



ARMI | MBH

Catalog of Reference Materials
and Sample Preparation Equipment



LGC



Quality

Over 1,400 reference materials
20 different alloy groups

Our certification process is accredited to ISO 17034 for reference material producers and includes both homogeneity testing of candidate material, and chemical analysis of major and trace elements using a wide range of analytical methods including XRF, ICP-OES, ICP-MS, Arc-Spark Optical Emission, GD-AES and GD-MS.

Chemical analyses are performed in our state-of-the-art laboratory accredited to ISO/IEC 17025 using XRF, ICP-OES and ICP-MS, as well as through a network of external laboratories through the use of multiple analytical techniques.

This approach insures that we produce high quality reference materials with the largest number of certified elements while limiting inter-technique biases.

#MeasureTheDifference

**ISO
17034**

**ISO/IEC
17025**

**ISO
9001**

**ISO
17043**

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Our Facility

ARMI | MBH is a producer of high quality reference materials for the chemical analysis of metal alloys.

Our reference materials are available in disc and chip forms to suit various analytical techniques including Optical Emission (OE), X-ray Fluorescence spectrometry (XRF), and Inductively Coupled Plasma (ICP). Custom forms are available upon request.

We recognize that sample preparation along with reference materials are critical components in producing high quality analytical data.

We therefore provide sample preparation equipment including disc and pendulum grinders for the surface preparation of metal samples for XRF and OE analysis, fusion systems for the preparation of powdered materials for XRF analysis, and a unique ColdBlock™ digestion system for ICP and AA sample preparation.



ARMI.com

#MeasureTheDifference

ARMI | MBH is part of the wider LGC Standards family. LGC is the UK's designated National Measurement Institute for chemical and bioanalytical measurements.

With 2,600 professionals working in 21 countries, our analytical measurement and quality control services are second to none.

As a global leader, LGC provides the widest range of reference materials available from any single supplier.

When you make a decision using our resources, you can be sure it's based on precise, robust data.

Together, we're creating fairer, safer, more confident societies worldwide.



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Science for a safer world



Available Matrices include:

Cast Iron

Carbon Steel

Low Alloy Steel

Stainless Steel

Tool Steel

Nickel Alloy

Cobalt Alloy

Copper Alloy

Foundry Aluminum Alloy

Magnesium Alloy

Titanium Alloy

Wrought Aluminum Alloy

Zinc Alloy

Tin

Lead

Magnesium

Cast Iron

Part Number	Grade	Description	Ag	Al	As	B	Bi	C	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	P	Pb	S	Sb	Se	Si	Sn	Te	Ti	V	W	Zn	Zr
11XSG2A	Spheroidal Graphite	Grey Cast Iron		0.0238	0.0022			3.48		0.0304	0.0245	0.055	0.297				0.0263	0.0353		0.0075			3.03			0.0146			0.040	
11XAR5K	Abrasion Resistant	White Cast Iron		0.120				3.20	0.34	8.83	0.0517		0.535	0.149		0.027	5.15	0.0405	0.0035	0.0215			1.695			0.062	0.0533	0.073		
11X15294V	Chromium	White Cast Iron						2.29	0.124	30.82	0.134		0.467	0.325			0.649	0.093	0.0084	0.031			0.399	0.0560		0.117	0.293			
11X15295R	Chromium	White Cast Iron						2.52	1.510	27.53	0.197		0.491	0.391		(0.036)	0.304	0.0504	(0.015)	0.0413			0.589	0.047		0.201	0.195			
11X15309S	Chromium	White Cast Iron						3.05	0.032	23.26	0.505		1.506	0.249		0.0192	0.919	0.040		0.086			1.398			0.0156	0.056	0.015		
11X0331.1J	Corrosion Resistant	White Cast Iron		0.122				2.82	0.1117	0.607	7.59		1.646	0.120		0.149	12.43	0.069	0.0327	0.13			2.50	0.0439		0.1099				
11X0331.2K	Corrosion Resistant	White Cast Iron		0.191				2.64	0.161	1.025	6.47		1.272	0.0644		0.104	14.26	0.049	0.0205	0.119			2.32	0.0205		0.14	0.0158			
11X0331.3H	Corrosion Resistant	White Cast Iron		0.0323				2.08	0.126	1.530	7.01		0.756	0.0381		0.071	16.51	0.0459	0.0088	0.056			1.83	0.0098		0.075	0.0386			
11X20001J†	Corrosion Resistant	White Cast Iron						2.90		1.50	0.01		0.58				21.4	0.005		0.143			1.01							
11X20002J†	Corrosion Resistant	White Cast Iron						2.67		2.03	0.30		1.06				20.0	0.060		0.045			2.04							
11X20003K†	Corrosion Resistant	White Cast Iron						2.91		2.53	0.52		1.53				17.8	0.174		0.007			3.03							
11XS/1Cr3J	Corrosion Resistant	White Cast Iron						2.91		1.61	9.01		0.861				14.53	0.072		0.023			1.07							



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Cast Iron

Cast Iron

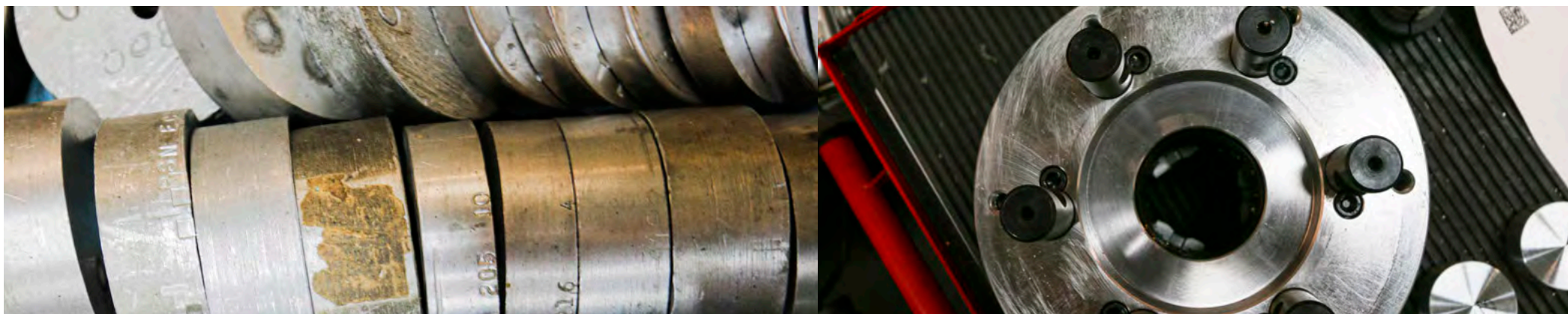
Part Number	Grade	Description	Ag	Al	As	B	Bi	C	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	P	Pb	S	Sb	Se	Si	Sn	Te	Ti	V	W	Zn	Zr
11XHPC1H	High Phosphorus	White Cast Iron						3.29		1.056			0.620	0.060				0.808		0.0035			3.27							
11XHPC2L	High Phosphorus	White Cast Iron						3.18		1.509	0.0460		1.005	0.0354		0.0354	0.388	1.51		0.0418			2.20			0.0502	0.0350			
11XHPC5A	High Phosphorus	White Cast Iron						3.68		1.42			1.028					0.246		0.223			1.175							
11XC1R	Low Alloy	White Cast Iron		0.0195	0.0141	0.0357	0.011	2.91	0.0694	0.250	0.132		1.350	0.0278	0.0091	0.09	0.557	0.102	0.005	0.057	0.046	0.0050	1.49	0.0391		0.112	0.109	0.100	0.0097	0.0030
11XC10D **	Low Alloy	White Cast Iron		0.021	0.022	0.003		3.40	0.059	0.415	0.645		0.750	0.290	0.007		0.880	0.104	0.0027	0.083	0.038		1.94	0.036		0.047	0.103	0.325		
11XC2V	Low Alloy	White Cast Iron		0.104	0.0541	0.0098	0.0084	3.17	0.116	1.126	0.191		1.23	0.116	0.0096	0.0160	1.803	0.256	0.0133	0.077	0.115	0.0157	1.180	0.0627		0.0870	0.328	0.0228	0.0115	
11XC3AD	Low Alloy	White Cast Iron		0.0104	0.086	0.0253	0.0124	3.45	0.240	1.669	0.351		0.896	0.235	0.0075	0.021	4.34	0.539	0.0170	0.180	0.243	0.028	1.06	0.166		0.127	0.605	0.040	0.007	
11XC4S	Low Alloy	White Cast Iron		0.006	0.0235	0.0351	0.0070	1.954	0.0210	1.382	0.095		0.565	0.177	0.0126	0.0233	3.21	0.1014	0.034	0.096	0.0055	0.009	2.98	0.0140		0.080	0.0165	0.099	0.0037	
11XC5Y	Low Alloy	White Cast Iron		0.060	0.0203	0.0058	0.005	2.78	0.0495	0.950	0.542		0.754	0.443	0.0094	0.020	1.186	0.092	0.0108	0.092	0.030	0.0072	1.913	0.0357	(0.002)	0.0934	0.0739	0.0072	0.0107	(0.002)
11XC7P	Low Alloy	White Cast Iron	(0.026)	0.029	0.0110	0.0099		3.24	0.0068	0.61	0.072		2.214	0.0401	0.0153	0.0195	0.0273	0.0587	0.0106	0.0081	0.009		0.604	0.0110		0.064	0.0081	0.053	0.0152	
11XC8V	Low Alloy	White Cast Iron		0.086	0.0812	0.0366	0.014	2.60	0.126	0.148	0.310		0.394	0.148	0.0065	0.0217	0.275	1.00	0.0052	0.204	0.069	0.0210	1.643	0.1063	0.0049	0.235	0.064	0.0258	0.0068	0.0064
11XC9D	Low Alloy	White Cast Iron		0.051	0.068	0.0049		3.24	0.1301	1.206	0.581		1.886	0.155		0.0766	2.79	0.069	0.0052	0.0260	0.149		1.462	0.040	0.011	(0.062)	0.359	0.304	0.009	



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; ++ = Unsuitable for use with glow discharge systems

Carbon Steel

Part Number	Grade	UNS	Form	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
213B>	A36	K02600		0.0009	0.006	0.0002		0.153	(0.0001)		0.008	0.138	0.28		0.78	0.035	0.0094	0.002	0.149	0.009	0.0094	(0.001)	0.041			0.214	0.01		0.0009	0.016	0.003	0.0029	0.0013
213C	A36	K02600		0.0019	0.0058	0.0003		0.201	0.0014		0.0074	0.099	0.149		0.922	0.022	0.0116	0.0011	0.068	0.0042	0.007	0.0011	0.025	0.002		0.25	0.0081	(0.007)	0.001	0.035	0.002	(0.006)	(0.0004)
213D	A36	K02600		0.003	(0.006)	(0.0004)		0.158	(<0.001)		0.009	0.093	0.207		0.725	0.0131	0.008	0.0012	0.076	(0.01)	0.012	(<0.001)	0.031	(0.0032)		0.226	0.0147	(<0.005)	0.0011	0.001	0.003	(0.002)	(0.0015)
12X 10180B	AISI 1018	G10180	W	0.043	0.0059			0.169				0.0451	0.0544		0.722	0.0062	0.0071		0.0333		0.0101		0.0056			0.114	0.0065					0.0079	
12X 10180C	AISI 1018	G10180	W	0.0198	0.0029			0.171				0.0793	0.0500		0.803	0.0047	0.0051		0.0284		0.0150		0.0200			0.147	0.0024					0.0005	
12X 10180D	AISI 1018	G10180	W	(0.003)	0.0068			0.179			0.0070	0.0251	0.0663		0.807	0.0026	0.0070		0.0531		0.0153		0.0259			0.286	0.0033						
28A*	AISI 1018	G10180		0.003	(0.006)	(0.0001)		0.2	(0.0004)		0.01	0.15	0.247		0.69	0.031	0.0113	0.002	0.099	(0.0106)	0.011	(<0.005)	0.023	(<0.01)		0.22	0.011		0.002	0.006	(0.012)		(0.002)
28B*	AISI 1018	G10180		0.0037	0.008	0.0002		0.18	(0.002)		0.011	0.13	0.36		0.75	0.029	0.0094	0.002	0.13	0.007	0.01	(<0.01)	0.029			0.23	0.014		0.002	(0.002)	(<0.01)		(<0.005)
28C*	AISI 1018	G10180		0.01	0.004	0.0002		0.16			0.008	0.073	0.23		0.76	0.042	0.0084	0.0014	0.24	0.0074	0.011		0.011			0.25	0.016		0.001	0.024	(0.004)		
28D*	AISI 1018	G10180		0.011	0.0039	0.0002		0.17			0.009	0.081	0.11		0.8	0.025	0.0079	0.002	0.09	0.006	0.01		0.016			0.27	0.008		0.001	0.019	(0.003)		
28E*	AISI 1018	G10180		0.011	0.007	0.0001		0.169	(0.0003)		0.008	0.079	0.12		0.68	0.033	0.0088	0.001	0.145	0.0052	0.009	(<0.001)	0.0026	(<0.001)		0.171	0.01		0.001	0.019	0.002		(<0.002)
28J	AISI 1018	G10180		0.003	0.0064	0.0003		0.17	0.0006		0.007	0.111	0.27	(0.0005)	0.82	0.024	0.0067	0.0011	0.087	0.0017	0.019		0.029	(0.003)		0.286	0.013	(0.002)	0.0015	0.0016	0.005	(0.001)	0.0012
28K	AISI 1018	G10180		0.0019	(0.005)	(0.0004)	(<0.001)	0.174	(<0.001)	(<0.001)	0.006	0.107	0.17	(<0.005)	0.805	0.0209	0.008	0.0015	0.064	(0.0029)	0.012	(0.0005)	0.027	(0.002)	(<0.005)	0.29	0.008	(<0.008)	(0.0014)	0.001	(0.0023)	(<0.003)	(0.00016)
359A	AISI 1026	G10260		0.002	0.0073	0.0003		0.267	0.0013		0.0069	0.121	0.186	(0.0005)	0.686	0.023	0.0094	0.002	0.068	0.0044	0.0094	(0.001)	0.02	(0.002)		0.233	0.01		0.0009	0.027	(0.001)		(0.001)

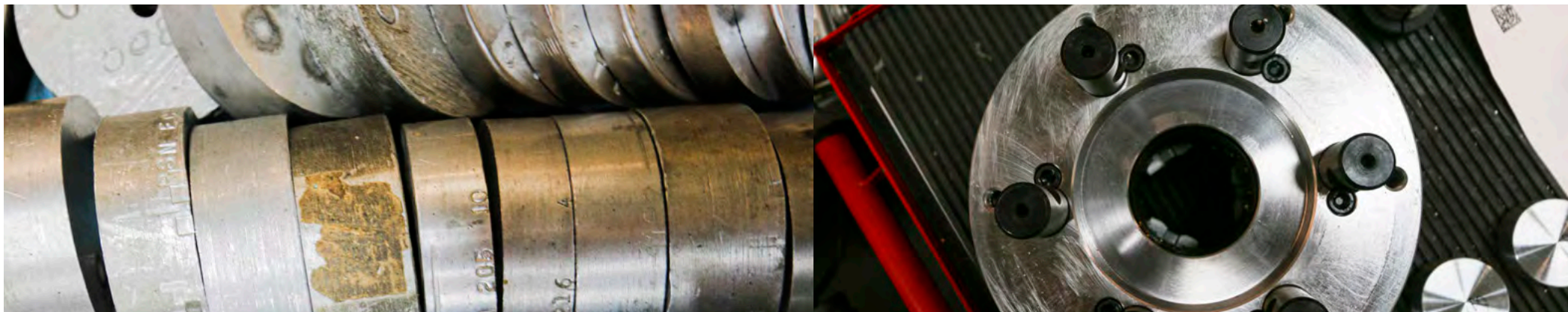


Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Carbon Steel

Carbon Steel

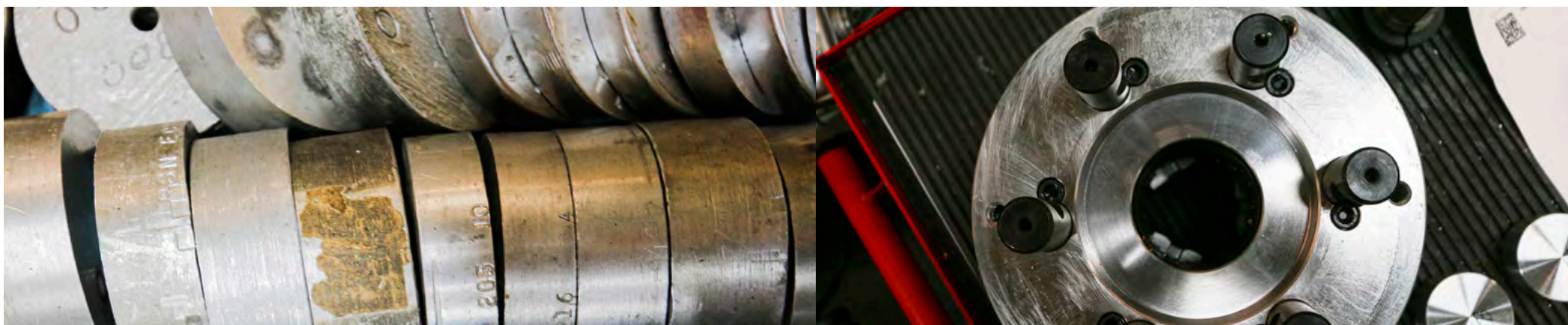
Part Number	Grade	UNS	Form	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
209D	AISI 1030	G10300		0.003	0.006	0.0002		0.322	0.002		0.007	0.137	0.243		0.68	0.037	0.0107	0.0014	0.079	0.005	0.0084	0.001	0.021	0.004		0.268	0.012		0.0011	0.042	0.002	(0.003)	
360A	AISI 1035	G10350		0.0016	0.006	0.0004		0.331	0.0017		0.0067	0.113	0.235	(0.0003)	0.733	0.024	0.0102	0.0015	0.078	0.004	0.008	(0.001)	0.023	0.0023		0.26	0.01		0.001	0.039	(0.001)	(0.003)	(0.001)
210D	AISI 1040	G10400		0.002	0.0059	0.0004		0.412	0.0009		0.007	0.096	0.273	(0.001)	0.73	0.034	0.011	0.001	0.122	0.0034	0.0052	0.001	0.03	0.002		0.23	0.01		0.0104	0.024	0.002		(0.001)
12X 10400 A	AISI 1040	G10400	W	0.0323	0.0068			0.420				0.139	0.140		0.754	0.0169	0.0133		0.0631		0.0137		0.0305			0.220	0.0127					0.0033	
200D	AISI 1045	G10450		0.004	0.005	(0.0002)		0.453	(0.0009)		0.007	0.109	0.232	(<0.001)	0.749	0.0217	0.009	0.001	0.097	(0.004)	0.0103	(<0.002)	0.024	(0.0019)		0.225	0.0079	(<0.005)	0.00013	0.0244	0.003	(0.002)	(0.001)
254A*	AISI 1050	G10500		0.025	0.005	0.0002		0.5	0.001		0.006	0.05	0.091		0.78	0.013	0.0096	0.001	0.044	(0.003)	0.01	(0.0003)	0.024	(0.004)		0.211	0.005		0.001	0.002	(0.001)		(0.001)
12X 10550 A	AISI 1055	G10550	W	0.0325	0.0059			0.549				0.338	0.0290		0.685	0.0086	0.0051		0.0247		0.0184		0.0055			0.281	0.0018					(0.002)	
373A	AISI 1060	G10600		0.002	0.0046	0.0003		0.625	0.0005		0.005	0.096	0.107	(0.0004)	0.7	0.0176	0.0088	0.001	0.048	0.002	0.0123	(0.001)	0.031	(0.002)		0.22	0.0069		0.0017	0.023	0.002	(0.003)	(0.003)
12X 15180 A	AISI 1518	G15180	W	0.018	0.0117			0.170				0.118	0.141		1.196	0.0231	0.0051		0.1030		0.0110		0.0022			0.212	0.0115					0.0016	
12X 15240 A	AISI 1524	G15240	W	0.0188	0.0106			0.201				0.1032	0.200		1.496	0.0166	0.0070		0.0761		0.0152		0.0201			0.198	0.0153			0.0020		0.0020	
349A	AISI 1541	G15410		0.002	0.005	0.0003		0.41	0.0015		0.0085	0.189	0.3	(0.0004)	1.49	0.059	0.01	0.0012	0.178	0.003	0.011	(0.001)	0.025	0.003		0.192	0.015	(0.007)	0.0013	0.027	0.004	(0.003)	(0.002)
12X 12700 A			C	0.055	0.0060			0.365			0.0047	0.070	0.0342		0.636	0.0345	0.0073		0.0197		0.0205		0.0116			0.238				0.0033		0.0120	
12X 12701 A			C	0.0426	0.0060			0.330			0.0058	0.235	0.0346		0.636	0.0163	0.0072		0.0557		0.0218		0.0124			0.308				0.0040		0.0014	



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Carbon Steel

Part Number	Grade	UNS	Form	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
12X 12746 V			W	0.459	0.051			0.048			0.142	0.374	0.646		1.198	0.658			0.226		0.0347		0.064		0.156	0.264		0.088	0.0208	0.105			
12X 12747 V			CC	0.0271	0.0075			0.201			0.211	0.58	0.232		1.240	0.606	0.025		0.494		0.0648		0.0275		0.298	0.144		0.099	0.0272	0.0276			
12X 12748 U			W	0.111	0.129			0.106			0.323	0.401	0.347		0.902	0.329			0.376		0.0309		0.050		0.221	0.080		0.105	0.0499	0.0464			
12X 12749 X**			W	0.195	0.085			0.175			0.435	0.455	0.25		1.37	0.19			0.475		0.025		0.062		0.47	0.018		0.018	0.069	0.035			
12X 12750 U			W	0.253				0.258			0.581	0.792	0.106		0.510	0.088	0.111	0.786		0.0078		0.0053		0.599	0.110		0.159	0.102	0.100				
12X 349 E			CC	0.154	0.0107			0.319			0.0194	0.131	0.156		0.600	0.077			0.216		0.0119		0.0128		0.256	0.115		0.090	0.0262	0.093			
12X 350 C			CC	0.290	0.057			0.159			0.0304	0.335	0.196		0.758	0.147			0.160		0.0296		0.0408		0.467	0.0382		0.076	0.0115	0.260			
12X 352 E**			W	0.26	0.028			0.35			0.025	0.245	0.12		0.81	0.22	0.055	0.34		0.067		0.095		0.43	0.11		0.24	0.024	0.27				
12X 353 G			W	0.0485	0.0461		0.0246	0.111			0.0240	0.701	0.232		0.726	0.1063	0.0027	0.0641	0.214		0.0099		0.0147	0.138	0.0192	0.207	0.113		0.0387	0.0189	0.135		
12X 354 B			W	0.0150	0.023			0.252			0.0237	0.0487	0.0679		5.03	0.0328	0.0027	0.0802	0.082		0.0478		0.0105		0.200	0.0154		0.0248	0.0204	0.0248			
12X 355 C			W	0.1104	0.0331			0.159			0.0495	0.113	0.657		0.508	0.1010	0.0023	0.023	0.0710		0.0214		0.0241	0.0796	0.0395	0.494	0.0564		0.153	0.1265	0.037		
12X 356 D**			CC	0.034	0.025		0.005	0.23			0.11	0.24	0.40		0.32	0.030	0.011	0.017	0.070		0.058		0.037	0.021	0.009	0.24	0.038		0.015	0.07	0.087	0.011	
12X 357 C			W	0.208	0.0147		0.0058	0.270			0.199	0.094	0.265		0.220	0.0105	0.0079	0.0051	0.0954		0.0101		0.0590	0.0140	0.004	0.153	0.0188		0.0569	0.166	0.0194	0.0094	
12X 358 A			W	0.0616	0.0393		0.0102	0.129			0.0355	0.625	0.250		0.709	0.108	0.0029	0.104	0.212		0.0102		0.0142	0.128	0.097	0.199	0.117		0.0453	0.0261	0.123		



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Free Machining/Rephosphorized/Resulfurized Carbon Steel

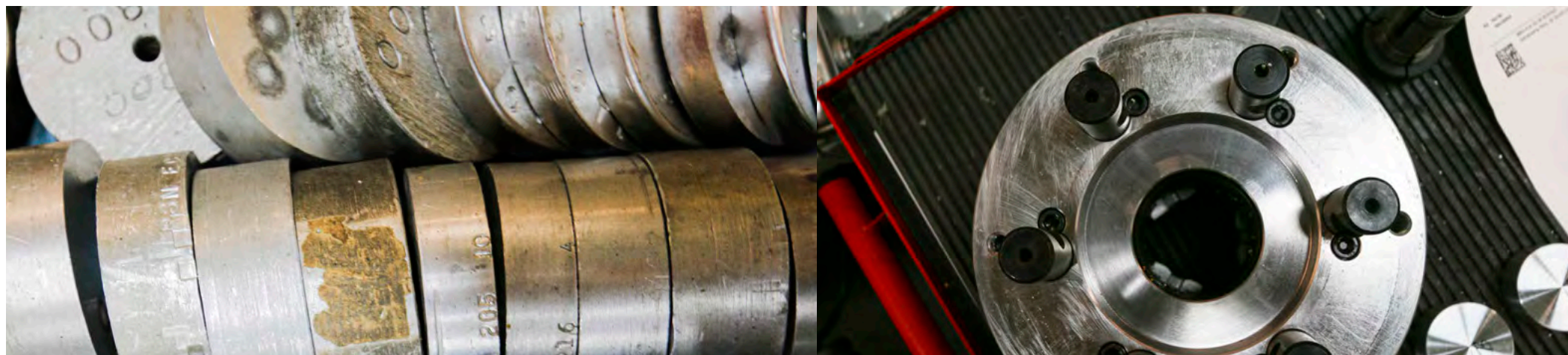
Free Machining/Rephosphorized/Resulfurized Carbon Steel

Part Number	Grade	UNS	Form	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
183C	AISI 12L14	G12144		0.0021	0.003	0.0011	(<0.001)	0.079			(0.002)	0.055	0.016	(<0.0005)	1.06	0.01	0.0049	0.001	0.019	0.016	0.078	0.18	0.31	(0.001)		0.004	0.003	(<0.001)	0.0009	0.002	(0.002)	(<0.001)	0.001
29C*	AISI 1117	G11170		0.003	0.009	(0.003)		0.18			(0.01)	0.076	0.15		1.2	0.016	0.01	(0.003)	0.075	0.005	0.011	(<0.001)	0.13			0.28	0.008		0.0015	0.003	(0.002)		
29E	AISI 1117	G11170		0.0032	0.0085	0.0007	(<0.013)	0.193	0.0012		0.008	0.105	0.253	(0.0003)	1.19	0.0269	0.0093	0.0024	0.082	0.005	0.0157	0.001	0.121	0.003	(0.0006)	0.239	0.0109	(0.0004)	0.0014	0.0255	(<0.007)	(0.004)	(<0.004)
307A	AISI 1118	G11180		0.032	0.008	(<0.005)	(<0.02)	0.163	(<0.0005)	(<0.001)	0.01	0.104	0.19	(<0.006)	1.44	0.045	0.0108	(0.002)	0.197	0.003	0.0113	0.002	0.096	(<0.004)	(<0.006)	0.281	0.009	(<0.005)	0.0015	0.0028	(0.005)	(<0.002)	(0.002)
307B	AISI 1118	G11180		0.034	(0.008)	(0.0005)	(<0.014)	0.162	(<0.001)	(<0.001)	0.0101	0.105	0.191	(<0.005)	1.45	0.045	0.011	0.0013	0.195	(0.004)	0.012	(0.006)	0.094	(<0.006)	(<0.005)	0.3	0.01	(<0.008)	0.003	0.003	(0.005)	(<0.004)	(0.004)
348A	AISI 1141	G11410		0.002	0.007	0.0013	(<0.02)	0.384	0.001	(<0.001)	0.01	0.123	0.23	(<0.006)	1.46	0.026	0.01	0.027	0.081	0.003	0.0121	(0.002)	0.102	(0.003)	(<0.005)	0.27	0.0112	(<0.008)	0.0015	0.0029	(0.009)	(<0.003)	(0.003)
199C	AISI 1144	G11440		0.0019	0.0059	(0.003)		0.469	(0.0011)		0.007	0.19	0.193	(0.0002)	1.55	0.0293	0.007	0.0016	0.085	0.0037	0.0155	0.001	0.281	(0.003)	(<0.006)	0.21	0.0084	(0.0007)	0.0016	0.0037	0.0023	(0.0006)	(<0.0040)
206B	AISI 1215	G12150		0.0025	0.0045	0.0006		0.074			0.007	0.038	0.113		1.01	0.018	0.0075	0.002	0.053	0.016	0.05	(0.001)	0.293	(0.002)		0.012	0.0064		0.0008	0.0016	(0.003)		0.002
14X 12130 A	AISI 1213	G12130	W	0.0024	0.0016			0.0871				0.0505	0.0201		1.219	0.0102	0.0097		0.0345		0.061		0.305			0.022	0.0054						
14X 12144 A	AISI 12L14	G12144	W	0.0034	0.0022			0.0800				0.0807	0.0106		1.227	0.0089	0.0066		0.0162		0.0630	0.328	0.325			0.0093							
14X 11170 A	AISI 1117	G11170	W	0.0023	0.0044			0.154				0.1126	0.1101		1.129	0.0317	0.0112		0.0877		0.0133	0.0011	0.120			0.151	0.0110						
14X 11390 A	AISI 1139	G11390	W	0.0026	0.0028			0.419				0.0609	0.0395		1.040	0.0067	0.0042		0.0239		0.0342		0.191			0.198	0.0022						
14X 606M36T A			W	0.0071	0.0085			0.378				0.163	0.179		1.574	0.272	0.0096		0.0931		0.0159		0.196			0.167	0.0103						
14XMSFM1L			CC	(0.08)				0.143			0.0509	0.89	0.1073		1.155	0.264	0.026		0.147		0.0689		0.414			0.404	0.0289			0.0154			
14XMSFM2K			CC	0.123				0.272			0.104	0.996	0.162		1.568	0.355	0.028		0.235		0.0491		0.248			0.353	0.0218			0.0324			
14XMSFM3 G			CC	(0.18)		0.0043		0.438			0.0494	0.454	0.205		1.809	0.390	0.0206		0.161		0.0297		0.147			0.292	0.0378			0.0199			
14XMSFM4 A			CC	(0.007)				0.226			0.0253	1.69	0.429		1.141	0.974	0.0220		6.22		0.0386		0.224			0.469	0.0141			0.0151			

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Low Alloy Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
12X16604A	1.6604			0.0111				0.299			0.0366	1.912	0.131		0.444	0.334	0.0046		1.892		0.0064		0.0018			0.239	0.0060			0.0069			
12X826M40A	1.6745			0.0404	0.0056			0.395				0.649	0.1294		0.529	0.510	0.0089		2.408		0.0094		0.0025			0.248	0.0085						
12X835M30A	1.6747			0.004	0.0068			0.275				1.119	0.195		0.457	0.213	0.0087		4.01		0.0071		0.0157			0.198	0.0101		0.0012	0.0029			
12X722M24A	1.7361			0.0187	0.0075			0.236				3.094	0.200		0.510	0.497			0.208		0.0135		0.0199			0.262	0.0116			0.0080		0.0028	
12X15CDV6A	1.7734			0.019	0.0041			0.171				1.397	0.0231		0.839	0.875	0.0069		0.044		0.0056		0.0086			0.152	0.0011			0.242			
12X40CDV12A	1.8523			0.0208	0.0040			0.401			0.0197	3.29	0.0978		0.604	0.946	0.0155		0.1062		0.0060		0.0013			0.250	0.0049			0.198			
12X19MNV56A	19MNV56			0.0101				0.174				0.1087	0.203		1.563	0.0270	0.0210		0.110		0.0114		0.0245			0.357	0.0214			0.0939			
12X605M36A	605M36			0.0105	0.0102			0.373	0.0033		0.0151	0.243	0.199		1.504	0.292	0.0095		0.146		(0.009)		0.0317			0.283	0.0101						
340A	AISI 300M		K44220	0.062	0.004	0.0004		0.414	(0.0004)		0.006	0.84	0.103	(0.0002)	0.755	0.39	0.002	0.015	1.8	(0.001)	0.011	(0.001)	0.001	0.0021		1.63	0.005		0.0098	0.064	0.005	(0.0001)	(0.002)
12X44220A	AISI 300M		K44220	0.029	0.0026			0.417				0.846	0.031		0.874	0.401	0.0030		1.89		0.0050		0.0009			1.662	0.0019			0.0764			
12X4330VA	AISI 4330V		J24045	0.0311	0.0059			0.327				0.922	0.0954		0.857	0.470	0.0078		1.99		0.0062		0.0030			0.303	0.0071			0.0507			
12X61500A	AISI 6150		G61500	(0.007)	0.0067			0.530				1.023	0.157		0.912	0.0195			0.0976		0.0104		0.0102			0.240	0.0114			0.110		0.0055	
12X86200A	AISI 8620		G86200	0.0305	0.0051			0.198				0.602	0.213		0.849	0.224	0.0091		0.598		0.0110		0.0104			0.299	0.0100			0.0045			

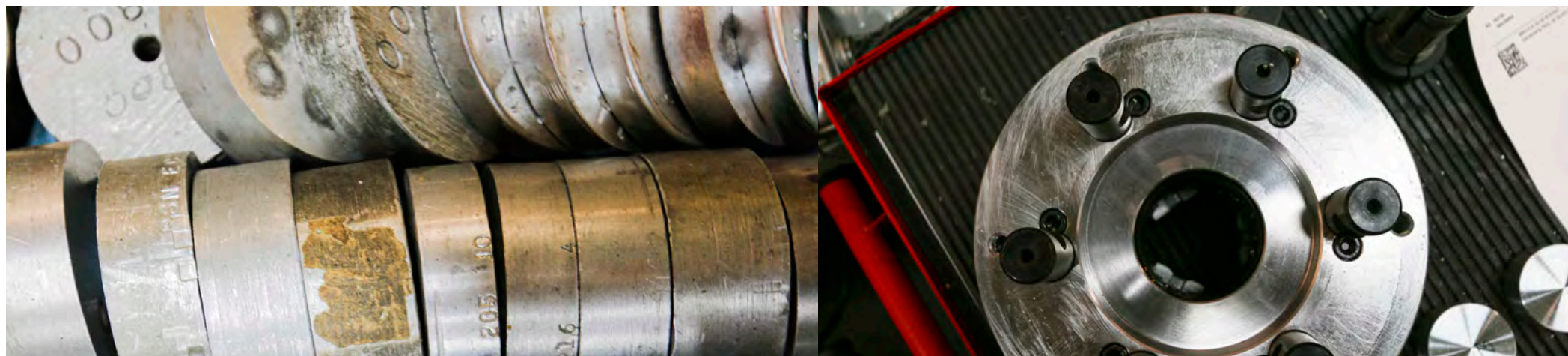


Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Low Alloy Steel

Low Alloy Steel

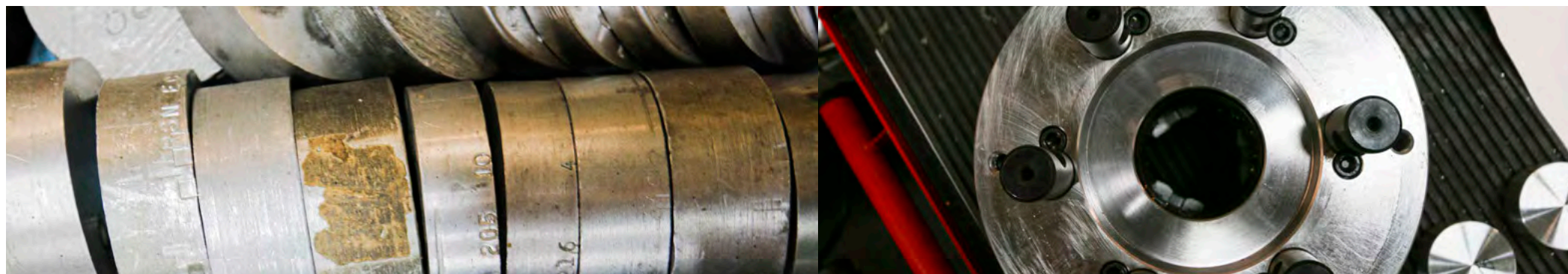
Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr	
12X93106A	AISI E9310		G93106	0.0246	0.0050			0.122				1.107	0.199		0.605	0.0879	0.0098		3.255		0.0071		0.0103			0.206	0.0094			0.0030				
229B	ASTMA182 Grade F1		K12822	0.025	0.002	0.0006	(<0.0005)	0.22	(0.0003)		0.0116	0.017	0.0153	(<0.001)	0.858	0.495	0.0072	0.0019	0.03	0.0017	0.0073	0.0005	0.0106	(0.0006)	(<0.0012)	0.329	0.0012	(0.003)	0.0019	0.0059	0.003	(<0.003)	0.0008	
35A*	ASTMA182 Grade F11 Class 2		K11572	0.028	(0.003)	(0.0002)		0.12	(0.0002)		0.008	1.23	0.078		0.52	0.49	0.0081	0.003	0.088	(0.0014)	0.005	(<0.005)	0.006			0.61	0.004		0.002	0.02			(0.002)	
35B*	ASTMA182 Grade F11 Class 2		K11572	0.016	0.006	0.0005		0.13	0.0001		0.008	1.12	0.11		0.45	0.46	0.0079	0.003	0.084	0.0016	0.006	(<0.01)	0.015			0.58	0.006		0.003	0.005	(<0.01)			(<0.005)
35C*	ASTMA182 Grade F11 Class 2		K11572	0.029	0.008	0.0004		0.115	(0.0004)		0.011	1.09	0.271		0.44	0.52	0.0093	0.002	0.102	0.0016	0.012	(0.001)	0.014	(0.005)		0.56	0.017		0.003	0.005	(0.005)			(0.002)
35L	ASTMA182 Grade F11 Class 2		K11572	0.017	0.0045	0.00044	(<0.001)	0.119	(<0.002)	(<0.001)	0.007	1.35	0.123	(<0.003)	0.535	0.607	0.0072	0.0026	0.071	(<0.005)	0.007	(<0.001)	0.014	(0.003)	(<0.002)	0.679	0.0088	(<0.002)	0.0015	0.0037	0.004	(<0.002)	(<0.004)	
12X11572A	ASTMA182 Grade F11 Class 2		K11572	0.0290	0.0030			0.111				1.107	0.0576		0.498	0.499	0.0058		0.0977		0.0069		0.0025			0.649	0.0049					0.0009		
36B*	ASTMA182 Grade F22		K21590	0.03	0.009	(0.0002)		0.14	0.0002		0.012	2.18	0.13		0.49	0.95	0.0102	0.004	0.18	0.0018	0.01	(0.003)	0.0038			0.21	0.008		0.003	0.006	(<0.01)			(<0.005)
36C	ASTMA182 Grade F22		K21590	0.017	0.005	(<0.01)	(<0.01)	0.14	(<0.001)	(<0.001)	0.008	2.43	0.142	(<0.003)	0.49	0.98	0.008	(0.004)	0.085	(0.004)	0.009	(<0.001)	0.014	(<0.002)	(<0.002)	0.25	0.008		(0.0022)	0.0061	(<0.006)	(<0.004)	(<0.004)	
12X21590A	ASTMA182 Grade F22		K21590	0.0202	0.0091			0.139				2.10	0.283		0.457	0.935	0.0134		0.144		0.0128		0.0059			0.211	0.0190		0.0011	0.0032		0.0045		
37C	ASTMA182 Grade F5a		K42544	0.01	0.009	(0.0003)	(<0.03)	0.096	(<0.002)		0.015	4.34	0.121	(<0.001)	0.408	0.5	0.008	0.004	0.148	(<0.02)	0.014	(<0.002)	0.004	(<0.01)	(<0.006)	0.31	0.009	(<0.002)	0.0025	0.017	0.012	(<0.008)	(0.002)	
38A*	ASTMA182 Grade F9		K90941	0.009	(0.023)	(0.0003)		0.13	(0.0005)		0.029	8.67	0.15		0.41	0.96	0.019	0.008	0.24	(0.0050)	0.008		0.018	(0.001)		0.38	0.014		0.003	0.02	(0.023)			(0.003)



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Low Alloy Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
38B*	ASTM A182 Grade F9		K90941	0.032	0.01	0.0004		0.13	0.0005		0.017	8.84	0.119		0.427	0.94	0.0192	0.007	0.15	0.003	0.023	(<0.001)	0.013	0.01		0.78	0.01		0.004	0.014	(0.01)		0.003
12X 14072 A	ASTM A193 B16		K14072	0.0039				0.430			0.0098	1.061	0.203		0.680	0.573	0.0103		0.136		0.0151		0.0061			0.322	(0.011)		0.301				
FeT23-18	ASTM A213 Grade T23		K40712			0.002		0.068			0.085	2.47	0.046		0.82	0.261	0.003	0.052	0.53	0.0044	0.012		0.006			0.18	0.004		0.004	0.238	1.6		
12X 19965 A	ASTM A485 Grade 3		K19965	0.0256				0.936				1.713	0.148		0.600	0.210	0.0087		0.141		0.0196		0.0081			0.247	0.0070		0.0087		0.0008		
321A*	Grade 722			0.004	0.0052	0.0008		0.53	0.0016		0.007	0.24	0.212		1.53	0.026	0.01	0.0017	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*	Grade 755			0.002	0.005	0.0009		0.317	0.0019		0.006	0.159	0.33		1.4	0.021			0.28	0.006	0.009	(0.001)	0.021	0.0027		0.42	0.016		0.0016	0.124	0.003		(0.001)
342A	Hy-TUF		K32550	0.019	0.006	0.0004		0.257	(0.0001)		0.008	0.38	0.11	(0.0002)	1.37	0.42	0.102	(0.002)	1.76	0.0006	0.006	0.0008	0.0051	0.0021		1.63	0.021		0.0028	0.023	(0.005)	(0.001)	(0.002)
12X 32550 A	HY-TUF		K32550	0.0178	0.0054			0.257				0.377	0.108		1.350	0.417	0.0101		1.750		0.0061		0.0054			1.59	0.0206		0.0222				
12X 24065 A	Nitralloy 135		K24065	1.035	0.0074			0.370				1.412	0.216		0.502	0.1716	0.0076		0.271		0.0129		0.0044			0.218	0.0120		0.0028	0.0040		0.0033	
196A	SPC 3			0.015	0.025	0.0017		1.08	0.0002			2.35	0.25		2.4	0.129	0.0084	0.087	0.61	0.0021	0.04	0.001	0.014	0.006		0.35	0.033		0.014	0.157	0.189		0.006
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	0.127	(0.015)	0.011	(<0.003)	0.035			0.21	0.01		(<0.001)	0.047	0.01		(<0.001)
12X 15217 R				0.081				0.166			0.193	1.011	0.257		0.885	0.311	0.014	0.102	0.860		0.064		0.078			1.392	0.058		0.607	0.100			
12X 15251 U				0.1085				1.017			0.228	0.612	0.1194		0.910	0.205	0.0031	0.266	0.896		0.0253		0.0215			2.05	0.0108		0.391	0.0393			
12X 15252 Q				0.074				0.0478			0.154	0.887	0.154		0.818	0.248	0.0218	0.10	2.03		0.0213		0.0580			0.265	0.0448	(0.054)	0.330				
12X 15253 T				0.0242	0.0216			0.222			0.265	2.022	0.266		1.208	1.039	0.029	0.374	0.991		0.0900		0.0821			0.347	0.309	0.007	0.276	0.276			

