13X 18001 A	0.22	0.32	0.057	0.022	1.40	6.41	15.92	0.80	0.16			0.04	0.57											40 x 15	C
	13X 18002 C **	0.15	0.62	0.02	0.02	0.80	7.9	18.0	0.23	0.085		0.06	0.06	1.6	0.055				0.06		** provisional values				40 x 15	CC
CRM	13X 18003 B	0.203	1.008	0.042	0.054	0.773	10.35	19.98	0.397	0.074			0.120	1.12	0.046										42 x 15	W
	13X 18004 A	0.07	1.44	0.012	0.094	2.1	12.55	21.64	0.63	0.04			0.18	0.83											40 x 15	C
CRM	13X 19001 B	0.055	1.20	0.0174	0.0151	0.460	5.10	15.07	1.51	0.202			0.025	0.032	0.070			(0.019)	0.083						40 x 15	W
CRM	13X 19003 B	0.0132	0.550	0.0390	0.0406	1.273	12.22	18.56	2.47	0.068			0.121	0.122	0.020										42 x 15	W
	13X 19004 B	0.066	0.36	0.014	0.069	1.96	17.9	22.8	3.62	0.022				0.18											40 x 15	C
CRM	13X 12533 Y	0.03	0.37	0.032	0.011	1.13	5.04	18.8	1.05	0.18	(0.03)	0.011	0.055		(0.014)	(0.01)		(0.17)				0.14			40 x 15	C
	13X 12534 U	0.0303	0.988	0.0209	0.0309	0.604	10.24	18.76	2.32	0.079		(0.04)	0.064		0.078			0.037				0.159			40 x 15	CC
CRM	13X 12535 BD	0.276	1.31	0.069	0.072	0.495	14.73	16.89	3.91	0.086	0.0182	0.267	0.711		0.0141	0.0135			0.090		1.18				40 x 15	CC
CRM	13X 12536 R	0.165	0.65	0.13	0.053	0.47	11.9	14.8	2.53	0.048	0.018	0.11	0.09			0.022		0.15				0.47			40 x 15	C
	13X 12537 S	0.090	1.18	0.048	0.092	1.174	11.10	19.32	3.12	0.659	0.049	(0.011)	0.114		0.043	0.007		(0.15)				0.053			40 x 17	CC
CRM	13X 12853 J	0.050	0.99	0.016	0.016	1.17	11.92	17.2	2.74	0.114			0.06		(0.011)	0.003	(0.007)	0.03		0.02	0.027	0.12	0.009		40 x 15	C
	13X 12854 L	0.053	1.308	0.0278	0.024	1.300	11.60	15.77	2.50	0.306			0.33	0.689	0.0550	0.0076	0.019	(0.06)			0.065	0.16			40 x 15	CC
CRM	13X 12855 L	0.0361	1.029	0.0123	0.0210	0.939	10.98	17.55	2.56	0.379			0.207			0.0036	0.0030	(0.11)		0.177	0.044	0.201			40 x 15	W
1.3.3 Maraging Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Al	Ti	Co	N											Size (mm) Ø x H	Form	
CRM	13X 14933 R	0.008	0.05	0.014	0.023	0.17	16.8	0.022	3.83	<0.005	0.029	11.4													40 x 15	C
	13X 14934 Q	0.0254	0.502	0.0288	0.024	0.254	17.60	0.368	4.22	0.15	0.694	9.03	0.006												40 x 15	CC
CRM	13X 14935 T	0.0105	0.441	0.055	0.036	0.494	18.96	0.745	5.61	(0.007)	0.106	7.17	0.0102												40 x 15	CC
1.3.4 Martensitic Stainless Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	Ti	V	As	Co	Nb	W	B	N					Size (mm) Ø x H	Form
CRM	13X 12547 L	0.335	0.246	0.110	0.062	1.16	0.58	16.43	0.741	0.544	0.0232			0.098		0.313	0.349			0.0511					42 x 15	W
CRM	13X 12548 M **	0.2	0.4	0.22	0.03	0.6	1.0	13	1.3	0.25						0.35	0.6	0.03		0.05	** provisional values				40 x 15	CC
	13X 12549 K	0.16	0.43	0.29	0.092	0.34	1.26	11.70	1.49	0.10						0.52	0.23								40 x 15	C
	13X 14775 R	0.05	0.63	0.054	0.053	1.37	1.75	17.7	0.47	0.21						0.15	0.75								40 x 15	C
	13X 15023 U	0.12	0.19	0.012	0.013	1.43	0.78	10.75	1.49	0.06						0.05	1.20								40 x 15	C
	13X 15024 W	0.12	0.77	0.028	0.030	0.57	2.84	14.94	0.24	0.36						0.10	0.10								40 x 15	C
	13X 15035 T	0.10	0.68	0.069	0.054	0.93	2.66	13.94	0.45	0.31						0.21	0.63								40 x 15	C
	13X 15059 N	0.057	0.48	0.020	0.015	1.22	1.30	15.97	0.63	0.14	(0.02)			0.06		0.26	0.81			0.049					40 x 15	C
CRM	13X 44004 A	1.052	0.363	0.0178	0.0214	0.346	0.207	16.74	0.462	0.0548		0.0305		0.076		0.0188		0.030		0.0247					40 x 15	W
CRM	13X 8110L C	0.697	0.788	0.0943	0.047	0.650	4.16	12.11	2.71	0.223		(0.004)	0.031	0.220	0.072	0.314			1.07	0.0200					40 x 15	CC

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Revised - 10/11/2011
 Page 24

MBH Stainless & High-Alloy Steel Solids

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1.3.5 Special Stainless Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Al	Ti	V	W	Co	Nb	N	Cd	Size (mm) Ø x H	Form			
CRM	13X 12538 J	0.04	0.64			0.78	6.07	23.72	1.53											40 x 15	C		
	13X 12540 L	0.15	1.05			0.44	5.17	27.88	0.54											40 x 15	C		
	13X 14207 K **	0.12	1.5	0.05	0.02	0.9	12.5	20.0	0.3	0.25				3.2	0.03	0.25	0.10		** provisional values	40 x 15	CC		
	13X 14211 P	0.112	1.75	0.018	0.016	0.65	12.8	25.7	0.31	0.28				2.80	0.056	0.15				40 x 15	C		
CRM	13X 14212 Q	0.069	2.50	0.041	0.058	0.66	10.33	20.90	0.540	5.56	(0.013)	(0.018)	0.152	3.32	0.241	0.612	0.121	0.0015		43 x 20	C		
CRM	13X 14215 K	0.126	0.56	0.016	0.016	1.08	15.70	23.8	0.046	0.03		0.08	0.06	2.89	0.016	(0.016)				40 x 15	C		
CRM	13X 14216 N	0.089	1.54	0.034	0.026	0.748	12.61	22.03	0.228	0.210	(0.004)	(0.005)	0.040	2.00	0.232	0.27	0.142			43 x 20	C		
	13X 14219 J	0.08	1.48	0.048	0.047	0.48	12.39	21.71	0.19	0.23				4.07		0.19				40 x 15	C		
1.3.6 Precipitation Hardening Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Ti	Al	V	As	Co	Nb	B	Ta	N	Size (mm) Ø x H	Form		
CRM	13X PH2 L	0.111	0.690	0.0251	0.027	1.140	3.67	16.77	0.500	4.08	0.063	0.051	0.119		0.116	0.336	0.0061		0.107		40 x 17	CC	
CRM	13X PH3 L	0.167	1.70	0.039	0.023	0.399	6.03	7.47	0.996	7.06			0.066		0.398	0.65	0.0046		0.0291		43 x 20	C	
CRM	13X PH4 M	0.0347	0.647	0.061	0.0152	0.728	4.39	13.73	0.323	5.42			0.582		0.655	0.338	(0.0037)	(0.049)	0.112		40 x 17	CC	
	13X PH5 J	0.122	1.03	0.015	0.065	0.98	4.51	17.85	0.51	4.42						0.58			0.046		40 x 15	C	
CRM	13X PH6 E	0.116	2.10	0.015	0.040	0.652	6.35	42.13	1.45	2.08			0.167	0.028	0.138	0.590			0.027	sold out, being remade sold out, being remade	43 x 20	C	
	13X PH7 E	0.10	1.40	0.024	0.034	1.10	5.59	43.15	2.53	0.70						0.20			0.060		40 x 15	C	
CRM	13X PH17400 A	0.0200	0.349	0.0215	0.0202	0.829	4.52	15.74	0.061	3.09			0.112		0.0411	0.184			0.0342		41 x 15	W	
1.3.7 High Nitrogen Stainless Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Al	V	W	Co	Nb	N				Size (mm) Ø x H	Form		
CRM	13X NSA1 E	0.07	0.41			0.42	7.9(6)	20.3	2.47							0.040					40 x 15	C	
	13X NSA2 G	0.142	0.805	0.0083		0.808	10.24	18.71	1.89							0.163					40 x 15	CC	
	13X NSA3 J	0.16	0.57			1.07	12.0	16.1	2.8							0.20					40 x 15	W	
CRM	13X NSA4 A	0.0262	0.44	0.0130	0.0281	5.59	17.11	23.79	4.19	0.487	(0.016)				0.079	0.532					40 x 17	CC	
CRM	13X NSA5 A	0.063	0.281	0.0212	(0.010)	4.27	9.52	20.73	2.32	0.098	(0.012)				0.574	0.340					40 x 17	CC	
CRM	13X NSA6 A	0.0132	0.258	0.0086	0.0183	1.59	31.32	26.93	6.75	1.16	0.003				0.053	0.188					40 x 17	CC	
CRM	13X NSA7 A	0.0209	0.359	0.0009	0.022	0.951	5.67	25.91	3.25	1.42	(0.009)				0.015	0.247					42 x 15	W	
CRM	13X NSA8 A	0.0240	(0.40)	0.0008	0.0216	0.656	6.29	25.93	3.60	0.903		0.060	0.586	0.0374	(0.004)	0.239					44 x 15	W	
CRM	13X NSB1 D	0.17	0.58			0.44	10.0	19.1	0.11							0.04						40 x 15	W
	13X NSB2 D	0.06	0.66			0.62	11.1	18.2	0.21							0.095						40 x 15	W
	13X NSB3 G	0.121	0.471			0.632	9.26	15.22	0.630							0.198						42 x 15	W
CRM	13X NSC1 M	0.350	0.90	0.0197		7.49	5.49	17.57	0.251	0.382	(0.010)	0.554			1.62	0.100						40 x 17	CC
CRM	13X NSC2 N	0.570	1.20	0.0233		8.36	4.00	20.14	0.782	1.040	(0.011)	0.293			2.25	0.269						40 x 17	CC
CRM	13X NSC3 W	1.34	1.81	0.0086		9.48	3.01	22.91	0.0939	0.130	0.08	0.150			2.43	0.469						40 x 15	CC
CRM	13X NSC4 D	0.522	1.50	0.0097		8.37	6.51	31.48	1.57	0.193	0.016	0.206	0.181	0.228	1.97	1.030						40 x 15	CC
CRM	13X NSC5 A	0.493	1.16	0.0095		2.49	4.16	22.47	0.002	0.745	0.315	0.026			2.31	0.257						40 x 17	CC
CRM	13X NSC6 A	0.0266	0.523	0.0055	0.0049	8.85	6.52	20.47	(0.002)	0.0064	(0.009)	0.0052				0.235						40 x 13	HP
CRM	13X NSD1 B	0.046	0.411	0.009	0.019	23.53	0.114	24.51	1.12	0.042	(0.013)		0.057	0.128	0.030	0.88						40 x 15	W

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Revised - 10/11/2011

Page 25

MBH Stainless & High-Alloy Steel Solids

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1.4.2 High Speed Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	V	W	As	Co	Nb	N	Pb	Alloy Type	Size (mm) Ø x H	Form
CRM	14X HS1 C	0.718	0.22	0.020	0.018	0.29	0.27	4.00	0.37	0.069	(0.035)		1.05	17.0		0.25		0.023		T-1	40 x 15	W
CRM	14X HS2 C	0.780	0.216	0.0146	0.021	0.240	0.190	4.10	0.445	0.106			1.17	18.09		5.06		0.0211		T-4	40 x 15	W
CRM	14X HS3 L	0.855	0.318	0.046	0.035	0.621	0.706	5.25	1.24	0.200	0.288		1.79	17.93	0.044	10.64		0.087	0.010	T-5/6	40 x 17	CC
CRM	14X HS9 A	2.14	0.406	0.0126	0.0222	0.259	0.239	12.40	1.11	0.039		(0.022)	4.06	0.011		0.037	(0.011)	0.032		D-7	42 x 15	HIP
CRM	14X HS10 A	1.710	0.660	0.0099	0.0135	0.134	0.146	14.83	1.679	0.0605			1.142	1.75		0.0666		(0.001)			48 x 13	HIP
CRM	14X HS11 A	1.739	0.794	0.0107	0.0133	0.237	0.188	19.34	1.52	0.0562			1.032	2.24		0.074		(0.002)			48 x 13	HIP
	14X 14944 D	0.62	0.17	0.011	0.016	0.23	0.19	2.87	0.14	0.10			1.00	15.5		0.15					40 x 15	C
	14X 14945 D	0.67	0.26	0.041	0.033	0.72	0.33	3.97	0.23	0.12			0.55	16.84		0.22					40 x 15	C
	14X 14946 D	0.85	0.46	0.048	0.051	0.53	1.06	5.06	0.21	0.25			1.03	16.9(7)		0.44				T-1	40 x 15	C
	14X 14948 C	0.83	0.26	0.017	0.011	0.65	0.29	4.04	0.14	0.04			0.65	18.8		0.16					40 x 15	C
	14X 14952 D	0.90	0.32	0.054	0.054	0.64	0.34	4.93	0.32	0.02			1.24	18.0		0.02					40 x 15	C
	14X 14890 K	0.81	0.69	0.028	(0.012)	0.58	0.08	3.60	5.59	0.09			1.99	5.30		0.32					40 x 15	C
	14X 14892 K	0.83	0.23	0.047	0.054	0.23	0.23	3.99	4.99	0.20			1.76	6.30		0.16					40 x 15	C
1.4.5 High Manganese Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	V	Nb	Ti	Ta	N			Size (mm) Ø x H	Form	
CRM	14X MN1 AH	0.427	0.260	0.0030	0.0191	19.64	0.694	1.291	0.535	0.044	0.0064	0.149	0.021	0.143	0.133	(0.005)	0.0366				40 x 15	CC
CRM	14X MN2 Q	0.788	1.27	0.0198	0.0228	9.57	0.501	0.381	1.56	(0.16)	0.0683	(0.008)	0.104	0.346			0.0148				40 x 17	CC
CRM	14X MN3 R	1.33	1.01	0.0263	0.053	11.14	2.11	1.17	0.459	0.357	0.0319	(0.026)	0.048	0.416			0.030				40 x 17	CC
CRM	14X MN4 Z **	1.2	0.85	0.008	0.025	13.3	1.06	2.1	0.75	0.24	0.018	0.06	0.03	0.08	0.15	0.01	0.022		** provisional values		40 x 15	CC
CRM	14X MN5 R	1.463	1.48	0.030	0.025	7.62	1.60	3.75	1.98	0.56	0.0111	(0.03)	0.0255	0.100			0.0274				40 x 17	CC
	14X 15195 P	1.64	1.45	0.018	0.062	12.06	0.09	0.11	0.30	0.12	0.05	0.08	0.33								40 x 15	C
	14X 15196 S	1.08	1.64	0.012	0.037	10.16	0.25	0.26	0.22	0.22	0.10(5)	0.13(5)	0.21								40 x 15	C
1.4.8 Free Machining & Resulphurised Steels		C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	V	Co	N					Size (mm) Ø x H	Form	
CRM	14X MSFM1 J	0.0098	0.351	0.364	0.0778	1.109	0.0205	0.017	0.249	0.0056	0.0041	0.0024	0.0026	0.0019	0.0060						40 x 15	C
CRM	14X MSFM1 K	0.062	0.490	0.382	0.078	1.07	0.036	0.319	0.196	0.0101	0.0253	(0.021)	0.0116	0.0578	0.005						40 x 15	CC
CRM	14X MSFM2 J	0.210	0.477	0.256	0.049	1.84	0.0667	0.568	0.287	0.0225	0.0095	(0.016)	0.0359	0.0137	0.0049						40 x 15	CC
	14X MSFM3 F	0.55	0.52	0.087	0.060	2.10			0.27												40 x 15	C
CRM	14X MSFM4 A	0.226	0.469	0.224	0.0386	1.141	6.22	1.69	0.974	0.429	0.0141	(0.007)	0.0151	0.0253	0.0220						40 x 15	CC
1.4.11 High-Ni Calibration Series		C	Si	S	P	Mn	Ni	Cr	Cu	Al	Co									Size (mm) Ø x H	Form	
CRM	14X FeNi20 B **	0.012	1.13	0.008	0.009	0.025	20.0	0.103	0.073	0.020	1.01										40 x 15	CC
CRM	14X FeNi25 B **	0.007	0.018	0.63	0.011	0.012	25.1	0.035	0.031	0.11	0.760										40 x 15	CC
CRM	14X FeNi35 B **	0.041	0.245	0.13	0.028	0.163	35.4	0.090	0.040	0.038	0.355					** provisional values					40 x 15	CC
CRM	14X FeNi40 B **	0.045	0.028	1.0	0.018	0.081	40.6	0.048	0.052	1.22	0.860										40 x 15	CC
CRM	14X FeNi45 B **	0.004	0.57	0.035	0.041	0.014	45.2	0.050	0.077	0.55	0.66										40 x 15	CC
CRM	14X FeNi50 B **	0.050	0.20	0.25	0.025	0.11	50.4	0.092	0.102	0.055	0.50										40 x 15	CC

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Revised - 10/11/2011

Page 26

Nickel & Nickel Alloys

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IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pb	Cr S	Cu Sb	Fe Si	La Sn	Mg Ta	Mn Ti	Mo V	N W	Nb Zr
98A Chips Only	Kovar K94610	0.04 (29.09)	---	0.019 (0.002)	(17.50) ---	0.12 0.002	0.05 ---	(52.77) 0.10	---	---	0.24 <0.01	0.05 <0.01	---	(0.03) (0.03)
98B Final	Kovar K94610	0.07 29.4	0.001 0.0021	0.007 0.002	17.00 ---	0.012 0.0007	0.028 ---	52.9 0.17	---	0.0040 <0.05	0.18 0.03	0.010 (0.003)	0.0024 (0.02)	0.002 <0.01
50B Final	Alloy 200 N02200	0.031 99.5	(0.0002) 0.0061	0.010 0.002	0.069 ---	0.010 0.0002	(0.001) ---	0.079 0.059	---	(0.001) <0.005	0.20 0.002	(0.003) 0.016	0.0001 0.010	(0.002) (0.001)
51A Chips Only	Alloy 400 N04400	0.05 ---	(0.001) ---	0.13 0.008	0.015 ---	0.01 0.001	29.87 ---	2.07 0.26	---	---	1.49 0.05	<0.01 (0.01)	---	<0.01 (0.01)
51B Chips Only	Alloy 400 N04400	0.004 64.9	---	0.16 0.011	0.029 ---	0.32 0.002	31.70 ---	1.60 0.105	---	0.015 ---	1.01 0.05	0.043 (0.01)	0.0004 (0.01)	<0.01 <0.01
51C Final	Alloy 400 N04400	0.13 64.4	---	0.122 0.010	0.019 ---	0.36 0.005	31.6 ---	2.17 0.11	---	0.0096 (0.01)	1.01 0.026	0.072 0.002	[0.0004 0.021	0.003 0.002
202A Final	Alloy R-405 N04405	0.080 64.8	(0.002) (0.0018)	0.13 0.011	0.020 ---	0.008 0.032	32.3 ---	1.31 0.046	---	0.024 (0.008)	1.03 0.005	(0.01) (0.01)	0.0004 (0.01)	---
52C Final	Alloy K-500 N05500	2.98 (63.6)	(0.001) (0.001)	0.153 0.009	0.005 ---	0.046 0.002	30.6 ---	1.04 0.14	---	0.0021 ---	0.89 0.55	0.011 0.003	(0.0002) (0.01)	0.003 0.051
69C Final	Alloy X N06002	0.11 48.7	0.0034 0.0017	0.068 0.011	1.11 ---	21.6 0.0005	0.069 ---	18.3 0.35	---	0.0030 ---	0.47 0.017	8.32 0.033	0.0180 0.62	0.09 0.004
69D Final	Alloy X N06002	0.21 48.1	0.0044 0.0012	0.090 0.012	1.67 ---	21.13 0.0003	0.075 ---	17.7 0.63	---	0.0021 ---	0.72 0.004	8.78 0.033	0.029 0.49	0.204 0.0074
65A Chips Only	Alloy C-22 N06022	0.27 ---	---	0.011 0.01	1.52 ---	21.38 0.0013	0.14 ---	4.37 0.05	---	(0.003) ---	0.37 0.01	13.31 0.16	---	0.08 (0.01)
65B Chips Only	Alloy C-22 N06022	0.283 57.3	(0.002) 0.0013	0.0054 0.006	0.59 ---	21.32 0.0005	0.054 ---	3.63 0.030	---	0.009 (0.06)	0.29 0.005	13.02 0.155	0.046 2.87	0.029 <0.001
65C Provisional	Alloy C-22 N06022	[0.18] [55.8]	[(0.001)] [(0.001)]	[0.005] [0.012]	[1.43] ---	[21.13] [0.0006]	[0.073] ---	[4.70] [0.04]	---	[0.0026] [(0.02)]	[0.288] [0.005]	[13.29] [0.010]	[0.034] [2.75]	[0.027] [(0.004)]
67A Chips Only	Alloy G-30 N06030	0.20 ---	(0.005) ---	0.019 0.016	3.61 ---	(28.77) 0.0014	1.88 ---	14.88 0.30	---	---	1.11 0.03	5.02 (0.04)	---	0.70 (0.01)
67C Provisional	Alloy G-30 N06030	[0.14] [45.8]	[(0.001)] [0.0014]	[0.006] [0.011]	[1.74] ---	[28.9] [0.0005]	[1.25] ---	[13.44] [0.14]	---	[0.007] [(0.005)]	[1.04] [0.006]	[4.93] [0.031]	[0.035] [1.96]	[0.38] [0.002]
258A Final	Hastelloy C-2000 N06200	0.30 58.6	0.001 0.0009	0.005 0.005	0.08 ---	22.8 0.0007	1.54 ---	0.85 0.015	---	0.009 <0.01	0.21 0.003	15.5 0.014	0.032 0.14	0.01 <0.005

() and < > Indicates non-certified value.

[] Indicates provisional value, certification in progress.

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Revised - 10/11/2011

Page 27

Nickel & Nickel Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pb	Cr S	Cu Sb	Fe Si	La Sn	Mg Ta	Mn Ti	Mo V	N W	Nb Zr
68C	Haynes 230	0.35	0.0026	0.104	0.18	22.01	0.017	1.10	---	0.004	0.50	1.35	0.0610	0.041
X-Ray Only	N06230	59.7	0.0009	0.006	---	0.0002	---	0.44	---	(0.01)	0.006	0.033	14.2	(0.002)
60A	RA 333	(0.08)	(0.003)	0.058	3.02	25.72	0.10	17.71	---	---	1.50	3.09	(0.044)	0.14
Chips Only	N06333	---	---	(0.017)	---	0.001	---	1.21	---	(0.02)	0.03	0.07	2.98	(<0.01)
60B	RA 333	0.05	0.002	0.062	2.9	25.3	0.05	17.9	---	(0.001)	1.53	2.87	0.029	0.016
Final	N06333	45.3	0.0035	0.015	---	0.0003	---	0.87	---	(0.01)	0.004	0.070	3.08	0.001
53D	Alloy 600	0.34	0.0035	0.045	0.052	15.20	0.015	6.86	---	0.007	0.49	0.02	0.0075	0.006
Final	N06600	76.2	0.0009	0.005	---	0.0005	---	0.35	---	<0.01	0.34	0.022	0.022	---
53E	Alloy 600	0.25	0.0026	0.072	0.045	15.39	0.168	9.42	---	0.045	0.21	0.22	0.006	0.024
Final	N06600	73.7	0.0003	0.007	(0.0001)	0.0011	(0.0002)	0.05	<0.005	(0.01)	0.254	0.013	0.024	(0.001)
272A	Alloy 617	[1.17]	[0.003]	[0.081]	[13.0]	[22.0]	[0.015]	[1.10]	---	[(0.004)]	[0.067]	[9.33]	[0.0047]	[0.015]
Provisional	N06617	[52.8]	[0.0005]	[0.002]	---	[0.0002]	---	[0.072]	---	[(0.01)]	[0.50]	[0.005]	[0.062]	[0.002]
54F	Alloy 625	[0.23]	[0.0026]	[0.025]	[0.076]	[21.86]	[0.040]	[3.78]	---	[0.0012]	[0.19]	[8.86]	[0.016]	[3.43]
Provisional	N06625	[61.1]	[0.002]	[0.005]	---	[0.0003]	[(0.0001)]	[0.176]	[0.001]	[0.005]	[0.28]	[0.014]	[0.059]	[0.004]
201A	Alloy 690	0.37	(<0.002)	0.019	0.009	29.9	0.008	9.09	---	0.006	0.19	0.018	0.0053	0.009
Final	N06690	59.9	(0.0009)	0.005	---	(0.0004)	---	0.15	---	---	0.30	0.011	(<0.01)	<0.01
62D	Waspaloy	[1.45]	[0.0048]	[0.032]	[13.7]	[19.2]	[0.020]	[0.89]	---	[0.005]	[0.02]	[4.09]	[0.007]	[0.049]
X-Ray Only	N07001	[57.5]	[0.0006]	[0.005]	---	[0.0004]	---	[0.05]	---	[0.01]	[2.96]	[0.02]	[0.04]	[0.042]
62E	Waspaloy	[1.36]	[0.0069]	[0.035]	[13.22]	[19.56]	[0.012]	[0.89]	---	[0.0018]	[0.02]	[4.27]	[0.0030]	[0.037]
Provisional	N07001	[57.3]	[0.0004]	[0.004]	---	[0.0003]	---	[0.05]	---	[(0.005)]	[3.07]	[0.034]	[0.03]	[0.060]
325A	Rene 41	[1.56]	[0.0082]	[0.067]	[10.47]	[18.53]	[0.004]	[0.07]	---	[0.0045]	[0.004]	[9.99]	[0.0017]	[(0.006)]
Provisional	N07041	[56.1]	[0.0005]	[0.003]	---	[0.0003]	---	[0.012]	[(0.0002)]	[(0.003)]	[3.16]	[0.01]	[0.03]	[0.002]
277A	Rene 77	4.38	0.015	0.080	14.5	14.35	0.004	0.16	---	0.0021	0.01	4.22	0.0017	0.034
Final	N/A	58.9	0.0005	0.002	---	0.037	---	0.0010	---	(0.02)	3.40	0.011	0.047	0.010
61A	Haynes 214	4.42	0.005	0.042	(<0.01)	16.12	(0.01)	3.57	---	(<0.002)	0.17	<0.01	---	(0.01)
Chips Only	N07214	75.62	---	0.003	---	0.001	---	0.02	---	(<0.01)	<0.01	(<0.01)	<0.01	0.02
287A	Udimet 500	[3.01]	[0.009]	[0.079]	[17.0]	[18.47]	[1.002]	[0.084]	---	[0.0023]	[0.003]	[3.51]	[0.0007]	[0.022]
Provisional	N07500	[54.8]	[0.0005]	[0.002]	---	[0.0008]	---	[0.017]	---	[0.010]	[3.01]	[0.004]	[0.013]	[0.008]
283A	B 1900	[6.0]	[0.014]	[0.11]	[9.8]	[8.1]	[(0.01)]	[0.043]	---	[0.003]	[0.002]	[5.93]	[0.0004]	[0.020]
Provisional	N/A	[64.4]	[0.0005]	[0.003]	---	[0.0006]	---	[0.02]	---	[4.3]	[0.98]	[(0.01)]	[0.05]	[0.053]
56F	Alloy 718	[0.50]	[0.0039]	[0.038]	[0.09]	[18.4]	[0.048]	[17.9]	---	[0.0014]	[0.08]	[3.02]	[0.009]	[5.33]
Provisional	N07718	[53.7]	[(0.001)]	[0.005]	[(0.0001)]	[0.0004]	---	[0.08]	[0.0013]	[0.01]	[0.94]	[0.020]	[0.059]	[(0.001)]

