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Introduction

Rocky Mountain Reference Materials (RMRMs) was founded in 2016 for the purpose of producing Reference Materials for the metals industry. Since that time, RMRMs has expanded its reference material inventory to include RMs for the following matrices:

Carbon & Low Alloy Steels

Tool Steels

Stainless Steels

High Temperature Steels

Nickel Alloys

Cobalt Alloys

Titanium Alloys

Copper, Brass & Bronze Alloys

Reference Material, RM, n - reference material with documented homogeneity that is intended for use for quality control purposes, calibration, evaluation of a calibration, or standardization whose values may have limited traceability and for which rigorously derived uncertainty information is not mandatory.

These materials are ideally suited for use with HHXRF & HHLIBS for every day use for the following:

Control Charting - Procedures to demonstrate that chemical measurement processes are under statistical control. This function requires demonstration of sufficient homogeneity of a material, but it does not require assignment of chemical and physical property values with associated, exhaustively evaluated uncertainties

Process Control - For efficient, high throughput in a laboratory, chemical measurement processes, namely test methods, must be kept under statistical control. Perhaps the most convenient way to accomplish this control is to measure one or more materials at appropriate time intervals. When the material(s) can be treated as a regular sample and taken through all steps of the process, the measured results easily can be used to demonstrate statistical control of the entire chemical measurement process.

Drift Correction - The purpose of a drift correction RM is to provide stable, high-precision signals for the constituents of interest. In this case, it is not necessary to know the values of the amounts of the constituents. Homogeneity and stability should be demonstrated as above, but the calculations can be done in units of the measured phenomenon on which the instrumental or chemical technique is based. One example is the count rate of fluorescent X-rays obtained under the chosen measurement conditions.

Instrument Conditioning - For certain test methods, the equipment must be stabilized and conditioned for use on a regular basis, typically daily. It is necessary to use materials similar in chemical and physical properties to the analysis samples, but it is not necessary to know accurately the compositions of materials used for conditioning. 6.3.1 It may be useful to have confidence that a conditioning material is homogeneous and stable. However, the purpose is to show that the instrument is ready for calibration, and the requirements for homogeneity and stability can be re-laxed relative to the calibrants.

Evaluation of Matrix Influence or Spectral Interference - Both of these phenomena involve systematic effects of one constituent on another or on itself. To evaluate the magnitude of an effect, a laboratory may require a set of materials specially prepared to have known relationships among the values of the subject constituents within the set. That is, the value of Constituent A in Material X may be twice the value in Material Y and three times the value of Constituent A in Material Z. There may be multiple pairs of related constituents in a set of materials. The known relationships allow the laboratory to calibrate influence and interference coefficients empirically or to validate coefficients determined from first principles. An RM for evaluation of matrix influence or spectral interference should have values obtained from an independent test method or multiple methods of analysis.

Type Standardization - Type standardization is often described as a form of drift correction. In fact, it is both a drift correction and a recalibration of the sensitivity of the calibration model. Laboratories use RMs to adjust a general calibration for a specific alloy or material type.

Carbon Steels, Page 1 of 6

RM#	Grade	UNS	Al	Sb	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo
			Ni	Nb	N	P	Si	S	Sn	Ti	W	V	Zr	Fe Bal.
CPIron-A	CP Iron	K00095	0.001	0.03	0.013	0.0002	0.001	0.001	0.002	<0.001	0.001	<0.005	0.001	0.001
			<0.001	<0.001	<0.001	0.001	0.02	0.001	<0.001	<0.001	<0.001	<0.005	0.001	0.002
CPIron-B	CP Iron	K00095	<0.001	---	<0.001	<0.0001	<0.0001	0.001	<0.001	<0.001	0.20	---	0.015	<0.001
			0.25	<0.001	---	0.004	<0.001	0.001	<0.001	<0.001	---	0.001	---	---
CPIron-C	CP Iron	K00095	0.094	<0.005	0.007	0.005	<0.0005	0.023	0.032	0.004	0.03	<0.005	0.20	0.007
			0.033	<0.001	0.004	<0.0005	0.008	0.020	0.003	<0.001	<0.005	<0.0005	<0.001	---
CPIron-D	CP Iron	K00095	0.001	---	0.001	---	---	0.003	0.001	0.002	0.001	---	---	---
			0.005	---	---	0.003	0.10	0.001	---	---	---	---	---	---
CPIron-E	CP Iron	K00095	0.001	---	<0.001	---	---	0.003	0.002	0.001	---	---	0.003	0.002
			0.004	0.001	---	0.002	0.007	0.001	0.001	<0.001	---	<0.0005	---	---
CPIron-F	CP Iron	K00095	0.001	---	<0.001	---	---	0.003	0.001	0.001	---	---	0.002	0.002
			<0.001	0.002	<0.001	0.003	0.004	0.001	0.001	0.001	---	0.0005	---	---
A36-A	A36 Steel	K02598	0.002	---	0.007	0.002	0.001	0.19	0.01	0.004	0.004	0.012	1.00	0.003
			0.007	0.001	---	0.03	0.19	0.022	0.002	<0.001	<0.005	---	0.002	---
A36-B	A36 Steel	K02598	<0.001	---	---	---	---	0.16	0.09	---	0.36	---	0.76	0.027
			0.09	<0.001	---	0.016	0.21	0.031	0.009	---	---	0.029	---	---
1018-A	AISI 1018	G10180	0.002	---	0.011	0.002	0.001	0.19	0.14	0.007	0.23	<0.005	0.81	0.021
			0.07	0.004	0.005	0.011	0.28	0.032	0.009	0.001	<0.005	---	0.002	---
1018-B	AISI 1018	G10180	0.001	---	0.004	0.0003	---	0.16	0.08	0.007	0.23	---	0.67	0.025
			0.10	---	---	0.008	0.24	0.032	0.009	0.001	<0.005	0.013	<0.001	---
1018-C	AISI 1018	G10180	0.003	---	0.004	0.005	---	0.16	0.085	0.003	0.09	---	0.71	0.019
			0.051	---	---	0.014	0.22	0.013	0.010	---	---	---	---	---
1018-D	AISI 1018	G10180	0.003	---	---	---	---	0.17	0.126	---	0.23	---	0.72	0.02
			0.07	0.002	---	0.016	0.21	0.027	---	---	---	0.004	---	---
1020-A	AISI 1020	G10200	---	<0.005	0.005	0.0002	---	0.23	0.12	0.008	0.18	---	0.56	0.025
			0.085	0.001	---	0.006	0.23	0.025	0.008	---	<0.005	0.020	---	---
1020-B	AISI 1020	G10200	0.003	---	0.004	0.0002	---	0.22	0.15	0.007	0.19	---	0.56	0.029
			0.075	---	---	0.012	0.21	0.018	0.007	<0.001	<0.005	0.035	---	---
1021-C	AISI 1021	G10210	0.001	---	0.008	<0.0002	---	0.15	0.068	0.002	0.32	<0.005	0.70	0.009
			0.07	0.001	---	0.020	0.26	0.035	0.019	0.001	<0.005	0.001	---	---

Carbon Steels, Page 2 of 6

RM#	Grade	UNS	Al	Sb	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo
			Ni	Nb	N	P	Si	S	Sn	Ti	W	V	Zr	Fe Bal.
1022-A	AISI 1022	G10220	0.003			0.0002	0.0018	0.22	0.12		0.22	0.0025	0.89	0.019
			0.078	0.002	0.01	0.009	0.22	0.023	0.009	0.0017		0.034		98.5
1026-A	AISI 1026	G10260	0.001			0.0003	0.0011	0.27	0.157		0.3	0.0035	0.75	0.028
			0.082	0.002	0.0097	0.01	0.18	0.029	0.012	0.0008		0.03		98.5
1030-A	AISI 1030	G10300	0.002	---	0.005	0.004	---	0.34	0.19	---	0.20	<0.005	0.77	0.019
			0.093	0.001	---	0.017	0.25	0.028	0.011	---	0.005	0.042	---	98.0
1030-B	AISI 1030	G10300	0.003	<0.005	0.006	0.0002	---	0.32	0.16	0.007	0.25	<0.005	0.75	0.020
			0.080	0.003	---	0.014	0.26	0.026	0.010	0.001	---	0.040	---	98.0
1030-C	AISI 1030	G10300	0.004	---	0.005	0.0003	0.002	0.33	0.11	0.006	0.18	---	0.75	0.027
			0.14	0.001	---	0.006	0.28	0.017	0.018	0.001	---	0.026	---	98.1
1030-D	AISI 1030	G10300				0.0002		0.32	0.19		0.24		0.84	0.028
			0.10			0.016	0.23	0.019	0.005			0.027		98.4
1040-A	AISI 1040	G10400	0.002	---	0.0014	0.0003	---	0.42	0.19	0.002	0.26	<0.005	0.78	0.027
			0.093	0.002	0.011	0.022	0.23	0.024	0.011	---	0.006	0.032	---	97.9
1040-B	AISI 1040	G10400	0.004					0.41	0.07		0.25		0.73	0.03
			0.10			0.002	0.25	0.031	0.01			0.029		98.5
1045-A	AISI 1045	G10450	0.025	---	0.004	---	---	0.49	0.11	---	0.11	---	0.83	0.020
			0.060	0.002	0.006	0.013	0.24	0.022	0.006	---	<0.005	0.004	---	98.1
1050-A	AISI 1050	G10500	0.023	---	---	0.0002	---	0.49	0.13	0.006	0.19	---	0.77	0.031
			0.089	<0.001	0.007	0.011	0.28	0.020	---	0.002	<0.005	0.003	---	98.0
1080-A	AISI 1080	G10800	0.004	---	0.004	<0.0002	---	0.81	0.14	0.007	0.20	---	0.75	0.022
			0.078	---	0.009	0.014	0.20	0.019	0.007	0.001	<0.005	0.003	0.001	97.7
1117-C	AISI 1117	G11170	0.003	---	---	---	---	0.19	0.090	0.043	0.10	<0.005	1.21	0.023
			0.048	---	0.006	0.013	0.063	0.094	---	---	---	---	---	98.1
1144-C	AISI 1144	G11440	0.0023	---	---	---	---	0.47	0.047	0.008	0.0033	0.027	1.59	0.007
			0.031	---	0.008	0.013	0.20	0.28	---	---	---	---	---	97.3
5Lx42-A	API 5L x42	NA	0.025	---	---	<0.0002	---	0.13	0.18	0.006	0.12	---	1.01	0.05
			0.08	0.002	0.01	0.015	0.19	0.002	0.01	0.002	<0.005	0.064	---	98.1
1522-A	AISI 1522	G15220	0.07	<0.005	0.005	0.0003	---	0.20	0.15	0.005	0.32	<0.005	1.26	0.04
			0.17	0.001	---	0.011	0.26	0.02	0.014	---	<0.005	0.075	---	97.4