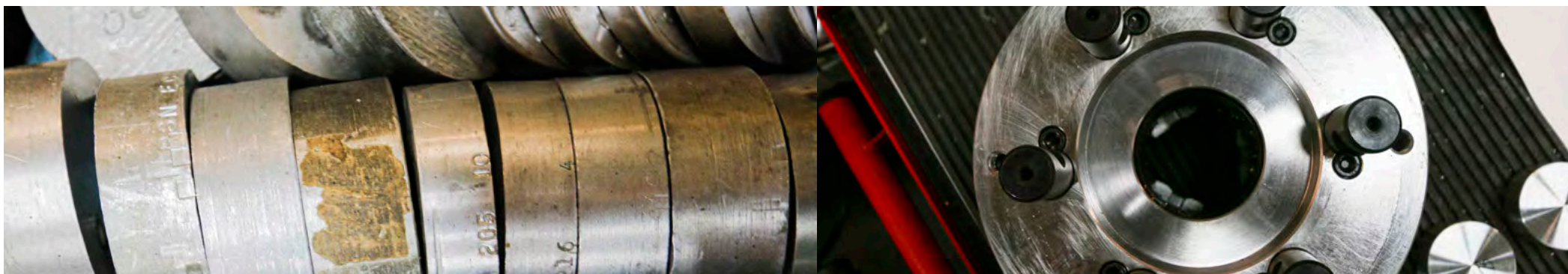


Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Low Alloy Steel

Low Alloy Steel

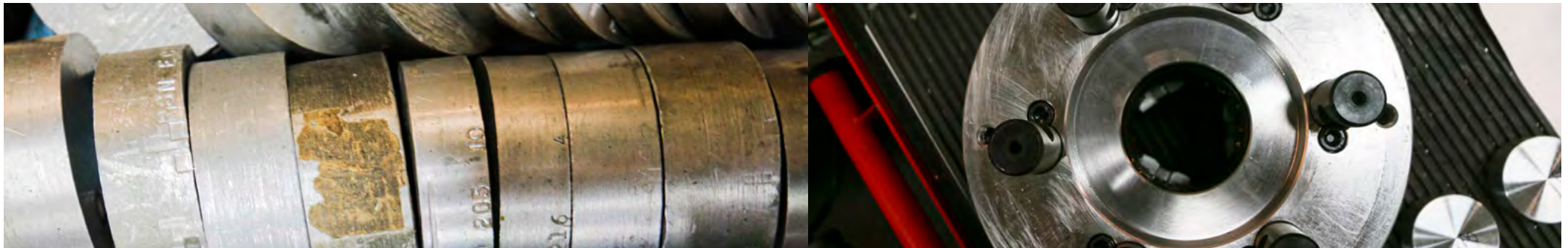
Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
12X15254AA				0.625				0.299			0.498	1.830	0.0853		1.151	0.711		0.310	0.311		0.065		0.0460			0.831	0.0458	0.003	0.285	0.288	0.310		
12X15255R**				0.155				0.39			0.045	1.45	0.285		1.08	0.11	0.006	0.21	0.31		0.083		0.064			1.02	0.11	0.035	0.052	0.48	0.14		
12X15256Q				0.1300				0.123			0.493	0.362	0.0550		0.492	0.0740	0.0056	0.0509	5.33		0.0125		0.0163			0.190	0.107			0.619	0.101		
12X15258P				0.087		0.0100		0.392			0.310	0.631	0.1090		1.23	0.361		0.133	0.497		0.0670		0.0322			1.014	0.0718	(0.002)	0.100	0.378	0.125		
12X15259Q				0.1488				0.603			0.141	0.512	0.200		0.401	0.407	0.0151	0.249	4.02		0.0401		0.0704			1.81	0.053			0.139	0.49		
12X15260W				0.191	0.055			0.352			0.0884	2.98	0.152		2.08	0.098		0.254	0.453		0.0275		0.074			0.485	0.0094	(0.016)		0.442			
12X15261X				1.648	0.0051			0.546			0.333	0.496	0.308		0.483	1.594		0.601	0.0985		0.090		0.0518			1.513	0.0172		0.385	0.122	0.269		0.0297
12X15266V				0.526	0.0640			0.455			0.286	3.49	0.226		1.240	0.298		1.438	1.317		0.0344		0.0258			0.674	0.0082	0.116		0.106			
12XLA1B				0.0104	0.0213			0.104			0.0144	1.026	0.0572		1.262	0.068	0.0144		0.210		0.0090		0.060			0.777				0.448			
12XLA2E				1.381	0.282			0.195			0.0306	0.813	0.786		0.57	0.136	0.0173		0.783		0.0241		0.0263			0.678	0.0066			0.0990			
12XLA3C				0.0410	0.0301			0.500			0.0475	0.375	0.213		1.693	0.303	0.0039		0.280		0.0274		0.0442			0.163				0.157		0.004	0.0197
12XLA4C**				0.18	0.019			0.65			0.097	0.53	0.26		0.36	0.40	0.011		0.47		0.052		0.025			0.475				0.37	0.090	0.0060	
12XLA5C				0.10	0.0085			0.783			0.166	0.678	0.158		0.726	0.305			0.484		0.0577		0.0261			0.493	0.0100			0.579		0.0091	
12XLA6D				0.174				0.0090			0.0051	0.099	0.0250		0.0867	0.0110	0.0070		0.0338		0.0041		0.0057			0.075				0.0033		0.0067	



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; ++ = Unsuitable for use with glow discharge systems

Low Alloy Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
143F	AISI 4130	G41300	Cr-Mo	0.026	0.0051	(<0.003)	(<0.02)	0.308	(<0.001)		0.01	0.865	0.221	(<0.005)	0.573	0.163	0.0098	0.0015	0.088	0.003	0.011	(<0.003)	0.0177	(<0.009)	(<0.005)	0.23	0.01	(<0.008)	0.0012	0.0046	0.003	(<0.005)	(<0.01)
12X 41300A	AISI 4130	G41300	Cr-Mo	0.027	0.0043			0.319				0.996	0.131		0.551	0.217	0.0095		0.084		0.0082		0.0156			0.183	0.0060					0.0012	
30C*	AISI 4140	G41400	Cr-Mo	0.027		(0.0001)		0.39	0.003		0.009	0.94	0.16		0.84	0.16	0.0108	(0.002)	0.18	0.0025	0.021		0.016			0.28	0.014		0.003	0.004			(0.003)
30D*	AISI 4140	G41400	Cr-Mo	0.035	0.008	0.0004		0.391	(0.0006)		0.013	0.978	0.241	(0.005)	0.83	0.22	0.0097	0.002	0.159	0.0014	0.013	(0.0003)	0.02			0.24	0.017	(0.003)	0.002	(0.004)	0.003		
30E*	AISI 4140	G41400	Cr-Mo	0.014	0.015	0.0002		0.408	(0.001)		0.012	1.06	0.301		0.92	0.209	0.0063	0.002	0.18	0.0014	0.011	(<0.001)	0.0071			0.264	0.017		0.003	0.005	0.005		
30H	AISI 4140	G41400	Cr-Mo	0.02	0.0046	0.0007	(0.002)	0.425	(0.0009)		0.0071	0.97	0.131	(0.001)	0.937	0.199	0.0081	0.003	0.063	0.0016	0.015	0.0005	0.022	0.0013	(<0.005)	0.253	0.008	(0.004)	0.0024	0.004	0.007	(0.002)	0.002
30I*	AISI 4140	G41400	Cr-Mo	0.026	0.0054	0.0002		0.408	(0.0002)		0.0093	0.98	0.138	(0.0005)	0.904	0.219	0.0086	0.0016	0.131	0.0007	0.0206	(0.001)	0.0171	0.0017		0.209	0.0089	(0.001)	0.0013	0.0051	0.003		(0.001)
30J	AISI 4140	G41400	Cr-Mo	0.023	0.005	(0.0004)	(<0.02)	0.405	(<0.001)	(<0.001)	0.0098	0.972	0.173	(<0.005)	0.884	0.205	0.01	0.0016	0.187	(0.003)	0.01	(0.002)	0.036	(0.004)	(<0.005)	0.256	0.0109	(<0.008)	0.0013	0.0045	0.005	(<0.002)	(0.003)
12X 41400A	AISI 4140	G41400	Cr-Mo	0.0195	0.0088			0.418				1.003	0.238		0.795	0.211	0.0101		0.127		0.0138		0.0210			0.221	0.0181						
12X 41400B	AISI 4140	G41400	Cr-Mo	0.0137	0.0152			0.452				0.999	0.161		0.764	0.177	0.0124		0.156		0.0095		0.0417			0.32	0.0099						
12X 41450A	AISI 4145	G41450	Cr-Mo	0.0220	0.0053			0.446				1.194	0.1318		1.011	0.340	0.0080		0.187		0.0093		0.0032			0.261	0.0090			0.0385			
Fe91-18	ASTMA182 Grade F91	K90901	Cr- Mo-V	0.006				0.099			0.013	8.24	0.041		0.453	0.94	0.046	0.07	0.187	0.003	0.015		0.002			0.27	0.004		0.0021	0.198	0.003		
FeP92-18	ASTMA182 Grade F92	K92460	Cr-Mo- W-V	0.005		0.0026		0.092			0.036	9.4	0.074		0.737	0.52	0.0036	0.096	0.82	0.013	0.005		0.005			0.2	0.006		0.003	0.188	1.97		
Fe5140H-18	AISI 5140H	H51400	Cr	0.013	0.011			0.37			0.0081	0.67	0.253		0.93	0.031	0.007	0.0015	0.266		0.014		0.022			0.187	0.0069		0.0015	0.0024	0.003		
12X 52986A	AISI E52100	G52986	Cr	0.0258	(0.002)			1.023				1.418	0.077		0.372	0.0169	(0.002)		0.0411		0.0049		0.0011			0.246	0.0063			0.0615			



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Low Alloy Steel

Low Alloy Steel

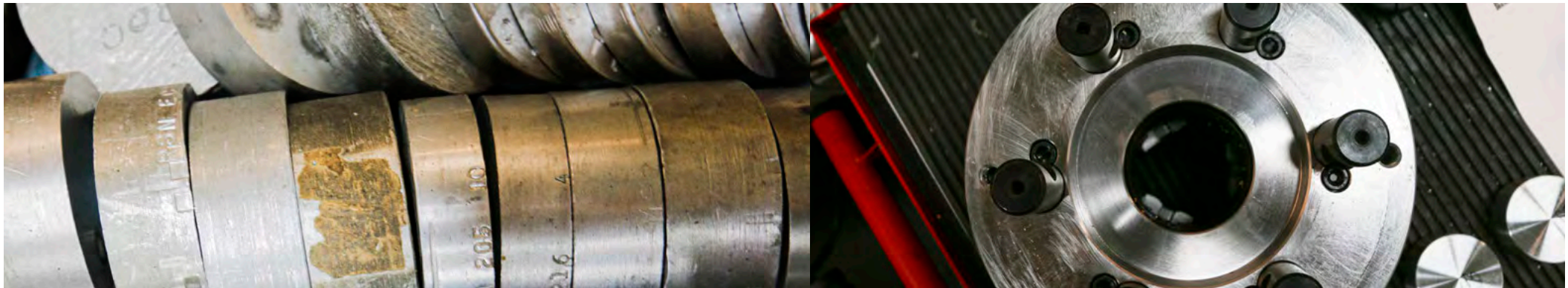
Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
49E	AISI E52100	G52986	Cr	0.024	0.0029	<0.005	<0.001	1.03	<0.003	<0.001	0.006	1.43	0.076	<0.0005	0.364	0.017	0.003	0.003	0.043	0.002	0.006	<0.001	0.002	(0.001)	<0.002	0.248	0.0065	<0.005	0.0006	0.066	(0.002)	(0.001)	(0.002)
34A*	AISI E6150	G61500	Cr-V	0.014	(0.006)	(0.0002)		0.51	(0.0002)		0.009	0.99	0.18		0.78	0.044	0.0076	0.003	0.14	(0.0014)	0.01		0.01			0.22	0.009		0.003	0.17	(0.016)		(0.002)
34B*	AISI E6150	G61500	Cr-V	0.024	0.006	0.0002		0.48	0.0002		0.009	0.94	0.21		0.81	0.053	0.0089	0.002	0.14	0.0018	0.021	<0.01	0.021			0.29	0.012		0.002	0.16	<0.01		<0.005
34C	AISI E6150	G61500	Cr-V	0.068	0.0024	0.0003		0.5	(0.0004)		0.005	0.914	0.078		0.739	0.022	0.003	0.004	0.085	0.0008	0.009	(0.0003)	0.0011	(0.001)		0.3	0.0058		0.0045	0.206	(0.003)		(0.001)
FeDP1080-18	Grade DP1080		Dual Phase	0.002				0.11			0.069	0.554	0.042		1.88	0.445	0.009	0.014	0.554	0.0055	0.014		0.006			0.11	0.0064		0.0013	0.0043	0.03		
27F	Commercially Pure Iron	K00095		(0.0009)	(0.0023)	<0.002	<0.01	0.002	<0.001	<0.003	0.0025	<0.005	<0.005	<0.001	<0.005	<0.005	<0.002	<0.002	<0.005	0.079	<0.005	<0.005	0.0011	<0.001	<0.005	0.004	<0.002	<0.005	<0.002	(0.0007)	<0.005	<0.002	<0.005
27G	Commercially Pure Iron	K00095		0.0013	0.0016	(0.0002)	<0.002	0.003	(0.0002)	<0.003	0.0009	0.043	0.04	(0.0002)	0.003	(0.002)	(0.0003)	(0.002)	0.045	0.025	0.003	<0.003	0.0011	<0.01	<0.02	0.07	(0.001)	<0.008	(0.0009)	(0.0007)	<0.002	<0.005	<0.01
14XMN1AL			Hign Mn	(0.23)				0.597				1.321	0.178		22.08	0.499	0.0585	0.096	0.692		0.053		0.0054			0.944	0.0393	(0.011)	0.0346	0.0226			
14XMN2S**			Hign Mn	0.022				0.79				0.36	0.087		12.4	1.08	0.037	0.23	0.73		0.025		0.007			2.20	0.015	0.004	0.019	0.090			
14XMN3U**			Hign Mn	0.048				1.07				0.59	0.135		10.2	0.35	0.026	0.41	0.39		0.025		0.016			1.05	0.027	0.010	0.102	0.023			
14XMN4AC			Hign Mn	0.20				0.938				1.983	0.270		13.62	0.796	0.0450	0.153	1.052		0.073		0.0194			0.900	0.0634		0.075	0.0332			
14XMN5U			Hign Mn	0.0257				1.36				3.18	0.691		8.78	1.93	0.0231	0.102	2.10		0.0552		0.0273			1.47	0.0228	(0.007)	0.93	0.0490			
14XMN5V			Hign Mn	0.145				1.42				3.28	0.551		8.02	2.26	0.0146	0.041	3.09		0.057		0.0207			2.27	0.0278	0.004	0.51	0.0810			
14X93603A	Invar (ASTM F1684)	K93603	Ni Steel	0.0404				0.0101			0.0974	0.024	0.0460	0.0019	0.339	0.0145	0.0057		35.79		0.0050		0.0045			0.153			0.0011				
24A*	Invar-36	K93601	Ni Steel	(0.002)				0.055			0.06	0.17	0.08		0.76	0.01	(0.003)	(0.01)	36.1	(0.01)	0.01		0.001		(0.17)	0.27	(0.002)	<0.2	(0.002)	0.02	(0.04)		



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Low Alloy Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
24B	Invar-36	K93601	Ni Steel	0.002	(<0.005)	(0.001)		0.053			0.036	0.121	0.052		0.82	0.011	0.0017	(<0.01)	35.86	0.003	0.009		0.001		0.19	0.28	0.0018	(<0.005)	0.002	(<0.005)	(<0.04)		(<0.005)
14X 94100 A	Iron-Nickel Sealing Alloy	K94100	Ni Steel					0.0055			0.0208	0.0265	0.0628	0.0021	0.443	0.0053	0.0016		41.00		0.0051		0.0027			0.103			0.0011				
14X FeNi10 A			Ni Steel	0.0251				0.094				0.070	0.0281		0.274		0.0052		10.10		0.0151		0.0275			0.061							
14X FeNi35 D			Ni Steel	(0.004)				0.035			0.400	0.409	0.0363		0.303				34.17		0.0400		0.146			0.255							
14X FeNi40 C			Ni Steel	2.00				0.0129			1.057	0.645	0.0810		0.0316				40.12		0.0148		1.03			0.050							
14X FeNi45 C			Ni Steel	0.988				0.0082			0.572	0.076	0.089		0.0222				45.88		0.0269		0.0015			0.772							
14X FeNi50 C			Ni Steel	0.319				0.0245			0.416	0.0662	0.089		0.0571				51.56		0.0168		0.16			0.151							
14X FeNi6 A			Ni Steel	0.0247				0.100				0.0732	0.0287		0.331		0.0056		6.09		0.0150		0.0275			0.0750							
14X FeNi8 A			Ni Steel	0.030				0.0974				0.251	0.0304		0.333		0.0062		8.11		0.0151		0.0284			0.099							
330A	AISI 4330M	K23080	Ni-Cr-Mo	0.045	0.003	0.0003		0.299	0.001			0.9	0.074		1	0.404	0.0024	0.003	1.8	0.0009	0.005	(0.0004)	0.001	(0.001)		0.273	0.0039		0.006	0.071	(0.004)		0.0015
330B	AISI 4330M	K23080	Ni-Cr-Mo	0.023	(<0.1)	(0.001)	(<0.001)	0.302	(0.0011)	(<0.001)	0.013	0.807	0.084	(<0.001)	0.82	0.406	(0.0043)	0.002	1.856	(0.004)	0.0075	(<0.01)	0.003	(<0.01)	(<0.001)	0.277	0.0047		(0.001)	0.076	0.024	(<0.001)	(0.013)
31A*	AISI 4340	G43400	Ni-Cr-Mo	0.036	(0.006)	(0.002)		0.41	(0.0012)		0.011	0.85	0.19		0.75	0.22	0.0114	0.003	1.66	(0.0015)	0.012		0.028	(0.002)		0.22	0.008		0.003	0.004			(0.003)
31G	AISI 4340	G43400	Ni-Cr-Mo	0.0214	0.004	0.0004	(<0.02)	0.4	(<0.0009)	(0.001)	0.0083	0.82	0.183		0.689	0.223	0.0069	0.0023	1.814	(0.002)	0.0136	(<0.007)	0.013	(<0.002)		0.262	0.0077	(<0.02)	0.0015	0.0036	0.004	(<0.003)	0.0012
12X 43400 A	AISI 4340	G43400	Ni-Cr-Mo	0.013	0.0084			0.422				1.181	0.177		0.592	0.223	0.0089		1.378		0.0164		0.0284		0.259	0.007					0.0027		
Fe8620-18	AISI 8620	G86200	Ni-Cr-Mo	0.0246	0.009			0.211			0.0085	0.536	0.197		0.857	0.199	0.007	0.0014	0.446		0.012		0.026		0.23	0.009		0.0015	0.0061	0.004			

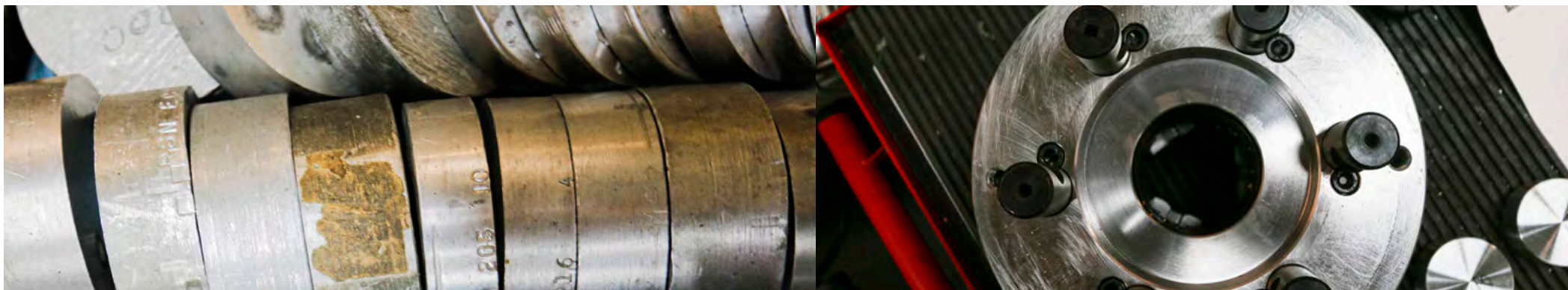


Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Low Alloy Steel

Low Alloy Steel

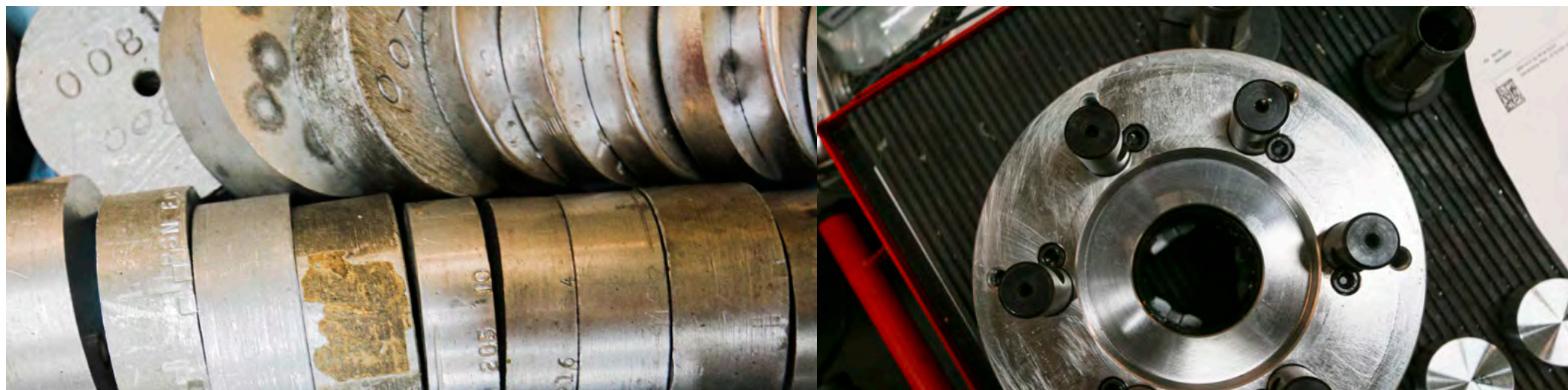
Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
182B	AISI 86L20		Ni-Cr-Mo	0.038	0.003	0.0003		0.21	(0.0005)		0.006	0.49	0.017		0.81	0.172	0.004	0.003	0.47	0.003	0.016	0.19	0.037	0.003		0.27	0.0019		0.003	0.004	(0.01)		0.001
252B*	AISI 8740	G87400	Ni-Cr-Mo	0.028	0.005	0.0002		0.419	0.0002		0.005	0.486	0.084		0.91	0.223	0.0081	0.002	0.461	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	G87400	Ni-Cr-Mo	0.017	0.004	(0.0001)		0.416	(0.0003)		0.008	0.501	0.109		0.92	0.205	0.0083	0.002	0.505	(0.002)	0.025	0.001	0.008	(<0.005)		0.248	0.007		0.001	0.005	(<0.005)		(<0.002)
252D	AISI 8740	G87400	Ni-Cr-Mo	0.024	0.0053	0.0002	(0.0005)	0.423	(0.001)		0.0078	0.468	0.27	(0.0002)	0.842	0.204	0.0068	0.0013	0.424	0.0013	0.0075	0.0004	0.0128	0.0024	(<0.003)	0.256	0.012	(<0.005)	0.0012	0.0022	0.004	0.0005	0.0013
252E	AISI 8740	G87400	Ni-Cr-Mo	0.028	0.0046	(0.001)	(<0.02)	0.413	(<0.001)	(<0.001)	0.0093	0.486	0.164	(<0.005)	0.87	0.204	0.0064	(0.003)	0.407	(0.003)	0.009	(0.005)	0.012	(0.003)	(<0.005)	0.257	0.0075	(<0.008)	0.001	0.0028	(0.006)	(<0.002)	(<0.003)
252F	AISI 8740	G87400	Ni-Cr-Mo	0.026	0.006	(0.001)	(<0.02)	0.406	(<0.001)	(<0.001)	0.0086	0.463	0.182	(<0.005)	0.88	0.21	0.0059	0.0016	0.412	(0.003)	0.011	(0.003)	0.009	(0.003)	(<0.005)	0.247	0.008	(<0.008)	0.001	0.003	0.003	(<0.002)	(0.003)
FeE9310-18	AISI E9310	G93106	Ni-Cr-Mo	0.036	(0.004)	(<0.005)	(<0.005)	0.121	(<0.005)	(<0.005)	0.009	1.09	0.158	(<0.02)	0.62	0.086	0.007	(0.002)	3.07	0.0017	0.009	(0.0001)	0.0128	(0.002)	(<0.005)	0.256	0.0072	(<0.005)	(0.001)	0.003	(0.003)	(0.001)	(0.002)
12X 46150 A	AISI 4615	G46150	Ni-Mo	0.0116	0.0016			0.160				0.0348	0.0158		0.471	0.243	0.0082		1.590		0.0162	0.0012	0.0074			0.24	0.0012			0.0019		0.0067	
33B*	AISI 4620	G46200	Ni-Mo	0.022	0.005	0.0002		0.19	0.0002		0.01	0.17	0.15		0.54	0.22	0.007	0.003	1.68	0.002	0.01	(<0.01)	0.014			0.22	0.01		0.002	0.002	(<0.01)		(<0.005)
33C*	AISI 4620	G46200	Ni-Mo	0.025	(0.005)	(0.0002)		0.184	(0.0003)		0.008	0.133	0.223		0.562	0.236	0.0078	0.002	1.71	0.0021	0.009	(<0.002)	0.017			0.25	0.009		0.0014	0.0021	0.0026		
33D	AISI 4620	G46200	Ni-Mo	0.026	0.0035	0.0002		0.209	(0.0003)		0.008	0.139	0.072		0.593	0.229	0.0053	0.002	1.78	0.0013	0.009	(<0.001)	0.023	(0.002)		0.207	0.005		0.003	0.002	(<0.005)		(<0.002)
155B*	AISI 4820	G48200	Ni-Mo	0.027	0.0038	0.0002		0.207	0.0026		0.011	0.149	0.152		0.635	0.239	0.008	0.0024	3.57	0.0017	0.009	0.0005	0.028	(0.001)		0.313	0.008		0.003	0.003	(0.01)		0.002
155F	AISI 4820	G48200	Ni-Mo	0.0356	0.0006	(0.0004)		0.199	(<0.001)	(<0.001)	0.012	0.144	0.219	(<0.001)	0.617	0.244	0.005	0.0016	3.36	0.003	0.008	(<0.006)	0.013	(<0.003)		0.223	0.0084	(<0.005)	0.002	0.0015	0.004	(<0.001)	(<0.002)
Fe4820-18	AISI 4820	G48200	Ni-Mo	0.022	0.006			0.192			0.0107	0.144	0.167		0.541	0.287	0.007	0.002	3.51	0.003	0.011		0.018			0.26	0.0089		0.0011	0.0015	0.004		
164A	CLA1		SCLA	0.72	(0.002)	(0.0001)		0.004	0.0002		0.006	0.032	0.88		1.57	0.009	0.0003	0.006	1.29	0.0005	0.004	(0.004)	0.07			0.019	0.002		0.002	0.78	1.44		(<0.005)



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Low Alloy Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
173A>	CLA10		SCLA	0.48	(<0.01)	0.0004		0.85	0.0002		0.01	4.39	0.72		0.011	0.015	0.0006	0.006	0.024	0.0007	0.015	(<0.01)	0.004			1.7	0.003		0.004	0.28	0.041		(<0.002)
180A	CLA11		SCLA	0.76	(0.004)	0.0004		0.007	0.0001		0.004	0.037	0.89		0.41	0.006	0.0096	(0.005)	1.29	0.0006	0.004	(0.002)	0.046			0.023	0.002		0.002	0.76	1.48		0.003
165Aw	CLA2		SCLA	0.8	(0.003)	(0.001)		0.003	(0.0002)		0.006	0.036	1.4		1.65	0.009	0.0004	0.007	1.43	0.0004	0.005	(<0.01)	0.086			0.021	0.002		0.002	1.13	1.57		(<0.005)
166A	CLA3		SCLA	0.55	(0.004)	(0.0002)		0.003	0.0003		0.004	0.014	0.64		1.29	1.08	0.0002	0.006	0.77	0.0006	0.005	(<0.01)	0.073			0.91	(0.003)		0.002	0.4	1.02		(<0.01)
167A>	CLA4		SCLA	0.64	(0.004)	(0.0002)		0.003			0.003	0.016	0.95		1.36	1.25			1		0.019	(0.002)	0.087			1.08	0.003			0.59	1.19		
168A	CLA5		SCLA	0.19	(0.003)	0.0004		0.003	0.0002		0.003	0.004	0.009		0.12	0.69	0.0002	0.003	2.32	0.0008	0.03	(<0.01)	0.064			0.46	0.003		0.004	0.004	0.52		(0.003)
169A>	CLA6		SCLA	0.3	(0.009)		(0.001)	0.31	(0.0003)		0.005	2.19	0.31		0.21	0.95	0.0004	0.005	2.5	0.0006	0.033	(0.002)	0.065			0.79	0.003		0.005	0.006	0.65		(<0.005)
169B	CLA6		SCLA	0.36	(0.002)	0.0003	(<0.011)	0.232	(<0.006)		0.003	0.01	0.005	(<0.005)	0.75	0.004	(0.004)	0.004	0.01	(0.004)	0.004	(0.001)	0.004	(0.0009)	(0.005)	0.32	0.002	(0.008)	0.23	0.002	0.003	(<0.001)	(0.004)
170A>	CLA7		SCLA	0.032	(0.005)	(0.0002)		0.56	(0.0001)		0.004	2.55	0.005		0.019	1.57	0.0003	0.004	1.51	0.0003	0.039	(<0.01)	0.025			0.01	0.002		0.006	0.006	(0.018)		(0.003)
170B	CLA7		SCLA	0.23	(0.005)	0.0004	(<0.01)	0.4	(<0.004)	(<0.001)	0.005	0.009	0.005	(<0.005)	0.821	0.003	(0.005)	0.004	0.197	(<0.006)	0.005	(<0.002)	0.004	(0.0007)	(<0.005)	0.21	0.002	(0.008)	0.19	0.002	(0.002)	(<0.002)	0.005
171A>	CLA8		SCLA	0.082	(<0.01)	(0.0006)		0.64	(0.0001)		0.005	2.88	0.49		0.02	1.91	0.0003	0.005	1.95	(0.0004)	0.043	(<0.01)	0.059			0.25	0.002		0.005	0.006	0.13		(0.003)
172A	CLA9		SCLA	0.39	(0.005)	0.0003		0.78	0.0001		0.006	3.52	0.4		0.01	0.014	0.0004	0.004	0.025	0.0006	0.007	(<0.01)	0.004			1.29	0.003		0.003	0.003	0.038		(<0.005)



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Reinforcing Steel

Reinforcing Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
378A	ASTMA615 Grade 75			0.0029	(0.0055)	0.0006	(<0.015)	0.274	(<0.002)		0.013	0.187	0.299	(<0.005)	1.38	0.031	0.02	0.003	0.142	(<0.014)	0.018	(0.003)	0.037	(0.004)		0.307	0.0236	(<0.008)	0.003	0.0844	0.006	(0.002)	(0.003)
323A	ASTMA706 Grade 60			0.003	0.006	0.0003	(0.0001)	0.41	0.0008		0.007	0.15	0.3	(0.0004)	1.14	0.023	0.0105	0.0012	0.084	0.01	0.0178	(0.001)	0.061	(0.002)		0.19	0.011	(0.005)	0.0012	0.02	0.004		(0.001)
380A	ASTMA706 Grade 60			0.0029	0.007	(0.0005)		0.268	(<0.001)	(<0.001)	0.01	0.192	0.265	(<0.001)	1.24	0.059	0.012	0.002	0.114	(0.007)	0.021	(<0.005)	0.025	(0.0038)		0.181	0.0117	(0.001)	(0.003)	0.0475	0.009	(0.002)	(0.0014)
380B	ASTMA706 Grade 60			0.0021	0.0058	(0.0005)	(<0.001)	0.243	(0.0004)	(<0.001)	0.014	0.153	0.307	(<0.001)	1.27	0.055	0.013	0.0016	0.182	(<0.014)	0.016	(0.002)	0.027	(0.003)	(<0.001)	0.238	0.0132	(<0.001)	0.0011	0.049	0.003	(<0.004)	(<0.002)
381A	ASTMA706 Grade 80			0.0023	0.0055	(0.0007)	(<0.001)	0.272	(0.0004)	(<0.001)	0.011	0.129	0.379	(<0.001)	1.16	0.0341	0.014	0.0018	0.185	(0.005)	0.013	(<0.007)	0.043	(0.005)	(<0.001)	0.269	0.0137	(<0.005)	0.002	0.0299	0.003	(<0.003)	(<0.002)

Alloy Steel Welding Wire

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
299A	D6-AC	K24728		0.092	0.003	0.0003		0.469	(0.001)		0.0054	1.03	0.1		0.7	0.99	0.0028	0.006	0.57	(0.002)	0.008	(0.001)	0.002	(0.002)		0.22	0.0055		0.0038	0.12	0.01		(0.001)

Superstrength Alloy Steel

Part Number	Grade	UNS	Form	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
341A	HP9-4-30	K91283		0.032	0.003	0.0005		0.298	0.0011		4.44	0.99	0.143		0.226	1.01	0.0025	0.005	7.16	0.0008	0.0038	(0.001)	0.0008	(0.001)		0.1	0.005		0.003	0.086	(0.01)	(0.0002)	(0.003)

Nitriding Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
305B	Nitralloy 135 Modified	K24065		0.92	0.006	0.0006	(<0.002)	0.425	0.0007		0.007	1.63	0.214	(0.002)	0.58	0.32	0.0044	0.002	0.156	0.0006	0.011	(0.0003)	0.014	0.004		0.349	0.011	(<0.005)	0.0044	0.004	0.004	(0.002)	0.0011



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; ++ = Unsuitable for use with glow discharge systems

Tool Steel

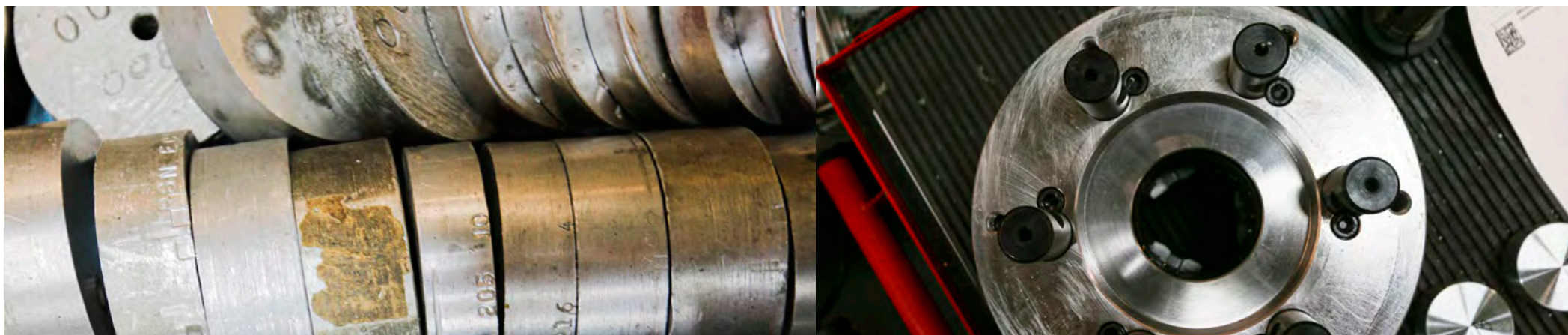
Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
306A>	AISIM-50	T11350	Bearing	0.005	(0.004)	(0.001)		0.83			0.011	4.16	0.042		0.209	4.2	0.118			(0.001)	0.006		0.003			0.16	0.005		0.002	0.97	0.003		
306B	AISIM-50	T11350	Bearing	0.082	0.004	0.0007	(<0.0001)	0.837	(0.001)		0.01	4.12	0.058	(<0.002)	0.24	4.23	0.005	0.005	0.095	0.0009	0.0061	(0.0008)	0.0011	(0.002)	(<0.002)	0.213	0.0042	(<0.011)	0.0016	0.98	0.009	(<0.055)	0.0014
39B	AISIA-2	T30102	Cold-work	0.006				0.99			0.014	4.79	0.1		0.54	1.01	0.0096	0.006	0.14		0.017		0.003			0.35	0.004		0.003	0.22	(0.026)		
39C	AISIA-2	T30102	Cold-work	0.017	(0.005)	0.001		0.99	(0.001)		0.013	4.99	0.077		0.45	0.97	0.011	0.004	0.144	0.001	0.019	(0.0001)	0.007	(0.002)		0.28	0.005		0.0029	0.21	0.011		(0.002)
40A*	AISIA-6	T30106	Cold-work	0.009	(0.007)	(0.0003)		0.68			0.011	1.04	0.092		2.15	1.05	0.0077	0.004	0.14	(0.0024)	0.024		0.01			0.25	0.006		0.003	0.007	(0.013)		
40B	AISIA-6	T30106	Cold-work	(0.006)		(0.0010)		0.68			0.015	1.04	0.5		1.98	1.22	0.0107	0.005	0.096	(0.0014)	0.012		0.003			0.39	0.004		0.003	0.014	0.013		
40C	AISIA-6	T30106	Cold-work	0.019	0.008	0.0009		0.72	(0.001)		0.01	0.99	0.142		1.91	1.27	0.0083	0.003	0.255	0.0013	0.014		0.012			0.32	0.008		0.008	0.01	0.009		(0.002)
41D	AISID-2	T30402	Cold-work	0.014	(0.01)	(0.0006)	(<0.002)	1.519	(0.0008)		0.02	11.5	0.047	(<0.001)	0.256	0.74	0.0152	0.004	0.114	0.003	0.021	(0.0008)	0.012	(<0.01)	(<0.002)	0.256	0.005	(<0.01)	0.003	0.77	0.034	(<0.002)	(0.002)
43A*	AISIL-6	T61206	High-Speed	0.03	(0.006)	(0.0002)		0.68	(0.0006)		0.016	0.66	0.15		0.61	0.2	0.0089	0.003	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	AISIL-6	T61206	High-Speed	0.021	0.005	0.0002		0.711	(0.002)		0.012	0.651	0.18	(<0.003)	0.56	0.206	0.0093	0.004	1.39	0.0016	0.008	(<0.0005)	0.013	(<0.002)		0.251	0.013	(<0.001)	0.0047	0.0035	(<0.005)		(<0.001)
304A	AISIM-1	T11301	High-Speed	0.009	(0.01)	0.002		0.857	(0.002)		0.278	3.55	0.14		0.26	8.04	0.034	0.021	0.133	0.002	0.019		0.0016	(0.001)		0.36	0.006	(0.002)	0.002	1.23	1.65		(0.002)
324A	AISIM-10	T11310	High-Speed	0.002	0.006	0.0004		0.99	0.0009		0.007	0.42	0.22		1.01	0.022	0.0082	0.014	0.081	0.003	0.009		0.028	(0.002)		0.163	0.011		0.0016	0.0017	(0.003)	(0.003)	(0.001)
44B*	AISIM-2	T11302	High-Speed					0.84			0.41	3.86	0.072		0.27	4.79	0.0251	0.016	0.18	0.0028	0.014	(0.0001)	0.006			0.39	(0.008)		0.004	1.83	5.98		
44C	AISIM-2	T11302	High-Speed	0.05	(0.01)	(0.002)		0.82			0.247	4.04	0.12		0.301	5.02	0.033	0.012	0.132	0.00321875	0.027	(0.002)	0.004	(0.004)		0.31	0.01	(0.004)	0.004	1.91	6	0.006	0.002
320A	AISIM-35	T11335	High-Speed	0.023	0.013	0.0011	(<0.0001)	0.093	(<0.003)		4.9	4.22	0.091	(<0.003)	0.33	4.79	0.014	0.015	0.204	0.0021	0.021	(<0.007)	0.0015	(<0.0011)	(<0.0001)	0.36	0.008	(<0.0020)	0.0032	1.76	6.01	(<0.001)	(0.003)
251A	AISIM-4	T11304	High-Speed	0.01	0.016	(0.002)		1.398	(0.0005)		0.129	4.1	0.13		0.33	5.16	0.044	0.016	0.131	(0.01)	0.014	(0.002)	0.058			0.58	0.011		0.003	3.9	5.5		(0.002)
FeM62-18	AISIM62	T11362	High-Speed	0.006		0.003		1.32			0.105	3.86	0.115		0.27	10.2	0.045	0.017	0.129	0.003	0.016		0.015			0.37			0.003	2.02	6.31		
48A*	AISIT-1	T12001	High-Speed	(0.016)	(0.051)	(0.0018)		0.79	(0.0006)		0.39	4.32	0.13		0.33	0.4	0.0221	(0.003)	0.23	(0.0107)	0.036		0.021			0.29	0.019		0.004	1.13	17.99		(0.006)
48C	AISIT-1	T12001	High-Speed	0.017	0.012	(0.001)		0.77			0.22	4.24	0.13	(0.0002)	0.39	0.17	0.0165	0.005	0.204	0.003	0.029	(0.0004)	0.018	(0.002)		0.45	0.012	(0.01)	0.006	1.27	17.5		(0.003)
14X14946 D†	AISIT-1	T12001	High-Speed					0.85			0.44	5.06	0.25		0.53	0.21			1.06		0.051		0.048			0.46				1.03	16.9(7)		
14XHS1C	AISIT-1	T12001	High-Speed					0.718			0.25	4.00	0.069		0.29	0.37	0.023		0.27		0.018		0.020			0.22	(0.035)			1.05	17.0		
FeT1-18	AISIT-1	T12001	High-Speed	0.054	(0.007)	(<0.005)	(<0.005)	0.8	(<0.005)	(<0.005)	0.096	3.98	0.034	(<0.012)	0.295	0.124	0.0195	0.004	0.14	0.0027	0.026	(<0.013)	(<0.001)	(<0.001)	(<0.005)	0.3	0.01	(<0.005)	0.026	1.05	18	(0.0017)	(0.003)
281A	AISIT-4	T12004	High-Speed	0.007	(0.02)	(0.003)		0.74			4.8	3.89	0.096	(0.003)	0.3	0.49	0.0064	0.094	0.15	0.003	0.015		0.019			0.29	0.02		0.004	0.9	17.6		(0.002)

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Tool Steel

Tool Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
255A	AISI H-11	T20811	High-Speed	0.01	(0.002)	0.0004		0.403	(0.0004)		0.009	4.84	0.049		0.27	1.33	0.0067	0.004	0.083	0.0011	0.013	(<0.001)	0.0012			0.93	0.006	(<0.005)	0.002	0.43	0.007		(<0.005)
255B	AISI H-11	T20811	High-Speed	0.032	(0.004)	(0.0004)	(<0.004)	0.389	(<0.0003)	(<0.0001)	0.009	4.82	0.073	(<0.0001)	0.317	1.3	0.005	0.006	0.062	(0.002)	0.01	(<0.0005)	0.002	(<0.002)	(<0.011)	0.91	0.006	(<0.008)	(0.0048)	0.515	(0.007)	(<0.011)	(<0.005)
42A >	AISI H-13	T20813	High-Speed	(0.024)		(0.0007)		0.39	(0.0002)		0.015	5.42	0.07		0.35	1.29	0.0143	(0.001)	0.32	(0.0019)	0.011	(<0.005)	0.007			1.04	0.005		0.005	1.02	(0.014)		
42B w	AISI H-13	T20813	High-Speed	0.013		(0.0005)		0.38			0.013	5.1	0.089		0.36	1.23	0.0105	0.004	0.18	0.0026	0.014	(0.003)	0.005			0.99	0.005		0.003	0.94	0.012		
42C	AISI H-13	T20813	High-Speed	0.018	(0.01)	0.0011		0.382	(0.0005)		0.022	4.86	0.066		0.4	1.29	0.0201	0.004	0.051	0.003	0.022	0.0007	0.0037	(0.004)		0.85	0.006	(0.004)	0.0125	0.84	0.32	(0.008)	(0.002)
45B	AISI O-6	T31506	Oil Hardening	0.01	0.002	(0.0001)		1.42	(0.001)		0.004	0.061	0.018		0.9	0.24	0.008	0.002	0.024	0.0005	0.01		0.008	(0.001)		0.92	0.008		0.002	0.003	(0.004)		(0.001)
46A w	AISI S-1	T41901	Shock resisting	0.011	(0.009)	(0.0012)		0.49	(<0.0002)		0.015	1.31	0.083		0.48	0.16	0.0144	0.004	0.3	(0.0027)	0.023	(<0.005)	0.012			0.94	0.024		0.004	0.16	1.84		(<0.005)
46B	AISI S-1	T41901		0.011	(0.01)	0.0003		0.45			0.013	1.09	0.147		0.27	0.222	0.0069	0.003	0.108	0.002	0.019	(<0.002)	0.004			0.89	0.016		0.007	0.17	1.96		
47A w	AISI S-5	T41905		0.017	(0.014)	(0.0003)		0.58			0.009	0.29	0.25		0.8	0.41	0.0084	(0.004)	0.23	(0.0021)	0.015	(<0.005)	0.01	(0.003)		1.92	0.031		0.008	0.22	(0.016)		(<0.01)
47B	AISI S-5	T41905		0.014		(<0.001)		0.59			0.007	0.23	0.17		0.79	0.2	0.0092	(0.002)	0.09	(0.0014)	0.017	(0.0003)	0.006			1.96	0.008		0.01	0.17	(0.016)		
259A	AISI S-7	T41907		0.016	0.006	0.0003		0.479	(0.0003)		0.011	3.27	0.081		0.399	1.43	0.0077	0.003	0.194	0.0014	0.02	(<0.0005)	0.0007	(0.002)		0.44	0.004	(0.005)	0.0026	0.256	0.035	(<0.005)	0.001
14XH510 A			HIP					1.710			0.0866	14.83	0.0605		0.134	1.679	(0.001)		0.146		0.0135		0.0099			0.660				1.142	1.75		
14X72305 A	AISI W-5	T72305	Water-Hardening	0.0049				1.085				0.425	0.149		0.349	0.0231	0.0068		0.089		0.0128		0.0028			0.206	0.0101			0.0045			



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; ++ = Unsuitable for use with glow discharge systems

Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
289A	AISI 301	S30100	Austenitic Steel	0.01		0.0003		0.126				0.054	17	0.016		1.67	0.005	0.0032		0.008		7.12	0.0104	0.006		0.0019		0.58	0.002	<0.005	0.028	0.01	0.01			
289B	AISI 301	S30100	Austenitic Steel	0.007	<0.004	0.0008		0.161	(0.001)		<0.001	0.013	17.09	0.241	<0.001	1.92	0.008	0.011		0.013		7.02	0.017	0.004	(0.005)	0.0025	<0.001	<0.006	0.99	0.002	(0.003)	0.005	0.018	0.012	<0.03	0.007
241D	AISI 302	S30200	Austenitic Steel	0.022	(0.001)	0.0011		0.125	(0.001)			0.022	18.1	0.24		1.94	(0.003)	0.006		0.03		9	(0.004)	0.003	(0.0004)	0.0021		(0.002)	0.99	0.002	(0.004)	0.018	0.034	(0.01)		(0.007)
234A	AISI 302 HQ	S30430	Austenitic Steel	0.36		0.0009		0.102				0.35	18	3.65		1.99	0.004	0.096		0.2		8.06	0.0007	0.004		0.0026			1.02	0.003	(0.01)	0.002	0.003	0.02		
234C	AISI 302 HQ	S30430	Austenitic Steel	0.035	(0.0010)	0.0023		0.092	(0.0017)			0.034	18.15	3.41	(0.0020)	1.93	0.012	0.01		0.053		9	0.005	0.009	(0.0010)	0.0027	(0.0040)	(0.0030)	0.88	0.0017	0.003	0.026	0.055	0.006	(0.0010)	0.006
13X 30300 A	AISI 303	S30300	Austenitic Steel			0.0035		0.041				0.0259	17.59	0.0252		1.84	0.333	0.0350				8.55		0.0199		0.312			0.424				0.092			
Fe303-18	AISI 303	S30300	Austenitic Steel	(0.004)	0.007	0.0012	<0.0001	0.046	(0.002)	<0.0001		0.14	17.2	0.61	<0.001	1.55	0.42	0.069		0.015		8.12	0.006	0.033	<0.0001	0.35	<0.001	<0.001	0.47	0.015	<0.005	(0.004)	0.072	0.029	<0.005	<0.005
253A	AISI 303Se	S30323	Austenitic Steel	0.003		0.0003		0.041				0.088	17.9	0.223		1.5	0.348	0.0373		0.016		9.17	0.009	0.14		0.0089		0.21	0.5	0.01		0.002	0.106	0.1		
253B	AISI 303Se	S30323	Austenitic Steel	0.004	0.0052	0.0007		0.051	(0.0006)		<0.001	0.145	17.64	0.44	(0.0006)	1.61	0.59	0.031		0.021		9.11	0.007	0.13	(0.0002)	0.011	(0.0018)	0.13	0.46	0.012	(0.003)	0.0027	0.092	0.05	<0.002	<0.008
Fe304H-18	AISI 304H	S30400	Austenitic Steel	0.005	0.0076	<0.005	<0.005	0.052	<0.005	<0.005		0.136	18.4	0.46	<0.005	1.82	0.43	0.072		0.01		8.35	0.008	0.031	<0.001	0.027	<0.005	<0.005	0.298	0.014	<0.005	<0.005	0.075	0.027	<0.005	<0.005
162D	AISI 304L	S30403	Austenitic Steel	0.0026	0.0072	0.0027		0.024	(0.003)			0.074	18.31	0.52	(0.0001)	1.82	0.573	0.097		0.009		8.15	0.005	0.0296	<0.003	0.0271	(0.0019)	<0.03	0.57	0.0102	0.005	0.013	0.063	0.028	<0.007	<0.007
13X30403 B	AISI 304L	S30403	Austenitic Steel	0.0056				0.0277	0.0027			0.178	18.30	0.497		1.820	0.313	0.083		0.0201		8.13		0.0321		0.0266			0.288	0.0139		0.0013	0.0700	0.035		
Fe304L-18	AISI 304L	S30403	Austenitic Steel	0.003	0.007	0.0012		0.024	(0.002)		<0.002	0.156	18.34	0.54	<0.001	1.39	0.462	0.081		0.013		8.17	0.006	0.034	<0.001	0.029	(0.002)	<0.001	0.43	0.013	<0.005	0.0056	0.076	0.056	<0.005	<0.005
13X 30600 A	AISI 306	S30600	Austenitic Steel	0.0204				0.0090				0.0149	17.43	0.0121	0.0016	0.648	0.0040	0.0270		(0.004)		14.96		0.0091		0.0007			4.23				0.0206			
3E	AISI 309	S30900	Austenitic Steel	0.0045	(0.005)	0.0005		0.0553	0.0015			0.12	22.47	0.259	(0.0003)	1.62	0.215	0.063		0.014		11.99	0.0048	0.0259	0.0003	0.0009	0.0013	<0.022	0.307	0.007	(0.005)	0.0022	0.126	0.018	(0.0004)	0.0018
13X 14828 A	AISI 309	S30900	Austenitic Steel	0.008				0.104				0.143	19.37	0.409		1.529	0.301	0.0377		0.0163		11.25		0.0268		0.0067			2.19	0.0128			0.0803	0.0167		
13X 30908 A	AISI 309S	S30908	Austenitic Steel	0.0035		0.0027		0.0560				0.120	22.51	0.269		1.638	0.221	0.0652		0.0142		12.05		0.0267		0.0011			0.320				0.128			
4D>	AISI 310	S31000	Austenitic Steel	0.009	(0.003)	0.0008		0.052				0.07	24.34	0.217	(0.0003)	1.2	0.39	0.046		0.01		20.2	0.004	0.022	(0.0003)	0.0009			0.49	0.007	0.005	0.0042	0.073	0.026		(0.001)
4E	AISI 310	S31000	Austenitic Steel	0.004	(0.005)	0.0011		0.044				0.066	24.25	0.234		1.07	0.32	0.038		0.024		20.18	0.0021	0.0224		0.0006			0.514	0.006	0.005	0.003	0.052	0.046		(0.001)
4F	AISI 310	S31000	Austenitic Steel	0.015	0.003	0.0012		0.047	(0.002)		<0.005	0.067	24.5	0.146	<0.002	1.17	0.142	0.056		0.007		20.1	0.004	0.0195	<0.001	0.0015	(0.001)	(0.001)	0.494	0.005	0.007	0.0031	0.146	0.012	(0.001)	0.002
4G	AISI 310	S31000	Austenitic Steel	0.008	0.005	0.0032		0.0454	(0.001)			0.085	24.9	0.32	0.007	1.36	0.58	0.058		0.008		19.2	0.003	0.027	(0.0005)	0.0008	(0.001)	(0.001)	0.63	0.008	0.008	0.029	0.092	0.017	(0.0005)	0.002
13X31008 A	AISI 310S	S31008	Austenitic Steel					0.063				0.078	24.48	0.159		1.234	0.338	0.063		0.013		19.34		0.0302		0.0040			0.503				0.078	0.165		
13X31400 A	AISI 314	S31400	Austenitic Steel	0.0225				0.0330	0.0024			0.1296	24.38	0.210		1.603	0.240	0.0288		0.0189		18.76		0.0262		0.0006			2.23				0.092	0.015		

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Stainless Steel

Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr	
339A	AISI 316H	S31609	Austenitic Steel	0.004	(0.001)	0.0006		0.16	0.0014			0.007	17	0.021	(0.0001)	1.71	2.79	0.006		0.005		12.9	0.016	0.004	(0.002)	0.009		(0.0003)	0.64	0.002	(0.005)	0.002	0.007	0.0119	(0.001)	0.003	
13X31603 D	AISI 316L	S31603	Austenitic Steel	0.006				0.0203	0.0029			0.188	17.58	0.356		1.475	2.019	0.062		0.010		10.04		0.0363		0.0265		0.395	0.0084		(0.001)	0.0722	0.040				
Fe316L-18	AISI 316L	S31603	Austenitic Steel	0.006	(<0.023)	(0.001)		0.021	(0.002)		(<0.002)	0.209	16.7	0.55	(0.0004)	1.7	2.02	0.067		0.027		10.12	0.005	0.033	(<0.003)	0.029	(0.0018)	(<0.004)	0.438	0.013	(<0.005)	0.003	0.067	0.06	(<0.005)	(<0.005)	
13X31635 A	AISI 316Ti	S31635	Austenitic Steel	0.0054				0.0254				0.174	16.98	0.404		1.807	2.089	0.020		0.010		10.80		0.0352		0.0301		0.487			0.149	0.0584	0.031				
153C	AISI 317L	S31703	Austenitic Steel	0.003	0.0061	0.0009		0.0225	(0.0026)			0.251	18.22	0.442		1.6	3	0.086		0.015		11.1	0.006	0.0289	(0.001)	0.0288	(0.0020)	(<0.04)	0.349	0.01	(0.006)	0.004	0.058	0.043	(<0.001)	0.004	
13X31726 A	AISI 317LMN	S31726	Austenitic Steel	0.0208				0.0124				0.0502	17.62	0.206		1.849	4.56	0.135		0.009		13.56		0.0218		0.0012		0.415				0.0426	0.0384				
13X32100 A	AISI 321	S32100	Austenitic Steel	0.0247		0.0025		0.0463				0.105	17.39	0.415		1.52	0.282	0.0115		0.0191		9.32		0.0298		0.0011		0.498	0.0115		0.376	0.106	0.021				
6I	AISI 321	S32100	Austenitic Steel	0.084	(0.005)	0.0034		0.049	(0.0004)		(<0.005)	0.052	17.76	0.202	(<0.03)	1.76	0.133	0.013		0.018		9.2	0.0012	0.0208	(<0.02)	0.023	(0.0008)	(<0.03)	0.31	0.006	(<0.01)	0.6	0.048	0.023	(0.003)	(0.003)	
6J	AISI 321	S32100	Austenitic Steel	0.0195	(<0.04)	0.0024		0.045	(<0.001)			0.191	17.74	0.383	(<0.001)	1.52	0.387	0.0109		0.01		9	(0.001)	0.028	(<0.03)	0.002	(<0.005)	(<0.001)	0.62	0.009	(0.01)	0.34	0.081	0.026	(<0.001)	(<0.002)	
13X32900 A	AISI 329	S32900	Austenitic Steel	0.007		0.0028		0.0251				0.0724	24.91	0.354		1.478	1.310	0.097				5.57		0.0276		0.0269		0.556				0.0938	0.017				
13X34700 A	AISI 347	S34700	Austenitic Steel	0.025		0.0007		0.016				0.132	17.22	0.165		1.283	0.392	0.0163		0.329		9.32		0.0276	(0.0005)		0.480	0.0053			0.123	0.144					
8G	AISI 347	S34700	Austenitic Steel	0.003	(0.007)	0.0005		0.042	(<0.0005)			0.162	17.2	0.39	(<0.0200)	1.468	0.359	0.046		0.53		9.02	0.003	0.0327	(<0.02)	0.0126	(<0.02)	0.01	0.36	0.0107	0.004	0.0024	0.062	0.032	(<0.005)	0.002	
8H	AISI 347	S34700	Austenitic Steel	0.005	(<0.01)	(0.0002)		0.049	(<0.002)			0.083	17.14	0.192	(<0.001)	1.81	0.237	0.027		0.48		9.08	(0.004)	0.025	(<0.03)	0.002	(<0.002)	(<0.001)	0.4	0.008	(0.01)	0.0027	0.049	0.016	(<0.001)	(<0.002)	
8I	AISI 347	S34700	Austenitic Steel	0.003	(<0.008)	(0.0005)		0.0424	(<0.001)			0.301	17.08	0.441		1.395	0.416	0.052		0.6		9.01	(0.004)	0.0352	(<0.03)	0.0118	(<0.002)	(<0.001)	0.38	0.012	(<0.005)	0.008	0.057	0.06	(<0.001)	(<0.005)	
318B	Alloy 16-6-2-2		Austenitic Steel	0.004	(0.004)	0.0003		0.05				0.1	15.9	1.63		1.02	1.57	0.032		0.086		5.71	0.009	0.022		0.0006		0.41	0.004	(0.004)	0.014	0.115	0.087		(0.003)		
316A	Alloy 253MA	S30815	Austenitic Steel	0.006	0.007	(0.0003)		0.07	0.0017		0.064	0.118	21.07	0.19		0.61	0.25	0.1605		0.003		10.81	0.0052	0.023	(0.0001)	0.0011		1.5	0.006	0.003	0.002	0.042	0.022	(0.0008)			



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Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr		
302B	Alloy 254SMO	S31254	Austenitic Steel	0.0159	(0.009)	0.0027		0.0226	(0.0031)			0.072	20.33	0.701	0.0009	0.93	6.24	0.18		0.012			17.7	0.0032	0.0256	(0.001)	0.0007	(0.0018)	(0.0006)	0.56	0.0075	0.004	0.0031	0.052	0.025	(<0.01)	(<0.01)	
13X31254A	Alloy 254SMO	S31254	Austenitic Steel	0.0134		0.0025		0.0185				0.125	20.11	0.575		0.590	6.13	0.205				18.34		0.0191		0.0011			0.400				0.0595	0.017				
19C	Nitronic 40	S21900	Austenitic Steel	0.007	(0.004)	0.0011		0.012				0.087	19.51	0.45		9.02	0.4	0.32		0.028			6.4	0.003	0.027		0.0007			0.31	0.0061	0.005	0.003	0.09	0.037			
17D	Nitronic 50	S20910	Austenitic Steel	0.0032	0.005	0.001		0.041	(0.002)			0.23	21.06	0.412	(0.0003)	4.15	1.52	0.311		0.14			11.83	0.003	0.026	(0.0002)	0.0018	(0.001)	(0.001)	0.416	0.0044	0.003	0.01	0.118	0.056	(0.0004)	0.002	
13X NSA10 A	Nitronic 50	S20910	Austenitic Steel			(0.0029)		0.016				0.061	20.69	0.175		5.23	2.636	0.343		0.142			12.96		0.0207		0.0006			0.375				0.151	0.061			
FeN50-18	Nitronic 50	S20910	Austenitic Steel	0.006	(0.006)	(0.0007)	(<0.005)	0.03	(0.0014)	(<0.005)		0.081	21	0.28	(<0.005)	5.27	2.01	0.26		0.18			11.9	0.006	0.026	(<0.005)	0.0013	(<0.02)	(<0.005)	0.24	0.007	(<0.005)	0.002	0.121	0.023	(<0.005)	(<0.005)	
18D	Nitronic 60	S21800	Austenitic Steel	0.006	(0.007)	0.0011	(<0.001)	0.069	(0.002)	(<0.001)	(<0.005)	0.086	16.7	0.421	(<0.021)	8.1	0.325	0.17		0.031			8.39	(0.004)	0.032	(<0.11)	0.0025	(<0.004)	(<0.03)	3.68	0.007	(0.01)	0.012	0.064	0.026	(<0.02)	(0.005)	
α21800 A	Nitronic 60	S21800	Austenitic Steel	0.012		(0.001)		0.0765				0.0943	16.81	0.431		8.00	0.325	0.125		0.007			8.32		0.032		0.0011			4.03				0.0619				
295A	NMS 140		Austenitic Steel	(0.01)		0.002		0.021				0.021	18	0.113		19.7	0.97	0.62		0.018			1.84	0.003	0.028		0.0041			0.36	0.004		0.0019	0.046	0.016		(0.001)	
294A	NMS J38		Austenitic Steel	(0.01)		(0.003)		0.017				0.021	19.7	0.34		21.6	1.8	0.78		0.03			2.9	0.003	0.026	(0.001)	0.0028			0.43	(0.006)	(0.003)	(0.002)	0.046	0.01		(0.002)	
296A	NMS MDC		Austenitic Steel	(0.005)		(0.001)		0.074				0.018	11.2	0.12		10.6	0.6	0.23		0.043			1.71	0.003	0.027		0.002			0.38	0.0007		0.002	0.056	0.01			
13X 12533 Z			Austenitic Steel	0.059		0.0100		0.110				0.0299	18.80	0.131		0.812	1.05	0.073				5.06		0.0149		0.0156			0.440	0.0097		0.147	0.181					
13X 12534 X			Austenitic Steel	0.0485				0.0716				0.0602	17.71	0.0586		0.589	2.04			0.201			8.50		0.0192		0.0086			0.811		0.031	0.348	0.110	0.010			
13X 12535 BE			Austenitic Steel	0.194		0.0051		0.229				0.146	16.95	0.130		0.342	4.09	0.029				14.79		0.0400		0.0591			1.407	0.0194	(0.020)	0.625	0.252					
13X 12536 T			Austenitic Steel	0.108		0.0214		0.146				0.280	16.09	0.0793		0.374	2.48	0.0084		0.060			12.12		0.0449		0.090			0.546	0.0068	0.104	0.444	0.0513				
13X 12537 T			Austenitic Steel	(0.062)		0.0029		0.0889				0.1520	20.43	0.248		1.116	3.05	0.048		0.102			10.71		0.0382		0.0206			1.151	0.0401	0.0194	0.273	0.0908				
13X 12853 L			Austenitic Steel	0.18		0.0018		0.069				0.0415	17.13	0.092		1.156	2.718	0.0086		0.180			12.31		0.0053		0.0062			0.994		0.034	0.0455		0.089			
13X 12855 N			Austenitic Steel	0.048		0.0098		0.107				0.155	16.29	0.340		0.918	2.96	0.0078		0.098			11.79		0.0020		0.0063	0.093		0.863		0.122	0.083		0.199			
13X 17001 C			Austenitic Steel	0.0312		0.0085		0.0769				0.0979	14.83	0.0161		1.543	0.0967			0.546			6.31		0.055		0.0134			0.215		0.0124						
13X 17002 E			Austenitic Steel	(0.030)		0.0012		0.112				0.0702	17.45	0.1012		0.801	0.204	0.061		0.487			7.87		0.0409		0.0250			0.486		(0.012)		0.0587				
13X 17003 A†			Austenitic Steel					0.10				0.07	11.89	0.08		0.85	0.27			0.34			11.90		0.037		0.035			0.78								
13X 17004 B			Austenitic Steel	0.0433		0.0066		0.0844				0.0555	21.37	0.0449		0.497	0.455	0.0086		0.179			16.04		0.0189		0.0396			1.23		0.057	0.034					

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Stainless Steel

Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr	
13X17005E			Austenitic Steel	0.049		0.0030		0.0217				0.0265	24.69	0.120		0.209	0.599	0.0097		0.101		20.06		0.0040		0.0431		1.739		0.015	0.0073						
13X18001B			Austenitic Steel	0.0157				0.207				0.0231	15.92	0.149		0.463	0.816	0.0347		0.612		6.13		0.0090		0.0786		0.203					0.0996				
13X18002D			Austenitic Steel	0.0617				0.159				0.0514	17.77	0.116		0.722	0.209	0.072		1.531		7.92		0.0245		0.0487		0.352					0.0542				
13X18003C			Austenitic Steel	0.0292				0.113				0.100	19.56	0.0433		1.000	0.401	0.090		1.042		10.08		0.0545		0.0245		0.805					0.0750				
13X18004B			Austenitic Steel	0.0111				0.099				0.211	21.57	0.050		1.400	0.601	0.061		0.749		12.67		0.068		0.0191		1.21					0.161				
13X19001B			Austenitic Steel					0.055				0.025	15.07	0.202		0.460	1.51	0.070		0.032		5.10		0.0151		0.0174		1.20		(0.019)		0.083					
13X19003C			Austenitic Steel					0.047				0.105	18.99	0.171		1.138	2.5	0.077		0.12		12.46		0.0382		0.046		0.497		(0.005)		0.0486					
13X19004C			Austenitic Steel	0.03		(0.001)		0.075				0.0501	22.77	0.0112		2.017	3.43			0.152		17.9		0.074		0.0135		0.356	(0.001)	0.011		0.0417					
292A	Alloy 2101	S32101	Duplex Stainless	0.01	(<0.01)	0.0011		0.03				0.031	21.35	0.29		5	0.097	0.245		0.009		1.47	0.0024	0.018		0.001		0.75	0.004	(0.006)	0.005	0.084	0.01				
13X32101A	Alloy 2101	S32101	Duplex Stainless	0.0122		0.0014		0.0325				0.0347	21.12	0.295		4.913	0.0970	0.241		0.0070		1.476		0.0194		(0.0004)		0.777				0.0830					
Fe2205-18	Alloy 2205	S32205	Duplex Stainless	0.007	(0.003)	(0.002)	(<0.0001)	0.018	(0.002)	(<0.0001)		0.104	22.6	0.208	(<0.001)	1.18	3.2	0.17		0.011		5.57	0.004	0.023	(<0.003)	0.001	(0.001)	(<0.001)	0.46	0.006	(0.02)	0.003	0.063	0.024	(<0.005)	(<0.005)	
317A	Alloy 2304	S32304	Duplex Stainless	0.005	(0.006)	0.0019		0.025	(0.0003)			0.064	22.5	0.21		1.26	0.249	0.123		0.004		4.19	0.0032	0.028	(0.001)	0.0007		0.39	0.008	(0.004)	(0.002)	0.061	0.015				
301A*	Alloy 2507	S32750	Duplex Stainless	0.02	(0.002)	0.0021		0.016	(0.002)			0.039	24.88	0.107		0.81	3.87	0.279		0.006		6.93	0.003	0.02	(0.0001)	0.0007		(0.0001)	0.27	0.003	0.003	0.003	0.045	0.015		(0.002)	
301B	Alloy 2507	S32750	Duplex Stainless	0.005	(0.004)	0.0024		0.0206	(0.0009)			0.055	25.06	0.192	(0.0003)	0.807	3.75	0.297		0.02		7.01	0.0069	0.251	(0.0003)	0.001	(0.0006)	(0.00008)	0.419	0.0051	0.003	0.003	0.07	0.05	(0.0004)	0.0008	
13XNSA13A	Alloy 2507	S32750	Duplex Stainless	(0.007)		0.0030		0.0200				0.0328	25.27	0.156		0.761	3.73	0.269		0.028		6.73		0.0249		0.0005		0.257				0.0712	0.035				
239C	Alloy 255	S32550	Duplex Stainless	0.007	(0.004)	0.0014		0.017	(<0.004)		(<0.005)	0.039	25.8	1.49	(<0.03)	0.87	3.33	0.228		0.006		6.14	(0.007)	0.023	(0.004)	0.001	(0.0004)	(<0.03)	0.38	0.003	(0.004)	0.004	0.083	0.05	(<0.03)	(0.003)	
239B >	Ferrallium 255	S32550	Duplex Stainless	0.008	(0.003)	0.0008		0.013				0.048	25.9	1.48		0.86	3.42	0.25		0.024		5.78	0.004	0.025	(0.001)	0.0005		0.39	0.003	(0.004)	0.002	0.099	0.106		0.002		
13XNSA7B	Ferrallium 255	S32550	Duplex Stainless	0.0142		0.0018		0.0130				0.0471	25.69	1.53		0.864	3.28	0.232		(0.009)		6.37		0.0160		0.0005		0.278				0.0802	0.133				
319A	Zeron 100	S32760	Duplex Stainless	0.01	(0.004)	0.002		0.015				0.051	25.2	0.51		0.53	3.56	0.24		0.006		6.92	0.0025	0.024		0.0006		0.23	0.0055	(0.002)	0.003	0.076	0.52		0.002		
13XNSA8B	Zeron 100	S32760	Duplex Stainless			0.0017		0.0206	0.0011			0.0448	25.49	0.589		0.598	3.49	0.232		0.026		7.48		0.0248		0.0007		0.285				0.0583	0.599				
FeZ100-18	Zeron 100	S32760	Duplex Stainless	0.017	(0.0045)	0.002	(<0.001)	0.017	(<0.002)	(<0.001)		0.123	25.5	0.55	(0.002)	0.52	3.61	0.22		0.005		7.1	0.003	0.026	(<0.003)	0.0009	(0.001)	(<0.004)	0.24	0.006	(<0.045)	(0.004)	0.09	0.56	(<0.005)	(<0.005)	
13X14122A	1.4122 DIN X39CrMo17-1		Martensitic Steel	(0.002)				0.356				0.0224	15.91	0.066		0.480	0.855	0.0290		0.006		0.632		0.0177		0.0021		0.449	0.0041			0.101	0.004				
13X14713A	1.4713 DIN X10CrAlSi7		Martensitic Steel	0.551				0.0446				0.0110	7.17	0.0368	0.0016	0.495	0.0266	0.0065				0.122		0.0203		0.0080		0.911	0.0034		0.0056	0.0411					

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
242A	Aermet 100	K92580	Martensitic Steel	0.004		(0.0005)		0.24				13.5	3	0.007		0.018	1.21	0.0003		0.004		11.1	0.0006	0.002		0.0004		0.02	(0.001)	0.008	0.009	0.01	(<0.01)		(0.002)	
FeA100-18	Aermet 100	K92580	Martensitic Steel	0.007				0.222				13.4	2.98	0.01		0.013	1.19	0.001		0.003		11.2	0.0009	0.004				0.039		0.008	0.007	0.006				
13X 40900 A	AISI 409	S40900	Martensitic Steel	0.0311				0.0354				0.0530	10.98	0.134		0.715	0.102	0.0070		0.0324		0.231		0.0032		0.0059		0.616	0.0080		0.530	0.0990				
13X 40930 A	AISI 409HP	S40930	Martensitic Steel	0.0362				0.0227				0.0241	11.09	0.222		0.707	0.0328	0.0075		0.051		0.301		0.0104		0.0046		0.689	0.0069		0.434	0.0339				
9B*	AISI 410	S41000	Martensitic Steel	0.024				0.13				0.016	11.97	0.054		0.54	0.064	0.0468		0.028		0.3	0.0019	0.019		0.006		0.29	0.004		0.005	0.048	0.01			
9D*	AISI 410	S41000	Martensitic Steel	0.003	0.003	0.0005		0.143	(0.001)			0.0213	12.51	0.11	(0.0004)	0.57	0.038	0.0225		0.0023		0.2	0.0053	0.033	(0.0002)	0.028		(0.0001)	0.38	0.006	0.004	0.0016	0.022	0.004	(0.0001)	(0.001)
Fe410-18	AISI 410	S41000	Martensitic Steel	0.003	(0.0032)	(<0.005)	(<0.005)	0.132	(<0.007)	(<0.005)		0.012	12.2	0.046	(<0.005)	0.5	0.146	0.046		0.0021		0.28	0.009	0.017	(<0.001)	0.0014	(<0.008)	(<0.005)	0.29	(0.004)	(<0.013)	(0.002)	0.065	0.008	(<0.005)	(<0.005)
13X 41001 A	AISI 410* ASTM A579	S41001	Martensitic Steel	(0.004)				0.136	0.0010			0.0143	12.06	0.056		0.464	0.0102	0.0316				0.0939		0.0142		0.0037		0.298	0.0051			0.079				
13X 41008 A	AISI 410S	S41008	Martensitic Steel	0.076				0.0292				0.0491	12.39	0.0915		0.711	0.0365	0.0131		0.0202		0.319		0.0105		0.0048		0.641	0.0077			0.0569			0.007	
13X 41008 B **	AISI 410S	S41008	Martensitic Steel	0.029				0.035				0.053	12.4	0.26		0.68	0.041	0.009		0.019		0.33		0.013		0.0072		0.72	0.008			0.059			0.049	
327A	AISI 415	S41500	Martensitic Steel	0.003	(0.004)	0.001		0.018				0.019	12.73	0.082	(0.0003)	0.54	0.53	0.0157		0.008		3.83	0.0047	0.018	(0.0001)	0.001		0.43	0.006	(0.004)	0.0026	0.036	0.009		(0.002)	
13X 41500 A	AISI 415	S41500	Martensitic Steel					0.0385				0.0999	13.00	0.1296		0.596	0.504	0.0504		0.0405		3.52		0.021		0.0101		0.402			0.0012	0.091				
10D	AISI 416	S41600	Martensitic Steel	0.0027	0.007	0.002		0.11	(0.0011)			0.0187	12.42	0.192	(<0.09)	1.11	0.148	0.0241		0.0027		0.291	0.005	0.0178	(0.0003)	0.334	(0.0022)	(<0.02)	0.475	0.01		0.0015	0.051	0.005	(0.006)	(<0.005)
13X 41600 A	AISI 416	S41600	Martensitic Steel	(0.004)				0.111				0.0216	13.23	0.160		0.627	0.0499	0.0245		0.0053		0.331		0.0253		0.302		0.442	0.0066			0.0888	(0.003)			
20C	AISI 418 Greek Ascoloy	S41800	Martensitic Steel	(0.004)				0.18				0.031	12.15	0.06		0.3	0.12	0.0222		0.01		1.93	0.0068	0.018		0.007		0.35	0.004		(0.003)	0.086	2.59			
13X 41800 A	AISI 418 Greek Ascoloy	S41800	Martensitic Steel	(0.003)				0.172				0.0357	12.30	0.104		0.328	0.0689	0.0283		(0.006)		2.053		0.0176		0.0006		0.316	0.0040			0.0200	2.75			
Fe418-18	AISI 418 Greek Ascoloy	S41800	Martensitic Steel	0.004	(0.003)	(<0.005)	(<0.005)	0.168	(<0.005)	(<0.005)		0.029	12.4	0.222	(<0.005)	0.429	0.104	0.031		0.019		2	0.004	0.016	(<0.005)	(0.0005)	(<0.05)	(<0.005)	0.32	0.005	(<0.005)	(0.004)	0.046	2.63	(<0.005)	(<0.005)
154A*	AISI 420	S42000	Martensitic Steel	0.008				0.39				0.021	12.82	0.044		0.47	0.052	0.0294		0.004		0.19	(0.0068)	0.018		0.003		0.35	0.004		0.002	0.045	0.011			
154B	AISI 420	S42000	Martensitic Steel	0.002		(0.001)		0.35				0.02	12.2	0.087		0.405	0.079	0.02		0.003		0.223	0.0016	0.017		0.0004		0.45	0.006		0.002	0.067	0.01			
154C	AISI 420	S42000	Martensitic Steel	0.0034	(0.004)	0.0007		0.339	(<0.001)			0.016	12.41	0.12	(<0.001)	0.423	0.036	0.054		0.014		0.215	0.0042	0.0174	(<0.01)	0.0043	(0.001)	(0.0003)	0.37	0.0058	(<0.005)	0.0015	0.043	0.005	(<0.005)	(0.0014)
13X 42000 A	AISI 420	S42000	Martensitic Steel			0.0013		0.208				0.0161	12.56	0.202		0.679	0.0398	0.0273				0.295		0.0241		0.0253		0.496	0.0073			0.046				
13X 14418 A	AISI 420* EN 1.4418	S42010	Martensitic Steel	(0.003)				0.0450				0.1004	15.44	0.173		0.819	0.847	0.0423		(0.009)		4.65		0.0265		0.0108		0.291	0.005			0.0539	0.013			
352A	AISI 420FS	S42020	Martensitic Steel	0.0025	0.005	0.0007		0.341	(<0.005)		(<0.005)	0.016	13.11	0.148	(<0.009)	1.13	0.38	0.029		0.012		0.269	0.005	0.0182	(<0.001)	0.21	(0.004)	(0.006)	0.357	0.0046	(0.0007)	0.0015	0.028	0.005	(<0.02)	(<0.003)

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Stainless Steel

Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
205D	AISI 422	S42200	Martensitic Steel	0.0021	0.004	0.0007		0.232	(0.002)		(<0.0010)	0.043	12.18	0.122	(0.0007)	0.736	1.002	0.0484		0.013		0.841	0.0053	0.0209	0.002	0.0028	(<0.0070)	(<0.0050)	0.257	0.0047	(<0.0050)	0.0022	0.319	1.07	(<0.0050)	0.0022
13X 14923 A	AISI 422	S42200	Martensitic Steel	0.003				0.205	0.0044			0.0207	11.26	0.0563		0.501	0.819	0.0321		0.005		0.452		0.0197		0.0031			0.330	0.004			0.295			
13X 42200 A	AISI 422	S42200	Martensitic Steel	0.0020				0.220				0.0114	11.41	0.136		0.651	1.042	0.0585		0.0203		0.738		0.0182		0.0012		0.314	0.0052			0.246	1.177			
11D	AISI 430	S43000	Martensitic Steel	0.015	(0.005)	0.0006		0.07	(0.002)			0.024	17.35	0.085	(0.0003)	0.4	0.075	0.021		0.009		0.6	0.004	0.023	(0.0005)	0.004		(0.001)	0.83	0.006	(0.003)	0.003	0.052	0.008	(0.004)	(0.001)
13X 43020 A	AISI 430F	S43020	Martensitic Steel	0.0047		(0.003)		0.147				0.0191	16.07	0.0687		1.439	0.226	0.0212		0.0102		0.517		0.0246		0.189		0.415			0.0542	0.0108				
355A	AISI 430FS	S43020	Martensitic Steel	0.0016	0.004	0.0011		0.0274	(<0.005)		(<0.005)	0.047	17.81	0.083	(0.0008)	0.47	0.337	0.0439		0.0095		0.427	0.01	0.0186	(0.0002)	0.31	(<0.004)	(0.0001)	0.435	0.005	(0.001)	0.002	0.038	0.018	(0.0007)	(0.002)
12A*	AISI 431	S43100	Martensitic Steel	(0.076)				0.14				0.03	16.03	0.1		0.61	0.07	(0.057)		0.04		2.27	(0.02)	0.024		0.006		0.37	(0.007)		0.004	0.07	0.024			
12B	AISI 431	S43100	Martensitic Steel	(0.003)		(0.0003)		0.174				0.018	16.02	0.143		0.6	0.057	2.15		0.011		2.15	0.0101	0.016	(<0.0005)	0.003		0.56	0.006		0.003	0.037	0.014		(0.002)	
12C	AISI 431	S43100	Martensitic Steel	0.004	0.004	0.0004		0.155	0.0007			0.048	15.78	0.33	(0.0002)	0.55	0.125	0.056		0.02		2.23	0.005	0.022	(0.0005)	0.0032		0.34	0.008	(0.0005)	0.002	0.04	0.015		(0.001)	
13X 43100 A	AISI 431	S43100	Martensitic Steel					0.166				0.0239	16.39	0.134		0.378	0.0768	0.075		0.006		2.10		0.0199		0.0050		0.535	0.004			0.0577	0.004			
13D	AISI 440C	S44004	Martensitic Steel	0.006	0.008	0.0005		1.04	(0.0007)			0.0212	16.36	0.184		0.697	0.488	0.0492		0.0074		0.256	0.0031	0.0195	(<0.0090)	0.0012	0.0027	(<0.02)	0.614	0.011	0.004	0.0035	0.058	0.046	(<0.02)	0.0017
13X 44004 B	AISI 440C	S44004	Martensitic Steel	0.0160				1.012				0.0167	16.50	0.0687		0.378	0.468	0.0308		0.008		0.197		0.0232		0.0018		0.440			(0.004)	0.0484	0.0156			
353A	AISI 440F Se	S44023	Martensitic Steel	0.0018	0.004	0.0006		0.98	(0.0003)		(<0.005)	0.032	17.01	0.13	(0.004)	0.95	0.5	0.027		0.011		0.265	0.005	0.019	(0.002)	0.025	(0.002)	0.17	0.49	0.0056	0.004	0.0015	0.116	0.041	(0.005)	0.002
13X 14742 A	AISI 442	S44200	Martensitic Steel	0.804				0.084				0.0186	17.60	0.1267	0.0022	0.714	0.0968	0.0209		0.0202		0.449		0.0214		0.0008		0.910	0.0046		0.0051	0.0463				
14A*	AISI 446	S44600	Martensitic Steel	(<0.01)				0.089				0.038	23.84	0.06		0.46	0.05	(0.17)		(<0.01)		0.31	(0.021)	0.023	(0.0005)	0.004		0.37	(0.013)		(<0.01)	0.045	0.014			
14B*	AISI 446	S44600	Martensitic Steel	0.004	(<0.005)	(0.0004)		0.016	(<0.005)			0.03	23.6	0.071	(<0.001)	0.426	0.095	0.043		0.006		0.29	0.0054	0.022	(<0.001)	0.0015		0.51	0.005	(<0.001)	0.0024	0.11	0.011		(<0.005)	
14C	AISI 446	S44600	Martensitic Steel	0.0041	0.003	0.0005		0.061	(0.001)			0.043	24.9	0.19	(0.0005)	0.385	0.101	0.058		0.013		0.364	0.006	0.021	(0.0001)	0.0015	(0.002)	(0.0001)	0.63	0.004	(0.002)	0.013	0.078	0.031	(0.0003)	(0.001)
13X 14762 A	AISI 446	S44600	Martensitic Steel	1.318				0.082	0.0025			0.0293	24.38	0.0801	0.0024	0.662	0.0553	0.0285		0.0277		0.346		0.0275		0.0007		1.069	0.0048		0.0058	0.0993				
13X 90901 A	ASTM A182 Grade F91	K90901	Martensitic Steel	0.0216				0.1020					8.43	0.0399		0.447	0.905	0.0472		0.0704		0.249		0.0148		0.0009		0.429	0.0020		(0.003)	0.208	0.0094			
13X 12547 M			Martensitic Steel					0.238				0.302	17.49	0.531		1.191	1.006	0.099		0.347		1.492		0.0441		0.0746		0.344	0.030			0.1021				
13X 12548 M			Martensitic Steel					0.189				0.352	12.98	0.228		0.576	1.33	0.0508		0.585		1.08		0.0260		0.218	0.022	0.421					0.033			
13X 12549 L			Martensitic Steel					0.1025				0.492	12.01	0.492		0.354	1.311	0.0393		0.19		1.203		0.0052		0.124		0.344				0.0144				
13X 14775 S			Martensitic Steel	0.0301	(0.002)			0.006				0.153	17.78	0.167		1.405	0.529			0.691		1.949		0.047		0.154		0.552	0.0007			0.0287				

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Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr			
13X15023 W			Martensitic Steel	(0.004)				0.089				0.0501	11.05	0.0312		1.75	0.961	0.0081		1.440		0.947		0.0078		0.0053		0.340			0.0308	0.0396							
13X15024 X			Martensitic Steel	0.0049				0.166				0.1059	14.65	0.332		0.610	0.299	0.0156		0.099		2.99		0.0284		0.0294		0.749			0.150	0.039							
13X15035 U			Martensitic Steel	(0.093)				0.115				0.199	14.00	0.204		0.674	0.399	0.0584		0.500		2.38		0.0415		0.0456		0.636			0.160	0.048							
13X15059 P			Martensitic Steel					0.084				0.266	15.85	0.105		0.995	0.600			0.430		1.584		0.0130		0.0133		0.495	(0.02)	0.038	0.070	0.081							
13X8110 LE			Martensitic Steel	(0.004)	0.072	1.07		0.697				(0.32)	0.223			0.650	2.71	0.0200				4.20		0.047		0.0943		0.788		0.031	0.220								
98A*	ASTMF15, Kovar	K94610	Fe-Ni-Co Sealing	0.04				0.019				17.5	0.12	0.05		0.24	0.05			<0.01		29.09		0.002		0.002		0.1	<0.01		<0.01	<0.01	0.03			<0.01			
98B	ASTMF15, Kovar	K94610	Fe-Ni-Co Sealing	0.07	<0.002	0.001		0.007	<0.0005			17	0.012	0.028	0.004	0.18	0.01	0.0024		0.002		29.4	0.0021	0.002	<0.0005	0.0007		0.17	0.002	<0.05	0.03	(0.003)	(0.02)	<0.0005	<0.01				
FeKovar-18	ASTMF15, Kovar	K94610	Fe-Ni-Co Sealing	<0.006	(0.003)	<0.005	<0.005	0.024	<0.005	<0.005		17.3	0.068	0.077	<0.01	0.26	0.062	<0.002		<0.005		29	<0.008	0.004	<0.005	0.0055	<0.005	<0.005	0.09	0.0021	<0.005	<0.005	<0.005	0.02	<0.005	<0.005			
214A	NMS-100		Non-Magnetic Steel	(0.002)		(0.001)		0.018				0.021	12.36	0.36		18.3	0.44	0.27		0.23		2.33	0.0026	0.033		0.002		1	0.008		0.002	0.04	0.02						
308A	Alloy C-250	K92890	Maraging Steel	0.097	(0.003)	0.0029		0.003	(0.0003)			7.8	0.023	0.018		0.019	4.78	0.0013		0.003		18.53	0.0005	0.004		0.0005		0.014	0.001	<0.01	0.46	0.01	0.01			0.01			
99B	Alloy C-300	K93120	Maraging Steel	0.095		0.0026		0.005				9.24	0.081	0.094		0.036	4.88	0.0011		(0.005)		18.46	0.0015	0.005		0.0005		0.022	(0.003)		0.74	0.012	0.016			<0.01			
99D	Alloy C-300	K93120	Maraging Steel	0.117	<0.002	0.0026		0.006	<0.001			9.24	0.12	0.045	<0.005	0.013	4.8	0.0014		0.011		18.4	<0.003	0.004	(0.01)	0.0011	<0.004	0.03	(0.002)	<0.032	0.67	0.037	0.01	<0.002	(0.008)				
309A	Alloy C-350	K93540	Maraging Steel	0.11	(0.004)	0.0032		0.0059	<0.001			12.3	0.053	0.023		0.018	4.71	0.001		0.004		18.4	0.0005	0.004		0.0006		0.02	(0.001)	(0.006)	1.47	0.01	0.01			0.008			
13X14935 T			Maraging Steel	(0.007)				0.0105				7.17	0.745			0.494	5.61	0.0102				18.96		0.036		0.055		0.441		0.106									
13X42027 A**	AISI 420*AMS 5898	S42027	High Nitrogen	0.005				0.30				0.02	15.3	0.035		0.36	0.99	0.39				0.16		0.014		0.0005		0.54			0.050	0.02							
13XNSA9 A	ASTMA182 Grade F51	S31803	High Nitrogen					0.019				0.072	22.57	0.240		1.592	3.11	0.156		0.012		5.44		0.0248		(0.0007)		0.469			0.068	0.024							
13XNSA9 B	ASTMA182 Grade F51	S31803	High Nitrogen			0.0018		0.0304				0.0337	22.39	0.154		1.524	3.27	0.184		0.021		5.75		0.0237		0.0009		0.290			0.0607	0.033							
13XNSA2 J			High Nitrogen					0.132					17.82	0.259		1.03	2.013	0.131		0.155		10.08		0.0252		0.0275		0.739			0.139								
13XNSA4 B			High Nitrogen	0.0048				0.115					23.85	0.595		5.55	4.32	0.446		0.154		17.62		0.0302		0.0095		0.519											
13XNSA6 B			High Nitrogen	(0.08)				0.0467					26.14	1.52		1.607	7.03	0.245		0.149		31.13		0.060		0.0113		0.64											
13XNSB1 D1			High Nitrogen					0.17					19.1			0.44	0.11	0.04				10.0						0.58											
13XNSB2 D1			High Nitrogen					0.06					18.2			0.62	0.21	0.095				11.1						0.66											
13XNSB3 G			High Nitrogen					0.121					15.22			0.632	0.630	0.198				9.26						0.471											

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Stainless Steel

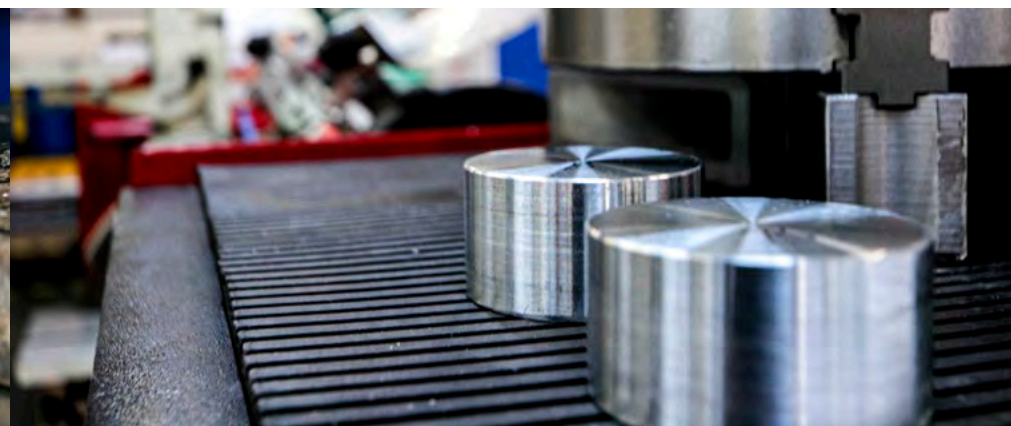
Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
13XNSC1P			High Nitrogen					0.316					18.76	0.391		6.53	0.196	0.0877		1.499		5.06				0.0097			0.788				0.501	0.100		
13XNSC3AA			High Nitrogen	0.051				0.868					22.32	0.292		8.43	0.057	0.498		2.45		5.00				0.0295			1.51				0.098			
13XNSC6A			High Nitrogen	(0.009)				0.0266					20.47	0.0064		8.85	(0.002)	0.235				6.52		0.0049		0.0055			0.523				0.0052			
291A	M152	S64152	High Strength	(0.004)	(0.005)	0.001		0.11	(0.001)			0.021	11.3	0.06		0.71	1.61	0.035		0.022		2.62	0.014	0.016		0.009		0.23	0.004	(0.001)	0.0011	0.29	(0.01)		(<0.005)	
13X64152A	M152	S64152	High Strength	0.0315				0.114				0.0185	11.34	0.0622		0.666	1.567	0.0339				2.50		0.0123		0.0020		0.224				0.275				
26D	A286	S66286	Fe Super Alloy	0.29	(0.003)	0.0063		0.038	(<0.0005)		(<0.015)	0.04	14.29	0.047	(<0.005)	0.224	1.23	0.0035		0.007		24.6	(0.001)	0.013	(<0.03)	0.0008	(<0.004)	(<0.03)	0.05	0.0039	(<0.008)	2.17	0.223	0.036	(<0.02)	(0.0016)
13X66286A	A286	S66286	Fe Super Alloy	0.193		0.0044		0.035				0.083	14.99	0.195		1.173	1.185	0.0040				25.21		0.0172		(0.0006)		0.216			1.92	0.262	0.098			
22C	AISI 15-5PH	S15500	Precip. Hardenable	0.006	0.004	0.0006		0.042	(0.0002)			0.086	14.28	3.24	(0.0001)	0.63	0.48	0.03		0.29		4.63	0.0021	0.027	0.00003	0.0004		0.39	0.013	(0.004)	0.002	0.068	0.031	(0.0005)	(0.002)	
23D*	AISI 17-4 PH	S17400	Precip. Hardenable	0.005	(0.005)	0.0019		0.038	0.0013			0.041	15.16	3.27	(0.0004)	0.52	0.159	0.037		0.29		4.88	0.0033	0.022	(0.001)	0.0006		(0.001)	0.49	0.0059	0.002	0.003	0.053	0.011	(0.001)	(0.001)
13XPH17400A	AISI 17-4 PH	S17400	Precip. Hardenable					0.0200				0.0411	15.74	3.09		0.829	0.061	0.0342		0.184		4.52		0.0202		0.0215		0.349				0.112				
Fe174PH-18	AISI 17-4PH	S17400	Precip. Hardenable	0.007	(<0.01)	(<0.005)	(<0.006)	0.041	(<0.005)	(<0.005)		0.047	15.1	3.33	(<0.006)	0.47	0.315	0.0436		0.285		4.73	0.0035	0.024	(<0.005)	(<0.004)	(<0.01)	(<0.005)	0.52	0.008	(0.0003)	(<0.006)	0.051	0.015	(<0.005)	(<0.003)
152C	AISI 17-7 PH	S17700	Precip. Hardenable	0.94	(0.004)	0.0029		0.072				0.113	16.99	0.316		0.74	0.36	0.0172		0.012		7.3	0.001	0.024		0.0006		0.263	0.007	(0.005)	0.098	0.072	0.026			
13XPH17700A	AISI 17-7 PH	S17700	Precip. Hardenable	1.172		0.0033		0.0732				0.0464	16.88	0.146		0.496	0.340	0.0192		0.0201		6.98		0.0181		0.0008		0.551			0.051	0.0390	0.009			
Fe177PH-18	AISI 17-7 PH	S17700	Precip. Hardenable	1.09	(0.004)	0.0017	(<0.005)	0.08	(<0.005)			0.048	17.08	0.36	(0.006)	0.73	0.35	0.0153		0.009		7.11	(0.004)	0.02	(<0.005)	0.0005	(<0.005)	(<0.005)	0.51	0.006	(<0.005)	0.083	0.062	0.011	(<0.005)	(<0.005)
21D	AISI PH13-8Mo	S13800	Precip. Hardenable	1.03	(0.003)	(0.0004)		0.032	(0.0004)			0.078	12.69	0.017	(<0.0005)	0.052	2.23	0.0037		0.005		8.29	(0.0006)	0.008	(<0.001)	0.0014	(<0.001)	(<0.001)	0.039	(0.001)	(<0.003)	0.016	0.017	0.012	(<0.002)	(0.002)
13XPH13800A	AISI PH13-8Mo	S13800	Precip. Hardenable	1.075				0.0386				0.0220	12.52	0.0449		0.0332	2.10	0.0041				8.04		0.0064		0.0030		0.081			0.0122	0.0188				
335A	Alloy AM355	S35500	Precip. Hardenable	0.019	(0.01)	0.0007		0.138	(0.001)			0.063	15.3	0.086		0.85	2.72	0.085		0.015		4.27	0.002	0.016	(0.002)	0.0005		0.39	0.0034	(0.01)	(0.002)	0.094	0.008		(0.002)	
15A*	Custom 450	S45000	Precip. Hardenable	0.029				0.033				0.11	14.9	1.59		0.38	0.77	(0.015)		0.62		6.54	(0.022)	0.021		0.003		0.41	0.005		(<0.01)	0.09	0.026			
15B	Custom 450	S45000	Precip. Hardenable	0.006				0.047				0.24	14.53	1.53		0.39	0.82	0.0355		0.65		6.94	0.0039	0.013		0.001		0.33	0.009		0.005	0.033	0.12			
15C	Custom 450	S45000	Precip. Hardenable	0.005	0.0044	0.0006		0.032	(0.0004)		(<0.01)	0.024	14.39	1.54	(<0.005)	0.76	0.722	0.0148		0.63		6.35	0.003	0.019	(0.003)	0.0018	(0.003)	(0.0003)	0.26	0.009	(0.004)	0.002	0.041	0.02	(0.01)	0.003
16C	Custom 455	S45500	Precip. Hardenable	0.072	0.003	0.0011		0.003				0.017	11.34	2.08	(0.0001)	0.024	0.009	0.003		0.248		8.23	0.0014	0.007		0.0046		0.03	0.003	(0.005)	1.16	0.07	0.008		0.001	
13X45500A	Custom 455	S45500	Precip. Hardenable	0.073				0.0041				0.0152	11.39	2.20		0.0263	0.0185	0.0030		0.250		8.36		0.0049		0.0020		0.059			1.187	0.0689				
354A	Custom 465	S46500	Precip. Hardenable	0.05	(0.002)	0.0023		0.0076	(0.0003)		(<0.001)	0.022	11.61	0.018	(0.0001)	0.012	0.95	0.0018		0.02		11.05	0.0012	0.0029	(0.004)	0.0019	(0.0002)	(<0.003)	0.04	0.002	(<0.004)	1.56	0.02	0.02	(<0.005)	(<0.005)