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Revised - 10/11/2011

Page 28

Nickel & Nickel Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pb	Cr S	Cu Sb	Fe Si	La Sn	Mg Ta	Mn Ti	Mo V	N W	Nb Zr
274A <i>Provisional</i>	Alloy 725 N07725	[0.26] [57.5]	[0.002] [0.0004]	[0.007] [0.007]	[0.14] ---	[21.0] [0.0004]	[0.10] ---	[7.60] [0.02]	--- ---	[0.002] [(0.002)]	[0.077] [1.55]	[8.06] [0.018]	[0.007] [0.06]	[3.48] [0.002]
57D Final	Alloy X750 N07750	0.60 73.0	0.003 0.0013	0.051 0.0041	0.040 ---	15.42 0.16	0.015 ---	7.31 0.0005	--- ---	0.0028 (0.004)	0.048 2.51	0.01 0.024	0.0022 0.01	0.869 0.037
25A Chips Only	20Cb3 N08020	0.01 33.57	--- (0.012)	0.024 0.020	0.27 ---	19.63 0.003	3.23 ---	--- 0.32	--- ---	--- (0.21)	0.48 0.004	2.10 0.10	0.0227 0.05	0.51 ---
25C Final	Alloy 20 N08020	0.024 33.26	0.001 0.003	0.017 0.022	0.092 ---	19.98 0.0010	3.52 ---	38.8 0.53	--- ---	0.002 (0.004)	0.89 0.003	2.26 0.097	0.025 0.07	0.59 (0.002)
7A Chips Only	Alloy 330 N08330	0.022 (35.53)	--- (0.014)	0.063 0.018	0.06 ---	19.00 0.004	0.19 ---	--- 1.24	--- ---	--- (0.19)	1.47 (0.004)	0.19 0.05	0.038 (0.045)	0.01 ---
7B Chips Only	Alloy 330 N08330	0.023 35.84	(0.002) 0.0026	0.062 0.018	0.069 ---	19.32 (0.001)	0.21 ---	--- 1.38	--- ---	--- (0.005)	0.0130 0.048	0.023 (0.031)	0.0130 (0.031)	0.023 ---
7C Final	Alloy 330 N08330	0.017 34.9	0.0027 0.0021	0.064 0.014	0.041 ---	18.4 0.0004	0.031 ---	43.5 1.21	--- ---	0.0015 (0.002)	1.32 0.0020	0.095 0.060	0.034 (0.02)	0.189 (0.001)
157A Chips Only	AL6XN N08367	0.021 23.8	--- ---	0.023 0.014	0.045 ---	20.7 0.001	0.14 ---	--- 0.39	--- ---	--- (0.004)	0.35 0.044	6.18 0.044	0.20 0.023	0.019 ---
157B X-Ray Only	AL6XN N08367	0.015 24.01	0.001 0.0025	0.014 0.022	0.21 ---	20.4 0.0005	0.21 ---	48.0 0.31	--- ---	--- ---	0.40 0.005	6.21 0.069	0.22 0.05	0.034 <0.005
157C <i>Provisional</i>	AL6XN N08367	[0.023] [23.9]	[0.0012] [0.003]	[0.018] [0.018]	[0.36] ---	[20.35] [0.0004]	[0.20] ---	[47.7] [0.32]	--- ---	--- [0.005]	[.041] [0.004]	[6.21] [0.059]	[.236] [0.13]	[0.17] [0.002]
58B Final	Alloy 800 N08800	0.45 30.7	0.0003 0.001	0.073 0.010	0.02 ---	19.6 0.001	0.011 ---	47.70 0.282	--- ---	(0.001) <0.01	0.51 0.50	0.01 0.035	0.010 0.01	0.01 <0.005
59A Chips Only	Alloy 825 N08825	0.05 ---	(0.002) ---	0.02 0.017	0.25 ---	22.12 0.001	1.71 ---	30.82 0.10	--- ---	(<0.001) (<0.01)	0.33 0.83	2.68 0.03	--- 0.13	0.02 <0.01
59B Chips Only	Alloy 825 N08825	0.18 40.01	(0.0008) 0.0030	0.032 0.010	0.049 ---	21.20 0.0028	2.48 ---	31.25 0.23	--- ---	(0.002) ---	0.45 0.96	3.05 0.048	0.0079 (0.012)	(0.005) (0.005)
59E <i>Provisional</i>	Alloy 825 N08825	[0.068] [39.8]	[0.0025] [0.004]	[0.008] [0.015]	[0.27] ---	[21.9] [0.0009]	[1.70] ---	[31.5] [0.23]	--- ---	[(0.0001)] [(0.004)]	[0.50] [0.81]	[2.72] [0.049]	[0.010] [0.17]	[0.19] [0.0021]
275A Final	Alloy 925 N09925	0.22 42.8	0.002 0.0013	0.010 0.019	0.41 ---	20.1 0.0003	1.77 ---	27.9 0.23	--- ---	<0.001 <0.01	0.61 2.31	3.20 0.032	0.0033 0.22	0.27 (0.001)
55A Chips Only	Haynes 242 N10242	0.24 ---	(0.005) ---	0.03 0.003	0.04 ---	7.90 (0.001)	(0.03) ---	1.09 0.11	--- ---	--- (0.01)	0.33 0.01	(25.40) (<0.01)	--- 0.09	(0.02) (<0.02)

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Page 29

Nickel & Nickel Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pb	Cr S	Cu Sb	Fe Si	La Sn	Mg Ta	Mn Ti	Mo V	N W	Nb Zr
55B	Haynes 242	0.09	0.002	0.004	0.036	8.25	0.013	1.12	---	0.011	0.323	24.62	0.016	0.08
Final	N10242	65.4	0.0009	0.005	---	0.0010	---	0.021	---	(0.08)	0.002	0.005	0.12	(0.005)
66C	Alloy C-276	0.23	0.0023	0.004	0.23	15.7	0.15	5.24	---	0.02	0.41	15.7	0.029	0.03
Chips Only	N10276	59.1	(0.001)	0.008	---	0.001	---	0.025	---	(0.01)	0.007	0.012	3.25	0.01
66D	Alloy C-276	[0.19]	[0.001]	[0.0041]	[0.036]	[14.81]	[0.014]	[5.47]	---	[(0.001)]	[0.52]	[15.37]	[0.0036]	[0.013]
Provisional	N10276	[60.1]	[0.0009]	[0.005]	---	[0.0004]	---	[0.039]	---	[(0.004)]	[0.006]	[0.21]	[3.24]	[0.005]
63A	Alloy B-2	0.28	---	0.005	0.09	0.55	0.05	1.47	---	---	0.19	27.48	---	(<0.01)
Chips Only	N10665	(69.67)	---	0.004	---	0.001	---	0.02	---	(<0.01)	<0.01	(<0.01)	[0.18]	(0.02)
63B	Alloy B-2	0.31	(<0.002)	0.0025	0.019	0.47	0.012	1.68	---	0.005	0.61	27.3	0.0041	(0.001)
Chips Only	N10665	69.6	0.0010	0.004	---	(0.0004)	---	0.019	---	---	0.003	(0.010)	0.060	(0.002)
63C	Alloy B-2	0.11	0.003	0.010	0.013	0.10	0.003	1.13	---	0.003	0.76	26.6	0.0006	0.002
Final	N10665	71.1	0.0005	0.005	---	0.0005	---	0.01	---	---	0.15	0.007	0.03	0.001
257A	Hastelloy B-3	0.34	<0.003	0.005	0.024	1.57	0.019	1.47	---	0.010	0.63	28.0	0.0039	<0.03
Final	N10675	67.9	0.0004	0.004	<0.0005	0.0005	---	0.024	<0.0005	<0.005	0.002	0.01	0.070	(0.008)
203A	Alloy 909	0.066	(0.002)	0.005	12.9	0.72	0.05	40.6	---	(<0.002)	0.023	0.09	0.0010	5.00
Final	N19909	38.4	---	0.006	---	0.0009	---	0.41	---	---	1.58	(<0.01)	(0.02)	(<0.01)
100A	Haynes 556	(0.29)	(0.0015)	0.11	17.66	21.82	0.09	---	---	---	1.00	2.87	(0.16)	0.11
X-Ray Only	R30556	(20.17)	---	(0.012)	---	0.001	---	0.45	---	(0.59)	(0.023)	0.04	2.42	(0.02)
100C	Haynes 556	0.35	(0.002)	0.104	17.9	21.9	0.105	31.20	---	(0.001)	0.97	3.06	1.26	0.172
Final	R30556	20.5	0.001	0.013	---	0.0005	---	0.441	0.003	0.67	0.013	0.039	2.49	0.001

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Hi-Purity Nickel Materials

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Ag Mo	Al N	As Ni	B O	Be P	Bi Pb	C S	Ca Sb	Cd Se	Co Si	Cr Sn	Cu Te	Fe Ti	Ga Tl	Mg V	Mn Zn
187A	HPNI	0.1	11	0.1	(<5)	(<1)	<0.1	13	<10	(<0.1)	1.0	(3)	2.2	19	<0.5	(2)	3.0
Final	N/A	(<1)	(1)	Bal.	(14)	<1.0	0.15	1.9	<0.5	<0.1	(18)	0.4	<0.1	(3)	<0.2	(0.8)	<0.5
188A	HPNI-LO	1.1	24	0.7	(<5)	(<1)	0.9	22	<10	0.2	1.7	(6)	1.8	19	<0.5	(4)	2.3
Final	N/A	<1	(1)	Bal.	(17)	1.4	1.0	1.8	1.1	0.7	18	1.1	0.8	(2)	-0.9	(<0.5)	2.3
189A	HPNI-MI	2.4	44	0.7	(<5)	(<1)	2.6	23	<10	0.8	3.1	(10)	9.0	38	<0.5	(8)	1.9
Final	N/A	(<1)	(1)	Bal.	(18)	3.7	2.9	1.8	3.9	2.1	19	2.2	1.7	(3.3)	2.3	(<0.5)	2.8
190A	HPNI-HI	10.9	50	28	<5	(<1)	11.1	22	<10	5	8	(1)	17	99	<0.5	(6)	1.8
Final	N/A	(<1)	(1)	Bal.	(19)	34	9.3	3.3	11	6.5	28	6.2	8.9	(6)	5.8	(<0.5)	8.1
191A	ELNI-HP	0.1	1.5	13	(<5)	(<1)	<0.1	14	<10	<0.1	545	2.1	4.2	7.9	<0.5	(2)	3.1
Final	N/A	(<1)	(2)	Bal.	(30)	<1.0	0.3	2.1	<0.5	1.9	(5)	0.4	<0.1	(<1)	<0.2	(<0.5)	1.9

All Values Reported in ppm.

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MBH Nickel Based Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

2.1.2	Residuals in Nickel															Size (mm)	Form	
	C	Si	Mn	Cu	Fe	Cr	Co	Ti	Al	Mg	S	Sn	Pb	B	N	Ø x H		
21X 17518 H	0.007	0.05	0.43	<0.004	0.52	0.05	4.05	0.032	0.45	0.034	(0.004)	(0.002)	(0.002)	(0.002)	<0.004	sold out - no remake planned	40 x 15	C
21X 17519 J		0.17	0.35	0.06	0.28	0.06	0.77	0.07	0.19	0.20	.....	.....	.....	.....	.....		40 x 15	C
21X 17520 H		0.20	0.18	0.09	0.25	0.10	0.48	0.08	0.04	0.06	.....	.....	.....	.....	.....		40 x 15	C
21X 17521 J		0.28	0.11	0.16	0.24	0.16	0.26	0.12	0.03	0.03	.....	.....	.....	.....	.....		40 x 15	C
21X 17522 G		0.35	0.02	0.20	0.07	0.23	0.04	0.31	0.03	<0.005	.....	.....	.....	.....	.....		40 x 15	C

2.2 Ni/Cr (Nimonic Type)																							Size (mm)	Form
	C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	Mg	Sn	Zr	V	Ag	Te	Bi	As	Sb	Pb	W	B	Ø x H	
22X 754 D	0.07	0.66	0.53	0.21	2.22	19.65	0.21	0.23	0.49	0.18	0.002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
22X 755 D	0.05	0.27	1.07	0.50	1.15	19.69	0.49	0.07	0.83	0.36	0.003	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
22X 801 D	0.14	0.51	0.56	0.22	0.57	20.75	0.25	0.25	2.19	1.33	0.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
22X 803 E	0.06	1.05	0.22	0.007	0.33	19.85	0.50	0.50	1.93	1.60	0.0002	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
22X 804 D	0.07	0.56	0.54	0.21	0.66	19.72	0.09	0.20	2.34	1.33	0.004	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
22X 805 D	0.20	0.22	1.01	0.54	1.06	19.82	0.10	0.22	2.71	1.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
22X 806 D	0.007	0.10	0.09	0.004	0.18	19.66	0.01	0.03	2.48	1.35	.....	.....	0.004	.....	.....	.....	.....	.....	.....	0.007	0.02	0.004	40 x 15	C
22X 808 C	.....	0.10	0.05	<0.01	0.11	19.73	<0.01	0.03	2.14	1.41	.....	0.030	0.035	0.05	0.007	0.008	0.002	0.013	0.017	0.007	0.11	0.014	40 x 15	C

	C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	Mg	S	P	B		Size (mm)	Form
																Ø x H	
22X 902 B	0.15	0.50	0.51	0.13	0.61	18.80	0.22	17.08	2.26	1.31	0.02	.....	.....	.....		40 x 15	C
22X 903 C	0.08	1.09	0.25	0.01	0.83	19.84	0.07	17.60	1.86	1.67	0.002	.....	.....	.....		40 x 15	C
22X 904 C	0.08	0.52	0.50	0.10	0.25	19.9	0.21	16.9	2.26	1.29	0.005	.....	.....	.....		40 x 15	C
22X 905 C	0.19	0.22	1.08	0.23	1.15	19.89	0.53	16.45	2.92	1.03	.....	.....	.....	.....		40 x 15	C
CRM 22X 1051 D	0.166	0.58	0.206	0.115	0.575	15.95	4.50	18.98	1.078	4.35	0.0186	0.0015	0.0040	0.0009		40 x 15	C
22X 1052 C	0.19	0.51	0.26	0.13	0.65	15.7	4.48	18.6	1.09	4.08	0.002	.....	.....	.....		40 x 15	C
CRM 22X 1055 D	0.274	0.24	0.03	0.02	1.26	14.9	3.87	19.9	0.52	3.97	(0.008)	0.009	.....	.....		40 x 15	C

2.3 Fe/Ni/Cr (Incoloy Type)														Size (mm)	Form
	C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	S	P	Ni	Ø x H	
CRM 23X 8001 G	0.130	0.191	1.29	0.078	(44.2)	20.28	0.540	0.982	0.650	0.55	0.0067	0.0067	30.98	40 x 15	C
23X 8002 E	0.06	0.47	0.68	0.28	.....	20.48	0.34	0.54	0.32	0.29	.....	.....	32.1	40 x 15	C
23X 8004 E	0.06	0.53	0.70	0.30		19.72	0.33	0.53	0.34	0.31			31.8	40 x 15	C
23X 8005 E	0.07	0.46	0.73	0.28		20.81	0.34	0.50	0.35	0.22			32.2	40 x 15	C

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Revised - 10/11/2011

Page 32

MBH Nickel Based Alloys

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2.3	Fe/Ni/Cr (Incoloy Type) continued	C	Si	Mn	Cu	Cr	Mo	Co	Ti	Al	Ni											Size (mm) Ø x H	Form
	23X DS2 E	0.06	2.07	1.00	0.30	17.81	0.30	0.48	0.17	0.04	37.4											40 x 15	C
	23X DS4 E	0.06	2.01	1.02	0.30	16.83	0.29	0.48	0.20	0.037	37.15											40 x 15	C
	23X DS5 E	0.080	1.98	1.04	0.30	18.64	0.30	0.50	0.17	0.083	36.57											40 x 15	C
2.4	Ni/Cr/Co/Mo	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al											Size (mm) Ø x H		
	24X 14939 E	0.42	0.63	0.52	0.57	21.0	6.62	19.58	1.88	0.76											40 x 15	C	
	24X 11005 E	0.36	0.63	0.26	0.79	19.84	6.10	18.72	2.44	0.58											40 x 15	C	
2.4.1	Waspalloy, 720-types	C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	S	P	Ni	B	V	W	Zr	Nb	Pb	Size (mm) Ø x H	Form	
CRM CRM	24X WASP1 B	0.01	0.59	0.13	0.08	2.16	16.64	6.14	12.8	3.13	1.64	0.011	0.019	.....	0.007	0.03	0.18	0.12	0.055	.....	40 x 15	C	
	24X WASP2 B	0.09	0.35	0.24	0.11	1.66	18.50	4.22	14.6	3.53	1.00	0.018	0.009	.....	0.008	0.06	0.14	0.07	0.12	.....	40 x 15	C	
	24X WASP3 E	0.102	0.403	0.650	0.470	1.197	19.76	3.98	13.77	3.904	1.54	0.0171	0.018	53.51	0.0102	0.082	(0.111)	0.146	0.149	.....	40 x 15	CC	
	24X WASP4 C	0.052	0.24	0.53	(0.004)	1.48	10.7	7.54	11.04	2.25	2.46	(0.04)	<0.005	54.3	0.014	0.145	0.25	0.08	0.25	0.004	Sold out, being remade		C
CRM	24X 07001 A	0.040	0.090	0.0269	0.0138	1.007	19.55	4.25	13.05	3.05	1.40	(0.0005)	0.0030	57.45	0.0075	.....	.....	0.0591	0.0500	.....	32 x 20	W	
CRM	24X 7201 A	0.0322	0.036	0.0022	.....	0.09	16.01	3.01	14.79	5.10	2.44	0.0024	(0.002)	57.10	0.0242	.....	1.32	0.0433	.....	.....	40 x 13	HP	
2.5	Ni/Cr/Nb/Mo	Si	Mn	Cu	Fe	Cr	Mo	Co	W	Nb											Size (mm) Ø x H	Form	
	25X 10221 F	0.45	0.28	0.11	0.62	20.0	6.57	0.26	2.23	7.43											40 x 15	C	
	25X 10225 G	0.25	0.29	0.12	0.55	18.27	5.95	0.30	1.74	7.00											40 x 15	C	
	25X 10230 G	0.34	0.35	0.12	0.76	21.9	6.06	0.59	3.83	7.04											40 x 15	C	
	25X 10231 D	0.14	0.13	0.06	0.55	20.58	6.00	0.11	2.67	6.76											40 x 15	C	
	25X 10235 E	0.56	0.53	0.26	1.26	19.87	5.85	0.53	3.14	7.25											40 x 15	C	
2.6	Ni/Cr/Mo	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al											Size (mm) Ø x H	Form	
	26X 11381 D	0.30	0.43	0.008	0.70	19.76	9.47	(0.047)	2.48	0.41											40 x 15	C	
	26X 11383 D	0.29	0.19	0.08	0.49	22.50	9.37	0.05	2.84	0.67											40 x 15	C	
	26X 11384 E	0.15	0.13	0.12	0.98	20.5	10.2	0.30	2.6	0.50											40 x 15	C	
	26X 14182 D	(0.01)	<0.005	0.006	0.09	21.61	10.11	0.06	2.75	0.76											40 x 15	C	
2.7	Ni/Cr/Mo/Co	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al											Size (mm) Ø x H	Form	
	27X 14184 F	0.41	0.40	0.09	0.40	21.8	10.7	10.5	0.02	0.02											40 x 15	C	
	27X 14188 D	0.33	0.30	(0.003)	0.44	21.17	10.3	10.4	0.03	<0.01											40 x 15	C	
	27X 14386 C	0.38	0.39	0.02	1.50	20.73	10.47	10.51	0.06	0.02											40 x 15	C	
	27X 14387 E	0.28	0.27	<0.005	1.11	20.2	10.8	10.0	<0.005	<0.005											40 x 15	C	

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Revised - 10/11/2011

Page 33

2.8	Ni/Cr/Fe (Inconel Type)																				Size (mm)	Form	
	C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	Mg	S	P	Sn	Nb	Ta	W	B	Ni	N	Ø x H		
	28X 6001 G		0.95	0.12	0.83	6.33	16.38		1.02	0.58	0.02	0.01										40 x 15	C
	28X 6002 F		0.25	0.65	0.02	8.24	16.23		0.22	0.12	0.18	0.004										40 x 15	C
	28X 6003 E		0.74	0.47	0.42	7.1	15.56		0.62	0.22	0.025	0.01										40 x 15	C
	28X 6004 E		0.65	0.38	0.42	7.17	16.21		0.77	0.27	0.05	0.008										40 x 15	C
	28X 6005 E		0.60	0.39	0.39	6.98	16.93		0.62	0.28	0.06	0.002										40 x 15	C
	28X X7502 D	0.10	0.33	1.03	0.22	6.70	14.93	0.35		2.60	0.74					0.96						40 x 15	C
	28X X7504 D	0.03	0.39	1.09	0.22	6.42	14.22	0.46		2.59	0.70					0.95						40 x 15	C
	28X X7505 D	0.11	0.34	1.04	0.22	6.25	16.08	0.33		2.33	0.80					1.07			sold out - no remake planned			40 x 15	C
CRM	28X 6251 L	0.028	0.274	0.139	0.072	3.28	20.49	9.94	(0.041)	0.017	(0.054)		0.0043	0.0055		2.00			(0.0043)	63.36	0.0431	40 x 17	CC
CRM	28X 6252 M	0.084	0.559	0.276	0.483	3.72	21.08	9.23	0.262	0.21	0.257		0.0138	(0.008)		3.96			0.0166	59.37	0.173	40 x 17	CC
CRM	28X 6253 P	0.126	1.13	0.677	0.299	5.23	21.66	7.69	0.417	0.360	(0.21)		0.0211	0.013		4.202	0.057			57.51	0.093	40 x 15	CC
CRM	28X 6254 L	0.047	(0.79)	0.457	0.044	3.33	22.71	8.92	0.195	0.179	(0.05)		0.0160	0.0097		3.60			0.005	59.55	0.0364	40 x 17	CC
CRM	28X 6255 L	0.035	0.591	0.230	0.686	1.88	19.41	8.05	0.239	0.413	0.35		0.016	0.008		4.11	0.194			63.6	0.099	40 x 15	CC
CRM	28X 6256 A	0.0173	0.041	0.0004	0.018	(0.034)	21.29	8.81		0.266	0.301		(0.002)	0.0033		3.75				65.4	0.007	40 x 13	HP
CRM	28X 06625 A	0.020	0.273	0.090	0.0288	0.917	21.94	9.15	0.031	0.238	0.184		0.0037	(0.002)		3.52			0.0009	63.49	0.0219	40 x 15	W
	28X 7181 H	0.008	0.71	0.108	0.013	(19.5)	18.71	2.94	0.01	0.025	(0.007)		0.005	(0.003)	0.003	4.97			0.0010	52.6	0.233	45 x 18	C
CRM	28X 7182 M	0.021	0.390	0.310	0.134	(14.7)	19.98	3.59	0.632	0.98	0.41		0.0106	0.007	0.005	4.74		0.030	0.0047	53.86		43 x 20	C
CRM	28X 7183 T	0.119	0.309	0.41	0.319	17.2	18.4	3.49	(0.91)	1.23	0.90		0.0097	0.015	0.0056	5.57	0.022	0.076	0.0120	51.0	0.019	43 x 20	C
CRM	28X 7184 K	0.085	0.403	0.215	0.123	18.22	16.91	3.07	0.44	0.633	0.620		0.0158	0.0103		5.							

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Revised - 10/11/2011
Page 34

MBH Nickel Based Alloys

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2.12	Ni/Cu (Monel Type)																						Size (mm)		Form	
			C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	Mg	S	P	Nb	Pb	Sn	Zn	Cd	Be	Bi	Se	Ni		Ø x H
CRM	212X 4001 N	0.0460	0.98	2.35	27.62	1.032	0.143	.....	0.107	0.344	0.316	0.16	0.019	0.0099	.....	0.054	.....	.....	.....	.....	.....	.....	.....	66.56	40 x 15	CC
CRM	212X 4002 L	0.0369	0.090	1.68	32.41	1.022	0.084	.....	0.064	0.0421	0.081	0.0222	0.0019	.....	0.0318	0.0373	.....	.....	.....	.....	.....	.....	.....	64.36	40 x 15	CC
CRM	212X 4003 J	0.0051	0.293	1.00	30.48	1.24	0.073	0.023	0.029	(0.063)	0.086	0.035	0.0069	0.0054	0.156	0.0134	.....	.....	.....	.....	.....	.....	.....	66.58	43 x 20	C
CRM	212X 4004 L	0.101	0.892	0.718	28.69	4.71	0.096	.....	0.097	1.06	0.479	.....	0.0078	0.0203	1.01	0.040	.....	.....	0.0023	.....	.....	.....	.....	62.11	40 x 15	CC
CRM	212X 4005 E	0.115	2.48	1.55	20.76	1.90	0.513	0.035	0.662	0.892	2.05	0.0304	0.0138	0.013	0.330	0.025	.....	.....	.....	.....	.....	.....	.....	68.13	40 x 15	CC
CRM	212X 4006 G	0.0241	4.01	0.763	24.95	1.75	0.120	.....	0.042	1.50	3.81	0.107	0.0275	.....	0.538	0.016	.....	.....	.....	.....	.....	.....	.....	62.30	40 x 15	CC
CRM	212X 4007 A	0.0219	2.19	0.955	29.39	1.89	.....	.....	.....	.....	.....	.....	0.0063	0.015	2.30	0.022	0.0207	0.0183	0.0125	0.0040	0.0490	0.023	63.05	40 x 15	CC	
	212X NA2 G	0.07	2.50	1.06	29.8	1.53	.....	.....	.....	.....	.....	0.008	0.023	0.019	.....	0.02	.....								40 x 15	C
	212X NA3 G	0.37	3.66	0.52	29.2	1.42	.....	.....	.....	.....	.....	0.74	0.008	0.022	.....	0.05	.....								40 x 15	C
CRM	212X NA4 A	0.098	3.83	1.082	29.34	2.26	0.120	0.026	0.046	0.037	0.012	0.0014	0.004	0.0053	(0.51)	0.018	62.8								40 x 13	CC
2.15	Ni/Co/Cr/Fe/Mo (Hastelloy Type)																						Size (mm)		Form	
		C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	S	P	B	N	V	W	Ni			Ø x H					
CRM	215X HB1 N	0.079	0.24	0.613	0.164	9.73	1.08	32.44	1.176	.....	.....	0.048	(0.014)	.....	0.0207	0.454	.....	.....							40 x 17	CC
CRM	215X HB2 F	0.045	0.48	0.925	(0.004)	2.43	1.63	32.1	0.51	.....	.....	0.039	0.011	.....	0.006	0.52	.....	61.2							45 x 20	C
CRM	215X HB3 G	0.0355	0.78	0.90	(0.027)	5.06	0.303	29.9	1.014	.....	.....	0.0195	0.0239	.....	0.005	0.292	(0.023)	61.59							43 x 20	C
CRM	215X HB4 F	0.079	1.02	0.666	(0.024)	7.02	0.414	27.59	1.71	.....	.....	0.013	0.036	.....	0.0028	0.115	(0.028)	61.21							43 x 20	C
CRM	215X HB5 L	0.151	1.05	0.335	0.268	3.45	0.123	26.1	2.49	0.192	0.49	0.0113	0.038	0.003	0.006	0.136	.....	65.3							40 x 15	CC
CRM	215X HC1 L	0.045	(0.20)	1.19	0.046	2.60	15.42	20.91	2.60	0.264	0.72	0.0086	0.007	.....	0.059	0.090	2.66	.....							40 x 15	CC
CRM	215X HC2 J	0.090	0.79	1.036	.....	4.02	16.19	19.28	1.72	(0.078)	(0.01)	0.024	0.012	(0.006)	0.092	0.362	3.92	52.09							40 x 17	CC
CRM	215X HC3 K	0.197	1.11	0.920	0.319	7.87	17.05	17.90	0.99	0.35	0.188	0.055	0.022	0.0106	0.064	0.263	4.32	.....							40 x 17	CC
CRM	215X HC4 J	0.146	0.264	0.548	0.052	6.18	18.17	16.46	0.500	0.149	(0.073)	0.0306	0.007	.....	0.045	0.444	5.26	.....							40 x 15	CC
CRM	215X HC5 T	0.169	0.805	0.249	0.642	6.34	19.71	15.59	0.159	0.06	(0.03)	0.034	0.038	.....	0.096	0.498	5.34	.....							40 x 15	CC
CRM	215X HC6 A	0.005	(0.048)	0.099	.....	5.00	15.67	16.14	1.16	0.003	0.066	0.0021	.....	.....	0.0034	0.012	3.22	58.45							40 x 13	HIP
2.19	Various Nickel Alloys																						Size (mm)		Form	
		C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	S	P	Ta	W	Zr	B	Nb	Ni	N			Ø x H			
CRM	219X 20500 B	0.0486	1.24	0.710	0.0103	3.65	49.99	0.082	0.016	.....	.....	0.0100	0.0026	.....	.....	.....	.....	0.214	43.88	0.175					40 x 15	CC
	219X 1837 A	0.004	0.053	0.003	.....	0.10	9.98	3.00	10.04	5.28	5.63	0.001	0.002	<0.01	0.012	0.027	0.11	<0.01	.....	.....					40 x 15	C
CRM	219X 1867 D	0.092	0.187	0.131	0.308	0.244	7.78	6.00	9.80	1.355	6.05	0.0055	0.0054	4.05	0.066	0.273	0.0152	0.052	63.81	.....					40 x 15	CC
2.21	Ni/B Hardfacing Alloys																						Size (mm)		Form	
		C	Si	Mn	Cu	Fe	Cr	Mo	Co	W	S	Bi	Se	Sn	B			Ø x H								
CRM	221X HF1 A	0.144	4.64	0.130	0.020	0.33	13.4	0.018	.....	.....	0.006	.....	.....	.....	2.42			Sold out, no remake planned							40 x 15	C
	221X HF2 B	0.117	3.08	0.387	0.231	3.08	2.96	0.130	0.494	.....	0.0106	0.0098	0.0048	.....	2.96										43 x 20	C
	221X HF3 B	0.71	5.5	0.14	0.16	3.44	7.7	0.05	0.25	1.13	0.011	0.005	0.002	0.10	1.69										43 x 20	C
	221X HF4 B	0.38	6.49	0.15	0.05	5.82	17.3	0.05	0.094	0.76	0.009				0.68	1.07										43 x 20

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Revised - 10/11/2011
 Page 35