Carbon & Low-Alloy Steels, Page 3 of 6

RM#	Grade	UNS	Al	Sb	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo
			Ni	Nb	N	P	Si	S	Sn	Ti	W	V	Zr	Fe Bal.
1524-A	AISI 1524	G15240	0.027	---	---	0.0002	---	0.25	0.11	0.003	0.10	---	1.36	0.043
			0.068	0.001	---	0.011	0.24	0.017	0.005	0.002	<0.005	0.004	---	97.8
1541-A	AISI 1541	G15410	0.036	---	---	0.0003	---	0.37	0.10	0.007	0.23	---	1.39	0.041
			0.079	0.003	---	0.017	0.23	0.030	0.009	0.002	<0.005	0.005	0.001	97.5
1552-A	AISI 1552	G15520	0.001	<0.005	0.006	0.0003	---	0.51	0.09	0.009	0.28	<0.005	1.37	0.04
			0.09	0.001	0.02	0.015	0.24	0.02	0.013	0.002	<0.005	0.026	---	97.3
A70660-A	A706/60	NA	0.002	0.005	0.005	0.0007	0.001	0.29	0.15	0.010	0.32	---	1.23	0.022
			0.12	0.004	0.010	0.017	0.25	0.03	0.012	0.001	0.006	0.031	<0.001	97.5
4130-D	AISI 4130	G41300	0.041	<0.005	---	0.0002	---	0.33	0.94	0.008	0.20	<0.005	0.47	0.17
			0.23	0.002	0.02	0.015	0.28	0.010	0.010	0.002	<0.005	0.005	---	97.3
4140-A	AISI 4140	G41400	0.005	---	---	0.0006	0.0003	0.41	0.96	0.009	0.24	---	0.85	0.18
			0.09	0.002	---	0.008	0.21	0.035	0.009	0.002	<0.005	0.027	---	97.0
4140-B	AISI 4140	G41400	0.006	---	---	0.0005	0.0007	0.41	0.93	0.008	0.23	---	0.94	0.17
			0.09	0.002	---	0.013	0.25	0.034	0.011	0.003	<0.005	0.029	---	96.9
4140-C	AISI 4140	G41400	0.035	---	---	0.0002	---	0.43	0.94	0.01	0.058	---	0.84	0.21
			0.18	0.001	---	0.005	0.28	0.013	0.009	0.003	<0.005	0.004	---	97.0
4140-D	AISI 4140	G41400	0.028	<0.005	0.004	0.001	0.0005	0.42	0.98	0.009	0.17	<0.005	0.92	0.18
			0.080	---	0.008	0.013	0.27	0.023	0.008	0.002	<0.005	0.004	---	96.9
4140-E	AISI 4140	G41400	0.027	<0.005	0.005	0.0003	---	0.42	1.00	0.009	0.14	---	0.95	0.18
			0.083	0.002	0.008	0.011	0.28	0.022	0.007	0.002	<0.005	0.004	0.002	96.9
4340-A	AISI 4340	G43400	0.03	---	0.003	---	---	0.42	0.83	0.007	0.02	---	0.74	0.26
			1.8	0.002	0.006	0.014	0.26	0.005	0.005	0.005	---	0.005	---	95.6
4340-C	AISI 4340	G43400	0.031	<0.005	0.010	0.0052	---	0.38	0.80	0.027	0.088	<0.005	0.69	0.24
			1.71	0.002	0.006	0.004	0.24	0.017	0.004	0.002	<0.005	0.002	---	95.7
4340-D	AISI 4340	G43400	0.027	---	0.005	0.0002	---	0.40	0.82	0.026	0.11	---	0.79	0.20
			1.81	0.002	0.009	0.026	0.29	0.017	0.007	0.017	0.010	0.010	0.002	95.4
4340H-A	AISI 4340H	H43400	0.026	---	0.004	---	---	0.39	0.80	0.010	0.22	---	0.69	0.21
			1.7	0.002	0.005	0.016	0.27	0.011	0.01	0.0013	---	0.003	---	95.6
300M-A	AISI 4340M	K44220	0.06			<0.001	<0.001	0.41	0.76	<0.05	0.17		0.74	0.40
			1.74	0.01	0.002	0.005	1.73	<0.001	0.004	<0.01	<0.05	0.09		97.5

Low-Alloy Steels, Page 4 of 6

RM#	Grade	UNS	Al	Sb	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo
			Ni	Nb	N	P	Si	S	Sn	Ti	W	V	Zr	Fe Bal.
300M-C	AISI 4340M	K44220	0.031	<0.005	0.009	0.0002	---	0.40	0.82	0.009	0.13	0.005	0.83	0.40
			1.75	0.003	---	0.005	1.56	0.003	0.007	0.007	0.007	0.005	0.055	---
4620-C	AISI 4620	G46200	0.022	0.005	0.003	0.005	---	0.21	0.15	0.072	0.18	---	0.62	0.23
			1.74	0.002	---	0.006	0.30	0.014	0.010	0.001	<0.005	---	---	96.4
4820-A	AISI 4820	G48200	0.024	<0.005	0.007	0.0002	---	0.19	0.14	0.01	0.17	<0.005	0.55	0.28
			3.5	0.002	---	0.01	0.26	0.02	0.01	0.0014	<0.005	0.002	---	94.8
4820-B	AISI 4820	G48200	0.038	<0.005	0.005	0.0002	---	0.18	0.15	0.010	0.17	<0.005	0.57	0.20
			3.3	0.002	---	0.006	0.33	0.023	0.009	0.003	<0.005	0.001	---	95.0
4820-C	AISI 4820	G48200	0.030	---	0.005	0.0002	0.001	0.18	0.11	0.013	0.20	<0.005	0.64	0.23
			3.5	0.002	0.007	0.009	0.32	0.016	0.013	0.002	---	---	0.002	94.8
5160-C	AISI 5160	G51600	0.004	<0.005	0.010	0.0002	0.003	0.56	0.95	0.011	0.26	<0.005	0.93	0.042
			0.11	0.052	0.03	0.025	0.25	0.027	0.008	0.002	0.006	0.004	---	96.7
52100-D	AISI 52100	G52986	0.004	<0.005	---	0.0001	---	1.00	1.40	0.011	0.056	---	0.35	0.019
			0.11	<0.001	0.007	0.005	0.29	0.005	0.004	0.005	<0.005	0.011	---	96.7
6150-A	AISI 6150	G61500	0.029	---	---	---	---	0.45	0.97	0.007	0.12	---	0.73	0.065
			0.13	0.0013	---	0.019	0.30	0.01	0.005	0.002	<0.005	0.12	0.0013	97.0
6150-B	AISI 6150	G61500	0.031	<0.005	0.007	0.0002	---	0.49	0.92	0.024	0.16	---	0.83	0.037
			0.13	0.003	---	0.013	0.29	0.016	0.009	0.004	---	0.15	---	96.9
6150-C	AISI 6150	G61500	0.048	<0.005	---	0.0002	---	0.50	0.92	0.009	0.17	<0.005	0.75	0.04
			0.14	0.003	0.007	0.011	0.31	0.011	0.008	0.006	0.005	0.18	---	96.9
6150-D	AISI 6150	G61500	0.032	<0.005	---	---	---	0.50	0.96	0.009	0.22	<0.005	0.85	0.043
			0.11	---	---	0.007	0.25	0.018	0.014	0.001	---	0.16	---	96.8
8620-A	AISI 8620	G86200	0.024	---	---	---	---	0.20	0.57	0.003	0.032	<0.005	0.84	0.18
			0.51	0.001	---	0.02	0.25	0.024	0.001	0.003	<0.005	0.006	---	97.3
8620-B	AISI 8620	G86200	0.024	<0.005	0.005	0.0002	0.001	0.21	0.45	0.009	0.20	---	0.81	0.18
			0.51	0.002	0.006	0.014	0.26	0.032	0.009	0.001	0.005	0.003	---	97.3
8620-C	AISI 8620	G86200	0.028	<0.005	0.01	0.0001	---	0.20	0.52	0.033	0.15	<0.005	0.79	0.16
			0.44	0.002	0.008	0.007	0.23	0.018	0.01	0.0014	<0.005	0.003	---	97.4
8620-D	AISI 8620	G86200	0.012	<0.005	0.017	0.0001	0.001	0.18	0.45	0.012	0.17	<0.005	0.72	0.17
			0.53	0.02	0.007	0.008	0.18	0.025	0.009	0.001	<0.005	0.003	---	97.5