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Stainless Steel

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Ce	Co	Cr	Cu	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr	
13X46500A	Custom 465	S46500	Precip. Hardenable	0.069		0.0016		(0.003)				0.0101	11.70	0.0373		0.004	0.948	0.0031		0.005		10.91		0.0020		0.0010		0.075		1.51	0.0049						
13XFV520B A	FV520B	S45000	Precip. Hardenable					0.0181				0.030	13.73	1.462		0.655	1.334	0.0197		0.301		5.29		0.0221		0.0016		0.342				0.080	0.020				
13XPH2S143 A	PH2S143	S45000	Precip. Hardenable					0.044				0.0483	13.46	1.61		0.546	1.326	0.0246		0.225		5.20		0.0212		0.0021		0.479				0.087	0.018				
13XPH2M			Precip. Hardenable	0.0419		0.0047		0.0598				0.0927	16.80	4.03		1.184	1.009	0.052		0.143		3.56		0.0201		0.0419		0.502		0.049	0.1028						
13XPH3M			Precip. Hardenable			0.0049		0.184				0.420	15.86	5.99		0.395	0.751	0.070		0.394		3.08		0.0188		0.0208		1.60				0.176					
13XPH4N			Precip. Hardenable	0.094		0.0033		0.0400				0.600	14.87	5.24		0.793	0.247	0.078		0.303		4.00		0.0285		0.0166		0.747		0.100	0.500						
13XPH7F			Precip. Hardenable	0.012				0.118				0.0493	13.16	0.777		1.487	2.52	0.044		0.241		5.41		0.0283		0.0057		1.402		0.0196	0.043						
13X14207L	14207		Special Stainless	0.0226				0.0388				0.0089	19.63	0.186		0.597	0.573	0.0099		0.258		12.43		0.0061		0.0060		1.448	0.082	0.0119	0.0043	2.99					
13X12538J†			Special Stainless					0.04					23.72			0.78	1.53					6.07						0.64									
13X12540M			Special Stainless					0.131				0.109	27.44	0.181		0.800	0.993	0.054		0.107		4.975		0.051		0.0512		0.805				0.210	0.097				
13X14212S			Special Stainless					0.119				0.1090	21.64	0.611		0.166	0.520	0.0055		0.550		8.81		0.032		0.0386		2.47				0.1175	3.68				
13X14215L			Special Stainless					0.136				0.0057	22.89	0.0110		1.110	0.0048			0.0196		15.86		0.0050		0.0068		0.596				0.0480	3.02				
13X14216P			Special Stainless					0.0424				0.248	23.44	0.231		0.663	0.209	0.0152		0.248		12.06		0.0048		0.0070		1.566				0.0722	2.25				
13X14219K			Special Stainless					0.0997				0.0475	21.46	0.138		0.482	0.169			0.140		12.66		0.0401		0.0456		1.504				0.0188	4.17				



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Nickel Alloy

Nickel Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Fe	La	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Y	Zr
53F	Alloy 600	N06600	Ni-Cr	0.17	(<0.001)	0.0026	(<0.0001)	0.077	(<0.001)	(<0.0003)	0.056	16	0.077	9.5	(<0.0001)	0.016	0.26	0.084	(0.007)	0.088	72.7	(0.001)	0.007	(0.0006)	0.0022	(0.00011)	(<0.001)	0.17	0.002	0.004	0.255	0.024	0.014	(<0.0001)	(0.002)
273A	Alloy C263	N07263	Ni-Cr	0.49	0.0011	0.0012		0.06	(<0.0020)		20.12	20.43	0.007	0.285		0.003	0.214	5.84	0.0037	0.019	50.3	0.0012	0.003	(<0.0001)	0.0003	(<0.001)		0.078	0.001	0.007	2.12	0.007	0.019		0.001
NiX-1B	Alloy X	N06002	Ni-Cr	0.24	(0.002)	0.0038	(<0.001)	0.08	(<0.005)	(<0.005)	1.43	22	0.046	19.2	(<0.0001)	0.003	0.215	8.6	0.042	0.024	46.9	0.0012	0.0107	(<0.00008)	(0.005)	(0.00027)	(<0.005)	0.49	(0.0017)	(<0.005)	0.017	0.037	0.55	(<0.001)	(<0.005)
57E	Alloy X750	N07750	Ni-Cr	0.74	(0.0004)	0.008	(0.000002)	0.06	(<0.0005)	(<0.0001)	0.021	15.3	0.01	8.01	(0.00002)	0.0013	0.079	0.014	(0.0025)	1	72.1	(0.0012)	0.005	(0.0003)	0.0009	(0.00007)	(<0.0006)	0.052	(<0.016)	(<0.023)	2.54	0.021	0.009	(<0.002)	0.037
61A	Haynes 214	N07214	Ni-Cr	4.42		0.005		0.042			(<0.01)	16.12	(0.01)	3.57		(<0.002)	0.17	(<0.01)		(0.01)	(75.62)		0.003	(<0.001)	0.001			0.02	(<0.001)	(<0.01)	(<0.01)	(<0.01)	(<0.01)		0.02
NiH214-18	Haynes 214	N07214	Ni-Cr	4.28	(0.0003)	0.0033	(<0.0001)	0.036	(<0.005)	(<0.005)	0.007	16.24	0.0011	3.48	(<0.0001)	0.0053	0.185	0.004	0.0026	0.003	75.6	(0.001)	0.0017	(<0.001)	(0.0004)	(<0.001)	(<0.005)	0.02	(<0.0001)	(0.0001)	0.003	0.003	0.02	0.008	0.026
Ni282-18	Haynes 282	N07208	Ni-Cr	1.57	(<0.005)	0.0014	(<0.0002)	0.06	(<0.002)	(<0.0001)	10.38	19.4	0.012	0.9	(<0.0001)	0.0054	0.042	8.4	(0.0073)	0.058	56.8	(<0.002)	0.003	(<0.0001)	0.0006	(<0.0002)	(<0.001)	0.054	(0.0003)	(<0.01)	2.2	0.013	0.043	(<0.002)	0.0014
22X 1052 C	Nimonic Type Alloy		Ni-Cr	4.08				0.19			18.6	15.7	0.13	0.65		0.002	0.26	4.48										0.51			1.09				
22X 804 D	Nimonic Type Alloy		Ni-Cr	1.33				0.07			0.20	19.72	0.21	0.66		0.004	0.54	0.09										0.56			2.34				
22X 806 D	Nimonic Type Alloy		Ni-Cr	1.35		0.004		0.007			0.03	19.66	0.004	0.18			0.09	0.01						0.007				0.10			2.48		0.02		0.004
22X 904 C	Nimonic Type Alloy		Ni-Cr	1.29				0.08			16.9	19.9	0.10	0.25		0.005	0.50	0.21										0.52			2.26				
325A	Rene 41	N07041	Ni-Cr	1.56	(0.0004)	0.0082		0.067	(0.0003)		10.46	18.52	(0.003)	0.07		0.0044	0.004	9.98	0.0016	0.007	56.1	0.0005	0.003	(0.00004)	0.0003			0.012	(0.0002)	0.003	3.16	0.01	0.03		0.002
287A	Udimet 500	N07500	Ni-Cr	3.02		0.009		0.079			16.99	18.47	(0.001)	0.086		0.0023	0.002	3.51	0.0007	0.022	54.8	0.0005	0.001		0.0008			0.02	0.0002	0.01	3.02	0.004	0.013		0.008
NiWasp-18	Waspaloy	N07001	Ni-Cr	1.36	(<0.005)	0.0061	(<0.001)	0.038	(<0.005)	(<0.005)	13.13	19.7	0.009	0.69	(<0.0001)	0.0018	0.022	4.28	0.0046	0.033	57.8	0.0009	0.0032	(<0.002)	(0.0004)	(0.00008)	(<0.005)	0.028	(0.0005)	0.005	3.01	0.023	0.03	(<0.002)	0.058
219X 20500 C			Ni-Cr					0.0212			0.0110	51.1	0.0101	1.515			0.300	0.0103	0.199	0.0117	45.45		0.0048				1.29						0.0086		
358A	Alloy 740		Ni-Cr-Co	1.33	(<0.01)	0.0011	(<0.002)	0.026	(0.001)	(<0.0005)	20.1	24.6	0.005	0.122		0.0019	0.259	0.31	0.0045	1.51	50.3	0.001	0.004	(<0.005)	0.0018	(<0.001)		0.145	(<0.001)	(0.006)	1.36	0.009	0.002		0.022
24X 07001 C	Waspaloy Type Alloy		Ni-Cr-Co	1.476		0.0062		0.0360			13.20	19.62	0.0118	1.023			0.024	4.31		0.050	56.92		0.0023		0.0005			0.042			3.14		0.041		0.060
24X 7201 A	Waspaloy Type Alloy		Ni-Cr-Co	2.47		0.0246		0.0326			14.79	15.99		0.09			0.0022	3.01	0.0043		57.09		0.0030		0.0027			0.039			5.11		1.29		0.0432
272A	Alloy 617	N06617	Ni-Cr-Co-Mo	1.16	(0.0002)	0.003	(<0.00001)	0.082			12.89	21.98	0.015	1.1		0.002	0.067	9.34	0.0049	0.015	52.68	0.0007	0.003	(0.0001)	0.0002	(0.0001)		0.07	(0.0003)	(0.01)	0.5	0.005	0.061		0.002
Ni617-18	Alloy 617	N06617	Ni-Cr-Co-Mo	1.08	(<0.005)	0.0023	(<0.001)	0.079	(<0.005)	(<0.028)	11.81	21.9	0.009	1.45	(<0.0001)	0.0011	0.24	9.33	0.0082	0.197	53.3	0.001	0.004	(<0.001)	0.0007	(<0.001)	(<0.005)	0.21	(<0.006)	(<0.009)	0.32	0.006	0.02	(<0.001)	0.06
60A	Alloy 333	N06333	Ni-Cr-Fe	0.08							3.02	25.72	0.1	17.71			1.5		0.044		(44.20)				0.001					0.03	0.07	2.98			
366A	Alloy 601	N06601	Ni-Cr-Fe	1.51		(0.0026)	(<0.0001)	0.025			0.041	22	0.038	14.3		0.004	0.205	0.079	0.0136	0.069	60.9	0.001	0.008	(<0.003)	0.0003			0.019	(<0.005)	(<0.02)	0.43	0.028	0.02	(<0.0001)	0.012
338A	Alloy 602CA	N06025	Ni-Cr-Fe	2.13	(<0.0005)	0.0049	(<0.0001)	0.168	0.002		0.035	25	0.0059	9.74		0.0058	0.052	0.0017	0.0276	0.004	62.3	0.001	0.003	0.00007	0.0008	(0.00009)		0.02	0.00037	(0.002)	0.13	0.0026	(<0.02)	0.06	0.081

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Nickel Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Fe	La	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Y	Zr	
Ni690-18	Alloy 690	N06690	Ni-Cr-Fe	0.25	(<0.001)	(<0.03)	(<0.0001)	0.025	(<0.001)		0.013	29.1	0.012	10		0.003	0.154	0.013	0.012	0.007	59.8	(0.0002)	0.004	(0.001)	0.0007	(<0.0001)		0.049	(<0.003)	(<0.006)	0.324	0.048	0.003		(0.002)	
372A	Alloy 693	N06693	Ni-Cr-Fe	3.28	(<0.0002)	0.0016	(<0.0001)	0.03	(<0.001)		0.009	28.3	0.004	3.12	(<0.0001)	0.016	0.285	0.006	0.011	0.71	63.6	0.0008	0.003	(0.001)	0.0016	(0.056)		0.02	(0.001)	(<0.022)	0.486	0.008	0.02	(<0.0001)	0.017	
67C	Alloy G-30	N06030	Ni-Cr-Fe	0.14		0.001		0.0058			1.75	28.9	1.24	13.48		0.0069	1.01	4.93	0.36	45.8	0.0016	0.011			0.0006	(0.0003)		0.14	0.0014	(0.006)	0.005	0.031	1.97		0.002	
NiPE16-18	Alloy PE16		Ni-Cr-Fe	1.2	(<0.005)	0.0028	(<0.001)	0.052	(<0.005)	(<0.009)	0.77	16.6	0.053	34.4	(<0.0001)	(<0.003)	0.122	3.29	0.006	0.04	42.9	0.0006	0.006	(<0.008)	0.0007	(<0.001)	(<0.005)	0.13	(<0.007)	(<0.03)	1.18	0.018	0.038	(<0.001)	0.019	
28X 06625 A	Inconel Type Alloy		Ni-Cr-Fe	0.184		0.0009		0.020			0.031	21.94	0.0288	0.917			0.090	9.15	0.0219	3.52	63.49		(0.002)		0.0037			0.273		0.238						
28X 07718 A	Inconel Type Alloy		Ni-Cr-Fe	0.544		0.0034		0.026			0.172	18.62	0.038	19.55			0.055	3.01	0.0056	5.05	51.99			0.0063		0.0015		0.076		0.945						
28X 6001 G	Inconel Type Alloy		Ni-Cr-Fe	0.02							1.02	16.38	0.83	6.33		0.01	0.12											0.95		0.58						
28X 6002 F	Inconel Type Alloy		Ni-Cr-Fe	0.18							0.22	16.23	0.02	8.24		0.004	0.65											0.25		0.12						
28X 6003 E	Inconel Type Alloy		Ni-Cr-Fe	0.025							0.62	15.56	0.42	7.1		0.01	0.47											0.74		0.22						
28X 6004 E	Inconel Type Alloy		Ni-Cr-Fe	0.05							0.77	16.21	0.42	7.17		0.008	0.38											0.65		0.27						
28X 6251 M	Inconel Type Alloy		Ni-Cr-Fe	0.006		0.0040		0.002			0.0078	20.24	0.057	4.21			0.069	9.58		2.64	62.95		0.0023		0.0013			0.252		0.0111	0.0097					
28X 6252 Q	Inconel Type Alloy		Ni-Cr-Fe	0.130				0.078			0.279	20.33	0.230	4.73			0.331	8.78	0.085	3.14	60.62		0.0110		0.0144			0.982		(0.004)	0.113					
28X 6253 T	Inconel Type Alloy		Ni-Cr-Fe	(0.19)				0.116			0.39	21.91	0.306	5.62			0.490	7.82	0.092	4.50	(56.8)		0.0242		0.0106			1.32		0.039	0.247					
28X 6255 M	Inconel Type Alloy		Ni-Cr-Fe	0.337		0.0101		0.0343			0.164	19.63	0.0646	2.03			0.203	8.31		4.09	64.2		0.0104		0.0081			0.447		0.093	0.348					
28X 6256 A	Inconel Type Alloy		Ni-Cr-Fe	0.301				0.0173				21.29	0.018	(0.034)			0.0004	8.81	0.007	3.75	65.4		0.0033		(0.002)		0.041			0.266						
28X 7181 K	Inconel Type Alloy		Ni-Cr-Fe	0.07		0.0021		0.0198			(0.014)	18.37	0.042	18.98			0.150	3.25	0.038	4.88	53.10		0.0146		0.0089			0.811			0.125					
28X 7186 K	Inconel Type Alloy		Ni-Cr-Fe	0.664		0.0048		0.0237			0.301	17.55	0.109	15.97			0.238	3.16	0.040	5.07	(55.3)		0.0192		0.0096			0.562			0.910					
219X 86182 B			Ni-Cr-Fe					0.148			0.047	15.88	0.150	7.88			7.68	0.078		2.17	64.7		0.0098		0.0034			0.83		0.031	0.40					
54G	Alloy 625	N06625	Ni-Cr-Mo	0.15	(0.002)	0.0027	(<0.0001)	0.053	(0.00004)	(<0.02)	0.06	21.1	0.066	4.03	(<0.0001)	0.004	0.172	8.52	0.022	3.48	61.9	(0.0011)	0.007	(<0.005)	(0.002)	(0.00048)	(<0.0008)	0.27	0.0009	(<0.03)	0.24	0.025	0.03	(<0.0001)	(<0.002)	
54H	Alloy 625	N06625	Ni-Cr-Mo	0.31		(0.0020)		0.018			0.099	21.95	(0.1)	4.05		(<0.001)	0.105	8.68	(<0.02)	3.51	60.7	(<0.001)	0.006		0.001			0.144	(<0.001)	(<0.03)	0.286	(<0.02)	(<0.08)			(<0.002)
56H	Alloy 718	N07718	Ni-Cr-Mo	0.51	(<0.001)	0.0045	(<0.0001)	0.0248	(<0.0001)	(<0.007)	0.049	17.86	0.012	18.6	(<0.0001)	0.001	0.04	2.9	0.0062	5.2	53.8	(0.0004)	0.0052	(<0.0001)	0.0005	(0.00009)	(<0.0008)	0.054	0.00026	0.006	0.96	0.025	0.014	(<0.01)	(<0.01)	
347A	Alloy 904L	N08904	Ni-Cr-Mo	0.016	0.006	0.002	(0.00001)	0.023	0.0029		0.083	20.14	1.34	47.4	(0.0006)	0.0008	1.24	4.16	0.062	0.01	24.88	0.0026	0.023	0.0003	0.0009	0.0013		0.56	0.011	(0.005)	0.007	0.078	0.02		(0.002)	
13X NSA12 A	Alloy 904L	N08904	Ni-Cr-Mo	0.0169		0.0020		0.0192			0.090	19.63	1.485				1.272	4.20	0.0662	0.0088	24.84		0.0267		0.0007			0.492			0.0660	0.047				

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Nickel Alloy

Nickel Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Fe	La	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Y	Zr
65D	Alloy C-22	N06022	Ni-Cr-Mo	0.29		(0.001)		0.0021			1.22	21.5	0.05	3.66		0.007	0.28	13.1	0.019	0.033	56.8	0.0005	0.008		0.0004		0.035	(0.001)	(0.01)	0.005	0.012	2.81		(0.002)	
276A	Alloy C-22HS	N27022	Ni-Cr-Mo	0.245	(0.0009)	0.0038	(0.000003)	0.004	(<0.007)		0.041	20.54	0.038	1.3	(<0.007)	0.007	0.305	16.2	0.0388	0.014	61.1	0.001	0.006	0.00004	0.0005	0.00019		0.043	0.0004	0.011	0.004	0.008	0.03		0.003
329A	Alloy G-35	N06035	Ni-Cr-Mo	0.29	0.0009	0.001	(<0.0001)	0.0086	(<0.006)		0.052	33.7	0.065	0.92		0.0124	0.222	8.38	0.073	0.131	55.8	0.0027	0.0059	0.00003	0.0003	0.00013		0.053	0.0005	(<0.008)	0.005	0.009	0.021		0.0012
26X 11384 E			Ni-Cr-Mo	0.50							0.30	20.5	0.12	0.98			0.13	10.2									0.15			2.6					
27X 14184 F			Ni-Cr-Mo-Co	0.02							10.5	21.8	0.09	0.40			0.40	10.7									0.41			0.02					
27X 14188 D			Ni-Cr-Mo-Co	<0.01							10.4	21.17	(0.003)	0.44			0.30	10.3									0.33			0.03					
27X 14387 E			Ni-Cr-Mo-Co	<0.005							10.0	20.2	<0.005	1.11			0.27	10.8									0.28			<0.005					
274A	Alloy 725	N07725	Ni-Cr-Mo-Nb	0.26		0.002		0.007			0.143	21	0.1	7.6		0.0019	0.08	8.06	0.007	3.48	57.5	0.0006	0.007		0.0004		0.02	0.001	(0.002)	1.55	0.019	0.06		(0.001)	
Ni725-18	Alloy 725	N07725	Ni-Cr-Mo-Nb	0.22	(<0.002)	0.0023	(<0.0001)	0.008	(<0.001)		0.077	20.5	0.103	7.47		0.005	0.076	7.9	0.008	3.47	58.4	(0.0005)	0.0047	(<0.001)	0.0008	(<0.0001)		0.084	0.0011	0.006	1.55	0.013	0.04	(<0.01)	(<0.005)
25X 10221 F			Ni-Cr-Mo-Nb								0.26	20.0	0.11	0.62			0.28	6.57		7.43							0.45					2.23			
362B	Alloy 686	N06686	Ni-Cr-Mo-W	0.32	(<0.01)	(0.003)	(<0.001)	0.0079	(<0.001)	(<0.0005)	0.01	20.4	(0.003)	0.1		0.008	0.229	16.1	0.006	0.015	58.7	0.0006	0.005	(<0.004)	0.0004	(<0.013)	(<0.005)	0.04	(<0.003)	(0.005)	0.052	0.01	3.9	(<0.0001)	(0.004)
68B	Haynes 230	N06230	Ni-Cr-W-Mo	0.22		(0.002)		0.097			0.4	21.02	0.019	1.48	(0.006)	0.004	0.52	2.34	0.05	0.018	59.8	(0.0009)	(0.005)		(0.0004)		0.38		(0.021)	0.008	0.013	13.45		(<0.01)	
68E	Haynes 230	N06230	Ni-Cr-W-Mo	0.3	(0.0003)	0.007	(0.000004)	0.099	(0.00002)	(<0.002)	0.16	21.88	0.022	1.06	0.008	0.006	0.51	1.18	0.05	0.035	(59.9)	0.0007	0.005	(0.0002)	0.0005	(0.00006)	(<0.0007)	0.39	(0.0004)	(<0.015)	0.015	0.007	14.6	(<0.001)	(0.001)
68F	Haynes 230	N06230	Ni-Cr-W-Mo	0.26		0.005	(<0.001)	0.101	(<0.005)		0.24	21.9	0.031	1.5		0.006	0.499	1.35	0.045	0.084	(59.6)	0.0007	0.006	(<0.001)	0.0005	(<0.001)	0.381	(<0.001)	(0.009)	0.01	0.007	14.5	(<0.001)	(0.002)	
283A	B-1900		Ni-Co-Cr	6.05		0.014		0.114			9.8	8.05	(0.01)	0.044	(0.002)	0.0033	0.001	5.94	0.0003	0.02	64.4	0.0004	0.003		0.0006	(0.00002)	0.019	(0.0002)	4.3	0.98	0.0058	0.056		0.053	
277A	Rene 77		Ni-Co-Cr	4.38		0.015		0.08			14.46887333	14.35	0.004	0.16		0.0021	0.01	4.22	0.0017	0.034	58.9	0.0005	0.002		0.001		0.037	(<0.003)	(0.02)	3.4	0.011	0.047		0.01	
51A	Alloy 400	N04400	Ni-Cu	0.05		(<0.001)		0.13			0.015	0.01	29.87	2.07		(0.024)	1.49	(<0.01)		(<0.01)	(66.02)		0.008		0.001				(<0.01)	0.05	(<0.01)	(<0.01)		(<0.01)	
51D	Alloy 400	N04400	Ni-Cu	0.036	(<0.003)	(<0.0003)	(<0.003)	0.139	(<0.001)	(<0.0001)	0.011	0.064	32.6	1.68	(<0.0001)	0.016	1.03	0.019	(0.00019)	0.006	64.1	(<0.0007)	0.01	(<0.001)	0.0015	(<0.0001)	(<0.0004)	0.16	(0.00016)	(<0.001)	0.033	(0.001)	(0.0017)	(<0.0005)	(0.0009)
52D	Alloy K500	N05500	Ni-Cu	2.95	(<0.003)	0.002	(<0.003)	0.125	(<0.003)	(<0.0001)	0.005	0.004	29.6	1.38	(<0.0001)	0.0065	0.59	(0.002)	(<0.002)	0.002	64.5	(0.0004)	0.002	0.002	0.0012	(<0.004)	(<0.0007)	0.17	0.0013	(<0.01)	0.6	0.001	(<0.008)	(<0.0005)	0.026
212X 04400 A	Monel Type Alloy		Ni-Cu	0.030		0.0019		0.157			0.0432	0.166	32.47	2.065		0.053	1.027	0.0307	0.0005		63.69		0.0033		(0.002)		0.253			0.0193					
212X 05500 A	Monel Type Alloy		Ni-Cu	3.00		0.0015		0.135			(0.009)	0.073	29.91	1.162		0.0098	0.634		0.0010		64.3		0.0031		0.0010		0.167			0.632				0.0343	
212X 4001 Q	Monel Type Alloy		Ni-Cu	(0.038)				0.0130			0.111	0.0795	28.92	0.503		0.0016	2.95			0.100	65.49		0.0198	0.0703	0.0206		1.48	(0.056)		(0.094)					
212X 4005 G	Monel Type Alloy		Ni-Cu	1.399				0.0494			0.156	0.20	21.53	1.053		(0.003)	1.437	0.102		0.341	(70.1)		0.0106	0.0091	0.0038		2.52			1.005					

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Nickel Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Fe	La	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Y	Zr	
212X 4007 B	Monel Type Alloy		Ni-Cu	0.0307			0.040	0.0483		(0.003)	0.0205	0.498	28.95	2.02		0.050	1.08	0.048		2.40	[bal]		0.025	0.0192	0.0039		0.019	2.18	0.0110		0.099					
212XNA2 G	Monel Type Alloy		Ni-Cu					0.07					29.8	1.53		0.008	1.06						0.019	0.02	0.023			2.50								
157D	AL 6XN	N08367	Ni-Fe-Cr	0.02	(<0.004)	0.0007	(<0.03)	0.0154	(<0.005)	(<0.02)	0.102	20.31	0.196	48	(<0.07)	(<0.0003)	0.626	6.08	0.203	0.149	23.9	(0.004)	0.016	(<0.002)	0.0005	(0.0007)	(<0.0002)	0.28	0.0036	(0.003)	0.009	0.05	0.036	(<0.001)	(0.001)	
13XNSA11 A	AL 6XN	N08367	Ni-Fe-Cr	(0.02)				0.0159			0.0981	20.19	0.187				0.640	6.16	0.203	0.150	23.89		0.0186		<0.001		0.275				0.0513	0.038				
357A	Alloy 028	N08028	Ni-Fe-Cr	0.09	(<0.01)	0.0014	(<0.0001)	0.0199	(<0.005)		0.17	27	0.81	34.3	(<0.001)	0.005	1.63	3.48	0.011	0.089	31.9	0.005	0.013	(<0.002)	0.0021	(<0.001)		0.458	(0.002)	(0.008)	0.079	0.091	0.108	(<0.001)	(0.005)	
25A	Alloy 20	N08020	Ni-Fe-Cr	0.01				0.024			0.27	19.63	3.23				0.48	2.1	(0.015)	0.51	33.57	(0.012)	0.02	(0.003)	0.003			0.32	0.028	(0.21)	0.004	0.1	0.05			
25D	Alloy 20	N08020	Ni-Fe-Cr	0.015	(0.004)	0.0036	(<0.0001)	0.028	(<0.009)	(<0.005)	0.14	20	3.46	38.7	(<0.001)	0.0016	1.14	2.1	0.034	0.66	32.6	0.005	0.019	(0.004)	0.0013	(0.0008)	(<0.0003)	0.7	0.008	(0.002)	0.009	0.089	0.13	(<0.0005)	(0.003)	
Ni256Mo-18	Alloy 25-6Mo	N08926	Ni-Fe-Cr	0.17		0.0009	(<0.0001)	0.0182	0.0014		0.02	20.3	1.98	44		(0.0092)	0.83	6.63	0.022	0.01	25.5	(0.003)	0.004	(<0.03)	0.0011	(<0.0001)		0.41	(<0.002)	(<0.03)	0.006	0.009	0.01		(0.003)	
7A	Alloy 330	N08330	Ni-Fe-Cr	0.022				0.063			0.06	19	0.19				1.51	0.31	0.038	0.013	(35.53)	(0.014)	0.018	(0.005)	0.004			1.24	0.003	(0.19)	(0.004)	0.05	(0.045)			
7B	Alloy 330	N08330	Ni-Fe-Cr	0.023		(0.002)		0.062			0.069	19.32	0.21	(43.0)			1.47	0.19	0.013	0.023	35.84	0.0026	0.018		(0.001)			1.38	0.004		(0.005)	0.048	(0.031)			
7C	Alloy 330	N08330	Ni-Fe-Cr	0.017	(0.002)	0.0027		0.064	(0.002)		0.041	18.4	0.031	43.5		0.0015	1.32	0.095	0.034	0.189	34.9	0.0021	0.014	(0.0001)	0.0004	(0.0003)		1.21	0.002	(0.002)	0.022	0.06	(0.02)		(0.001)	
58B	Alloy 800	N08800	Ni-Fe-Cr	0.45	(0.002)	0.0003		0.073			0.02	19.6	0.011	47.7		(0.001)	0.51	0.01	0.01	0.01	30.7	0.001	0.01	(0.0001)	0.001			0.282	0.002	(<0.01)	0.5	0.035	0.01		(<0.005)	
59A	Alloy 825	N08825	Ni-Fe-Cr	0.05		(0.002)		0.02			0.25	22.12	1.71	30.82		(<0.001)	0.33	2.68		0.02	(40.91)		0.017		0.001			0.1	(0.001)	(<0.01)	0.83	0.03	0.13			(<0.01)
Ni825-18	Alloy 825	N08825	Ni-Fe-Cr	0.11	(0.002)	0.0023	(<0.001)	0.006	(<0.005)	(<0.005)	0.55	22.4	1.81	29.5	(<0.0001)	(0.0002)	0.49	2.8	0.0093	0.31	40.8	0.002	0.013	(<0.001)	(0.003)	(0.004)	(<0.005)	0.17	0.0023	0.0011	0.96	0.047	0.23	(<0.001)	0.002	
Ni925-18	Alloy 925	N09925	Ni-Fe-Cr	0.23		0.0034		0.0114			0.43	20.8	1.69	26.4			0.518	2.82	0.0033	0.4	44.2	0.0011	0.012		0.0024			0.075			2.19	0.031	0.27			
328A	Alloy 945	N09945	Ni-Fe-Cr	0.189	0.0009	0.0011	(<0.001)	0.006	(<0.004)		0.003	20.57	1.94	22.41	(<0.0005)	0.0008	0.017	3.16	0.0056	3.14	47.03	0.0006	0.004	0.00002	0.0006	0.00023		0.021	0.0002	0.004	1.53	0.008	0.015		0.004	
328B	Alloy 945X	N09945	Ni-Fe-Cr	0.116	(<0.001)	0.001		0.01	(0.001)	(<0.001)	0.063	20.5	2	15		(0.0013)	0.077	3.12	0.006	3.99	53.7	(0.002)	0.005	(<0.001)	0.0006	(<0.0001)	(<0.002)	0.05	(0.001)	(0.01)	1.53	0.014	0.04	(<0.01)	(<0.001)	
282A	Alloy HR-120	N08120	Ni-Fe-Cr	0.085	(0.003)	0.005	(<0.0001)	0.054			0.12	24.6	0.0615	0.0615		0.004	0.81	0.21	0.207	0.57	37.1	0.0023	0.016	(0.001)	0.0003	(0.0004)		0.63	0.003	(0.005)	0.019	0.052	0.043		(0.002)	
23X 08811 A	Incoloy Type Alloy		Ni-Fe-Cr	0.453		0.0038		0.068			0.082	19.72	0.247	45.81		0.0044	1.009	0.242	0.0096	0.009	31.31		0.0212		<0.001			0.263	0.0054		0.543	0.060	0.0279			
23XDS4 E	Incoloy Type Alloy		Ni-Fe-Cr	0.037				0.06			0.48	16.83	0.30				1.02	0.29			37.15						2.01			0.20						
23XDS5 E	Incoloy Type Alloy		Ni-Fe-Cr	0.083				0.080			0.50	18.64	0.30				1.04	0.30			36.57						1.98			0.17						
219X 08825 A			Ni-Fe-Cr	0.149		0.0028		0.015			0.0646	21.94	1.87	31.82		(0.003)	0.499	3.01		(0.007)	39.12		0.0189		(0.001)			0.232			1.192	0.038			0.0021	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Nickel Alloy

Nickel Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Fe	La	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Y	Zr
203A	Alloy 909	N19909	Ni-Fe-Co	0.066		(0.002)		0.005			12.9	0.72	0.05	40.6		(<0.002)	0.023	0.09	0.001	5	38.4		0.006		0.0009			0.41			1.58	(<0.01)	(0.02)		(<0.01)
Ni909-18	Alloy 909	N19909	Ni-Fe-Co	0.009	(<0.005)	0.0013	(<0.001)	0.006	(<0.005)	(<0.001)	13.1	0.01	0.007	42.4	(<0.0001)	0.00012	0.03	(<0.04)	0.0026	4.6	37.7	0.004	0.002	(<0.001)	0.0018	(<0.001)	(<0.005)	0.42	(<0.012)	0.006	1.62	(<0.0001)	0.009	(<0.0011)	(<0.003)
Ni244H-18	Alloy 244H	N02216*	Ni-Fe-Mn Weld Filler	0.23	0.0009	0.002	(<0.005)	0.052	(0.0003)	(<0.005)	0.005	6.9	0.013	39.9	(<0.0005)	0.0014	10.9	0.003	0.0087	0.7	41.1	0.0009	0.003	(<0.025)	0.0038	0.00012	(<0.001)	0.16	0.0003	(0.001)	0.2	0.004	(0.002)	(<0.001)	0.0008
219X 20004 A			Ni-Mn					0.224			(0.104)	13.63	0.319	9.48			14.07	0.104		1.53	59.1		0.0147		0.0028			0.916		0.077	0.52				
63D	Alloy B-2	N10665	Ni-Mo	0.13	(<0.001)	0.0017	(<0.0001)	0.0079	(<0.001)	(<0.07)	0.013	0.153	0.003	1.56	(<0.01)	0.0013	0.76	26.6	(0.0007)	0.04	70.4	(<0.006)	0.004	(<0.001)	0.0006	(<0.0005)	(<0.0002)	0.03	(0.002)	(<0.011)	0.14	0.007	0.02	(<0.001)	0.002
NiB3-18	Alloy B-3	N10675	Ni-Mo	0.41	(0.002)	(0.002)	(<0.001)	0.003	(<0.005)	(<0.005)	0.142	1.55	0.014	1.57	(<0.0001)	0.01	0.7	28.2	0.0027	0.15	67.2	(0.0007)	0.005	(<0.004)	(0.0004)	(0.00023)	(<0.0001)	0.021	(0.0015)	(0.0007)	0.007	0.007	0.07	(<0.001)	(<0.0005)
NiC276-18	Alloy C276	N10276	Ni-Mo-Cr	0.114	(<0.005)	0.002	(<0.001)	0.0032	(<0.005)	(<0.005)	0.17	15.9	0.14	6.09	(<0.001)	0.01	0.42	15.4	0.017	0.061	58.5	(0.001)	0.008	(<0.001)	0.0007	(0.001)	(<0.005)	0.017	(0.0005)	(<0.06)	0.007	0.018	3.23	(<0.001)	(<0.001)
215X 10276 A	Hastelloy Type Alloy		Ni-Mo-Cr	0.203				0.008			0.182	15.56	0.0423	5.79		0.0090	0.498	15.96	0.0099	0.031	57.81		0.0027		(0.001)			0.029			0.0186	0.196	3.59		0.009
215XHB1P	Hastelloy Type Alloy		Ni-Mo-Cr					0.0422			0.252	1.090	0.0718	5.78			0.697	33.04	0.0156	0.203	58.00		0.0056		0.0506			0.150			0.504				
215XHB4G	Hastelloy Type Alloy		Ni-Mo-Cr	0.0159				0.0843			1.703	0.375	0.0192	5.94			0.597	27.94	0.0013	0.056	61.80		0.049		0.0313			1.005			0.0338	0.212	(0.096)		
215XHC1M	Hastelloy Type Alloy		Ni-Mo-Cr	0.008				0.0255			2.49	15.62	0.024	4.03			1.272	19.72	0.0040						(0.002)		0.493			0.267	0.149	3.59			
215XHC2K	Hastelloy Type Alloy		Ni-Mo-Cr	0.005				0.0456			1.70	16.46		2.97			0.909	18.44	0.0091		(53.8)				0.0163			1.22			0.181	0.282	4.02		
215XHC3M	Hastelloy Type Alloy		Ni-Mo-Cr	0.111				0.0897			0.973	17.86	0.0988	4.84			0.685	17.38	0.0066				0.0211		0.0131			0.944			0.150	0.399	4.63		
215XHC4M	Hastelloy Type Alloy		Ni-Mo-Cr	(0.052)				0.141			0.709	18.44	0.331	6.01			0.441	16.93	0.071		(50.3)		0.0390		0.0222			1.15			(0.094)	0.491	4.99		
215XHC5V	Hastelloy Type Alloy		Ni-Mo-Cr	0.721				0.201			0.0460	20.05	0.485	8.15			0.100	16.03	0.0081		(45.9)		0.054		0.038			1.379			0.198	0.607	6.19		
55A	Haynes 242	N10242	Ni-Mo-Cr	0.24		0.005		0.03			0.04	7.9	0.03	1.09			0.33	25.4		0.02	(64.71)		0.003		0.001			0.11	(<0.01)	(0.01)	0.01	(<0.01)	0.09		(<0.02)
55B	Haynes 242	N10242	Ni-Mo-Cr	0.09		0.002		0.004	(<0.005)		0.036	8.25	0.013	1.12		0.011	0.323	24.62	0.016	0.08	65.4	0.0009	0.005	(<0.002)	0.001	(<0.0001)		0.021	(<0.001)	(0.08)	0.002	0.005	0.12		(0.005)

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Commercially Pure Nickel - Values listed in %

Part Number	Grade	UNS	Al	B	C	Ca	Co	Cr	Cu	Fe	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Si	Ti	V	Zn
50C	Ni200	N02200	0.004	0.0027	0.015	(0.0012)	0.011	0.005	0.028	0.084	0.005	0.22	(0.0005)	0.002	99.4	(0.006)	0.0014	(0.001)	0.0012	0.031	0.026	(0.0006)	(0.00009)

High Purity Nickel - Values listed in PPM

Part Number	Grade	Type	Ag	Al	As	B	Be	Bi	C	Ca	Cd
187A	HPNI	Carbonyl Ni	0.1	11	0.1	(<5)	(<1)	(<0.1)	13	(<10)	(<0.1)
188A	HPNI-LO	Carbonyl Ni-Low	1.1	24	0.7	(<5)	(<1)	0.9	22	(<10)	0.2
189A	HPNI-MI	Carbonyl Ni-Mid	2.4	44	0.7	(<5)	(<1)	2.6	23	(<10)	0.8
190A	HPNI-HI	Carbonyl Ni-High	10.9	50	28	(<5)	(<1)	11.1	22	(<10)	5
191A	ELNI-HP	High Purity Electrolytic	0.1	1.5	13	(<5)	(<1)	(<0.1)	14	(<10)	



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Cobalt Alloy

Cobalt Alloy

Part Number	Grade	UNS	Type	Al	As	B	Be	C	Ca	Co	Cr	Cu	Fe	Mg	Mn	Mo	N	Nb	Ni	O	P	S	Si	Sn	Ta	Ti	V	W	Zn	Zr
112X14943H	Stellite 8/BS3531 Type		Co-Cr-Mo	(0.13)		0.0045		0.190			31.00	0.203	0.763		1.008	7.96	0.0284	0.099	0.151		0.0043	0.0197	0.201		(0.014)			0.051		
Co6B-18	Alloy 6B	R30016	Co	0.07	(<0.01)	(0.0006)		1.02	(<0.005)	58	30.5	0.016	2.68	(<0.01)	1.48	0.02	0.017	0.014	2.6	(0.001)	(0.004)	(<0.005)	0.62	(<0.01)	(<0.02)	0.007	0.011	3.92	(<0.01)	(<0.01)
CoElgloy-18	Elgloy	R30003	Co	0.011	(<0.022)	0.002	(<0.0001)	0.008	(0.0015)	40.4	20.4	0.005	12.6	(<0.002)	2.36	8.6	0.0034	0.006	15.9	0.009	0.0019	0.0018	0.05	(<0.0001)	(0.01)	0.004	0.009	0.008		(<0.001)
119XCOB1H			Co	0.056				0.0518			24.62	0.0607	15.14		0.513	0.416	0.094	0.398	22.11		0.0195	0.0099	0.492					11.99		
64A*	Ultimet 1233	R31233	Co-Cr	0.16				0.057		(55.38)	24.78	0.02	2.98		0.81	4.72	0.077	(<0.01)	8.92		0.006	0.002	0.34	(<0.01)	0.03	0.02	(<0.01)	1.83		(<0.01)
326A	Permendur 2V	R30005	Soft Magnetic	(0.003)	(<0.005)	(0.001)		(0.002)		48.4	(0.002)	(0.002)	49.6	(0.001)	0.003	(0.002)	0.0004	0.038	0.037	0.0082	0.0013	0.0011	0.029	(<0.001)	(0.01)	(0.002)	1.94	(0.001)		0.002

Zirconium Alloy

Part Number	Grade	UNS	Type	Al	C	Cr	Cu	Fe	H	Hf	In	Mn	Mo	N	Nb	Ni	O	S	Sn	Ta	Ti	V	W	Zr
Z702-18	Grade 702	R60702		0.014	0.017	0.009	(0.001)	0.09	0.0011	0.84	(0.0005)	(0.0020)	(0.0010)	0.003	(<0.0001)	(0.0022)	0.141	(0.0002)	0.04	(0.0002)	0.004	(0.005)	(0.0001)	(98.78)
Z705-18	Grade 705	R60705		(<0.01)	0.009	0.007	0.007	0.08	0.0012	0.38	(<0.0005)	(<0.005)	(<0.005)	0.005	2.53	(0.0021)	0.133	(0.0001)	(0.0200)	(0.0018)	(0.0015)	(0.0040)	(0.0001)	(96.76)