Cobalt Based Alloys

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IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pb	Cr S	Cu Si	Fe Sn	La Ta	Mg Ti	Mn V	Mo W	N Zr	Nb
326A Final	Permendur 2V R30005	(0.003) 0.037	(0.001) 0.0082	(0.002) 0.0013	48.4 ---	(0.002) 0.0011	(0.002) 0.029	49.6 <0.001	--- (0.01)	(0.001) (0.002)	0.003 1.94	(0.002) (0.001)	0.0004 0.002	0.038
95C Chips Only	Alloy 6B R30016	0.13 2.88	(0.002) (0.004)	1.10 0.009	57.0 ---	29.0 0.001	0.014 0.54	2.47 <.0005	--- 0.03	(0.0004) 0.004	1.55 0.004	1.37 3.96	0.033 (0.005)	(0.008)
207A Final	MP35N R30035	0.040 35.19	0.011 0.0011	0.007 0.002	33.46 ---	19.98 0.0027	0.017 0.053	0.64 ---	--- 0.007	(0.0005) 0.91	0.015 0.011	9.62 0.028	0.0031 0.003	0.043
208A X-Ray Only	F 75 R30075	0.07 0.80	0.002 (0.003)	0.28 0.030	63.4 0.0003	27.7 0.001	0.021 0.77	0.78 0.007	--- 0.012	0.0003 0.012	0.68 0.012	5.3 0.07	0.063 (0.001)	0.020
208B Final	F 75 R30075	0.04 0.42	0.005 0.0015	0.100 0.004	60.0 0.0006	30.0 0.0009	0.03 0.63	1.17 0.004	--- 0.042	(0.0004) 0.029	0.75 0.05	6.63 0.03	0.003 0.002	0.06
208C Final	F 75 R30075	0.07 0.63	0.002 0.0010	0.052 0.008	64.0 ---	27.55 0.0004	0.01 0.62	0.29 0.001	--- (0.02)	0.0002 0.012	0.53 0.012	6.12 0.02	0.169 0.0014	0.011
256A Final	MP159 R30159	0.17 25.7	0.013 0.0011	0.020 0.006	35.6 ---	19.1 0.002	0.008 0.07	9.0 ---	--- <0.005	<0.001 3.03	0.014 0.03	7.0 0.02	0.0032 (0.005)	0.51
97B Final	Alloy 188 R30188	0.08 19.4	(0.002) 0.003	0.096 0.009	42.5 ---	21.2 (0.001)	0.07 0.34	1.92 <.005	0.005 0.019	<0.002 0.006	0.76 0.012	0.56 12.9	0.014 (0.001)	0.022
97C Final	Alloy 188 R30188	0.19 22.8	0.0028 0.0007	0.130 0.011	35.8 ---	22.2 0.0004	0.027 0.47	2.37 0.001	--- 0.04	0.0010 0.011	0.82 0.010	0.36 14.6	0.075 (0.007)	0.023
96A Chips Only	Alloy 25 R30605	0.03 10.53	(0.003) ---	0.10 0.009	(49.48) ---	20.17 0.0011	0.04 0.17	2.29 <.01	--- (0.08)	---	1.52 0.01	0.28 15.2	---	0.07
96B Final	Alloy 25 R30605	0.035 10.04	0.0021 0.002	0.132 0.0063	49.4 ---	20.54 0.0005	0.047 0.16	2.29 ---	--- 0.028	(0.0005) 0.007	1.39 0.012	1.17 14.52	0.007 0.007	0.046
96C Final	Alloy 25 R30605	0.08 10.36	0.002 0.001	0.132 0.008	47.1 ---	19.95 0.001	0.08 0.31	2.93 ---	--- 0.03	(0.0002) 0.007	1.91 0.012	1.88 15.4	0.031 0.009	0.047
96D Final	Alloy 25 R30605	0.23 10.66	0.003 0.0006	0.079 0.006	49.8 ---	19.97 0.005	0.038 0.23	2.17 0.001	--- 0.03	(0.004) 0.046	1.40 0.008	0.35 14.71	0.0084 (0.007)	0.08
64A Chips Only	Ultimet 1233 R31233	[0.16] [8.92]	--- ---	0.057 [0.006]	(55.38) ---	[24.78] 0.002	[0.02] 0.34	2.98 <.01	--- [0.03]	---	0.81 (<0.01)	4.72 1.83	[0.077] (<0.01)	(<0.01)
64B Final	Ultimet 1233 R31233	0.12 9.06	(0.001) (0.0009)	0.062 0.005	54.2 ---	25.26 (0.0004)	0.020 0.27	3.02 ---	--- (0.028)	0.005 0.011	0.78 (0.014)	4.77 2.12	0.12 <0.01	(0.018)
64C Final	Ultimet 1233 R31233	0.138 9.47	0.0010 0.0012	0.064 0.0064	53.4 ---	25.4 0.0004	0.019 0.24	2.99 <.01	--- 0.02	0.0043 0.007	0.79 0.020	4.72 2.39	0.113 <0.01	0.016

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Revised - 10/11/2011

Page 36

Cobalt Based Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pb	Cr S	Cu Si	Fe Sn	La Ta	Mg Ti	Mn V	Mo W	N Zr	Nb
260A	FSX414	0.006	0.008	0.244	50.7	29.4	0.012	0.49	---	<0.005	0.46	0.015	0.0323	0.015
Final	NA	10.72	0.006	0.005	---	0.0013	0.85	---	<0.02	0.01	0.010	7.0	<0.005	

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MBH Cobalt Based Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

11.1 Co/Cr/W (Alloy Wt 52 Type)		C	Si	S	P	Mn	Ni	Cr	W	Fe	Mo	Nb	Ta	Al	Cu	N	Pb	Sn	Size (mm) Ø x H	Form
CRM	111X 12667 M	0.008	0.749	0.0068	(0.003)	0.52	(0.70)	21.79	8.22	1.36	0.161	1.50	0.145	0.005	0.047	0.085	.....	.....	43 x 20	C
	111X 12669 J	.....	0.71	.....	.....	0.57	0.62	22.04	10.65	1.41	.....	2.06	.....	.....	.....	.....	.....	.....	40 x 15	C
CRM	111X 12670 N	(0.007)	0.589	0.026	0.0052	0.48	1.10	19.24	10.95	1.28	(0.057)	2.53	0.105	(0.004)	(0.059)	0.006	.....	0.021	40 x 15	C
	111X 12671 J	.....	0.51	.....	.....	0.61	0.88	20.5	11.8	1.45	.....	1.95	.....	.....	.....	.....	.....	.....	40 x 15	C
	111X 12672 J	0.126	0.78	0.014	.....	0.72	0.71	21.8	9.3	1.87	0.29	1.87	0.09	0.27	0.14	.....	0.01	0.034	40 x 15	C
CRM	111X 12673 A	(0.005)	0.82	0.022	0.010	0.52	1.69	19.0	9.75	1.70	0.086	2.35	0.06	<0.005	0.104	0.031	(0.003)	0.074	40 x 15	C

11.2	Co/Cr/Mo (Stellite 8 / BS 3531 Type)	C	Si	S	P	Mn	Ni	Cr	W	Fe	Mo	Al	Ti	Nb	Cu	B	N	Size (mm) Ø x H	Form	
CRM	112X 14936 N	0.45	0.23	—	—	0.77	4.67	23.00	4.42	0.30	4.65	0.48	—	—	—	—	—	out of stock - to be remade	40 x 15	C
	112X 14937 S	0.340	1.18	0.0242	0.009	0.407	2.88	25.17	2.84	2.28	7.16	0.012	0.017	0.191	0.093	0.0123	0.142	42-48 x 15	C	
	112X 14941 M	0.38	0.45	—	—	0.44	4.47	26.85	0.54	0.76	4.16	0.03	—	—	—	—	—	sold out - no remake planned	40 x 15	C
	112X 14942 M	0.090	1.02	—	—	0.46	0.29	28.47	1.67	1.09	6.22	0.18	—	—	—	—	—	40 x 15	C	
CRM	112X 14943 G	0.129	0.58	0.026	0.006	1.20	0.138	30.64	0.060	1.23	7.94	(0.024)	—	0.119	0.229	0.0059	0.056	40 x 15	CC	
CRM	112X 14944 A	0.225	0.71	0.0040	0.0017	0.744	0.128	29.24	<0.02	0.14	6.29	<0.01	—	<0.01	0.006	(0.0004)	0.148	40 x 19	W	

11.3 Co/Cr/Ni/W (Stellite 31 Type)		C	Si	S	P	Mn	Ni	Cr	W	Fe	B	Size (mm) Ø x H	Form
	113X X401 G	0.56	1.22	.....	.....	0.20	11.74	25.24	7.09	0.73	0.008	40 x 15	C
	113X X402 H	0.38	0.32	0.036	0.045	1.26	9.41	24.86	7.96	2.15	.....	40 x 15	C
	113X X403 G	0.52	0.85	0.022	0.021	0.69	10.40	25.03	7.82	1.06	0.006	40 x 15	C
	113X X404 D	0.51	0.75	0.006	0.002	0.69	10.76	23.7	7.71	1.28	0.001	40 x 15	C
	113X X405 E	0.48	0.76	0.005	0.002	0.68	10.79	26.7	7.65	1.30	0.001	40 x 15	C

11.9 Various Cobalt Alloys		C	Si	S	P	Mn	Ni	Cr	W	Fe	Mo	Cu	Nb	Ta	Al	Mg	B	N	Size (mm) Ø x H	Form
CRM	119 X COB1 G	0.065	0.40	0.015	0.026	0.395	20.8	24.7	11.6	14.6	0.40	0.088	0.345	.....	0.020	.....	.....	0.130	40 x 15	CC
CRM	119X 81601 B	0.396	0.601	0.033	0.021	1.44	19.9	18.56	4.14	(5.37)	4.08	.....	4.20	0.104	.....	(0.012)	.....	0.056	43 x 20	C
CRM	119 X ST3 K	2.39	0.794	0.063		1.09	2.55	29.8	12.1	3.10	0.353	0.078					0.148	0.040	40 x 15	CC

Copper, Brass & Bronze Alloys

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IARM Status	Grade UNS#	Ag Nb	Al Ni	As O	Be P	Bi Pb	C S	Cd Sb	Co Se	Cr Si	Cu Sn	Fe Te	Mg Ti	Mn Zn	N Zr
70B	CDA 110	0.0011	---	(0.0001)	---	<0.0002	(0.007)	---	<0.003	---	>99.9	<0.001	---	<0.0003	---
Final	C11000	---	<0.0002	---	0.002	(0.0003)	(0.0005)	(0.0002)	<0.0002	<0.0005	(0.0002)	---	---	<0.001	---
278A	CDA 145	(0.001)	<0.002	(0.001)	---	(0.001)	0.003	---	0.001	(0.001)	99.5	0.004	---	(0.0004)	0.0001
Final	C14500	---	<0.005	0.0004	0.011	0.003	0.002	<0.005	---	0.002	0.001	0.53	---	0.002	---
71B	CDA 172	(0.002)	0.040	---	1.84	---	0.003	---	0.21	0.0030	97.7	0.042	---	0.0010	---
Final	C17200	---	0.021	---	0.004	0.006	(0.0004)	(0.002)	---	0.060	0.005	---	---	0.005	---
279A	CDA 182	0.003	0.002	(0.002)	---	(0.001)	0.002	---	0.002	0.86	99.1	0.025	---	(0.002)	0.0003
Final	C18200	---	0.014	0.001	0.005	0.01	0.0015	(0.004)	---	0.020	0.021	---	---	0.01	0.012
72A	CDA 314	<0.005	<0.01	---	<0.001	---	(0.014)	---	<0.01	---	---	0.011	---	<0.01	---
Chips Only	C31400	---	<0.01	---	(0.007)	1.78	0.0014	<0.01	---	<0.01	<0.01	---	---	8.48	---
72B	CDA 314	(0.002)	---	(0.003)	---	---	0.002	---	---	---	90.08	0.007	---	---	0.0002
Final	C31400	---	0.004	0.002	0.005	1.99	0.0015	0.006	---	(0.002)	0.029	---	---	7.81	---
73C	CDA 360	[0.006]	[0.002]	[0.004]	---	[0.011]	[(0.002)]	---	[0.002]	[0.001]	[61.3]	[0.199]	---	[0.002]	---
Provisional	C36000	---	[0.095]	---	[0.003]	[2.97]	[0.003]	[0.008]	---	[0.003]	[0.256]	---	---	[35.1]	---
74A	CDA 464	(0.002)	<0.01	(<0.01)	---	---	(0.012)	---	---	---	---	0.01	---	<0.01	---
Final	C46400	---	0.01	---	0.006	0.02	0.001	<0.01	---	<0.01	0.50	---	---	38.14	---
74B	CDA 464	(0.005)	0.003	<0.01	---	<0.005	---	0.002	---	---	60.4	0.011	---	<0.01	---
Final	C46400	---	0.006	---	(0.008)	0.017	(0.003)	0.003	---	0.003	0.70	---	---	38.9	---
75A	CDA 482	---	<0.01	<0.01	---	---	(0.010)	---	---	---	---	0.052	---	<0.01	---
Chips Only	C48200	---	0.025	---	0.005	0.83	0.002	<0.01	---	<0.01	0.89	---	---	38.39	---
75B	CDA 482	(0.005)	(0.005)	(0.004)	---	(0.001)	(0.004)	---	(0.003)	---	60.63	0.06	---	(0.003)	---
Final	C48200	---	0.02	---	0.003	0.63	(0.001)	(0.004)	---	(0.003)	0.59	---	---	38.0	---
76A	CDA 485	(0.002)	<0.01	<0.01	---	---	(0.031)	---	---	---	---	0.08	---	<0.01	---
Chips Only	C48500	---	0.03	---	0.005	1.80	0.002	<0.02	---	<0.01	0.99	---	---	36.14	---
76B	CDA 485	0.005	(0.005)	(0.003)	---	---	(0.004)	0.0014	0.0007	---	60.5	0.060	---	(0.003)	---
Chips Only	C48500	---	0.015	---	0.005	1.94	0.003	0.006	---	---	0.69	---	---	36.71	---
76C	CDA 485	(0.002)	(0.004)	(0.003)	---	---	0.003	---	---	---	60.4	0.013	---	(0.001)	---
Final	C48500	---	0.003	<.005	0.003	1.6	(0.001)	(0.004)	---	(0.003)	0.66	---	---	37.2	---
77A	CDA 510	(0.010)	<0.01	(<0.01)	---	---	(0.012)	---	<0.01	---	---	0.01	---	0.01	---
Chips Only	C51000	---	<0.01	---	0.12	(0.011)	0.003	(0.01)	---	<0.01	4.60	---	---	0.03	---
77B	CDA 510	(0.002)	(0.001)	(0.001)	---	(0.004)	0.003	---	---	---	95.2	0.002	---	(0.002)	0.0001
Final	C51000	---	0.002	0.002	0.148	0.016	0.002	0.005	---	(0.003)	4.66	---	---	0.007	---

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Page 39

Copper, Brass & Bronze Alloys

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IARM Status	Grade UNS#	Ag Nb	Al Ni	As O	Be P	Bi Pb	C S	Cd Sb	Co Se	Cr Si	Cu Sn	Fe Te	Mg Ti	Mn Zn	N Zr
78B	CDA 544	0.008	(0.002)	<0.003	---	(0.001)	<0.002	---	<0.0005	---	87.7	0.02	---	(0.002)	---
Final	C54400	---	0.077	---	0.19	3.87	0.010	0.01	---	<0.002	4.73	---	---	3.55	---
79B	CDA 623	0.002	9.19	---	---	(0.003)	0.002	---	(0.002)	(0.003)	88.4	2.13	---	0.16	---
Final	C62300	---	0.075	---	0.005	(0.003)	(0.001)	---	---	0.019	0.017	---	---	0.013	---
79C	CDA 623	<0.005	9.20	0.003	---	---	0.003	---	<0.003	(0.002)	87.6	2.28	---	0.20	<0.0001
Final	C62300	---	0.55	0.001	0.006	<0.005	<0.001	<0.005	---	0.033	0.010	---	---	0.014	---
80A	CDA 630	<0.005	9.89	<0.01	---	---	(0.013)	---	<0.01	---	---	4.01	---	0.23	---
Chips Only	C63000	---	4.85	---	(0.009)	(0.007)	0.003	<0.01	---	0.022	0.02	---	---	0.18	---
80B	CDA 630	0.006	10.19	(0.004)	---	<0.005	(0.01)	---	0.014	0.012	81.2	3.31	---	0.54	---
Chips Only	C63000	---	4.69	---	0.009	0.009	(0.001)	(0.004)	---	0.030	0.018	---	---	0.078	---
80C	CDA 630	---	[10.1]	[0.005]	---	---	[0.008]	---	[0.008]	[0.013]	[80.6]	[3.87]	---	[0.58]	---
Provisional	C63000	---	[4.71]	[0.001]	[0.0036]	[(0.003)]	[(0.001)]	[(0.01)]	---	[0.076]	[0.003]	---	---	[0.097]	---
81B	CDA 642	(0.004)	6.70	0.058	---	<0.001	0.002	---	---	0.002	91.2	0.047	---	0.012	---
Final	C64200	---	0.003	---	0.004	0.006	<0.001	0.003	---	1.84	0.008	---	---	0.176	---
82A	CDA 655	<0.005	(0.012)	<0.01	---	---	(0.014)	---	(<0.01)	---	---	0.04	---	1.02	---
Chips Only	C65500	---	<0.01	---	(0.004)	(0.02)	0.002	<0.01	---	3.07	0.015	---	---	(0.01)	---
82B	CDA 655	---	0.002	<0.002	---	---	(0.003)	---	---	0.004	95.3	0.080	---	1.04	<0.0005
Final	C65500	---	0.011	0.001	0.004	0.011	0.003	<0.01	---	3.22	0.017	---	---	0.38	---
83A	CDA 675	<0.005	<0.01	<0.01	---	---	(0.007)	---	(<0.01)	---	---	0.99	---	0.22	---
Chips Only	C67500	---	0.01	---	0.005	0.058	0.002	0.008	---	<0.01	0.57	---	---	39.81	---
83B	CDA 675	(0.002)	0.002	---	---	---	0.003	---	(0.003)	(0.003)	58.7	0.97	---	0.13	---
Final	C67500	---	0.010	---	0.004	0.017	(0.001)	(0.004)	---	(0.003)	0.85	---	---	39.3	---
84A	CDA 706	<0.005	<0.01	<0.01	---	---	0.013	---	0.01	<0.01	---	1.33	---	0.68	---
Chips Only	C70600	---	9.89	---	0.010	0.007	0.011	<0.01	---	<0.01	0.01	---	---	0.13	---
84B	CDA 706	0.005	(0.002)	---	---	---	(0.01)	---	0.013	(0.003)	87.9	1.30	---	0.62	---
Final	C70600	---	10.03	---	0.004	0.008	0.008	(0.002)	---	0.01	0.014	---	---	0.082	---
85A	CDA 715	<0.005	<0.005	---	---	---	0.043	---	0.01	<0.01	---	0.58	0.001	0.8	---
Chips Only	C71500	---	(29.79)	---	0.005	0.005	0.005	<0.01	---	<0.01	0.02	---	---	0.01	---
85B	CDA 715	---	<0.01	---	---	---	0.011	---	0.034	---	---	0.53	---	0.53	---
Final	C71500	---	29.60	---	0.007	0.005	0.010	<0.01	---	<0.01	0.014	---	---	0.12	---
85C	CDA 715	<0.002	<0.01	0.0009	---	---	0.008	---	0.016	0.002	67.3	0.63	0.01	0.65	<0.0003
Final	C71500	---	31.3	0.003	0.003	0.004	0.002	---	---	0.01	0.005	---	---	0.057	---

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Page 40

Copper, Brass & Bronze Alloys

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IARM Status	Grade UNS#	Ag Nb	Al Ni	As O	Be P	Bi Pb	C S	Cd Sb	Co Se	Cr Si	Cu Sn	Fe Te	Mg Ti	Mn Zn	N Zr
158B	CDA 815	(0.01)	0.002	(0.001)	---	---	0.002	---	0.002	0.85	98.5	0.090	---	0.019	<0.0005
Final	C81500	---	0.32	0.002	0.005	0.01	0.003	0.002	---	0.02	0.01	---	---	0.014	---
158C	CDA 815	(0.01)	0.002	(0.001)	---	---	0.002	---	0.002	1.04	98.5	0.090	---	0.019	<0.0005
Final	C81500	---	0.32	0.002	0.005	0.01	0.003	0.002	---	0.02	0.01	---	---	0.014	---
86B	CDA 836	(0.027)	<0.01	---	---	---	(0.01)	---	<0.01	---	---	0.029	---	<0.01	---
Chips Only	C83600	---	0.78	---	0.071	5.49	0.03	0.092	---	(<0.01)	4.58	---	---	4.18	---
86D	CDA 836	0.022	0.002	0.007	---	0.04	0.003	---	0.004	(0.004)	(84.5)	0.035	---	0.0011	---
Final	C83600	---	0.40	---	0.072	5.4	0.029	0.112	---	0.002	4.9	(0.01)	---	4.6	---
250A	CDA 844	(0.02)	(0.002)	---	---	0.02	<0.005	---	(0.002)	<0.003	80.2	0.17	---	<0.002	---
Final	C84400	---	0.33	---	0.003	7.2	0.046	0.052	---	0.003	2.46	---	---	9.7	---
87B	CDA 857	(0.01)	0.20	0.007	---	0.003	0.003	---	0.007	(0.002)	60.9	0.29	---	0.006	---
Final	C85700	---	0.095	---	0.008	1.58	(0.001)	0.014	---	0.004	0.78	---	---	36.1	---
88A	CDA 863	---	6.03	(<0.01)	---	---	(0.022)	---	(<0.01)	---	---	2.27	---	3.72	---
Chips Only	C86300	---	0.02	---	(0.004)	0.03	(0.002)	<0.01	---	0.02	0.04	---	---	23.25	---
88B	CDA 863	---	5.66	(0.01)	---	---	0.003	---	---	---	63.9	2.12	---	2.93	---
Final	C86300	---	0.065	<0.01	0.011	0.066	<0.001	<0.005	---	0.09	0.020	---	---	25.1	---
150A	CDA 872	<0.01	(<0.01)	---	---	---	(<0.01)	---	---	---	---	0.045	---	1.05	---
X-Ray & Chips Only	C87200	---	0.013	---	0.005	0.011	(0.001)	<0.03	---	3.93	0.016	---	---	0.03	---
151A	CDA 875	<0.01	<0.01	---	---	---	<0.01	---	---	---	---	0.076	---	0.002	---
X-Ray & Chips Only	C87500	---	0.009	---	0.006	---	---	---	---	3.95	(0.006)	---	---	14.02	---
151B	CDA 875	(0.01)	0.002	(0.002)	---	---	0.005	---	---	(0.003)	84.0	0.025	---	0.002	---
Final	C87500	---	0.011	---	0.003	0.013	<0.001	(0.001)	---	3.11	0.009	---	---	12.94	---
211A	Magnolia B	0.005	0.002	(0.01)	---	5.0	---	---	(0.001)	(0.002)	88.4	0.004	---	(0.003)	---
Final	C89320	---	0.003	---	0.19	0.014	0.002	0.057	---	0.003	6.23	---	---	0.006	---
226A	EnviroBrass 2-1	0.004	0.002	0.003	---	1.7	0.003	---	0.001	(0.001)	86.7	0.054	---	0.002	<0.0005
Final	C89520 Mod	---	0.54	<0.001	0.005	0.040	0.005	0.004	0.93	0.002	5.1	---	---	4.8	---
227A	EnviroBrass 2-2	0.004	0.002	0.003	---	2.3	0.003	---	0.001	(0.001)	85.9	0.060	---	0.001	0.0002
Final	C89520 Mod	---	0.53	0.0013	0.003	0.042	0.005	<0.01	1.21	0.002	5.1	---	---	4.7	---
228A	EnviroBrass 2-3	0.003	0.002	0.003	---	1.53	0.003	---	0.001	0.001	89.0	0.052	---	0.001	<0.0005
Final	C89520 Mod	---	0.45	0.002	0.032	0.026	0.004	0.01	0.67	0.002	4.1	---	---	4.1	---
263A	Federalloy I-848A	0.006	0.002	0.003	---	2.55	<0.005	---	0.001	0.002	(78)	0.047	---	0.002	---
Final	N/A	---	0.66	---	0.040	0.022	0.002	0.06	0.002	0.003	3.5	---	---	15.8	---

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Page 41

Copper, Brass & Bronze Alloys

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IARM Status	Grade UNS#	Ag Nb	Al Ni	As O	Be P	Bi Pb	C S	Cd Sb	Co Se	Cr Si	Cu Sn	Fe Te	Mg Ti	Mn Zn	N Zr
264A Final	Federalloy I-844 C89831	(0.005) ---	0.003 0.54	(0.004) ---	--- 0.027	3.6 0.057	(0.004) 0.0013	--- 0.074	0.001 (0.001)	(0.002) 0.003	(87.3) 3.03	0.048 ---	--- ---	0.002 5.33	---
265A Final	Federalloy I-836 C89833	(0.002) ---	0.003 0.69	(0.005) ---	--- 0.024	2.4 0.011	--- (0.002)	--- 0.015	(0.001) (0.002)	(0.001) 0.003	(90) 4.4	0.013 ---	--- ---	(0.002) 2.45	---
266A Final	Federalloy I-932 C89835	0.001 ---	0.002 0.46	0.004 ---	--- 0.032	2.37 0.010	0.002 0.002	--- 0.010	(0.001) 0.001	(0.002) 0.002	(87) 6.9	0.035 ---	--- ---	0.002 3.48	---
89A Chips Only	CDA 903 C90300	--- ---	<0.01 0.15	--- ---	--- 0.11	--- 0.09	(0.009) 0.018	--- <0.01	<0.01 ---	--- <0.01	--- 8.14	0.009 ---	--- ---	<0.01 3.48	---
89B Chips Only	CDA 903 C90300	--- ---	<0.01 0.15	--- ---	--- 0.087	--- 0.089	--- 0.018	--- <0.01	<0.01 ---	--- (<0.01)	--- 8.17	0.013 ---	--- ---	<0.01 3.96	---
89C Provisional	CDA 903 C90300	[0.005] ---	[0.002] [0.008]	[0.003] [0.01]	--- [0.004]	[0.01] [0.17]	[0.002] [0.001]	--- [0.008]	[0.002] ---	--- [0.003]	[87.6] [9.1]	[0.004] ---	--- ---	[0.001] [3.1]	---
90B X-Ray & Chips Only	CDA 922 C92200	--- ---	(<0.01) 0.69	--- ---	--- 0.054	--- 1.66	--- 0.035	--- 0.06	<0.01 ---	--- (<0.01)	--- 6.44	0.019 ---	--- ---	<0.01 2.98	---
91A Chips Only	CDA 932 C93200	(0.008) ---	<0.01 0.09	<0.01 ---	--- 0.01	--- 6.39	(0.010) 0.052	--- 0.07	<0.01 ---	--- <0.005	--- 6.71	0.08 ---	--- ---	<0.01 3.19	---
91B Chips Only	CDA 932 C93200	0.021 ---	(0.002) 0.56	(0.01) ---	--- 0.012	--- 7.15	--- 0.045	--- 0.19	0.003 ---	--- <0.005	82.0 6.57	0.056 ---	--- ---	<0.01 3.49	---
91D Provisional	CDA 932 C93200	[0.020] ---	[<0.003] [0.43]	[0.01] ---	--- [0.09]	[0.06] [7.8]	[0.002] [0.017]	--- [0.12]	[0.012] [<0.002]	[<0.001] [0.002]	[82] [6.5]	[0.024] ---	--- ---	[<0.001] [3.20]	---
92C Provisional	CDA 937 C93700	[0.05] ---	[0.001] [0.17]	[0.01] ---	--- [0.08]	[0.01] [9.5]	--- [0.027]	--- [0.076]	--- [<0.002]	--- [0.002]	[80.4] [9.7]	[0.01] ---	--- ---	--- [0.15]	---
184A Final	CDA 941 C94100	(0.01) ---	0.0016 0.30	0.010 ---	--- 0.008	0.03 19.0	(0.004) 0.021	--- 0.27	(0.001) ---	(0.001) 0.002	(74) 6.0	0.003 ---	--- ---	0.002 0.37	---
267A Final	CDA 947 C94700	0.002 ---	0.003 5.1	(0.004) ---	--- 0.037	(0.005) 0.026	(0.003) 0.0014	--- <0.03	0.002 0.002	(0.001) 0.003	(87.8) 4.95	0.019 ---	--- ---	0.002 2.06	---
204A Final	CDA 954M C95410	0.009 ---	10.55 1.95	<0.01 ---	--- 0.007	--- 0.004	0.006 (0.002)	--- <0.01	0.008 ---	0.008 0.034	83.3 0.005	3.87 ---	--- ---	0.052 0.22	---
94A Chips Only	CDA 955 C95500	--- ---	10.63 4.37	<0.01 ---	--- <0.01	--- 0.009	(0.014) (0.003)	--- <0.01	0.01 ---	--- <0.01	--- (<0.01)	4.04 ---	--- ---	0.16 0.09	---
94B Final	CDA 955 C95500	0.017 ---	10.8 4.31	<0.01 ---	--- 0.011	--- 0.004	(0.006) 0.002	--- (0.011)	0.011 ---	0.017 0.028	80.6 (0.003)	3.99 ---	--- ---	0.071 0.14	---

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Page 42

Copper, Brass & Bronze Alloys

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IARM Status	Grade UNS#	Ag Nb	Al Ni	As O	Be P	Bi Pb	C S	Cd Sb	Co Se	Cr Si	Cu Sn	Fe Te	Mg Ti	Mn Zn	N Zr
235A	CDA 958	<0.005	8.9	<0.005	---	(0.004)	0.009	---	0.01	0.01	81.2	4.07	---	1.17	0.0001
Final	C95800	---	4.44	0.001	0.012	0.012	0.002	(0.004)	---	0.061	0.018	---	---	0.083	
236A	CDA 964	---	0.003	---	---	0.003	0.010	---	0.004	0.002	66.7	0.91	---	1.04	0.0002
Final	C96400	0.92	30.0	0.002	0.003	0.004	0.003	<0.005	---	0.19	0.005	---	<0.005	0.002	---
159A	NARloy-A	3.48	<0.01	---	---	---	(0.002)	---	<0.01	<0.01	---	<0.01	---	<0.01	0.0003
Final	N/A	---	<0.01	0.0006	<0.01	<0.01	<0.01	---	---	<0.01	<0.01	---	---	<0.01	---
160A	NARloy-Z	3.03	<0.01	---	---	---	0.003	---	<0.01	<0.01	---	<0.01	---	<0.01	0.002
Final	N/A	---	<0.01	0.0030	(0.004)	<0.01	<0.003	---	---	<0.01	<0.01	---	---	<0.01	0.40

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MBH Copper, Brass, & Bronze Alloys

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3.1 Brass - Cu/Zn Binaries		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	Cr	Co	P	S	B	Cd	Cu	Size (mm) Ø x H	Form
CRM	31X B1 N	0.0234	0.039	43.76	0.0193	0.0089	0.0011	0.0141	0.0029	0.0022	0.0044	0.0040	.....	.....	0.0184	(0.0013)	0.0019	.....	56.07	42 x 18	OC
CRM	31X B2 L	0.151	0.0129	39.57	0.0191	0.0125	0.0172	(0.007)	0.0222	0.0249	0.0107	0.0207	.....	.....	.....	.....	0.0056	.....	60.13	42 x 18	OC
CRM	31X B3 K	0.0268	0.024	33.89	0.065	0.059	0.0114	0.017	0.0200	0.0187	0.0127	0.0096	.....	.....	.....	.....	0.0031	.....	65.80	42 x 18	OC
CRM	31X B4 L	0.073	0.064	28.39	0.026	0.0571	.....	0.025	0.046	0.0074	0.0076	0.0076	0.087	0.033	(0.023)	0.0091	.....	0.0330	71.10	40 x 17	OC
CRM	31X B5 K	0.045	0.021	23.60	0.056	0.0085	(0.001)	(0.001)	0.0054	0.0006	0.0061	0.0057	0.0002	0.0062	.....	.....	0.0002	0.00050	76.22	40 x 15	OC
	31X B6 J	<0.005	<0.005	19.4	(0.01)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	.....	.....	.....	.....	.....	.....	80.6	40 x 15	OC
CRM	31X B7 J	0.101	0.010	15.01	0.018	0.020	<0.005	<0.005	0.0016	0.0002	0.086	0.0019	.....	.....	.....	.....	0.0030	.....	84.80	42 x 17	OC
CRM	31X B8 H	0.035	0.072	9.52	0.0267	0.0083	(0.0013)	0.0051	0.0081	0.0012	0.031	0.0108	.....	.....	.....	.....	0.0021	.....	90.28	42 x 17	OC
CRM	31X B9 L	0.0245	0.0549	3.83	0.0168	0.0129	(0.0005)	0.0036	0.0053	0.0017	0.0068	0.0075	.....	.....	.....	.....	(0.0003)	.....	96.05	40 x 17	OC
	31X B95	0.45	<0.001	4.99	(0.007)	<0.001	<0.005	(0.01)	(0.008)	<0.001	(0.007)	<0.001	.....	.....	.....	.....	<0.001	.....	94.4	40 x 15	OC

Se = 0.0029.

