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CRM	CHROMIUM CHIPS													100 g units
Number	Cr	Al	As	C	Cu	Fe	N	P	Pb	S	Si	Sn	Zn	
VS F8/1	99.2	0.17	0.00026	0.028	0.0014	0.26	0.025	0.0035	0.00031	0.013	0.25	0.00030	0.0030	

COBALT BASE CHIPS													BAM, C119X, ECRM: 100 g units	others: 30 g units	
Number	C	Si	Mn	Ni	Cr	W	Nb	Fe	Cu	Mo	Al	P	N	S	Other
CRM															
C119XST30	2.04	0.95	0.62	2.40	30.5	9.95	<0.01	1.52	<0.05	0.45	.	0.007	0.104	0.020	
ECRM 378-1C	1.181	1.172	0.0579	0.617	28.22	4.43	.	0.606	.	0.0503	.	(0.0023)	.	0.0055	
BAM 328-1	0.390	0.629	1.395	20.54	20.54	4.16	3.61	2.40	0.013	4.41	0.070	0.005	0.027	.	Co: 41.65 Ta: 0.18
RM typical analysis															
C113X4010	0.53	1.25	0.20	11.5	26.9	7.14	.	0.65	.	.	.	.	.	.	
C111X126690	0.51	0.62	0.54	0.57	22.7	12.3	2.59	1.2	0.006	.	.	.	.	.	Pb: 0.001 Sn: 0.01
C112X149360	0.50	0.12	0.74	1.57	23.0	0.95	.	0.44	.	4.97	0.50	.	.	.	
C113X4020	0.42	0.28	1.13	9.64	24.75	7.95	.	2.17	.	.	.	.	.	.	
C111X126670	0.38	0.064	0.97	1.12	19.7	10.2	1.53	2.20	0.11	.	.	.	.	.	Pb: 0.03 Sn: 0.10
C119XC0B10	0.009	0.41	0.52	22.8	24.3	11.1	.	16.4	<0.005	.	0.39	(0.001)	0.188	0.0015	

CRM	COBALT BASE CHIPS													100 g units
Number	Grade	Al	B	C	Co	Cr	Cu	Fe	La	Mg	Mn	Mo	N	
IARM 208A	F 75	0.07	0.002	0.28	63.4	27.7	0.021	0.78	.	0.0003	0.68	5.3	0.063	
IARM 208B	F 75	0.04	0.005	0.100	60.0	30.0	0.03	1.17	.	(0.0004)	0.75	6.63	0.003	
IARM 208C	F 75	0.07	0.002	0.052	64.0	27.55	0.01	0.29	.	0.0002	0.53	6.12	0.169	
IARM 207A	MP35N	0.040	0.011	0.007	33.46	19.98	0.017	0.64	.	(0.0005)	0.015	9.62	0.0031	
IARM 256A	Provisional	0.17	0.013	0.018	35.5	19.1	.	9.0	.	.	0.014	7.0	0.003	
IARM 96B	Stellite 25	0.035	0.0021	0.132	49.4	20.54	0.047	2.29	.	(0.0005)	1.39	1.17	0.007	
IARM 96C	Stellite 25	0.08	0.002	0.132	47.1	19.95	0.08	2.93	.	(0.0002)	1.91	1.88	0.031	
IARM 96D	Stellite 25	0.23	0.003	0.079	49.8	19.97	0.038	2.17	.	(0.004)	1.40	0.35	0.0084	
IARM 95B	Stellite 6B	0.07	(0.002)	0.946	60.9	28.8	0.008	1.10	.	(0.0004)	0.99	0.83	0.0027	
IARM 95C	Stellite 6B	0.13	(0.002)	1.10	57.0	29.0	0.014	2.47	.	(0.0004)	1.55	1.37	0.033	
IARM 97B	Stellite 188	0.08	(0.002)	0.096	42.5	21.2	0.07	1.92	0.005	<0.002	0.76	0.56	0.014	
IARM 97C	Stellite 188	0.19	0.0028	0.130	35.8	22.2	0.027	2.37	.	0.0010	0.82	0.36	0.075	
IARM 64B	Ultimet 1233	0.12	(0.001)	0.062	54.2	25.26	0.020	3.02	.	0.005	0.78	4.77	0.12	

Number	Nb	Ni	O	P	S	Si	Ta	Ti	V	W	Zr
IARM 208A	0.020	0.80	(0.003)	0.030	0.001	0.77	0.012	0.012	0.012	0.07	(0.001)
IARM 208B	0.06	0.42	0.0015	0.004	0.0009	0.63	0.042	0.029	0.05	0.03	0.002
IARM 208C	0.011	0.63	0.0010	0.008	0.0004	0.62	(0.02)	0.012	0.012	0.02	0.0014
IARM 207A	0.043	35.19	0.0011	0.002	0.0027	0.053	0.007	0.91	0.011	0.028	0.003
IARM 256A	0.5	25.6	.	.	.	.	.	3.0	.	.	.
IARM 96B	0.046	10.04	0.002	0.0063	0.0005	0.16	0.028	0.007	0.012	14.52	0.007
IARM 96C	0.047	10.36	0.001	0.008	0.001	0.31	0.03	0.007	0.012	15.4	0.009
IARM 96D	0.08	10.66	0.0006	0.006	0.005	0.23	0.03	0.046	0.008	14.71	(0.007)
IARM 95B	(0.002)	2.25	(0.001)	0.010	0.0006	0.46	0.03	0.004	(0.002)	3.42	(0.002)
IARM 95C	(0.008)	2.88	(0.004)	0.009	0.001	0.54	0.03	0.004	0.004	3.96	(0.005)
IARM 97B	0.022	19.4	0.003	0.009	(0.001)	0.34	0.019	0.006	0.012	12.9	(0.001)
IARM 97C	0.023	22.8	0.0007	0.011	0.0004	0.47	0.04	0.011	0.010	14.6	(0.007)
IARM 64B	(0.018)	9.06	(0.0009)	0.005	(0.0004)	0.27	(0.028)	0.011	(0.014)	2.12	<0.01

**CRM COPPER CHIPS**

analysis listed in mg/kg 50 g units

Number	Ag	As	Bi	Cd	Co	Cr	Fe	Mn	Ni	P	Pb	S	Sb	Se	Sn	Te	Zn
BCR 074C	(12.8)	0.78	(0.10)	<0.02	<0.05	<0.1	1.14	1.27	1.04	.	0.97	.	0.58	0.37	<0.07	(0.21)	0.46
BCR 017B	.	.	.	.	.	.	.	.	.	6.9	.	10.4	.	.	.	.	.

**CRM COPPER CHIPS**

analysis listed in mass % BAM, BCS: 100 g units    all others: 50 g units

Number	Cu	Ag	Al	As	Au	B	Be	Bi	Cd	Co	Cr	Fe	Mg
IPT 64	99.98	0.0010	(<0.0006)	(0.0002)	.	.	.	(<0.0001)	.	.	.	0.00045	.
BAM 365	99.937	0.01027	.	0.00298	.	.	.	0.00294	.	0.00236	.	0.00223	.
BCS 399	REM	.	.	(<0.001)	.	.	.	(0.001)	(0.003)	.	.	(0.006)	.
C39X178700	.	0.049	0.0024	0.003	0.031	0.0014	<0.001	0.081	0.0014	0.0024	0.0016	0.054	(0.0007)
C39X178680	.	0.027	0.017	0.017	.	.	.	0.027	0.018	0.021	0.003	0.021	0.003
C39X178710	.	0.025	<0.0005	0.029	0.0048	.	.	0.069	0.0031	0.0008	.	.	.
C39X178660	.	<0.001	<0.002	0.037	.	.	.	0.001	<0.001	0.003	0.002	<0.001	<0.001

continued

Number	Mn	Ni	P	Pb	S	Sb	Se	Si	Sn	Te	Zn
IPT 64	.	0.00018	.	0.00006	.	(0.0002)	(<0.0002)	.	(<0.0005)	(<0.0001)	(0.001)
BAM 365	(<0.0001)	0.01753	.	0.00288	(0.00077)	0.00088	.	.	(<0.0005)	0.00046	.
BCS 399	.	(0.002)	0.045	(0.002)	.	(<0.001)	.	.	(0.003)	.	(0.003)
C39X178700	0.024	0.0053	0.075	0.059	(0.0039)	0.054	0.007	(0.0022)	0.016	0.011	0.008
C39X178680	0.016	0.019	0.018	0.022	0.027	0.024	.	0.009	0.027	0.027	0.078
C39X178710	0.0010	0.027	<0.0005	0.0092	0.0080	0.017	0.028	<0.0005	.	0.011	.
C39X178660	<0.001	0.034	<0.002	<0.001	0.003	<0.001	.	<0.005	0.013	<0.001	0.005

**CRM COPPER BASE CHIPS**

GBW: 95 g units all others: 100 g units

Number	Cu	Sn	Zn	Pb	P	Ni	Fe	Al	Mn	Sb	As	Si	S	Bi	Other
VS 1974-80	96.42	0.076	0.021	(0.004)	.	0.39	0.140	0.097	.	.	.	0.094	.	.	Be: 2.63 Ti: 0.126
BAM 211	87.71	10.60	0.56	0.74	0.0267	0.122	0.110	.	0.0019	0.033	0.0213	.	0.0211	0.002	Cd: 0.00144 Ag: 0.059
VS 1925-80	86.51	0.10	0.92	0.097	0.043	0.55	0.51	9.40	1.73	0.0010	.	0.15	.	.	
GBW 02130	86.42	7.98	.	2.26	.	2.98	.	.	.	.	.	.	.	.	
GBW 02129	86.24	9.02	.	1.95	.	2.52	.	.	.	.	.	.	.	.	
GBW 02131	85.56	12.16	.	0.98	.	1.02	.	.	.	.	.	.	.	.	
BAM 228	85.34	9.76	3.32	1.24	0.019	0.109	0.036	(0.0001)	(<0.001)	0.078	0.024	.	0.036	0.0086	Se: 0.0012
VS 1924-80	83.3	0.19	1.29	0.21	0.094	1.03	0.94	10.40	2.08	0.0012	.	0.26	.	.	
GBW 02128	82.94	10.49	.	2.68	.	3.53	.	.	.	.	.	.	.	.	
GBW 02127	82.21	10.66	.	2.93	.	3.96	.	.	.	.	.	.	.	.	