Code Key: ☉ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Titanium Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Co	Cr	Cu	Fe	H	Hf	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	Pd	Ru	S	Sb	Si	Sn	Ta	Ti	V	W	Y	Zr
312B	Grade 1	R50250	Comm. Pure	0.018		<0.001		0.0092		<0.002	0.01	0.003	0.072	0.0004	(0.0004)	<0.002	(0.001)	0.003	0.007	(0.001)	0.019	0.128	<0.002		<0.005	<0.001	(0.0008)	(0.0003)	0.006	0.004	<0.005	(99.7)	0.009	<0.005	<0.001	0.0014
311A	Grade 2	R50400	Comm. Pure	0.32				0.009			0.013	0.0013	0.06	0.0021			0.0013	0.0012	0.012	(0.002)	0.014	0.083							0.005	0.002		(99.4)	0.004	(0.002)	(0.0002)	0.012
303B	Ti Grade 7	R52400	Comm. Pure	0.015		<0.001		0.035		<0.002	0.0018	0.002	0.12	0.0008	<0.003	<0.001	0.001	0.002	0.017	0.006	0.0013	0.176	<0.002		0.13	<0.01	<0.002		0.006	0.006	<0.005	(99.6)	0.0023	<0.002	<0.001	0.0028
361A	Ti Grade 12	R53400		0.013		(0.0005)		0.012		<0.002	0.008	0.003	0.095	0.0027	<0.004	<0.002	<0.05	0.288	0.006	(0.004)	0.88	0.15	<0.003		(0.002)	<0.006	<0.004		0.012	0.004	<0.005	(98.5)	0.006	<0.03	(0.0004)	0.0016
271A	Grade 6(5-2.5)	R54520	Alpha	5.28				0.026		(0.002)	0.016	0.004	0.31	0.013			0.002	0.011	0.012	(0.003)	0.035	0.016	(0.002)				(0.002)		0.021	2.49			0.09			0.015
271B	Grade 6(5-2.5)	R54520	Alpha	5.21		0.0012		0.0128		(0.0010)	0.01	0.0068	0.196	0.0139		(0.001)	0.0036	0.0063	0.013	0.005	0.0089	0.155	(0.0011)		(0.0011)	(0.003)	(0.001)		0.01	2.52	(0.0104)	(91.9)	0.057	(0.0021)	(0.00018)	0.059
Ti1023-18	Ti 10-2-3	R56410	Beta	3.31	<0.005	<0.005	<0.005	0.032	<0.005	(0.001)	0.016	0.006	1.98	0.002	<0.005	<0.005	0.0024	0.003	0.005	<0.01	0.009	0.109	<0.01	<0.01			<0.001	<0.025	0.018	(0.002)	<0.005	84.8	9.75	<0.005	<0.005	<0.005
344A	Ti 15-3-3-3	R58153	Meta Stable Beta	3.15		0.0011		0.011		(0.001)	3.09	0.002	0.2	(0.015)			(0.003)	0.004	0.005	(0.005)	0.011	0.107	(0.002)		(0.001)		(0.001)		0.03	3.09	(0.001)	(74.9)	15.3	(0.003)	<0.001	(0.002)
344B	Ti 15-3-3-3	R58153	Meta Stable Beta	3.03		<0.001		0.0095		<0.004	2.91	0.0024	0.118	0.007	<0.001	<0.004	0.003	0.006	0.016	(0.003)	0.021	0.118	<0.003	<0.001	<0.03	<0.02	<0.003	<0.001	0.03	3.01	<0.04	(76.0)	14.7	<0.03	<0.006	0.002
314A>	Ti 5-5-5-3		Near Beta	5.5				0.008		(0.003)	3.09	0.002	0.46	0.004			0.002	4.78	0.0034		0.022	0.155	(0.005)					0.02	(0.01)		(81)	4.98		(0.0003)	0.002	
Ti6242-18	Ti 6-2-4-2	R54620	Near-Alpha	6.11	<0.005	<0.01		0.007	<0.005	<0.005	(0.002)	(0.003)	0.025	0.0022	<0.005	<0.01	<0.005	2.02	0.004	<0.01	0.0038	0.121	(0.003)	<0.01			<0.01	<0.001	0.077	2.06	<0.001		(0.0017)	<0.005	<0.005	4.05
269B	Ti 8-1-1	R54810	Near Alpha	7.86		<0.001		0.014		<0.0005	0.0014	0.0023	0.071	0.007		<0.0001	0.0071	0.98	0.006	0.004	(0.001)	0.09	(0.003)		<0.005	(0.004)	(0.003)		0.025	0.008	<0.005	(89.9)	1.03	(0.001)	<0.001	0.002
367A	Ti 2-1.5		Pseudo-Alpha	2.02		<0.001		0.014		<0.002	0.012	0.002	0.064	0.003	<0.001	<0.001	1.61	0.0023	0.0074	<0.01	0.013	0.105	<0.005	<0.001	<0.01	<0.01	(0.0012)	<0.0005	0.011	0.0019	<0.005	(96.1)	0.005	<0.002	<0.001	0.003

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Titanium Alpha-Beta Alloy

Titanium Alpha-Beta Alloy

Part Number	Grade	UNS	Type	Al	As	B	Bi	C	Ca	Co	Cr	Cu	Fe	H	Hf	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	Pd	Ru	S	Sb	Si	Sn	Ta	Ti	V	W	Y	Zr	
Ti64ELI-18	Grade 23 (6-4 ELI)	R56407	Alpha-Beta	6.11	<0.005	<0.01	<0.005	0.033	<0.005	<0.0002	0.004	0.002	0.167	0.0021	<0.01	<0.01	0.0014	(0.002)	0.006	(0.003)	0.003	0.118	<0.005	<0.01			(0.0005)	(0.001)	0.014	0.022	<0.01		4.01	(0.0005)	<0.01	(0.002)	
Ti42515-18	Grade 38 (4-2.5-1.5)	R54250	Alpha-Beta	3.99				0.007			0.015	0.0022	1.58	0.0018			0.006	0.0014	0.0026	0.0016	0.009	0.250						0.011	0.004			2.53				0.0019	
175D	Grade 5 (6-4)	R56400	Alpha-Beta	6.38		(0.0008)		0.008			0.015	0.002	0.220	0.0028			0.002	0.003	0.030	(0.008)	0.016	0.177						0.009	0.01		(89.2)	4	(0.002)	(0.001)	(0.002)		
Ti64-18	Grade 5 (6-4)	R56400	Alpha-Beta	6.52	<0.01		<0.005	0.034	<0.005	(0.0004)	0.013	(0.002)	0.190	0.0031	<0.01	<0.01	(0.001)	0.004	0.025	(0.004)	0.011	0.181	<0.005	<0.01	<0.001	<0.01	<0.001	<0.001	<0.02	0.011	0.003	(0.0002)		4.08	(0.0002)	<0.005	<0.01
261A	Grade 9 (3-2.5)	R56320	Alpha-Beta	3.00				0.007		(0.001)	0.013	0.002	0.190	0.0023			0.0011	0.003	0.007	(0.01)	0.006	0.100					(0.001)		0.012	0.008			2.48		(0.001)	(0.002)	
261B	Grade 9 (3-2.5)	R56320	Alpha-Beta	2.98		0.0004		0.011		<0.004	0.016	0.003	0.190	(0.001)			(0.003)	0.004	0.004	(0.002)	0.023	0.083	(0.004)			(0.001)	(0.0004)		0.008	0.004		(94.4)	2.23	(0.003)	(0.0004)	0.002	
261C	Grade 9 (3-2.5)	R56320	Alpha-Beta	3.05		0.0004		0.011		(0.005)	0.014	0.003	0.180	0.001			(0.003)	0.004	0.005	(0.003)	0.016	0.085	(0.003)		(0.002)	(0.001)	(0.001)		0.007	0.006		(94.1)	2.46	(0.001)	(0.0004)	0.003	
261D	Grade 9 (3-2.5)	R56320	Alpha-Beta	3.02		0.0003		0.011		<0.001	0.016	0.0028	0.185	(0.0005)			(0.002)	0.003	0.0051	(0.003)	0.018	0.083	<0.004		(0.002)	(0.0005)	(0.001)		0.008	0.005	(0.0005)	(94.2)	2.5	(0.001)	(0.0005)	0.003	
261E	Grade 9 (3-2.5)	R56320	Alpha-Beta	3.05		0.0003		0.012		(0.0004)	0.016	0.0025	0.180	(0.0005)			(0.001)	0.003	0.006	(0.005)	0.018	0.084	<0.003		(0.002)	(0.001)	(0.001)		0.007	0.005		(94.1)	2.51	(0.001)	(0.001)	(0.003)	
280A	Ti 4-4-2		Alpha-Beta	4.11				0.005		(0.002)	0.0055	0.003	0.044	0.0015			(0.002)	4.01	0.0014	(0.001)	0.012	0.190			(0.002)		(0.001)		0.470	2.07		(88.7)	0.023		(0.0003)	0.002	
345A	Ti 5-2-2-4-4	R58650	Alpha-Beta	5.12		(0.001)		0.010		(0.002)	3.89	0.002	0.121	0.004			0.0009	4.09	0.0025	(0.002)	0.015	0.120	(0.002)		(0.002)		(0.001)		0.013	1.99	(0.003)	(82.8)	0.005	(0.002)	0.0003	1.90	
337A	Ti 6-2-2-2-2	R56222	Alpha-Beta	5.60		(0.001)		0.008		0.0011	2.01	0.002	0.114	0.005				2.05	0.0017	(0.004)	0.011	0.104					(0.001)		0.14	1.96		(86.0)	(0.003)	(0.003)	(0.0004)	1.89	
336A	Ti 6-2-4-6	R56260	Alpha-Beta	5.90		(0.001)		0.005		0.002	0.002	0.002	0.115	0.0022				6.16	0.0015		0.002	0.102					(0.002)		0.019	2.03		81.7	0.005	(0.004)	(0.0003)	3.92	
336B	Ti 6-2-4-6	R56260	Alpha-Beta	6.04		(0.001)		0.006		(0.002)	(0.001)	0.002	0.132	0.0029				6.16	0.0016		0.002	0.101	(0.002)				(0.002)		0.020	2.04		81.4	0.004	(0.005)	(0.0002)	4.12	
178C	Ti 6-6-2	R56620	Alpha-Beta	5.44		0.001		0.022		(0.003)	0.014	0.61	0.660	0.0025			0.002	0.012	0.011	<0.01	0.013	0.168	(0.003)		(0.003)	(0.002)	(0.002)		0.045	1.98	<0.002	(85.8)	5.41		(0.001)	0.0038	
178D	Ti 6-6-2	R56620	Alpha-Beta	5.49		(0.001)		0.028		0.005	0.031	0.52	0.550	0.0016			0.003	0.1	0.017	(0.01)	0.067	0.170	(0.002)		(0.003)	(0.001)	(0.001)		0.053	1.84	(0.001)	(85.8)	5.47	(0.001)	(0.001)	0.026	
Ti662-18	Ti 6-6-2	R56620	Alpha-Beta	5.61				0.007			0.046	0.46	0.510	0.0089			0.005	0.0031	0.021		0.039	0.190						0.011	2.01		85.8	5.35			0.0011		
300A	Ti 6-7	R56700	Alpha-Beta	5.96		(0.0008)		0.007		(0.001)	0.0097	0.0039	0.191	0.0018		(0.0004)	0.0012	(0.001)	0.0033	6.86	0.0081	0.162	(0.001)						0.018	0.007	0.004	86.71	0.005	<0.002	(0.0004)	0.003	
300B	Ti 6-7	R56700	Alpha-Beta	6.09		(0.0012)		0.008		(0.002)	0.0174	0.014	0.175	0.0025		<0.002	0.006	0.0013	0.003	6.84	0.012	0.171	<0.004		(0.005)		(0.001)		0.016	0.004	0.005	(86.3)	0.004	<0.005	<0.005	0.013	
300C	Ti 6-7	R56700	Alpha-Beta	5.97		(0.0006)		0.010		(0.001)	0.008	0.003	0.181	(0.0006)		<0.001	(0.003)	0.0023	0.0061	6.80	0.014	0.174	<0.001	<0.0001	<0.005		(0.0005)	(0.0005)	0.018	(0.006)	(0.005)	(86.7)	0.03	<0.002	(0.002)	(0.005)	
300D	Ti 6-7	R56700	Alpha-Beta	6.06		(0.001)		0.010		(0.004)	0.006	0.003	0.183			<0.001	<0.005	0.0019	0.005	6.82	0.013	0.166	<0.002	<0.0005	<0.005	<0.001	(0.001)	(0.0004)	0.021	(0.005)	(0.005)	(86.7)	0.03	<0.002	(0.003)	(0.005)	
300E	Ti 6-7	R56700	Alpha-Beta	6.16		<0.002		0.008		(0.004)	0.007	<0.02	0.170	(0.001)	<0.001	<0.001	<0.02	0.0028	0.0059	6.85	0.011	0.180	<0.001	<0.0001	<0.001	<0.01	<0.001	<0.001	0.017	0.005	(0.006)	(86.5)	0.03	<0.002	0.003	<0.02	

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
102A	AA 2014	A92014	Al-Cu		(0.001)	0.003	0.027	0.003			0.043	4.51	0.48	0.028		0.45	0.77		0.04	0.005	0.034		0.89	0.036		0.051	0.024	0.053	0.011
103A	AA 2018	A92018	Al-Cu		(0.001)	0.004	0.027	0.005			0.011	4.16	0.38	0.026		0.65	0.02		2.16	0.003	0.026		0.5	0.027		0.036	0.01	0.033	0.011
104A	AA 2024	A92024	Al-Cu		(0.002)	0.004	0.015	0.007			0.016	4.66	0.25	0.026		1.65	0.65		0.03	0.002	0.025		0.31	0.02		0.03	0.01	0.017	0.012
104B	AA 2024	A92024	Al-Cu	(0.0005)	0.0016	0.00021	(<0.002)	(<0.002)	(<0.0002)	(0.0005)	0.0088	4.63	0.262	0.011		1.56	0.645		0.0053	(<0.005)	0.014	(<0.02)	0.15	0.003		0.056	0.006	0.065	0.001
343A	AA 7055	A97055	Al-Cu	(<0.003)	0.0007	(<0.004)	(<0.009)	0.0024	(0.0002)	(0.0008)	0.0009	2.29	0.084	0.012		2.04	0.002		0.005	0.001	0.0012	(<0.004)	0.05	(<0.005)		0.0175	0.0058	8.15	0.152
56X G2000J1 C			Al-Cu	0.0048			0.008			0.00044	0.0007	3.29	0.086		(0.0001)	1.70	1.27		0.0046		0.022		0.099	0.099		0.0053	0.0097	0.864	0.293
56X G2000J2 C			Al-Cu	0.0446		0.0054	0.078			0.056	0.0200	3.73	1.38		0.0112	1.292	0.937		0.149		1.114		0.517	0.092		0.096	0.170	0.711	0.188
56X G2000J3 C			Al-Cu	0.0105		0.0039	0.152			0.108	0.0573	4.78	0.382		0.0019	1.018	0.589		0.091		0.375		0.773	0.0157		0.196	0.0099	0.114	0.0268
56X G2000J4 C			Al-Cu	0.0122			0.0049			0.0247	0.053	5.02	0.705		0.0025	0.505	0.271		0.089		0.879		1.33	0.0092		0.135	0.0132	0.0131	0.105
56X G2000J5 C			Al-Cu	0.234		0.0050	0.136			0.077	0.0078	5.52	0.98		0.009	0.39	0.007		0.204		0.69		0.321	<0.005		0.063	0.027	0.368	0.064
56X G14H4 C			Al-Cu							0.0288	0.0309	3.82	0.251			1.72	0.122		2.37		0.050		0.504	0.037		0.069	0.0252	0.091	
56X G2007 A			Al-Cu				0.147	0.0051			0.0354	3.699	0.252			0.663	0.605		0.0087		0.889		0.328	0.0676		0.0236		0.386	0.0020
56X G2011 A			Al-Cu				0.527				0.0031	5.70	0.632			0.0102	0.0183		0.0044		0.332		0.089	0.0037		0.0121		0.0188	
56X G2014 A			Al-Cu				0.0013				0.0766	4.41	0.243			0.453	0.572		0.0070		0.0110		0.611	(0.0047)		0.0244		0.195	0.135
56X G2024 A			Al-Cu								0.0389	4.34	0.178			1.509	0.658		0.0055		0.0010		0.122	0.0010		0.0099	0.0070	0.0446	0.0053
56X G250J1 C			Al-Cu			<0.0005				0.008	0.0067	3.82	0.41			0.075	0.040		1.33		0.101	(0.003)	0.26	0.125		0.008	0.102	0.28	(0.003)
56X G250J2 D			Al-Cu							0.195	0.063	4.81	0.346			0.060	0.225		1.10		(0.0016)	0.324	0.211	(0.004)		0.210	0.018	0.155	0.247
56X G250J3 C			Al-Cu			0.0014				0.264	0.024	4.90	0.079			(0.001)	0.278		0.92		0.024	0.35	0.11	0.031		0.162	0.036	0.103	0.275
56X G250J5 D			Al-Cu			0.0022				0.34	0.047	4.36	0.535			0.022	0.150		1.77		0.076	0.076	0.205	0.097		0.051	0.021	0.086	0.22
56X G2618 A			Al-Cu					0.0020			0.0165	2.45	1.057			1.625	0.0394		0.953		0.0020		0.175	0.0007		0.069	0.0162	0.0139	0.0011
56X A201.1 A		A12010	Al-Cu-Ag	0.494							0.0029	4.49	0.089			0.198	0.310		0.0066		0.0020		0.193	(0.0025)		0.132		0.0113	
57X AlCu25 A			Al-Cu-Si									25.08	0.42			0.0012	0.0035		0.0017				5.78	0.0024				5.89	
57X AlCu28 A			Al-Cu-Si									27.78	0.22			0.0020	0.0032		0.0030				5.44	0.0023				5.42	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Aluminum Alloy

Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
57X G12H1 C			Al-Cu-Si			0.0019			0.012	0.113	0.069	5.54	0.88		0.008	0.40	0.032		0.31		0.016		2.52	0.095		0.114	0.15	1.03	0.07
57X G12H2 C			Al-Cu-Si		(0.003)				0.0025	0.0391	0.0148	7.96	1.021			0.336	0.0900		0.309		0.12		2.79	0.202		0.0081	0.0027	0.999	0.0111
57X G12H3 C			Al-Cu-Si			0.0016			0.0055	0.039	0.086	8.69	0.350			0.296	0.117		0.479		0.092		1.48	0.132		0.196	0.0126	0.554	(0.001)
57X G12H5 G			Al-Cu-Si			0.003			0.023	0.054	0.016	12.2	0.19	0.017		0.028	0.073		0.11		0.068	0.066	0.55	0.067		0.036	0.033	0.072	0.045
57X G12H6 A			Al-Cu-Si			(0.0003)			0.0028	0.0247	0.054	8.28	0.85			0.292	0.223		0.387		0.110		1.63	0.108		0.108	0.0143	6.74	0.0262
57X G12H7 A			Al-Cu-Si		0.0093				0.0002	0.0483	0.0221	4.75	0.369			0.020	0.0327		0.0380		0.030		1.21	0.0307		0.0565	0.0111	0.384	0.0328
106A	AA 5052	A95052	Al-Mg		(0.001)	0.004	0.021	0.008			0.198	0.05	0.32	0.029		2.59	0.07		0.03	0.003	0.03		0.1	0.024		0.039	0.01	0.04	0.012
107A	AA 5083	A95083	Al-Mg		(0.001)	0.004	0.028	0.005			0.14	0.08	0.38	0.029		4.75	0.789		0.03	0.001	0.025		0.18	0.021		0.034	0.01	0.041	0.016
108A	AA 5356	A95356	Al-Mg		(0.001)	0.004	0.02	0.006			0.062	0.04	0.2	0.029		5.08	0.111		0.02	0.001	0.025		0.13	0.021		0.09	0.01	0.02	0.011
109C	AA 6061	A96061	Al-Mg	(0.0004)	(0.0012)	(0.001)	0.003	0.002	(0.0003)	(0.0006)	0.102	0.302	0.529	0.013		0.83	0.108		0.0123	(0.002)	0.0072	(<0.005)	0.616	0.004		0.0176	0.009	0.121	0.0018
Al6061-18	AA 6061	A96061	Al-Mg	(<0.002)	(0.0008)	(<0.0001)	(<0.007)	(0.0020)	(0.0001)		0.103	0.271	0.31	(0.0122)		0.88	0.105	(<0.001)	0.0081	(0.003)	0.0023	(<0.01)	0.67	0.005		0.016	0.013	0.023	0.0022
111A	AA 7075	A97075	Al-Mg		(0.002)	0.004	0.021	0.008			0.208	1.73	0.87	0.029		2.75	0.045		0.03	0.001	0.021		0.17	0.018		0.094	0.02	5.764	0.006
111B	AA 7075	A97075	Al-Mg	(<0.002)	(0.0008)	0.00087	(<0.002)	(0.001)	(0.0003)	(0.0005)	0.205	1.38	0.225	0.008		2.2	0.093		0.0098	(<0.0040)	0.0063	(<0.015)	0.192	(0.002)		0.0427	0.0035	5.7	0.0132
511X G05H1J			Al-Mg						0.0071		0.245	0.319	0.730	0.0096		1.99	0.0111		0.120		0.0132		0.397	0.203		0.201	0.071	0.230	0.0022
511X G05H2H			Al-Mg		0.0083	0.0018			0.0023		0.172	0.188	0.641			3.58	0.124		0.157		0.049		0.299	0.0495		0.068	0.0248	0.372	0.0105
511X G05H3H			Al-Mg			0.0074					0.095	0.093	0.41			3.97	0.40		0.090		0.107		0.21	0.096		0.25		0.092	
511X G05H4F			Al-Mg			0.014					0.029	0.056	0.14			5.1	0.55		0.040		0.15		0.11	0.14		0.048		0.062	
511X G05H5G			Al-Mg		0.0011	0.0004			0.0115		0.0306	0.0365	0.081			8.99	1.273		0.0124		0.247		0.0626	0.0112		0.0246	0.0216	0.131	0.100
511X G10H4C			Al-Mg			0.0061					0.083	0.163	0.193			10.24	0.228		0.117		0.080		0.244	0.075		0.155		0.117	
511X G10H5B			Al-Mg			0.0274					0.0017	0.0227	0.057		0.0032	13.97	0.098		0.036		0.165		0.050	0.013		0.0052		0.029	
511X G3000B1 C			Al-Mg								0.0972	0.287	0.669	0.051		0.253	0.752		0.142		0.145		0.788	0.163		0.0327	0.054	0.0347	
511X G3000B2 B			Al-Mg			0.0017			(0.0007)	0.007	0.200	0.20	0.335	0.012	0.017	0.68	0.81	(0.059)	0.063		0.137		0.23	0.105		0.111	<0.005	0.098	
511X G3000B3 B			Al-Mg			0.005			(0.001)	0.008	0.056	0.120	0.376	0.014		0.80	1.06	(0.093)	0.116		0.062		0.35	0.028		0.22	<0.005	0.140	

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
511XG3000B4C			Al-Mg			0.0140					0.0121	0.086	0.440	0.0284		1.267	0.916		0.0347		0.0285		0.130	0.0456		0.052	0.0199	0.058	
511XG5083A			Al-Mg				0.0016				0.237	0.042	0.363			3.98	0.592		0.0094		0.0069		0.22	0.0015		0.0294	0.0092	0.0488	0.0011
511XG6061A			Al-Mg								0.200	0.260	0.304	0.0160		0.896	0.0721		0.0044		0.0014		0.696	0.0012		0.0204	0.0138	0.0105	
511XG6063A			Al-Mg								0.0021	0.0014	0.185			0.437	0.0239		0.0021		0.0011		0.412	(0.001)		0.011	0.0087	0.0062	
511XG6082A			Al-Mg								0.0606	0.0184	0.081			0.759	0.534		0.0035		0.0012		0.753	0.0011		0.0278		0.054	
511XG6082B			Al-Mg				(0.0007)				0.0055	0.0141	0.180			0.660	0.566		0.0044		(0.001)		0.910	(0.001)		0.0158		0.0016	
511XG6012		A96012	Al-Mg w/Bi, Sn and Pb			0.0072	0.552				0.269	0.114	0.285			1.10	0.910		0.0154		1.10		1.35	0.040		0.016		0.255	0.032
511XG6012A		A96012	Al-Mg w/Bi, Sn and Pb			0.0110	0.701				0.0223	0.351	0.71			0.712	0.424		0.048		0.211		0.768	1.88		0.197		0.060	0.0480
511XG6023A		A96023	Al-Mg w/Bi, Sn and Pb			0.0020	0.353				0.0054	0.451	0.51			0.512	0.556		0.036		0.0110		1.21	1.037		0.0117		0.0260	0.0110
511XG6026A		A96026	Al-Mg w/Bi, Sn and Pb		0.0017		0.498				0.0706	0.413	0.470	0.0092		0.692	0.703		0.0075		0.277		0.898	0.0043		0.0255	0.0066	0.0775	0.0030
511XG6065A		A96065	Al-Mg w/Bi, Sn and Pb			0.0011	1.27				0.0759	0.214	0.74			1.180	0.131		0.0144		0.0310		0.495	0.0251		0.112		0.164	0.144
511XG6262A		A96262	Al-Mg w/Bi, Sn and Pb			0.0011	0.444				0.121	0.267	0.58			0.881	0.163		0.028		0.0081		0.649	0.539		0.045		0.198	0.0051
511XG6262B		A96262	Al-Mg w/Bi, Sn and Pb				0.424				0.0666	0.243	0.329			0.829	0.0737		0.0034		0.499		0.557	(0.001)		0.0194		0.0209	
105A	AA 3003	A93003	Al-Mn		(0.001)	0.003	0.017	0.003			0.019	0.09	0.66	0.028		0.01	1.08		0.04	0.005	0.023		0.25	0.022		0.023	0.01	0.038	0.013
514X9091.1C			Al-Mn								<0.005	0.046	0.081			(0.001)	6.93		(0.0026)		0.016		0.035	0.013		0.0017		0.029	0.184
110A	AA 6253	A96253	Al-Si		(0.001)	0.005	0.03	0.007			0.259	0.04	0.29	0.028		1.36	0.025		0.03	0.003	0.03		0.65	0.026		0.046	0.01	2.104	0.016
112A	AA 4343	A94343	Al-Si		(0.003)	0.004	0.015	0.004			0.021	0.06	0.5	0.029		0.03	0.048		0.04	0.003	0.02		7.49			0.05	0.01	0.049	0.015
113A	AA 4032	A94032	Al-Si		(0.001)	0.004	0.022	0.004			0.031	0.94	0.47	0.031		1.18	0.033		0.97	0.002	0.03		11.38	0.027		0.057	0.02	0.033	0.008
114A	AA 4643	A94643	Al-Si		(0.001)	0.004	0.019	0.005			0.028	0.04	0.16	0.028		0.1	0.041		0.04	0.005	0.02		3.82	0.017		0.052	0.01	0.031	0.008
115A	AA 4145	A94145	Al-Si		(0.002)	0.004	0.028	0.004			0.05	4.24	0.55	0.028		0.04	0.052		0.03	0.003	0.028		10.13	0.024		0.061	0.03	0.051	0.007
116A	AA 4043	A94043	Al-Si		(0.002)	0.004	0.023	0.006			0.027	0.05	0.34	0.03		0.05	0.05		0.06	0.004	0.029		5.21	0.029		0.046	0.02	0.05	0.007
54XG06H1R			Al-Si				0.006		0.0074	0.015	0.084	0.630	1.08		<0.001	0.489	0.022		0.611		0.082		8.43	0.133		0.248	0.010	0.60	
54XG06H3P			Al-Si				0.0067		0.0048	0.0208	0.0530	0.322	0.510			0.202	0.345		0.214		0.0203		9.94	0.0488		0.079	0.0278	0.0270	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Aluminum Alloy

Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
54X G06H4R			Al-Si					0.0024	0.0028	0.117	0.0132	0.128	0.262	0.0057	0.0018	0.123	0.502		0.124		0.040		11.96	0.0057	0.0024	0.121	0.0604	0.124	
54X G06H5L			Al-Si						(0.0002)		0.026	0.0229	0.210		(0.0001)	(0.0022)	0.85		0.0067		(0.0020)		13.76	0.022		0.0106	0.008	0.225	
54X G13H1N			Al-Si			0.0078	<0.001			0.0051	0.062	1.87	0.801			2.89	0.0137		1.83		0.240		8.91	0.260	<0.001	0.112		0.37	<0.005
54X G13H2M			Al-Si							0.004	0.103	1.29	0.767			1.37	0.248		1.15		0.083		10.42	0.145		0.166		0.530	
54X G13H3M			Al-Si			0.0075				0.009	0.060	0.82	0.79			0.89	0.43		0.95		0.050		10.2	0.092		0.152		0.42	(0.004)
54X G13H4Q			Al-Si			0.0018		(0.0015)		0.0048	0.283	0.688	0.534			0.644	0.227		0.789		0.062		12.41	0.060	(0.037)	0.109		0.443	0.0165
54X G13H4R**			Al-Si			0.0022		0.0035		0.010	0.032	0.68	0.39	0.01		0.64	0.59		0.75		0.047		12.2	0.047	0.043	0.091	0.003	0.195	0.019
54X G13H5L			Al-Si			0.0049				0.0016	0.044	0.216	0.715			0.092	0.119		0.115		0.013		13.26	0.009	(0.033)	0.032		0.070	
54X G231H1E			Al-Si			0.0018					0.107	1.141	0.945			0.336	0.0568		0.349		0.096		10.52	0.156	(0.009)	0.0233		0.726	
54X G231H1F			Al-Si			(0.0001)		0.0075			0.116	1.063	0.892			0.339	0.0111		0.295		0.147		9.50	0.169	0.0041	0.0290		0.624	
54X G231H2C			Al-Si			0.0146					0.0469	0.868	0.131			0.159	0.191		0.171		0.082		11.6	0.127	(0.0006)	0.085		0.397	
54X G231H3C			Al-Si			0.0003					0.0630	0.420	0.393			0.039	0.477		0.0932		0.0080		13.17	0.0139		0.128		0.130	
54X G25D1L			Al-Si			0.0011	0.112				0.140	0.010	0.721			0.67	0.815		0.262		(0.0033)		3.37	<0.005		0.099	0.016	0.359	(0.004)
54X G25D2K			Al-Si			0.049	0.22		0.011	0.105	0.150	0.130	0.576			0.59	0.479		0.139		0.073		3.93	0.042		0.152	(0.006)	0.169	
54X G25D3T			Al-Si			0.0022				0.0086	0.0413	0.119	0.379			0.386	0.256		(0.038)		0.050		6.29	0.046	(0.04)	0.067	0.0047	0.102	
54X G25D4P			Al-Si			0.0067	0.0705		0.0070	0.0204	0.043	0.148	0.14			0.151	0.195		0.0665		0.142		7.22	0.076		0.0978	0.0542	0.207	
54X G25D6A			Al-Si			0.0220					0.0009	0.0021	0.080	0.0027		0.715	0.0096		0.0044		(0.003)		5.97	(0.002)		0.0071	0.0133	0.0050	
54X G25DXA			Al-Si					0.0048			0.0053	0.0200	0.0792	0.0209		0.402	0.0302		0.0084		0.0018		7.20	0.0011		0.1519	0.0080	0.0354	0.0065
54X GS20J1E			Al-Si			(0.0001)					0.115	0.308	0.79			0.186	0.097		0.159		0.120		18.8	0.130	<0.0001	0.129		0.43	
54X GS20J2E			Al-Si			<0.0001					0.066	0.168	0.56			0.178	0.059		0.091		0.066		18.7	0.075	<0.0001	0.082		0.305	
54X GS20J3D			Al-Si			<0.0001					0.0017	0.079	0.328			0.118	0.302		(0.003)		0.077		23.9	(0.012)	<0.0001	0.0055		0.030	
54X GS20J4D			Al-Si			0.0017					0.194	(0.0037)	0.227			0.0050	0.146		0.265		0.0014		25.5	(0.0021)	(0.002)	0.107		0.224	
55XA30J1J**			Al-Si			0.0047	0.017	0.0032		0.075	0.007	5.04	1.13			0.87	0.105		0.0095	0.0025	0.145		14.9	0.009		0.21	0.0114	0.14	

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Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
55XA30J4G			Al-Si								0.0752	3.21	0.511			0.508	0.350		0.164	(0.003)	0.0257		16.4	0.0190		0.0231	0.020	0.067	
55XA30J5A			Al-Si			0.0029	0.0100	0.0053		0.0396	0.069	4.51	0.727			0.722	0.213		0.209	0.016	0.084		17.08	0.0776		0.070		0.693	
55X G02D10L			Al-Si			0.0389			0.0012	0.0544	0.128	4.59	0.975			0.0206	0.0524		0.645		0.022	0.0086	7.33	0.138		0.0302	0.0341	2.77	
55X G02D5A			Al-Si			0.0037			0.0182	0.0752	0.760	0.406	0.557			0.331	0.391		0.0652		0.067	0.031	10.03	0.051		0.0180	0.0129	0.131	
55X G02D6K			Al-Si			0.0026			0.0115	0.0195	0.366	0.510	0.528			0.376	0.300		0.0511		0.0580	0.0150	11.55	0.0355		0.055	0.0182	0.577	
55X G02D7P			Al-Si			0.0001		0.0070	0.0008	0.0378	0.0558	1.489	1.02			0.343	0.493		0.209		0.352	0.0021	10.24	0.171		0.214	0.0242	0.908	
55X G02D8M			Al-Si			0.0008			0.0029	0.0107	0.0756	2.481	0.776			0.1517	0.256		0.406		0.201	0.0112	9.24	0.201		0.1535	0.0536	1.415	
55X G02D9K			Al-Si			0.0035	0.033		0.0012	0.0074	0.185	3.51	0.423			0.093	0.269		0.494		0.10	0.049	8.49	0.187		0.096	0.0223	2.48	
55X G02DXB			Al-Si	0.0046			0.0168	0.0021	0.0007	0.0096	0.0308	2.198	0.762			0.115	0.244		0.207	0.0019	0.0319		9.45	0.0285		0.0553	0.0119	0.989	0.0109
55X G02DYA			Al-Si	0.0102		0.0012	0.0100	(0.001)	0.0032	0.0195	0.063	3.67	0.591			0.309	0.107		0.109	(0.01)	0.0620		11.31	0.0747		0.0687	0.0250	0.153	0.0218
55X G04H10D			Al-Si				0.029			0.043	0.090	1.36	0.512	0.011	(0.001)	0.004	0.532		0.0232		(0.0074)		7.21	<0.01		0.0097	0.008	2.26	
55X G04H6E			Al-Si				0.029		0.0039	0.0024	0.126	5.56	0.83		0.019	0.151	0.028		0.77		0.221		3.30	0.181		0.126	0.014	0.199	
55X G04H7E			Al-Si				0.022		0.0073	0.030	0.035	4.65	0.633		0.0066	0.263	0.212		0.500		0.227		4.43	0.174		0.0476	0.0057	0.537	
55X G04H8J			Al-Si				0.007		0.0055	0.0160	0.0301	2.86	0.529		0.0033	0.126	0.255		0.197		0.128		4.96	0.0809		0.179	0.0214	0.998	
55X G04H9E			Al-Si				(0.0037)		0.0018	0.0114	0.0172	2.70	0.393		(0.0028)	0.043	0.436		0.160		0.101		6.60	0.0563		0.117	0.0188	1.70	
55X G04HXA			Al-Si	0.0030		0.0006	0.0058	0.0011	0.0048	0.0060	0.0165	3.40	0.280			0.063	0.193		0.302	(0.002)	0.0125	0.0053	5.78	0.0112		0.176	0.0183	0.492	0.0278
55X G26H1F			Al-Si				0.07			0.022	0.20	4.34	1.78			0.29	0.015		0.012		0.24		7.69	(0.008)		0.21	0.012	1.14	
55X G26H2F			Al-Si				0.035		(0.0024)	0.052	0.083	4.14	0.71			1.49	0.52		0.41		0.111		9.36	0.110		0.120	0.011	0.64	
55X G26H3F			Al-Si							0.076	0.130	2.19	1.07			1.01	0.45		0.51		0.23		9.6	0.16		0.147	0.020	0.79	
55X G26H4D			Al-Si				(0.025)				0.0623	3.72	0.511			1.64	0.165		0.909		0.120		10.37	0.234		0.304	0.0189	0.286	
55X G26H5E			Al-Si				0.0201			0.015	0.0394	1.40	0.199			1.41	0.495		1.13		0.0108		11.38	0.035		0.018	0.0169	0.008	
55X G28J1Z			Al-Si							0.119	0.319	1.82	0.678			1.26	0.024		2.47	(0.0048)	0.0036		14.33	0.182		0.104	0.0095	0.258	
55X G28J2T			Al-Si			(0.0002)			0.0023	0.0029	0.088	1.44	0.516			0.0902	0.231		1.63		0.058	0.030	15.04	0.136		0.065	0.0221	0.292	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Aluminum Alloy

Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
55X G28J3U			Al-Si								0.09	1.45	0.43			1.30	0.33		1.47		0.07		21.6	0.11		0.07		0.30	
55X G28J4T			Al-Si							0.079	0.040	0.82	0.52			0.60	0.45		0.84	(0.002)	0.094		20.4	0.041		0.28	0.010	0.32	
55X G28J5Y			Al-Si								0.009	0.69	0.26			0.73	0.67		0.43	<0.005	0.18		27.6	0.03		0.24		0.015	
55X G900J1F			Al-Si			0.0011	0.071				0.0012	0.91	0.549			0.966	0.0133		0.0048		0.202		0.127	0.348		0.0056	0.0108	0.152	0.0236
55X G900J2G			Al-Si			0.0035	0.366				0.080	0.726	0.504		(0.007)	0.594	0.192		0.083		0.217	0.0374	0.227	0.240		0.079		0.295	0.0637
55X G900J3F			Al-Si							0.070	0.25	0.41	0.29			0.38	0.56		0.21		0.14	(0.029)	0.82	0.15		0.16		0.39	
55X G900J4F			Al-Si				0.285				0.343	0.249	0.306			0.459	0.75		0.351		0.088		1.39	0.153		0.171	(0.010)	0.149	
55X G900J5E			Al-Si								0.46	0.024	0.18			0.009	1.16		0.41		0.014		1.65	0.006		0.33		0.023	
58X G40H10C			Al-Zn			(0.0003)				0.050	0.468	0.188	0.361			1.25	0.269		0.097		0.044		0.224	0.042		0.187		4.66	0.215
58X G40H6B			Al-Zn			(0.002)			0.032	0.006	0.005	0.111	0.08		(0.004)	(0.003)	0.004		0.008		<0.002	<0.0005	0.09	<0.005		0.064		7.55	(0.004)
58X G40H7B			Al-Zn			0.0012			0.027	0.026	0.0018	0.050	0.101		(0.0003)	0.304	0.078		0.142		0.054	0.007	0.161	0.067		0.0045		7.16	0.0030
58X G40H8B			Al-Zn								0.22	0.14	0.30			0.69	0.20		0.22		0.090		0.1	0.010		0.063		6.5	(0.004)
58X G40H9C			Al-Zn			(0.0001)				0.0150	0.241	0.172	0.320			0.960	0.0372		0.062		0.190		0.347	0.068		0.279		4.83	0.157
59X G7020 A			Al-Zn-Mg-Cu		0.0025						0.192	0.0320	0.178			1.313	0.200		0.0051		0.0018		0.049	0.0022		0.0261	0.0107	4.82	0.146
59X G7022 A			Al-Zn-Mg-Cu								0.140	0.631	0.120			2.69	0.127		0.0030		0.0019		0.126	0.0006		0.0160		5.17	0.0016
59X G7050 A			Al-Zn-Mg-Cu		0.0011						0.0097	2.119	0.0745			2.030	0.0047		0.0041		0.0010		0.045	0.0010		0.0242	0.0092	6.18	0.100
59X G7068 A			Al-Zn-Mg-Cu								0.0324	1.676	0.117			2.70	0.0156		0.0056		0.0020		0.051	(0.001)		0.0419		7.96	0.088
59X G7075 B			Al-Zn-Mg-Cu		(0.003)						0.1831	1.227	0.122	0.0105		2.231	0.0229		0.0035		0.0011		0.066	(0.001)		0.0248	0.0058	5.49	0.0008
59X G77J1 G			Al-Zn-Mg-Cu				0.0578		0.0351	0.0104	0.297	2.810	0.209	0.010		4.52	0.810		0.205		0.158		0.1015	0.148		0.251	0.0064	2.289	0.0484
59X G77J2 E			Al-Zn-Mg-Cu						0.0023		0.0966	2.37	0.293			3.04	0.239		0.527		0.127		0.206	0.0054		0.0156	0.0153	3.25	0.152
59X G77J3 F			Al-Zn-Mg-Cu				0.0297		0.0095	0.032	0.150	1.30	0.70			2.53	0.246		0.402		0.108		0.647	0.122		0.148	0.0181	4.72	0.0144
59X G77J4 E			Al-Zn-Mg-Cu						0.00054		0.071	0.81	1.04			1.47	0.224		0.0037		0.073		0.59	0.219		0.119	0.0067	5.30	0.080
59X G77J5 E			Al-Zn-Mg-Cu			0.0036			0.0142	0.0373	0.0301	0.0203	1.37			0.851	0.0398		1.002		0.0194		0.562	0.0140		0.0255	0.052	7.82	0.0194

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Li	Mg	Mn	Mo	Ni	P	Pb	Sb	Si	Sn	Sr	Ti	V	Zn	Zr
59XG77J6B			Al-Zn-Mg-Cu			0.0079			0.0015	0.0087	0.0127	1.08	0.293			2.60	0.0318		0.0248		0.0123		0.094	0.0267		0.020	0.0107	12.02	0.261
518X429A			Pressed Powder Al		(0.002)			0.020		2.22	0.0034	1.023	0.201			1.25	0.0165		0.014	(0.004)	0.0020		28.9		0.0006	0.0163	0.0090	0.0042	
518X905A			Pressed Powder Al					(0.0007)		0.0033	0.0090	2.51	2.54			0.645	0.994	0.807	4.98		(0.001)		0.10	(0.0024)		0.587	0.0186	0.0052	0.77



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Aluminum Alloy

Residuals in Aluminum Alloy

Part Number	Grade	UNS	Type	Ag	As	B	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	Mg	Mn	Ni	P	Pb	Sb	Si	Sn	Ti	V	Zn	Zr
101A	AA 1100	A91100	Residuals in Al			(0.002)	0.003	0.014	0.002			0.017	0.092	0.6	0.03		0.012	0.029	0.036	0.005	0.018		0.16	0.017	0.032	0.012	0.03	0.011
51X G00H1 D			Residuals in Al					0.023				0.0061	0.0131	0.831			0.054	0.0074	0.231		0.0021	(0.003)	0.142	0.096	0.0135	0.0081	0.243	(0.001)
51X G00H2 E			Residuals in Al		(0.005)			0.011		0.0031		0.0174	0.111	0.356	0.011		0.093	0.154	0.119		0.114	0.0265	0.350	0.0065	0.128	0.0148	0.113	0.0150
51X G00H3 D			Residuals in Al	0.0079	(0.0003)			0.076		0.0186	0.0042	0.095	0.399	0.313	0.010	<0.001	0.0077	0.210	0.0115		0.055	0.0025	0.895	0.083	0.0043	0.0142	0.097	0.0095
51X G00H4 C			Residuals in Al	0.0208	(0.0026)			0.0246		0.0267	0.0109	0.0602	0.0465	0.082	0.0315	0.0011	0.054	0.0792	0.0323		0.0204	0.0077	(0.04)	0.0285	0.0292	0.0220	0.197	0.0278
51X G00H5 B			Residuals in Al	0.11	(0.0005)			0.130		0.0103	0.045	0.0249	0.227	0.490	0.0122	<0.001	0.110	0.196	0.161		0.130	0.056	0.739	0.201	0.100	0.0295	0.479	0.0005
51X A1350 A		A91350	Residuals in Al								0.0005	0.0024	0.0016	0.0968	0.0137		0.0032	0.0019	0.0071		(0.001)		0.0232	0.0005	0.0029	0.0042	0.0148	0.0007



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; ++ = Unsuitable for use with glow discharge systems