3.1.1 Alloyed Brass																					Size (mm) Form		
		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	B	Co	Cr	Cd	Hg	Cu	Ø x H	Form	
CRM	31X B10 L	0.0386	0.0161	35.36	1.25	1.572	0.472	0.034	0.0062	0.206	0.0086	0.0126	.....	.....	.....	.....	.....	.....	.....	61.01	42 x 18	OC	
CRM	31X B11 H	0.0117	0.0134	36.65	0.802	1.033	0.0262	0.0063	0.0061	0.653	0.0054	0.0057	.....	.....	.....	.....	.....	.....	.....	60.72	40 x 15	OC	
CRM	31X B12 G	0.0229	0.0244	36.67	0.430	0.491	0.081	0.0207	0.0181	1.720	0.0198	0.0194	.....	.....	.....	.....	.....	.....	.....	60.51	40 x 15	OC	
CRM	31X B13 G	0.0127	0.0188	36.67	0.182	0.212	0.0148	0.032	0.0120	2.84	0.0116	0.0056	.....	.....	.....	.....	.....	.....	.....	60.03	40 x 15	OC	
CRM	31X B14 G **	0.49	0.010	36.5	0.018	0.018	4.00	0.050	0.009	0.012	0.011	0.015				0.011				58.8	** provisional values	40 x 15	OC
CRM	31X B15 H **	0.95	0.008	36.9	0.018	0.010	2.98	0.107	0.005	0.012	0.008	0.011				0.0045				59.0	** provisional values	40 x 15	OC
CRM	31X B16 G	2.17	(0.04)	37.4	(0.02)	(0.01)	2.04	0.20	(0.006)	(0.01)	<0.001	<0.001	.....	.....	.....	.....	.....	.....	.....	58.0	40 x 15	OC	
CRM	31X B17 F	0.010	(0.05)	(33.9)	(0.02)	(0.01)	6.05	(0.007)	(0.015)	<0.001	<0.001	<0.001	.....	.....	.....	.....	.....	.....	.....	60.0	40 x 15	OC	
CRM	31X B18 J	0.046	0.916	39.11	0.0193	0.0143	0.0236	0.018	0.0196	0.00110	0.0051	0.0129	0.0117	<0.005	.....	.....	.....	.....	.....	59.82	42 x 18	OC	
CRM	31X B19 P	0.035	2.51	38.50	0.028	0.0127	(0.004)	0.004	0.0110	0.0055	0.0047	0.0134	0.031	(0.002)	.....	.....	.....	.....	.....	58.85	40 x 17	OC	
CRM	31X B20 N	0.0244	4.43	37.03	0.024	0.021	0.0025	(0.005)	0.0028	0.0005	0.0025	0.0039	0.0230	(0.004)	.....	.....	.....	.....	.....	58.53	42 x 17	OC	
CRM	31X B21 D	0.132	0.120	29.50	0.129	0.107	0.121	0.147	0.108	0.0647	0.114	0.130	0.100	(0.002)	0.0050	.....	.....	.....	.....	69.24	42 x 18	OC	
CRM	31X B22 E	0.209	0.209	17.32	0.168	0.166	0.125	0.171	0.169	0.097	0.193	0.173	0.157	0.104	0.0033	.....	.....	.....	.....	80.77	42 x 18	OC	
CRM	31X B23 D	0.060	0.046	9.97	0.060	0.047	0.0048	0.0046	0.0482	0.0053	0.0463	0.0448	0.030	0.053	.....	0.0472	.....	0.0010	.....	89.57	40 x 15	OC	
CRM	31X B24 D	1.93	0.050	1.99	0.0342	0.134	(0.002)	.....	0.0116	0.0030	0.0126	0.118	0.0065	0.050	.....	.....	.....	0.0008	.....	95.65	40 x 15	OC	
CRM	31X B25 B	0.613	0.298	40.83	0.056	0.236	0.470	0.254	0.0284	0.127	0.0594	0.0843	0.093	.....	(0.0045)	.....	.....	.....	.....	56.95	42 x 17	OC	
CRM	31X B26 E **	1.55	0.75	30	1.1	1.6	1.0	0.19	0.11	0.45	0.09	0.11	0.055		0.001	0.11		0.016		bal	** provisional values	40 x 15	OC
CRM	31X B27 B	0.985	0.492	17.65	0.111	0.0315	0.0015	0.0044	0.048	0.0059	0.0320	0.0243	0.0150	0.0080	(0.0005)	.....	.....	.....	.....	80.65	42 x 18	OC	
CRM	31X B28 A	0.0126	0.081	35.47	0.0490	0.063	0.034	.....	.....	0.094	.....	.....	.....	(0.0018)	.....	.....	0.073	0.0072	0.0007	64.02	42 x 18	OC	
CRM	31X B29 A	0.0328	0.146	24.75	0.144	4.11	0.219	.....	.....	0.0625	.....	.....	3.33	.....	.....	.....	0.062	0.0144	.....	67.08	40 x 15	OC	

3.1.2 Brass - Trace Elements																			Size (mm) Form	
		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	Cr	Se	Cd	B	C	Cu	Ø x H	
CRM	31X TB1 J	0.231	0.201	36.90	0.038	0.220	0.210	0.093	0.153	0.314	0.049	0.104	0.084	0.006	0.0114	0.0006	.....	61.39	40 x 15	OC
CRM	31X TB2 G	0.105	0.107	37.16	0.072	0.093	0.084	0.042	0.101	0.088	0.031	0.051	.....	.....	.....	<0.0005	0.0040	61.97	42 x 18	OC
CRM	31X TB3 K	0.089	0.169	37.92	0.0282	0.0637	0.0045	0.016	0.0454	0.0244	0.0030	0.0222	.....	.....	0.0043	(0.0005)	.....	61.58	40 x 17	OC
CRM	31X TB4 F	0.0356	0.0225	34.86	0.0229	0.0114	(0.0004)	(0.0027)	0.0065	0.0021	0.0056	0.0064				0.0021	0.0018	65.00	42 x 18	OC

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Revised - 10/11/2011

Page 44

MBH Copper, Brass, & Bronze Alloys

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3.1.3 Naval Brass		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Co	B	C	Cu	Size (mm) Ø x H	Form
CRM	31X NB1 H	0.535	0.504	29.73	0.037	0.520	(0.0004)	0.004	0.161	0.051	0.0065	0.0057	0.0223	0.0024	(0.0006)			68.35	42 x 17	OC
CRM	31X NB2 G	1.06	0.293	28.82	0.095	0.065	0.085	0.096	0.105	0.116	0.052	0.115	0.091	<0.002	.....	.....	.....	68.93	42 x 17	OC
CRM	31X NB3 H	1.67	0.197	24.64	0.113	0.0299	0.094	0.145	0.074	0.0166	0.093	0.265	0.150	(0.006)	.....	0.0026	(0.0020)	72.45	42 x 18	OC
CRM	31X NB4 J	2.01	0.067	32.57	0.235	0.230	0.178	0.203	0.0062	0.0053	0.104	0.450	0.230	(0.0032)	.....	0.0009	.....	63.71	42 x 17	OC

3.1.5 High Tensile Brass		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Sb	P	S	C	Cu	Size (mm) Ø x H	Form
CRM	31X HT31 A	0.0149	0.020	18.19	2.90	0.196	6.70	0.041	0.0006	5.27	(0.0011)	0.00032	(0.00003)	0.006	66.67	50 x 18	W
CRM	31X HT37 A	0.0116	0.623	34.69	0.0344	0.0105	0.0004	1.38	0.0011	2.88	0.0007	0.003	<0.0005	0.003	60.33	40 x 18	W
CRM	31X HT38 A	0.039	0.051	36.66	0.0530	0.0242	0.960	0.869	0.0008	2.60	(0.0006)	0.0024	(0.001)	0.003	58.77	50 x 18	W

3.1.6 Bismuth Brass		Bi	Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Sb	P	S	Se	Cd	B	Cu	Size (mm) Ø x H	Form
CRM	31X B1B1 C	1.948	0.488	0.211	36.67	0.113	0.313	0.0718	0.099	0.0282	0.0479	0.0158	0.0637	(0.001)	0.0064	0.0082	.....	59.93	40 x 15	OC
CRM	31X B1B2 B	0.921	1.186	0.0617	33.85	0.379	0.466	0.411	0.322	0.084	0.0451	0.119	0.0358	(0.0014)	0.0142	0.0020	.....	62.05	42 x 18	OC
CRM	31X B1B3 B	4.05	0.111	0.149	32.46	0.099	0.098	0.0298	0.061	0.057	0.243	0.0417	0.0175	(0.0005)	0.003	0.0029	.....	62.48	40 x 17	OC
CRM	31X B1B4 A	0.980	0.400	0.091	36.89	0.148	0.175	0.358	0.0018	.....	0.0039	0.0144	0.0064	(0.0007)	0.0162	0.0005	0.0008	60.88	42 x 18	OC

3.1.7 Lead Brass																					Size (mm)	Form	
		Pb	Sn	Zn	Fe	Ni	Mn	Al	Si	As	Bi	Sb	P	S	Co	Ag	Se	Cd	B	Cu	Ø x H		
CRM	31X 7835.1 R	2.699	0.293	35.31	0.118	0.143	.....	0.0319	0.010	0.0201	0.0113	0.0161	0.0222	.....	0.0232	(0.001)	(0.001)	0.0028	0.0012	61.20	40 x 15	OC	
CRM	31X 7835.2 J	2.08	0.211	31.86	0.094	1.35	.....	0.172	0.0217	0.0225	0.0084	0.0240	0.0276	.....	0.0279	0.003	0.003	0.0026	(0.0016)	64.03	42 x 18	OC	
CRM	31X 7835.3 G	1.274	0.0912	35.34	0.299	0.282	.....	0.384	0.022	0.098	0.0257	0.104	0.042	.....	0.0053	0.0010	0.0010	0.0030	0.0014	62.10	40 x 15	OC	
CRM	31X 7835.4 H	1.03	0.046	30.09	0.020	0.492	.....	0.561	.....	0.206	.....	0.188	0.125	.....	.....	.....	.....	.....	.....	67.10	40 x 15	OC	
CRM	31X 7835.5 A	1.64	0.116	6.23	0.126	0.249	.....	0.078	.....	0.104	.....	0.114	0.018	.....	.....	.....	.....	.....	.....	91.25	42 x 18	OC	
CRM	31X 7835.6 A	1.498	0.080	38.05	0.091	0.0173	.....	0.546	(0.001)	0.0006	0.0026	0.0127	<0.0005	0.0017	0.0005	0.0007	0.0007	0.0010	0.0005	59.67	42 x 18	OC	
CRM	31X 7835.7 A	2.29	0.137	7.50	0.030	0.943	.....	0.0084	0.039	.....	0.048	0.0327	0.080	0.0075	0.0120	.....	.....	0.0047	.....	88.87	40 x 15	OC	
CRM	31X 7835.8 A **	3.1	0.51	24.9	0.095	0.145	0.095			0.14	0.11	0.11	0.12		0.31	0.46		0.085		bal	** provisional values	40 x 15	OC

See also Section 3.1.1 products 31X B18 - B20

3.1.8	Manganese Brass																				Size (mm)	Form	
		Mn	Sn	Pb	Zn	Fe	Ni	Al	Si	As	Bi	Sb	P	S	Co	Nb	Ag	Cr	C	Cu	Ø x H		
CRM	31X MNB1 C	0.188	0.105	1.44	29.37	0.268	0.053	0.599	0.128											67.77	** provisional values	42 x 18	OC
CRM	31X MNB2 D	2.05	0.289	0.983	31.30	0.548	0.118	0.272	0.579	0.0201		0.0177	0.0246		0.0086		0.041			63.75		40 x 15	OC
CRM	31X MNB3 E **	3.0	0.45	0.50	26.0	1.15	0.34	0.60	1.52			0.005	0.025		0.056	0.1	0.015			68.20		40 x 15	OC
CRM	31X MNB4 E	4.14	1.080	0.640	27.12	1.73	3.23	2.16	0.90	0.0068		(0.006)	0.0252		0.057		0.0171			58.95		42 x 18	OC
CRM	31X MNB5 Q	0.137	1.60	0.243	37.12	0.013	0.996	2.96	0.44	0.0100	.....	0.0118	(0.008)	.....	0.0155	.....	0.0063	0.19	.....	56.18	42 x 17	OC	
CRM	31X MNB5 R	0.175	1.228	0.157	37.11	0.898	1.32	3.24	0.528	0.0021	.....	(0.006)	0.0399	.....	0.066	.....	0.0195	0.0116	.....	55.14	40 x 17	OC	
CRM	31X MNB6 C	0.871	0.0310	0.016	28.53	0.0697	0.261	0.0148	0.0196	0.0107	.....	0.0128	0.0226	.....	0.0107	.....	0.0509	.....	.....	70.01	40 x 15	OC	
CRM	31X MNB11 A	11.99	0.161	1.610	22.85	0.337	4.46	1.19	0.071	0.0010	0.0021	0.0051	0.0186	(0.0007)	0.0046	.....	.....	0.0046	(0.009)	57.36	42 x 18	OC	
CRM	31X MNB12 A	17.88	0.231	1.99	22.12	0.335	0.491	0.749	0.013	0.0022	0.0021	0.0056	0.019	(0.0012)	0.0012			0.0038	(0.011)	56.16	42 x 18	OC	

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Revised - 10/11/2011

Page 45

MBH Copper, Brass, & Bronze Alloys

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3.1.9 Silicon Brass		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Co	Cr	Mg	Cd	Cu	Size (mm) Ø x H	Form		
CRM	31X WSB1 J	0.525	0.435	6.14	0.557	0.229	0.957	4.58	0.063	0.964	0.0387	0.048	0.044	.....	0.210	0.184	0.0258	0.0115	84.61	42 x 17	CC		
CRM	31X WSB2 F	0.134	0.166	12.24	0.183	0.198	0.080	4.04	0.0305	0.096	.....	0.0302	0.029	0.002	0.0529	.....	0.0087	0.0017	82.72	40 x 15	CC		
CRM	31X WSB3 D	0.607	0.397	11.96	0.22	0.371	0.509	3.44	0.053	1.06	0.0195	0.028	0.033	(0.0024)	0.129	0.0480	(0.004)	0.0028	81.14	43 x 20	C		
CRM	31X WSB4 T	0.192	0.432	5.03	0.241	0.092	0.327	4.56	0.0290	0.342	.....	0.067	0.065	.....	0.162	.....	.....	0.0030	88.29	40 x 15	CC		
CRM	31X WSB5 C	4.05	0.400	0.343	0.79	0.492	0.218	6.07	0.0284	0.496	0.039	0.424	0.080	0.0084	0.057	0.0087	0.0042	0.0047	80.06	sold out - no remake planned			
CRM	31X WSB6 D	0.056	0.95	0.881	0.032	0.117	0.059	2.48	0.0051	0.248	0.0056	0.007	(0.020)	(0.002)	0.247	0.058	(0.001)	0.0071	94.74	43 x 20	C		
CRM	31X WSB7 B	1.93	0.025	7.58	1.95	3.03	3.87	4.25	0.103	3.39	0.190	0.636	0.188	.....	0.0118	0.0145	.....	0.0077	72.74	42 x 17	CC		
3.2.1 Phosphor-Bronze		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Co	Mg	C	Se	Cu	Size (mm) Ø x H	Form		
CRM	32X PB10 N	11.87	0.067	0.0494	0.014	0.054	<0.001	(0.004)	0.0138	0.0005	0.0128	0.0201	0.003	0.0162	.....	0.004	.....	0.0058	87.85	40 x 17	CC		
CRM	32X PB11 F	3.40	1.038	1.50	0.566	0.904	<0.001	0.099	0.200	0.201	0.033	0.478	0.885	0.0227	0.097	0.0041	.....	.....	90.54	40 x 15	CC		
CRM	32X PB12 E	5.25	0.102	0.546	0.032	0.221	0.0067	0.0099	0.087	0.0110	0.057	0.160	0.172	0.0127	0.0142	0.0033	.....	.....	93.29	40 x 17	CC		
CRM	32X PB13 D	7.09	0.104	0.240	0.057	0.111	0.039	0.073	0.081	0.0300	0.0137	0.117	0.128	0.015	0.0052	0.0144	.....	.....	91.88	40 x 15	CC		
CRM	32X PB14 D	9.00	0.048	0.038	0.0056	0.144	(0.0009)	(0.0025)	0.0331	(0.0002)	0.224	0.055	(0.008)	0.065	0.0013	0.0003	.....	.....	90.26	40 x 17	CC		
CRM	32X PB15 A	2.21	0.174	0.76	0.116	0.212	0.045	0.043	0.123	0.0125	.....	0.026	0.0873	.....	0.0509	0.0275	.....	.....	96.07	40 x 15	CC		
CRM	32X PB20 A	4.55	0.0045	0.007	0.0013	0.0090	<0.001	0.0046	0.0011	(0.007)	.....	0.0012	0.196	0.0030	.....	.....	(0.0014)	.....	95.22	38 x 17	W		
CRM	32X PB23 A	7.56	0.0042	0.0020	(0.0005)	0.0033	(0.0004)	0.0016	0.0011	(0.0006)	.....	0.0025	0.319	0.0015	.....	.....	0.004	.....	92.04	49 x 17	W		
3.2.2 Lead Bronze		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Co	Ag	Cu	Size (mm) Ø x H		Form			
	32X LB3 G	10.71	9.96	0.051	0.095	1.54	(0.0006)	(0.0024)	0.021	0.025	0.0091	0.024	0.0050	(0.0015)	.....	.....	77.5	40 x 15		CC			
CRM	32X LB10 E	8.16	11.74	0.566	0.013	0.687	(0.001)	(0.001)	0.151	0.0004	0.0608	0.591	(0.001)	0.0116	0.0456	0.042	77.98	40 x 17		CC			
CRM	32X LB11 C	11.01	10.56	0.306	0.036	0.672	(0.002)	(0.003)	0.088	0.0020	0.0293	0.109	0.033	(0.046)	0.0178	0.0121	76.97	42 x 18		CC			
CRM	32X LB12 D	9.52	9.06	0.584	0.0223	0.433	(0.001)	<0.001	0.0897	.....	0.0231	0.442	0.383	0.094	0.0751	.....	79.27	40 x 15		CC			
CRM	32X LB13 C	5.80	7.59	0.520	0.0160	0.828	0.0011	(0.0035)	0.131	0.0005	0.0721	0.0186	0.0161	0.115	0.0293	0.0063	84.87	40 x 17		CC			
CRM	32X LB14 F	5.42	14.65	0.042	0.057	0.318	(0.0006)	0.006	0.052	0.0050	0.974	0.062	0.189	0.016	0.212	0.0619	78.08	40 x 17		CC			
CRM	32X LB15 D	5.38	21.76	0.049	0.0089	0.104	(0.0004)	(0.002)	0.0222	0.0014	0.0173	0.092	0.0037	0.0136	0.0033	0.0312	72.52	40 x 17		CC			
CRM	32X LB16 A	5.55	18.78	0.458	0.0040	0.793	(0.001)	.....	.....	.....	0.0119	(0.001)	(0.002)	0.0012	.....	0.0016	74.42	32 x 17		W			
3.2.3 Aluminium Bronze		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	P	Cr	Co	Mg	Bi	Sb	Ag	C	Se	Be	Cu	Size (mm) Ø x H	Form
CRM	32X ALB1 P	0.0314	0.207	0.0228	3.11	5.74	8.83	0.106	0.0083	0.057	0.0145	0.0052		0.0092							81.85	42 x 18	CC
CRM	32X ALB2 J	0.103	0.266	0.247	4.05	4.53	9.60	0.295	0.0066	0.056	0.048	0.0031		0.0035							80.70	42 x 18	CC
CRM	32X ALB3 R	0.110	0.105	0.311	3.97	3.47	11.20	0.173	0.0114	0.0297	0.022	0.0060		0.0117							80.31	42 x 18	CC
CRM	32X ALB4 H	0.085	0.120	0.264	3.55	7.03	7.87	0.252	0.0130	1.028	0.036	0.022		0.153							79.61	42 x 18	CC
CRM	32X ALB5 J	0.062	0.093	0.487	2.22	4.14	6.91	0.086	0.064	1.21	0.048	0.0056	0.0307	0.0176							84.61	42 x 18	CC
CRM	32X ALB6 J	0.147	0.096	0.685	2.53	5.31	8.05	0.295	0.012	0.904	0.0101	0.0097		0.0019				(0.002)			81.98	42 x 18	CC
CRM	32X ALB7 C	0.30	0.029	0.527	4.82	4.96	4.01	0.399	0.056	0.383	0.057	0.061		0.0039							84.40	42 x 18	CC
CRM	32X ALB8 E **	0.30	0.07	0.35	5.7	6.7	6.2	0.50	0.14	1.6	0.15	0.40	0.55	0.012		(0.1)	0.005	** provisional values			bal	40 x 15	CC
CRM	32X ALB9 B	0.061	0.377	1.17	3.13	1.21	13.86	0.282	0.0275	0.090	(0.054)	(0.064)	0.0259	0.205			0.042	(0.006)			79.24	42 x 18	CC
CRM	32X ALB10 A	0.202	0.107	0.315	4.23	7.58	11.25	0.169	0.017	1.73	0.040	0.0103		0.0029				(0.0022)			74.28	42 x 18	CC
CRM	32X ALB11 A	0.0289	0.118	0.576	3.81	4.33	8.80	0.069		1.13	0.045		0.089	0.075	0.120	0.093			0.006	0.0194	80.58	40 x 15	CC
CRM	32X ALB11 B	0.0062	0.0316	0.508	3.99	4.44	8.85	0.015		1.290	0.0249		0.0180	0.072	0.082	0.203			0.007	0.064	80.38	40 x ~17	CC

() Indicates non-certified value.
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Revised - 10/11/2011
 Page 46

MBH Copper, Brass, & Bronze Alloys

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3.2.3	Aluminium Bronze (continued)																Size (mm)	Form
		Sn	Pb	Zn	Fe	Ni	Al	Si	Mn	P	Cr	Mg	Co	Ag	C	Cu	Ø x H	
CRM	32X CA1 A	0.0180	0.007	0.162	4.63	4.94	9.79	0.090	0.296	0.003	0.0049	0.0003	.....	0.0012	(0.007)	80.03	42 x 18	W
CRM	32X CA7 A	0.0172	(0.004)	0.006	2.09	0.234	9.37	0.017	0.151	.....	0.0028	0.0004	0.0003	0.0009	0.0028	88.06	42 x 18	W
CRM	32X CA12 A	0.0157	(0.0017)	0.0405	0.657	0.088	6.14	2.57	0.0290	.....	.....	0.0005	(0.0003)	0.0010	(0.002)	90.48	42 x 18	W
CRM	32X CA23 A	0.0164	(0.0026)	0.031	3.63	4.71	9.19	0.026	1.298	0.0011	0.0018	0.0003	.....	0.0008	(0.0050)	81.05	50 x 18	W
CRM	32X CA31 A	0.0037	(0.0024)	0.041	4.06	4.28	8.95	0.036	0.336	(0.003)	0.0026	0.0008	0.0029	0.0008	0.006	82.24	42 x 18	W

3.2.4	Bismuth Bronze (Sebily Type)																Size (mm) Ø x H	Form	
		Sn	Pb	Zn	Fe	Ni	As	Bi	Sb	P	S	Co	B	Se	Cd	Cu			
CRM	32X SEB1 C	4.23	0.209	8.79	0.0293	0.101	0.043	5.31	0.355	0.0054	0.0011	0.0089	.....	0.97	(0.0017)	79.96	40 x 17	CC	
CRM	32X SEB2 C	9.34	0.424	3.73	0.078	0.028	0.0094	4.36	0.0120	0.013	.....	0.0121	.....	0.026	.....	(81.8)	40 x 17	CC	
CRM	32X SEB3 C ^	2.07	0.109	0.85	0.082	1.52	0.0161	(5.4)	0.054	0.040	.....	0.025	0.0021	1.42	0.0016	(88.4)	* Bi and Cu are not homogeneous in this material	40 x 17	CC
CRM	32X SEB4 C	9.26	0.011	8.60	0.366	0.0091	0.0012	2.65	0.0056	(0.006)	.....	0.48	0.0021	0.105	0.0004	78.6		42 x 17	CC
CRM	32X SEB5 B	5.28	0.0149	6.64	0.360	0.308	0.0121	1.17	0.0344	0.183	.....	0.0048	0.0028	0.512	0.0067	85.5		40 x 17	CC
CRM	32X SEB6 C	7.14	0.0463	4.55	0.151	0.860	0.083	0.615	0.235	0.0118	.....	0.231	(0.0004)	0.322	0.0036	85.66		40 x 17	CC
CRM	32X SEB7 A	3.20	0.343	4.42	0.074	1.165	0.038	3.58	0.262	0.0206	0.067	0.119	.....	1.19	0.0074	85.46		42 x 17	CC

* Bi and Cu are not homogeneous in this material

3.2.9	Bronze																				Size (mm)	Form
		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Cr	Co	Bi	Sb	Cd	Au	Ag	P	S	Cu	Ø x H	
CRM	32X SN1 E	11.55	5.32	0.401	0.006	1.69	(0.0003)	(0.0006)	0.0153	0.0002	.....	0.0100	.....	0.0126	.....	.....	.....	(0.0010)	0.0087	80.94	42 x 17	CC
CRM	32X SN2 H	13.54	1.97	1.28	0.0332	0.104	0.0004	0.0028	.....	0.0043	.....	.....	.....	0.100	.....	.....	.....	0.082	0.0326	82.80	42 x 18	CC
CRM	32X SN3 F	15.50	0.285	0.386	0.124	0.447	0.0120	0.005	0.0306	0.128	.....	0.048	.....	0.194	.....	.....	.....	0.331	0.062	82.55	40 x 17	CC
CRM	32X SN4 A	18.80	1.059	0.342	0.060	0.556	0.034	(0.004)	0.0468	0.0065	.....	0.151	.....	0.102	.....	.....	.....	0.988	0.040	77.88	42 x 18	CC
CRM	32X SN5 A **	16	0.26	0.50	1.3	0.45	0.45	.....	0.055	0.71	0.06	0.15	0.10	0.65	0.15	0.01	0.09	.....	0.001	bal	40 x 15	CC
CRM	32X SN6 A **	7.3	1.6	1.2	0.09	0.19	0.03	.....	0.75	0.002	0.01	0.68	0.16	0.31	0.09	0.003	1.15	.....	0.015	bal	40 x 15	CC
		** provisional values																				
	32X 14953 C	1.37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
	32X 14954 B	3.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
	32X 14955 B	5.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C
	32X 14956 B	7.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40 x 15	C