**CRM COPPER BASE CHIPS**

analysis listed in mg/kg 100 g chips

Number	Zn	Sn	Pb	Fe	Ni	Ag	As	Bi	Cd	P	S	Sb	Se	Te
BAM 366	15.6	111	10.8	23.4	3.2	7.9	1.11	(<0.3)	0.27	263	8.7	0.99	(<1.1)	(<0.3)

## COPPER BASE CHIPS

100 g chips

Number	Cu	Ag	Be	Bi	Fe	Mn	Ni	Se	Sn	Zn	Al	As
CRM												
IARM 70B	99.9+	0.0011	.	<0.0002	<0.001	<0.0003	<0.0002	<0.0002	(0.0002)	<0.001	.	(0.0001)
IARM 71B	97.7	(0.002)	1.84	.	0.042	0.0010	0.021	.	0.005	0.005	0.040	.
IARM 228A *	89.1	0.004	.	1.52	0.05	0.002	0.46	0.68	4.10	4.06	0.002	0.005
IARM 84B	87.9	0.005	.	.	1.30	0.62	10.03	.	0.014	0.082	(0.002)	(0.002)
IARM 226A *	86.8	(0.005)	.	1.71	0.055	0.003	0.54	0.94	5.14	4.76	0.002	0.005
IARM 227A *	86.0	(0.004)	.	2.29	0.06	(0.003)	0.53	1.21	5.12	4.71	0.002	0.005
IARM 85B	.	.	.	.	0.53	0.53	29.60	.	0.014	0.12	<0.01	.
RM												
IARM 160A	.	3.03	.	.	<0.01	<0.01	<0.01	.	<0.01	<0.01	<0.01	.
IARM 159A	.	3.48	.	.	<0.01	<0.01	<0.01	.	<0.01	<0.01	<0.01	.

Number	C	Co	Cr	P	Pb	S	Sb	Si	Zr
IARM 70B	(0.007)	<0.003	.	0.002	(0.003)	(0.0005)	(0.0002)	<0.0005	.
IARM 71B	0.003	0.21	0.0030	0.004	0.006	(0.0004)	(0.002)	0.060	.
IARM 228A *	(0.003)	(0.002)	(0.002)	0.03	0.02	0.004	0.02	0.002	.
IARM 84B	(0.01)	0.013	(0.003)	0.004	0.008	0.008	(0.002)	0.01	.
IARM 226A *	.	.	.	0.005	0.043	0.005	0.006	0.002	.
IARM 227A *	0.003	(0.001)	0.002	0.004	0.04	0.005	0.01	0.002	.
IARM 85B	0.011	0.034	.	0.007	0.005	0.010	<0.01	<0.01	.
IARM 160A	0.003	<0.01	<0.01	(0.004)	<0.01	<0.003	.	<0.01	0.40
IARM 159A	(0.002)	<0.01	<0.01	<0.01	<0.01	<0.01	.	<0.01	.

## RM COPPER BASE CHIPS

typical analysis listed in mass %

50 g units

Number	Si	Fe	Mn	P	S	Cu	Al	Ni	Cr	Sn	Pb	Zn	As	Sb	Bi
DH 0202	.	0.911	0.007	.	0.037	98.15	.	0.034	0.003	0.381	0.139	0.229	.	0.008	.
DH 0209	.	.	.	.	.	87.01	.	0.265	.	11.92	0.542	.	.	.	.
DH 0206	0.043	1.79	0.044	0.017	0.059	83.05	0.059	0.221	.	2.78	0.891	10.89	0.025	0.060	.
DH 0213	.	0.243	.	0.009	0.086	.	.	0.670	.	9.41	5.78	1.684	.	.	.
DH 0201	.	0.677	0.035	0.046	.	81.84	0.022	0.795	.	8.84	1.17	6.30	0.076	0.104	0.006
DH 0208	0.052	2.54	0.711	0.027	.	81.67	4.15	2.82	0.009	4.78	1.31	1.85	.	0.083	.
DH 0204	0.22	5.70	0.057	0.007	.	77.00	12.51	.	0.009	2.16	0.58	1.36	.	0.336	.
DH 0203	0.23	5.76	0.057	.	.	76.88	12.50	.	.	2.17	0.59	1.36	.	0.329	.
DH 0205	0.22	5.66	0.056	0.008	.	76.82	12.53	.	.	2.14	0.76	1.36	.	0.350	.
DH 0207	.	0.936	0.027	.	.	65.66	.	0.174	.	0.74	2.16	30.20	.	0.014	.
DH 0210	0.071	2.57	3.65	0.018	.	65.39	5.16	0.769	0.006	0.295	0.352	21.56	.	0.012	.

## RM COPPER-BERYLLIUM-COBALT ALLOY CHIPS

typical analysis

50 g units

Number	Sn	Zn	Pb	Ni	Fe	Al	Mn	Si	Cr	Be	Co
C36XCBC40	0.01	0.02	0.30	0.04	0.09	0.06	0.003	0.09	0.01	1.82	0.21
C36XCBC20	0.004	0.03	0.004	0.07	0.02	0.03	<0.01	0.05	0.005	0.56	2.44
C36XCBC10	0.002	<0.01	0.002	1.88	0.03	0.02	<0.01	0.04	0.005	0.42	0.13
C36XCBC30	<0.002	0.02	0.003	0.02	0.04	0.02	<0.01	0.06	0.005	1.81	0.23

**SEBILOY / ENVIROBRASS CHIPS**

Number	As	Bi	Co	Cu	Fe	Ni	P	Pb	Sb	Se	Sn	Zn	Units
CRM													
C32X SEB20	0.009	4.35	0.013	81.8	0.078	0.078	0.014	0.42	0.013	0.027	9.40	3.75	100 g
RM typical analysis													
C32X SEB10	0.052	5.78	0.011	76.6	0.062	0.120	0.026	0.56	0.36	0.89	3.80	11.7	100 g

**CUPRO-NICKEL CHIPS**

C212X: 50 g units      all others: 100 g units

Number	Ni	Al	B	Bi	C	Co	Cr	Cu	Fe	Mg	Mn	Nb	P	Pb
CRM														
C36XCN60	33.46	(0.0024)	(0.0015)	0.0058	0.0180	0.0440	1.10	63.35	0.878	.	0.451	0.514	0.031	0.0066
BCS 180/2	30.35	.	.	.	0.04	.	.	68.12	0.68	.	0.75	.	.	(0.003)
RM Typical Analysis														
C212X40010	67.6	0.09	.	.	0.10	0.12	0.05	.	0.57	0.13	3.04	.	.	0.08
C212X40020	65.2	0.05	.	.	0.04	0.08	0.02	.	1.17	0.02	2.00	.	.	0.04
C212X40060	63.3	3.85	.	.	0.03	0.05	0.12	.	1.95	0.016	0.83	.	.	0.02
C36XCN40	30.2	.	.	.	.	0.04	.	.	0.50	0.003	0.33	.	.	0.015
C36XCN90	28.1	.	0.005	<0.01	0.02	<0.01	2.19	.	0.93	.	1.20	.	0.016	0.05
C36XCN10	9.5	.	.	.	.	0.10	.	.	1.94	0.015	1.91	.	.	0.05
CURM 62.12	7.94	.	.	.	.	0.081	.	89.42	0.45	0.002	1.59	.	.	0.053

Number	S	Si	Sn	Ti	Zn	Zr
C36XCN60	0.0109	0.144	0.0307	0.0066	0.026	.
BCS 180/2	0.006	(0.018)	.	.	.	.
C212X40010	0.022	1.48	.	0.11	.	.
C212X40020	0.075	0.10	.	0.06	.	.
C212X40060	0.035	3.94	.	1.34	.	.
C36XCN40	.	0.54	.	.	.	.
C36XCN90	0.002	0.56	.	0.12	.	0.13
C36XCN10	.	0.19	.	.	.	.
CURM 62.12	0.034	0.109	0.111	.	0.180	.

**COPPER-NICKEL-SILVER CHIPS**

Number	Cu	Zn	Pb	P	Ni	Fe	Mn	Sb	As	Si	S	Bi	Mg	Ag	Co	Al	C
CRM 100 g units																	
GBW 02104	Rem	20.81	0.019	0.0048	14.87	0.47	0.32	0.0020	0.0098	0.146	.	0.0019	0.033	.	.	.	.
RM typical analysis      100 g units																	
C34XNS50	.	21.4	0.85	0.046	19.7	0.76	0.03	.	.	0.18	0.042	.	.	.	.	.	.
C34XNS10	.	29.0	0.05	0.010	7.67	0.05	0.02	.	.	0.03	<0.002	.	.	.	.	.	.
C34XNS30	66.30	17.94	0.155	0.013	14.86	0.201	0.129	.	.	0.018	0.063	.	0.0011	0.108	0.102	0.038	0.014

**RM PHOSPHORUS DEOXIDIZED COPPER CHIPS**

analysis listed in mass % except \* which is mg/kg

100 g chips

Number	Ag%	Al*	As%	Bi*	Co*	Cu%	Fe*	Mn*	Ni*	P%	Pb%	Sb*	Si%	Sn%	Te%	Zn%
CURM 09.03	0.012	<3	<0.001	<3	<3	99.92	33	<3	<3	0.056	<0.0005	<5	<0.001	<0.001	<0.001	<0.001
CURM 09.01	0.011	<5	<0.001	<3	<3	99.82	19	<3	<3	0.151	<0.0005	<5	<0.001	<0.001	<0.001	0.0008
CURM 09.02	0.0055	<5	<0.001	<5	<5	99.90	42	<5	<5	0.078	<0.001	<5	<0.002	<0.001	<0.001	<0.001
CURM 09.04	0.0033	<5	<0.001	<5	<5	99.96	47	<5	<5	0.0174	<0.001	<5	<0.002	<0.001	<0.001	<0.001

**GUN METAL CHIPS**

analysis listed in mass %

Number	Cu	Sn	Zn	Pb	P	Ni	Fe	Al	Mn	Sb	As	Si	S	Bi	Cr	Ag
CRM	100 g units															
BCS 207/2	87.35	9.74	1.60	0.70	(0.018)	0.28	0.029	0.013	.	0.10	0.066	0.016	.	0.04	.	.
C33XGM70	.	9.23	2.06	0.78	0.067	0.36	0.05	0.03	0.18	0.06	0.12	0.09	0.001	0.08	.	.
BCS 183/4	84.08	7.27	3.47	3.15	0.090	1.30	0.056	(<0.002)	(0.01)	0.23	0.13	(0.01)	0.11	0.005	.	.
RM	typical analysis		100 g units													
CURM 71.33-6	83.91	4.91	4.75	5.01	0.232	1.00	0.003	<0.001	<0.0005	<0.002	<0.001	<0.002	<0.001	<0.002	<0.002	0.0014
CURM 71.31-5	83.00	4.06	3.98	6.07	0.060	1.98	0.118	0.023	0.037	0.128	0.110	0.020	0.059	0.030	0.039	0.046
C33XGM80	82.3	4.03	6.21	6.78	0.0213	0.115	0.298	0.0067	0.0010	.	.	(0.0010)	0.0055	0.0138	.	0.105
CURM 71.32-4	80.48	6.46	6.52	4.43	0.016	0.70	0.35	0.12	0.046	0.26	0.25	0.022	0.08	0.051	0.05	0.34
C33XGM50	.	4.73	5.08	4.72	0.029	1.45	0.23	<0.005	0.05	0.08	0.05	0.03	0.094	0.05	.	.