Low-Alloy Steels, Page 5 of 6

RM#	Grade	UNS	Al	Sb	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo
			Ni	Nb	N	P	Si	S	Sn	Ti	W	V	Zr	Fe Bal.
8620-E	AISI 8620	G86200	0.022	0.002	0.004	0.0002	0.0013	0.22	0.47	0.01	0.15	0.001	0.86	0.15
			0.42	0.004	0.009	0.01	0.22	0.024	0.012	0.0018	0.01	0.002	0.002	98.1
8740-A	AISI 8740	G87400	0.02	---	0.004	---	---	0.39	0.49	0.007	0.18	---	0.84	0.21
			0.41	---	0.01	0.023	0.24	0.010	0.007	---	---	0.004	---	97.2
8740-B	AISI 8740	G87400	0.036	---	---	---	---	0.40	0.51	0.012	0.23	---	0.94	0.22
			0.45	---	0.024	0.007	0.29	0.003	0.01	---	---	0.002	---	96.9
8740-C	AISI 8740	G87400	0.021	---	0.003	0.0001	---	0.41	0.49	0.007	0.095	---	0.84	0.21
			0.44	0.002	0.007	0.010	0.26	0.010	0.005	0.001	<0.005	0.003	---	97.2
8740-D	AISI 8740	G87400	0.025	---	0.004	0.0001	---	0.40	0.48	0.008	0.17	---	0.88	0.20
			0.41	0.002	0.008	0.016	0.26	0.011	0.011	0.001	<0.005	0.003	---	97.1
9310-A	AISI 9310	G93106	0.036	---	---	0.001	---	0.13	1.1	0.01	0.15	---	0.62	0.09
			3.1	0.002	---	0.01	0.26	0.002	0.007	0.001	---	0.004	---	94.5
9310-B	AISI 9310	G93106	0.018	---	---	0.0007	0.001	0.10	1.13	0.012	0.15	---	0.62	0.11
			3.10	0.002	---	0.009	0.26	0.001	---	0.002	0.006	0.004	0.002	94.5
9310-C	AISI 9310	G93106	0.008	<0.005	---	0.001	---	0.11	1.21	0.021	0.098	<0.005	0.61	0.12
			3.2	0.002	0.002	0.007	0.27	0.001	0.005	0.002	0.005	0.007	---	94.3
Mang-C	Manganal	J91129	0.025	---	---	---	---	1.03	0.30	0.010	0.055	---	12.8	0.069
			0.32	---	0.012	0.024	0.40	0.017	0.006	0.001	---	---	---	84.9
F11-C	1½Cr-½Mo	K11572	0.029	---	0.009	0.0004	---	0.16	1.19	0.009	0.19	---	0.55	0.44
			0.20	0.002	0.009	0.012	0.67	0.015	0.010	0.003	0.008	0.008	---	96.5
F22-C	2½Cr-1Mo	K21590	0.03	---	---	0.004	0.0005	0.14	2.35	0.018	0.14	<0.005	0.55	0.93
			0.11	0.004	---	0.01	0.30	0.02	0.008	0.002	0.007	0.006	---	95.4
Nit135-A	Nitalloy 135	K24065	1.06					0.414	1.58		0.19		0.60	0.34
			0.11			0.006	0.22	0.004						95.8
Nit135-C	Nitalloy 135	K24065	1.14	0.005	---	0.0004	---	0.40	1.66	0.006	0.11	<0.005	0.60	0.33
			0.14	0.0023	---	0.009	0.31	0.001	0.007	0.015	<0.005	0.009	0.007	95.3
D6A-C	Alloy D-6	K24728	0.011	---	---	0.0003	0.0005	0.46	1.09	0.007	0.079	---	0.78	0.99
			0.60	0.003	---	0.008	0.26	0.002	---	0.001	0.011	0.12	0.001	95.6
D6A-D	Alloy D-6	K24728	0.013	---	---	0.0003	0.0004	0.44	1.07	0.012	0.043	---	0.80	0.99
			0.60	0.003	---	0.008	0.25	0.002	---	0.001	0.009	0.13	0.001	95.6

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RM#	Grade	UNS	Al	Sb	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo
			Ni	Nb	N	P	Si	S	Sn	Ti	W	V	Zr	Fe Bal.
HYTUF-C	HY-TUF	K32550	0.024	---	---	0.0004	---	0.25	0.31	0.025	0.15	<0.005	1.35	0.38
			1.82	0.0015	---	0.012	1.55	0.006	0.010	0.018	0.007	0.006	---	94.1
F5-A	5Cr-½Mo	K41545	0.03	---	---	---	---	0.12	5.02	0.011	0.13	0.01	0.48	0.51
			0.11	0.002	---	0.012	0.41	0.01	0.01	0.003	0.007	0.02	---	93.1
F5-C	5Cr-½Mo	K41545	0.01	<0.005	---	0.0003	0.002	0.13	5.9	0.030	0.87	0.005	0.38	0.70
			0.21	0.005	0.07	0.012	0.37	0.031	0.028	<0.001	0.011	0.17	---	91.1
F9-C	9Cr-1Mo	K90941	0.004	---	---	0.0003	---	0.09	8.6	0.028	0.096	<0.005	0.41	0.92
			0.34	0.008	0.02	0.015	0.63	0.014	0.006	0.001	0.052	0.21	0.002	88.5
LAS1-A	LAS-1	NA	0.26	---	0.005	0.001	---	0.45	1.40	0.004	0.28	---	0.96	0.46
			0.63	0.36	0.005	0.007	0.76	0.004	0.001	0.32	<0.005	0.28	0.002	93.8
LAS1-B	LAS-1	NA	0.21	---	0.002	0.0002	---	0.39	1.30	0.005	0.26	---	0.95	0.42
			0.73	0.21	0.007	0.001	0.67	0.004	---	0.31	<0.005	0.26	0.003	94.3
LAS1-C	LAS-1	NA	0.005	---	0.003	0.0004	---	0.44	1.22	0.006	0.24	---	0.96	0.39
			0.82	0.30	0.004	0.002	0.66	0.002	<0.001	0.23	0.006	0.37	0.003	94.3
LAS2-A	LAS-2	NA	0.22	<0.005	0.005	0.001	---	0.017	1.25	---	0.41	---	1.67	0.82
			0.19	0.09	---	0.01	0.03	0.003	0.001	0.16	0.19	0.35	---	94.6
LAS2-B	LAS-2	NA	0.33	<0.005	0.001	0.0004	---	0.001	1.29	0.006	0.39	<0.005	1.59	0.75
			0.17	0.09	---	---	0.012	0.005	0.001	0.16	0.26	0.39	---	94.6
LAS3-A	LAS-3	NA	0.008	---	0.003	0.0005	---	0.62	4.6	0.006	0.96	---	0.013	1.45
			1.47	0.010	0.004	0.007	1.02	0.003	0.002	0.96	0.010	0.47	---	88.4
LAS3-B	LAS-3	NA	0.006	---	---	---	---	0.62	4.81	0.005	0.93	---	0.005	1.48
			1.37	0.034	---	---	1.02	<0.001	0.002	1.14	0.08	0.44	---	88.1

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RM#	Grade	UNS	Al	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni	Nb
			N	P	Se	Si	S	Ta	Sn	Ti	W	V	Zr	Fe Bal.
M1-D	AISI M-1	T11301	<0.001	0.0007	<0.001	0.81	3.87	0.066	0.082	0.001	0.21	8.57	0.52	<0.001
			---	0.016	0.002	0.42	0.002	<0.01	<0.001	0.002	1.43	1.09	0.003	82.9
M2-D	AISI M-2	T11302	0.015	---	---	0.85	3.9	0.13	0.063	---	0.23	4.7	0.19	0.013
			0.03	0.017	---	0.38	0.003	---	0.007	0.003	6.0	1.8	---	81.6
M4-D	AISI M-4	T11304	0.020	0.001	---	1.29	4.4	0.22	0.08	<0.005	0.19	4.45	0.40	0.015
			---	0.017	---	0.33	0.002	---	0.007	0.003	5.6	4.2	---	78.8
M7-C	AISI M-7	T11307	---	0.0014	0.001	1.00	3.7	0.40	0.091	---	0.28	8.2	0.28	0.021
			---	0.020	---	0.45	0.005	---	0.006	0.006	1.66	1.9	0.013	82.0
M42-D	AISI M-42	T11342	0.024	0.002	0.001	1.08	3.69	8.1	0.071	<0.005	0.25	9.5	0.14	0.023
			---	0.019	---	0.43	<0.001	---	0.004	0.008	1.69	1.10	---	73.9
M50-D	AISI M-50	T11350	0.004	---	---	0.83	4.17	0.011	0.039	---	0.26	4.17	0.075	---
			---	0.013	---	0.17	0.001	---	0.003	0.002	0.007	1.00	---	89.3
MatI-C	Matrix I	NA	0.021	0.001	0.001	0.45	4.6	0.11	0.040	---	0.19	3.0	0.12	0.004
			---	0.014	---	0.18	0.002	<0.01	---	0.001	1.98	0.95	0.002	88.4
MatII-C	Matrix II	NA	0.042	0.001	0.0004	0.53	3.77	8.0	0.058	---	0.19	5.26	0.14	0.016
			---	0.013	---	0.27	0.001	---	---	0.007	1.27	0.91	0.002	79.5
VasDyne-C	VascoDyne	NA	0.02	0.001	---	0.97	3.79	0.52	0.062	<0.01	0.31	4.09	0.24	<0.01
			---	0.02	<0.01	0.94	<0.01	<0.01	<0.01	<0.01	1.52	1.85	0.003	85.7
VasWear-C	VascoWear	NA	0.02	0.001	---	1.07	7.65	0.18	0.051	<0.01	0.35	1.83	0.26	<0.01
			---	0.02	<0.01	1.11	<0.01	<0.01	<0.01	<0.01	1.17	2.35	0.003	83.9
T1-C	AISI T-1	T12001	0.012	---	---	0.80	3.82	0.13	0.07	---	0.37	0.55	0.14	0.005
			0.019	0.024	---	0.33	0.012	---	0.01	0.006	17.6	0.98	---	75.1
T4-C	AISI T-4	T12004	<0.01	0.001	<0.01	0.70	3.90	4.72	0.075	<0.005	0.31	0.54	0.11	0.017
			---	0.018	0.022	0.40	0.009	0.01	0.005	0.011	18.5	0.86	0.002	69.8
T15-C	AISI T-15	T12015	0.012	0.001	---	1.60	4.8	4.9	0.092	---	0.32	0.98	0.31	0.016
			---	0.019	---	0.26	0.002	---	0.010	0.018	12.7	5.0	0.002	69.0
H13-C	AISI H-13	T20813	0.004	---	---	0.38	5.1	0.012	0.044	---	0.43	1.27	0.15	0.005
			0.028	0.011	---	1.00	0.004	---	0.004	0.001	0.011	0.97	---	90.6
A2-E	AISI A-2	T30102	<0.001	<0.0001	<0.001	0.96	4.83	0.021	0.056	0.002	0.68	0.99	0.095	<0.001
			---	0.007	0.003	0.29	0.009	<0.01	0.006	0.002	<0.005	0.23	0.003	91.8