3.3	Gun Metal																			Size (mm)	Form	
		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Cr	Co	Ag	Cd	Cu	Ø x H		
CRM	33X GM4 AB	2.56	4.69	7.13	0.053	1.795	(0.001)	(0.001)	0.287	0.0007	0.084	0.0261	0.0088	0.112	.....	0.259	0.0265	.....	82.96	40 x 17	CC	
CRM	33X GM5 L	5.22	5.13	4.19	0.136	1.008	(0.007)	(0.001)	0.059	0.0018	0.0225	0.093	0.0112	0.061	.....	0.0662	0.0099	.....	83.98	40 x 17	CC	
CRM	33X GM6 J	6.56	3.90	2.01	0.0338	0.833	0.0098	0.069	0.180	0.0307	0.0313	0.279	0.0406	0.093	.....	0.0056	0.0065	.....	85.99	40 x 17	CC	
CRM	33X GM7 H	9.97	0.97	2.29	0.0278	0.500	0.051	0.065	0.133	0.151	0.085	0.111	0.034	0.0139	0.0146	.....	0.0574	.....	85.49	42 x 18	CC	
CRM	33X GM8 F	4.13	6.11	5.45	0.098	0.148	0.0005	(0.001)	0.0159	0.0008	0.0248	0.0146	0.0029	0.0119	(0.0004)	.....	0.097	.....	83.81	40 x 17	CC	
CRM	33X GM20 A **	4.0	0.10	3.8	0.58	1.0	0.005		0.18	0.22	0.03	2.0	0.07		0.02	0.04	0.14	0.022	bal	** provisional values	40 x 15	CC
CRM	33X GM24 A	3.85	3.35	3.67	0.0083	0.0087	.....	0.0028	0.0010	<0.0005	0.0009	0.0012	0.190	0.003	(0.0013)	.....	0.0046	.....	88.88	44 x 17	W	
CRM	33X GM29 A	6.12	0.050	4.23	0.0102	0.0289	.....	0.0027	0.0017	(0.0005)	0.0019	0.0015	0.138	0.0024	(0.0004)	.....	0.0026	.....	89.36	33 x 19	W	
CRM	33X RB1 A	2.137	5.02	7.95	0.928	0.0539	0.0048	0.063	0.0030	0.0167	0.0029	0.432	0.020	0.0044	0.0013	.....	0.0174	.....	83.24	42 x 17	CC	
CRM	33X RB2 A	3.19	3.85	9.14	0.493	0.255	0.0352	0.0116	0.0211	0.0028	0.101	0.019	0.0208	0.078	0.0017		0.0029		82.67	42 x 17	CC	

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Revised - 10/11/2011

Page 47

MBH Copper, Brass, & Bronze Alloys

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3.4 Nickel Silver		Sn	Pb	Zn	Fe	Ni	Al	Si	Mn	P	S	Co	Cr	Ag	Mg	C	Cu					Size (mm) Ø x H	Form				
CRM	34X NS1 F	0.0110	0.0141	33.41	0.064	7.81	(0.003)	(0.002)	0.0009	0.0140	(0.0004)	0.052	0.0003	0.069	0.0020	(0.0018)	58.63					42 x 18	CC				
CRM	34X NS2 F	0.019	0.063	25.31	0.085	13.39	.....	(0.003)	0.0013	0.0091	(0.020)	0.0118	(0.001)	0.0026	<0.0005	.....	61.09					42 x 17	CC				
CRM	34X NS3 F	0.056	0.178	19.96	0.285	14.96	<0.001	(0.002)	0.0377	0.0295	0.0028	0.0922	.....	0.100	<0.001	.....	64.16					40 x 15	CC				
CRM	34X NS4 F	0.0301	0.071	17.09	0.449	16.61	0.0454	0.102	0.304	0.0570	0.0110	0.152	.....	0.0324	0.0009	.....	64.97					40 x 15	CC				
CRM	34X NS5 F	0.194	1.29	(23.1)	0.717	17.16	0.674	0.158	0.127	0.067	.....	0.197	0.0014	0.0102	0.704	.....	55.11					42 x 17	CC				
3.6.1 Cupro Nickel		Sn	Pb	Zn	Fe	Ni	Al	Si	Mn	Bi	P	S	Co	Cr	Mg	B	C	Ti	Nb	Zr	Be	Cu	Size (mm) Ø x H	Form			
CRM	36X CN1 N	0.0578	0.160	0.412	2.15	10.11	0.006	0.089	1.80	.....	0.0436	0.0070	0.154	0.0258	.....	0.0013	(0.003)	.....	.....	.....	.....	84.90	40 x 17	CC			
CRM	36X CN2 J	0.061	0.048	0.0358	1.70	15.47	0.005	0.044	1.26	0.0045	0.015	0.035	0.264	0.240	0.0006	.....	0.004	0.0102	(0.032)	.....	.....	80.78	40 x 17	CC			
CRM	36X CN3 L	0.063	0.053	0.80	1.07	19.95	0.0055	0.490	0.920	.....	0.032	0.029	0.072	0.050	0.012	0.0064	0.035	.....	0.15	.....	0.0163	76.3	40 x 15	CC			
CRM	36X CN4 K	0.009	(0.023)	0.041	2.67	27.49	0.0013	0.025	0.164	0.0077	0.0079	0.0076	0.052	0.022	(0.0004)	.....	0.0053	(0.004)	0.0139	.....	.....	69.48	40 x 17	CC			
CRM	36X CN5 N	0.015	0.027	0.232	0.791	32.26	0.006	0.80	0.090	.....	0.041	0.074	0.018	0.118	0.014	0.0091	0.0253	.....	0.441	.....	0.011	65.1	40 x 15	CC			
CRM	36X CN6 G	0.0307	0.0066	0.026	0.878	33.46	(0.0023)	0.144	0.451	0.0058	0.031	0.0109	0.0440	1.10	.....	(0.0016)	0.0180	0.0066	0.51	.....	.....	63.34	40 x 15	CC			
CRM	36X CN7 F	0.039	0.028	0.203	1.021	29.95	.....	0.304	0.659	(0.014)	(0.021)	0.0151	0.108	1.51	0.0041	(0.004)	0.0106	(0.037)	0.58	(0.003)	.....	65.58	40 x 17	CC			
CRM	36X CN8 H	0.046	0.095	0.159	0.86	30.61	0.0009	0.132	0.881	0.103	0.046	0.022	0.104	1.28	0.021	0.0025	0.0225	.....	0.18	.....	.....	65.51	40 x 15	CC			
CRM	36X CN9 H	(0.015)	0.0497	.....	1.62	27.86	0.030	0.625	1.22	0.020	0.028	0.0098	0.329	2.21	.....	0.0204	0.0099	0.252	1.22	(0.011)	.....	64.48	40 x 15	CC			
CRM	36X CN10 A	(0.009)	0.004	0.026	4.28	29.3	1.23	1.02	0.262	0.014	(0.020)	0.055	0.081	1.59	0.0026	0.0029	0.064	0.03	(0.055)	.....	.....	61.01	40 x 15	CC			
CRM	36X CN11 A	(0.002)	(0.003)	(0.006)	0.992	14.96	1.457	0.083	4.34	.....	(0.002)	0.0012	0.0049	0.380	0.0241	.....	(0.001)	.....	0.124	.....	.....	77.56	40 x 17	W			
																As	Ag	Cd	C								
CRM	36X CN21 A	0.038	0.051	0.0203	0.0316	5.50	1.95	.....	0.0391	.....	0.053	.....	0.0079	0.0050	0.0067	0.0064	0.0021	.....	.....	.....	.....	92.17	40 x 17	CC			
CRM	36X CN22 A	0.0371	0.0260	0.0175	0.088	1.806	6.09	.....	(0.016)	.....	0.0178	.....	0.0231	0.0144	0.0208	0.0196	0.0083	.....	.....	.....	.....	91.80	40 x 17	CC			
CRM	36X CN23 A	0.102	0.115	14.88	0.140	14.38	0.007	.....	0.0095	.....	0.0299	.....	0.0509	0.0021	0.047	0.042	0.0021	.....	.....	.....	.....	70.22	40 x 17	CC			
CRM	36X CN24 A	(0.002)	0.0056	8.00	0.127	15.41	(0.001)	.....	23.60	.....	0.0037	.....	0.0096	0.0065	(0.001)	0.0466	.....	0.0436	.....	.....	.....	52.56	38 x 13 x 13	C			
3.6.1a Cu/Ni/Sn (Spinodal Alloy)		Sn	Ni	Cu	Zn	Fe	Al	Si	Mn	Bi	Sb	P	S	Ag	Pb	Mg	Co	B	Ti	Nb	Size (mm) Ø x H		Form				
CRM	36X SP1 A	5.75	8.33	84.90	0.344	0.45	0.0020	0.004	0.084	0.0039	0.0177	(0.003)	0.005	0.005	0.0115	.....	0.057	0.0007	(0.0004)	(0.031)	40 x 15		CC				
CRM	36X SP2 A	8.92	15.72	74.91	0.029	(0.09)	0.0003	(0.0023)	0.0019	(0.0027)	0.006	(0.0006)	0.0030	0.0181	0.026	0.0002	0.119	0.0005	(0.0008)	.....	40 x 15		CC				
3.6.4 Cu/Be/Co		Sn	Pb	Zn	Fe	Ni	Al	Si	Mn	Co	Cr	Ag	Mg	Be	Cu					Size (mm) Ø x H	Form						
CRM	36X CBC2 E	0.009	0.0099	0.0103	0.0208	0.0472	0.0231	0.0205	0.0015	2.47	0.0044	0.0020	.....	0.450	96.96					40 x 17	W						
CRM	36X CBC3 D	0.0021	0.0025	0.004	0.046	0.007	0.019	0.039	.....	0.209	.....	.....	0.0040	1.840	97.77					40 x 15	W						
CRM	36X CBC4 D	0.003	0.318	0.005	0.026	0.004	0.018	0.041	.....	0.207	.....	.....	0.0070	1.865	97.46					40 x 15	W						
CRM	36X CBC5 A	0.01	0.009	0.038	0.028	1.69	0.021	0.036	(0.001)	0.14	0.006			0.32	97.6					40 x 15	W						

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Revised - 10/11/2011
 Page 48

MBH Copper, Brass, & Bronze Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

3.6.5 Cu/Cr		Sn	Pb	Zn	Fe	Ni	Al	Si	Mn	S	Co	Cr	Ag	Mg	Cd	Zr	Cu	Size (mm) Ø x H	Form							
CRM	36X CCR1 D	0.0049	0.0017	0.008	0.0378	0.0035	(0.001)	0.015	0.0010	0.0018	.....	0.948	0.0016	0.0015	.....	0.067	98.95	50 x 17	W							
CRM	36X CCZ A	0.0045	0.0023	0.0076	0.033	0.0084	0.0003	0.0031	0.0008	0.0010	0.0012	0.667	0.0019	.....	0.0027	0.049	99.22	50 x 17	W							
CRM	36X 274 A	0.0140	0.0021	0.0395	0.0779	2.54	0.0013	0.594	0.0148	0.0035	0.0028	0.531	.....	.....	.....	<0.005	96.23	46 x 17	W							
3.6.7 Cu/Cd		Sn	Zn		Ag		Cd												Size (mm) Ø x H	Form						
CRM	36X CCD1 A	<0.001	(0.0017)		(0.0014)		1.01												30 x 15	W						
CRM	36X CCD3 A	0.473	(0.0018)		(0.0011)		1.10												30 x 15	W						
3.7.1 Various Copper Alloys		Sn	Pb	Zn	Fe	Ni	Al	Si	Mn	P	S	Cr	Co	C	Zr	Cu	Size (mm) Ø x H	Form								
CRM	37X 218 A	0.015	0.0025	0.027	0.074	2.52	0.0022	0.58	0.083	0.0014	0.007	0.032	0.0013	0.0022	.....	96.57	38 x 17	W								
CRM	37X 226 A	0.0030	(0.001)	2.82	1.51	0.0024	0.0020	3.55	0.577	0.0022	0.0005	0.0023	.....	0.006	(0.0002)	91.58	57 x 17	W								
	37X HK7 A #	2.30	5.32	0.38	1.72	30.7	.....	.....	.....	.....	.....	.....	.....	.....	.....	59.3	# These alloys are for XRF use only	40 x 10	CC							
	37X HK8 A #	10.4	21.0	0.17	0.23	5.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	63.2		40 x 10	CC							
3.8 Residuals in Pure Copper - Wire		Sn	Pb	Zn	Fe	Ni	Ag	As	Mn	Bi	Sb	All Elements ppm				P	Cd	Te	Se	S	O	Size (mm) Ø x H	Form			
												Co	Cr	Si												
	38X C1 A	0.7	0.4	1.5	2	0.8	7.8	<1.0	<1.0	0.2	<1.0	<1.0	<1.0	.....	.....	<0.1	0.4	0.7	.....	.....	.....	3mm x 400mm (5 x 80mm pcs.)	Wire			
	38X C1 B	<0.3	0.8	0.45	1.2	1.0	13	0.8	1.2	0.1	0.6	0.03	0.06	.....	.....	<0.01	0.3	.....	.....	.....	.....		Wire			
CRM	38X C1 C	(0.01)	(0.05)	<0.1	1.7	0.27	11	0.19	(0.005)	0.10	0.10	.....	<0.005	<0.1	<0.05	<0.01	(0.21)	(0.25)	2.0	266	.....		Wire			
	38X C4	21	23	22	19	29	21	19	2.7	5	9	3	3	.....	.....	8	8	.....	.....	.....	.....	Each	Wire			
	38X C6	120	111	40	107	166	104	98	0.3	22	45	33	1	.....	.....	32	30	.....	.....	.....	.....		Wire			
3.9 Residuals in Pure Copper		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	All Elements ppm				Co	Cr	Cd	Ag	Au	Se	Te	In	Ge	Size (mm) Ø x H	Form
CRM	39X 17866 AF	122	73	30	4	471	.....	.....	381	.....	61	54	.....	26	49	.....	62	69	19	34	26	170	.....	40 x 15	CC	
CRM	39X 17867 AB	53	58	(10)	9	339	(3)	10	417	3	122	145	(12)	41	3	(2)	173	117	120	87	104	29	.....	40 x 17	CC	
CRM	39X 17868 AF	(37)	460	(24)	15	211	2	.....	196	23	202	200	(20)	56	2	.....	23	323	129	120	240	9	.....	40 x 17	CC	
CRM	39X 17869 AE	57	120	(13)	5	100	.....	.....	100	.....	234	370	.....	51	8	.....	19	423	89	177	105	35	.....	40 x 15	CC	
CRM	39X 17870 AF	44	296	48	(9)	65	(4)	.....	84	1.3	334	337	14	44	25	(2)	36	456	484	208	52	31	.....	40 x 17	CC	
CRM	39X 17871 B	119	131	280	80	329	.....	.....	288	7	690	147	(5)	72	40	(5)	37	222	51	360	101	.....	.....	42 x 17	CC	
CRM	39X 27866 A	448	54	287	30	487	.....	.....	383	.....	47	52	147	469	308	12	139	57	16	28	32	437	29	38 x 20	W	
CRM	39X 27869 A	106	225	65	30	190	.....	.....	98	.....	376	362	119	112	36	(2)	28	349	80	127	153	90	123	38 x 20	W	
		Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	All Elements %				Co	Cr	Cd	Mg	Ag	Au	Se	Te	In	Size (mm) Ø x H	Form
CRM	39X 17872 A	0.180	0.293	0.107	(0.045)	0.0537	0.0118	.....	0.0203	0.0055	0.0240	0.0217	0.0045	0.0242	0.0102	.....	0.0013	.....	0.0214	(0.002)	0.0103	0.0208	0.0241	42 x 15	C	
CRM	39X 17873 A	0.0274	0.065	0.0231	0.019	0.0173	0.015	0.030	0.0209	0.0182	0.0233	0.0229	0.078	0.0206	0.0233	0.0231	0.0052	0.011	0.0228		0.0114	0.0070	0.0212	40 x 15	C	

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Revised - 10/11/2011

Page 49

Titanium & Titanium Alloys

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IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pd	Cr S	Cu Si	Fe Sn	H Ta	Mn V	Mo W	N Y	Nb Zr
312A	Ti CP Grade 1	0.006	---	0.004	(0.001)	(0.002)	0.002	0.028	0.0049	(0.001)	(0.002)	0.0023	---
Final	R50250	0.002	0.066	---	(0.004)	(0.001)	0.006	0.0012	---	(0.002)	---	(0.0004)	(0.001)
174C	Ti CP Grade 4	(0.003)	---	0.0057	(0.001)	0.009	0.0015	0.28	0.0027	0.0019	0.002	0.004	(0.004)
Final	R50700	0.007	0.34	---	---	(0.0005)	(0.006)	0.023	---	0.002	---	(0.0004)	(0.003)
311A	Ti CP	0.32	---	0.009	---	0.013	0.0013	0.060	0.0021	0.0013	0.0012	0.012	(0.002)
Final	BT1-0	0.014	0.083	---	---	---	0.005	0.0020	---	0.004	(0.002)	(0.0002)	0.012
303A	Ti CP Grade 7	0.008	---	0.011	---	0.021	0.002	0.051	0.0011	0.002	0.001	0.0069	<0.0005
Final	R52400	0.022	0.134	---	0.139	---	0.004	<0.005	---	0.005	---	(0.0003)	(0.001)
280A	Ti 4-4-2-0.5	4.11	---	0.005	(0.002)	0.0055	0.003	0.044	0.0015	(0.002)	4.01	0.0014	(0.001)
Final	IMI 550	0.012	0.19	---	(0.002)	(0.001)	0.47	2.07	---	0.023	---	(0.0003)	0.002
271A	Ti 5-2.5	5.28	---	0.026	---	0.016	0.004	0.31	0.013	0.002	0.011	0.012	---
Final	R54520	0.035	0.16	(0.002)	---	(0.002)	0.021	2.49	---	0.09	---	---	0.015
314A	Ti 5-5-5-3	5.50	---	0.008	(0.003)	3.090	0.002	0.46	0.004	0.002	4.78	0.0034	---
Final	Ti555	0.022	0.155	(0.005)	---	---	0.02	(0.01)	---	4.98	---	(0.0003)	0.002
177C	Ti 6-2-4-2	6.02	(0.001)	0.005	(0.001)	0.012	0.003	0.033	0.0014	0.0015	1.96	0.0022	---
Final	R54620	0.0110	0.107	---	(0.004)	---	0.086	2.02	---	0.020	---	(0.0002)	3.99
269A	Ti 8-1-1	7.79	---	0.015	---	0.010	0.003	0.133	0.0059	(0.001)	1.02	0.0039	<0.005
Final	R54810	0.010	0.104	---	---	(0.002)	0.080	(0.01)	---	1.00	---	---	0.0010
285A	Ti 6-2-1-1	5.81	(0.002)	0.007	(0.002)	(0.001)	0.008	0.037	0.0038	(0.001)	0.77	0.006	2.00
Final	R56210	0.0043	0.076	---	---	(0.0004)	0.009	0.004	0.97	0.004	(0.01)	0.0024	0.002
336A	Ti 6-2-4-6	[5.9]	---	[0.005]	[(0.001)]	[(0.001)]	[0.003]	[0.11]	[0.0022]	[(0.01)]	[6.2]	[0.002]	---
Provisional	R56260	[0.002]	[0.102]	[(0.001)]	[(0.003)]	---	[0.018]	[2.03]	---	[0.004]	---	[(0.0003)]	[3.93]
337A	Ti 6-2-2-2-2	[5.6]	---	[0.007]	[(0.001)]	[2.01]	[0.002]	[0.12]	[0.005]	[(0.004)]	[2.05]	[0.002]	[(0.003)]
Provisional	Ti 6-22-22	[0.011]	[0.103]	---	[(0.001)]	---	[0.14]	[1.97]	---	[0.002]	---	[(0.0004)]	[1.91]
261A	Ti 3-2.5	3.00	---	0.007	---	0.013	0.002	0.19	0.0023	0.0011	0.003	0.007	---
Final	R56320	0.006	0.10	---	---	(0.001)	0.012	0.008	---	2.48	---	(0.001)	(0.002)
315A	Ti 4-2	4.58	---	0.011	(0.004)	0.016	0.005	0.065	0.0016	0.008	0.008	0.0052	---
Final	PT3V	0.012	0.099	(0.001)	(0.003)	---	0.014	0.004	---	1.84	---	0.0002	0.0044
175C	Ti 6-4	6.33	0.0006	0.014	(0.001)	0.054	0.005	0.34	0.0038	0.0074	0.011	0.0081	0.009
X-Ray Only	R56400	0.028	0.150	---	---	---	0.024	0.006	(0.002)	3.95	(0.002)	(0.0002)	0.0027
176B	Ti 6-4 ELI	5.86	---	0.010	---	0.013	0.003	0.111	0.0036	0.001	0.006	0.0051	---
X-Ray Only	R56402	0.012	0.109	---	---	---	0.017	0.009	---	3.87	---	---	(0.002)

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Revised - 10/11/2011

Page 50

Titanium & Titanium Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

IARM Status	Grade UNS#	Al Ni	B O	C P	Co Pd	Cr S	Cu Si	Fe Sn	H Ta	Mn V	Mo W	N Y	Nb Zr
176C <i>Provisional</i>	Ti 6-4 ELI R56407	[5.97] [0.011]	--- [0.111]	[0.012] ---	--- [(0.004)]	[0.011] ---	[0.003] [0.016]	[0.14] [0.007]	[0.0034] ---	[(0.001)] [4.00]	[0.005] ---	[0.005] [(0.0001)]	--- [0.003]
297A Final	Ti 10-2-3 R56410	3.12 0.0041	(0.003) 0.109	0.014 ---	--- ---	0.007 (0.001)	0.002 0.022	1.86 0.006	0.0045 (0.01)	0.007 9.710	0.004 ---	0.008 ---	(0.06) 0.002
178B Final	Ti 6-6-2 R56620	5.58 0.017	--- 0.157	0.030 ---	--- ---	0.015 (0.001)	0.51 0.025	0.56 2.00	0.0028 ---	0.003 5.56	0.008 ---	0.008 ---	--- 0.004
300A <i>Provisional</i>	Ti 6-7 R56700	[5.97] [0.008]	--- [0.16]	[0.006] ---	--- ---	[0.009] ---	[0.003] [0.019]	[0.19] [(0.01)]	[0.0019] ---	[(0.001)] [(0.01)]	[(0.001)] ---	[0.004] ---	[6.9] ---
262A X-Ray Only	Ti 7-4 R56740	7.1 0.006	0.001 0.094	0.012 (0.005)	--- ---	0.007 (0.002)	0.010 0.047	0.21 0.02	0.0072 ---	0.007 0.011	4.180 ---	0.008 (0.0004)	--- <0.005
286A X-Ray Only	Ti 3-8-6-4-4 R58640	3.25 0.010	--- 0.089	0.010 ---	(0.006) (0.02)	6.300 (0.001)	(0.004) 0.030	0.09 (0.003)	0.0039 ---	(0.002) 8.100	4.15 ---	0.013 0.0010	--- 4.080

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MBH Titanium Based Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

10.1		Al	Sn	V	Mo	Nb	Zr	Cr	Fe	Ni	Cu	Si	Y	C	S	N	O	H	Size (mm) Ø x H	Form	
CRM	101X Ti1 A	3.08	.....	.....	14.98	2.75	.....	.....	0.035	0.0099	0.05	0.201	0.0030	0.0417	(0.003)	0.005	0.169	0.0069	40 x 13	HIP	
CRM	101X Ti2 A	6.02	2.05	.....	2.08	.....	3.97	0.0054	0.053	0.0073	(0.003)	0.110	0.0002	0.016	.....	0.0053	0.143	0.0076	40 x 13	HIP	
CRM	101X Ti3 A	6.14	0.0215	4.00	0.0213	.....	0.0152	0.0194	0.104	0.0303	0.0047	0.013	0.0101	0.0619	.....	0.010	0.198	0.0034	40 x 13	HIP	
CRM	101X Ti4 A	3.95	0.072	0.044	0.301	0.070	0.0688	0.0688	0.125	0.779	0.0645	0.072	0.0079	0.115	.....	0.0195	0.199	0.0050	continued		
CRM	101X Ti5 A	5.33	2.09	0.0779	3.98	.....	2.09	3.00	0.162	0.047	0.277	0.092	0.0111	0.089	0.0114	0.015	0.172	0.0039			
CRM	101X Ti6 A	5.99	0.067	3.95	0.064	0.0639	0.0653	0.0636	0.221	0.0421	0.0632	0.054	0.0087	0.0340	0.0061	0.0137	0.171	0.0043			
Continuation from above		B	Co	Mn	P	Pd	Ru	Ta	W											Size (mm) Ø x H	Form
	101X Ti4 A	0.0093	0.066	0.0653	0.0076	0.145	0.054	0.096	0.072											40 x 13	HIP
	101X Ti5 A	0.0098		0.073	0.010				0.084											40 x 13	HIP
	101X Ti6 A	0.0080	0.0621	0.0623	0.0069	0.141	0.062	0.084	0.066											40 x 13	HIP

Note: these products are available in other thicknesses on request

MBH Magnesium Pure & Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

6.1 Residuals in Pure Magnesium		Al	Zn	Mn	Zr	Cu	Si	Fe	Ni	Ca	Sn	Pb	Ag	Be	Cd	Ce	La	Nd	Y	Size (mm) Ø x H	Form
CRM	61X MGP1 A **	0.014	(0.002)	0.0035	<0.0005	0.0008	0.005	0.027	(0.001)	<0.001	<0.002	<0.002	<0.0002	<0.0002	<0.0002	<0.001	<0.001	.....	.....	45 x 20	C
CRM	61X MGP2 A **	0.065	0.0122	0.0118	(0.0007)	0.0109	0.031	0.0061	0.0029	0.0138	0.0073	0.0061	0.003	<0.0001	0.0063	0.0019	0.0014	.....	++ unsuitable for use with	45 x 20	C
CRM	61X MGP3 A **	0.096	0.0196	0.0137	(0.0014)	0.0292	0.044	0.014	0.0048	0.054	0.0155	0.0148	0.0125	<0.0001	0.0154	0.0055	0.0038	.....	glow-discharge systems	45 x 20	C
CRM	61X MGP4 A **	0.0247	0.0158	0.0100	0.030	0.0108	0.037	(0.0044)	0.0028	0.028	0.0067	0.0066	0.0203	<0.0001	0.0071	0.0041	0.0030	.....	.....	45 x 20	C
CRM	61X MGP5 A	0.119	0.099	0.201	.....	0.092	0.094	0.0048	0.0176	.....	0.0352	0.0357	0.0342	0.0018	0.0292	0.049	0.0382	0.0446	0.0132	40x15 or 50x20	C
CRM	61X MGP6 A	0.0449	0.010	0.0125	.....	0.0067	0.044	0.0041	0.0025	(0.001)	0.0091	0.0120	0.0043	.....	0.0025	0.0209	0.0137	0.0238	0.0375	40x15 or 50x20	C
6.3 Mg/Mn		Al	Zn	Mn	Zr	Cu	Si	Fe	Ni	Ca	Sn	Pb	Ag	Ce	La	Be	Cd	Ti		Size (mm) Ø x H	Form
CRM	63X MGE1 D	0.056	0.0514	0.492	<0.001	0.0486	0.040	0.0045	0.0091	(0.014)	0.0033	0.0113	0.0197	0.0010	0.0006	0.00036	.....	0.00012	.....	40 x 18	C
CRM	63X MGE2 B	0.0432	0.0245	1.75	.....	0.0203	0.019	0.0020	0.0035	0.0015	0.0024	0.0020	0.0090	.....	.....	.....	0.0009	.....	.....	40x15 or 50x20	C
CRM	63X MGE3 B	0.015	0.022	2.36	<0.001	0.012	(0.009)	0.004	0.0023	0.13	0.0055	0.005	.....	.....	.....	.....	0.0009	<0.001	.....	40x15 or 45x20	C
6.4 Mg/Al		Al	Zn	Mn	Cu	Si	Fe	Ni	Sn	Pb	Be	Ce	La	Nd						Size (mm) Ø x H	Form
CRM	64X MGQ1 A	1.083	0.235	0.377	0.0840	0.062	0.0034	0.0041	0.0195	0.0199	0.00036	.....	.....	.....		AZ10A				40x15 or 50x20	C
CRM	64X MGQ2 A	4.53	0.107	0.378	0.0151	0.051	0.0041	0.0061	0.0107	0.0107	0.0013	.....	.....	.....		AM50A				40x15 or 50x20	C
CRM	64X MGQ3 A	8.66	0.0039	0.206	0.0349	0.083	0.0090	0.0032	0.0019	0.0022	0.0041	.....	.....	.....		AM90A				40x15 or 50x20	C
CRM	64X MGQ4 A	6.50	0.188	0.183	0.310	0.067	0.0040	0.0068	0.0282	0.0322	0.00029	.....	.....	.....		AM60A				40x15 or 50x20	C
CRM	64X MGQ5 A	5.76	0.0465	0.276	0.0072	0.052	0.0043	0.0010	0.0050	0.0056	0.0013	.....	.....	.....		AM60B				40x15 or 50x20	C
CRM	64X MGQ6 A	2.31	0.072	(0.26)	0.0045	(0.97)	(0.004)	0.0026	0.0055	0.0060	0.0007	.....	.....	.....		AS21A		Mn and Si segregation		40x15 or 50x20	C
CRM	64X MGQ7 A	4.02	0.061	(0.43)	0.0167	(1.05)	0.0028	0.0053	0.0096	0.0126	0.00042	.....	.....	.....		AS41A		Mn and Si segregation		40x15 or 50x20	C
CRM	64X MGQ8 A	1.030	0.0442	0.700	0.0019	0.045	0.0018	0.0004	0.0022	0.0008	0.00015	.....	.....	.....		AZ10-mod				40x15 or 50x20	C
CRM	64X MGQ9 A	2.14	0.243	0.0684	0.0104	(0.37)	0.0069	0.0020	0.0076	0.0096	0.0015	0.111	0.083	0.114		AS21B		Si segregation		40x15 or 50x20	C
6.5 Mg/Al/Zn		Al	Zn	Mn	Cu	Si	Fe	Ni	Sn	Pb	Be	Ca	Ag	Ce	La	Cd	Sr	Hg		Size (mm) Ø x H	Form
CRM	65X MGA1 J **	5.45	1.26	0.060	0.221	0.20	0.021	0.021	0.072	0.012	0.006	0.029	0.012	0.009	0.007	0.013	.....	.....	++ unsuitable for use with	45 x 20	C
CRM	65X MGA5 A	8.00	0.411	0.401	0.0195	0.110	0.006	0.0201	0.0124	0.042	0.0013	(0.014)	0.0050	.....	.....	0.0035	0.0004	.....	glow-discharge systems	40x15 or 50x20	C
CRM	65X MGA7 A	9.38	0.66	0.285	0.0010	0.006	0.0103	0.0009	<0.002	<0.002	.....	.....	<0.0005	.....	.....	.....	0.015	.....	.....	40 x 17	C
CRM	65X MGA11 A	3.63	1.59	0.044	0.0496	0.022	0.0048	0.0134	0.093	0.0190	0.0021	0.102	(0.0002)	(0.0005)	(0.0005)	0.0014	.....	0.006		40x15 or 50x20	C
CRM	65X MGA12 A	5.68	3.18	0.198	0.266	0.0142	0.0053	0.0148	0.0021	0.010	(0.0036)	0.037	0.0128	0.0009	0.0007	0.0121	.....	(0.016)		40x15 or 50x20	C
CRM	65X MGA13 A	7.45	0.925	0.092	0.125	0.022	(0.008)	0.0039	0.043	0.0085	(0.010)	0.0064	0.0074	0.0024	0.0021	0.0055	.....	(0.033)		40x15 or 50x20	C
CRM	65X MGA14 A	9.09	0.685	0.282	0.0102	0.080	0.008	0.0082	0.0085	0.006	0.0029	0.016	0.0016	0.0120	0.0111	0.0014	.....	(0.082)		40x15 or 50x20	C
CRM	65X MGA15 A	10.67	0.348	0.067	0.0273	0.034	0.010	0.0026	0.0021	0.0051	0.0062	(0.0014)	0.030	0.0069	0.0048	0.0034	.....	0.011		40x15 or 50x20	C
CRM	65X MGA16 A	6.78	4.03	0.271	0.099	0.023	0.0073	0.0057	0.028	0.050	0.0011	0.0024	0.0035	0.0017	0.0012	0.0066	.....	0.005		40x15 or 50x20	C
CRM	65X MGA17 A	4.20	0.128	0.203	0.0215	0.33	0.0069	0.0141	0.0050	0.0009	.....	0.021	0.0064	.....	.....	0.0049	.....	.....		40x15 or 50x20	C
CRM	65X MGA18 A	6.75	0.502	0.192	0.052	0.043	0.0081	0.0074	0.0114	0.0244	0.00051	.....	.....	.....	.....	.....	.....	.....	AZ61A	40x15 or 50x20	C
CRM	65X MGA19 A	8.97	2.17	0.322	0.0426	0.196	0.0085	0.0065	0.0489	0.0489	0.00025	.....	.....	.....	.....	.....	.....	.....	AZ92A	40x15 or 50x20	C
CRM	65X MGA20 A	5.87	1.32	0.067	0.0131	0.052	0.0078	0.0025	0.0320	0.0075	0.0018	.....	.....	.....	.....	.....	.....	.....	AZ61A	40x15 or 50x20	C
CRM	65X MGA21 A	12.37	5.11	0.0777	0.0020	0.028	0.0140	0.0010	0.0063	0.0048	0.0006	.....	.....	.....	.....	.....	.....	.....	AZ125A	40x15 or 50x20	C
CRM	65X MGA22 A	8.62	0.89	0.40	0.078	0.085	0.0060	0.0058	0.0033	0.0038	0.0006	.....	.....	.....	.....	.....	.....	.....	AZ91A	40x15 or 50x20	C
CRM	65X MGA23 A	9.75	0.555	0.130	0.0155	0.027	0.0085	0.0011	0.0024	0.0019	0.0024								AZ91D	40x15 or 50x20	C