**CRM COPPER ANODE**

analysis listed in mg/kg

425 g chips

Number	Ag	Au	As	Bi	Fe	Pb	Ni	Sb	Se	Sn	Te
CAN CUAR-1	294	2.3	145	.	76	864	.	.	.	113	33
CAN CUPD-1	216	3.9	306	62	40	69	153	147	237	5	.

**CRM COPPER CONCENTRATE POWDER**

analysis listed in mass % except \* which is mg/kg

Number	Cu%	Ag*	Al <sub>2</sub> O <sub>3</sub> %	As*	Au*	Bi*	C%	CaO%	Cd%	Co*	Cr*	F*	Fe%	Hg*	Ir*	MgO%	Mn%	Mo*
VS 2891-84	40.4	7.077	.	.	.	.	.	.	0.029	.	.	.	(5.78)	.	.	.	.	.
CAN CCU-1C	25.62	129	(0.34)	34	4.94	(70)	0.09	0.15	0.0136	(18)	(30)	(294)	29.34	(32)	.	1.02	0.012	20
VS 1701-86	23.3	.	.	.	3.8	.	.	.	.	.	.	.	.	.	0.052	.	.	.

  

Number	Ni%	Os*	Pb%	Pd*	Pt*	Re*	Rh*	Ru*	S%	Se*	SiO <sub>2</sub> %	Zn%	LOI%	Units
VS 2891-94	.	.	2.25	.	.	28.2	.	.	(15.98)	.	(21.74)	2.89	.	50 g
CAN CCU-1C	(0.0011)	.	(0.34)	.	.	.	.	.	33.3	107	2.52	3.99	(16.4)	200 g
VS 1701-86	1.6	0.022	.	37.6	8.6	.	0.27	0.12	.	.	.	.	.	70 g

**CRM BRASS CHIPS**

analysis listed in mass %

analysis listed in mg/kg

100 g units

Number	Cu	Zn	Sn	Pb	Fe	Ni	As	P	Sb	Se
BAM 229	63.334	36.63	48.5	192	106.1	111.4	21.7	(10.6)	7.2	34

**CRM BRASS CHIPS** 100 g chips

Number	Zn	Cu	Fe	Ni	Pb	Si	Sn	Ag	Al	As	Bi
IARM 74B	38.9	60.4	0.011	0.006	0.017	0.003	0.70	(0.005)	0.003	<0.01	(<0.005)
IARM 74A	38.14	.	0.01	0.01	0.02	(<0.01)	0.50	(0.002)	<0.01	(<0.01)	.
IARM 75B	38.0	60.63	0.06	0.02	0.63	(0.003)	0.59	(0.005)	(0.005)	(0.004)	(0.001)
IARM 76B	36.71	60.5	0.060	0.015	1.94	.	0.69	0.005	(0.005)	(0.003)	.
IARM 87B	36.1	60.9	0.29	0.095	1.58	0.004	0.78	0.01	0.20	0.007	0.003
IARM 73B	35.3	61.5	0.17	0.059	2.71	(0.002)	0.15	0.005	0.001	(0.005)	(0.005)
IARM 151B	12.94	84.0	0.025	0.011	0.013	3.11	0.009	(0.01)	0.002	(0.002)	.
IARM 250A	9.7	80.2	0.17	0.33	7.2	0.003	2.46	0.02	(0.002)	.	0.02
IARM 86C *	5.4	84.5	0.25	0.27	5.0	(0.005)	4.4	(0.02)	(0.002)	(0.004)	(0.01)

Number	C	Co	Cr	Mn	P	S	Sb
IARM 74B	.	.	.	<0.01	(0.008)	(0.003)	0.003
IARM 74A	(0.012)	.	.	<0.01	0.006	0.001	<0.01
IARM 75B	(0.004)	(0.003)	.	(0.003)	0.003	(0.001)	(0.004)
IARM 76B	(0.004)	0.0007	.	(0.003)	0.005	0.003	0.006
IARM 87B	0.003	0.007	(0.002)	0.006	0.008	(0.001)	0.014
IARM 73B	(0.004)	(0.003)	.	(0.001)	0.003	(0.004)	0.007
IARM 151B	0.005	.	(0.003)	0.002	0.003	<0.001	(0.001)
IARM 250A	<0.005	(0.002)	<0.003	<0.002	0.003	0.046	0.052
IARM 86C *	(0.002)	(0.004)	<0.001	<0.002	0.004	0.04	0.15

\* Provisional Analysis

**BRASS CHIPS**

analysis listed in mass %

100 g units

Number	Cu	Sn	Zn	Pb	P	Ni	Fe	Al	Mn	Sb	As	Si	Cd	Bi	Other
CRM															
BCS 344	68.98	.	30.98	.	.	.	.	.	.	.	.	.	.	.	.
BAM 223	58.74	0.089	38.82	2.13	0.0003	0.0214	0.091	(<0.002)	(<0.001)	0.0040	0.0084	(<0.003)	.	0.0018	S: 0.0011
BCS 179/2	58.5	0.70	35.8	0.35	.	0.56	1.02	2.22	0.86	.	(0.008)	0.044	(0.003)	.	
IPT 40	58.10	0.18	39.1	2.45	.	0.0012	0.007	0.010	.	0.023	.	.	0.049	.	Ag: 0.002
GBW 02101	58.00	0.54	Rem	0.19	0.0076	.	0.89	0.26	0.73	0.0091	.	.	.	0.0024	
BAM 224	57.40	0.066	39.40	1.13	0.0112	0.038	0.136	0.0012	1.70	0.0026	0.0025	(0.002)	.	0.0006	S: 0.0004
BCS 390	57.1	0.34	38.6	1.04	.	0.033	0.83	0.83	1.30	.	.	(0.023)	(0.011)	.	
GBW 02103	55.64	0.186	Rem	0.44	0.020	.	1.13	0.10	3.41	0.045	.	.	.	.	
RM typical analysis															
C31XB950	95.0	0.5	.	*	*	*	(0.01)	(0.001)	*	*	(0.01)	(0.01)	.	(0.01)	S: (<0.001)
CURM 30.09	89.53	<0.001	10.47	<0.001	.	<0.003	0.0005	<0.001	<0.0003	<0.001	<0.001	<0.001	.	<0.001	
CURM 48.04	72.68	0.018	26.99	0.043	0.006	0.096	0.008	<0.001	0.012	0.026	0.034	0.004	<0.0003	0.014	S: 0.011
C31XB40	70.7	0.025	.	0.007	.	0.008	0.014	<0.005	<0.005	<0.005	<0.01	<0.005	.	<0.005	
CURM 48.05	68.69	0.083	31.0	<0.003	0.007	0.117	0.066	<0.002	0.016	<0.0005	<0.001	0.026	<0.0003	<0.0005	S: 0.013
CURM 48.02	67.16	0.035	32.58	0.084	0.012	<0.001	0.053	0.013	0.067	0.037	0.025	0.010	<0.0005	0.004	S: 0.007 Cr: 0.004
CURM 48.01	66.98	<0.002	32.6	0.106	0.016	0.134	0.049	<0.001	<0.001	0.047	0.067	0.041	<0.0003	0.038	
CURM 30.18	63.66	0.58	32.33	<0.005	.	<0.001	0.006	3.28	<0.001	<0.001	<0.005	0.131	.	<0.001	
CURM 30.20	61.46	0.40	35.71	<0.002	.	<0.001	<0.005	2.32	<0.001	<0.002	<0.001	0.17	.	<0.002	
C31XB20	60.8	0.18	.	0.21	.	0.21	0.035	0.15	0.20	0.05	0.115	0.10	.	0.09	
CURM 30.15	60.66	<0.002	38.88	<0.005	.	<0.001	0.50	<0.001	<0.001	<0.001	<0.005	<0.005	.	<0.001	
CURM 30.16	60.53	<0.002	38.33	<0.005	.	<0.001	1.14	<0.001	<0.001	<0.001	<0.005	<0.005	.	<0.001	
CURM 30.11	59.86	<0.002	38.17	0.005	.	1.70	0.002	<0.001	0.23	<0.001	<0.001	<0.001	.	<0.002	
CURM 30.23	58.77	<0.001	39.19	2.04	.	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	.	<0.002	
CURM 30.24	58.33	<0.002	38.32	3.31	.	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	.	<0.002	
CURM 30.21	56.23	2.01	40.08	0004	.	<0.001	0.003	1.44	<0.001	<0.002	<0.001	0.213	.	.	

\* Indicates a value of (<0.001).