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RM#	Grade	UNS	Al	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni	Nb
			N	P	Se	Si	S	Ta	Sn	Ti	W	V	Zr	Fe Bal.
A2S-C	AISI A-2S		0.001	<0.0001	<0.001	0.95	5.23	0.023	0.049	0.004	0.81	1.08	0.13	<0.001
			---	0.011	0.003	0.42	0.100	<0.01	0.004	0.003	<0.005	0.30	0.013	90.9
A6-C	AISI A-6	T30106	In Process											
A6-D	AISI A-6	T30106	<0.001	0.0003	<0.001	0.66	0.90	0.007	0.053	0.002	1.9	1.27	0.073	<0.001
			---	0.019	0.007	0.28	0.015	<0.01	0.004	0.002	<0.005	<0.001	0.003	94.8
D2-D	AISI D-2	T30402	0.02	---	---	1.52	11.3	0.025	0.067	---	0.30	0.79	0.23	0.006
			0.02	0.019	---	0.39	0.002	---	0.004	0.002	0.011	0.88	---	84.4
D3-C	AISI D-3	T30403	<0.01	0.002	<0.01	2.07	11.9	<0.01	0.023	<0.01	0.28	<0.01	0.41	<0.01
			---	<0.01	<0.01	0.44	<0.01	<0.01	<0.01	<0.01	<0.01	0.031	0.007	84.8
O1-C	AISI O-1	T31501	<0.01	0.001	---	0.97	0.55	<0.01	0.092	<0.01	1.17	0.03	0.07	<0.01
			---	0.01	<0.01	0.34	<0.01	<0.01	<0.01	<0.01	0.50	0.19	0.004	96.1
O2-C	AISI O-2	T31502	<0.01	0.002	<0.01	0.90	0.29	<0.01	0.029	<0.01	1.58	0.18	0.03	<0.01
			---	0.01	0.02	0.33	<0.01	<0.01	<0.01	<0.01		0.078	0.004	96.6
O6-C	AISI O-6	T31506	<0.001	0.0016	<0.001	1.30	0.19	0.005	0.034	0.003	0.80	0.25	0.18	<0.001
			---	0.016	<0.001	0.90	0.020	<0.01	0.007	0.004	<0.005	0.012	0.004	96.3
S2-C	AISI S-2	T41902	<0.01	0.002	<0.01	0.49	0.19	<0.01	0.019	<0.01	0.34	0.47	0.03	<0.01
			---	0.01	0.01	1.08	<0.01	<0.01	<0.01	<0.01		0.002	0.004	97.4
S5-D	AISI S-5	T41905	0.004	0.001	<0.001	0.60	0.14	0.011	0.078	0.004	0.73	0.44	0.111	<0.001
			---	0.002	0.002	1.79	0.003	<0.01	0.012	0.007	<0.005	0.21	0.003	95.9
S7-C	AISI S-7	T41907	<0.01	0.001	<0.01	0.49	3.34	<0.01	0.058	<0.01	0.66	1.42	0.09	<0.01
			---	0.31	<0.01	0.31	<0.01	<0.01	0.02	<0.01	<0.01	0.027	<0.01	93.3
F2-C	AISI F-2	T60602	<0.01	0.002	0.01	1.37	0.20	<0.01	0.038	<0.01	0.13	0.04	0.03	<0.01
			---	0.02	0.02	0.20	<0.01	<0.01	<0.01	<0.01	3.04	0.004	0.004	94.9
L6-C	AISI L-6	T61206	0.022	---	---	0.71	0.96	0.008	0.017	---	0.31	0.026	1.67	---
			---	0.010	---	0.31	0.002	---	---	0.002	---	0.030	---	95.9

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RM#	Grade	UNS	Al	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni
			Nb	N	P	Se	Si	S	Ta	Sn	Ti	W	V	Fe Bal.
T250-C	Alloy T-250	K92150	0.18	---	---	---	0.009	0.022	0.045	0.039	---	0.049	2.82	18.7
			---	---	0.002	---	0.10	0.001	---	0.002	1.25	<0.005	0.009	76.8
C250-A	Alloy C250	K92890	0.09	---	0.003	---	0.003	0.034	8.20	0.006	---	0.011	5.08	17.86
			<0.005	---	0.004	---	0.014	<0.001	---	0.001	0.49	0.010	0.010	68.2
C250-C	Alloy C-250	K92890	0.096	---	---	---	0.006	0.074	8.48	0.072	---	0.016	4.67	18.7
			---	---	0.001	---	0.13	0.001	---	---	0.43	0.005	---	67.4
InvarFC-D	Invar FC	K93050	0.002	---	0.001	---	0.056	0.089	0.038	0.029	---	0.73	0.01	36.1
			---	---	0.01	0.19	0.27	0.001	---	0.002	0.002	---	---	62.5
T300-C	Alloy T-300	NA	0.14	---	---	---	0.008	0.12	0.47	0.21	---	0.027	3.89	18.3
			---	---	0.001	---	0.068	0.002	---	---	1.78	<0.005	---	75.0
C300-C	Alloy C-300	K93120	0.11	---	---	---	0.006	0.092	8.9	0.009	---	0.012	5.02	18.6
			---	---	0.004	---	0.025	0.002	---	---	0.65	0.046	---	66.6
Kovar-C	Kovar	K94610	0.007	---	---	---	0.005	0.14	17.8	0.089	---	0.23	0.084	29.0
			---	---	0.003	---	0.068	0.002	---	0.003	---	---	0.010	52.6
138Mo-D	PH13-8 Mo	S13800	1.05	---	0.0004	---	0.035	12.4	0.072	0.027	---	0.078	2.18	8.4
			---	0.003	0.004	---	0.026	0.001	---	0.003	0.013	0.016	0.003	75.7
155PH-A	15-5 PH	S15500	0.002	---	---	<0.0002	0.045	14.40	0.076	3.23	---	0.49	0.36	4.53
			0.30	0.023	0.026	---	0.34	0.002	---	0.003	0.003	0.031	0.066	76.1
155PH-D	15-5 PH	S15500	0.013	---	0.0002	---	0.032	15.1	0.025	3.27	---	0.40	0.024	4.60
			0.26	0.012	0.015	---	0.42	0.001	---	0.001	0.002	0.017	0.034	75.8
166PH-D	16-6 PH	S16600	0.41	---	0.0004	---	0.040	15.6	0.09	0.08	---	0.80	0.30	7.5
			<0.005	0.011	0.022	---	0.39	0.002	---	0.004	0.46	0.047	0.059	74.2
174PH-D	17-4 PH	S17400	0.003	---	0.001	---	0.041	15.8	0.062	3.32	---	0.37	0.19	4.24
			0.24	0.028	0.022	---	0.52	0.019	---	0.007	0.001	0.027	0.044	75.1
177PH-D	17-7 PH	S17700	0.80	---	0.001	---	0.06	16.7	0.12	0.29	---	0.71	0.36	6.9
			0.19	---	0.02	---	0.44	<0.001	---	0.007	0.037	0.04	0.16	73.1
182FM-C	18-2 FM	S18200	0.001	0.005	0.002	---	0.044	18.2	0.025	0.077	---	1.9	2.1	0.42
			0.009	---	0.019	---	0.44	0.51	---	0.004	0.002	0.017	0.13	76.1
203-C	AISI 203EZ	S20300	0.002	0.008	0.001	---	0.054	16.2	0.070	1.83	---	5.67	0.073	5.8
			0.012	---	0.026	---	0.50	0.36	---	0.010	---	0.016	0.059	69.3