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Revised - 10/11/2011
Page 53

MBH Magnesium Pure & Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

6.5 Mg/Al/Zn - continued		Al	Zn	Mn	Cu	Si	Fe	Ni	Ca	Sn	Pb	Ag	Ce	La	Be	Cd	Ti	Size (mm) Ø x H	Form
CRM	65X MGB1 C ⁺⁺	2.34	1.71	0.61	0.195	0.14	0.006	0.012	0.001	0.012	0.013	0.03	0.010	0.010	0.0006	0.07	.....	45 x 20	C
CRM	65X MGB2 C	2.67	0.95	0.333	0.113	0.069	0.010	0.0028	0.011	0.0047	0.0036	0.0099	0.0009	0.0007	0.0008	0.0115	0.0003	40 x 18	C
CRM	65X MGB3 B ⁺⁺	3.19	0.608	0.0122	0.0214	0.012	(0.005)	0.0020	0.030	0.0050	0.0037	(0.002)	.....	.....	0.0029	0.012	(0.003)	45 x 20	C
CRM	65X MGB4 C	3.86	0.333	0.031	0.0183	0.037	(0.009)	0.0003	0.0010	0.0050	0.0037	0.0046	0.0003	(0.0001)	0.0033	0.00016	(0.0008)	40 x 18	C

6.6	Mg/Zn	Al	Zn	Mn	Zr	Cu	Si	Fe	Ni	Ca	Sn	Pb	Ag	Ce	La	Nd	Be	Sr	Size (mm) Ø x H	Form	
CRM	66X MGC2 E	<0.003	4.82	0.0036	0.47	0.0037	(0.0013)	0.0000	0.0044		0.0007	0.0074	0.0048	0.0206	0.0164		<0.0004		temporarily out of stock	40 x 15	C
CRM	66X MGC3 B	0.011	4.97	0.020	0.13	0.009	(0.003)	(0.001)	0.006	.....	<0.002	0.003	0.001	.....	.....	.....	.....	.....	40 x 15	C	
CRM	66X MGC4 C	0.039	6.81	0.166	<0.001	0.0024	0.06	0.006	0.0009	.....	0.021	0.0030	0.0074	.....	.....	.....	(0.0001) (0.00014)	.....	40x15 or 50x20	C	
CRM	66X MGD1 B	0.147	1.19	0.125	.....	0.066	(0.073)	0.0029	0.0162	.....	0.026	0.026	.....	0.065	0.031	0.064	.....	.....	40x15 or 50x20	C	
	66X MGD2 A	0.30	1.13	0.74	<0.01	0.08	0.07	0.014	0.008	<0.005	0.011	0.012	.....	.....	.....	.....	.....	.....	40 x 15	C	
	66X MGD3 B ⁺⁺	0.041	1.97	0.28	0.029	0.058	0.020	0.023	0.002	(0.07)	0.007	0.009	0.005	0.004	0.004	.....	0.0003	.....	45 x 20	C	
CRM	66X MGD4 B	0.0012	2.77	0.0053	0.69	0.0041	<0.001	0.0010	.....	.....	(0.001)	(0.001)	(0.002)	0.015	0.014	.....	<0.0002	.....	40 x 15	C	
CRM	66X MGD5 A	0.040	6.25	0.307	.....	2.88	0.134	0.008	0.0120	(0.030)	0.104	0.097	0.044	.....	.....	.....	<0.0005	.....	40x15 or 50x20	C	

6.7 Mg/Rare Earth		Al	Zn	Mn	Zr	Cu	Si	Fe	Ni	Sn	Pb	Ag	La	Ce	Nd	Pr	Size (mm) Ø x H	Form
CRM	67X MGF1 B	0.0176	0.501	0.0039	0.022	0.0048	<0.005	0.0024	(0.0003)	<0.002	<0.001	<0.001	1.12	1.88	(0.05)	0.48	40 x 15	C
CRM	67X MGF2 B	0.0038	1.71	0.0047	0.30	0.0033	<0.002	(0.001)	0.0008	<0.002	0.019	<0.001	0.98	1.42	0.29	0.112	40 x 15	C
CRM	67X MGF3 B	<0.001	3.34	0.0040	0.53	0.0010	(0.001)	<0.002	.....	<0.002	0.0140	<0.001	0.84	1.17	0.212	0.106	40 x 15	C
CRM	67X MGF4 B	0.079	5.04	0.0023	0.024	0.0302	(0.0014)	<0.002	.....	<0.001	<0.001	<0.0005	0.47	0.81	0.048	0.195	40 x 15	C
CRM	67X MGF5 B	0.094	6.29	0.171	<0.001	0.0735	0.0026	0.0290	0.0004	<0.001	<0.0005	<0.0005	0.239	0.412	0.011	0.100	40 x 15	C

6.8 Mg/Ag/Rare Earth		Al	Zn	Mn	Zr	Cu	Si	Fe	Ni	Ca	Sn	Pb	La	Ag	Ce	Nd	Pr	Total R.E.	Size (mm) Ø x H	Form
CRM	68X MGH1 B	<0.002	0.053	0.0027	0.47	0.0046	<0.005	<0.002	(0.0006)	.....	<0.002	<0.002	0.034	3.21	0.040	3.05	(0.014)	.....	40 x 17	C
CRM	68X MGH2 B	<0.002	0.123	0.0038	0.46	0.0050	<0.002	(0.0006)	(0.0006)	.....	<0.005	(0.0021)	0.044	2.94	0.055	2.70	(0.013)	.....	40 x 17	C
	68X MGH6 A	0.23	0.21	0.17	<0.01	0.11	0.01(5)	0.03	0.01	.....	<0.002	<0.005	.....	1.13	.....	.....	.....	(1.0)	40 x 15	C

The rare-earths in the above product were added as Neodymium rich R.E, but breakdowns of the individual R.E. values are not available.

6.9 Mg/Y/Rare Earth		Al	Zn	Mn	Zr	Cu	Fe	Ni	Pb	Ce	La	Nd	Pr	Gd	Sm	Size (mm) Ø x H	Form
CRM	69X MGY4 A	(0.0023)	0.495	0.0104	0.29	0.0011	0.0012	0.0009	(0.001)	0.011	0.0078	2.36	0.0056	1.54	0.0083	60 x 6	CC

Samples marked ⁺⁺ may be unsuitable for use with glow discharge analysers.

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Revised - 10/11/2011
Page 54

MBH Tin Pure & Alloys

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7.1	Tin with Impurities																			Size (mm) Ø x H	Form	
	As	Bi	Sb	Pb	Cu	Fe	Cd	Zn	Ni	Al	Ag	S	In	Au	Te	Se	Ga	Hg				
CRM	71X PB3 A	0.0022	0.0103	0.0024	2.77	0.0074	.....	0.0008	0.0016	.....	.....	0.0011	.....	.....	.....	.....	.....	.....	.....	40 x 15	C	
CRM	71X PB4 A	0.0045	(0.002)	0.0059	4.00	0.0014	.....	0.0027	0.0063	.....	.....	0.0047	.....	.....	.....	.....	.....	.....	.....	40 x 15	C	
CRM	71X SR0 B	0.0008	(0.0025)	0.0034	0.0113	0.0013	0.0008	0.0015	0.0034	0.0004	0.0197	0.0018	.....	0.0047	0.0007	0.0009	0.0005	0.0027	0.0044	40 x 15	C	
CRM	71X SR1 E	0.0102	0.0107	0.0156	0.0324	0.0111	(0.0021)	0.0104	0.0146	0.0041	(0.0016)	0.0212	.....	0.0120	0.0014	0.0112	(0.0015)	0.0049	0.0142	40 x 15	C	
CRM	71X SR2 E	0.043	0.060	0.061	0.112	0.060	0.0160	0.0435	0.0072	0.0192	0.0010	0.0209	(0.0023)	0.055	0.0084	0.030	0.0097	0.0166	0.144	40 x 15	C	
CRM	71X SR3 F	0.097	0.123	0.128	0.306	0.121	0.0203	0.100	0.054	0.0371	(0.0014)	0.050	.....	0.104	0.0145	0.070	0.0031	0.0339	0.115	40 x 15	C	
7.2	Tin with Antimony																			Size (mm) Ø x H	Form	
	As	Bi	Sb	Pb	Cu	Fe	Cd	Zn														
		72X SA4R B	0.03	0.1	4.0	0.08	0.02	0.1	0.003	0.007											40 x 15	C
		72X SA5R B	0.02	0.005	5.0	0.025	0.005	0.003	0.02	0.001											40 x 15	C
		72X SA6R B	0.05	0.25	6.0	0.25	0.1	0.05	0.01	0.02											40 x 15	C
7.3	Tin White Metals (Pewter, Babbit)																Size (mm) Ø x H	Form				
	As	Bi	Sb	Pb	Cu	Fe	Cd	Zn	Ni	Al	Ag	Co	In	S	P							
	CRM	73X SC1 A	0.008	0.084	1.48	0.067	2.02	0.0025	0.006	0.003	0.0041	0.0025	0.010	<0.001	0.008	<0.002	.....	40 x 15	C			
	CRM	73X SC2 A	0.035	0.62	3.07	0.029	1.06	0.030	0.036	0.003	0.0048	(0.002)	0.006	0.021	(0.002)	<0.001	.....	40 x 15	C			
	CRM	73X SC3 A	0.029	0.020	4.60	0.040	0.222	0.017	0.024	0.0014	0.0136	0.001	0.013	0.006	0.031	(0.002)	.....	40 x 15	C			
	CRM	73X SC4 B	0.0268	0.153	5.94	0.429	2.63	0.0014	0.0085	(0.001)	0.0130	(0.002)	0.0525	0.0020	0.0143	.....	0.005	40 x 15	C			
	CRM	73X SC5 A	0.013	0.43	7.03	0.136	0.57	0.004	0.008	0.001	0.0058	0.003	0.063	0.011	0.036	(0.001)	.....	40 x 15	C			
	CRM	73X SC6 A	0.204	0.115	0.092	0.100	5.17	0.007	0.0125	0.01	0.013	(0.003)	0.08	0.0050	0.058	(0.004)	.....	40 x 15	C			
	CRM	73X SC7 A	0.047	0.009	14.01	0.366	6.51	0.046	0.0018	(0.003)	0.008	0.001	0.006	0.0160	0.014	<0.001	.....	40 x 15	C			
	CRM	73X SC8 A	0.121	0.037	9.65	0.037	3.89	0.073	0.133	(0.008)	0.014	0.004	(0.0015)	0.017	0.017	(0.011)	.....	40 x 15	C			
	CRM	73X SC9 A	0.53	0.066	8.18	0.20	8.47	0.037	0.078	(0.003)	0.008	<0.001	0.004	0.0030	0.010	(0.008)	.....	40 x 15	C			
	CRM	73X SC11 B	0.292	0.560	12.01	0.061	11.18	0.011	1.75	0.063	0.452	0.0025	0.066	.....	.....	.....	0.019	40 x 15	C			
	CRM	73X SC12 B **	0.032	0.030	7.55	0.085	6.1	0.025	0.76	0.022	0.12	0.001	0.83	0.022	.....	.....	.....	** provisional values	40 x 15	C		
	7.4	Tin Lead-Free Solders																		Size (mm) Ø x H	Form	
		As	Bi	Sb	Pb	Cu	Fe	Cd	Zn	Ni	Al	Ag	P	Se	Au	Co	Ge	In				
CRM		74X AM E	0.045	0.175	1.06	0.119	2.97	(0.016)	0.0072	(0.002)	0.0203	(0.008)	0.562	0.018	0.0115	.....	.....	.....	.....	40 x 15	C	
CRM		74X E F	0.0092	0.0099	0.0168	0.0248	2.94	0.0008	0.0003	(0.005)	0.0069	(0.001)	0.667	(0.001)	0.0008	.....	.....	.....	0.0074	40 x 15	C	
CRM		74X HA G	0.0032	0.0639	2.10	0.077	0.629	0.0029	0.0018	2.73	0.0133	(0.002)	2.80	(0.001)	(0.001)	.....	.....	.....	0.0090	40 x 15	C	
CRM		74X HB F	0.028	(0.007)	5.40	0.036	4.56	0.014	0.0095	0.0117	1.27	0.0013	0.070	(0.002)	<0.001	.....	.....	.....	.....	40 x 15	C	
CRM		74X HN E	0.010	0.122	0.037	0.0404	3.82	0.010	0.0057	(0.0009)	0.185	0.005	0.143	(0.002)	0.0016	.....	.....	.....	.....	40 x 15	C	
CRM		74X TC F	0.024	0.106	0.124	0.183	4.99	0.0031	0.0150	0.004	0.0167	(0.001)	0.039	(0.002)	0.0473	.....	.....	.....	0.0215	40 x 15	C	
CRM		74X BZ1 A	0.0119	3.03	0.031	0.0238	0.026	0.011	0.0012	8.27	0.0097	0.0021	0.004	.....	.....	.....	.....	.....	.....	40 x 15	C	
CRM	74X AB1 **	0.030	1.02	0.10	0.035	0.029	0.045	0.020	.....	0.004	.....	3.58	.....	.....	0.0009	0.003	.....	0.028	** provisional values	40 x 15	C	
CRM	74X GE1 A				0.0339	0.662		0.0059		0.0289	0.065	0.052					0.046		38 x 13	C		
CRM	74X GE2 A				0.0467	0.713		0.0086		0.031	0.068	0.079					0.479		38 x 13	C		

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Revised - 10/11/2011

Page 55

MBH Tin Pure & Alloys

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7.4	Tin Lead-Free Solders	As	Bi	Sb	Pb	Cu	Fe	Cd	Zn	Ni	Al	Ag	S	P	In	Au	Se	Co	Hg	Ge	Size (mm) Ø x H	Form
CRM	74X OA A	0.080	1.065	0.0098	0.128	3.41	0.007	0.00063	(0.002)	0.0025	(0.001)	0.100	....	0.0072	0.0034	(0.0001)	....	....	....	....	40 x 15	C
CRM	74X WS A	0.0105	0.0063	1.49	0.037	4.58	(0.004)	0.00140	0.0009	0.0048	(0.001)	0.298	....	0.0122	0.0032	(0.0002)	....	....	....	....	40 x 15	C
CRM	74X CA1 B	....	0.0131	0.0169	0.077	0.682	....	0.0071	....	....	0.0262	0.440	....	....	....	0.0053	....	....	....	....	40 x 15	C
CRM	74X CA2 A	0.0100	0.0329	0.0737	0.0331	0.782	0.0021	0.0010	0.0003	0.0308	0.0002	3.50	(0.005)	0.0055	0.0062	0.0014	0.0015	....	0.0007	....	40 x 15	C
CRM	74X CA3 B	0.0039	0.0156	0.0266	0.0491	0.0869	0.006	0.00045	0.0009	0.0077	0.0010	2.98	....	0.031	0.0042	0.007	....	....	....	0.0093	40 x 15	C
CRM	74X CA4 B	0.0094	0.061	0.039	0.080	0.502	0.0043	0.00075	(0.001)	0.0542	(0.002)	3.02	....	(0.001)	0.0041	....	0.0027	0.0085	....	....	40 x 15	C
CRM	74X CA5 A	0.0353	0.0207	0.133	0.0116	1.098	0.0019	0.0025	0.0009	0.0147	(0.0003)	4.01	0.0006	0.0108	0.0111	0.0049	0.003	....	0.0006	....	40 x 15	C
CRM	74X CA6 A	0.0086	0.008	0.0078	0.0176	0.629	0.0061	0.00033	0.0006	0.0194	0.0006	0.282	(0.0008)	0.0046	0.0218	0.0106	0.0007	....	0.0064	....	40 x 15	C
CRM	74X CA7 A	0.0095	0.0081	0.0103	0.0965	0.333	0.0047	0.0045	....	0.0007	....	4.21	....	0.003	0.0026	....	....	....	0.053	....	40 x 15	C
CRM	74X CA8 A	0.0100	0.0032	0.0045	0.0403	0.947	0.0037	0.0103	....	0.0007	....	2.44	....	0.0077	0.0041	....	....	....	0.101	....	40 x 15	C
CRM	74X CA9 A	0.0173	0.0364	0.076	0.038	0.097	0.0085	0.0015	0.0010	0.0039	0.0007	1.002		0.011	0.0165	0.0025				0.0049	40 x 15	C

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Revised - 10/11/2011

Page 56

Cookson Electronics Pig Tin Standards

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		Sn Cu	Al In	Sb Fe	As Pb	Bi Ni	Cd Ag	Co Zn
NF-54	Standard #1	Balance	0.0003*	0.0065	0.0105	0.0026	0.0003	0.002*
		0.0107	0.0053	0.003**	0.023	0.0018	0.006	0.0002*
	Standard #2	Balance	0.008*	0.011	0.082**	0.0046	0.0006	0.002
		0.047	0.013	0.014**	0.148	0.0033	0.010	0.0001*
	Standard #3	Balance	0.018*	0.020	0.13	0.010	0.0009	0.008
		0.15	0.02	0.018*	0.41	0.012	0.032	0.001*
	Standard #4	Balance	--	0.045	0.27	0.022	0.005	0.02
		0.29	0.043	0.023*	0.72	0.024	0.063	0.0003*
	Standard #5	Balance	--	0.095	0.47	0.038	0.01	--
		0.52	0.098	--	1.0	--	0.10	0.016*
	Standard #6	Balance	--	0.0024	0.0007	0.0006	--	--
		0.0011	0.0005	--	0.006	--	0.0010	0.0003

* Severe Segregation Noted

** Slight Segregation Noted

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Revised - 10/11/2011

Page 57

MBH Lead Pure & Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

8.1	Pb/Sb & Pb/As Binaries																			Size (mm)	Form
		Sb	As																	Ø x H	
CRM	81X PA0.5 C	0.481	.....																	40 x 15	C
CRM	81X PA1.0 C	0.989	.....																	40 x 15	C
CRM	81X PA2.0 D	1.996	.....																	40 x 15	C
CRM	81X PA3.5 E **	3.5	.....	** provisional value																40 x 15	C
CRM	81X PA7.0 D	7.02	.....																	40 x 15	C
CRM	81X PA10.0 C	9.60	.....																	40 x 15	C
CRM	81X PA12.5 D	12.72	.....																	40 x 15	C
	81X PAs1 A	.....	1.25																	40 x 15	C
8.2	Pb/Ag																			Size (mm)	Form
		Sn	Sb	Bi	Cu	As	Ag	Zn	Cd	Fe	In	Al								Ø x H	
CRM	82X PAg 1.5R E	0.036	0.386	0.065	0.27	0.005	1.55	(0.004)	.....	.....	.....	.....								40 x 15	C
CRM	82X PAg 2.5R D	0.082	0.246	0.13	0.26	0.009	2.21	(0.0024)	.....	.....	.....	.....								40 x 15	C
CRM	82X PAg 3.5R D	0.25	0.106	0.290	0.073	0.020	3.54	(0.0004)	0.0027	<0.001	0.037	0.0015								40 x 15	C
CRM	82X PAg 6.0R A	0.50	0.48	0.52	0.18	0.021	5.93	0.007	0.010	<0.001	0.008	<0.001								40 x 15	C
	82X PAG0.7 A	.....	.....	.....	.....	.....	0.733	.....	.....	.....	.....	.....								40 x 15	C
	82X PAG0.9 A	.....	.....	.....	.....	.....	0.903	.....	.....	.....	.....	.....								40 x 15	C
8.3	Lead with Impurities																			Size (mm)	Form
		Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Te	Se	Au	Tl	Na	Hg	Pt		
CRM	83X PR1 J	0.0059	0.0048	0.0551	0.0039	0.0287	0.123	(0.0007)	0.006	0.0932	0.0356	0.0004	0.0016	(0.001)	.....	.....	.....	.....	(0.0016)		
CRM	83X PR2 F	0.104	0.050	0.0310	0.0346	0.0235	0.0537	.....	(0.0008)	0.0021	0.0012	0.0026	0.0114	(0.002)	0.0008	0.0012	0.0021	0.0041	.....		
CRM	83X PR3 F	0.050	0.095	0.162	0.0551	0.0017	0.0033	.....	(0.0011)	0.0479	0.0069	0.0142	0.0021	0.0104	0.0041	0.0125	0.0026	0.0103	.....		
CRM	83X PR4 G	0.0112	0.0164	0.0187	0.0138	0.0054	0.0146	.....	.....	0.0083	0.0030	(0.0009)	0.0198	0.0053	(0.0023)	0.0033	.....	0.044	.....		
CRM	83X PR5 D	0.0011	0.0002	0.0080	0.0006	0.0002	0.0004	.....	0.0001	0.0002	0.0001	0.0001	0.0002	0.0001	.....	.....	.....	0.0002	.....		
CRM	83X PR7 B	0.189	0.795	0.479	0.176	0.051	0.290	(0.0008)	(0.0006)	0.455	0.653	(0.0015)	0.0097	0.0052	.....	.....	.....	.....	0.0047		
CRM	83X PR8 C	0.603	0.259	1.186	0.066	0.155	0.505	.....	.....	0.211	0.224	0.0020	0.0011	0.0064	0.0082	.....	0.0073	0.089	.....		
8.4	Battery Alloys (Pb/Sn/Ca)																			Size (mm)	Form
		Sn	Sb	Bi	Cu	As	Ag	Zn	Cd	Ni	Al	Te	Ca	Hg						Ø x H	
CRM	84X BA1 H	0.899	(0.002)	0.0174	0.0009	0.0007	0.0082	0.0048	0.0019	(0.0004)	0.0240	(0.0005)	0.0960	.....						40 x 15	C
CRM	84X BA2 C	0.490	0.0010	0.0319	0.0033	0.0008	0.0107	0.0129	0.0040	0.00025	0.0127	.....	0.0754	(0.003)						40 x 15	C
CRM	84X BA3 C	0.341	0.010	0.0411	0.006	(0.0006)	0.0082	(0.0055)	0.0044	(0.0004)	0.0026	0.0004	0.0163	.....						40 x 15	C
CRM	84X BA4 C	0.0480	0.0078	0.0260	0.0064	(0.003)	0.0020	0.0065	0.0092	(0.0004)	0.0015	0.0205	0.0014	.....						40 x 15	C
CRM	84X BA8 B	0.346	0.0009	0.0198	0.0009	0.0006	0.0064	0.0028	0.00096	0.00015	0.0298	.....	0.141	(0.002)						40 x 15	C
CRM	84X BA9 B	2.92	0.0022	0.0186	0.0026	<0.0005	0.0017	0.0020	0.0010	(0.0003)	0.0154	<0.0005	0.109	.....						40 x 15	C
CRM	84X BA10 A	1.51	0.0008	0.0190	0.0005	0.0005	0.0015	0.0003	0.0002	(0.0002)	0.0100	(0.0002)	0.0596	.....						40 x 15	C
CRM	84X BA11 A	1.304	0.0079	0.0165	0.0026	0.0005	0.0023	0.0005	0.0006	.....	0.0125	.....	0.0552	.....						40 x 15	C
CRM	84X BA12 A	1.527	0.0008	0.0173	0.0020	0.0005	0.0050	0.0023	0.0010	.....	0.0172	.....	0.0646	.....						40 x 15	C
CRM	84X BA13 A	1.716	0.0010	0.0370	0.0007	0.0008	0.0075	0.0047	0.0014		0.0198		0.0738							40 x 15	C

More battery alloys are on the next page

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Revised - 10/11/2011
 Page 58