## BRONZE CHIPS

100 g chips

Number	Sn	Al	Bi	Cu	Fe	Mn	Ni	P	Pb	Si	Zn
CRM											
IARM 92B	9.75	(<0.01)	.	.	0.009	(<0.01)	0.36	0.028	9.50	(<0.01)	0.28
IARM 89B	8.17	(<0.01)	.	.	0.013	(<0.01)	0.15	0.087	0.089	(<0.01)	3.96
IARM 91C	6.8	0.002	0.025	83.2	0.03	0.002	0.46	0.054	6.8	0.012	2.61
IARM 90B	6.44	(<0.01)	.	.	0.019	(<0.01)	0.69	0.054	1.66	(<0.01)	2.98
IARM 211A	6.24	0.002	5.07	88.3	0.005	0.0015	0.003	0.2	0.013	0.004	0.005
IARM 78B	4.73	(0.002)	(0.001)	87.7	0.02	(0.002)	0.077	0.19	3.87	<0.002	3.55
IARM 77B	4.66	(0.001)	(0.004)	95.2	0.002	(0.002)	0.002	0.148	0.016	(0.003)	0.007
IARM 83B	0.85	0.002	.	58.7	0.97	0.13	0.010	0.004	0.017	(0.003)	39.3
IARM 83A	0.57	<0.01	.	.	0.99	0.22	0.01	0.005	0.058	<0.01	39.81
IARM 72B	0.029	.	.	90.08	0.007	.	0.004	0.005	1.99	(0.002)	7.81
IARM 88B *	0.022	5.7	.	63.7	2.11	2.92	0.067	0.011	0.06	0.10	25.4
IARM 235A *	0.018	8.89	(0.006)	81.2	4.06	1.18	4.42	0.012	(0.008)	0.059	0.081
IARM 80B	0.018	10.19	<0.005	81.2	3.31	0.54	4.69	0.009	0.009	0.030	0.078
IARM 79B	0.017	9.19	(0.003)	88.4	2.13	0.16	0.075	0.005	(0.003)	0.019	0.013
IARM 82B	0.017	0.002	.	95.3	0.080	1.04	0.011	0.004	0.011	3.22	0.38
IARM 93B	0.009	10.33	.	85.4	3.87	0.024	0.088	(0.002)	0.012	0.024	0.17
IARM 81B	0.008	6.70	<0.001	91.2	0.047	0.012	0.003	0.004	0.006	1.84	0.176
IARM 204A	0.005	10.55	.	83.3	3.87	0.052	1.95	0.007	0.004	0.034	0.22
IARM 236A *	(0.005)	(0.004)	(0.004)	66.6	0.91	1.05	30.1	0.004	(0.004)	0.19	(0.03)
IARM 94B	(0.003)	10.8	.	80.6	3.99	0.071	4.31	0.011	0.004	0.028	0.14
RM											
IARM 77A	4.60	(<0.01)	.	.	0.01	0.01	<0.01	0.12	(0.011)	<0.01	0.03
IARM 94A	(<0.01)	10.63	.	.	4.04	0.16	4.37	<0.01	0.009	<0.01	0.09

Number	Ag	As	Be	C	Co	Cr	S	Sb
IARM 92B	(0.031)	.	.	(<0.01)	(<0.01)	.	0.036	0.35
IARM 89B	.	.	.	.	(<0.01)	.	0.018	(<0.01)
IARM 91C	(0.02)	0.012	.	(0.02)	(0.01)	(0.002)	0.04	0.16
IARM 90B	.	.	.	.	(<0.01)	.	0.035	0.06
IARM 211A	0.007	0.007	0.001	0.011	0.001	0.002	0.003	0.059
IARM 78B	0.008	<0.003	.	<0.002	<0.0005	.	0.010	0.01
IARM 77B	(0.002)	(0.001)	.	0.003	.	.	0.002	0.005
IARM 83B	(0.002)	.	.	0.003	(0.003)	(0.003)	(0.001)	(0.004)
IARM 83A	(<0.005)	(<0.01)	.	(0.007)	(<0.01)	.	0.002	0.008
IARM 72B	(0.002)	(0.003)	.	0.002	.	.	0.0015	0.006
IARM 88B *	.	.	.	0.003	.	.	(0.001)	(0.004) * Provisional Analysis
IARM 235A *	(0.004)	(0.01)	.	0.010	(0.008)	0.007	(0.001)	(0.004) * Provisional Analysis
IARM 80B	0.006	(0.004)	.	(0.01)	0.014	0.012	(0.001)	(0.004)
IARM 79B	0.002	.	.	0.002	(0.002)	(0.003)	(0.001)	.
IARM 82B	.	<0.002	.	(0.003)	.	0.004	0.003	<0.01
IARM 93B	(0.004)	<0.01	.	0.007	0.006	(0.007)	0.002	0.012
IARM 81B	(0.004)	0.058	.	0.002	.	0.002	<0.001	0.003
IARM 204A	0.009	(<0.01)	.	0.006	0.008	0.008	(0.002)	(<0.01)
IARM 236A *	<0.002	<0.005	.	0.012	0.006	0.002	0.003	<0.05 * Provisional Analysis
IARM 94B	0.017	<0.01	.	(0.006)	0.011	0.017	0.002	(0.011)
IARM 77A	(0.010)	(<0.01)	.	(0.012)	<0.01	.	0.003	(<0.01)
IARM 94A	.	(<0.01)	.	(0.014)	0.01	.	(0.003)	(<0.01)

## ALUMINUM BRONZE CHIPS

Number	Cu	Sn	Zn	Pb	P	Ni	Fe	Al	Mn	Sb	As	Si	Mg	Cr	Units
CRM															
GBW 02117	Rem	0.091	0.99	0.022	0.0158	0.48	0.55	9.03	2.04	.	.	0.115	.	.	100 g
GBW 02102	Rem	0.090	1.00	0.011	0.012	0.45	2.82	9.21	0.25	0.0025	0.011	0.11	.	.	100 g
GBW 02118	Rem	0.054	0.51	0.031	0.0155	0.48	2.89	9.44	1.69	0.0024	0.0108	0.161	.	.	100 g
GBW 02119	Rem	0.052	0.299	0.021	0.0105	4.47	4.33	10.08	0.332	0.0024	0.0108	0.106	.	.	80 g
C32XALB60	80.7	0.126	0.19	0.060	0.036	5.62	3.06	8.42	1.41	.	(0.021)	0.30	0.0026	(0.004)	50 g
C32XALB10	(80.4)	0.025	0.035	0.218	0.016	5.90	3.00	10.3	0.094	.	(0.002)	0.132	0.0013	0.011	50 g
BCS 304/1	80.23	0.03	0.31	0.010	.	4.82	4.64	9.71	0.12	.	.	0.08	(<0.01)	.	100 g
C32XALB80	(75.3)	0.58	1.02	0.009	0.14	6.79	6.70	8.1	0.31	.	0.17	0.69	(0.002)	0.045	50 g
RM typical analysis															
CURM 51.11	93.95	0.027	0.111	0.33	0.035	0.012	0.060	5.27	<0.001	.	<0.001	0.159	.	.	100 g
CURM 51.13	88.79	0.270	0.335	0.104	0.022	0.057	1.81	7.30	0.898	.	0.215	0.174	.	.	100 g
CURM 51.14	88.57	0.113	0.656	0.003	0.12	0.219	0.72	8.42	0.55	.	0.44	0.286	.	.	100 g
CURM 51.12	88.29	0.196	0.45	0.219	<0.001	0.112	2.87	6.36	1.33	.	0.111	0.005	.	.	100 g
C32XALB30	.	0.19	1.73	0.09	.	3.84	5.08	11.46	0.29	.	.	0.34	0.03	.	50 g
C32XALB50	.	0.03	0.16	0.04	.	5.11	1.95	7.6	1.39	.	.	0.03	0.018	.	50 g

## PHOSPHOR BRONZE CHIPS

Number	Cu	Sn	Zn	Pb	P	Ni	Fe	Al	Mn	Sb	As	Si	S	Mg	Units
CRM															
GBW 02132	94.50	4.77	.	.	0.673	.	.	.	.	.	.	.	.	.	150 g
GBW 02133	93.72	5.79	.	.	0.423	.	.	.	.	.	.	.	.	.	150 g
GBW 02136	93.70	5.79	.	0.021	0.372	.	0.011	.	.	0.0058	.	0.0012	.	.	150 g
GBW 02134	92.85	6.82	.	.	0.238	.	.	.	.	.	.	.	.	.	150 g
GBW 02135	91.73	7.92	.	.	0.106	.	.	.	.	.	.	.	.	.	150 g
C32XPB130	(91.5)	6.96	0.27	0.25	0.22	0.26	0.14	<0.001	0.096	0.12	0.052	<0.005	(0.03)	<0.001	100 g
C32XPB140	91.0	8.58	0.029	0.051	0.032	0.092	0.005	(0.001)	<0.002	0.061	0.021	<0.005	0.086	<0.001	100 g
C32XPB110	(89.5)	3.00	1.93	1.02	0.72	1.01	0.49	0.067	0.80	0.54	0.175	0.52	0.016	<0.001	100 g
BCS 374	89.5	9.80	0.006	0.064	0.59	0.014	(<0.005)	(<0.005)	.	(0.01)	.	(<0.005)	0.012	.	150 g
RM typical analysis															
CURM 54.01	95.42	3.17	0.346	0.307	0.053	0.348	0.028	0.040	0.158	0.070	0.044	0.039	0.023	0.008	100 g
CURM 54.02	92.87	5.53	0.410	0.663	0.107	0.109	0.102	0.020	0.101	0.026	0.023	0.012	0.030	0.0020	100 g
C32XPB120	(92.0)	4.64	0.49	0.47	0.42	0.51	0.31	<0.001	0.39	0.24	0.098	0.01	(0.010)	<0.001	100 g
CURM 54.03	91.74	7.30	0.003	0.003	0.954	0.0019	0.005	<0.001	<0.0005	0.0007	0.006	<0.002	<0.001	<0.0003	100 g
C32XPB100	87.0	12.9	0.008	0.033	0.020	0.016	0.002	<0.001	<0.001	0.005	0.005	<0.001	0.003	<0.001	100 g
CURM 54.04	86.54	9.47	1.09	0.79	0.250	0.536	0.316	0.074	0.419	0.33	0.106	0.065	0.046	0.0009	100 g
CURM 54.05	84.78	11.36	0.554	1.14	0.501	1.28	0.051	0.055	0.078	0.111	0.063	0.006	0.063	0.0021	100 g
C32XPB20	.	4.13	0.20	0.06	0.42	0.50	0.06	<0.01	0.075	0.11	0.09	0.07	.	.	100 g
C32XPB10	.	11.0	0.02	0.37	0.84	0.12	<0.01	<0.01	<0.01	0.07	0.05	0.01	.	.	100 g