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RM#	Grade	UNS	Al	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni
			Nb	N	P	Se	Si	S	Ta	Sn	Ti	W	V	Fe Bal.
Nit50-A	Nitronic 50	S20910	0.003	---	0.005	0.001	0.035	21.0	0.11	0.30	---	4.85	2.11	12.1
			0.14	0.33	0.026	---	0.38	0.002	---	0.005	0.006	0.083	0.15	58.5
Nit50-D	Nitronic 50	S20910	0.001	---	0.001	0.001	0.021	22.1	0.33	0.15	<0.005	4.8	2.30	12.6
			0.16	0.31	0.021	---	0.43	0.003	---	0.003	0.005	0.049	0.17	56.6
Nit60-A	Nitronic 60	S21800	0.011	---	0.001	---	0.074	16.7	0.074	0.20	---	8.00	0.27	8.2
			0.039	0.16	0.022	---	4.15	0.001	0.01	0.005	0.012	0.019	0.072	62.0
Nit60-B	Nitronic 60	S21800	0.020	---	---	---	0.086	16.4	0.075	0.38	---	7.74	0.28	8.11
			0.026	0.14	0.026	---	4.25	---	---	0.009	0.008	0.023	0.070	62.4
Nit40-C	Nitronic 40	S21900	0.007	---	0.001	---	0.015	19.4	0.06	0.20	---	9.4	0.33	7.1
			0.032	0.31	0.021	---	0.41	0.001	---	0.004	---	0.13	0.12	62.5
1818-C	18-18 Plus	S28200	0.016	---	0.002	---	0.069	17.2	0.026	1.14	---	17.9	0.93	0.76
			---	0.43	0.023	---	0.43	0.003	---	---	0.002	0.017	0.048	61.0
303-D	AISI 303	S30300	0.002	---	0.0004	---	0.06	17.3	0.14	0.38	---	1.9	0.55	8.6
			0.03	0.03	0.03	---	0.66	0.44	---	0.009	0.001	0.10	0.14	69.6
303Se-C	AISI 303Se	S30323	0.003	---	0.0003	---	0.05	17.5	0.19	0.27	---	1.47	0.59	8.96
			0.023	0.034	0.17	0.20	0.54	0.012	---	0.007	0.002	0.14	0.11	69.7
304-A	AISI 304	S30400	---	0.006	0.001	---	0.050	18.3	0.15	0.43	---	1.83	0.41	8.3
			0.010	0.07	0.038	---	0.31	0.025	<0.01	0.011	0.0014	0.033	0.07	70.0
304-B	AISI 304	S30400	0.003	---	0.0003	---	0.052	18.3	0.18	0.44	---	1.83	0.36	8.3
			0.037	0.078	0.031	---	0.31	0.027	---	0.011	0.001	0.051	0.070	70.0
304-C	AISI 304	S30400	0.003	---	---	0.002	0.051	18.4	0.16	0.51	---	1.83	0.37	8.3
			0.011	0.077	0.036	---	0.31	0.026	---	0.012	0.002	0.035	0.070	69.9
304-D	AISI 304	S30400	0.004	---	0.0002	---	0.060	18.2	0.13	0.30	---	0.83	0.32	8.5
			0.010	0.057	0.028	---	0.60	0.023	---	0.006	0.001	0.037	0.062	70.8
304-E	AISI 304	S30400	0.003	0.003	0.0001	0.003	0.049	18.1	0.17	0.41	---	1.84	0.34	8.3
			0.013	0.076	0.025	---	0.32	0.022	<0.01	0.006	0.002	0.058	0.063	70.2
304L-A	AISI 304L	S30403	---	0.007	0.001	---	0.019	18.1	0.14	0.36	---	1.9	0.41	8.3
			0.015	0.10	0.033	---	0.53	0.028	0.01	0.010	0.017	0.17	0.073	69.8
304L-B	AISI 304L	S30403	0.004	---	0.002	---	0.020	16.8	0.11	0.50	---	1.51	2.03	10.3
			0.020	0.062	0.029	---	0.53	0.025	---	0.014	0.018	0.034	0.070	68.7

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RM#	Grade	UNS	Al	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni
			Nb	N	P	Se	Si	S	Ta	Sn	Ti	W	V	Fe Bal.
304L-C	AISI 304L	S30403	0.004	---	---	---	0.023	18.7	0.43	0.46	---	1.33	0.54	9.6
			0.030	0.027	0.024	---	0.43	0.015	---	0.006	0.002	0.044	0.07	68.2
309-A	AISI 309	S30900	0.003	---	0.0007	0.005	0.063	22.8	0.09	0.32	---	1.76	0.22	13.9
			0.031	0.08	0.027	---	0.38	0.003	0.01	0.009	0.003	0.038	0.08	60.2
309-B	AISI 309	S30900	0.005	---	0.0002	---	0.067	22.3	0.24	0.43	---	1.60	0.36	12.4
			0.015	0.056	0.028	---	0.30	0.004	---	0.009	0.003	0.053	0.080	62.1
309-D	AISI 309	S30900	0.008	---	0.0006	0.001	0.063	22.6	0.18	0.12	---	1.95	0.17	13.4
			0.09	0.08	0.022	---	0.37	0.005	---	0.005	0.004	0.039	0.008	60.9
310-A	AISI 310	S31000	0.007	---	0.0005	---	0.046	24.5	0.10	0.27	---	1.40	0.50	19.5
			0.017	0.056	0.027	---	0.68	0.001	---	0.007	0.004	0.10	0.085	52.7
310-B	AISI 310	S31000	0.009	---	0.003	---	0.056	25.0	0.29	0.28	---	1.58	0.38	20.3
			0.057	0.072	0.025	---	0.47	0.006	---	0.004	0.002	0.090	0.073	51.3
310-D	AISI 310	S31000	0.001	0.02	0.004	---	0.056	24.6	0.14	0.13	---	1.66	0.25	20.1
			0.022	0.06	0.023	---	0.45	0.007	0.020	0.002	0.019	0.035	0.07	52.3
254SMO-A	Alloy 254SMO	S31254	0.005	---	0.002	0.0006	0.019	20.1	0.080	0.63	---	0.94	6.18	18.5
			---	0.22	0.027	---	0.32	0.001	---	0.008	0.003	0.045	0.060	52.9
316-A	AISI 316	S31600	0.005	0.001	---	0.001	0.046	16.8	0.31	0.32	---	1.44	2.03	10.0
			0.010	0.051	0.025	---	0.43	0.026	---	0.007	0.002	0.079	0.067	68.3
316-B	AISI 316	S31600	0.005	---	0.001	---	0.047	16.7	0.38	0.38	---	1.45	2.07	10.0
			---	---	0.029	---	0.49	0.028	---	0.008	0.003	0.080	0.053	68.3
316-D	AISI 316	S31600	0.004	---	0.001	---	0.040	17.0	0.42	0.49	---	1.67	2.02	12.1
			0.052	0.041	0.028	---	0.60	0.020	---	0.009	0.003	0.061	0.077	65.4
316L-A	AISI 316L	S31603	0.005	0.007	0.0006	0.002	0.017	16.8	0.30	0.47	---	1.72	2.04	10.2
			0.024	0.07	0.03	---	0.45	0.026	---	0.012	0.003	0.07	0.06	67.7
316L-C	AISI 316L	S31603	0.004	---	0.001	---	0.012	16.6	0.16	0.45	---	1.32	2.24	12.6
			0.015	0.040	0.029	---	0.65	0.014	---	0.013	0.004	0.036	0.064	65.7
316L-D	AISI 316L	S31603	0.005	---	0.001	---	0.016	16.6	0.13	0.37	---	1.45	2.04	10.2
			0.025	0.056	0.032	---	0.59	0.025	---	0.020	0.009	0.023	0.065	68.4
316L-E	AISI 316L	S31603	0.004	---	0.002	---	0.020	16.8	0.11	0.50	---	1.51	2.03	10.3
			0.020	0.062	0.029	---	0.53	0.025	---	0.014	0.018	0.034	0.070	67.9

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RM#	Grade	UNS	Al	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni
			Nb	N	P	Se	Si	S	Ta	Sn	Ti	W	V	Fe Bal.
317L-C	AISI 317L	S31703	0.008	---	0.001	---	0.015	18.4	0.32	0.35	---	1.60	3.14	12.9
			0.028	0.048	0.027	---	0.63	0.013	---	0.004	0.004	0.060	0.11	62.3
321-A	AISI 321	S32100	0.026	0.006	0.002	---	0.044	17.4	0.19	0.45	---	1.48	0.39	9.1
			0.009	0.011	0.033	---	0.45	0.001	0.010	0.014	0.39	0.052	0.081	69.9
321-B	AISI 321	S32100	0.025	0.004	0.001	---	0.043	17.2	0.17	0.39	---	1.43	0.36	9.1
			0.02	0.013	0.03	---	0.40	0.004	---	0.014	0.38	0.03	0.08	70.3
321-D	AISI 321	S32100	0.16	0.005	---	---	0.04	17.4	0.29	0.30	---	1.36	0.39	10.2
			0.02	0.02	0.03	---	0.5	0.001	---	0.01	0.30	---	0.11	68.8
321H-A	AISI 321H	S32109	0.023	---	0.002	0.0002	0.051	17.3	0.13	0.28	---	1.10	0.29	9.63
			0.019	0.012	0.026	---	0.41	0.001	---	0.009	0.47	0.027	0.071	70.1
2205-A	Alloy 2205	S32205	0.004	---	0.003	---	0.021	22.6	0.074	0.38	---	1.49	3.38	5.16
			---	0.15	0.030	---	0.49	0.002	---	0.005	0.002	0.039	0.053	66.1
2507-A	Alloy 2507	S32750	0.007	---	0.002	0.001	0.017	25.6	0.072	0.24	---	0.75	3.67	6.58
			---	0.25	0.023	---	0.48	0.001	---	0.004	0.003	0.056	0.066	62.2
347-A	AISI 347	S34700	---	0.03	0.0005	---	0.05	17.3	0.17	0.48	---	1.44	0.36	9.0
			0.57	0.03	0.036	---	0.35	0.01	0.01	0.01	0.003	0.04	0.06	70.0
347-B	AISI 347	S34700	---	0.049	0.0005	---	0.053	18.3	0.091	0.30	---	1.78	0.20	9.7
			0.73	0.017	0.026	---	0.26	0.005	0.010	0.007	0.003	0.019	0.062	68.4
347-C	AISI 347	S34700					0.045	17.15	0.12			1.85		9.17
			0.56		0.022		0.41	0.0008	0.005					71.7
347-D	AISI 347	S34700	---	---	0.0005	---	0.05	17.64	0.10	0.19	---	1.35	0.32	9.5
			0.61	0.021	0.024	---	0.54	0.003	0.012	0.006	0.002	0.015	0.07	69.5
347H-A	AISI 347H	S34709	0.003	---	0.0004	---	0.12	18.1	0.012	<0.005	---	1.78	0.020	11.1
			1.04	0.015	0.005	---	0.87	0.005	---	0.002	0.006	0.013	0.016	66.9
347H-B	AISI 347H	S34709	0.002	---	<0.0005	---	0.11	18.5	0.005	0.10	---	1.65	0.093	10.3
			0.95	0.030	0.005	---	0.83	0.006	<0.01	---	0.003	0.020	0.015	67.4
355-C	AM 355	S35500	0.023	---	0.001	---	0.12	15.1	0.064	0.13	---	0.69	2.84	4.26
			<0.005	0.085	0.020	---	0.45	0.006	---	0.005	0.001	0.052	0.041	76.1
355-D	AM 355	S35500	0.018	---	0.0005	---	0.12	15.4	0.055	0.19	---	0.75	2.90	4.29
			0.011	0.082	0.020	---	0.47	0.005	---	0.007	0.001	0.029	0.046	75.6