MBH Lead Pure & Alloys

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8.4	Battery Alloys (continued)																		Size (mm) Ø x H	Form
	Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	Ni	Al	Te	Se	Ca	Mn	Mg	S			
CRM	84X BA20 A	0.299	0.0030	0.0194	.....	.....	0.0290	.....	0.0438	0.0057	.....	0.0483	.....	.....	0.334	.....	.....	.....	40 x 15	C
CRM	84X BA21 A	0.161	0.0091	0.0224	.....	.....	0.0122	.....	0.0136	0.0057	.....	0.0067	.....	.....	0.608	.....	.....	.....	40 x 15	C
CRM	84X BA22 A	0.108	0.00114	0.0162	.....	.....	0.0059	.....	0.0053	0.00139	.....	0.033	.....	.....	0.911	.....	.....	.....	40 x 15	C
CRM	84X BA23 A	0.170	0.0020	0.0163	.....	.....	0.0039	.....	0.00218	0.00014	.....	0.0229	.....	.....	1.21	.....	.....	.....	40 x 15	C
CRM	84X BAH C E	<0.0005 (0.0001)		0.0130	0.0005	(0.00015)	0.0005	<0.0001	(0.00017)	<0.0001	<0.0001	0.0304	(0.0001)	<0.0001	0.139	<0.0001	(0.0001)	<0.0001	55 x 12	C
8.5	Various Lead Alloys																		Size (mm) Ø x H	Form
	Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Te	Se	Au	Tl	S	Hg			
CRM	85X PSn2 B	1.97	0.0269	0.0508	0.0344	0.0047	0.0033	.....	0.0005	0.0012	.....	0.0010	0.0041	0.0011	.....	.....	(0.0008)	.....	40 x 15	C
CRM	85X PSb3 F	0.151	2.32	0.0234	0.0406	0.240	0.0057	.....	(0.0006)	0.0045	.....	0.0031	0.0049	0.0187	.....	.....	(0.0036)	.....	40 x 15	C
CRM	85X PSb5 B	0.94	4.87	0.0195	0.0346	0.197	0.0257	.....	(0.0017)	0.0011	.....	0.0011	0.0018	0.0020	.....	.....	(0.0040)	.....	40 x 15	C
CRM	85X PSb5 C	0.040	4.46	0.0219	0.0238	0.135	0.0026	.....	(0.0006)	0.0009	.....	0.0013	0.0015	0.0020	.....	.....	0.030	.....	40 x 15	C
CRM	85X PSb5 D	0.094	4.68	0.0204	0.0251	0.180	0.0023	.....	(0.0020)	0.0013	.....	0.0017	0.0018	0.0024	.....	.....	0.0075	.....	40 x 15	C
CRM	85X PSb8 B	0.041	8.04	0.0178	0.0169	0.0352	0.0049	.....	<0.001	0.0010	.....	0.0016	0.0043	0.0022	.....	.....	0.005	.....	40 x 15	C
CRM	85X PSb10 B	0.090	10.00	0.0410	0.169	0.127	0.0020	.....	0.015	0.0018	.....	0.0027	0.0037	0.0020	.....	.....	<0.001	.....	40 x 15	C
CRM	85X PSb12 B	0.270	11.50	0.0310	0.330	0.071	0.0019	.....	0.071	0.00053	.....	0.0033	0.0056	0.0004	.....	.....	<0.001	.....	40 x 15	C
CRM	85X ANTH E	1.45	6.05	0.0194	0.0291	0.217	0.0071	(0.010)	(0.0007)	0.0046	.....	0.0062	0.0071	0.0149	.....	.....	(0.0036)	.....	40 x 15	C
CRM	85X CADH B	0.096	1.85	0.0292	0.0260	0.201	0.0076	0.0005	0.044	2.09	.....	0.0045	0.0121	0.0010	.....	.....	<0.0005	.....	40 x 15	C
CRM	85X CADL A	0.010	1.54	0.0169	0.0093	0.0065	0.0076	(0.0006)	(0.002)	1.69	.....	(0.0005)	0.0030	(0.001)	.....	.....	.....	.....	40 x 15	C
CRM	85X HRH H	0.851	1.107	0.0996	0.072	0.721	0.236	.....	.....	0.0066	.....	0.0012	0.0024	0.0375	.....	.....	(0.0022)	.....	40 x 15	C
CRM	85X SASH A	0.0130	1.54	0.0602	0.0245	0.683	0.0016	.....	.....	0.00024	.....	0.0005	0.0006	.....	.....	.....	(0.0005)	.....	40 x 15	C
CRM	85X SSBC A	9.70	2.14	0.413	.....	0.075	0.456	.....	.....	0.455	0.209	.....	0.0037	0.00290	0.0079	0.0196	(0.0008)	.....	40 x 15	C
CRM	85X SSCH A	2.64	5.52	0.0441	0.177	0.208	0.0134	(0.002)	0.0007	0.0040	.....	0.010	0.0070	(0.015)	.....	.....	0.0035	.....	40 x 15	C
CRM	85X 0494Pb1 A	0.051	0.95	0.0017	0.012	0.049	.....	.....	.....	.....	.....	.....	.....	0.004	.....	.....	.....	.....	40 x 15	C
CRM	85X 0494Pb2 B	0.147	1.93	0.0174	0.0361	0.111	0.0302	(0.0010)	.....	.....	.....	.....	0.0051	0.0302	.....	.....	(0.0053)	.....	40 x 15	C
CRM	85X 0494Pb3 B	0.344	3.10	0.0433	0.101	0.301	0.0142	(0.0007)	.....	.....	.....	.....	0.0151	0.077	.....	.....	(0.015)	.....	40 x 15	C
CRM	85X 0616Pb1 B	0.065	1.756	0.0395	0.0496	0.077	0.0048	.....	0.0005	0.0029	.....	0.0009	0.0048	0.0149	.....	.....	.....	(0.0003)	40 x 15	C
8.6	Lead Babbitts																		Size (mm) Ø x H	Form
	Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Al	Pd	Te						
CRM	86X PSS1 B	4.29	11.54	0.195	0.0249	0.554	0.0049	0.0018	0.0030	0.0057	0.0074	0.0100	.....	0.0023	.....	.....	.....	.....	40 x 15	C
CRM	86X PSS2 B	7.00	8.04	0.0646	0.127	1.43	0.0179	(0.001)	0.031	0.066	0.0059	0.0165	.....	0.0049	.....	.....	.....	.....	40 x 15	C
CRM	86X PSS3 A	9.01	14.02	0.031	0.608	0.10	0.006	(0.0016)	<0.001	0.020	0.004	0.0040	<0.001	(0.003)	.....	.....	.....	.....	40 x 15	C
CRM	86X PSS3 B	9.39	14.13	0.0273	0.489	0.409	0.0140	0.0025	0.0030	0.0170	0.0111	0.0009	.....	.....	0.0050	.....	.....	.....	40 x 15	C
CRM	86X PSS4 B	10.64	15.93	0.102	0.355	0.241	0.0264	0.0035	0.012	0.0539	0.0174	0.0010			0.0146				40 x 15	C

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Revised - 10/11/2011

Page 59

MBH Tin / Lead Solders

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9.1 Tin / Lead Solders		Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Al	Te	Au	Hg	Size (mm) Ø x H	Form
CRM	91X S10PR1 C**	9.1	0.03	0.03	0.01	0.006	0.005	0.001	0.001	0.003		0.001		** provisional values			40 x 15	C
	91X S10PR2 C	10.98	0.51	0.15	0.05	0.04	0.05	0.003	0.03	0.007	....	0.003	....				40 x 15	C
	91X S10PR3 B	11.97	0.26	0.23	0.12	0.02	0.03	0.002	0.003	0.011	....	(0.02)	....				40 x 15	C
CRM	91X S10P D	10.07	(0.002)	(0.006)	(0.001)	(0.001)	(0.001)	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.001	....	....	....	40 x 15	C
	91X S30PR1 B	29.3	0.047	0.057	0.19	0.006	0.007	(0.08)	0.0013	0.0024	....	0.0023	....	....	....	....	40 x 15	C
	91X S30PR2 C	30.17	0.619	0.158	0.095	0.028	0.060	0.009	0.016	0.0060	....	0.0077	<0.0005	....	0.0017	....	40 x 15	C
CRM	91X S30PR3 C	30.88	0.269	0.294	0.102	0.0126	0.024	0.0016	(0.003)	0.0115	0.0085	0.0269	....	....	0.0063	....	40 x 15	C
	91X S30P C	30.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	....	<0.001	....	....	....	....	40 x 15	C
	91X S40PR1 B	39.1	0.059	0.060	0.20	0.006	0.005	<0.005	0.008	0.001	....	0.002	....	....	....	....	40 x 15	C
CRM	91X S40PR2 D**	40.6	0.60	0.15	0.075	0.01	0.075	0.01	0.028	0.005	....	0.005	....	** provisional values			40 x 15	C
	91X S40PR3 B	41.8	0.25	0.25	0.094	0.018	0.022	0.01	0.002	0.010	....	0.016	....				40 x 15	C
	91X S40P D	40.00	(0.002)	(0.005)	(0.001)	(0.007)	(0.001)	(0.001)	<0.0001	<0.0001	(0.002)	<0.001	<0.0005	....	....	....	40 x 15	C
CRM	91X S50PR3 C	51.4	0.26	0.25	0.10	0.015	0.020	0.009	0.008	0.002	....	0.016	....	....	....	....	40 x 15	C
	91X S50PR4 A	54.6	0.098	0.097	1.58	0.044	0.045	(0.0034)	0.0105	0.0118	0.052	0.0114	<0.001	....	0.029	....	40 x 15	C
	91X S50P E	50.05	(0.002)	(0.005)	(0.002)	(0.006)	(0.001)	(0.001)	<0.0001	<0.0001	(0.003)	(0.001)	<0.0005	....	....	....	40 x 15	C
CRM	91X S62AG2 A	61.68	0.347	0.168	0.069	0.022	2.03	0.0065	0.0011	0.0016	....	(0.0016)	(0.0011)	....	0.0020	....	40 x 15	C
CRM	91X S63PR0 B	60.03	0.0182	0.0084	0.0202	0.0094	0.0097	(0.002)	<0.0005	0.0097	0.0048	0.0018	....	0.0034	0.0148	0.004	40 x 15	C
CRM	91X S63PR1 G	61.45	0.052	0.0588	0.214	0.0064	0.0061	(0.002)	(0.002)	0.0045	0.0308	0.0060	....	0.0047	0.0348	(0.015)	40 x 15	C
CRM	91X S63PR2 J	62.38	0.539	0.144	0.0733	0.0190	0.054	0.0129	0.004	0.0130	0.0154	0.0092	(0.0014)	0.0032	0.076	....	40 x 15	C
CRM	91X S63PR3 G	64.01	0.243	0.254	0.101	0.0264	0.0193	0.0078	0.0061	0.0009	0.0097	0.0085	....	0.0068	0.169	(0.038)	40 x 15	C
CRM	91X S63PR4 A	66.8	0.093	0.030	0.021	<0.002	0.030	<0.005	<0.001	0.021	0.014	<0.005	....	0.006	0.05	....	40 x 15	C
CRM	91X S63Bi1 A	61.9	0.470	0.597	0.105	<0.002	0.0592	0.0204	(0.002)	0.0095	0.0067	0.0131	(0.0015)	0.0012	0.074	....	40 x 15	C
CRM	91X S63P H	63.30	(0.003)	(0.006)	(0.003)	(0.007)	(0.001)	(0.002)	<0.0001	<0.0005	(0.004)	(0.001)	<0.0005	....	....	....	40 x 15	C

9.3 Tin / Lead / Antimony Solders		Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Te	Size (mm) Ø x H	Form
CRM	93X S30APR1 C	28.58	2.54	0.059	0.192	0.010	0.0144	(0.012)	(0.0004)	0.0014	0.0094	0.0010	0.0024	40 x 15	C
CRM	93X S30APR2 C	30.68	1.80	0.168	0.062	0.0178	0.049	0.0026	0.028	0.0061	0.0199	0.042	0.0102	40 x 15	C
CRM	93X S30APR3 C	33.0	0.96	0.28	0.008	0.018	0.021	0.0026	0.005	0.009	....	0.010	....	40 x 15	C
	93X S40APR1 A	38.5	2.70	0.06	0.23	0.011	0.007	(0.01)	0.002	0.002	....	0.003	....	40 x 15	C
	93X S40APR2 A	39.6	2.10	0.19	0.07	0.030	0.052	(0.02)	0.04	0.006	....	0.006	....	40 x 15	C
	93X S40APR3 A	41.4	1.70	0.26	0.12	0.024	0.021	(0.03)	0.022	0.011	....	0.014	....	40 x 15	C
	93X S50APR1 A	48.4	3.2	0.052	0.18	0.007	0.010	(0.01)	0.002	0.002	....	0.002	....	40 x 15	C
	93X S50APR2 A	49.6	2.8	0.15	0.049	0.027	0.055	0.01	0.042	0.006		0.014		40 x 15	C
	93X S50APR3 A	51.2	2.3	0.25	0.093	0.023	0.025	(0.02)	0.013	0.010		0.010		40 x 15	C

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 Page 60

MBH Zinc Pure & Alloys

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4.1	Residuals in Pure Zinc																	Size (mm) Ø x H	Form
	Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	Ti	Tl	In	Si	Hg			
CRM	41X Z1 P	0.0016	<0.0001	0.0001	0.0006	0.0024	0.0005	0.0010	0.0003	0.0002	0.0003	0.0002	....	0.0008	0.0002	....	0.0001	50 x 20	C
CRM	41X Z2 N	0.0026	0.0001	0.0008	0.0017	0.0077	0.0016	0.0018	0.0013	0.0005	0.0005	0.0006	....	0.0012	0.0006	....	0.0003	50 x 20	C
CRM	41X Z3 L	0.0080	0.0138	0.0164	0.0050	0.0022	0.0029	0.0066	0.0029	0.0029	0.0022	0.0045	....	0.0012	0.0010	....	(0.0013)	50 x 20	C
CRM	41X Z4 K	0.0091	0.0019	0.0096	0.0066	0.003	0.0070	0.0047	0.0069	0.0012	....	0.005	<0.0005	0.0037	0.0015	(0.0014)	....	50 x 20	C
CRM	41X Z5 M	0.0275	0.0098	0.041	0.0310	0.011	0.0275	0.0296	0.00054	0.0138	....	0.0098	0.00044	0.0073	0.0050	(0.002)	....	50 x 20	C
CRM	41X Z6 A	0.031	<0.0005	0.0096	0.0093	(0.002)	0.0038	0.0088	0.0002	0.0002	0.0122	....	....	0.0004	0.0228	....	....	50 x 20	C
CRM	41X Z11 A	0.0077	....	0.0261	0.0155	0.0019	0.0072	0.0116	....	....	0.0189	0.0026	....	(0.0010)	0.0345	....	(0.0009)	50 x 20	C
4.1.1	Zinc with Impurities																	Size (mm) Ø x H	Form
	Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	Tl	In	Ag	As				
	41X 0336Zn1 K	0.95	0.0049	0.014	0.0056	0.0124	0.0053	0.0070	(0.0006)	0.0035	....	....	....	....	....	....		50 x 20	C
CRM	41X 0336Zn2 M	0.486	0.099	1.55	0.145	(0.01)	0.038	0.354	0.0137	0.0212	0.0099	0.0007	0.0012	....	0.0102	0.0009		50 x 20	C
CRM	41X 0336Zn3 K**	0.026	0.145	0.33	0.34	0.045	0.12	0.35	0.002	0.009	....	....	....	....	....	....	** provisional values	50 x 20	C
CRM	41X 0336Zn4 B	2.87	0.179	1.39	0.638	(0.018)	2.38	0.874	0.0074	0.038	0.027	0.048	(0.004)	0.0035	0.0023	0.0005		50 x 20	C
CRM	41X 0336Zn5 A	0.91	<0.0005	0.035	0.056	0.016	0.21	0.023	(0.0005)	(0.0001)	(0.001)	0.008	....	....	....	....		50 x 20	C
CRM	41X 0336Zn6 A	1.82	0.0008	0.105	0.0140	0.08	0.0023	0.0203	0.0018	0.0010	0.123	0.234	0.0132	0.0123	0.0055	0.0020		50 x 20	C
		Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	Ti	Cr	Si	Co		Size (mm) Ø x H	Form
CRM	41X 4380Zn1 C	0.068	0.0011	0.055	0.376	0.01	0.049	0.175	0.0029	0.0015	0.0017	0.002	(0.001)	0.002	0.006	....		50 x 20	C
CRM	41X 4380Zn2 C	0.268	0.0243	0.0153	0.284	0.048	0.0021	0.0288	0.0023	0.0087	0.0076	0.0093	0.0251	0.0027	....	....		50 x 20	C
CRM	41X 4380Zn3 C	0.180	0.0220	0.0203	0.0950	0.017	0.080	0.073	0.0120	0.0180	0.0103	0.0046	0.125	0.0029	....	....		50 x 20	C
CRM	41X 4380Zn4 D	0.310	0.118	0.446	0.086	0.017	0.0416	0.0284	0.0172	0.0092	0.0101	0.0156	(0.0003)	0.0029	....	0.0018		50 x 20	C
CRM	41X 4380Zn5 C	0.140	0.00165	0.0215	0.0571	0.0120	0.0101	0.071	0.00147	0.035	0.0308	0.0061	0.339	0.0075	....	....		50 x 20	C
CRM	41X 4380Zn6 C	0.411	0.0043	0.0051	0.0423	0.018	0.110	0.022	0.00058	0.024	0.00109	0.0359	0.062	0.0022	....	....		50 x 20	C
CRM	41X 4380Zn7 D**	1.18	0.0030	0.28	0.016	0.002	0.0035	0.014	0.012	0.003	....	0.087	0.007	....	....	....	** provisional values	50 x 20	C
CRM	41X 4380Zn8 C	0.73	0.007	0.225	0.0079	0.003	0.011	0.020	0.024	0.0015	0.011	0.016	0.012	0.0019	(0.005)	....		50 x 20	C
CRM	41X 4380Zn9 A	0.0139	0.0153	0.295	0.0032	0.0113	0.0008	0.0416	0.0009	0.0018	0.00046	0.0060	....	0.0015	....	....		50 x 20	C
4.1.2	Galvanising Alloys																	Size (mm) Ø x H	Form
	Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	As	Cr	Co	V				
CRM	41X GLV1 C**	0.022	0.0008	0.200	0.010	0.0035	0.012	0.019	0.007	....	0.004	0.001	0.001	....	0.0002	....	** provisional values	50 x 20	C
CRM	41X GLV2 A	0.214	....	0.068	0.0025	0.048	0.003	0.0052	0.0070	....	0.017	0.006	<0.001	....	....	....		50 x 20	C
CRM	41X GLV3 B	0.0091	0.00145	0.334	0.0188	0.0031	0.0060	0.0260	0.0300	0.0111	0.0016	0.058	(0.0007)	0.00084	0.00150	....		50 x 20	C
CRM	41X GLV4 C	0.0062	0.0034	0.514	0.0006	0.0028	0.0024	0.0321	0.0441	0.0089	0.0061	0.0287	(0.0003)	0.0007	0.0037	....		50 x 20	C
CRM	41X GLV5 A	0.0187	....	0.014	0.0138	0.076	0.020	0.0116	0.0030	....	0.0105	0.162	0.0041	....	....	....		50 x 20	C
CRM	41X GLV6 A	0.120	....	0.474	0.0053	0.0047	0.0152	0.039	0.0008	0.0013	0.0248	0.0112	0.0014	0.0029	0.0047	<0.0005		50 x 20	C
CRM	41X GLV7 A	0.082	....	0.399	0.00056	0.0031	(0.0006)	0.023	0.0060	0.0025	0.0108	0.0031	0.0016	0.0010	(0.0001)	<0.0001		50 x 20	C
CRM	41X GLV8 A	0.0037	0.0012	0.263	0.0003	0.0062	0.0005	0.0139	0.0006	0.0012	0.0005	0.0057		0.0012				50 x 20	C
CRM	41X CGL F	0.046		0.28	(0.0015)		<0.001	(0.0005)										42-48 x 20	C

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Revised - 10/11/2011

Page 61

MBH Zinc Pure & Alloys

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4.1.3		Zn/Mn, Zn/Mg, Zn/Ni & Zn/Sb Binaries											Size (mm)		Form					
		Pb	Al	Cd	Fe	Cu	Ni	Mn	Mg	Sb	Sn	Bi	Ø x H							
CRM	41X ZMn1 A	(0.0026)	(0.0001)	(0.0002)	(0.0025)	(0.0005)	(0.0009)	1.07	....	....	....	....		50 x 20	C					
	41X ZMg1 A	....	....	....	....	....	....	....	1.13	....	....	....		40 x 15	C					
	41X ZMg3 A	....	....	....	....	....	....	....	2.80	....	....	....		40 x 15	C					
	41X ZNiBi A	0.0187	0.050	0.0020	0.0133	0.0132	2.02	....	....	....	0.154	0.502		50 x 20	C					
CRM	41X ZNi2 A	0.0172	0.0135	0.0010	0.0061	0.0056	1.97	....	....	....	0.141	0.0050		50 x 20	C					
	41X ZSb1 A	....	....	....	....	....	....	....	....	1.03	....	....		40 x 15	C					
	41X ZSb4 A	....	....	....	....	....	....	....	....	3.78	....	....		40 x 15	C					
	41X ZSb8 A	....	....	....	....	....	....	....	....	7.68	....	....		40 x 15	C					
4.1.4		Special Alloys											Size (mm)		Form					
		Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Ti	Cr	Ø x H							
CRM	41X 2951Zn1 A	0.0042	0.0029	0.029	0.0005	0.011	(0.0007)	0.79	0.0038	0.0013	0.278	0.083		50 x 20	C					
CRM	41X 2951Zn2 A	0.0040	0.0123	0.032	0.0037	0.019	(0.0015)	1.37	0.0027	0.0011	0.209	0.142		50 x 20	C					
CRM	41X 2951Zn3 A	0.0065	0.0164	0.078	0.0062	0.029	(0.006)	1.89	0.0010	0.0018	0.133	0.184		50 x 20	C					
4.1.5		RoHS Monitors											Size (mm)		Form					
		Pb	Cd	Hg	Cr								Ø x H							
CRM	41X ZSC1 A	0.0621	0.0288	0.026	0.0039									50 x 20	C					
CRM	41X ZSC2 A	0.111	0.0016	0.0053	0.0036									50 x 20	C					
CRM	41X ZSC3 A	0.0273	0.119	0.0021	0.0148									50 x 20	C					
CRM	41X ZSC4 A	0.156	0.0131	0.050	0.0299									50 x 20	C					
CRM	41X ZSC5 A	0.0137	0.0502	0.147	<0.0002									50 x 20	C					
CRM	41X ZSC6 A	0.0077	0.215	0.029	<0.0002									50 x 20	C					
4.2		Zn/Al																Size (mm)		Form
		Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Sb	Cr	Si	Ti	In	Ce	La	Zr	Ø x H	
CRM	42X Z1 H	0.0022	0.0041	4.61	0.0005	0.0024	0.0006	0.0019	0.0017	0.0007	(0.0009)	<0.0005	0.0046			0.0027	0.0026		50 x 20	C
CRM	42X Z2 J	0.0064	0.0150	4.08	0.0020	0.0072	0.0063	0.0307	0.0032	0.0058	(0.001)	0.0014	0.011			0.0072	0.0031		50 x 20	C
CRM	42X Z3 H	0.0060	0.0288	3.72	0.0048	(0.047)	0.0030	0.159	0.0102	0.0252	0.003	0.0020	0.015			(0.0003)	(0.0003)		50 x 20	C
CRM	42X Z4 H	0.0113	0.058	3.55	0.0076	0.012	0.0060	0.063	0.0177	0.0077	(0.0029)			(0.003)	0.0016	0.020	0.020		50 x 20	C
CRM	42X Z5 L **	0.005	0.047	4.3	0.0027	0.02	0.002	0.105	0.035	0.003					0.003	0.025	0.015	** provisional values	50 x 20	C
CRM	42X Z6 B	0.0093	0.177	3.67	0.0039	0.008	0.0057	0.238	0.00030	0.0157	0.0169	0.0034	(0.010)	0.0021	0.0019	(0.012)	(0.011)		50 x 20	C
CRM	42X Z7 A	0.0097	0.0095	4.39	0.030	0.027	0.012	0.0249	0.0067	0.0045		(0.0001)	0.006			0.053	0.047		50 x 20	C
CRM	42X Z8 A	0.0025	0.0033	7.03	0.0003	0.013	(0.002)	0.0215	0.0019	0.0014		(0.0002)	0.013			0.0081	0.0079		50 x 20	C
CRM	42X Z9 A	0.0021	0.0464	5.58	0.0054	0.032	(0.0004)	0.0070	(0.0003)	0.0006			(0.004)			0.0047	0.0044	0.011	50 x 20	C
CRM	42X Z11 A	0.0058	0.0329	3.19	0.0020	(0.036)	0.0017	0.093	0.0241	0.0196	0.0047	0.0016		0.0047	0.0037	0.0014	(0.0009)		50 x 20	C
CRM	42X Z12 A	0.0079	0.0488	4.72	0.00277	0.046	0.0022	0.156	0.0413	0.0483	0.0070	0.00063		0.0076	0.0068	0.0116	0.0084		50 x 20	C

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Revised - 10/11/2011

Page 62

MBH Zinc Pure & Alloys

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4.3	Zn/Al/Cu	Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	Ti	Cr	Si	Be	Size (mm) Ø x H	Form
CRM	43X Z1 J	0.0017	0.0145	4.50	0.00037	0.0058	(0.0007)	0.501	0.0010	0.0005	0.0031	0.0016	0.0014	0.0009	(0.0037)		50 x 20	C
CRM	43X Z2 M	0.0106	0.0628	3.89	0.0053	0.0081	0.0099	1.004	0.0024	0.0086	0.0022	0.0068	0.0008	0.0063	0.011	....	50 x 20	C
CRM	43X Z3 L	0.0132	0.0143	3.64	0.0132	0.061	0.0125	1.58	0.0061	0.0125	0.018	(0.0030)	....	0.0045	0.005	....	50 x 20	C
CRM	43X Z4 B	(0.0024)	0.043	4.76	0.0025	(0.064)	(0.0023)	3.21	0.0286	0.088	0.012	0.0043	0.0017	0.0063	(0.0065)	....	50 x 20	C
CRM	43X Z5 A	0.0045	0.041	3.05	0.0111	0.023	0.0032	6.05	0.0021	0.0030	....	....	0.0009	0.0010	0.003	....	50 x 20	C
CRM	43X Z6 A	0.0016	0.0256	4.02	0.0016	0.019	0.0053	2.72	0.029	0.0006	0.0049	0.0045	0.0013	0.0006	0.012	....	50 x 20	C
CRM	43X Z7 A	0.0058	0.062	3.68	0.00092	0.029	0.0031	3.14	0.0005	0.0025	(0.001)	0.0016	0.067	0.0003	....	0.0194	50 x 20	C
CRM	43X Z8 A	0.0027	0.00155	2.51	0.00090	(0.002)	(0.0005)	0.481	0.00033	0.00021	....	....	....	0.00024	....	....	50 x 20	C
CRM	43X Z9 A	0.0078	0.0472	3.17	0.0034	0.073	0.0020	4.82	0.0027	0.0108	0.0033	0.0033	0.0012	0.0034	....	0.0010	50 x 20	C
CRM	43X Z10 A	0.0046	0.0403	3.99	0.0014	0.007	0.0012	2.97	0.0036	0.0050	....	....	....	0.0003	0.009	....	50 x 20	C
CRM	43X Z11 E	0.0305	0.053	11.61	0.0224	0.0091	0.0206	0.515	0.0014	0.0089	0.0035	0.0091	0.013	0.0010	0.020	....	50 x 20	C
CRM	43X Z12 D	0.0133	0.027	10.05	0.0114	0.047	0.0089	0.796	0.0035	0.0059	(0.002)	0.0039	0.0054	0.0023	(0.008)	....	50 x 20	C
CRM	43X Z13 D	0.0125	0.0204	9.55	0.0100	0.05	0.0111	0.981	0.0109	0.0070	....	0.009	....	....	(0.0048)	....	50 x 20	C
CRM	43X Z14 E	0.015	0.0133	8.05	0.0083	0.031	0.0054	1.13	0.0066	0.0050	0.0096	0.0089	0.0014	0.0047	0.016	....	50 x 20	C
CRM	43X Z15 C	0.0054	0.0024	7.36	0.0030	0.009	0.004	1.53	0.0019	0.0020	0.005	0.005	0.0020	0.0025	(0.011)	....	50 x 20	C
CRM	43X Z21 C	0.012	0.047	23.5	0.027	0.12	0.0140	1.81	0.043	0.0104	....	....	0.013	0.0087	0.022	....	50 x 20	C
CRM	43X Z22 C	0.0060	0.022	27.4	0.0050	(0.36)	0.0061	2.32	0.027	0.0096	....	....	0.0065	0.019	0.038	....	50 x 20	C
CRM	43X Z23 D	0.0045	0.0207	30.9	0.0043	0.16	0.0055	3.15	0.0156	0.0132	....	....	0.0030	0.0144	0.061	....	50 x 20	C
		Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Cr	Si	Ce	La			Size (mm) Ø x H	Form
CRM	43X SC1 A	0.0150	0.740	3.75	0.0011	0.073	0.0082	1.903	0.0161	0.0201	0.0082	0.022	....	....			50 x 20	C
CRM	43X SC2 A	0.0097	0.498	3.41	0.0018	0.046	0.0031	4.80	0.0096	0.0183	0.023	0.0133	....	....			50 x 20	C
CRM	43X SC3 A	0.0066	0.257	3.14	0.0028	0.018	0.0078	3.03	0.0261	0.0337	0.0108	0.022	....	....			50 x 20	C
CRM	43X SC4 A	0.0064	0.093	4.35	0.0058	0.022	0.0056	1.122	0.0249	0.044	0.009	0.022	....	....			50 x 20	C
CRM	43X GALF1 A	0.0505	0.0999	4.68	0.0499	0.061	0.0514	4.39	....	....	....	....	0.0569	0.0284			50 x 20	C
CRM	43X GALF2 A	0.0050	0.0504	5.40	0.0043	0.032	0.0040	0.0585	....	....	....	....	0.0318	0.0158			50 x 20	C
CRM	43X GALF3 A	0.0032	0.0099	8.37	0.0018	0.018	0.0025	0.507	....	....	....	....	0.0152	0.0076			50 x 20	C
CRM	43X GALF4 A	0.0122	0.0062	10.71	0.0108	0.074	0.0110	2.470	....	....	....	....	0.079	0.041			50 x 20	C
CRM	43X GALF5 A	0.0084	0.0016	15.03	0.0080	(0.072)	0.0081	0.0114	....	....	....	....	0.0041	0.0019			50 x 20	C
4.4	High Alloy Zinc	Pb	Cd	Fe	Sn	Cu	Ni	Bi	Sb	Ag							Size (mm) Ø x H	Form
	44X ZnCd30 A	0.09	31.0	0.002	0.05	0.05	0.001	0.05	1.03	0.05							40 x 15	C
4.5	Zn/Al 'Galvalume'	Zn	Si	Fe	Cu	Sn	Pb	Mg	Ca	Ti	Li	Sr	Al				Size (mm) Ø x H	Form
	45X ZnAl1 B	24.6	3.07	0.22	0.057	0.017	0.021	0.044	0.0021	0.016	0.0015	....	bal.				55 x 6	CC
	45X ZnAl6 A	42.3	1.71	0.067	0.062	0.030	0.006	0.0010		0.006		0.011	(56.0)				55 x 6	CC
	45X ZnAl11 A	27.4	2.21	0.139	0.037	0.008	0.010	0.011	0.0020	0.012	(0.001)		bal.				55 x 6	CC