## LEADED BRONZE CHIPS

Number	Cu	Sn	Zn	Pb	P	Ni	Fe	Al	Mn	Sb	As	Si	S	Bi	Units
CRM															
C32XLB130	83.58	6.03	0.58	8.17	0.063	1.29	0.025	0.0126	<0.001	0.028	0.116	0.022	0.100	0.035	100 g
BCS 364	80.6	9.35	0.13	9.25	0.056	0.28	(<0.005)	(<0.002)	.	0.18	(0.07)	(<0.005)	(0.06)	(<0.01)	100 g
C32XLB20	(76.8)	12.38	0.27	9.42	0.04	0.22	0.40	0.04	0.22	0.023	0.017	<0.01	(0.001)	0.009	100 g
RM typical analysis															
C32X SN10	79.96	11.75	0.804	5.15	0.0025	2.17	0.0034	(<0.002)	0.0018	0.006	.	.	0.0064	.	100 g
CURM 50.02	78.84	10.34	0.006	10.67	0.046	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.002	<0.002	<0.001	<0.0005	100 g
CURM 50.03	77.42	8.41	1.72	8.86	0.159	2.89	0.018	0.005	0.037	0.24	0.11	0.005	0.064	0.051	100 g
CURM 50.04	76.11	11.30	0.66	9.94	0.035	1.10	0.10	0.014	0.028	0.50	0.06	0.011	0.14	0.10	100 g
CURM 50.01	74.08	9.45	1.17	11.74	0.113	2.24	0.243	0.018	0.024	0.59	0.22	0.007	0.113	0.029	100 g
C32XLB30	.	10.3	<0.01	9.4	0.006	1.52	<0.01	<0.01	<0.01	0.04	0.02	.	0.020	0.025	100 g

**CRM LEAD POWDER**

analysis listed in mg/kg

Number	Ag	Au	Ni	Units
VS 2036-81	2322	32.6	.	100 g
VS 2038-81	415	0.21	0.410	100 g

**CRM LEAD CHIPS**

analysis listed in mg/kg

160 g chips

Number	Type	Ag	As	Bi	Cd	Cu	Ni	Sb	Se	Sn	Te	Tl	Zn
BCR 288B	Added impurities	30.5	55.7	215.8	33.3	19.3	4.57	32.5	<0.2	30.6	32.8	2.3	8.2
BCR 287B	Thermal refined	15.2	<0.003	67.3	0.36	0.98	0.024	0.040	<0.005	<0.05	<0.02	0.73	<0.1
BCR 286B	Electro refined	0.015	<0.0002	21.5	0.125	1.49	0.041	0.10	<0.05	<0.05	<0.1	2.5	<0.1

**LEAD BASE CHIPS**

analysis listed in mass %

Number	Cu	Sn	Pb	Ni	Sb	As	Bi	Ag	Fe	Zn	Cd	Units
CRM												
GBW 02402	2.88	5.69	76.22	.	15.02	0.012	0.0075	.	.	.	.	100 g
GBW 02401	1.96	15.97	65.72	.	16.09	0.014	0.024	.	.	.	.	100 g
BCS 177/2	0.12	5.07	84.5	0.007	10.1	0.05	0.028	.	.	.	.	100 g
RM typical analysis												
C93XS30APR30	0.008	33.1	.	0.011	0.96	0.018	0.29	0.021	0.004	0.005	0.010	100 g

**LEAD BASE CHIPS**

analysis listed in mass %

100 g units

Number	Sn	Sb	Bi	Cu	As	Ag	Zn	Cd	Ni	Te	In	Ca	Na	Se	Other
CRM															
C85X ANTH	1.32	6.32	0.059	0.0234	0.487	0.0058	0.0004	0.0052	0.0035	0.010	.	.	.	0.017	Fe: 0.0041
C85XHRH	0.874	1.13	0.092	0.080	0.74	0.247	.	(0.0002)	0.001	0.002	.	.	.	0.037	
C84XBA10	0.85	*1	0.0084	0.0041	*1	0.0088	0.0007	0.0016	.	0.006	.	0.106	.	.	
C83XPR80	0.61	0.26	1.15	0.09	0.17	0.56	0.008	0.26	0.004	0.003	0.74	0.001	0.020	0.012	Au: 0.011
C83XPR70	0.21	0.85	0.52	0.21	0.05	0.30	0.002	0.51	0.020	0.002	0.16	0.002	0.002	0.01	Au: 0.001
C83XPR40	0.009	0.012	0.014	0.015	(0.002)	0.014	0.005	0.010	0.013	0.025	0.005	0.0026	0.001	0.003	Au: 0.002
C83XPR10	0.004	0.005	0.080	0.006	0.050	0.088	0.002	0.075	0.001	0.003	0.045	0.004	0.01	<0.002	Au: 0.008
RM typical analysis															
C86XPSS40	10.69	16.97	0.120	0.328	0.278	(0.006)	*2	0.047	0.0031	.	0.013	.	.	.	
C86XPSS20	6.33	8.16	0.054	0.118	1.42	0.004	*2	0.069	0.0080	.	(0.002)	.	.	.	Fe: *1
C85XSn20	1.87	0.023	0.0093	0.035	*5	0.002	*1	*1	*1	*1	.	.	.	0.0058	Fe: *1
C84XBA20	0.51	0.002	0.024	0.003	*05	0.008	0.019	0.0052	.	*2	.	0.061	.	.	
C85XSb120	0.21	11.4	0.007	0.30	0.11	0.0015	0.087	*1	0.0016	*5	.	.	.	*1	Fe: *1
C85XSb30	0.13	2.66	0.010	0.032	0.14	*2	(0.0002)	*1	0.0013	*2	.	.	.	0.024	Fe: *1
C84XBA40	0.11	0.061	0.074	0.031	(0.0008)	0.003	(0.0003)	0.010	0.0007	0.029	.	(0.014)	.	.	
C85XSb80	0.085	8.43	0.010	0.032	0.02	0.016	(0.0002)	*1	0.0014	*5	.	.	.	0.0007	Fe: *1
C85XSb100	0.080	10.2	0.007	0.14	0.11	0.0015	0.014	*1	0.0013	*2	.	.	.	*1	Fe: *5
C85X0616Pb10	0.070	1.78	0.025	0.048	0.070	0.002	0.001	0.0023	0.001	0.001	.	.	.	0.018	Fe: *1
C85XSb50	0.057	5.14	0.022	0.007	0.12	0.0017	*1	*1	0.0025	*1	.	.	.	0.0008	Fe: *1

\* In the above chart, \* represents <0.00 (so \*1=<0.001).

## LEAD-SILVER ALLOY CHIPS

Number	Ag	Sn	Sb	Bi	Cu	As	Zn	Cd	Fe	Al	In	Units
CRM												
C82XAg1.5	1.55	0.04	0.39	0.06	0.27	0.006	0.004	.	.	.	.	100 g
RM typical analysis												
C82XAg6.0	6.0	0.50	0.48	0.54	0.19	0.025	0.008	0.010	0.001	0.002	0.006	100 g
C82XAg3.5	3.48	0.24	0.11	0.27	0.075	0.022	0.001	0.004	0.001	<0.001	0.045	100 g

## RM LEAD BASE BATTERY ALLOY CHIPS

typical analysis

100 g units

Number	Sn	Zn	As	Sb	Bi	Ca	Ag	Cu	Te	Cd
C84XBA50	1.18	<0.0005	<0.001	<0.001	0.01	0.093	0.002	(0.0007)	<0.001	(0.002)
C84XBA60	0.73	<0.001	<0.001	0.001	0.008	0.095	0.002	0.0010	<0.001	(0.002)
C84XBA70	0.61	<0.0005	<0.001	0.002	0.009	0.036	0.002	0.0009	<0.001	<0.002

## CRM MAGNESIUM CHIPS

Number	Ag	Al	Be	Ca	Cd	Ce	Cu	Fe	La	Mn	Ni	Pb	Si	Sn	Zn	Units
C61XMgP30	0.013	0.090	<0.0001	0.053	0.015	0.006	0.030	0.014	0.004	0.015	0.005	0.015	0.050	0.016	0.019	30 g
C61XMgP20	0.003	0.065	<0.0001	0.014	0.006	0.002	0.012	0.006	0.002	0.012	0.003	0.006	0.031	0.007	0.012	30 g
C61XMgP10	<0.001	0.013	<0.0005	<0.001	<0.0005	.	(0.0006)	0.027	.	0.0037	<0.002	0.005	0.005	(0.001)	0.002	30 g

## MAGNESIUM BASE CHIPS

Number	Al	Zn	Mn	Cu	Si	Fe	Ni	Ca	Sn	Pb	Zr	R.E.	Ag	Be	Other	
CRM																
BCS: 100 g units      others: 30 g units																
BCS 316	8.01	0.68	0.28	0.040	0.055	0.009	0.004	.	0.005	0.024	.	.	.	.	.	
C65XMgA50	8.01	0.411	0.399	0.020	0.110	0.006	0.020	0.013	0.013	0.043	.	.	0.0050	0.0013	Cd: 0.0035    Sr: 0.00034	
C65XMgA20	7.19	0.95	0.14	0.112	0.13	0.011	0.003	(0.005)	0.050	0.006	.	.	.	0.0007	Sr: 0.0005	
C65XMgA10	5.45	1.26	0.060	0.221	0.20	0.021	0.021	0.029	0.072	0.012	(0.0015)	.	0.012	0.006	Cd: 0.013    Ce: 0.009    La: 0.007	
C65XMgB30	3.21	0.60	0.012	0.021	0.011	0.007	0.0019	0.029	0.005	0.004	.	.	(0.002)	0.0030	Cd: 0.011	
C65XMgB10	2.39	1.71	0.68	0.20	0.17	0.016	0.012	0.41	0.011	0.01	.	.	0.03	0.0007	Cd: 0.07    Ce: 0.015    La: 0.013	
BCS 307	(0.008)	2.08	0.006	0.005	.	0.002	.	.	.	.	0.56	2.84	.	.	.	
RM typical analysis      30 g units																
C65XMgA40	11.5	0.005	0.008	0.061	0.03	0.008	0.004	0.03	0.010	0.004	.	.	0.018	0.0011	.	
C65XMgA30	8.97	0.70	0.152	0.006	0.044	0.004	(0.0015)	(0.0005)	0.003	(0.0036)	.	.	.	0.0007	.	
C65XMgB20	2.32	0.95	0.44	0.096	0.06	0.015	0.005	0.008	0.012	0.012	.	.	.	.	.	
C63XMgE20	0.056	0.04	1.58	0.058	0.035	0.009	0.012	(0.003)	0.011	0.013	.	.	.	.	.	
C65XMgD30	0.041	1.97	0.28	0.058	0.020	0.023	0.002	(0.07)	0.007	0.009	0.029	0.008	0.005	0.0003	.	
C67XMgF30	0.01	3.18	0.015	0.03	0.005	0.009	0.002	0.006	0.006	0.017	0.48	2.40	.	.	.	
C66XMgC20	0.007	5.93	0.016	0.15	0.007	0.013	0.016	0.006	0.010	0.018	0.45	.	.	.	.	
C66XMgD40	0.006	2.80	0.02	0.01	0.01	0.003	0.002	0.004	0.003	0.017	0.44	.	.	.	.	
C68XMgH40	0.004	0.17	0.015	0.03	0.002	0.001	0.004	.	.	.	0.46	2.4	2.05	.	.	
C68XMgL10	0.002	0.009	0.016	0.013	0.001	0.009	0.005	.	.	.	0.54	2.09	1.41	.	Th: 0.24	
C67XMgG40	0.001	5.47	0.015	0.06	0.003	0.003	0.007	0.001	0.005	0.009	0.72	(<0.01)	.	.	Th: 1.85	