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RM#	Grade	UNS	Al	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni
			Nb	N	P	Se	Si	S	Ta	Sn	Ti	W	V	Fe Bal.
410-A	AISI 410	S41000	---	0.003	0.0003	---	0.14	11.9	0.014	0.074	---	0.40	0.034	0.21
			<0.005	0.02	0.022	---	0.41	0.001	---	0.005	---	---	0.043	86.7
410-D	AISI 410	S41000	---	---	---	---	0.10	12.26	0.021	0.062	---	0.38	0.036	0.34
			0.005	0.023	0.017	---	0.36	0.006	---	---	0.001	---	0.072	86.3
416-D	AISI 416	S41600	---	---	---	---	0.088	12.9	0.020	0.048	---	0.38	0.023	0.16
			---	0.036	0.018	---	0.64	0.34	---	0.007	0.002	---	0.069	85.3
416Se-C	AISI 416Se	S41623	0.002	---	0.0004	0.0003	0.11	13.5	0.015	0.11	---	0.47	0.076	0.25
			<0.005	---	0.022	0.31	0.62	0.022	---	---	0.001	0.019	0.050	84.4
418-C	Greek Ascoloy	S41800	0.002	0.005	---	---	0.17	12.4	0.041	0.11	---	0.33	0.15	1.95
			0.006	0.040	0.018	---	0.34	0.005	---	0.003	---	2.62	0.06	81.7
418-D	Greek Ascoloy	S41800	0.002	0.005	---	---	0.17	12.3	0.029	0.14	---	0.28	0.14	1.90
			<0.005	0.040	0.022	---	0.39	0.004	---	0.003	---	2.48	0.054	82.1
420-C	AISI 420	S42000	0.002	---	---	---	0.32	13.50	0.020	0.047	---	0.34	0.049	0.20
			<0.005	0.020	0.024	---	0.61	0.001	---	0.006	0.003	---	0.072	84.8
420F-C	AISI 420F	S42020	0.002	---	0.001	---	0.25	13.21	0.024	0.077	---	0.42	0.047	0.22
			---	---	0.019	---	0.38	0.28	---	---	0.001	0.006	0.065	85.0
422-A	AISI 422	S42200	0.011	0.004	<0.0005	---	0.23	11.52	0.030	0.096	<0.005	0.62	0.92	0.69
			0.042	0.047	0.016	---	0.43	0.002	<0.01	0.004	0.002	0.91	0.26	84.2
BG42-C	AISI 427	S42700	0.056	---	0.001	0.0004	1.25	14.9	0.017	0.040	---	0.43	4.04	0.12
			---	---	0.011	---	0.35	0.006	---	---	0.003	---	1.27	77.6
430-D	AISI 430	S43000	0.001	0.004	---	---	0.072	16.16	0.026	0.062	---	0.36	0.40	0.22
			0.007	0.044	0.016	---	0.49	0.003	---	0.009	0.005	0.13	0.12	81.9
430F-C	AISI 430F	S43020	0.001	---	0.001	---	0.042	17.3	0.020	0.078	---	0.37	0.27	0.22
			<0.005	0.045	0.020	---	0.57	0.34	---	0.009	0.003	0.012	0.043	80.7
431-C	AISI 431	S43100	---	---	---	---	0.16	16.14	0.012	0.026	---	0.61	0.016	2.40
			0.005	---	0.017	---	0.47	0.004	---	0.007	0.003	---	0.036	80.1
440A-C	AISI 440A	S44002	0.005	---	0.001	---	0.66	17.4	0.021	0.055	---	0.42	0.48	0.17
			---	---	0.016	---	0.34	0.001	---	---	0.003	0.016	0.046	80.4
440C-D	AISI 440C	S44004	---	---	---	---	1.04	16.8	0.029	0.050	---	0.35	0.45	0.15
			<0.005	0.037	0.022	---	0.62	0.001	---	0.012	0.004	---	0.043	80.4

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RM#	Grade	UNS	Al	As	B	Ca	C	Cr	Co	Cu	Pb	Mn	Mo	Ni
			Nb	N	P	Se	Si	S	Ta	Sn	Ti	W	V	Fe Bal.
440FSe-C	AISI 440F Se	S44023	0.004	---	0.0008	0.0006	1.00	16.7	0.029	0.07	---	1.07	0.46	0.26
			0.019	---	0.021	0.26	0.49	0.017	---	---	0.002	0.081	0.14	79.4
443-C	AISI 443	S44300	0.004	---	0.0004	0.001	0.10	20.8	0.023	1.01	---	0.44	0.046	0.27
			0.005	---	0.025	---	0.31	0.008	---	---	0.002	0.009	0.072	76.9

CP Nickel & Nickel Alloys, Page 1 of 3

RM#	Grade	UNS	Al	B	Ca	C	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo
			Nb	N	P	Si	S	Ta	Sn	Ti	W	V	Zr	Ni Bal.
Ni200-D	Nickel 200	N02200	0.029	---	---	0.07	0.001	0.005	0.002	0.07	---	0.008	0.14	0.002
			0.002	---	0.002	0.001	<0.001	---	---	0.004	---	---	---	---
R405-C	Alloy R-405	N04405	0.084	---	---	0.16	0.17	0.20	33.4	1.73	---	0.051	1.14	---
			---	---	0.012	0.13	0.066	---	---	0.013	---	---	---	62.8
K500-C	Alloy K-500	N05500	2.93	---	---	0.16	0.066	0.041	29.4	1.26	---	---	0.56	0.071
			---	---	0.011	0.063	0.005	---	---	0.50	---	0.002	0.021	64.9
X-D	Alloy X	N06002	0.12	0.003	---	0.066	20.9	1.58	0.13	19.2	---	---	0.21	8.86
			0.11	---	0.015	0.21	<0.001	---	---	0.034	0.52	0.023	0.004	48.0
C22-C	Alloy C-22	N06022	0.27	0.002	---	0.002	21.1	0.57	0.066	3.64	---	0.007	0.17	13.8
			0.029	---	0.009	0.034	<0.001	<0.005	---	0.005	3.31	0.18	0.002	56.7
333-D	Alloy 333	N06333	0.009	0.005	0.001	0.059	18.5	0.071	0.15	43.6	---	---	1.52	0.20
			0.039	0.042	0.015	1.20	0.003	<0.005	0.003	0.017	0.049	0.086	0.001	34.4
600-A	Alloy 600	N06600	0.17	0.003	---	0.069	15.8	0.048	0.09	9.3	---	0.008	0.23	0.17
			0.04	---	0.008	0.09	0.001	---	---	0.30	0.05	0.033	0.002	73.6
600-B	Alloy 600	N06600	0.19	---	---	0.071	15.3	0.026	0.030	8.53	---	---	0.47	0.034
			0.034	---	0.009	0.18	0.001	0.026	---	0.21	---	0.026	0.007	74.8
600-D	Alloy 600	N06600	0.13	0.002	---	0.040	15.28	0.065	0.028	8.5	---	0.007	0.25	0.035
			0.035	---	0.006	0.31	<0.001	---	---	0.24	0.006	0.024	0.002	75.0
625-A	Alloy 625	N06625	0.28	0.001	---	0.028	22.2	0.05	0.014	4.8	---	0.002	0.11	9.0
			3.4	---	0.006	0.11	<0.001	0.007	0.002	0.31	0.042	0.008	---	59.6
625-B	Alloy 625	N06625	0.20	0.002	---	0.050	22.2	0.10	0.024	3.74	---	0.006	0.057	8.9
			3.60	---	0.004	0.10	<0.001	<0.005	---	0.25	0.023	0.019	<0.001	60.8
625-D	Alloy 625	N06625	0.094	0.001	---	0.03	21.9	0.064	0.27	4.25	<0.005	0.002	0.11	8.9
			3.54	0.011	0.009	0.28	<0.001	<0.005	0.002	0.21	0.021	0.015	0.001	60.3
G3-C	Alloy G-3	N06985	0.21	0.0011	---	0.006	22.4	2.02	1.96	19.8	---	0.006	0.80	6.72
			0.42	---	0.013	0.68	0.001	---	---	0.010	0.68	0.06	<0.001	44.3
Wasp-C	Waspalloy	N07001	1.28	0.005	---	0.038	19.16	12.93	0.016	1.99	---	---	0.026	4.22
			0.034	---	0.003	0.046	0.001	0.012	---	3.02	0.043	0.072	0.048	57.0
Wasp-D	Waspalloy	N07001	1.26	0.006	---	0.033	19.17	12.44	0.014	0.79	---	---	0.017	4.26
			0.032	---	0.003	0.035	0.001	---	---	3.07	0.038	0.055	0.052	58.7