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Revised - 10/11/2011

Page 63

IRMM Impurities in Zinc Metal

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Part #	Grade	Al	Cd	Cu	All Values in mg/kg		Mg	Ni	Pb	Sn	Ti	Size (mm)	
					Fe	In						Ø	H
BCR-351	ZnAl4	43.55	(0.21)	12.13	---	---	131.0	(1.9)	4.50	---	0.74	80 x 20	
BCR-352	ZnAl4	41.50	2.88	31.26	---	3.02	283.0	6.74	(6.4)	6.0	3.2	80 x 20	
BCR-353	ZnAl4	39.5	10.44	100.0	---	2.55	452.5	---	24.4	5.60	3.95	80 x 20	
BCR-354	ZnAl4	37.27	29.7	312.3	---	9.8	602	83.1	30.8	14.1	11.01	80 x 20	
BCR-355	ZnAl4	34.43	58.1	1035	---	24.6	786	268	56.9	29.1	23.25	80 x 20	
BCR-356	ZnAl4Cu1	44.34	0.73	3.944	31.5	---	132.3	3.43	9.87	(0.32)	0.79	80 x 20	
BCR-357	ZnAl4Cu1	42.27	2.83	5.849	25.7	3.30	273	9.82	13.8	3.51	2.76	80 x 20	
BCR-358	ZnAl4Cu1	39.46	10.22	7.93	40.5	7.04	403	26.98	22.5	7.87	6.09	80 x 20	
BCR-359	ZnAl4Cu1	37.11	29.8	9.89	119.7	15.5	557	92.6	36.2	16.93	13.34	80 x 20	
BCR-360	ZnAl4Cu1	34.27	59.50	12.340	---	29.80	705.0	267.00	73.90	33.00	25.90	80 x 20	
BCR-361	ZnAl4Cu1	40.68	(0.80)	7.98	10.34	---	---	---	5.31	46.3	37.4	80 x 20	

IRMM Zirconium Alloys

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Part #	Grade	O	N	C	All Values in mg/kg
					Form
BCR-275	Zircaloy-4	1670	39.0	113	1 bottle of 10 discs 13mm x 1mm
BCR-276	Zircaloy-4	1540	41	108	1 bottle of approximately 100 discs 4.5mm x 2mm

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Revised - 10/11/2011
Page 64

Set-Up Standards (SUSs)

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Cast Irons

IARM Status	Grade	Al Ni	As P	B Pb	Bi S	C Sb	Co Si	Cr Sn	Cu Ti	Mg V	Mn W	Mo Zn	Nb Zr
215A	QA 21	(0.037)	---	---	---	(3.5)	---	(0.6)	(0.6)	---	(1.3)	(0.5)	---
Final		(0.9)	(0.3)	---	(0.13)	---	(2.1)	(0.17)	(0.07)	(0.5)	---	---	---
216A	QA 22	(0.06)	(0.03)	(0.037)	(0.004)	(3)	(0.6)	(1.5)	(0.08)	(0.08)	(0.3)	(0.004)	(0.3)
Final		(2)	(0.026)	(0.005)	(0.001)	(0.06)	(3)	(0.04)	(0.007)	(0.03)	(0.043)	(0.01)	(0.05)

LAS

IARM Status	Grade	Al P	As Pb	B S	C Sb	Ca Si	Co Sn	Cr Ta	Cu Ti	Mn V	Mo W	N Zn	Nb Zr	Ni Fe
217A	QA A	(0.0002)	(0.003)	(<0.0001)	(0.01)	(0.0001)	(0.004)	(0.01)	(0.001)	(0.003)	(0.01)	(0.0005)	(0.001)	(0.01)
Final		(0.002)	(0.004)	(0.001)	(0.006)	(0.01)	(0.0005)	(0.01)	(0.0001)	(0.002)	(0.005)	(<0.0001)	(0.005)	>99.9
218A	QA C	(0.003)	(0.1)	(0.0004)	(0.05)	(<0.0001)	(0.01)	(0.1)	(0.6)	(2)	(0.1)	(0.007)	(<0.0001)	(5)
Final		(0.1)	(<0.001)	(0.07)	(0.02)	(0.1)	(0.1)	(0.02)	(0.01)	(1)	(0.7)	(<0.001)	(<0.00)	>89.8
219A	QA D	(0.2)	(0.01)	(0.01)	(0.9)	(<0.0001)	(1)	(5)	(0.6)	(0.02)	(1.5)	(0.002)	(0.4)	(2.8)
Final		(0.003)	(0.003)	(0.002)	(0.1)	(2)	(0.06)	(0.01)	(1.7)	(0.3)	(0.01)	(0.01)	(0.002)	>83.3

Aluminum

IARM Status	Grade	Ag Mn	B Na	Be Ni	Bi P	Ca Pb	Cd Si	Cr Sb	Co Sn	Cu Sr	Fe Ti	Ga V	Li Zn	Mg Zr
220E	QA 10	---	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0002)	(0.0003)	(<0.0001)	(<0.0001)	(0.0002)
Final		(<0.0001)	(<0.0001)	(<0.0001)	(0.0001)	(<0.0001)	(0.0003)	(0.0001)	(0.0001)	(<0.0001)	(<0.0001)	(0.0001)	(0.0002)	(0.0001)
221A	QA 11	---	---	(0.005)	---	(0.03)	---	(0.2)	(0.2)	(0.6)	(0.2)	(0.03)	---	(4.8)
Final		(0.4)	---	---	---	---	(0.2)	(0.01)	---	---	(0.1)	---	(6.7)	---
221B	QA 11	---	---	(0.005)	---	(0.03)	---	(0.2)	(0.2)	(0.6)	(0.2)	(0.03)	---	(4.8)
Final		(0.4)	---	---	---	---	(0.2)	(0.01)	---	---	(0.1)	---	(6.8)	---
221C	QA 11	---	---	(0.005)	---	(0.03)	---	(0.2)	(0.2)	(0.6)	(0.2)	(0.03)	---	(4.8)
Final		(0.4)	---	---	---	---	(0.2)	(0.01)	---	---	(0.1)	---	(6.8)	---
221D	QA 11	---	---	(0.005)	---	(0.03)	---	(0.2)	(0.2)	(0.6)	(0.2)	(0.03)	---	(4.8)
Final		(0.4)	---	---	---	---	(0.2)	---	---	---	(0.1)	---	(6.7)	---
222D	QA 12	(0.2)	---	(0.003)	---	---	(0.2)	---	(0.02)	(4.9)	(0.9)	(0.06)	---	(0.2)
Final		(1.1)	---	(0.3)	(0.003)	(0.1)	(1.1)	---	(0.1)	---	(0.2)	(0.1)	(0.3)	(0.2)

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Revised - 10/11/2011

Page 65

MBH Set-Up Samples (SUSs)

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16.2	Steel	C	Si	S	P	Mn	Ni	Cr	Mo	Cu	Sn	Al	Ti	V	W	As	Co	Nb	Pb	Bi	Sb	Zn	Zr	Size (mm) Ø x H	Form	Price
	162X FESUS1	1.1	1.8	0.35	0.15	0.8	0.5	25.0	0.45	0.3	0.05	0.6	0.4	0.4	0.2	0.005	1.1	0.05	0.005	0.005	0.015	0.002	0.04	43 x 20	C	
16.4.2	Aluminium	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Sn	Ti	Cr	Co	Be	Sb	Ca	Sr	Zr	Ag					Size (mm) Ø x H	Form	Price
	164X ALSUS7	4	0.15	0.9	0.55	0.06	1.1	0.12	0.11	0.01	0.3	0.01	0.2	0.1	0.12	<0.001	0.003	0.18						50 x 25	C	
	164X ALSUS8	0.75	0.9	9.5	0.25	0.45	0.12	0.25	0.001	0.13	0.02	0.06	0.025	0.015	0.03	<0.001	0.07	0.025	0.09					50 x 25	C	
16.5.1	Pure Copper	Sn	Pb	Zn	Fe	Ni	Al	All Elements ppm														Size (mm) Ø x H	Form	Price		
	165X CUSUS1	0.7	11	0.4	8	1	0.05	0.05	0.05	0.01	0.05	0.1	1	11	0.01	0.1	0.05	0.01	(0.5)	0.05	(370)	(6)		50 x 45	W	
16.5.2	Copper	Sn	Pb	Zn	Fe	Ni	Al	Si	As	Mn	Bi	Sb	P	S	Cr	Co	Mg	Cd	Se	Cu			Size (mm) Ø x H	Form	Price	
	165X MNB5 SUS	1.6	0.20	38	0.55	1.1	3.2	0.40	.....	0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	55			40 x 17	C		
	165X PB10 SUS	11.0	0.04	0.05	0.002	0.06	0.001	0.001	0.02	<0.001	0.02	0.15	0.002	0.03	0.001	0.01	.....	.....	0.01	89			42 x 18	CC		
	165X ALB1 SUS	0.03	0.20	0.06	2.8	5.3	9.0	0.10	0.005	0.08	0.015	.....	0.015	.....	0.01	.....	0.04	.....	.....	82			40 x 18	CC		
	165X WSB4 SUS	1.0	0.25	5.5	0.80	0.25	0.35	4.5	0.03	1.5	0.01	0.08	0.08	0.002	0.03	.....	0.08	0.003	.....	85			40 x 17	CC		
	165X GM4 SUS	2.7	5.2	6.5	0.03	1.9	0.001	0.002	0.01	0.0005	0.01	0.01	0.005	0.12	0.0005	.....	.....	0.0002	.....	83.6			40 x 17	CC		
16.6	Magnesium	Al	Zn	Mn	Zr	Cu	Si	Fe	Ni	Ca	Sn	Pb	Ag	Be	Cd	Sr							Size (mm) Ø x H	Form	Price	
	166X MGSUS1	0.04	6.8	0.17	<0.001	0.002	0.06	0.005	0.001	<0.001	0.02	0.003	0.007	0.0001	.....	0.0001							40 x 40	C		
	166X MGSUS2	8	0.4	0.4	.....	0.02	0.12	0.005	0.02	0.015	0.01	0.04	0.005	0.0015	0.004	0.0003							40 x 40	C		

() Indicates non-certified value.

[] Provisional value, certification in progress.

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Revised - 10/11/2011

Page 66

MBH Set-Up Samples (SUSs)

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

16.8	Lead	Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	In	Ni	Te	Se	Tl	Au	S	Size (mm) Ø x H	Form				
	168X PBSUS1	1.6	6.1	0.07	0.04	0.4	0.015	<0.001	0.003	0.02	0.01	0.003	0.015	0.008	.....	0.003	0.002	45 x 35	C				
	168X PBSUS5	1.2	0.4	0.35	0.10	0.35	0.20	<0.001	0.001	0.10	0.15	0.002	0.005	0.002	0.005	0.001	0.0005	45 x 35	C				
	168X PBSUS6	0.15	0.12	0.22	0.10	0.025	0.04	<0.001	0.002	0.015	0.01	0.003	0.0005	0.003	0.03	0.001	0.0005	45 x 35	C				
16.8.1	Lead for fire assay	ppm Pt	ppm Pd	ppm Au	ppm Rh	ppm Ru	ppm Ir	ppm Ag	ppm Fe	ppm Bi	ppm Cu	ppm Ni	ppm Te	ppm As	ppm Sb	ppm Ti	ppm S						
	168X PBSUS PM1	55	20	35	12	0.1	2	40	1	100	5	3	1	2	1	10	2	48 x 28	C				
16.9	Zinc	Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Bi	Sb	Ti	Tl	In	Ag	Cr	Si	Size (mm) Ø x H	Form			
	169X ZN SUS1	0.6	0.002	0.35	0.3	0.05	0.3	0.35	0.06	0.001	0.005	0.2	0.001	0.06	0.25	0.04	0.001	0.003	50 x 20	C			
16.90	Zinc control sample	Pb	Mg	Al	Cd	Fe	Sn	Cu											Size (mm) Ø x H	Form			
	1690X ZnChk1	0.005	0.02	4	0.005	0.025	0.003	1.2											50 x 20	C			
	1690X ZnChk2	2	<0.001	0.01	0.12	0.75	1	0.42											50 x 20	C			
16.11	Tin	As	Bi	Sb	Pb	Cu	Fe	Cd	Zn	Ni	Al	Ag	Co	In	Au	Se	Te	Tl	Pt	Size (mm) Ø x H	Form		
	1611X SNSUS6	0.08	0.09	0.13	0.95	0.50	0.050	0.008	0.005	0.030		0.08	0.015	0.005	0.003	0.001	0.001	0.005		50 x 20	C		
	1611X SNSUS7	2.3	2.6	11.1	0.32	12.3	(0.05)	0.018	0.03	0.10	<0.001	0.12	0.0005	0.050	0.0005	0.005	0.003	0.03	0.0005	50 x 20	C		
16.12	Cobalt	C	Si	S	P	Mn	Ni	Cr	W	Fe	Mo	Al	Nb	Cu	B	Sn	Pb	Ta	Ti	V	Co	Size (mm) Ø x H	Form
	1612X COSUS1	1.0	1.6	0.07	0.05	1.7	17	26	8.0	3.5	6.5	1.5	2.2	0.15	0.01	0.08	0.01	0.02	0.20	0.25	~30	43 x 20	C

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Page 67

Heavy Metals in Plastic RMs - XRF Analysis

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

European Communion (EC) directives have defined specific limits for heavy metals in plastic. Sets of PE and PVC have been designed for screening heavy metals to check for compliance with these limits.

These sets of reference materials consist of 3 individual discs. Each disc is 31 mm in diameter and at least 12.9 mm thick. The overall error of concentration of the added element is estimated at less than 4% relative at a 95% confidence level, except, below 100 mg/kg, the estimated error is 5 mg/kg absolute at a 95% confidence level.

There are many various additives combined with different plastics or polymers to give specific properties. XRF is often used to monitor these products. If you have a specific or special application need, please contact us for the possibility of custom made reference materials.

These RMs are sold as sets only.

Heavy Metals in PE

Element	PE-High	PE-Low	PE-Blank
	Amount added, (mg/kg)	Amount added, (mg/kg)	Amount added, (mg/kg)
Br	1100	500	0
Hg	1100	200	0
Cr	1000	400	0
Pb	1200	400	0
Cd	300	100	0

Heavy Metals in PVC

Element	PVC-High	PVC-Low	PVC-Blank
	Amount added, (mg/kg)	Amount added, (mg/kg)	Amount added, (mg/kg)
Br	1100	500	0
Hg	1100	200	0
Cr	1000	400	0
Pb	1200	400	0
Cd	300	100	0

Every effort is made to assure the high quality of these standards and their data. The use of these standards and the interpretation of the results is the sole responsibility of the user.

Laboratory Proficiency Testing Program

LABORATORY PROFICIENCY TESTING PROGRAM

"Let ARMI be a cornerstone member of your Quality Team!"

In support of "Total Quality Assurance" programs, Analytical Reference Materials International (ARMI) developed its Laboratory Proficiency Testing (PT) Program in 1991. Having been in the business of CRM characterization, statistical evaluation, and certification of standards for many years, the Company has compiled a vast database of statistical information that is easily utilized as an extremely effective quality assurance tool. This statistical information library, combined with ARMI's CRMs, composes the basis for an unrivaled PT program to support your internal Quality System.

The PT Program offers benchmark proficiency testing which is directed towards supporting internal quality assurance programs, as well as fulfilling the accreditation requirements of several accrediting bodies, such as A2LA, NADCAP, and many others. The Program can also be incorporated into ISO 9000 and ISO 17025 certification requirements.

ARMI's PT Program is a direct, tailor made program, custom designed for the individual subscribing company. The participating company selects the timing and material matrix for testing. ARMI then selects the specific material from its extensive CRM inventory and sends it to the subscriber for testing and evaluation. Once the analysis results are received, ARMI reports back within 48 hours the results of the company's testing versus the certified values for that specific material. The results are reported in an easily read graphical format that allows for instant performance level recognition. This rapid turnaround ensures the company's ability to take corrective action for any problem quickly and efficiently and furthermore, the information is kept totally confidential. Finally, since the material used for testing is from a CRM, the company also now has an actual standard for use in its daily operations.

The PT Program is NOT method or instrument specific. The Program can be used for a single technique, method, and instrument or for several techniques, methods, and instruments. The Program has the flexibility to be adapted for most any laboratory situation. In addition, the PT Program is NOT a round-robin comparison. Your results are only compared against certified values and the results are returned to you within 48 hours, not 30, 60, or even 90 days.

The PT Program samples used are all actual CRMs and traceable to NIST. The analytical data used for the evaluation of the PT Program results is the same data generated by the expert members of ARMI's ILAP group. This is the same group of Industry and commercial laboratories that supports ARMI's CRM development and certification program. The data has been thoroughly critiqued, statistically evaluated, and it is free of any outliers. The end result is that by utilizing ARMI's PT Program, your performance test results are now indisputable and traceable to NIST!

Laboratory Proficiency Testing

Prices subject to change - (303) 216-2621 or (800) 421-9454

	Plan 1 - Monthly 12 Samples per Year Unit Price per Sample	Plan 2 - Quarterly 4 Samples per Year Unit Price per Sample	Plan 3 - Bi-Annual 2 Samples per Year Unit Price per Sample
Carbon Steel	\$160.00	\$220.00	\$280.00
Cast Iron (Solid Disk Only)	N/A	\$325.00	\$385.00
Low Alloy Steel	\$160.00	\$220.00	\$280.00
Tool Steel	\$160.00	\$220.00	\$280.00
Stainless Steel	\$170.00	\$230.00	\$290.00
High Temperature Steel	\$170.00	\$230.00	\$290.00
Nickel Alloy	\$185.00	\$250.00	\$305.00
Cobalt Alloy	\$200.00	\$265.00	\$320.00
Copper Alloy	\$160.00	\$220.00	\$280.00
Aluminum Alloy	\$500.00	\$525.00	\$550.00
Titanium Alloy	\$275.00	\$325.00	\$385.00
Magnesium Alloy	Call for quote	Call for quote	Call for quote
Sulfur in Refined Petroleum	N/A	\$150.00	\$175.00
Sulfur in Coal	N/A	\$150.00	\$175.00
Sulfur & Prox in Coal	N/A	\$175.00	\$200.00

Terms and Conditions

A one-time Initial Setup & Administrative Fee of \$225.00 will be added to invoices for new customers only. This includes a subscriber, instrument, and/or technique profile plus the set up of an individual historical database. A single invoice will be issued prior to the first sample being shipped for the total subscription period. Terms are 'Net 30 days'.

Unit prices apply to one set of data points per sample. In the case of a subscriber reporting multiple data sets from a single sample, add \$65.00 for each additional data set submitted. For metals, all prices include a single solid sample. Optional 10g Chip Sample Packs and/or a Pin Disk or Solid Pin Packs for C, S, O₂, and N₂ are available at an additional charge of \$25.00 per sample pack. Subscribers desiring chip samples only will be provided an equivalent weight.

Price includes hard copy reports and delivery of samples in the United States and Canada. Shipping will be added for other destinations.

Please contact ARMI for a formal price quotation.

90-10 Share Program

The 90/10 Share Program

In the same spirit of cooperation that has become the very foundation of ARMI's efforts to develop new CRMs in the private sector, in May of 1990, the Company launched its "90/10 Share Program." Although many materials are quite common, spectrochemical standards for these materials are frequently non-existent. The 90/10 Program was created to solve this all too common problem.

The 90/10 Program is a very simple and cost effective service offered by ARMI allowing the Company (which is a leading producer of CRMs) to work together with the scientific community by sharing the task, as well as the costs, of developing new commercially available CRMs.

Here is how it works! The customer furnishes ARMI with the material of the specific alloy, usually in the form of round bar stock. The bar stock needs to be a minimum of 1.25" outside diameter and an 1.5" outside diameter is ideal. The overall length should be at least 10 to 12 feet. Forms other than bar stock are acceptable as long as the quantity is sufficient for the sampling that is required for the laboratories' examinations. The material is then processed through ARMI's ILAP for certification as a CRM. Approximately 15% to 20% of the material is expended in the analysis process. After certification, 10% of the remaining material is returned to the customer in any form desired (OES solids, chips, X-Ray discs, etc.) and ARMI retains the balance for sale commercially.

The only cost to the customer is the cost of the material. ARMI has well-established vendors for most alloy materials and will assist in the location and acquisition of the base stock material.

That is all there is to it! By working together, we make available a new CRM, traceable to NIST, for the scientific community.

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
HK200 - Disk Grinder		
HK200	Manual disc grinding machine for preparation of iron and steel samples for OES and XRF analysis, desktop machine. Dimensions - ~40x45x40cm, Weight 22kg, 220V/60Hz	1
HKPACK	Export packing, wooden box	1
Optional Accessories		
HKHOLD3	Magnetic sample holder, round, 40-50mm Ø	1
HKHOLD4	Magnetic sample holder, rectangular, 35x35mm	1
Consumables		
PAP200K/40	Grinding paper Al ₂ O ₃ , 40 grit, PSA, 200mm Ø	100 pcs/pack
PAP200K/60	Grinding paper Al ₂ O ₃ , 60 grit, PSA, 200mm Ø	100 pcs/pack
PAP200K/80	Grinding paper Al ₂ O ₃ , 80 grit, PSA, 200mm Ø	100 pcs/pack
PAP200S/40	Grinding paper SiC, 40 grit, PSA, 200mm Ø	100 pcs/pack
PAP200S/60	Grinding paper SiC, 60 grit, PSA, 200mm Ø	100 pcs/pack
PAP200S/80	Grinding paper SiC, 80 grit, PSA, 200mm Ø	100 pcs/pack
PAP200Z/40	Grinding paper ZrO ₂ , 40 grit, PSA, 200mm Ø	100 pcs/pack
PAP200Z/60	Grinding paper ZrO ₂ , 60 grit, PSA, 200mm Ø	100 pcs/pack
PAP200Z/80	Grinding paper ZrO ₂ , 80 grit, PSA, 200mm Ø	100 pcs/pack
Special Accessories		
HK200W	Disc Grinder, dry & wet applications	1
HK210	Disc Grinder, Spectrographic & Metallographic	1
HKHOLD5	Non-magnetic sample holder, round	1
HKHOLD6	Magnetic sample holder, rectangular, 50x50mm	1

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
HK350 - Disk Grinder		
HK350	Manual disc grinding machine for preparation of iron and steel samples for OES and XRF analysis. Disk grinder, complete with dust trap and exhauster. Dimensions - ~70x70x105cm, Weight 100kg, 220V/60Hz	1
HKPACK	Export packing, wooden box	1
Optional Accessories		
HK350ERS	Spare parts set (bellows, safety glass, lamp, fuses)	1
HKHOLD3	Magnetic sample holder, round, 40-50mm Ø	1
HKHOLD4	Magnetic sample holder, rectangular, 35x35mm	1
HKEXFILT	Round filter, exhauster HK150/350, PAS 11-21	1
Consumables		
PAP350K/40G	Grinding paper Al ₂ O ₃ , grit 40, 350mm Ø	100 pcs/pack
PAP350K/60G	Grinding paper Al ₂ O ₃ , grit 60, 350mm Ø	100 pcs/pack
PAP350K/80G	Grinding paper Al ₂ O ₃ , grit 80, 350mm Ø	100 pcs/pack
PAP350S/40	Grinding paper SiC, grit 40, 350mm Ø	100 pcs/pack
PAP350S/60	Grinding paper SiC, grit 60, 350mm Ø	100 pcs/pack
PAP350S/80	Grinding paper SiC, grit 80, 350mm Ø	100 pcs/pack
PAP350Z/40	Grinding paper ZrO ₂ , grit 40, 350mm Ø	100 pcs/pack
PAP350Z/60	Grinding paper ZrO ₂ , grit 60, 350mm Ø	100 pcs/pack
PAP350Z/80	Grinding paper ZrO ₂ , grit 80, 350mm Ø	100 pcs/pack
Special Accessories		
HKHOLD5	Non-magnetic sample holder, round	1
HKHOLD6	Magnetic sample holder, rectangular, 50x50mm	1
HKEXFILT	Round filter, exhauster HK150/350, PAS 10-20	1
HKDUST	Spark arrester with metal tube for HK150 & HK350	1
PAP350K/60PE	Grinding paper PE63, grit 60, 350mm Ø	100 pcs/pack

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
HK150 - Disk Grinder		
HK150	Manual sample grinding machine for preparation of iron and steel samples for OES and XRF analysis. Pendulum grinder (bench top) complete for operation with stones (BR HKT32J), tools, and vice with low and high brackets. Dimensions - ~70x70x105cm, Weight 120kg, 220V/60Hz	1
HKPACK	Export packing, wooden box	1
Alternate Configuration		
HK150EXS	HK150 configuration as above with steel cabinet, exhauster, spark arrester, and tubing (floor standing). Dimensions - ~70x70x105cm, Weight 120kg, 3Ø 230/60Hz - Cabinet & Exhauster ~70x70x105cm, Wght 70kg	1
HKPACK	Export packing, wooden boxes (2)	2
Optional Accessories		
HK150ERS	Spare parts set (bellows, safety glass, lamp, fuses)	1
HK150MS	Magnetic plate, complete with arm, 100x65mm	1
HK150VICE	Vice for samples 44-58mm Ø	1
HKEXFILT	Round filter, exhauster HK150/350, PAS 11-21	1
Consumables		
HKT46J1	Al ₂ O ₃ -grinding stone	1-3 packs 3 pcs/pack
HKT46J2	Al ₂ O ₃ -grinding stone	4-8 packs 3 pcs/pack
HKT46J3	Al ₂ O ₃ -grinding stone	9+ packs 3 pcs/pack
HKT49M1	SiC-grinding stone	1-3 packs 3 pcs/pack
HKT49M2	SiC-grinding stone	4-8 packs 3 pcs/pack
HKT49M3	SiC-grinding stone	9+ packs 3 pcs/pack
Special Accessories		
HKEXFILT	Round filter, exhauster HK150/350, PAS 10-20	1
HKDUST	Spark arrester with metal tube for HK150 & HK350	1

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
HK80F - Milling Machine		
HK80F	Semi-automatic milling machine for preparation of non-ferrous metal samples for OES and XRF analysis. Dimensions - ~56x78x75cm, Weight 140kg, 220V/60Hz	1
HK80F80	Standard milling head with cutters, 80mm Ø	1
HKPACK	Export packing, wooden box	1
Optional Accessories		
HK80FERS	Spare parts set (bellows, safety glass, lamp, fuses)	1
HK80FWP	Hard metal cutters (standard)	10 pcs/pack
HK80FSN	Brackets for lower samples >3mm, 16-52mm Ø	1
HK80FSG	Brackets for universal use >9mm, 16-52mm Ø	1
HK80WZ	Measuring base, cutter positioning	1
HK80FSR	Special chuck, rectangular samples	1
Special Accessories		
HK80F63	Milling head complete with cutters, 63mm Ø	One
HK80F8022	Special milling head with special cutters, 80mm Ø	One
HK80FWPS	Special hard metal cutters, octagonal	6 pcs/pack

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
HK40 - Swing Grinder		
HK40	Swing grinder, desktop model for grinding of mineral samples for XRF or solution analysis. Dimensions - ~50x40x67cm, Weight 48kg, 115V/60Hz	1
HK40MG1	Vessel, Corundum 99.6%, bio-inert, 100ml	
HKPACK	Export packing, wooden box	1
Optional Accessories		
HK40MG2	Vessel, Corundum 99.9%, bio-inert, 100ml	1
HK40MG3	Vessel, Hardened Cr-steel, 100ml	1
HK40MG4	Vessel, Nitrided, Cr-steel, 100ml	1
HK40MG5	Vessel, Tungsten Carbide, 100ml	1
HK40MG6	Vessel, Zirconia Oxide >99.9%, 100ml	1
SPECTAB 20	Grinding & Pelletizing agent, tablets	4000 x 0.25g
BR70 - Jaw Crusher		
BR-70	Jaw crusher, laboratory model for crushing of mineral samples for XRF or solution analysis (with regular acc). Dimensions - ~50x60x60cm, Weight 90kg, 3Ø 220/60Hz	1
HKPACK	Export packing, wooden box	1

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
Manual Hydraulic Press		
PE-MAN	Hydraulic press, manual, variable from 0-20 tons available pressure for preparation of XRF and IR pellets.	1
	Dimensions - ~70x59x47cm, Weight 55kg	
HKPACK	Export packing, wooden box	1
Optional Accessories		
4030	Evacuated Die Set, SS, includes 2 SS-pellets, 32mm Ø	1
4038	Evacuated Die Set, SS, includes 2 SS-pellets, 35mm Ø	1
4040	Evacuated Die Set, SS, includes 2 SS-pellets, 40mm Ø	1
Special Accessories		
4035	Press plate, tungsten carbide, 32mm Ø	1
4037	Press plate, tungsten carbide, 35mm Ø	1
4045	Press plate, tungsten carbide, 40mm Ø	1
4060	Press plate, stainless steel, 40mm Ø	1
Consumables		
HWC	Micropowder C, binder XRF-pellets	1 kg
HWC	Micropowder C, binder XRF-pellets	5 kg
HWC	Micropowder C, binder XRF-pellets	10 kg
HWC	Micropowder C, binder XRF-pellets	20 kg

Sample Preparation Equipment Parts List

Please call for availability and current pricing – (303) 216-2621 or (800) 421-9454

Catalog #	Description	Quantity/Pk
Electro-Hydraulic Press		
PE-EL	Electro-hydraulic press, manual, variable from 0-20 tons available pressure for preparation of XRF and IR pellets. Dimensions - ~70x59x47cm, Weight 70kg, 120V/60Hz	1
HKPACK	Export packing, wooden box	1
Optional Accessories		
4030	Evacuated Die Set, SS, includes 2 SS-pellets, 32mm Ø	1
4038	Evacuated Die Set, SS, includes 2 SS-pellets, 35mm Ø	1
4040	Evacuated Die Set, SS, includes 2 SS-pellets, 40mm Ø	1
Special Accessories		
4035	Press plate, tungsten carbide, 32mm Ø	1
4037	Press plate, tungsten carbide, 35mm Ø	1
4045	Press plate, tungsten carbide, 40mm Ø	1
4060	Press plate, stainless steel pellet, 40mm Ø	1
Consumables		
HWC	Micropowder C, binder XRF-pellets	1 kg
HWC	Micropowder C, binder XRF-pellets	5 kg
HWC	Micropowder C, binder XRF-pellets	10 kg
HWC	Micropowder C, binder XRF-pellets	20 kg