R.E. = Total Rare Earths

**RM MOLYBDENUM POWDER**

typical analysis

100 g units

Number	CaO	SiO <sub>2</sub>	Fe	P <sub>2</sub> O <sub>5</sub>	S	CuO	Al <sub>2</sub> O <sub>3</sub>	MgO	Mo	TiO <sub>2</sub>	PbO	ZnO	Na <sub>2</sub> O	K <sub>2</sub> O	CO <sub>2</sub>	C tot	-H <sub>2</sub> O 900°C
DH 4705	0.423	9.71	3.61	0.022	0.063	0.539	1.08	0.182	55.50	0.048	.	0.118	0.415	0.357	0.028	0.008	0.051
DH 4702	0.143	2.88	1.21	0.067	0.033	0.582	0.495	0.129	63.29	0.034	0.004	0.011	0.110	0.106	.	0.008	0.072

**CRM NICKEL POWDER**

analysis listed in mg/kg except % which is mass % 200 g units

Number	Ni%	Pt	Pd	Rh	Ir	Ru	Os	Au	Ag
VS 1702-86	5.4	8.6	30.0	0.98	0.11	0.34	0.06	0.84	23.4

**RM NICKEL POWDER**

certified analysis listed in mg/kg 100 g units

informational values

Number	Al	C	Cr	Cu	Fe	Mn	Mo	P	Pb	S	Si	Ag	As	B	Ba	Be	Bi	Ca	Cd	Co	Ga
BS HPN-1	70	268	22	2	202	2	3	5	0.2	4	6	<0.1	<0.5	<2	<1	<1	<0.2	3	<0.1	<2	<0.5

continued informational values

Number	H	In	Mg	N	Na	O	Sb	Se	Sn	Te	Ti	Tl	V	Zn
BS HPN-1	70	<0.2	1	17	4	1400	<0.1	<0.2	<1	<0.2	<1	<0.1	<1	<1

**CRM NICKEL CHIPS**

analysis listed in mg/kg Nickel content is 99.995%

100 g units

Number	Ag	Al	As	C	Ca	Cd	Co	Cr	Cu	Fe	Ga	Mg	Mn	N	Pb	Sb	Se	Sn	Tl	Zn
BAM RS 4	<1	<1	<0.5	9.4	<1	<0.2	<1	<0.5	<2	4.2	<0.2	<0.8	<0.5	2.5	<1	<0.2	<1	<0.3	<0.2	<4

continued informational analysis

Number	B	Bi	Hg	In	Mo	Na	O	S	Si	Te	V	W
BAM RS 4	<2	<0.1	<1	<0.2	<0.2	<1	29	<2	<2	<0.2	<0.2	<0.1

**CRM NICKEL CHIPS**

100 g chips

Number	Al	B	C	Co	Cr	Cu	Fe	Mg	Mn	Mo	N	Nb	Ni
IARM 50B	0.031	(0.0002)	0.010	0.069	0.010	(0.001)	0.079	(0.001)	0.20	(0.003)	0.0001	(0.002)	99.5

Number	O	P	S	Si	Ta	Ti	V	W	Zr
IARM 50B	0.0061	0.002	0.0002	0.059	<0.005	0.002	0.016	0.010	(0.001)

**RM NICKEL CHIPS** 100 g chips

Number	Ag	Al	As	B	Be	Bi	C	Ca	Cd	Co	Cr	Cu	Fe
IARM 190A	0.00109	0.0050	0.0028	<0.0005	(<0.0001)	0.00111	0.0022	<0.0010	0.0005	0.0008	(0.0001)	0.0017	0.0099
IARM 189A	0.00024	0.0044	0.00007	(<0.0005)	(<0.0001)	0.00026	0.0023	<0.0010	0.00008	0.00031	(0.0010)	0.00090	0.0038
IARM 188A	0.00011	0.0024	0.00007	(<0.0005)	(<0.0001)	0.00009	0.0022	<0.0010	0.00002	0.00017	(0.0006)	0.00018	0.0019
IARM 187A	0.00001	0.0011	0.00001	(<0.0005)	(<0.0001)	<0.00001	0.0013	<0.0010	(<0.00001)	0.00010	(0.0003)	0.00022	0.0019
IARM 191A	0.00001	0.00015	0.0013	(<0.0005)	(<0.0001)	<0.00001	0.0014	<0.0010	<0.0001	0.0545	0.00021	0.00042	0.00079
IARM 192A	0.00001	0.00023	0.0062	<0.0005	<0.0001	0.00008	0.0011	<0.0010	0.00004	0.1400	0.00031	0.0045	0.0015

Number	Ga	Mg	Mn	Mo	N	O	P	Pb	S	Sb	Se	Si
IARM 190A	<0.00005	(0.0006)	0.00018	(<0.0001)	(0.0001)	(0.0019)	0.0034	0.00093	0.00033	0.0011	0.00065	0.0028
IARM 189A	<0.00005	(0.0008)	0.00019	(<0.0001)	(0.0001)	(0.0018)	0.00037	0.00029	0.00018	0.00039	0.00021	0.0019
IARM 188A	<0.00005	(0.0004)	0.00023	<0.0001	(0.0001)	(0.0017)	0.00014	0.00010	0.00018	0.00011	0.00007	0.0018
IARM 187A	<0.00005	(0.0002)	0.00030	(<0.0001)	(0.0001)	(0.0014)	<0.00010	0.000015	0.00019	<0.00005	<0.00001	(0.0018)
IARM 191A	<0.00005	(0.0002)	0.00031	(<0.0001)	(0.0002)	(0.0030)	<0.00010	0.00003	0.00021	<0.00005	0.00019	(0.0005)
IARM 192A	<0.00005	(0.0002)	0.00052	(<0.0001)	(0.0001)	(0.0042)	0.00011	0.00028	0.0165	0.00010	0.00028	(0.0007)

Number	Sn	Te	Ti	Tl	V	Zn
IARM 190A	0.00062	0.00089	(0.0006)	0.00058	(<0.00005)	0.00081
IARM 189A	0.00022	0.00017	(0.0003)	0.00023	(<0.00005)	0.00028
IARM 188A	0.00011	0.00008	(0.0002)	0.00009	(<0.00005)	0.00023
IARM 187A	0.00004	<0.00001	(0.0003)	<0.00002	(0.00008)	<0.00005
IARM 191A	0.00004	<0.00001	(<0.0001)	<0.00002	(<0.00005)	0.00019
IARM 192A	0.00011	<0.00001	(<0.0001)	<0.00002	(<0.00005)	0.0011

**CRM NICKEL BASE CHIPS**

Number	analysis listed in mass %													NCS HC23501, JSS: 150 g units		NCS HC245series: 70 g units		all others: 100 g units	
	C	Si	Mn	S	Cr	Mo	Ni	Al	Co	Ti	Fe	Cu	P	Other					
BCS 371	0.30	0.34	.	0.013	.	.	.	.	0.39	.	.	.	.	Mg: 0.060					
BCS 363/1	0.140	0.028	1.26	(0.002)	(0.05)	.	64.7	0.027	0.032	(0.03)	1.86	31.90	.						
BCS 350	0.14	0.010	0.030	0.003	13.50	4.30	Rem.	6.00	0.30	0.80	1.5	.	.	Nb: 2.0					
NCS HC20501	0.14	0.710	0.534	0.018	10.54	3.15	.	3.11	.	3.32	.	.	0.045	W: 4.96	Zr: 0.014	B: 0.032	Ce: 0.0098		
BAM 326-1	0.092	1.46	0.406	0.0028	16.37	(0.025)	61.16	.	0.223	.	.	(0.027)	.	Zr: 0.129					
BCS 310/1	0.068	0.46	0.35	.	19.45	.	58.6	1.06	17.0	2.43	0.25	.	.						
NCS HC23504	0.059	0.631	0.442	0.0107	20.30	2.06	.	0.635	.	0.613	.	.	0.0182						
BCS 387/1	0.050	0.050	0.020	0.005	11.50	6.00	41.0	0.20	0.020	3.00	38.00	0.020	0.005						
JSS 683-2	0.049	0.39	0.32	0.0013	15.82	.	73.43	0.12	(0.011)	0.013	9.66	0.051	(0.0008)	Mg: 0.013					
NCS HC23501	0.042	0.37	0.345	0.006	20.30	.	.	1.09	.	2.89	.	0.059	0.011						
NCS HC23505	0.038	0.19	0.28	0.005	14.28	.	37.83	1.88	.	2.89	.	.	0.008	W: 5.87					
BCS 351	0.025	0.14	0.037	0.0006	18.12	3.06	53.1	0.55	0.136	1.06	18.26	0.016	.	Nb: 5.20	B: 0.0051				
NCS HC20502	0.0015	0.317	0.983	0.0024	0.466	4.13	80.07	.	0.043	0.0040	.	0.027	0.007						
NCS HC24522	.	1.12	0.77	.	20.06	.	75.55	0.1	.	0.163	1.63	.	.						
NCS HC24523	.	0.531	0.415	.	22.68	.	74.72	0.088	.	0.153	0.86	.	.						
NCS HC24524	.	0.344	0.258	.	24.03	.	74.18	0.08	.	0.182	0.53	.	.						
NCS HC24525	.	0.868	0.616	.	21.45	.	75.23	0.14	.	0.172	1.18	.	.						
NCS HC24526	.	1.27	0.449	.	23.35	.	74.08	0.18	.	0.081	0.44	.	.						