Magnesium Alloy

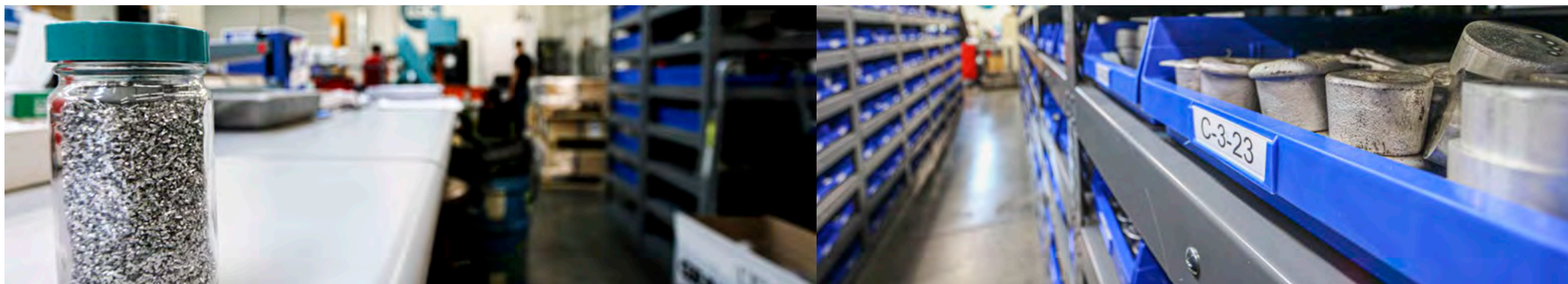
Part Number	Grade	UNS	Type	Ag	Al	Be	Ca	Cd	Ce	Cu	Fe	Gd	Hg	La	Mn	Nd	Ni	Pb	Pr	Si	Sn	Sr	Ti	Y	Zn	Zr
63XMGE1E			Mg-Mn	0.0195	(0.088)	(0.0002)		0.0017		0.0503	0.0014				0.860		0.0162	0.011		0.052	0.0053				0.083	
63XMGE2B			Mg-Mn	0.0090	0.0432		0.0015	0.0009		0.0203	0.0020				1.75		0.0035	0.0020		0.019	0.0024				0.0245	
63XMGE3C			Mg-Mn	0.0041	(0.056)	<0.0001		0.0046		0.0072	0.0005				1.62		0.0028	0.0046		0.014	0.006				0.0101	
64XMGQ1A	AZ10A		Mg-Al		1.083	0.00036				0.0840	0.0034				0.377		0.0041	0.0199		0.062	0.0195				0.235	
64XMGQ2A	AM50A		Mg-Al		4.53	0.0013				0.0151	0.0041				0.378		0.0061	0.0107		0.051	0.0107				0.107	
64XMGQ3A	AM90A		Mg-Al		8.66	0.0041				0.0349	0.0090				0.206		0.0032	0.0022		0.083	0.0019				0.0039	
64XMGQ4A	AM60A		Mg-Al		6.50	0.00029				0.310	0.0040				0.183		0.0068	0.0322		0.067	0.0282				0.188	
64XMGQ5A	AM60B		Mg-Al		5.76	0.0013				0.0072	0.0043				0.276		0.0010	0.0056		0.052	0.0050				0.0465	
64XMGQ6A	AS21A	Mn Si seg	Mg-Al		2.31	0.0007				0.0045	(0.004)				(0.26)		0.0026	0.0060		(0.97)	0.0055				0.072	
64XMGQ7A	AS41A	Mn Si seg	Mg-Al		4.02	0.00042				0.0167	0.0028				(0.43)		0.0053	0.0126		(1.05)	0.0096				0.061	
64XMGQ8A	AZ10-mod		Mg-Al		1.030	0.00015				0.0019	0.0018				0.700		0.0004	0.0008		0.045	0.0022				0.0442	
64XMGQ9A	AS21B	Si Seg	Mg-Al		2.14	0.0015			0.111	0.0104	0.0069			0.083	0.0684	0.114	0.0020	0.0096		(0.37)	0.0076				0.243	
65XMG11J++			Mg-Al-Zn	0.012	5.45	0.006	0.029	0.013	0.009	0.221	0.021			0.007	0.060		0.021	0.012		0.20	0.072				1.26	
65XMG11B			Mg-Al-Zn	(0.0002)	3.63	0.0022	(0.09)	0.0014	(0.0005)	0.0496	0.0048		0.006	(0.0005)	0.047		0.0134	0.0183		(0.024)	0.093				1.59	
65XMG12A			Mg-Al-Zn	0.0128	5.68	(0.0036)	0.037	0.0121	0.0009	0.266	0.0053		(0.016)	0.0007	0.198		0.0148	0.010		0.0142	0.0021				3.18	
65XMG13A			Mg-Al-Zn	0.0074	7.45	(0.010)	0.0064	0.0055	0.0024	0.125	(0.008)		(0.033)	0.0021	0.092		0.0039	0.0085		0.022	0.043				0.925	
65XMG14B			Mg-Al-Zn	0.0016	9.09	0.0029		0.0014	0.0120	0.0102	0.0084		(0.08)	0.0111	0.282		0.0082	0.0061		0.080	0.0085				0.685	
65XMG15A			Mg-Al-Zn	0.030	10.67	0.0062	(0.0014)	0.0034	0.0069	0.0273	0.010		0.011	0.0048	0.067		0.0026	0.0051		0.034	0.0021				0.348	
65XMG16A			Mg-Al-Zn	0.0035	6.78	0.0011	0.0024	0.0066	0.0017	0.099	0.0073		0.005	0.0012	0.271		0.0057	0.050		0.023	0.028				4.03	
65XMG17A			Mg-Al-Zn	0.0064	4.20		0.021	0.0049		0.0215	0.0069				0.203		0.0141	0.0009		0.33	0.0050				0.128	
65XMG18A	AZ61A	M11610	Mg-Al-Zn		6.75	0.00051				0.052	0.0081				0.192		0.0074	0.0244		0.043	0.0114				0.502	
65XMG19A	AZ92A	M11920	Mg-Al-Zn		8.97	0.00025				0.0426	0.0085				0.322		0.0065	0.0489		0.196	0.0489				2.17	
65XMG20A	AZ61A	M11610	Mg-Al-Zn		5.87	0.0018				0.0131	0.0078				0.067		0.0025	0.0075		0.052	0.0320				1.32	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Magnesium Alloy

Magnesium Alloy

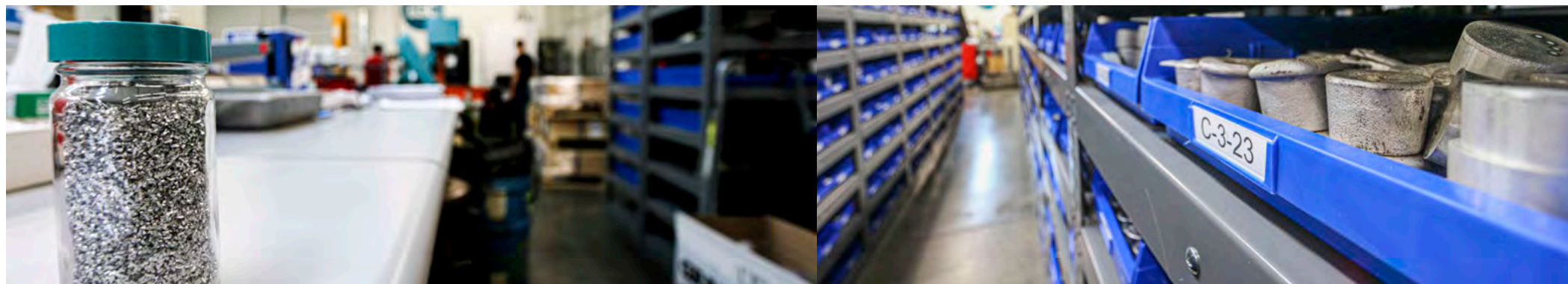
Part Number	Grade	UNS	Type	Ag	Al	Be	Ca	Cd	Ce	Cu	Fe	Gd	Hg	La	Mn	Nd	Ni	Pb	Pr	Si	Sn	Sr	Ti	Y	Zn	Zr
65X MGA21 A	AZ125A	M11125	Mg-Al-Zn		12.37	0.0006				0.0020	0.0140				0.0777		0.0010	0.0048		0.028	0.0063				5.11	
65X MGA22 A	AZ91A	M11910	Mg-Al-Zn		8.62	0.0006				0.078	0.0060				0.40		0.0058	0.0038		0.085	0.0033				0.89	
65X MGA23 B	AZ91D	M11916	Mg-Al-Zn		9.72	0.0030				0.0153	0.0083				(0.13)		0.0011	0.0020		0.028	0.0026				0.543	
65X MGB1 E			Mg-Al-Zn	0.0300	1.90	0.0008	(0.067)	0.076		0.051	0.0027				0.770		0.0020	0.0095		0.069	0.0098				1.60	
65X MGB2 C			Mg-Al-Zn	0.0099	2.67	0.0008	0.011	0.0115	0.0009	0.113	0.010			0.0007	0.333		0.0028	0.0036		0.069	0.0047		0.0003		0.95	
65X MGB2 D			Mg-Al-Zn	0.0099	2.81	0.0014	(0.010)	0.0103		0.065	0.0032				0.526		0.0043	0.0053		(0.088)	0.0052				1.047	
65X MGB3 B++			Mg-Al-Zn	(0.002)	3.19	0.0029	0.030	0.012		0.0214	(0.005)				0.0122		0.0020	0.0037		0.012	0.0050		(0.003)		0.608	
65X MGB3 C			Mg-Al-Zn	0.0028	3.38	0.0019	(0.003)	0.0025		0.0222	0.0028				0.277		0.0027	0.0023		0.042	0.0017				0.711	
65X MGB4 C			Mg-Al-Zn	0.0046	3.86	0.0033	0.0010	0.00016	0.0003	0.0183	(0.009)			(0.0001)	0.031		0.0003	0.0037		0.037	0.0050		(0.0008)		0.333	
66X MGC4 C			Mg-Zn	0.0074	0.039	(0.0001)				0.0024	0.006				0.166		0.0009	0.0030		0.06	0.021	(0.00014)			6.81	<0.001
66X MGC5 A			Mg-Zn		0.072					0.0286	0.0008				1.17		0.0111	0.0281		0.026	0.0051				6.61	
66X MGD1 B			Mg-Zn		0.147				0.065	0.066	0.0029			0.031	0.125	0.064	0.0162	0.026		(0.073)	0.026				1.19	
66X MGD5 A			Mg-Zn	0.044	0.040	<0.0005	(0.030)			2.88	0.008				0.307		0.0120	0.097		0.134	0.104				6.25	
67X MGK2 A			Mg-Al - Rare Earth		3.84	0.0025			0.70	0.0041	0.0016	0.053		0.34	0.534	0.125	0.0033		0.053	0.057					0.132	
67X MGK3 A			Mg-Al - Rare Earth		4.56	0.0007			0.83	0.0017	0.0024	0.038		0.374	0.516	0.175	0.0016		0.069	0.068					0.050	



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; ++ = Unsuitable for use with glow discharge systems

Residuals in Pure Magnesium

Part Number	Grade	UNS	Type	Ag	Al	Be	Ca	Cd	Ce	Cu	Fe	Gd	Hg	La	Mn	Nd	Ni	Pb	Pr	Si	Sn	Sr	Ti	Y	Zn	Zr
61XMGP2A++				0.003	0.065	<0.0001	0.0138	0.0063	0.0019	0.0109	0.0061			0.0014	0.0118		0.0029	0.0061		0.031	0.0073				0.0122	(0.0007)
61XMGP3A++				0.0125	0.096	<0.0001	0.054	0.0154	0.0055	0.0292	0.014			0.0038	0.0137		0.0048	0.0148		0.044	0.0155				0.0196	(0.0014)
61XMGP4A++				0.0203	0.0247	<0.0001	0.028	0.0071	0.0041	0.0108	(0.0044)			0.0030	0.0100		0.0028	0.0066		0.037	0.0067				0.0158	0.030
61XMGP5A				0.0342	0.119	0.0018		0.0292	0.049	0.092	0.0048			0.0382	0.201	0.0446	0.0176	0.0357		0.094	0.0352			0.0132	0.099	
61XMGP6A				0.0043	0.0449		(0.001)	0.0025	0.0209	0.0067	0.0041			0.0137	0.0125	0.0238	0.0025	0.0120		0.044	0.0091			0.0375	0.010	



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Zinc Alloy

Zinc Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Be	Bi	Cd	Ce	Co	Cr	Cu	Fe	Hg	In	La	Mg	Mn	Ni	Pb	Sb	Si	Sn	Sr	Ti	Tl	Zn	Zr
41XGLV1E			Galvanizing		0.285	(0.0004)		0.0045	0.0087		0.0008		0.0188	(0.001)				0.0021		0.0021	0.0175	0.0016		0.0049					
41XGLV10A			Galvanizing		0.969			0.0031	0.0030		0.0002		0.0073	0.0051				0.0040	0.0062	0.0022	0.0066	0.0009		0.0062					
41XGLV11A			Galvanizing		0.463			0.0009	0.0010		(0.0001)		0.0017	0.0027				0.0009	0.0008	0.0008	0.0057	0.168		0.0009	(0.0004)				
41XGLV12A**			Galvanizing	0.0043	0.171			0.0050	0.0050		0.0035		0.0089	0.016				0.0043	0.0086	0.0095	0.0100	0.0064		0.0082					
41XGLV13A**			Galvanizing	0.0011	0.220			0.0008	0.0011		0.0012		0.0050	0.006				0.0013	0.0008	0.0028	0.0030	<0.005		0.0012					
41XGLV2C			Galvanizing		0.0905	0.0017		0.0158	0.0037		0.0055	0.0015	0.0057	0.0155				0.0006	0.0218	0.0053	0.0248	0.0049		0.0097					
41XGLV3C			Galvanizing		0.326	0.0036		0.0031	0.0183		0.0034	0.0003	0.0332	0.0014				0.0014	0.0185	0.0335	0.0249	0.0555		0.0031					
41XGLV4E			Galvanizing		0.503	0.0002		0.0047	0.0013		0.0061	0.0010	0.0246	(0.01)				0.0025	0.164	0.0078	0.0058	0.0235		0.0035					
41XGLV5B			Galvanizing		0.0139	0.00044		0.0098	0.0136		0.0011		0.0103	0.0443				0.0014		0.0025	0.0166	0.148		0.0172					
41XGLV6B			Galvanizing		0.441			0.0254	0.0051		0.0061	0.0007	0.0371	0.0020					0.00235	0.0007	0.097	0.0122		0.0155					
41XGLV7A			Galvanizing		0.399	0.0016		0.0108	0.00056		(0.0001)	0.0010	0.023	0.0031					0.0025	0.0060	0.082	0.0031		(0.0006)					
41XGLV8B			Galvanizing		0.258			0.0006	0.0004			(0.0001)	0.0111	0.0080				0.0009	0.0035	0.0023	0.0039	0.0062		0.0005					
41XGLV9A			Galvanizing		0.547			0.0019	0.0028		0.0005		0.0037	0.0039				0.0014	0.0027	0.0009	0.0043	0.0048		0.0028					
56XG2000J4C			Galvanizing	0.0122				0.0049				0.0247	0.053	5.02	0.705					0.0025	0.505	0.271			0.089	0.879	0.105		
56XG2000J5C			Galvanizing	0.234			0.0050	0.136				0.077	0.0078	5.52	0.98					0.009	0.39	0.007			0.204	0.69	0.064		
56XG14H4C			Galvanizing									0.0288	0.0309	3.82	0.251						1.72	0.122			2.37	0.050			
56XG250J1C			Galvanizing				<0.0005					0.008	0.0067	3.82	0.41						0.075	0.040			1.33	0.101	(0.003)		
56XG250J2D			Galvanizing									0.195	0.063	4.81	0.346						0.060	0.225			1.10	(0.0016)	0.247		
56XG250J3C			Galvanizing				0.0014					0.264	0.024	4.90	0.079						(0.001)	0.278			0.92	0.024	0.275		
56XG250J5D			Galvanizing				0.0022					0.34	0.047	4.36	0.535						0.022	0.150			1.77	0.076	0.22		
41XZ11A			Residuals in Pure Zn		0.0261			0.0189	0.0155				0.0116	0.0019	(0.0009)	0.0345					0.0077	0.0026		0.0072			(0.001)		
41XZ3M			Residuals in Pure Zn		0.00158			0.0032	0.0033				0.0035	0.0061	0.0029	0.0023		(0.0003)	0.0052	0.0021	0.0050	0.0017		0.0030			0.0021		
41XZ4L			Residuals in Pure Zn		0.0065			0.0032	0.0044				0.0033	0.0148	0.0025	0.0030		0.0033	0.0029	0.0032	0.0058	0.0034		0.0022			0.0028		

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Zinc Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Be	Bi	Cd	Ce	Co	Cr	Cu	Fe	Hg	In	La	Mg	Mn	Ni	Pb	Sb	Si	Sn	Sr	Ti	Tl	Zn	Zr
41XZ5N			Residuals in Pure Zn		0.0243			0.0056	0.0165				0.0109	0.0262	0.0050	0.0057		0.0107	0.0049	0.0051	0.0286	0.0054		0.0063			0.0068		
41XZ6A			Residuals in Pure Zn		0.0096			0.0122	0.0093				0.0088	(0.002)		0.0228		<0.0005	0.0002	0.0002	0.0310			0.0038			0.0004		
41X2951Zn1A			Zn-Cu		0.029				0.0005			0.083	0.79	0.011				0.0029	0.0013	0.0038	0.0042			(0.0007)		0.278			
41X2951Zn2A			Zn-Cu		0.032				0.0037			0.142	1.37	0.019				0.0123	0.0011	0.0027	0.0040			(0.0015)		0.209			
41X2951Zn3A			Zn-Cu		0.078				0.0062			0.184	1.89	0.029				0.0164	0.0018	0.0010	0.0065			(0.006)		0.133			
41X0336Zn1L			Zn With Impurities		0.0177	0.0008			0.0067				0.0088	0.0106				0.0062	0.0102	0.0009	1.007					0.0051			
41X0336Zn2N			Zn With Impurities	0.0131	1.000			0.0043	0.147		0.0190		0.216	0.0283				0.0568	0.0227	0.0047	0.492	0.0019		0.0547			0.0016		
41X0336Zn3K			Zn With Impurities		0.336	0.0003			0.341				0.353	0.0456				0.147	0.0106	0.0022	0.0282					0.127			
41X0336Zn5A			Zn With Impurities		0.035			(0.001)	0.056				0.023	0.016				<0.0005	(0.0001)	(0.0005)	0.91	0.008		0.21					
41X4380Zn1D			Zn With Impurities	0.0012	0.039			0.0021	0.394			0.0007	0.178	0.0276				0.0032	0.0006	0.0058	0.0618	0.0019		0.0510		0.0004			
41X4380Zn10A			Zn With Impurities		0.0004				0.0007			0.117	0.0022	0.49				0.184		0.063	0.0043	0.0005		0.0014					
41X4380Zn2C			Zn With Impurities		0.0153			0.0076	0.284			0.0027	0.0288	0.048				0.0243	0.0087	0.0023	0.268	0.0093		0.0021		0.0251			
41X4380Zn3C			Zn With Impurities		0.0203			0.0103	0.0950			0.0029	0.073	0.017				0.0220	0.0180	0.0120	0.180	0.0046		0.080		0.125			
41X4380Zn4D			Zn With Impurities		0.446			0.0101	0.086		0.0018	0.0029	0.0284	0.017				0.118	0.0092	0.0172	0.310	0.0156		0.0416		(0.0003)			
41X4380Zn5C			Zn With Impurities		0.0215			0.0308	0.0571			0.0075	0.071	0.0120				0.00165	0.035	0.00147	0.140	0.0061		0.0101		0.339			
41X4380Zn6D			Zn With Impurities	0.0030	0.0260			0.0047	0.0466		0.0091	0.0064	0.0327	0.0307				0.0044	0.200	0.0073	0.427	(0.002)		0.101		0.0029			
41X4380Zn7D			Zn With Impurities		0.277				0.0156				0.0133	0.0018				0.0029	0.0036	0.0120	1.18	0.086		0.0036		0.0065			
41X4380Zn8D			Zn With Impurities	0.0140	0.232			0.0156	0.0097			(0.0001)	0.0208	0.0074				0.0054	0.0081	0.0445	0.700	0.0151		0.0177		0.0020			
41X4380Zn9A			Zn With Impurities		0.295			0.00046	0.0032			0.0015	0.0416	0.0113				0.0153	0.0018	0.0009	0.0139	0.0060		0.0008					
42XZ1J			Zn-Al		4.66				0.0014	0.0011		0.0004	0.0050	0.013			(0.0008)	0.0009	0.0038	0.0014	0.0017	0.0011	(0.002)	0.0007					
42XZ10A			Zn-Al		4.93				0.0029				0.314	0.0009		0.0018		0.0020	0.0183	0.0099	0.0065	0.0022		0.0033		0.0013			
42XZ11A			Zn-Al		3.19				0.0020	0.0014		0.0016	0.093	(0.036)		0.0037	(0.0009)	0.0329	0.0196	0.0241	0.0058	0.0047		0.0017		0.0047			
42XZ12A			Zn-Al		4.72				0.00277	0.0116		0.00063	0.156	0.046		0.0068	0.0084	0.0488	0.0483	0.0413	0.0079	0.0070		0.0022		0.0076			

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Zinc Alloy

Zinc Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Be	Bi	Cd	Ce	Co	Cr	Cu	Fe	Hg	In	La	Mg	Mn	Ni	Pb	Sb	Si	Sn	Sr	Ti	Tl	Zn	Zr
42XZ15A			Zn-Al		9.99				0.0023			0.0003	0.0028	0.026		0.0024		0.0026	0.0037	0.0017	0.0074	0.0006		0.0006					
42XZ16A			Zn-Al		12.28				0.0045			0.0007	0.235	0.033		0.0051		0.105	0.0028	0.0039	0.0090		0.011	0.0034			(0.003)		
42XZ2K			Zn-Al		3.79				0.0017	0.0055		(0.0001)	0.0300	0.0055			0.0026	0.0146	0.0274	0.0155	0.0029	0.0010	0.0011	0.0011					
42XZ3J			Zn-Al		3.84				0.0065	0.0032			0.135	0.0145			0.0013	0.0503	0.0090	0.0071	0.0068	0.0006	(0.002)	0.0048					
42XZ4J			Zn-Al		3.52				0.0065	0.0361		(0.0002)	0.0752	0.019		0.0025	0.0183	0.0663	0.0083	0.0170	0.0133		0.006	0.0052					
42XZ5M			Zn-Al		4.33				0.0013	0.0328		(0.0002)	0.111	(0.05)		0.0047	0.0150	0.0508	0.0049	0.041	0.0030			0.0012			0.0017		
42XZ6B			Zn-Al		3.67				0.0039	(0.012)		0.0034	0.238	0.008		0.0019	(0.011)	0.177	0.0157	0.00030	0.0093	0.0169	(0.010)	0.0057			0.0021		
42XZ7D**			Zn-Al		4.35				0.0021	0.059			0.024	0.024			0.027	0.0097	0.0047	0.008	0.004		0.002	0.0025					
42XZ8A			Zn-Al		7.03				0.0003	0.0081		(0.0002)	0.0215	0.013			0.0079	0.0033	0.0014	0.0019	0.0025		0.013	(0.002)					
42XZ9A			Zn-Al		5.58				0.0054	0.0047			0.0070	0.032			0.0044	0.0464	0.0006	(0.0003)	0.0021		(0.004)	(0.0004)					0.011
45XZnAl7C†	Galvalume		Zn-Al										0.0050	0.077			0.0070		0.0049	0.010			1.59	0.0096	(0.0004)	0.0049		47.5	
45XZnAl7E†	Galvalume		Zn-Al										0.0100	0.170			0.0005		0.0032	0.0042			1.56	(0.0005)	(0.004)	0.028		43.6	
43XGALF2A	Galfan Type	Z38510*	Zn-Al-Cu		5.40				0.0043	0.0318			0.0585	0.032			0.0158	0.0504			0.0050			0.0040					
43XGALF3A	Galfan Type	Z38510*	Zn-Al-Cu		8.37				0.0018	0.0152			0.507	0.018			0.0076	0.0099			0.0032			0.0025					
43XGALF4A	Galfan Type	Z38510*	Zn-Al-Cu		10.71				0.0108	0.079			2.470	0.074			0.041	0.0062			0.0122			0.0110					
43XGALF1A			Zn-Al-Cu		4.68				0.0499	0.0569			4.39	0.061			0.0284	0.0999			0.0505			0.0514					
43XGALF5A			Zn-Al-Cu		15.03				0.0080	0.0041			0.0114	(0.072)			0.0019	0.0016			0.0084			0.0081					
43XSC1A			Zn-Al-Cu		3.75				0.0011			0.0082	1.903	0.073				0.740	0.0201	0.0161	0.0150		0.022	0.0082					
43XSC2A	spin-casting		Zn-Al-Cu		3.41				0.0018			0.023	4.80	0.046				0.498	0.0183	0.0096	0.0097		0.0133	0.0031					
43XSC3A	spin-casting		Zn-Al-Cu		3.14				0.0028			0.0108	3.03	0.018				0.257	0.0337	0.0261	0.0066		0.022	0.0078					
43XSC4A			Zn-Al-Cu		4.35				0.0058			0.009	1.122	0.022				0.093	0.044	0.0249	0.0064		0.022	0.0056					
43XZ1L			Zn-Al-Cu	0.0037	4.48			(0.0008)	0.0004				0.720	0.0009				0.0345	0.0075	0.0069	0.0011	(0.0006)		(0.0005)					
43XZ10A			Zn-Al-Cu		3.99				0.0014			0.0003	2.97	0.007				0.0403	0.0050	0.0036	0.0046		0.009	0.0012					

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Zinc Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Be	Bi	Cd	Ce	Co	Cr	Cu	Fe	Hg	In	La	Mg	Mn	Ni	Pb	Sb	Si	Sn	Sr	Ti	Tl	Zn	Zr	
43XZ11F			Zn-Al-Cu		11.12			0.0046	0.0175			(0.0003)	0.335	0.015				0.0357	0.0032	0.0014	0.0202	0.0009	0.0013	0.0145						
43XZ12E			Zn-Al-Cu		10.38			0.0021	0.0045			0.0008	0.791	0.037				0.0287	0.0026	0.0033	0.0041	0.0032	(0.002)	0.0017		0.0050				
43XZ13E			Zn-Al-Cu		9.01			0.0014	0.0072			0.0004	1.113	0.0045				0.0198	0.0025	0.0036	0.0086	0.0020	(0.001)	0.0056						
43XZ14F			Zn-Al-Cu		7.98			0.0106	0.00567			0.0037	1.238	0.0025				0.0123	<0.001	0.0058	0.0019	0.0105	<0.001	0.0005		<0.001				
43XZ15D**			Zn-Al-Cu		8.30			0.0053	0.0036				1.17	0.0053				0.023	0.0067	0.008	0.0029	0.0005		0.0017						
43XZ2P			Zn-Al-Cu	0.0098	4.07			0.0038	0.0031				1.019	0.0013				0.0614	0.0162	0.0100	0.0048	0.0012		0.0033						
43XZ21D			Zn-Al-Cu		23.9				0.0010				2.68	0.0067				0.0142	0.0022	0.0021	0.0087		0.0191	0.0007	(0.0005)					
43XZ22D			Zn-Al-Cu		27.4				0.0043			0.0010	2.11	0.068				0.0099	0.0057	0.0101	0.0053		0.019	0.0020		0.0073				
43XZ23E			Zn-Al-Cu		30.7				0.0042			0.0147	3.22	0.055				0.0242	0.0090	0.0236	0.0112		0.077	0.0115		0.0045				
43XZ3M			Zn-Al-Cu		3.40			0.0092	0.0109			0.0046	1.499	(0.042)				0.114	0.0013	0.0062	0.0077	0.0029		0.0058						
43XZ4C			Zn-Al-Cu		4.79			0.0113	0.0033				2.69	0.0017				0.0480	0.0153	0.0258	0.0062	(0.002)	(0.001)	0.0030						
43XZ5B			Zn-Al-Cu	0.0254	3.164			0.0148	0.0030				5.92	0.10				0.0144	0.0061	0.0056	0.0029	0.065		(0.0004)	(0.0013)					
43XZ6B			Zn-Al-Cu		4.51			0.0054	0.0031			0.0005	2.85	0.024				0.0238	0.0022	0.0027	0.005	0.0044		0.0052						
43XZ7A	Berictype		Zn-Al-Cu		3.68		0.0194	(0.001)	0.00092			0.0003	3.14	0.029				0.062	0.0025	0.0005	0.0058	0.0016		0.0031		0.067				
43XZ8A			Zn-Al-Cu		2.51				0.00090			0.00024	0.481	(0.002)				0.00155	0.00021	0.00033	0.0027			(0.0005)						
43XZ9A			Zn-Al-Cu		3.17		0.0010	0.0033	0.0034			0.0034	4.82	0.073				0.0472	0.0108	0.0027	0.0078	0.0033		0.0020		0.0012				
41XZSb1A †			Zn-Sb Binary																											
41XZSb4A †			Zn-Sb Binary																											
41XZSb8A †			Zn-Sb Binary																											
41XZNi2A			Zn-Ni Binary		0.0135			0.0050	0.0010				0.0056	0.0061							1.97	0.0172			0.141					
41XZNiBiA			Zn-Ni Binary		0.050			0.502	0.0020				0.0132	0.0133							2.02	0.0187			0.154					

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Zinc Alloy

RoHS Monitors

Part Number	Grade	UNS	Type	Ag	Al	As	Be	Bi	Cd	Ce	Co	Cr	Cu	Fe	Hg	In	La	Mg	Mn	Ni	Pb	Sb	Si	Sn	Sr	Ti	Tl	Zn	Zr
41XZSC1A			RoHS Monitor						0.0288			0.0039			0.026						0.0621								
41XZSC2A			RoHS Monitor						0.0016			0.0036			0.0053						0.111								
41XZSC3A			RoHS Monitor						0.119			0.0148			0.0021						0.0273								
41XZSC4A			RoHS Monitor						0.0131			0.0299			0.050						0.156								
41XZSC6A			RoHS Monitor						0.215			<0.0002			0.029						0.0077								



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Copper Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Ge	In	Mg	Mn	N	Nb	Ni	O	P	Pb	Pd	S	Sb	Se	Si	Sn	Te	Ti	Zn	Zr	
264A	Federalloy I-844	C89831	Cu-Sn	(0.005)	0.003	(0.004)				3.6	(0.004)		0.001	(0.002)	(87.3)	0.048				0.002			0.54		0.027	0.057		0.0013	0.074	(0.001)	0.003	3.03			5.33		
265A	Federalloy I-836	C89833	Cu-Sn	(0.002)	0.003	(0.005)				2.4			(0.001)	(0.001)	(90)	0.013				(0.002)			0.69		0.024	0.011		(0.002)	0.015	(0.002)	0.003	4.4			2.45		
266A	Federalloy III-932	C89835	Cu-Sn	0.001	0.002	0.004				2.37	0.002		(0.001)	(0.002)	(87)	0.035				0.002			0.46		0.032	0.01		0.002	0.01	0.001	0.002	6.9			3.48		
263A	Federalloy I-848A		Cu-Sn	0.006	0.002	0.003				2.55	(<0.005)		0.001	0.002	(78)	0.047				0.002			0.66		0.04	0.022		0.002	0.06	0.002	0.003	3.5			15.8		
Cu172-18	CDA 172	C17200	Cu-Be	(0.002)	0.022	(<0.005)		(<0.005)	1.79	(<0.005)	(0.003)	(<0.005)	0.344	0.0007	97.7	0.029				(0.0013)	0.0017	(<0.001)		0.01	(<0.005)	0.003	0.005		(0.001)	(0.001)	(<0.005)	0.057	0.0009		(<0.005)	0.008	(<0.005)
36X CBC4 E	CDA 173	C17300	Cu-Be-Co		0.0258				1.869				0.215		97.47	0.0274				0.0035			0.0080		0.0027	0.329					0.048	0.002			0.003		
36X CBC2 F	CDA 175	C17500	Cu-Be-Co	0.0013	0.0097				0.439				2.22		97.15	0.0076				0.0036			0.121		0.0067	(0.001)					0.0257	(0.001)			0.0018	(0.001)	
36X CBC5 B		C17510	Cu-Be-Co	0.0011	0.0104				0.404				0.0084		97.61	0.0108				0.0009			1.905			0.0015					0.004	0.0013			0.0010		
36X CBC3 D	CDA 170	C17000	Cu-Be-Co		0.019				1.840				0.209		97.77	0.046				0.0040			0.007			0.0025				0.039	0.0021			0.004			
36X CBC6 A			Cu-Be-Co	0.0015	0.0490				0.507				1.045		97.11	0.0243				0.0070			1.132		0.0016	0.0014					0.0263	0.0041			0.0010	0.0553	
36X 274 B	CDA 180	C18000	Cu-Cr	0.0016	0.0011								0.0042	0.333	96.44	0.0164					0.0004		2.59		0.0015	0.0011				0.645	(0.001)			(0.001)			
36X CCR1 E		C18150	Cu-Cr	0.0042	0.0013	0.0007								0.652	99.24	0.0170				(0.0003)			0.0111		0.0223	0.0008		0.0016				0.0018			(0.001)	0.079	
279A	CDA 182	C18200	Cu-Cr	0.003	0.002	(0.002)				(0.001)	0.002	(0.0005)	0.002	0.86	99.1	0.025				(0.001)	(0.002)	(0.0003)		0.014	(0.001)	0.005	0.01		0.0015	(0.004)		0.02	0.021		0.01	0.012	
158B	CDA 815	C81500	Cu-Cr	(0.01)	0.002	(0.001)				0.002			0.002	0.85	98.5	0.09				0.019	(<0.0005)		0.32	0.002	0.005	0.01		0.003	0.002		0.02	0.01			0.014		
158C	CDA 815	C81500	Cu-Cr	(0.01)	0.002	(0.001)				0.002		(0.005)	0.002	1.04	98.5	0.09				0.019	(<0.0005)		0.32	0.002	0.005	0.01		0.003	0.002		0.02	0.01			0.014		
36X 70600 A	CDA 706	C70600	Cu-Ni		(0.001)								0.0087		86.70	1.619				0.759			10.65		0.0062	0.0086		0.0136				0.0090			0.115		
84C	CDA 706	C70600	Cu-Ni	0.002	(0.002)	(0.002)			(<0.002)	(<0.005)	0.003	(0.001)	0.006	(0.0008)	89.4	0.28				(0.0007)	0.04		9.8	(0.008)	0.06	0.047	0.047	0.006	0.0012	(0.002)	0.004	0.13	(<0.03)		0.13	(0.0004)	
36X 71500 A	CDA 715	C71500	Cu-Ni		(0.001)			0.0049		0.0240			0.0163		66.74	0.888				0.850			31.24		0.0074	0.0114		0.0454				0.0113			0.150		
85C	CDA 715	C71500	Cu-Ni	(<0.002)	(<0.01)	0.0009				0.008			0.016	0.002	67.3	0.63			0.01	0.65	(<0.0003)		31.3	(0.003)	0.003	0.004		0.002			0.01	0.005			0.057		
36X CN11 A		C72420	Cu-Ni		1.457						(0.001)		0.0049	0.380	77.56	0.992				0.0241	4.34		0.124	14.96		(0.002)	(0.003)		0.0012			0.083	(0.002)		(0.006)		
36X SP1 A	CDA 727/Spinelodal Type	C72700	Cu-Ni	0.005	0.0020			0.0007		0.0039			0.057		84.90	0.45				0.084		(0.031)	8.33		(0.003)	0.0115		0.005	0.0177		0.004	5.75		(0.0004)	0.344		
36X SP2 A	CDA 729/Spinelodal Type	C72900	Cu-Ni	0.0181	0.0003			0.0005		(0.0027)			0.119		74.91	(0.09)				0.0002	0.0019			15.72		(0.0006)	0.026		0.0030	0.006		(0.0023)	8.92		(0.0008)	0.029	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Copper Alloy

Copper Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Ge	In	Mg	Mn	N	Nb	Ni	O	P	Pb	Pd	S	Sb	Se	Si	Sn	Te	Ti	Zn	Zr
236A	CDA964	C96400	Cu-Ni		0.003					0.003	0.01		0.004	0.002	66.7	0.91				1.04	0.0002	0.92	30	0.002	0.003	0.004		0.003	<0.005		0.19	0.005			0.002	
36XCN1P			Cu-Ni		0.055						0.0106		0.114	0.156	(85.9)	1.856			0.0321	1.77		0.0236	9.27		0.0574	0.035		0.0071			0.104	0.227			0.351	
36XCN10C			Cu-Ni					(0.012)			0.0107		0.122	1.491	61.67	4.76			0.552		0.450	28.35		(0.009)	0.013		0.030			0.906	0.0164		(0.22)	0.058	0.080	
36XCN12A			Cu-Ni		2.41			0.0055			0.0101		0.0056		83.79	0.105			0.072	0.402		0.0010	13.05		0.0011	0.0037				0.040	(0.001)			0.157		
36XCN13A	Hiduron 130		Cu-Ni		2.65			(0.002)			(0.003)		(0.001)		81.46	0.870			0.0039	0.442			14.52		0.0011	(0.001)		(0.002)		0.012	(0.001)			0.0017		
36XCN2K			Cu-Ni		0.0009						0.0013		0.197	0.0043	86.25	0.0404			0.030	(0.69)		0.0176	11.45		0.0408	0.0449		0.0100		0.049	0.0258		0.0350	1.03		
36XCN21A			Cu-Ni	0.0064	1.95	0.0067						0.0021	0.0079	0.0050	92.17	0.0316			0.0391				5.50		0.053	0.051					0.038			0.0203		
36XCN22A			Cu-Ni	0.0196	6.09	0.0208						0.0083	0.0231	0.0144	91.80	0.088				(0.016)			1.806		0.0178	0.0260						0.0371			0.0175	
36XCN23A			Cu-Ni	0.042	0.007	0.047						0.0021	0.0509	0.0021	70.22	0.140							14.38		0.0299	0.115						0.102			14.88	
36XCN24A			Cu-Ni	0.0466	(0.0010)	(0.0011)					0.0436		0.0096	0.0065	52.56	0.127							15.41		0.0037	0.0056						(0.0023)			8.00	
36XCN3M			Cu-Ni					(0.002)	0.0042		0.020		0.0701	0.0259	76.60	0.996			0.075	0.726		0.030	19.55		0.049	0.223		0.0153		0.349	0.190			1.014		
36XCN4L			Cu-Ni		0.040					0.0096	(0.005)		0.0305	0.0273	72.09	0.548			0.008	0.529		0.461	25.58		0.0140	0.0193		0.0075		0.448	0.0093			0.164		
36XCN5P			Cu-Ni					0.0053	0.0035		(0.008)		0.0238	0.141	66.67	0.347			0.0106	0.217		0.430	31.03		0.034	0.0120		0.088		0.689	0.0090		0.0203	0.209		
36XCN6J			Cu-Ni		0.079					0.0260	0.0198		0.0433	2.17	63.41	0.481				0.567		0.271	32.51		0.0187	0.0165		0.0097		0.150			0.0510	0.147	0.0228	
36XCN7F			Cu-Ni					(0.004)		(0.014)	0.0106		0.108	1.51	65.58	1.021			0.0041	0.659		0.58	29.95		(0.021)	0.028		0.0151		0.304	0.039		(0.037)	0.203	(0.003)	
36XCN8J			Cu-Ni		(0.030)			0.005		0.0518	0.013		0.121	1.38	65.78	1.65				0.951		0.585	28.94		0.019	0.037		0.0119		0.309	0.0502		(0.039)	0.107		
36XCN9K			Cu-Ni		0.051					0.0197	0.005		0.0785	2.02	66.94	1.262				1.005		1.37	26.40		(0.021)	0.070		0.0105		0.406	0.0351		0.111		0.102	
34X79830A		C79830	Ni-Ag	0.0028	0.0012						(0.005)		(0.001)		45.88	0.079				0.311			9.76		0.0047	2.033		(0.001)				0.1158			41.80	
298A	CDA976	C97600	Ni-Ag	0.009	0.003	0.004		<0.005	<0.001	0.014	0.013	<0.001	0.016	0.005	65.3	0.73			0.0004	0.34	<0.001	<0.01	19.6	<0.005	0.004	4.0		0.011	0.04	<0.02	0.019	4.0	<0.005		5.8	<0.01
34XNS3F			Ni-Ag	0.100	<0.001								0.0922		64.16	0.285			<0.001	0.0377			14.96		0.0295	0.178		0.0028			(0.002)	0.056			19.96	
34XNS5G			Ni-Ag	0.0096	0.085								0.211		57.53	0.247				0.1103			16.55		0.104	0.896					0.122	0.142			23.87	
159A	NARloy-A		High Strength	3.48	<0.01						(0.002)		<0.01	<0.01	(96.5)	<0.01				<0.01	0.0003		<0.01	0.0006	<0.01	<0.01		<0.01		<0.01	<0.01			<0.01		
160A	NARloy-Z		High Strength	3.03	<0.01						0.003		<0.01	<0.01	(96.6)	<0.01				<0.01	0.002		<0.01	0.003	(0.004)	<0.01		<0.003		<0.01	<0.01			<0.01		
70C	CDA 110	C11000	Electrolytic	0.0011	0.0014	0.0009		(0.0004)	<0.002	(0.002)	0.002	(0.0008)	0.0014	(0.0002)	99.94	0.0016	<0.0002	<0.0001	(0.0003)	(0.0002)	<0.008	(0.004)	(0.0004)	(0.002)	0.0014	0.0013		0.0008	(0.003)	(0.001)	0.0006	0.0005	(0.001)		(0.002)	(0.001)

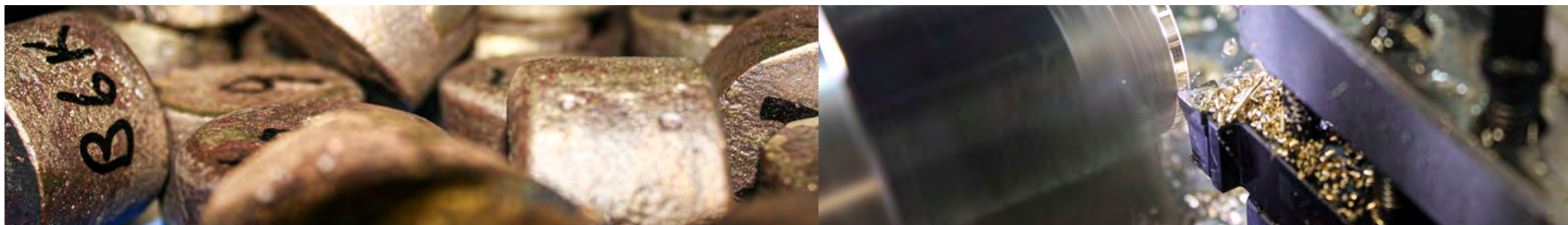
Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Copper Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Ge	In	Mg	Mn	N	Nb	Ni	O	P	Pb	Pd	S	Sb	Se	Si	Sn	Te	Ti	Zn	Zr
278A	CDA 145	C14500	P Deoxidized	(0.001)	<0.002	(0.001)				(0.001)	0.003		0.001	(0.001)	99.5	0.004			(0.0005)	(0.0004)	(0.0001)		<0.005	(0.0004)	0.011	0.003		0.002	<0.005		0.002	0.001	0.53		0.002	
37X218B	CDA 180	C18000	Cr-Ni-Si		0.0018									0.176	97.29	0.0209				0.0022			1.892			0.0014					0.564	0.0032			0.0054	

Residuals in Pure Copper

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Ge	In	Mg	Mn	N	Nb	Ni	O	P	Pb	Pd	S	Sb	Se	Si	Sn	Te	Ti	Zn	Zr
39X 17866 AH			CC	0.0086	0.0028	0.0435	(0.0004)			0.0109		0.041	0.0273	0.0316		0.0075	0.0052	0.0097		0.0147			0.0511		0.0125	0.0501		0.0326	0.0095	0.0053		0.0614	0.0065		0.084	
39X 17867 AD			CC	0.0079		0.0387	0.0075			0.0153		0.011	0.0194				0.0062	0.013	0.0041				0.041		0.0015	0.0196		0.041	0.0143	0.0067		0.115	0.0078		0.0325	
39X 17868 AH			CC	0.0209	0.0098	0.0145				0.0226		0.028	0.005	0.0267		0.0227	0.0272	0.0197	(0.0100)	0.0204			0.0277		0.0107	0.019		0.0124	0.0319	0.0103		0.0322	0.0273		0.55	
39X 17869 AG			CC	0.0399	0.0168	0.0104	0.0022			0.0401		0.0027	0.0084	0.0199		0.0365	0.0047	0.0026	0.0103	0.0325			0.0111		0.0245	0.0714		0.0069	0.0375	0.0197		0.07	0.0392		0.0261	
39X 17870 AH			CC	0.0556	0.144	0.0023	0.0017			0.0494		0.0022	0.0021	0.0012		0.074		0.0102	0.033	0.0596			0.0555		0.0535	0.0328		0.0018	0.0415	0.0118		0.0054	0.05		0.0285	
39X 17871 D			CC	0.0309		0.015	0.0005			0.0527		0.0027				0.0019	(0.0009)	0.0032					0.0412		0.0204	0.0503		0.0052	0.0141	0.031		0.1058	0.0137		0.0918	
39X 17872 A			C	0.0214	0.0118	0.0203	(0.002)			0.0240		0.0013	0.0102			(0.045)		0.0241		0.0055			0.0537		0.0045	0.293		0.0242	0.0217	0.0103		0.180	0.0208		0.107	
39X 17873 B			CC	0.0291		0.0197				0.0254		0.0023	0.0004	(0.0003)		0.0052		0.0040		0.0005			0.0280		0.0009	0.059		0.0095	0.0202	0.0143		0.0247	0.0144		0.0160	
39X 27866 A			W	0.0057		0.0383	0.0016			0.0047		0.0139	0.0308	0.0012		0.003	0.0029	0.0437					0.0487		0.0147	0.0054		0.0469	0.0052	0.0028		0.0448	0.0032		0.0287	
39X 27869 A			W	0.0349		0.0098	0.008			0.0376		0.0028	0.0036	(0.0002)		0.003	0.0123	0.009					0.019		0.0119	0.0225		0.0112	0.0362	0.0127		0.0106	0.0153		0.0065	
38XC1C			Wire	0.0011		0.000019				0.00001		<0.00001		<0.000005		0.00017				(0.0000005)			0.000027	0.0266	<0.000005	(0.000005)		0.0002	0.00001	(0.000025	<0.00001	(0.000001)	(0.000021)		<0.00001	