Nickel Alloys, Page 2 of 3

RM#	Grade	UNS	Al	B	Ca	C	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo
			Nb	N	P	Si	S	Ta	Sn	Ti	W	V	Zr	Ni Bal.
282-A	Alloy 282	N07208	In Process											
U500-C	Udimet 500	N07500	2.94	0.007	---	0.070	19.0	17.9	0.003	0.95	---	0.002	0.006	4.12
			0.044	---	0.002	0.020	0.001	0.013	---	3.00	0.025	---	0.006	51.8
U500-D	Udimet 500	N07500	3.1	0.008	---	0.084	18.5	17.3	0.001	0.080	<0.005	<0.007	0.002	3.5
			<0.05	0.001	0.001	0.030	0.001	<0.05	<0.001	3.0	<0.10	<0.005	0.009	54.4
R26-C	Refractaloy 26	NA	0.17	0.004	---	0.047	18.3	19.1	0.14	19.9	---	---	0.11	3.32
			0.024	---	0.012	0.096	---	---	---	2.69	0.016	0.044	---	36.1
I700-C	AllVac I-700	NA	2.97	0.006	---	0.12	14.6	28.5	0.015	0.87	---	0.002	0.007	3.72
			0.034	---	<0.001	0.035	<0.001	0.010	---	2.51	0.012	0.014	0.078	46.4
718-A	Alloy 718	N07718	0.51	0.002	---	0.023	18.0	0.19	0.040	17.9	---	---	0.09	3.01
			4.95	---	0.007	0.082	<0.001	<0.005	0.005	0.90	0.029	0.039	0.004	54.2
718-B	Alloy 718	N07718	0.51	0.0036	---	0.021	17.7	0.14	0.030	18.6	---	0.001	0.063	2.89
			5.04	---	0.008	0.070	<0.001	0.008	0.005	0.95	0.024	0.023	0.004	53.9
718-D	Alloy 718	N07718	0.49	0.004	---	0.040	18.1	0.038	0.023	19.2	---	---	0.11	3.05
			5.2	---	0.009	0.09	0.001	<0.005	---	0.98	0.023	0.048	0.002	52.6
X750-D	Alloy X750	N07750	0.81	0.003	---	0.051	15.87	0.042	0.28	6.89	---	---	0.12	0.010
			0.95	---	0.005	0.28	0.001	<0.005	---	2.52	0.014	0.026	0.036	72.1
751-C	Alloy 751	N07751	1.24	0.018	---	0.066	15.3	0.001	0.022	8.38	---	---	0.059	0.095
			0.95	---	0.006	0.10	0.001	0.016	---	2.38	0.022	0.036	0.035	71.3
20Cb3-C	Alloy 20	N08020	0.009	0.002	---	0.023	18.8	0.12	3.43	40.7	---	---	0.32	2.22
			0.50	0.023	0.021	0.52	0.003	---	---	0.001	0.039	0.08	---	33.2
20Cb3-D	Alloy 20	N08020	0.012	0.002	---	0.021	19.8	0.38	3.27	39.0	---	---	0.43	2.09
			0.49	0.017	0.016	0.24	0.002	---	---	0.001	0.095	0.070	---	34.1
028-A	Alloy 028	N08028	0.086	0.001	---	0.020	27.1	0.17	0.80	34.0	(0.004)	0.005	1.62	3.47
			0.089	0.010	0.013	0.46	0.002	0.013	0.003	0.078	0.11	0.089	0.001	31.9
330-C	Alloy 330	N08330	0.017	0.005	0.001	0.059	18.7	0.18	0.17	42.4	---	---	1.53	0.29
			0.031	0.044	0.021	1.17	0.002	0.005	0.004	0.023	0.049	0.088	0.001	35.2
330-D	Alloy 330	N08330	0.009	0.005	0.001	0.059	18.5	0.071	0.15	43.6	---	---	1.52	0.20
			0.039	0.042	0.015	1.20	0.003	<0.005	0.003	0.017	0.049	0.086	0.001	34.4

Nickel Alloys, Page 3 of 3

RM#	Grade	UNS	Al	B	Ca	C	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo
			Nb	N	P	Si	S	Ta	Sn	Ti	W	V	Zr	Ni Bal.
800-C	Alloy 800	N08800	0.47	0.0003	---	0.078	20.0	0.046	0.41	43.3	---	---	0.80	0.12
			0.042	---	0.013	0.29	0.001	---	---	0.36	0.007	0.051	---	34.1
800H-C	Alloy 800H	N08810	0.53	0.0004	---	0.079	20.0	0.046	0.26	45.1	---	---	0.91	0.063
			0.020	---	0.012	0.42	0.001	---	---	0.56	0.009	0.045	---	32.0
825-A	Alloy 825	N08825	0.078	0.003	---	0.012	22.3	0.078	2.09	31.0	<0.005	---	0.46	3.24
			0.035	---	0.015	0.41	0.001	---	0.004	1.05	0.10	0.055	0.001	39.0

Cobalt Alloys, Page 1 of 1

RM#	Grade	UNS	Al	B	Ca	C	Cr	Cu	Fe	Pb	Mg	Mn	Mo	Ni
			Nb	N	P	Si	S	Ta	Sn	Ti	W	V	Zr	Co Bal.
6B-E	Alloy 6B	R30016	0.077	0.002	---	1.14	29.7	0.008	0.98	---	---	1.53	0.77	2.46
			0.021	---	0.006	0.65	<0.001	0.025	---	0.009	4.15	0.010	---	58.4
188-D	Alloy 188	R30188	0.11	0.002	---	0.12	22.1	0.029	1.54	---	---	0.93	0.49	23.8
			0.023	---	0.008	0.41	0.001	---	---	0.010	13.81	---	---	36.7
L605-D	Alloy L605	R30605	0.067	0.002	---	0.10	20.4	0.011	2.31	---	---	1.86	0.33	10.7
			0.082	---	0.009	0.28	0.001	0.021	---	0.020	15.6	0.014	---	48.3

CP Copper & Copper, Brass & Bronze Alloys, Page 1 of 3

RM#	Grade	UNS	Al	Sb	As	Be	Bi	Cd	C	Cr	Co	Fe	Pb	Mg
			Mn	Ni	Nb	P	Se	Si	Ag	S	Te	Sn	Zn	Cu Bal.
110-Q	CDA 110	C11000	0.001	<0.005	<0.005	---	---	---	---	---	<0.005	0.001	---	---
			---	---	---	0.001	<0.005	<0.001	---	0.001	0.001	---	0.001	99.99
14510-C	CDA 145	C14500	---	---	---	---	---	---	---	---	<0.005	0.003	<0.005	---
			0.001	<0.005	---	0.013	---	0.001	---	0.001	0.70	0.002	---	99.28
170-C	CDA 170	C17000	0.055	<0.005	<0.005	1.78	<0.005	0.001	0.003	0.003	0.23	0.09	---	0.010
			0.004	0.031	---	0.004	---	0.081	0.005	<0.001	---	0.009	---	97.70
172-C	CDA 172	C17200	0.086	<0.005	---	1.82	---	---	0.004	---	0.23	0.075	<0.005	---
			0.002	0.027	---	0.004	---	0.073	0.003	<0.001	---	---	0.006	97.6
173-C	CDA 173	C17300	0.040	<0.005	---	1.85	---	---	---	0.003	0.22	0.071	0.22	---
			0.001	0.018	---	0.004	---	0.09	0.003	<0.001	---	0.004	0.005	97.5
320-C	CDA 320	C32000	---	0.005	<0.005	---	<0.005	---	---	---	<0.005	0.016	1.55	---
			---	0.021	---	0.004	---	0.002	---	0.003	---	0.020	12.1	86.3
360-C	CDA 360	C36000	---	0.006	<0.005	---	<0.005	0.003	---	0.001	<0.005	0.043	2.63	---
			---	0.031	---	0.002	---	---	0.005	---	---	0.034	35.9	61.3
360-D	CDA 360	C36000	---	0.013	<0.005	---	<0.005	0.003	---	0.001	<0.005	0.14	3.3	---
			---	0.091	---	0.003	---	---	0.005	---	---	0.22	35.2	61.0
360-E	CDA 360	C36000	---	0.011	<0.005	---	<0.005	0.002	---	---	---	0.12	3.23	---
			0.002	0.17	---	0.002	---	---	0.003	0.001	---	0.091	35.8	60.6
464-C	CDA 464	C46400	---	0.011	0.018	---	<0.005	---	---	0.001	---	0.028	0.077	---
			---	0.012	---	0.005	---	0.006	---	0.002	---	0.97	38.1	60.8
482-C	CDA 482	C48200	---	<0.005	<0.005	---	<0.005	---	---	0.003	<0.005	0.022	0.66	---
			---	0.010	---	0.003	---	0.081	---	0.002	---	0.68	38.6	60.0
485-A	CDA 485	C48500	0.002	---	0.021	---	---	---	0.003	---	---	0.027	1.7	---
			0.003	<0.005	---	0.005	---	0.003	---	0.021	---	0.73	36.7	60.7
485-C	CDA 485	C48500	---	<0.005	0.010	---	<0.005	0.015	---	0.001	0.009	0.07	1.9	---
			0.008	0.012	---	0.003	---	0.003	0.004	0.003	---	0.62	36.0	61.4
510-D	CDA 510	C51000	---	---	---	---	---	---	---	---	---	0.008	0.011	---
			0.01	<0.005	---	0.096	---	0.005	---	---	---	4.8	0.012	95.0
544-C	CDA 544	C54400	---	0.011	<0.005	---	---	0.007	---	---	---	0.002	3.86	---
			---	0.046	---	0.12	---	---	0.002	0.009	---	4.11	2.42	89.4