**NICKEL BASE CHIPS**

Number	C	Si	Mn	Cu	Fe	Cr	Co	Ti	Al	Mo	Nb	Mg	S	P	B	N	Ni
CRM	50 g units																
C28X62520 *	0.077	0.61	0.28	0.145	4.14	21.5	0.20	(0.027)	0.21	8.77	3.39	.	0.004	0.010	0.014	0.32	59.9
C28X62540	0.037	0.58	0.093	0.027	6.46	21.1	0.22	0.30	0.05	5.89	3.53	.	.	.	0.233	0.065	.
C28X71860	0.005	0.63	0.25	0.09	.	18.00	0.41	0.25	0.32	2.95	5.20	.	0.015	0.018	0.004	0.084	54.9
RM	typical analysis 50 g units																
C22X10550	0.30	0.26	<0.01	<0.01	1.22	15.52	21.7	0.44	4.74	3.96	.	0.014	.	.	.	.	.
C27X141840	0.29	0.39	0.41	0.09	0.57	21.0	10.3	0.07	0.05	10.2	.	.	.	.	.	.	.
C22X9050	0.20	0.21	0.97	0.22	1.09	18.10	20.99	2.75	1.01	0.51	.	.	.	.	.	.	.
C28X71830	0.19	0.38	0.47	0.35	.	17.78	1.00	1.40	1.77	3.31	5.44	.	0.05	0.026	.	.	54.8
C28X60020	0.16	0.20	0.64	0.03	10.07	13.95	0.21	0.12	0.26	.	.	0.05	.	.	.	.	.
C28X62530	0.15	0.74	0.60	0.32	5.5	22.9	0.45	0.53	0.53	7.69	4.96	.	0.013	0.01	.	.	.
C22X7550	0.12	0.22	0.99	0.23	1.11	18.09	0.10	0.84	0.58	0.52	.	.	.	.	.	.	.
C22X10530	0.12	0.98	0.51	0.21	0.40	13.91	17.74	1.37	5.24	6.05	.	0.0007	.	.	.	.	.
C28X75010	0.10	0.60	1.52	0.52	5.08	16.82	.	2.31	0.98	0.51	1.46	.	.	.	.	.	.
C22X7530	0.06	0.96	0.23	0.05	5.00	19.9	0.52	0.26	0.07	0.06	.	0.05	.	.	.	.	.
C28X60010	0.06	0.85	0.14	1.08	5.98	16.75	0.98	0.60	0.02	.	.	0.003	.	.	.	.	.
C28X75030	0.06	0.25	0.54	0.07	8.04	13.72	.	2.93	0.41	0.12	0.55	.	.	.	.	.	.
C28X71810	0.05	0.24	0.10	0.02	.	21.16	0.01	0.21	0.17	2.23	4.34	.	0.011	0.005	.	.	49.7
C28X62510	0.02	0.27	0.08	0.03	2.19	19.9	0.02	0.01	0.003	10.36	2.93	.	0.004	0.003	.	.	.

\* C28X62520 also contains Ag: 0.009, As: 0.009, Bi: 0.010, Sn: 0.009, and Zn: 0.008

**RM NICKEL BASE CHIPS**

typical analysis												50 g units	
Number	C	Si	Mn	Cu	Fe	Cr	Mo	Co	Ti	Al	Mg		
C24XWASP40	0.14	0.02	0.42	0.23	2.33	20.7	3.06	11.76	2.53	0.91	.		
C22X8010	0.12	0.22	0.50	0.22	0.66	21.88	0.20	0.53	2.81	1.03	0.008		
C24X26350	0.11	0.55	0.11	0.23	0.17	20.9	6.62	18.9	1.96	0.605	.		
C22X90130	0.11	0.29	0.68	0.25	.	11.02	6.38	1.02	3.88	0.34	.		
C22X90120	0.10	0.25	0.52	0.14	.	13.76	4.49	0.38	2.01	0.13	.		
C24X26310	0.06	0.12	0.71	0.07	0.74	18.96	5.66	20.9	2.56	0.30	.		
C22X9030	0.05	1.00	0.20	0.01	0.33	20.96	0.06	18.04	1.85	1.66	(<0.005)		
C22X8030	0.03	1.09	0.21	0.08	1.88	17.7(2)	0.50	1.99	1.81	1.84	0.001		
C24XWASP10	0.02	0.56	0.11	0.07	0.58	17.82	6.20	14.9	3.68	1.65	.		

Number	B	Pb	Sn	Zr	Ag	S	P	Ni	Nb	V	W
C24XWASP40	0.011	.	.	0.10	.	0.008	<0.001	.	0.12	0.15	0.22
C22X8010	(0.0001)	1 ppm	10 ppm	<0.01	<0.1 ppm	.	.	.	.	.	.
C24X26350	<0.001	.	.	.	.	0.005	.	.	.	.	.
C22X90130	0.036	.	.	.	.	0.034	0.036	43.6	.	.	.
C22X90120	0.008	.	.	.	.	0.022	0.015	41.1	.	.	.
C24X26310	0.006	.	.	.	.	0.002	.	.	.	.	.
C22X9030	0.023	.	.	.	.	.	.	.	.	.	.
C22X8030	(<0.001)	0.023	0.018	0.05	0.018	.	.	.	.	.	.
C24XWASP10	<0.001	.	.	0.03	.	0.002	0.009	.	<0.01	<0.01	0.02

**RM Ni/Cr/Al/Mo ALLOY CHIPS**

typical analysis													50 g units	
Number	C	Si	Mn	Cr	Mo	Al	Co	Ti	Cu	Fe	Nb	Zr	B	
C211X71320	0.16	0.51	0.27	12.9	5.50	6.59	1.04	1.13	0.13	0.39	1.64	0.18	0.016	
C211X71310	0.04	0.11	0.06	10.92	3.53	5.5	0.14	0.45	0.008	0.57	2.78	0.06	<0.001	

## NICKEL BASE CHIPS

100 g chips

Number	Al	Co	Cr	Cu	Fe	Mg	Mn	Mo	Nb	Ni	Si	Ti	W
CRM													
IARM 52B	3.02	0.004	0.047	30.22	0.77	0.012	0.77	0.011	(0.004)	64.3	0.09	0.50	(0.005)
IARM 62B	1.38	12.95	19.06	0.024	0.79	(0.001)	0.026	4.17	0.050	58.33	0.073	3.02	0.068
IARM 56D	0.60	0.298	18.37	0.063	18.10	0.0051	0.200	3.06	5.22	52.8	0.119	0.98	0.064
IARM 56C	0.521	0.011	18.02	0.016	18.39	0.0007	0.064	2.94	5.18	53.68	0.049	0.99	0.02
IARM 66B	0.40	0.90	15.86	0.086	5.80	0.004	0.47	16.06	0.019	56.65	0.028	0.006	3.42
IARM 54C	0.24	0.069	21.3	0.09	2.71	0.0007	0.050	8.69	3.50	62.8	0.10	0.31	0.04
IARM 257A *	0.36	0.023	1.47	0.020	1.47	0.011	0.64	28.07	(0.02)	67.7	0.03	(0.01)	0.08
IARM 68C *	0.35	0.19	22.0	0.018	1.10	0.005	0.50	1.35	0.042	59.7	0.44	0.005	14.1
IARM 63B	0.31	0.019	0.47	0.012	1.68	0.005	0.61	27.3	(0.001)	69.6	0.019	0.003	0.060
IARM 65B	0.283	0.59	21.32	0.054	3.63	0.009	0.29	13.02	0.029	57.3	0.030	0.005	2.87
IARM 67B	0.26	3.69	28.54	1.74	14.26	0.007	1.12	4.98	0.73	41.1	0.24	0.005	3.10
IARM 53C	0.21	0.035	14.95	0.045	7.16	0.008	0.21	0.047	0.024	76.5	0.33	0.34	(0.008)
IARM 69B	0.20	1.58	21.90	0.11	17.84	0.006	0.68	8.78	0.11	47.37	0.38	0.011	0.78
IARM 53B	0.17	0.057	14.55	0.13	9.75	0.005	0.25	0.12	0.073	74.2	0.11	0.33	0.018
IARM 55B	0.09	0.036	8.25	0.013	1.12	0.011	0.323	24.62	0.08	65.4	0.021	0.002	0.12
IARM 7B	0.023	0.069	19.32	0.21	(Rem)	.	0.0130	0.023	0.023	35.84	1.38	(0.005)	(0.031)
IARM 25B	0.006	0.14	19.42	3.25	(Rem)	2.06	1.51	0.31	0.52	33.31	0.37	(0.005)	(0.021)
IARM 51B	0.004	0.029	0.32	31.70	1.60	0.015	1.01	0.043	(<0.01)	64.9	0.105	0.05	(<0.01)
RM													
IARM 58A	0.53	0.10	20.71	0.03	(44.90)	(<0.001)	0.65	0.17	(0.03)	32.01	0.26	0.49	(<0.01)
IARM 201A	0.37	0.009	29.9	0.008	9.09	0.006	0.19	0.018	0.009	59.9	0.15	0.30	(<0.01)
IARM 202A	0.080	0.020	0.008	32.3	1.31	0.024	1.03	(<0.01)	.	64.8	0.046	0.005	(<0.01)
IARM 203A	0.066	12.88	0.72	0.05	40.6	(<0.002)	0.023	0.090	5.00	38.44	0.41	1.58	(0.02)
IARM 157A	0.021	0.045	20.7	0.14	(Rem)	.	0.35	6.18	0.019	23.8	0.39	(0.004)	0.023
IARM 100A	(0.29)	17.66	21.82	0.09	(Rem)	.	1.00	2.87	0.11	(20.17)	0.45	(0.023)	2.42