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Brass Alloy

Brass Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
313A	CDA 693	C69300	Alloyed	0.0017	(0.001)	0.001	0.0008	(0.0003)	(0.001)	(0.002)	(0.0003)	(0.004)	(0.001)	75.4	0.011	(0.0003)	(0.001)	(0.0001)	(0.001)	0.002	(0.001)	0.09	0.042	0.0016	0.014	(0.001)	3.09	0.006	(0.003)	21.3	(0.0004)
31XB10M			Alloyed		0.358	0.0087			0.0215			0.0390	0.0192	60.18	(1.39)		0.205			1.475			0.0274		0.0124		0.0389	0.0310		36.05	
31XB11H			Alloyed		0.0262	0.0061			0.0054					60.72	0.802		0.653			1.033			0.0134		0.0057		0.0063	0.0117		36.65	
31XB12G			Alloyed		0.081	0.0181			0.0198					60.51	0.430		1.720			0.491			0.0244		0.0194		0.0207	0.0229		36.67	
31XB13G			Alloyed		0.0148	0.0120			0.0116					60.03	0.182		2.84			0.212			0.0188		0.0056		0.032	0.0127		36.67	
31XB14G			Alloyed	0.0130	4.02	0.0091			0.0103			0.0109		58.85	0.0183		0.0117			0.0190			0.0104		0.0139		0.051	0.486		36.52	
31XB15H			Alloyed	0.0071	2.98	0.0048			0.0074			0.0046		59.07	0.0176		0.0122			0.0102			0.0073		0.0111		0.109	0.944		36.80	
31XB16H			Alloyed	0.0052	1.98	0.0056			0.0042			0.0023		58.37	0.0162		0.0029			0.0076			0.0295		0.0126		0.197	2.13		37.18	
31XB17F			Alloyed		6.05	(0.015)			<0.001					60.0	(0.02)		<0.001			(0.01)			(0.05)		<0.001		(0.007)	0.010		(33.9)	
31XB18K			Alloyed	0.0143	0.0193	0.0215			0.0196		0.0254	0.0015	(0.013)	59.37	0.0237		0.0207			0.0233		0.0195	1.018		0.0205		0.019	0.0117	0.017	39.41	
31XB20N			Alloyed		0.0025	0.0028			0.0025					58.53	0.024		0.0005			0.021		0.0230	4.43	(0.004)	0.0039		(0.005)	0.0244		37.03	
31XB21E			Alloyed		0.0244	0.0908			0.104					69.32	0.126		0.0603			0.117		0.1269	0.113	(0.002)	0.105		0.059	0.101		29.55	
31XB22F			Alloyed		0.0402	0.165	0.0043		0.17		0.0117	0.139		82.47	0.158					0.154		0.207	0.152	0.030	0.161		0.047	0.160		15.92	
31XB23D			Alloyed		0.0048	0.0482			0.0463		0.0010	0.0472		89.57	0.060		0.0053			0.047		0.030	0.046	0.053	0.0448		0.0046	0.060		9.97	
31XB24D			Alloyed		(0.002)	0.0116			0.0126		0.0008			95.65	0.0342		0.0030			0.134		0.0065	0.050	0.050	0.118			1.93		1.99	
31XB26F			Alloyed	0.053	1.005	0.126			0.106		0.0147	0.1197		62.93	0.650		0.408			1.397		0.0593	0.930		0.098		0.252	1.476		30.30	
31XB29A			Alloyed		0.219						0.0144		0.062	67.08	0.144		0.0625			4.11		3.33	0.146					0.0328		24.75	
31XBIB1D		C89550*	Bismuth Brass		0.124	0.0303			1.87		0.0100			59.57	0.053		0.0273			0.255		0.0451	0.157	(0.001)	0.0106	0.0031	0.169	0.463		37.20	
31XBIB2E		C89550*	Bismuth Brass		0.504	0.0224			1.031		0.0055	0.0437		61.12	0.143					0.550		0.0232	0.118	<0.001	0.087	0.0027	0.151	1.267		35.01	
31XBIB3C		C89550*	Bismuth Brass		0.154	0.0476			4.04		0.0014	0.0032		63.18	0.0510					0.127		0.0626	0.181	0.0018	0.0321	0.0047	0.0516	0.198		31.83	
31XBIB4C		C89550*	Bismuth Brass		0.412	0.0131	0.0017		0.851		0.0028	0.0291		62.45	0.123		0.0146			0.199		0.0373	0.092		0.0477	0.0133	0.203	0.85		34.69	
31XB1Q			Cu-Zn Binary		(0.001)	0.0070	0.0007		0.0183		0.0018	0.0015	0.0091	54.99	0.0223		0.0079			0.0200		0.0385	0.0155		0.0075		(0.007)	0.0279		44.82	
31XB2N**			Cu-Zn Binary	0.012	0.15	0.015	0.003		0.015		0.003	0.04	[bal]	0.10			0.03			0.10		0.018	0.055		0.013		0.015	0.013	0.002	39.5	

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Brass Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
31XB3M			Cu-Zn Binary	0.0247	0.074	0.0196	0.0022		0.0149		0.0040	0.0109		64.58	0.0264		0.0296			0.0259		0.0421	0.0299		0.0205			0.0202	0.0098	35.01	
31XB3N			Cu-Zn Binary	0.0152		0.0104	0.0008		0.0152		0.0027	0.0066		64.56	0.0408		0.0290			0.0171		0.0366	0.085		0.0148			0.0394	0.0056	35.05	
31XB4N**			Cu-Zn Binary			0.055			0.015		0.035	0.008	0.002	[bal]	0.025		0.030			0.010		0.008	0.080	0.005	0.007		0.03	0.050		30.5	
31XB5L			Cu-Zn Binary		0.0138	0.0357	(0.001)		0.0088		0.0040	0.0250		75.38	0.038		(0.002)			0.0275			0.084		0.016		(0.005)	0.266		23.98	
31XB6K			Cu-Zn Binary		0.0010	0.0009	0.0023		0.0010		0.0037	0.0063	<0.0005	79.90	0.0097		0.0039						0.0122		0.0011		0.015	0.0029		19.93	
31XB7L			Cu-Zn Binary		0.0435	0.0054	0.0013		0.0607		0.0064	0.0044		84.22	0.099		0.0088			0.0351			0.0416		0.0196		0.018	0.089	(0.002)	15.34	
31XB8J			Cu-Zn Binary		(0.001)	0.0074			0.030		0.0155	0.0072	(0.001)	89.37	0.132		0.0006			0.0421		0.0026	0.082	0.045	0.0254		(0.002)	0.0311		10.23	
31XB9M			Cu-Zn Binary	0.0065	(0.001)	0.0103	(0.001)		0.0059					94.81	0.0361		0.0006			0.0379		0.0047	0.090		0.0089			0.062	0.0181	4.92	
73C	CDA 360	C36000	Free Cutting	0.006	(0.001)	0.005	(0.0004)		0.011	(0.003)	0.0014	0.002	0.001	61.3	0.199	(0.001)	0.003		(0.001)	0.095	(0.0003)	0.003	2.97	0.002	0.008		0.003	0.256		35.1	
31XHT38A	CDA 674	C67400	High Tensile		0.960	0.0008				0.003				58.77	0.0530		2.60			0.0242		0.0024	0.051	(0.001)	(0.0006)		0.869	0.039		36.66	
31XHT37A			High Tensile		0.0004	0.0011				0.003				60.33	0.0344		2.88			0.0105		0.003	0.623	<0.0005	0.0007		1.38	0.0116		34.69	
31XCZ114A	CZ114	C67500	Leaded Brass		0.714				0.0107					57.10	0.740		1.475			0.0183		0.0018	1.219		(0.003)		(0.006)	0.511		38.25	
31XCZ115A	CZ115		Leaded Brass	0.0041	0.0007	0.0008								57.19	0.601		1.095			0.0143		0.0091	1.169		0.0020		(<0.005)	0.729		39.20	
31XCZ121A	CZ121	C38500	Leaded Brass	0.0060	0.0034	0.0299			0.0046					57.84	0.167		0.0052			0.1028		0.0028	3.01		0.0050		(0.003)	0.1940		38.57	
31XCZ122A	CZ122	C37700	Leaded Brass	0.0030		0.150					0.0011			61.51	0.066		0.00097			0.0261			1.97		0.0088		(0.001)	0.0866		36.21	
31XCZ132A	CZ132	C35330	Leaded Brass	0.0050	0.0007	0.0119					0.0012	0.0009		57.63	0.165		0.0007			0.0510			2.05	0.0008	0.0054		(0.004)	0.160		39.90	
31X7835.1 U**			Leaded Brass	0.009	0.020	0.014			0.008		0.0037	0.009		[bal]	0.175		0.011			0.120		0.050	2.77		0.016		0.018	0.44		33.5	
31X7835.10A			Leaded Brass		0.648	0.0635			0.0202			0.0203		62.55	0.408		0.0318			0.159		0.0417	1.419		0.0216		0.010	0.234		34.36	
31X7835.11A			Leaded Brass		0.908	0.143			0.011			0.0065		65.75	0.192		0.0101			0.1007		0.024	1.695		0.0122		0.010	0.1522		30.98	
31X7835.2K			Leaded Brass	0.0102	0.060	0.0280	0.0023		0.0099		0.0020	0.0290		64.49	0.0309					0.0462		0.0226	2.07		0.0358		0.0193	0.152		32.94	
31X7835.3 K**			Leaded Brass	0.021	0.485	0.059			0.029		0.0060	0.007		[bal]	0.49		0.048			0.15		0.035	1.70		0.061		0.07	0.355		36.5	
31X7835.4 K**			Leaded Brass		0.16	0.057	0.002		0.018		0.009	0.007		[bal]	0.24		0.027			0.10		0.16	0.97		0.03			0.21		37.9	
31X7835.5A			Leaded Brass		0.078	0.104								91.25	0.126					0.249		0.018	1.64		0.114			0.116		6.23	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Brass Alloy

Brass Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
31X7835.6 D**			Leaded Brass	0.005	0.63	0.007	0.004		0.004		0.0017	0.006		[bal]	0.12					0.06		0.04	1.29				0.01	0.71		37.0	
31X7835.7 A			Leaded Brass		0.0084				0.048		0.0047	0.0120		88.87	0.030					0.943		0.080	2.29	0.0075	0.0327		0.039	0.137		7.50	
31X7835.8 B			Leaded Brass	0.549	0.219	0.151			0.101		0.0944	0.313		72.7	0.0446		0.0102			0.157		0.154	3.22		0.110			0.451		21.55	
31X7835.9 B			Leaded Brass	2.014	0.119	0.101			0.91		0.0586	0.113		76.6	0.191		0.0045			0.196		0.0627	1.045	0.0200	0.44	0.300	0.0471	1.60		16.26	
226A	EnviroBrass II	C89520M	Pb-Free Casting	0.004	0.002	0.003			1.7	0.003		0.001	(0.001)	86.7	0.054		0.002	(<0.0005)		0.54	(0.001)	0.005	0.04	0.005	0.004	0.93	0.002	5.1		4.8	
227A	EnviroBrass II	C89520M	Pb-Free Casting	0.004	0.002	0.003			2.3	0.003		0.001	(0.001)	85.9	0.06		0.001	(0.0002)		0.53	0.0013	0.003	0.042	0.005	(<0.01)	1.21	0.002	5.1		4.7	
228A	EnviroBrass II	C89520M	Pb-Free Casting	0.003	0.002	0.003			1.53	0.003		0.001	0.001	89	0.052		0.001	(<0.0005)		0.45	(0.002)	0.032	0.026	0.004	0.01	0.67	0.002	4.1		4.1	
31X MNB11 B			Mn Brass		1.204	0.0060			0.0051			0.0636		59.24	0.420		12.50			4.71		0.0380	0.345		0.0073		0.0545	0.199		21.21	
31X MNB2 D			Mn Brass	0.041	0.272	0.0201						0.0086		63.75	0.548		2.05			0.118		0.0246	0.983		0.0177		0.579	0.289		31.30	
31X MNB3 F**			Mn Brass	0.005	1.4	0.045						0.038	0.038	[bal]	1.25		2.1			0.38		0.055	0.52		0.045		1.65	0.42		25.5	
31X MNB4 F			Mn Brass	0.0131	3.91	0.0125						0.0312		64.62	1.728		2.97			0.347		0.0274	0.221		0.0189		0.103	0.547		25.59	
31X MNB5 Q			Mn Brass	0.0063	2.96	0.0100						0.0155	0.19	56.18	0.013		0.137			0.996		(0.008)	0.243		0.0118		0.44	1.60		37.12	
31X MNB5 R			Mn Brass	0.0195	3.24	0.0021						0.066	0.0116	55.14	0.898		0.175			1.32		0.0399	0.157		(0.006)		0.528	1.228		37.11	
31X MNB6 C			Mn Brass	0.0509	0.0148	0.0107						0.0107		70.01	0.0697		0.871			0.261		0.0226	0.016		0.0128		0.0196	0.0310		28.53	
31XNB1 H			Naval Brass		(0.0004)	0.161			0.0065			(0.0006)		68.35	0.037		0.051			0.520		0.0223	0.504	0.0024	0.0057		0.004	0.535		29.73	
31XNB2 H			Naval Brass		0.168	0.0970			0.100					62.21	0.112		0.151			0.0578		0.0139	0.239	0.0019	0.099		0.107	1.009		35.47	
31XNB3 J			Naval Brass	0.0464	0.130	0.0559	0.0028		0.0786					72.86	0.071		0.124			0.0599		0.203	0.127	(0.004)	0.197		0.127	1.38		24.46	
31XNB4 J			Naval Brass		0.178	0.0062	0.0009		0.104					63.71	0.235		0.0053			0.230		0.230	0.067	(0.0032)	0.450		0.203	2.01		32.57	
76A*	CDA 485	C48500	Naval High Pb	(0.002)	(<0.01)					(0.031)					0.08		(<0.01)			0.03		0.005	1.8	0.002	(<0.01)		(<0.01)	0.99		36.14	
76D	CDA 485	C48500	Naval High Pb	0.0014	0.002	0.004	(<0.001)	0.0006	0.0011	0.002	0.001	0.001	0.0006	60.7	0.013	0.0005	0.0006	(<0.001)	(<0.002)	0.003	(0.0006)	0.0018	1.69	0.0012	0.004	(<0.001)	0.0037	0.73	(<0.0009)	36.8	(<0.0001)
75A*	CDA 482	C48200	Naval Med Pb		(<0.01)	(<0.01)				(0.01)				(59.79)	0.052		(<0.01)			0.025		0.005	0.83	0.002	(<0.01)		(<0.01)	0.89		38.39	
75B	CDA 482	C48200	Naval Med Pb	(0.005)	(0.005)	(0.004)			(0.001)	(0.004)	(0.002)	(0.003)		60.63	0.06		(0.003)			0.02		0.003	0.63	(0.001)	(0.004)		(0.003)	0.59		37.98	
75C	CDA 482	C48200	Naval Med Pb	(0.004)	(0.003)	0.005	(<0.1)	(<0.001)	0.0012	(0.002)	0.0015	0.0007	0.0009	60.7	0.06	(0.0003)	0.0024	(0.0006)	(<0.001)	0.013	(0.0007)	0.004	0.42	0.0015	0.007	(0.005)	0.005	0.69	(0.003)		(<0.001)

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Brass Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
74A*	CDA 464	C46400	Naval Uninhibited	(0.002)	(<0.01)	(<0.01)				(0.012)					0.01		(<0.01)			0.01		0.006	0.02	0.001	(<0.01)		(<0.01)	0.5		38.14	
74B	CDA 464	C46400	Naval Uninhibited	(0.005)	0.003	(<0.01)			(<0.005)		(0.002)			60.4	0.011		(<0.01)			0.006		(0.008)	0.017	(0.003)	0.003		0.003	0.7		38.9	
31X CZ112A	CZ112	C46400*	Naval Uninhibited	0.0043	(0.001)	0.0052								61.24	0.0488				0.0150		0.0136	0.458		0.0043		(0.003)	1.130		37.07		
31X WSB6F	CDA 872	C87200	Si Brass	0.0131	(0.001)	0.0110	0.0054				0.0039	0.0095		95.40	0.158		0.924			0.0509		0.0179	0.0310		0.0406		3.13	0.0142		0.0506	
151A	CDA 875	C87500	Si Brass	(<0.01)	(<0.001)					(<0.01)					0.076				0.009		0.006	0.02	(<0.01)	(<0.03)		3.95	(0.006)		14.02		
151B	CDA 875	C87500	Si Brass	(0.01)	0.002	(0.002)				0.005			(0.003)	84	0.025				0.011	(0.002)	0.003	0.013	(<0.001)	(0.001)		3.11	0.009		12.94		
31XTB1K			Traces in Brass	0.0455	0.493	0.111	0.0010		0.0414		0.0118	0.0500		63.08	0.171		0.280			0.0619			0.207		0.105		0.080	0.134		35.17	
31XTB2J			Traces in Brass	0.0142	0.0282	0.0166			0.0176		0.0015	0.0151	0.0054	63.68	0.059		0.142			0.0758			0.065		0.0498		0.049	0.127	0.0206	35.71	
31XTB3L**			Traces in Brass	0.013	0.04	0.048	0.0015		0.008		0.010	0.004		[bal]	0.02		0.035			0.03			0.12		0.03		0.02	0.14	0.003	37.0	
31XTB4G			Traces in Brass		0.0041	0.0106	(0.0004)		0.0058		0.0032	0.0067		66.07	0.0340					0.0133			0.0246		0.0095		0.0203	0.0197	0.0035	33.64	
31XTB5B			Traces in Brass	0.216	0.0711	0.396			0.292		0.49	0.0202	0.0031	61.49	0.094		0.283			0.106			0.575		0.229		0.111	0.129		35.62	



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Bronze Alloy

Bronze Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	In	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
32X CA7 A	CDA 623	C62300	Al Bronze	0.0009	9.37						0.0028			0.0028	88.06	2.09		0.0004	0.151			0.234			(0.004)			0.017	0.0172		0.006		
79B	CDA 623	C62300	Al Bronze	0.002	9.19					(0.003)	0.002		(0.002)	(0.003)	88.4	2.13			0.16	(0.001)		0.075	(0.002)	0.005	(0.003)	(0.001)		0.019	0.017		0.013		
79C	CDA 623	C62300	Al Bronze	<0.005	9.2	0.003					0.003		<0.005	(0.002)	87.6	2.28			0.2	<0.0001		0.55	(0.001)	0.006	<0.005	<0.001	<0.005	0.033	0.01		0.014		
32X ALB12 A	CDA 628	C62800	Al Bronze	0.044	8.29								0.0056		82.90	1.094		0.0013	0.958			6.33		0.0101	0.0018			0.0202	0.310		0.0625		
80D	CDA 630	C63000	Al Bronze	0.04	9.67	0.009		(0.003)	<0.002	0.004	(0.004)	(0.002)	0.022	0.005	(81.7)	2.99		0.003	0.346	(0.002)	<0.02	5.01	(0.001)	0.005	0.005	0.003	<0.02	<0.03	0.025	0.093	(0.04)	0.007	<0.002
32X CA23 A	CDA 632	C63200	Al Bronze	0.0008	9.19						(0.0050)			0.0018	81.05	3.63		0.0003	1.298			4.71		0.0011	(0.0026)			0.026	0.0164		0.031		
Cu642-18	CDA 642	C64200	Al Bronze	(0.015)	6.5	(0.01)		<0.005		(0.001)	<0.005	<0.005	<0.005	<0.005	90	0.039		<0.005	0.0024	(0.001)	<0.005	0.014	(0.001)	0.009	0.019	(0.002)	<0.005	(0.002)	1.96	0.019		1.19	<0.005
204A	CDA 954M	C95410	Al Bronze	0.009	10.55	<0.01					0.006		0.008	0.008	83.3	3.87			0.052			1.95		0.007	0.004	(0.002)	<0.01	0.034	0.005		0.22		
94B	CDA 955	C95500	Al Bronze	0.017	10.8	<0.01					(0.006)		0.011	0.017	80.6	3.99			0.071			4.31		0.011	0.004	0.002	(0.011)	0.028	(0.003)		0.14		
334A	CDA 955M	C95510	Al Bronze	(0.001)	9.76	(0.004)		(0.001)	(0.001)	(0.001)	0.0058	(0.001)	(0.003)	(0.01)	80.7	3.82		(0.001)	0.69	(0.0001)		4.77	(0.0003)	(0.005)	0.01	0.0007	0.0043	0.073	0.025		0.11		
334B	CDA 955M	C95510	Al Bronze	0.0013	9.91	(0.003)		(0.002)	(0.001)	(0.001)	0.005	(0.001)	(0.003)	(0.004)	80.8	3.7		(0.001)	0.6	(0.0004)	(0.001)	4.7	(0.0006)	0.005	0.006	0.0008	(0.004)	(0.004)	0.075	0.019		0.122	
32X ALB2 M**			Al Bronze	0.022	10.7	0.017							0.16	0.05	[bol]	3.8		0.008	0.32		0.025	4.8		0.035	0.03			0.21	0.10		0.27		
32X ALB3 S			Al Bronze	0.0272	10.43	0.0213							0.0760	0.0392	80.01	3.718		0.0659	0.243		0.018	3.51		0.0345	0.118			0.155	0.1209		1.314		
32X ALB4 H			Al Bronze		7.87	0.0130								0.022	79.61	3.55		0.153	1.028			7.03		0.036	0.120		low stock	0.252	0.085		0.264		
32X ALB5 K			Al Bronze	0.0061	7.21								0.0606	0.192	83.71	2.04		0.179	1.417		0.181	3.92		(0.05)	0.0512			0.107	0.0293		0.80		
32X ALB6 K			Al Bronze	0.0082	9.69	0.0116							0.139		80.77	2.71		0.0104	0.787			5.42		(0.006)	0.0749			0.073	0.120		0.126		
32X ALB8 F			Al Bronze	0.0100	6.21	0.189							0.425	0.088	77.04	5.37		0.194	1.57		(0.002)	6.11		0.261	0.049		0.0250	0.513	0.435		1.395		
32X ALB9 C			Al Bronze	0.0417	13.52	0.0163							0.0027	0.0206	81.64	3.12		0.090	0.159			0.628		0.096	0.267			0.235	0.0601		0.142		
32X ALB10 B			Al Bronze	0.0144	12.11	0.0194							0.0984	0.0152	73.64	3.63		0.0122	1.626			7.21		0.069	0.152			0.158	0.201		0.961		
32X ALB13 A			Al Bronze		7.09								0.0011		84.96	1.171			5.39			1.381		0.009	(0.001)			0.086	0.0072		0.0194		
32X CA12 A		C64250	Al Bronze	0.0010	6.14						(0.002)				90.48	0.657		0.0005	0.0290			0.088			(0.0017)			2.57	0.0157		0.0405		
32X CA31 A			Al Bronze	0.0008	8.95						0.006			0.0026	82.24	4.06		0.0008	0.336			4.28		(0.003)	(0.0024)			0.036	0.0037		0.041		
32X 61400 A	CDA 614	C61400	Al Bronze D	0.0010	6.81										89.99	2.74		0.0050	0.082			0.0242		0.0008	(0.001)			0.0124	0.301		0.060		

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Bronze Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	In	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr	
32X SEB1 D	Sebiloy Type	C89510*	Bi Bronze			0.0402				4.25		0.0033	0.0478		81.88	0.071						0.102		0.0021	0.197	0.0052	0.305	0.812		4.26		7.81		
32X SEB2 D	Sebiloy Type	C89510*	Bi Bronze	0.0443		0.0160				4.57		0.0255	0.0133		86.56	0.074	0.074					0.0449		0.036	0.104	0.030	0.0222	0.044		6.96		1.40		
32X SEB3 E	Sebiloy Type	C89510*	Bi Bronze			0.0325				6.47		0.0095	0.0491		86.47	0.0113						1.214		0.0139	0.296	0.0180	0.108	1.30		2.96		0.887		
32X SEB4 F	Sebiloy Type	C89510*	Bi Bronze		0.0007	0.0065				2.50		0.0017	0.32		79.82	0.093						0.0199		0.0043	0.0357		0.0343	0.119		10.05		7.02		
32X SEB5 C	Sebiloy Type	C89510*	Bi Bronze		(0.001)					1.056		0.0051	0.0156		87.21	0.0430						0.317		0.072	0.268	0.050	0.0334	0.471		5.18		5.30		
32X SEB7 B**	Sebiloy Type	C89510*	Bi Bronze	0.033		0.035				3.2		0.008	0.13		[bal]	0.09						1.15		0.005	0.28	0.05	0.16	1.35		3.1		4.7		
32X CSN1 A			Bronze													0.0020													0.306		0.0039			
32X SN1 F			Bronze		(0.001)	0.0111							0.0136		80.34	0.0014								0.0022	5.66	0.0126	0.0274		(0.001)	11.65		0.259		
32X SN2 J			Bronze	0.0107	(0.002)	0.0119				0.119			0.0343		81.17	0.041								0.220	2.06	0.0106	0.106		0.009	14.22		0.940		
32X SN3 G			Bronze		(0.14)	0.0323							0.0460		81.7	0.14								0.646	0.159	0.035	0.362		0.0247	16.14		0.150		
32X SN4 B			Bronze	0.495	0.0513	0.0651				0.0150			0.100		76.87	0.0811								1.208	0.864	0.0132	0.143		0.0223	18.96		0.496		
32X SN6 B			Bronze	1.007	0.059	0.804	0.0027			0.127		0.0242	0.750	0.015	85.73	0.376									1.644		0.304			6.78		2.00		
32X SN7 B**			Bronze	0.32	0.025	1.15				0.20		0.03	0.35		[bal]	0.035									0.005	2.3	0.02	0.24			12.5		1.2	
211A	Magnolia B-1	C89320	Pb-Free Bronze	0.005	0.002	(0.01)				4.98			(0.001)	(0.002)	88.4	0.004								0.19	0.014	0.002	0.057		0.003	6.23		0.006		
72A*	CDA 314	C31400	Leaded Bronze	(<0.005)	(<0.01)						(0.014)		(<0.01)		(89.71)	0.011								(0.007)	1.78	0.0014	(<0.01)		(<0.01)	(<0.01)		8.48		
72B	CDA 314	C31400	Leaded Bronze	(0.002)		(0.003)					0.002				90.08	0.007						(0.0002)	0.004	0.002	0.005	1.99	0.0015	0.006		(0.002)	0.029		7.81	
32X 93700 A	CDA 937	C93700	Leaded Bronze										0.0004		80.43	0.0011								(0.0015)	8.38	0.0017	0.0051			9.95		0.78		
32X LB16 A	CDA 941	C94100	Leaded Bronze	0.0016	(0.001)					0.0119					74.42	0.0040								(0.002)	18.78	0.0012	(0.001)			5.55		0.458		
32X LB10 G			Leaded Bronze	0.0686	(0.001)	0.169				0.093			0.084		77.10	0.0011								0.0034	12.60	0.0100	0.599			8.29	0.0107	0.110		
32X LB11 E			Leaded Bronze	0.0617	(0.001)	0.0408				0.0519			0.0098		78.72	0.0034								0.0050	10.21	0.0295	0.0680		0.0093	10.19	0.0147	0.039		
32X LB12 E			Leaded Bronze	0.0450	0.0337	0.112				0.0338			0.061		79.76	0.029								0.240	8.64	0.053	0.484		0.0099	9.63	0.0215	0.459		
32X LB14 G			Leaded Bronze	0.120	0.0006	0.0500				0.720			0.089		77.02	0.0094								0.0589	15.42	0.0176	0.0750		(0.001)	5.63		0.586		
150A*	CDA 872	C87200	Cu-Si Bronze	(<0.01)	(<0.01)						(<0.01)					0.045								0.005	0.011	(0.001)	(<0.03)		3.93	0.016		0.03		

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Bronze Alloy

Bronze Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	In	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
83A*	CDA 675	C67500	Mn Bronze A	<0.005	<0.01	<0.01					(0.007)		<0.01			0.99			0.22			0.01		0.005	0.058	0.002	0.008		<0.01	0.57		39.81	
83B	CDA 675	C67500	Mn Bronze A	(0.002)	0.002						0.003	(0.003)	(0.003)	(0.003)	58.7	0.97		(0.001)	0.13			0.01	(0.001)	0.004	0.017	(0.001)	(0.004)		(0.003)	0.85		39.3	
88A*	CDA 863	C86300	Mn Bronze		6.03	<0.01					(0.022)		<0.01			2.27			3.72			0.02		(0.004)	0.03	(0.002)	(0.01)		0.02	0.04		23.25	
88C	CDA 863	C86300	Mn Bronze	0.004	5.79	0.007		<0.1	<0.005	0.004	0.005	0.0009	0.001	0.008	64.5	2.98		0.0006	2.99	(0.00016)	(0.0001)	0.276	(0.0006)	0.02	0.133	0.001	(0.003)	<0.005	0.091	0.147	(0.0001)	22.86	0.0004
31XHT31B	CDA 670	C67000	Mn Bronze B		6.82	0.0005		0.0014			0.0057				67.00	3.01			5.69			0.226		0.0030	0.0139	0.0007		0.0443	0.079		17.06		
33XGM20 B**			Gun Metal	0.21	0.14	0.28				0.035		0.02	0.04		[bal]	0.43			0.04			0.21		0.06	0.30		2.35			4.5		1.78	
33X GM21 B			Gun Metal	0.701	0.173	0.333				0.459		0.249			78.86	0.693						0.197		0.0697	7.53	0.0628	1.033	0.173	0.0213	4.50		4.96	
33X GM24 A			Gun Metal	0.0046		0.0010				0.0009				(0.0013)	88.88	0.0083			<0.0005			0.0087		0.190	3.35	0.003	0.0012		0.0028	3.85		3.67	
33X GM29 A			Gun Metal	0.0026		0.0017				0.0019				(0.0004)	89.36	0.0102			(0.0005)			0.0289		0.138	0.050	0.0024	0.0015		0.0027	6.12		4.23	
33X GM4 AD			Gun Metal	0.0206	0.0015	0.0228				0.0442			0.0077		84.02	0.0932			0.0006			1.482		0.0034	5.27	0.034	0.0568		0.0010	3.02		5.90	
33X GM5 P			Gun Metal	0.0497	0.055	0.0498				0.018		0.0048	0.0298		83.39	0.127						0.728		0.0507	5.18	0.0411	0.072		0.0310	4.48		5.66	
33X GM6 K			Gun Metal	0.0148	0.0012	0.158				0.0359			0.0100		86.51	0.0256			0.0022			0.890		0.0041	3.94	0.090	0.259		(0.001)	6.58		1.409	
33X GM7 K			Gun Metal	0.0682		0.095				0.098			0.100		85.69	0.0178						0.531		0.0050	1.79	0.0613	0.111			10.07		1.363	
33X GM8 H**			Gun Metal	0.10	0.005	0.01				0.015			0.015	0.015	[Bal]	0.14						0.49		0.035	5.8	0.02	0.06			3.9		6.0	
33X GM9 A			Gun Metal	0.0321	0.0052	0.0251				0.076		0.0072	0.079		75.1	0.090						0.710		0.0547	6.91	0.0153	0.184		(0.003)	2.93		13.81	
33X RB2 B			Gun Metal	0.105	0.0078	0.0395				0.091			0.0326		82.02	0.503			0.0076			0.330		0.0435	2.99	0.069	0.0494		(0.002)	4.65		9.01	
267A	CDA 947	C94700	Ni-Sn Bronze	0.002	0.003	(0.004)				(0.005)	(0.003)		0.002	(0.001)	87.8	0.019			0.002			5.1		0.037	0.026	0.0014	<0.03	0.002	0.003	4.95		2.06	
32X 51000 A	CDA 510	C51000	Phosphor Bronze 5%	0.0024	(0.001)										94.84	0.0025						0.0083		0.300	0.0031	0.0021				4.86		0.0112	
77A*	CDA 510	C51000	Phosphor Bronze 5%	(0.010)	<0.01	<0.01					(0.012)		<0.01			0.01			0.01			<0.01		0.12	(0.011)	0.003	(0.01)		<0.01	4.6			
77B	CDA 510	C51000	Phosphor Bronze 5%	(0.002)	(0.001)	(0.001)				(0.004)	0.003				95.2	0.002			(0.002)	(0.0001)		0.002	(0.002)	0.148	0.016	0.002	0.005		(0.003)	4.66		0.007	(0.001)
33X 54400 A	CDA 544	C54400	Phosphor Bronze B-2	0.0124	0.0009	0.0156							0.0013		86.79	0.072						0.244		0.243	4.69	0.0251	0.0362			3.97		3.87	
78B	CDA 544	C54400	Phosphor Bronze B-2	0.008	(0.002)	<0.003				(0.001)	<0.002		<0.0005		87.7	0.02			(0.002)			0.077		0.19	3.87	0.01	0.01		<0.002	4.73		3.55	
32X 52480 A	ASTM B888	C52480	Phosphor Bronze	0.0131						0.0013					88.54	0.020						0.369		0.0103	0.329	0.0071	0.0182		(0.002)	10.33		0.397	

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Bronze Alloy

Part Number	Grade	UNS	Type	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Cu	Fe	In	Mg	Mn	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	Zr
32XPB20 A	CDA 510	C51000	Phosphor Bronze		<0.001	0.0011									95.22	0.0013			(0.007)			0.0090		0.196	0.0045	0.0030	0.0012		0.0046	4.55		0.007	
32XPB10 P			Phosphor Bronze		(0.002)	0.0126				0.034			0.0062		87.14	0.0043			<0.001			0.0130		0.0030	0.0182	0.0144	0.0134		(0.001)	12.37		0.256	
32XPB12 F			Phosphor Bronze	0.0155	(0.001)	0.0512				0.0647			0.0150		94.16	0.053			0.0014			0.205		0.076	0.0436	0.0108	0.1822		(0.002)	5.03		0.130	
32XPB13 F			Phosphor Bronze	0.0196	0.0034	0.0309				0.0309			0.0091		92.64	0.057			0.0216			0.099		0.128	0.075		0.1091		0.0107	6.34	0.0298	0.374	
32XPB14 E			Phosphor Bronze	0.0152	0.0201	0.0235				0.146			0.0047		89.70	0.0211			0.0141			0.103		0.128	0.0354	0.070	0.0433		(0.003)	9.65		0.103	
32XPB15 A			Phosphor Bronze		0.045	0.123							0.0509		96.07	0.116		0.0275	0.0125			0.212		0.0873	0.174		0.026		0.043	2.21		0.76	
32XPB16 A			Phosphor Bronze	0.0166	(0.001)	0.0035				0.0530					82.02	(0.001)						0.127		0.0073	0.088	0.0049	0.013		0.005	17.59	(0.002)	0.0082	
32X 52100 A	CDA 521	C52100	Phosphor Bronze 8%	0.0011	0.0008	0.0009				0.0019					92.08	(0.001)						0.0110		0.147	0.0031	0.0007				7.72		0.0028	
82A*	CDA 655	C65500	Silicon Bronze A	<(0.005)	(0.012)	<(0.01)					(0.014)		<(0.01)			0.04			1.02			<(0.01)		(0.004)	(0.02)	0.002	<(0.01)		3.07	0.015		(0.01)	
82B	CDA 655	C65500	Silicon Bronze A		0.002	<(0.002)					(0.003)			0.004	95.3	0.08			1.04	<(0.0005)		0.011	(0.001)	0.004	0.011	0.003	<(0.01)		3.22	0.017		0.38	
37X 65500 A	CDA 655	C65500	Silicon Bronze A		0.0028						(0.004)			0.0029	95.75	0.035			0.960			0.0059		0.0046	0.0034	0.0010			3.13	0.0426		0.0353	
89A*	CDA 903	C90300	Sn Bronze		<(0.01)						(0.009)		<(0.01)			0.009			<(0.01)			0.15		0.11	0.09	0.018	<(0.01)		<(0.01)	8.14		3.48	
89C	CDA 903	C90300	Sn Bronze	0.005	(0.002)	0.004			(0.0005)	(0.003)	0.002	(0.001)	(0.001)	(0.002)	87.5	0.004		(0.0004)	(0.001)	(0.0004)	(0.005)	0.008	0.006	0.004	0.17	0.0011	0.008	(0.001)	0.003	9.14	(0.0004)	3	(0.001)
310A	CDA 907	C90700	Sn Bronze	0.002	0.0009	0.002			(0.001)	(0.001)	(0.005)	(0.001)	0.0011	(0.001)	89.2	0.006		(0.001)	(0.001)			0.043	(0.001)	0.094	0.064	0.0021	(0.002)	(0.001)	(0.001)	10.56		0.1	
90C	CDA 922	C92200	Sn Bronze Leaded	0.011	(0.001)	0.002			(0.0003)	0.009	(0.002)	0.0003	0.0012	0.001	87.5	0.101		(0.0002)	0.003	(0.0003)	(0.0005)	0.266	(0.001)	0.026	1.4	0.01	0.022	0.0013	0.0012	6.3	(0.003)	4.3	(0.0002)
91E	CDA 932	C93200	Sn Bronze Leaded	0.015	0.0015	0.008		(0.0005)	0.0005	0.109	0.003	0.0011	0.0024	0.0008	81.3	0.11		<(0.0050)	0.0007	(0.0004)	(0.0005)	0.3	(0.0020)	0.026	7.59	0.028	0.168	0.004	0.0021	6.69	<(0.04)	3.68	
92C	CDA 937	C93700	Sn Bronze Leaded	0.05	0.0013	0.005			<(0.001)	0.011	(0.002)		(0.0007)	(0.0007)	80.35	0.008			0.0016			0.17	(0.004)	0.073	9.42	0.026	0.078	(0.001)	0.0019	9.65		0.15	
184A	CDA 941	C94100	Sn Bronze Leaded	(0.01)	0.0016	0.01				0.03	(0.004)		(0.001)	(0.001)	(74)	0.003			0.002			0.3		0.008	19	0.021	0.27	(0.002)	0.002	6		0.37	

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Lead Alloy

Lead Alloy

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Ca	Cd	Cu	Fe	Hg	In	Mg	Na	Ni	Pd	Pt	Re	Rh	Ru	S	Sb	Se	Sn	Te	Tl	Zn	
84XBA1K	L50790	Battery Alloy (Pb-Sn-Ca)	0.0098	0.0336	0.0005		0.0146	0.120	0.0014	(0.0013)						(0.0001)							0.0009		0.888	(0.0003)		0.0068	
84XBA11B	L507550	Battery Alloy (Pb-Sn-Ca)	0.0025	0.0207	0.0006		0.0159	0.0546	0.0006	0.0017													(0.005)		1.289			0.0006	
84XBA12C	L507550	Battery Alloy (Pb-Sn-Ca)	0.0051	0.0158			0.0146	0.0647	0.0012	0.0014													0.0029		1.460			0.0032	
84XBA13B	L507550	Battery Alloy (Pb-Sn-Ca)	0.0076	0.0363	0.0004		0.0282	0.0725	0.0014	0.0010													0.0018		1.685			0.0079	
84XBA14A		Battery Alloy (Pb-Sn-Ca)	0.0103	0.0188	(0.0004)		0.0162	0.076	0.0015	0.0016						(0.0002)							(0.002)		0.959	(0.0002)		0.0057	
84XBA15A		Battery Alloy (Pb-Sn-Ca)	0.0095	0.0161	0.0005		0.0140	0.0865	0.0013	0.0011													0.0047		0.941			0.0062	
84XBA2D		Battery Alloy (Pb-Sn-Ca)	0.0044	0.0183	0.0004		0.0230	0.0756	0.0040	(0.002)						(0.0004)								(0.003)		0.544	(0.0003)		0.0273
84XBA20B		Battery Alloy (Pb-Sn-Ca)	0.0295	0.065			0.0144	0.368	0.0051															0.0038		0.370			0.0435
84XBA21B		Battery Alloy (Pb-Sn-Ca)	0.0102	0.0125			0.0173	0.553	0.0007															0.0028		0.162			0.0155
84XBA22B		Battery Alloy (Pb-Sn-Ca)	0.0044	0.074			0.0138	0.799	0.0018															0.0022		0.128			0.0053
84XBA23C**		Battery Alloy (Pb-Sn-Ca)	0.0031	0.042			0.021	1.015	0.0002					0.0033										0.002		0.19			0.0020
84XBA3D		Battery Alloy (Pb-Sn-Ca)	0.0062	0.0043	<0.001		0.0351	0.0212	0.0047	0.0061														(0.006)		0.324			0.0032
84XBA4D**		Battery Alloy (Pb-Sn-Ca)	0.017		<0.001		0.015	<0.001	0.013	0.027			0.003			<0.001								0.013		0.006	0.039		0.0035
84XBA7B		Battery Alloy (Pb-Sn-Ca)	0.0015	0.0085	(0.0004)		0.0140	0.0391	0.0004	0.0020						(0.0003)								0.0022		0.594	(0.0002)		0.0024
84XBA8D		Battery Alloy (Pb-Sn-Ca)	0.0035	0.0359	0.0005		0.0147	0.136	0.00043	0.0008						0.0002								0.0043		0.325	(0.00024)		0.0018
84XBA8E**		Battery Alloy (Pb-Sn-Ca)	0.003	0.0034			0.014	0.117	0.0005	0.0008				0.0005		<0.001								0.002		0.29			0.0018
84XBA9C		Battery Alloy (Pb-Sn-Ca)	0.0023	0.0207	(0.0005)		0.0145	0.118	0.0011	0.0021						(0.0001)								(0.005)		2.94	(0.0003)		0.0017
86XPSS1B		Babbits	0.0049		0.554		0.195		0.0057	0.0249	0.0018		0.0074			0.0100	0.0023							11.54		4.29			0.0030
86XPSS2C**		Babbits	0.02		0.52		0.06		0.21	0.14	0.001		0.016			0.001								8.9		6.5	0.003		0.001
86XPSS3B		Babbits	0.0140		0.409		0.0273		0.0170	0.489	0.0025		0.0111			0.0009								14.13		9.39	0.0050		0.0030
86XPSS4C		Babbits	0.0279		0.202		0.119		0.0575	0.113	0.0012		0.0194			0.0005								16.18		10.22	0.0071		0.0156
83XCU06A		Pb w/ Impurities	0.0019		(0.0001)		0.0134		(0.0001)	0.0554						0.0003							0.0011	(0.0008)	(0.0005)	(0.0004)	(0.0002)		(0.0003)
83XPR1K		Pb w/ Impurities	0.1029		0.0338	0.0019	0.0508		0.074	0.0465			0.0080			(0.0004)								0.0100	0.0008	0.016	0.0058		(0.002)

Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Lead Alloy

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Ca	Cd	Cu	Fe	Hg	In	Mg	Na	Ni	Pd	Pt	Re	Rh	Ru	S	Sb	Se	Sn	Te	Tl	Zn
83XPR2 G		Pb w/ Impurities	0.055		0.0233	0.0005	0.0404		0.0020	0.0309		0.003	0.0010		0.0013	0.0006							0.0499	0.0005	0.0948	0.0100	(0.0017)	0.0005
83XPR3 G		Pb w/ Impurities	0.0029		0.0011	0.0036	0.144		0.0462	0.0694		0.0008	0.0093		(0.004)	0.0116							0.0888	0.0166	0.0417	0.0039	0.0033	(0.0007)
83XPR4 H		Pb w/ Impurities	0.0114		0.0003	0.0021	0.0150		0.0081	0.0454		0.019				0.0029							0.0050	(0.004)		0.0229	0.0021	
83XPR5 G2		Pb w/ Impurities	0.0011		0.0003		0.0086		0.0003	0.0006		(0.0001)	(0.0001)			(0.0002)							0.0006	0.0004	(0.0007)	0.0003	(0.0001)	(0.0002)
83XPR7 C**		Pb w/ Impurities	0.29		0.052		0.49		0.46	0.15			0.58			0.0025		0.004					0.78	0.006	0.22	0.009		
83XPR8 D		Pb w/ Impurities	0.497		0.134	0.0106	1.18		0.199	0.0448		0.086	0.293			0.0008							0.257	(0.0003)	0.604	0.0014		0.0004
83XPR11 A		Pb w/ Impurities	0.0030		0.0095		0.0117		0.0008	0.0551	(0.0003)					0.0011						0.009	0.497	(0.0001)	0.119		0.0042	
83XPR12 A		Pb w/ Impurities	0.0030		(0.0003)		0.0119		0.0011	0.0353	(0.0003)					0.0009						(0.0002)	0.0011	(0.0002)	0.0005		0.0051	
81XPA0.5C		Pb-Sb Binary																					0.481					
81XPA1.0C		Pb-Sb Binary																					0.989					
81XPA10.0C		Pb-Sb Binary																					9.60					
81XPA12.5D		Pb-Sb Binary																					12.72					
81XPA3.5E		Pb-Sb Binary																					3.49					
81XPMg1 A †		Pb-Mg Binary												1.15														
81XPMg2 A †		Pb-Mg Binary												0.173														
81XPMg3 A †		Pb-Mg Binary												0.023														
82XPAg 1.5RE		Pb-Ag Alloy	1.55		0.005		0.065			0.27													0.386		0.036			(0.004)
82XPAg 2.5RD		Pb-Ag Alloy	2.21		0.009		0.13			0.26													0.246		0.082			(0.0024)
82XPAg 3.5RD		Pb-Ag Alloy	3.54	0.0015	0.020		0.290		0.0027	0.073	<0.001		0.037										0.106		0.25			(0.0004)
82XPAG0.7 A †		Pb-Ag Alloy	0.733																									
82XPAG0.9 A †		Pb-Ag Alloy	0.903																									
85X0494Pb1 A					0.049		0.0017			0.012													0.95	0.004	0.051			
85X0494Pb3 D			0.0186		0.245		0.126			0.0974	0.0005											0.0185	2.99	0.049	0.221	0.0155		