Copper, Brass & Bronze Alloys, Page 2 of 3

RM#	Grade	UNS	Al	Sb	As	Be	Bi	Cd	C	Cr	Co	Fe	Pb	Mg
			Mn	Ni	Nb	P	Se	Si	Ag	S	Te	Sn	Zn	Cu Bal.
619-C	CDA 619	C61900	9.9	---	<0.005	---	---	---	0.004	---	---	3.17	0.011	---
			0.015	0.034	---	0.007	---	0.018	---	---	---	---	0.013	0.086
623-C	CDA 623	C62300	9.2	0.010	0.007	---	<0.005	0.002	---	0.002	---	2.19	---	---
			0.25	0.09	---	0.007	0.014	0.006	<0.001	0.002	0.004	0.004	0.027	---
630-A	CDA 630	C63000	9.8	---	---	---	---	---	---	0.005	---	3.6	0.01	---
			0.74	4.8	---	0.007	---	0.03	---	---	---	---	0.02	0.07
630-D	CDA 630	C63000	9.9	---	0.006	---	---	---	0.01	0.006	0.006	3.3	0.005	---
			0.62	4.8	---	0.004	---	0.04	---	---	0.003	0.006	0.16	81.1
642-C	CDA 642	C64200	6.8	<0.005	0.008	---	---	---	0.002	0.005	0.005	0.21	0.023	---
			0.12	0.10	---	0.007	---	1.73	0.002	0.001	---	0.006	0.12	90.8
642-D	CDA 642	C64200	6.33	---	0.079	---	---	---	---	0.001	---	0.041	<0.005	<0.001
			0.006	0.007	---	0.003	---	1.86	---	0.001	---	0.004	0.24	91.4
651-D	CDA 651	C65100	---	---	---	---	---	---	---	---	---	0.012	<0.005	---
			0.45	---	---	---	---	1.43	---	0.001	---	0.001	0.14	98.0
655-D	CDA 655	C65500	0.002	<0.005	<0.005	---	---	---	---	0.002	---	0.022	---	---
			0.77	0.006	---	0.003	---	3.16	0.002	0.002	---	0.041	0.011	96.0
673-C	CDA 673	C67300	0.006	0.005	<0.005	---	---	---	---	---	0.020	0.048	0.55	---
			2.34	0.035	---	0.010	---	0.87	0.004	---	---	---	0.063	34.0
675-C	CDA 675	C67500	---	<0.005	0.023	---	---	---	---	0.005	---	0.9	0.061	---
			0.27	---	---	---	---	---	---	0.001	---	0.81	39.4	58.5
706-E	CDA 706	C70600	---	---	---	---	<0.005	---	0.009	0.003	---	1.34	<0.005	<0.001
			0.56	10.4	---	0.007	---	0.002	---	0.004	---	0.002	0.004	87.7
715-C	CDA 715	C71500	0.008	---	<0.005	---	---	---	---	0.003	0.018	0.58	0.006	0.017
			0.45	30.5	---	0.004	---	0.013	0.003	0.003	---	---	0.14	68.3
715-D	CDA 715	C71500	0.007	---	<0.005	---	---	---	---	0.003	0.016	0.60	<0.005	0.004
			0.67	30.5	---	0.003	---	0.005	0.002	0.003	---	---	0.05	68.1
836-D	CDA 836	C83600	---	0.12	0.022	---	0.007	---	---	---	---	0.040	5.07	---
			0.001	0.20	---	0.008	---	0.002	---	0.046	---	5.28	4.02	85.2
858-C	CDA 858	C85800	---	0.010	0.009	---	<0.005	0.010	---	---	---	0.08	0.65	---
			0.003	0.079	---	0.001	---	0.001	0.003	0.004	---	0.75	39.2	59.2

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RM#	Grade	UNS	Al	Sb	As	Be	Bi	Cd	C	Cr	Co	Fe	Pb	Mg
			Mn	Ni	Nb	P	Se	Si	Ag	S	Te	Sn	Zn	Cu Bal.
863-C	CDA 863	C86300	5.24	<0.005	<0.005	---	---	<0.001	---	0.004	<0.005	2.23	0.014	0.001
			3.01	0.30	---	---	<0.005	0.064	0.016	0.001	---	0.009	24.5	64.6
863-D	CDA 863	C86300	5.34	<0.005	<0.005	---	---	<0.001	---	0.004	<0.005	2.2	0.014	0.001
			2.97	0.30	---	---	<0.005	0.060	0.015	0.001	---	0.01	24.9	64.2
903-C	CDA 903	C90300	---	0.009	0.013	---	---	---	---	---	0.012	0.031	0.19	---
			---	0.52	---	0.062	---	---	0.006	0.014	---	8.7	3.33	87.1
903-D	CDA 903	C90300	---	0.006	0.008	---	---	---	---	---	---	0.08	0.050	---
			---	0.59	---	0.12	---	---	0.007	0.007	---	8.2	3.98	87.0
932-A	CDA 932	C93200	---	0.16	0.007	---	0.018	---	---	---	<0.005	0.030	6.7	---
			0.003	0.44	---	0.015	---	---	---	0.032	---	6.4	3.5	82.6
932-E	CDA 932	C93200	---	0.16	0.025	---	---	---	---	---	---	0.08	6.78	---
			---	0.14	---	0.040	---	---	0.017	0.043	---	6.9	3.97	81.9
937-D	CDA 937	C93700	---	0.37	0.005	---	0.044	---	0.009	---	<0.005	---	9.5	---
			0.009	0.44	---	0.051	---	---	---	0.029	0.02	9.7	0.81	79.1
954-D	CDA 954	C95400	10.3	0.013	<0.005	---	---	---	---	---	---	4.27	0.33	---
			0.14	0.35	---	0.050	---	0.065	0.003	0.003	---	0.13	0.10	84.2

CP Titanium & Titanium Alloys, Page 1 of 1

RM#	Grade	UNS	Al	B	C	Cr	Co	Cu	H	Fe	Mn	Mo	Ni
			Nb	N	O	Pd	Si	Ta	Sn	V	Y	Zr	Ti Bal.
TiCP2-D	Ti CP-2 (Gr 3)	R50550	0.05	---	0.006	0.004	---	0.001	(0.001)	0.10	0.01	0.005	0.01
			---	<0.005	0.16	---	0.005	---	0.016	0.006	---	0.007	99.8
Ti52.5-D	Ti 5-2.5	R54520	5.4	---	0.022	0.009	---	0.004	0.009	0.33	---	---	0.018
			---	0.014	0.15	---	0.006	---	2.5	0.012	---	0.004	94.2
Ti6242-A	Ti 6-2-4-2	R54620	6.1	---	---	0.006	---	---	0.020	---	2.0	0.006	---
			---	---	---	0.18	---	1.9	0.015	---	4.0	---	91.8
Ti6242-D	Ti 6-2-4-2	R54620	5.9	---	0.008	0.003	---	0.003	0.011	0.15	---	2.0	0.002
			---	<0.005	0.12	---	0.05	---	1.9	0.016	---	3.8	91.9
Ti811-A	Ti 8-1-1	R54810	7.8	---	---	---	---	0.001	---	0.085	---	1.04	---
			<0.005	0.005	---	---	0.022	---	0.006	1.04	---	<0.005	90.0
Ti64-A	Ti 6-4 (Gr 5)	R56400	6.6	---	0.04	0.003	---	---	0.002	0.19	---	---	0.003
			---	0.026	0.18	---	0.021	---	---	4.2	---	---	93.2
Ti64-E	Ti 6-4 (Gr 5)	R56400	6.3	---	0.011	---	---	0.002	0.007	0.15	---	0.004	0.012
			---	0.007	0.19	---	0.022	---	0.009	4.1	---	---	93.6
Ti662-D	Ti 6-6-2	R56620	5.5	---	0.012	0.007	---	0.68	0.006	0.56	0.003	0.019	0.007
			---	0.013	0.2	---	0.08	---	2.0	5.5	---	0.001	93.2

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RM#	Grade	UNS	Sb	Be	Bi	Cd	Ca	Cr	Cu	Ga	Fe	Pb	Li
			Mg	Mn	Ni	P	Si	Sn	Ti	V	Zn	Zr	Al Bal.
6060-A	AA6060	A96060	---	---	0.001	0.0002	0.0005	0.005	0.013	0.014	0.22	0.002	---
			0.49	0.011	0.005	---	0.43	---	0.021	0.006	0.012	---	98.8
6060-B	AA6060	A96060	---	---	0.001	0.0002	0.002	0.015	0.021	0.009	0.3703	0.002	---
			0.49	0.051	0.011	---	0.49	---	0.016	0.011	0.033	---	98.5
6061-A	AA6061	A96061	---	---	0.002	---	---	0.15	0.18	---	0.61	---	---
			0.92	0.10	0.004	---	0.74	---	0.049	0.015	0.13	---	97.1
6061-B	AA6061	A96061	---	---	0.008	---	---	0.053	0.28	---	0.36	---	---
			0.91	0.061	0.012	---	0.74	---	0.021	0.010	0.10	---	97.4
6262-A	AA6262	A96262	0.011	0.002	0.48	0.001	0.001	0.12	0.30	0.012	0.41	0.60	---
			1.04	0.14	0.003	0.008	0.70	0.002	0.026	0.011	0.063	---	96.1
6262-B	AA6262	A96262	---	---	0.56	0.001	0.001	0.10	0.37	0.010	0.32	0.66	---
			1.01	0.14	0.004	0.008	0.76	---	0.021	0.014	0.014	---	96.0