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Lead Alloy

Lead Alloy

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Ca	Cd	Cu	Fe	Hg	In	Mg	Na	Ni	Pd	Pt	Re	Rh	Ru	S	Sb	Se	Sn	Te	Tl	Zn
85X0616Pb1D			0.0089		0.0600		0.0365		0.0018	0.0158		(0.001)				0.0007							1.539	0.0047	(0.002)	0.0082		(0.001)
85X2.5LAA			0.0017		0.334		0.0142		(0.0002)	0.0372						0.0005						(0.0006)	2.48	0.0006	0.068	0.0004		0.0002
85X9494Pb2C			0.0279		0.102		0.0387			0.0279	<0.001											0.0052	1.928	0.0272	0.124	0.0038		
85XA16A			0.0297		0.0503		0.0165		0.0001	0.0006	(0.0001)					0.0006						(0.0003)	1.57	0.0218	0.0356			0.0001
85XANTHF			0.0070		0.183		0.0196		0.0039	0.0072	(0.0004)					0.0045						0.0026	6.25	0.014	1.25	0.0067		0.0005
85XCADHC			0.0093		0.0918		0.0138		2.01	0.013	0.0010					0.0007							1.89		0.115	0.0035		(0.0004)
85XCADLA			0.0076		0.0065		0.0169		1.69	0.0093	(0.0006)					(0.0005)							1.54	(0.0011)	0.010	0.0030		(0.0018)
85XCADLB			0.0132		0.102		0.0489		1.22	0.0384	0.0008					0.0002							2.00		0.0182	<0.001		(0.011)
85XHRHH			0.236		0.721		0.0996		0.0066	0.072						0.0012						(0.0022)	1.107	0.0375	0.851	0.0024		
85XM2A			0.0016		0.259		0.0141		0.0003	0.0281	(0.0002)					0.0005						(0.0008)	1.847	0.0247	0.071			(0.0001)
85XMS2XA			0.0043		0.176		0.0188		0.0002	0.0277	(0.0001)					0.0004						(0.0002)	1.367	0.0334	0.392			0.0003
85XN35A			0.0011		0.201		0.0130		0.00013	0.0246	(0.0001)					0.0006						0.007	3.42	0.0004	0.044			0.0001
85XPSb10B			0.0020		0.127		0.0410		0.0018	0.169						0.0027						<0.001	10.00	0.0020	0.090	0.0037		0.015
85XPSb12B			0.0019		0.071		0.0310		0.00053	0.330						0.0033						<0.001	11.50	0.0004	0.270	0.0056		0.071
85XPSB24A**	L52710		0.0012		0.14		0.011			0.027												0.0004	2.37	0.027	0.235			
85XPSB28A**			0.0014		0.24		0.011			0.010												0.0015	2.78	0.010	0.065			
85XPSb3K**			0.0045		0.27		0.022		0.0022	0.029						0.002						0.009	2.26	0.038	0.145	0.005		0.001
85XPSB33A**	L52770		0.0014		0.14		0.011			0.036												0.0008	3.25	0.021	0.21			
85XPSb5E			0.0018		0.149		0.0134		0.0016	0.0593						0.0015						0.018	4.51	0.014	0.285	0.0029		0.00057
85XPSb5F			0.0038		0.221		0.0267		0.0011	0.0361						0.0018						0.0056	4.69	0.0077	0.207	0.0007		0.0009
85XPSb5G**			0.0030		0.25		0.012		0.0005	0.051						0.0008						0.009	4.65	0.014	0.29	0.0015		0.0002
85XPSb6A			0.0459		0.111		0.0270		0.0046	0.0651						0.0021							6.51	0.0018	0.065	0.0108		

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Lead Alloy

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Ca	Cd	Cu	Fe	Hg	In	Mg	Na	Ni	Pd	Pt	Re	Rh	Ru	S	Sb	Se	Sn	Te	Tl	Zn
85XPSB60 A**	L53105		0.0011		0.078		0.009			0.040												0.003	5.90	0.008	0.025			
85XPSb8B			0.0049		0.0352		0.0178		0.0010	0.0169						0.0016						0.005	8.04	0.0022	0.041	0.0043		<0.001
85XPSn2C	L54210		0.0048		0.0048		0.0154		0.0007	0.0128						0.0003						(0.0009)	0.0239	0.0042	2.06	0.0045		(0.0004)
85XS744 A			0.0046		0.125		0.0182		0.0003	0.0366	<0.001					0.0005						0.0028	1.532	0.0253	0.237			0.0002
85XSASHA			0.0016		0.683		0.0602		0.00024	0.0245						0.0005						(0.0005)	1.54		0.0130	0.0006		
85XSB28 A			0.0025		0.162		0.0140		(0.0001)	0.0035	(0.0002)					0.0012						0.0010	2.87	0.0223	0.051			(0.0001)
85XSM31 A			0.0009		0.0581		0.0114		(0.0001)	0.0084	(0.0001)					0.0006						0.0003	2.98	0.0183	0.0274			0.0002
85XSSBCA			0.456		0.075	0.0079	0.413		0.455				0.209									(0.0008)	2.14	0.0029	9.70	0.0037	0.0196	
85XYUMA			0.0018		0.306		0.0137		0.0002	0.0234						0.0007						0.0062	2.47	0.0008	0.0046	0.0005		(0.0002)

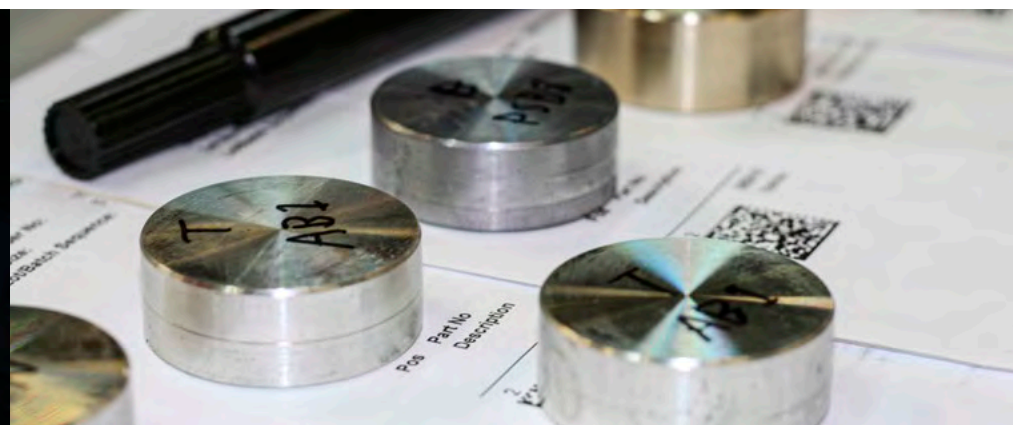


Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Silver Alloy

Silver Alloy

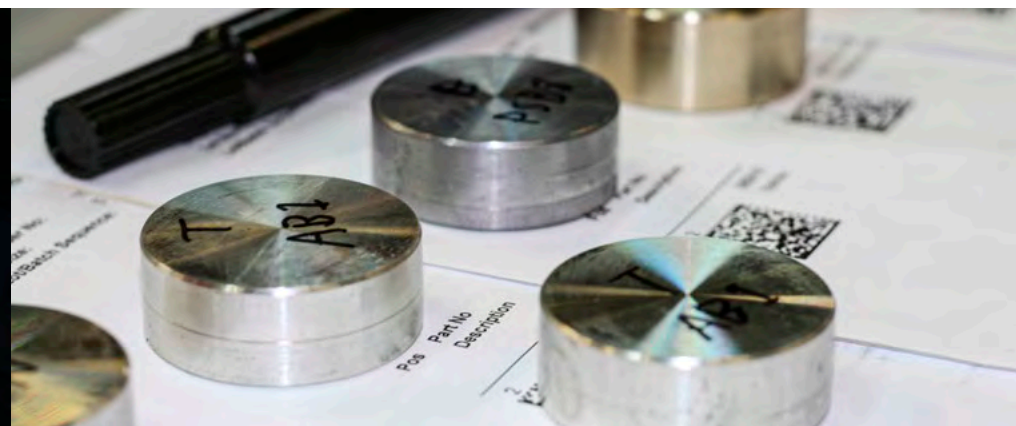
Part Number	Type	Al	As	Au	Bi	Cd	Co	Cr	Cu	Fe	Ga	Ge	In	Mn	Ni	Pb	Pd	Pt	Sb	Se	Si	Sn	Te	Zn
131X AGP1B	Ag with Impurities		0.0145	0.0521	0.0523	0.0377			0.0815	0.0057				0.0404	0.0276	0.042	0.0332	0.0505	0.0485	0.0299		0.0505	0.0435	0.0502
131X AGP2B	Ag with Impurities		0.0029	0.0114	0.0096	0.0056			0.0193	(0.0020)				0.0049	0.0057	0.0075	0.0105	0.0112	0.0107	0.0065		0.0095	0.009	0.0109
131X AGP3B	Ag with Impurities		0.0006	0.0026	0.0012	0.0006			0.0066	(0.0011)				0.0003	0.0012	0.0012	0.0016	0.0023	0.0021	0.0016		0.0022	0.0018	0.0034
131X AGP4B	Ag with Impurities		0.0003	0.0009	0.0007	0.0002			0.0041	(0.0023)				0.0003	0.0006	0.0005	0.0007	0.0007	0.0012	0.0006		0.0006	0.0005	0.002
131X AgSe1A	Ag with Impurities				0.0304					0.0023										0.0162				
131X AgSe2A	Ag with Impurities	0.0043			0.079			0.0037	0.1333	0.0022										0.0465	0.0039			
131X APag1A	Ag with Impurities	0.0008	0.0012	0.012	0.004	0.0035			0.0075	0.0005	0.006			0.0035	0.0025	0.004	0.018	0.0035	0.005	0.0035	0.003	0.004	0.012	0.005
131X APag2A	Ag with Impurities	0.0002	0.0008	0.002	0.0012	0.0005			0.040	0.0007	0.0015			0.001	0.0009	0.0012	0.018	0.001	0.0012	0.001	0.0004	0.001	0.0015	0.004
133X AGA1A	Silver Alloy	0.0096	0.0255	1.48	0.194	0.0165	0.0406		19.95	0.039		0.0107	0.0037	0.0061	0.0118	0.207	0.0054	0.0067	0.050	0.0169		0.291	0.0271	0.211
133X AGA2A	Silver Alloy	0.00019	0.0144	0.507	0.113	0.0113	0.0163		10.00	0.027		0.0047	0.0065	0.0115	0.0264	1.02	0.0076	0.0114	0.192	0.0078		0.520	0.098	0.502
133X AGA3A	Silver Alloy	(0.0020)	0.008	0.258	0.048	0.0042	0.005		4.91	(0.015)		0.0045	0.0134	0.0098	0.045	1.89	0.0156	0.0256	0.459	0.0044		0.921	0.054	0.816
133X AGQ1C	Silver Alloy			0.251					2.532							0.245								
133X AGQ2C	Silver Alloy			0.978					5.808							0.469								
133X AGQ3C	Silver Alloy			1.975					9.612							0.921								



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Silver-Copper Alloy

Part Number	Type	Ag	Cu	Zn
132X925Zn1B	Ag-Cu Alloy	92.7	6.09	1.39
132X925Zn3B	Ag-Cu Alloy	92.64	4.53	2.88
132XAGB100C	Ag-Cu Alloy	99.94	0.009	
132XAGB75C	Ag-Cu Alloy	75.11	24.53	
132XAGB85C	Ag-Cu Alloy	84.87	15.09	
132XAGB87B	Ag-Cu Alloy	87.13	12.67	
132XAGB90B	Ag-Cu Alloy	89.73	10.24	
132XAGB93B	Ag-Cu Alloy	92.7	7.27	



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Tin Alloy

Tin Alloy

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Cd	Co	Cr	Cu	Fe	Ga	Ge	Hg	In	Ni	P	Pb	S	Sb	Se	Te	Zn
71XSR3F		Sn with Impurities	0.050	(0.0014)	0.097	0.0145	0.123	0.100			0.121	0.0203	0.0339		0.115	0.104	0.0371		0.306		0.128	0.0031	0.070	0.054
71XSR0C		Sn with Impurities	0.0024	0.0414	0.0005	0.0012	0.0029	0.0024	0.0004		0.0073	0.004	0.0054	0.0021	0.0099	0.0088	0.0025	0.0004	0.0457		0.0055	0.0006	0.0021	0.0053
71XPB3A		Sn with Impurities	0.0011		0.0022		0.0103	0.0008			0.0074								2.77		0.0024			0.0016
71XPB4A		Sn with Impurities	0.0047		0.0045		(0.002)	0.0027			0.0014								4.00		0.0059			0.0063
71XSR1F		Sn with Impurities	0.0165	(0.002)	0.0032	0.0022	0.0102	0.0109	0.0016		0.0016	(0.002)		0.011	0.0178	0.0104	0.0058	0.0014	0.0256		0.0203	0.004	0.001	0.0126
71XSR2F		Sn with Impurities	0.0305	0.0022	0.007	0.0077	0.0403	0.0351		0.0031	0.116	0.0133		0.009	0.140	0.0597	0.0183		0.151		0.074		0.0246	0.0058
73XSC2B		White Metal (Pewter Babbitts)	0.0318		0.0355		0.602	0.0282	0.0217		1.028	0.0037				0.0099	0.0156		0.0457		3.05			(0.0007)
73XSC4B		White Metal (Pewter Babbitts)	0.0525	(0.002)	0.0268		0.153	0.0085	0.0020		2.63	0.0014				0.0143	0.0130	0.005	0.429		5.94			(0.001)
73XSC5A		White Metal (Pewter Babbitts)	0.063	0.003	0.013		0.43	0.008	0.011		0.57	0.004				0.036	0.0058		0.136	(0.001)	7.03			0.001
73XSC7B		White Metal (Pewter Babbitts)	0.0059	(0.001)	0.059		0.013	0.0019	0.0143		5.71	(0.043)				0.0194	0.0160		0.32	(0.001)	13.86			0.0033
73XSC8B		White Metal (Pewter Babbitts)	0.0253	(0.001)	0.11		0.0531	0.098	0.0267		3.78	0.055				0.0325	0.0351		0.110	0.004	5.52			0.004
73XSC9B		White Metal (Pewter Babbitts)	0.0055	(0.001)	0.117		0.0825	0.0506	0.0051		8.03	0.053				0.0059	0.0084		0.305		8.31			
73XSC11C		White Metal (Pewter Babbitts)	(0.056)		0.248		0.554	1.72			11.51	0.0052					0.110	0.025	0.0630		12.98			0.005
73XSC12B		White Metal (Pewter Babbitts)	0.842	0.0015	(0.034)		0.0301	0.758	0.0210		6.03	0.024					0.115		0.091		7.50			0.0210
73XSC13A		White Metal (Pewter Babbitts)		(0.01)	0.054		0.0188	0.0021			4.19	0.053						(0.02)	0.259		4.21			0.0126
73XSC13A		White Metal (Pewter Babbitts)		(0.01)	0.054		0.0188	0.0021			4.19	0.053						(0.02)	0.259		4.21			0.0126



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Solders

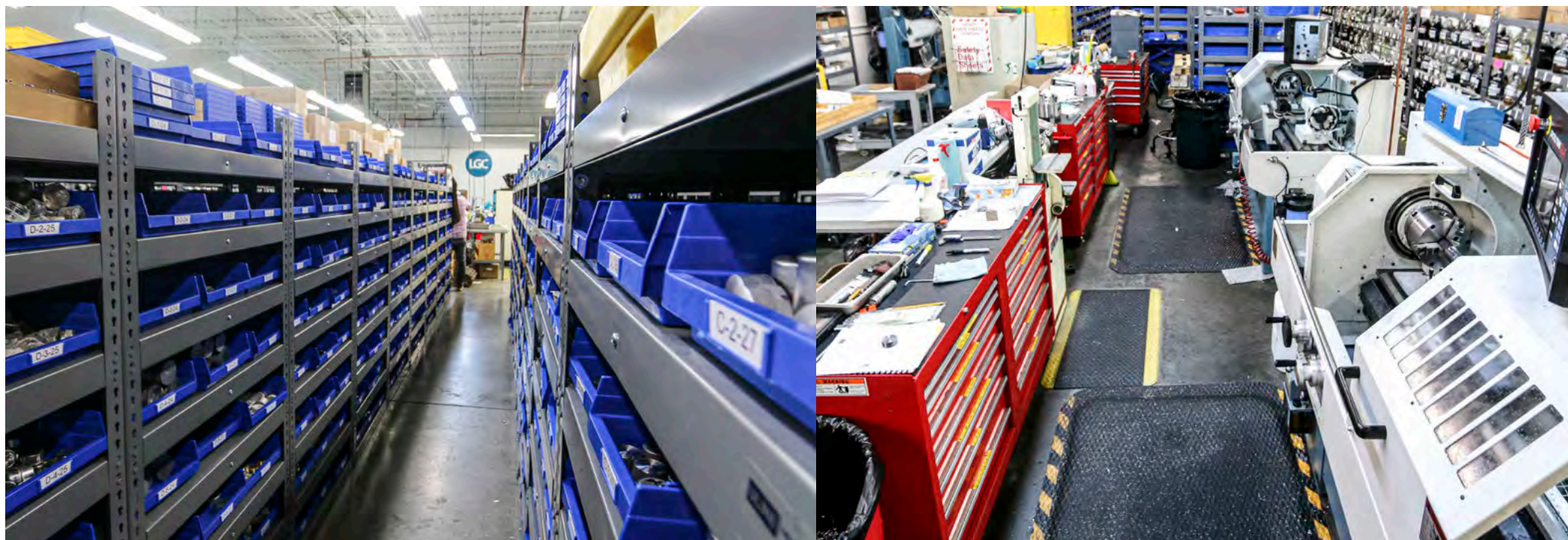
Part Number	UNS	Type	Ag	Al	As	Au	Bi	Cd	Co	Cu	Fe	Hg	In	Ni	Pb	Sb	Se	Sn	Te	Zn
95XBIS50P1 B †		Fusible Alloy					49.8	0.022			0.03			0.025				50.0		0.003
95XBIS50P2 B †		Fusible Alloy	0.090	(0.001)	0.005	0.015	49.6				0.01							50.3		
95XBIS70P1 A †		Fusible Alloy	1.10	<0.001	0.025	0.0004	29.6				0.010		0.040	0.029				69.1		
95XBIS50P3 A †		Fusible Alloy	1.50		0.073	0.0025	49.8	0.015			0.003							48.6		0.002
95XBIS40P2 A †		Fusible Alloy	0.005	0.002	0.002	0.0006	55.3	0.0008	0.001	0.003	0.001		0.005	0.002	0.020	0.005		44.7		0.002
95XPBS40P1 A †		Fusible Alloy	0.011	(0.0006)	0.005		13.8	0.0043		0.025	(0.0006)		0.005		(43.6)	0.016		42.6		0.0010
95XBIS40P1 B †		Fusible Alloy	0.035		0.0101		57.4	0.0050		0.0670	(0.001)		0.0164		0.043	0.092		42.3		
95X 117 A †		Fusible Alloy	0.0047				45.3	4.99		0.011			18.6		23.1	0.012		7.99		0.0053
95X 136 A †		Fusible Alloy	0.0057				48.7	0.0091		0.0029			21.5		17.8	0.023		12.05		0.030
95X 158 A †		Fusible Alloy	0.002				50.2	9.6		0.048			0.006		27.0	0.057		13.5		0.044
95X 174 A †		Fusible Alloy	0.0076				57.12	0.0089		0.0029			26.2		0.081	0.082		16.79		0.036
95X 255 A †		Fusible Alloy	0.0019				55.7	0.0065		0.045			0.010		43.7	0.32		0.24		0.035
95XBIS70P2 A †		Fusible Alloy	2.01	<0.001			32.8						0.049					65.0		0.001
95XSC34 A †		Fusible Alloy						(65.99)										34.05		
95XSC36 A †		Fusible Alloy						(63.98)										36.09		
91XS10PD		Sn/Pb Solder	(0.001)	<0.001	(0.001)		(0.006)	<0.0001		(0.001)	<0.001		<0.001	<0.001		(0.002)		10.07		<0.0001
91XS63B1 A		Sn/Pb Solder	0.0592	(0.0015)	<0.002	0.074	0.597	0.0095		0.105	0.0204		0.0067	0.0131		0.470		61.9	0.0012	(0.002)
91XS40PR2 D		Sn/Pb Solder	0.086		0.010		0.154	0.0046		0.085	0.0096			0.0050		0.596		40.68		0.0275
91XS30PR2 C		Sn/Pb Solder	0.060	<0.0005	0.028	0.0017	0.158	0.0060		0.095	0.009			0.0077		0.619		30.17		0.016
91XS63PR3 G		Sn/Pb Solder	0.0193		0.0264	0.169	0.254	0.0009		0.101	0.0078	(0.038)	0.0097	0.0085		0.243		64.01	0.0068	0.0061
91XS62AG2 A		Sn/Pb Solder	2.03	(0.0011)	0.022	0.0020	0.168	0.0016		0.069	0.0065			(0.0016)		0.347		61.68		0.0011
91XS63PR2 K		Sn/Pb Solder	0.0528	0.0005	0.0094	0.082	0.175	0.0089		0.0841	0.0053		0.0157	0.0027		0.531		61.84	0.0036	0.0032
91XS50PR4 B		Sn/Pb Solder	0.0704	(0.0006)	0.0364	0.0355	0.114	0.0123		1.184	0.0025		0.0502	0.0171		0.132	0.003	53.06		0.032
91XS63P J		Sn/Pb Solder	0.0170	(0.0003)	(0.001)	(0.0005)	0.0056	(0.0001)		0.0156	0.0015		0.0064	0.0003		0.011		62.96	(0.0002)	(0.0003)

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Solders

Solders

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Cd	Co	Cu	Fe	Hg	In	Ni	Pb	Sb	Se	Sn	Te	Zn
91XS63PR0 C **		Sn/Pb Solder	0.020		0.016	0.0005	0.010	0.0125		0.024	0.0015	0.008	0.010	0.004		0.024		60.0	0.0005	0.0004
91XS40P D		Sn/Pb Solder	(0.001)	<-0.0005	(0.007)		(0.005)	<-0.0001		(0.001)	(0.001)		(0.002)	<-0.001		(0.002)		40.00		<-0.0001
91XS50P E		Sn/Pb Solder	(0.001)	<-0.0005	(0.006)		(0.005)	<-0.0001		(0.002)	(0.001)		(0.003)	(0.001)		(0.002)		50.05		<-0.0001
91XS10PR1 C		Sn/Pb Solder	0.0078		0.0045		0.0277	0.0029		0.0097	(0.0016)			0.0006		0.0278		9.10		<-0.001
91XS63PR1 G		Sn/Pb Solder	0.0061		0.0064	0.0348	0.0588	0.0045		0.214	(0.002)	(0.015)	0.0308	0.0060		0.052		61.45	0.0047	(0.002)
91XS63PR0 B		Sn/Pb Solder	0.0097		0.0094	0.0148	0.0084	0.0097		0.0202	(0.0024)	0.004	0.0048	0.0018		0.018		60.03	0.0034	<-0.0005
93XS30APR2 C		Sn/Pb/Sb Solders	0.049		0.0178		0.168	0.0061		0.062	0.0026		0.0199	0.042		1.80		30.68	0.0102	0.028
93XS30APR3 C		Sn/Pb/Sb Solders	0.021		0.018		0.28	0.009		0.008	0.0026			0.010		0.96		33.0		0.005
93XS30APR1 C		Sn/Pb/Sb Solders	0.0144		0.010		0.059	0.0014		0.192	(0.012)		0.0094	0.0010		2.54		28.58	0.0024	(0.0004)



Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; +++ = Unsuitable for use with glow discharge systems

Tin Based, Lead Free Solders

Part Number	UNS	Type	Ag	Al	As	Au	Bi	Cd	Co	Cr	Cu	Fe	Ge	Hg	In	Ni	P	Pb	Sb	Se	Zn
74XAB1 A		Pb-Free Solder	3.58		0.0280	0.0010	0.997	0.0199	0.0032		0.0285	0.0435			0.0262	0.0036		0.0353	0.0111		
74XAMF	L13938	Pb-Free Solder	0.496	(0.001)	0.0038		0.190	0.0061			3.07	(0.001)			0.0082	0.0260	(0.002)	0.126	1.064	(0.001)	(0.006)
74XBZ1 A		Pb-Free Solder	0.004	0.0021	0.0119		3.03	0.0012			0.026	0.011				0.0097		0.0238	0.031		8.27
74XCA1 B		Pb-Free Solder	0.440	0.0262		0.0053	0.0131	0.0071			0.682							0.077	0.0169		
74XCA2 C		Pb-Free Solder	3.50		0.0145	0.0016	0.0298	0.0039	0.0025		0.797	0.0038	0.014	0.0054	0.0084	0.0336	0.005	0.057	0.0806		0.0015
74XCA3 B		Pb-Free Solder	2.98	0.0010	0.0039	0.007	0.0156	0.00045			0.0869	0.006	0.0093		0.0042	0.0077	0.031	0.0491	0.0266		0.0009
74XCA4 D		Pb-Free Solder	3.07		0.0030	0.0020	0.0512	0.0025	0.0005	0.0010	0.552	0.0040		0.0075	0.009	0.0588		0.081	0.0612		0.0051
74XCA5 B		Pb-Free Solder	4.09	(0.001)	0.0125	0.0091	0.0050	0.0023			1.189	0.0021		0.0030	0.0129	0.0149	(0.011)	0.044	0.124	0.0004	(0.002)
74XCA6 B		Pb-Free Solder	0.305	(0.0003)	0.0133	0.0048	0.0098	0.0005			0.602	0.0120		0.0039	0.0243	0.0246	(0.001)	0.0287	(0.010)	(0.0005)	(0.0005)
74XCA7 B		Pb-Free Solder	4.02		0.0085		0.0102	0.0059	(0.002)	0.0045	0.347	0.007		0.049	0.0053	0.0315		0.107	0.0194		0.0501
74XCA8 B		Pb-Free Solder	2.47		0.0144		0.0172	0.0101	0.0202		0.950	0.0043	0.0020	0.101	0.0062	0.0020	0.010	0.084	0.0180		
74XCA9 A		Pb-Free Solder	1.002	0.0007	0.0173	0.0025	0.0364	0.0015			0.097	0.0085	0.0049		0.0165	0.0039	0.011	0.038	0.076		0.0010
74XEF	L13935	Pb-Free Solder	0.667	(0.001)	0.0092		0.0099	0.0003			2.94	0.0008			0.0074	0.0069	(0.001)	0.0248	0.0168	0.0008	(0.005)
74XGE1 A		Pb-Free Solder	0.052	0.065				0.0059			0.662		0.046			0.0289		0.0339			
74XGE2 A		Pb-Free Solder	0.079	0.068				0.0086			0.713		0.479			0.031		0.0467			
74XHAG	L13955	Pb-Free Solder	2.80	(0.002)	0.0032		0.0639	0.0018			0.629	0.0029			0.0090	0.0133	(0.001)	0.077	2.10	(0.001)	2.73
74XHB G	L13952	Pb-Free Solder	0.086	(0.003)	0.045		0.038	0.0103			4.49	0.0138			0.0179	1.22	(0.002)	0.056	4.81	0.0038	(0.02)
74XHNF	L13933	Pb-Free Solder	0.160	0.0011	0.016		0.042	0.0046			4.12	0.020			0.0052	0.195	(0.001)	0.0050	0.038	0.0024	0.0068
74XOA A	L13937	Pb-Free Solder	0.100	(0.001)	0.080	(0.0001)	1.065	0.00063			3.41	0.007			0.0034	0.0025	0.0072	0.128	0.0098		(0.002)
74XTCF	L13931	Pb-Free Solder	0.039	(0.001)	0.024		0.106	0.0150			4.99	0.0031			0.0215	0.0167	(0.002)	0.183	0.124	0.0473	0.004
74XWS A	L13939	Pb-Free Solder	0.298	(0.001)	0.0105	(0.0002)	0.0063	0.00140			4.58	(0.004)			0.0032	0.0048	0.0122	0.037	1.49		0.0009

Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Setting Up Samples

Setting Up Samples

Part Number	Base	Ag	Al	As	B	Be	Bi	C	Ca	Co	Cr	Cu	Fe	Mg	Mn	Mo	N	Nb	Ni	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr
164X ALSUS7 †	Al					0.1			<0.001	0.2	0.01	4	0.55	0.15	0.06				1.1		0.11											0.18
164X ALSUS8 †	Al	0.09				0.015			<0.001	0.025	0.06	0.75	0.25	0.9	0.45				0.12		0.001											0.025
217A	CS	(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)	(0.002)	(0.004)	(0.001)	(0.006)		(0.01)	(0.0005)	(0.01)	(0.0001)	(0.002)	(0.005)	(<0.0001)	(0.005)
165XALB1 SUS †	Cu		9.0	0.005			0.015				0.01	82	2.8	0.04	0.08				5.3	0.015	0.20				0.10	0.03					0.06	
165XMNBS SUS †	Cu		3.2									55	0.55		0.20				1.1		0.20				0.40	1.6					38	
165XPB10 SUS †	Cu		0.001	0.02			0.02			0.01	0.001	89	0.002		<0.001				0.06	0.002	0.04	0.03	0.15	0.01	0.001	11.0					0.05	

Setting Up Samples - Pb, Zn, Sn

Part Number	Base	Ag	Al	As	Au	Bi	Cd	Co	Cr	Cu	Fe	Ge	Hg	In	Ir	Mg	Mn	Ni	Pb	Pd	Pt	Rh	Ru	S	Sb	Si	Se	Sn	Te	Ti	Tl	Zn
168X PBSUS1 †	Lead	0.01		0.37	0.001	0.04	0.015			0.03	0.002			0.01					0.003					0.002	6.2		0.01	1.3	0.01		0.001	0.001
168X PBSUS5 †	Lead	0.2		0.35	0.0005	0.35	0.09			0.06	<0.001		0.02	0.08					0.001					0.0005	0.35			0.9	0.003		0.002	
168X PBSUS6 †	Lead	0.04		0.025	0.001	0.22	0.015			0.10	<0.001			0.01					0.003					0.0005	0.12		0.003	0.15	0.0005		0.03	0.002
168XPBSUS PM1 †	Pb Fire Assay	0.004		0.0002	0.0035	0.01				0.0005	0.0001				0.0002				0.0003		0.002	0.0055	0.0012	0.00001	0.0002	0.0001		0.0001		0.001		
169X ZNSUS1 †	Zn	0.04	0.35			0.005	0.30		0.001	0.35	0.05			0.25		0.002	0.001	0.06	0.60						0.20	0.003		0.30		0.001	0.06	
1611X SNSUS6 †	Tin	0.1		0.3	0.001	0.08	0.01	0.02		0.4	0.03			0.005				0.03	1.0						0.15		0.003		0.001		0.005	0.005
1611X SNSUS7 †	Tin	0.15	<0.001	1.9	0.005	2.4	0.02	0.01		11	(0.06)	0.002		0.05				0.09	0.35						11		0.005		0.005		0.025	(0.001)

Setting Up Samples - Residuals in Aluminum

Part Number	Grade	Ag	As	B	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga	Hf	Hg	In	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Zr						
220G	QA 10 - SUS	(<0.00001)	(0.000012)	(0.00057)	(<0.00001)	(<0.00001)	(0.000010)	(<0.00001)	(0.00034)	(<0.00001)				(0.00014)	(<0.00001)		(<0.00001)		(0.00087)		(0.000015)	(0.000030)			(0.00060)	(0.000015)	(0.000088)					
221B	QA 11 - SUS				(0.005)		(0.03)			(0.2)	(0.2)	(0.6)	(0.2)	(0.03)					(4.8)	(0.4)												
221C	QA 11 - SUS				(0.005)		(0.03)			(0.2)	(0.2)	(0.6)	(0.2)	(0.03)					(4.8)	(0.4)												
221D	QA 11 - SUS				(0.005)		(0.03)			(0.2)	(0.2)	(0.6)	(0.2)	(0.03)					(4.8)	(0.4)												

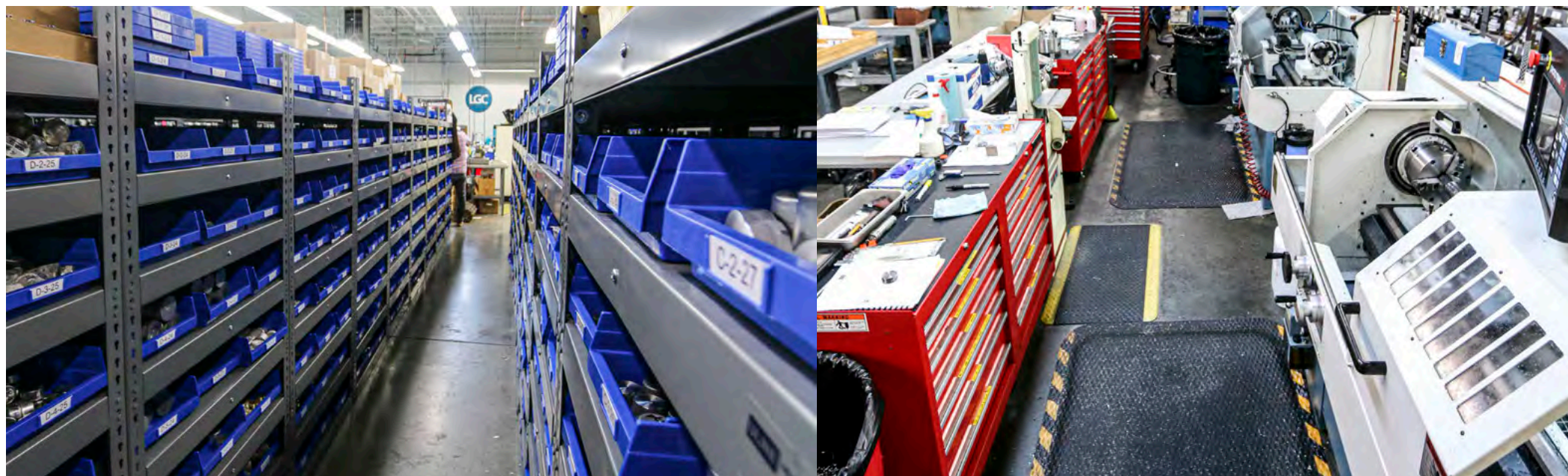
Code Key: ☺ = X-Ray Only; * = Chips Only; ♦ = Chips and X-Ray Only; † = Not CRM; ** = Provisional Values Subject To Change Upon Certification; + + = Unsuitable for use with glow discharge systems

Additive Manufacturing Powders

Part Number	Grade	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Fe	H	Hf	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Y	Zn	Zr
Fe316LP-18	AISI 316L	75g	0.006	(0.001)	(<0.005)	(<0.001)	0.006	(<0.005)	(<0.005)	0.006	17.9	0.0031		(<0.001)	(<0.001)	(<0.005)	1.56	2.81	0.081	(0.001)	13.9	0.043	0.011	(<0.01)	0.0041	(<0.005)	(<0.005)	0.29	(<0.005)	(<0.005)	(<0.008)	0.006	(<0.012)	(<0.001)	(<0.01)	(<0.005)
Ni718P-18	Alloy 718	75g	0.49	(<0.01)	(0.0007)		0.036	(<0.005)	(<0.008)	0.097	19.6	0.018	17.0	(<0.001)	(<0.002)	(<0.005)	0.026	3.13	0.01	4.95	53.6	0.014	0.006	(<0.02)	0.0013	(<0.01)	(<0.005)	0.036	(<0.005)	0.006	1.01	0.017	0.01	(<0.001)	(<0.01)	(<0.003)
Ti64P-18	Grade 5 (6-4)	75g	6.44	(<0.005)	(<0.005)	(<0.005)	0.051	(<0.005)	(<0.001)	(<0.011)	(0.004)	(<0.005)	0.215	0.0019	(<0.002)	(<0.01)	0.01	(<0.005)	0.05	(0.0004)	(0.003)	0.14	(0.001)	(0.0003)	0.0012	(0.0003)	(<0.005)	(0.021)	0.008	(<0.005)		4.22	(0.0004)	(<0.002)	(<0.01)	(<0.004)

Gases in Tool Steel

Code	Grade	Type	Al	As	B	Bi	C	Ca	Cd	Co	Cr	Cu	Mg	Mn	Mo	N	Nb	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Ta	Ti	V	W	Zn	Zr	Zn	Zr	
18XD7 A	12% Cr, 4% V, 1% Mo	100g					2.32									0.0124			0.072			0.0111												0.0029	0.0013



Form Key: C=Cast; CC=Chill Cast; R=Rolled; W=Wrought; HIP=Hot Isostatically-pressed Powder

Metal Alloy Proficiency Testing Program (PTP)

Why Choose ARMI | MBH PTP?

- Monitor your analytical performance as stipulated in the ISO/IEC 17025 laboratory accreditation process
- Measure analytical performance against a CRM's "Assigned Value"
- Large library of materials – over 1,400 metal alloys from aluminum to zinc
- Developed as an alternative to typical round-robin style proficiency testing schemes, which measure performance with non-certified materials
- Provides confidential assessment against peer performance
- Results delivered within days, not months, making it easy to implement as part of your laboratory quality program



Our Reports Include:

- Results presented in a one-page report with a single statistical graph
- A color-coded Certificate of Performance which compares your results to the actual benchmarked data
- A color-coded control chart graphically depicting your data compared to the certified average for each element examined
- A Certificate of Analysis confirming that a CRM was used in the test

How it Works:

- Choose the type of material by matrix group and sample configuration (solids or chips)
- Receive your blind sample, selected from our full stock of CRMs
- Analyze the blind sample, and submit your results to us
- Receive your report within days

#MeasureTheDifference

Learn More: www.armi.com/armi-ptp

ColdBlock™ IR Digestion Systems for ICP Sample Preparation

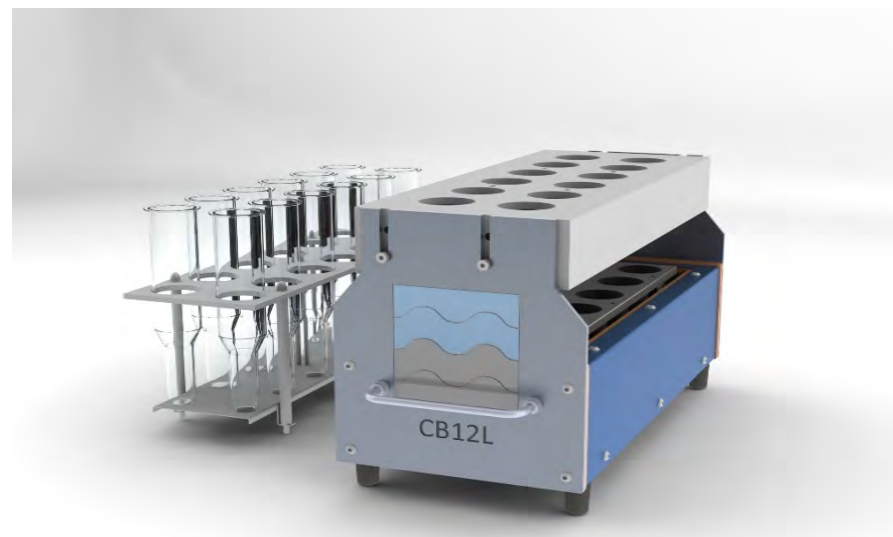
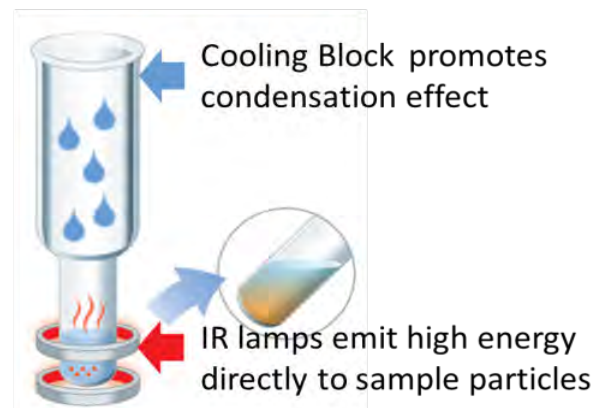
The ColdBlock™ digestion system uses IR radiation to rapidly digest samples for analysis by ICP and AA. The IR radiation directly heats the sample rather than the acid leading to rapid digestion while the cooling block condenses the evolving vapor limits loss of volatile elements.

The ColdBlock™ system offer

- Rapid sample digestion (10-15 minutes)
- Increased safety – reduce or eliminate the need for HF and Perchloric acids
- Cost effective- lower acid volumes required
- Faster sample throughput – faster digestion than microwave digestion or hot block
- Simplify workflows – simple operation and fewer digestion recipes

The ColdBlock™ is available in 6, 12 and 15 position units. The 12 and 15 units are the building blocks for modular expansion of the system for higher throughput.

First Sample Digestion Technology
Using Short-Wave Infrared (IR)



Sample Grinder HK150EX

Manual pendulum grinder with steel cabinet and integrated spark trap and dust exhauster. Clean, powerful sample grinding system with stone – ready to go.

- Floor standing machine, dustproof, covered compartment, halogen spotlight
- Steel cabinet with switch board, dust trap, exhauster and drawer
- Reproducible flat surface, easily operated pendulum arm in taper bearings
- Simple and reliable machine construction
- Specially suitable for hard materials, like white cast irons
- Adaptable to various qualities by special stone cup wheels
- Vertical moving of grinding head by hand wheel with 0.1 mmv

Technical Specifications

Grinder Motor	3 x 400 V/50 Hz, 1.1 kW (three phases, each 230V) 1 x 230 V/50 Hz 3 x 220 V/60 Hz (USA/Canada)
Instrument Dimensions	grinder 400 x 400 x 680 mm cabinet 600 x 600 x 870 mm
Mass	grinder approx. 100 kg, cabinet approx. 50 kg
Revolution Speed	2800 rpm/3440 rpm
Grinding Stone	150 x 80 x 32 mm
Grinding Height	min. 4 mm, max. 90 mm
Lighting	12 V/20 W halogen

Consumables

Part Number	Grade	Quantity	
HKT46J1	Al2O3-grinding stone	1-3 packs	3 pcs/pack
HKT46J2	Al2O3-grinding stone	4-8 packs	3 pcs/pack
HKT46J3	Al2O3-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

Accessories

Part Number	Description
HK150ERS	Spare parts set (bellows, safety glass, lamp, fuses)
HK150MS	Magnetic plate, complete with arm, 100x65mm
HK150VICE	Vice for samples 44-58mm Ø
HKEXFILT	Round filter, exhauster HK150/350, PAS 11-21
HKEXFILT	Round filter, exhauster HK150/350, PAS 10-20
HKDUST	Spark arrester with metal tube for HK150 & HK350

Mobile but sturdy sample preparation machine for spectrometer samples.

- Mobile desk-top model
- For use with self-adhesive grinding paper
- Solid steel cabinet, cast iron disc pan and motor base
- Easy to clean
- Disc pan with exhaust outlet.



Technical Specifications

Power supply	230 V / 50 Hz, 370 W
Instrument dimensions (mm)	270 w x 290 d x 280 h
Grinding disc diameter	205 mm
Alternative power	"230 V / 60 Hz or 115 V / 60 Hz"
Mass	22 kg
Revolution speed	2880 rpm

Sample Holders

Part Number	Description
HKHOLD3	Magnetic sample holder, round, 40-50mm Ø
HKHOLD4	Magnetic sample holder, rectangular, 35x35mm
HKHOLD5	Non-magnetic sample holder, round
HKHOLD6	Magnetic sample holder, rectangular, 50x50mm

Adhesive Grinding Paper

Part Number	Grade	Quantity
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

Our Production Facility

Our high-tech production facility in Manchester, NH is accredited to ISO 17034 as a producer of reference materials and ISO 17043 as a proficiency testing provider.

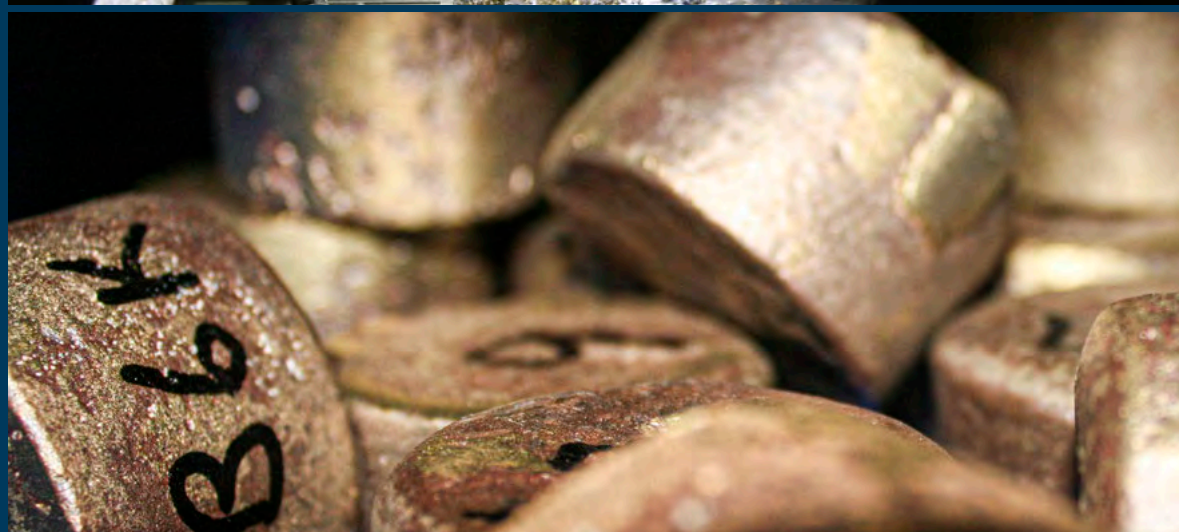
Our technicians utilize cutting-edge machining and engraving equipment to prepare and provide custom packaging for our range of over 1,400 metal alloy CRMs.

Our state-of-the-art analytical lab is accredited to ISO/IEC 17025 and is fully fitted with a wide array of testing equipment, including XRF, ICP-OES and ICP-MS used for homogeneity and composition testing for our products.

Our expertise with various instrumentation allows us to quickly adapt to our customers' needs, create custom sample compositions, and custom reference materials when needed.

We always strive to provide our customers with the best possible service, and are continually expanding our range of product offerings to meet their needs.

#MeasureTheDifference



ARMI | MBH

ARMI | MBH reference materials are prepared and certified in Manchester, NH USA. All of our products are produced in our manufacturing facility accredited to ISO 17034 and certified to ISO 9001. They then pass rigorous quality control in our laboratory accredited to ISO/IEC 17025.

We have a state-of-the-art machine shop and an analytical laboratory with a comprehensive array of equipment. Our sales and technical team have extensive knowledge of analysis techniques and reference materials, and are ready to help you choose the right reference material for your specific needs.



Contact us directly at our main production and sales office for your reference material needs, or if you require a custom material.

1 USA + Canada
Tel: +1 (603) 935 4100
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