Number	B	C	La	N	O	P	S	Sn	Ta	V	Zr	
IARM 52B	(0.0003)	0.154	.	0.0002	(0.001)	0.009	0.0010	.	.	0.003	0.039	
IARM 62B	0.005	0.028	.	0.0022	0.0014	0.0028	0.0003	.	.	0.022	0.036	
IARM 56D	0.0044	0.041	.	0.0084	0.0014	0.010	0.0003	0.0019	0.007	0.033	(0.001)	
IARM 56C	0.0029	0.025	.	0.0089	0.0004	0.009	0.0003	.	0.008	0.027	(0.004)	
IARM 66B	0.0020	0.0044	.	0.0108	0.0010	0.008	0.0003	.	.	0.16	0.02	
IARM 54B	0.0021	0.021	.	0.009	0.0005	0.005	0.0009	(0.01)	(0.01)	0.014	0.005	
IARM 257A *	(<0.003)	0.025	.	0.0039	0.0005	0.005	0.0002	.	.	(0.01)	.	* Provisional Analysis
IARM 68C *	0.003	0.10	0.005	0.0611	0.0011	0.005	0.0002	.	.	0.034	.	* Provisional Analysis
IARM 63B	(<0.002)	0.0025	.	0.0041	0.0010	0.004	(0.0004)	.	.	(0.010)	(0.002)	
IARM 65B	(0.002)	0.0054	.	0.046	0.0013	0.006	0.0005	.	(0.06)	0.155	<0.001	
IARM 67B	(0.001)	0.008	.	0.060	0.0014	0.012	0.0010	.	(0.03)	0.054	(0.002)	
IARM 53C	0.004	0.070	.	0.0079	(0.0016)	0.006	(<0.0001)	.	.	0.029	<0.01	
IARM 69B	(0.0007)	0.074	.	0.0155	0.0011	0.013	0.0004	.	.	0.10	0.005	
IARM 53B	0.005	0.064	.	0.0095	.	0.008	0.0008	.	.	0.024	<0.01	
IARM 55B	0.002	0.004	.	0.016	0.0009	0.005	0.0010	.	(0.08)	0.005	(0.005)	
IARM 7B	(0.002)	0.062	.	0.0130	0.0026	0.018	(0.001)	.	.	0.048	.	
IARM 25B	0.0026	0.022	.	(0.015)	0.0056	0.015	0.001	.	.	0.098	.	
IARM 51B	.	0.16	.	0.0004	0.0022	0.011	0.002	.	.	(<0.01)	<0.01	
IARM 58A	(<0.001)	0.076	.	.	.	0.011	(<0.001)	.	(<0.01)	0.03	(<0.01)	
IARM 201A	(<0.002)	0.019	.	0.0053	(0.0009)	0.005	(0.0004)	.	.	0.011	<0.01	
IARM 202A	(<0.002)	0.13	.	0.0004	(0.0018)	0.011	0.032	.	(0.008)	(<0.01)	0.010	
IARM 203A	(0.002)	0.005	.	.	.	0.006	0.0009	.	.	(<0.01)	<0.01	
IARM 157A	.	0.023	.	0.20	.	0.014	0.001	.	.	0.044	.	
IARM 100A	(0.0015)	0.11	.	(0.16)	.	(0.012)	0.001	.	(0.59)	0.04	(0.02)	

**HASTELLOY CHIPS**

Number	C	Si	Mn	S	Cr	Mo	Co	V	W	P	Fe	Cu	Al	Ti	N
CRM	50 g units														
C215XHB50	0.150	1.32	0.44	0.002	0.03	26.0	2.47	0.14	.	0.053	3.05	0.05	0.19	0.03	0.008
C215XHC20	0.066	1.02	0.97	.	15.7	18.9	1.70	0.38	3.91	.	3.62	0.023	0.18	0.03	0.18
C215XHB10	0.056	0.48	1.21	0.026	0.84	33.6	0.094	0.87	.	0.006	7.71	0.054	0.31	(0.026)	0.042
RM	typical analysis 50 g units														
C215XHC50	0.67	1.04	0.27	0.078	19.9	15.5	0.13	0.60	5.5	0.085	10.96	.	.	.	.
C215XHC10	0.04	0.38	1.28	0.007	16.0	19.6	2.28	0.13	3.58	0.006	4.50	.	.	.	.

**IN 100 TYPE NICKEL ALLOY CHIPS**

analysis listed in mass %

Number	C	Cr	Mo	Al	B	Co	Ti	V	Zr	Fe	Si	Mn	Cu	N	Units
CRM															
BCS 345	0.153	9.93	3.01	5.58	0.019	14.70	4.74	1.00	0.044	.	.	.	.	.	100 g
BCS 346	(0.15)	(10)	(3)	(5.5)	.	(15)	(5)	(1)	.	.	.	.	.	.	100 g
RM	typical analysis														
C210X117750	0.023	10.45	3.18	7.00	.	14.90	5.70	0.46	.	1.02	0.37	0.125	0.008	0.003	50 g

continued analysis listed in mg/kg

Number	Mg	Sn	Pb	Bi	Ag	Se	Te	Tl	Sb	As	Cd	Ga	Zn	Ca	In
BCS 345	5	6	0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<2	(2)	<0.1	8	<0.5	(<5)	.
BCS 346	147	91	21	10	35	9	12	.	47	50	0.4	(52)	29	(36)	(19)
C210X117750	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

**CRM TRACE ELEMENTS IN SUPERALLOY CHIPS**

analysis listed in mg/kg

50 g units

Number	Ag	As	B	Bi	Cd	Ce	Cu	Hf	Ga	Ge	In	P	Pb	Sb	Sc	Se	Sn	Te	Tl	Zn
NCS HC11529	5.4	25	13	1.8	.	0.19	53	12	49	27	10	80	11	33	0.6	2.2	43	1.3	1.1	13
NCS HC11528	4.4	44	24	2.0	.	0.28	94	33	52	75	31	131	8.2	49	1.2	2.5	45	2.3	3.9	15
NCS HC11527	2.5	96	25	1.2	.	0.44	172	3.8	38	38	2.6	55	4.7	16	1.2	4.1	18	7.5	4.3	14
NCS HC11526	1.0	14	47	0.19	.	1.8	363	7.4	34	24	7.2	36	3.7	3.3	2.7	12	8.3	31	0.16	13
NCS HC11525	0.78	6.7	90	0.14	0.31	0.37	571	3.5	31	13	0.88	41	3.4	1.4	1.3	9.8	3.2	28	0.13	12

**CRM SILICON METAL POWDER**

analysis listed in mass %

analysis listed in mg/kg

Number	Al	C	Ca	Fe	S	Cr	Cu	Mg	Mn	Ni	P	Ti	V	Units
IPT 134	0.085	0.025	0.102	0.29	0.002	11	14	48	113	6	33	97	4	powder 60 g
IPT 135	0.045	0.018	0.011	0.125	0.002	6	8	12	70	5	27	113	3	powder 60 g

**CRM TIN POWDER**

analysis listed in mass %

Number	Ag	As	Cu	Fe	Pb	S	Sb	Zn	SiO <sub>2</sub>	Sn	WO <sub>3</sub>	Units
GBW 07231	0.0025	0.574	.	21.33	2.89	0.183	0.024	0.264	.	45.80	.	100 g
GBW 07232	.	0.306	0.043	9.53	1.62	0.090	0.016	0.120	0.93	.	0.182	100 g

**RM TIN CHIPS**

Number	Bi	C	Cu	Fe	Ni	Pb	S	Sb	Sn	Zn	Melting Point 'C	Units
BCS 192h	<0.0001	0.001	<0.0001	<0.0002	<0.0001	0.0007	0.0002	<0.0005	99.998	<0.0001	231.9	100 g chips

**CRM TIN CHIPS**

Number	Ag	Al	As	Au	Bi	Cd	Cu	Fe	In	Ni	Pb	Sb	Se	Te	Zn	Units
C74XHA	2.69	.	0.0076	.	0.057	0.0027	0.604	0.052	.	0.016	0.025	1.98	.	.	2.59	50 g
C74XE	0.742	.	0.088	.	0.0097	0.0021	3.01	0.052	.	0.011	0.0262	0.027	0.0025	.	<0.001	50 g
C74XHB	0.070	.	0.026	.	0.008	0.011	4.75	0.12	.	1.12	0.058	5.00	.	.	0.018	50 g
C71XSR20	0.029	0.003	0.057	0.008	0.057	0.042	0.055	<0.001	0.051	0.005	0.13	0.063	.	0.023	0.010	50 g
C71XSR10	0.009	0.001	0.004	0.003	0.01	0.008	0.01	<0.001	0.015	0.002	0.027	0.021	.	0.002	0.007	50 g
C71XSR30	0.007	0.003	0.077	0.003	0.10	0.022	0.10	0.001	0.030	0.002	0.28	0.14	.	0.008	0.015	50 g

**TIN BASE CHIPS**

Number	Cu	Sn	Zn	Pb	Ni	Fe	Sb	As	Bi	Cd	Ag	Al	In	Co	Au	Units
CRM																
GBW 02302	6.72	80.27	.	1.20	.	.	11.81	0.020	0.012	.	.	.	.	.	.	100 g
BCS 178/2	4.58	82.2	0.040	3.18	0.17	0.024	9.45	0.15	0.11	0.14	(0.002)	.	.	.	.	100 g
GBW 02301	4.06	86.61	.	1.32	.	.	7.87	0.018	0.014	.	.	.	.	.	.	100 g
BCS 347	0.169	62.6	0.0015	BAL	0.0072	(0.002)	0.191	(0.02)	0.080	0.004	0.099	.	.	.	0.037	100 g
BAM BNM 010	0.0417	63.40	(<0.0001)	36.47	0.0021	(0.0020)	0.0488	(0.012)	0.0245	0.0016	(0.014)	.	(<0.001)	.	(<0.001)	100 g
RM typical analysis																
C73XSC110	10.7	.	0.066	0.04	0.48	0.07	11.7	0.30	0.53	1.63	0.06	<0.005	.	.	.	50 g
C73XSC90	8.47	.	(0.003)	0.20	0.008	0.037	8.18	0.53	0.066	0.078	0.004	<0.001	0.010	0.0030	.	50 g
C73XSC70	6.51	.	(0.003)	0.356	0.008	0.046	14.01	0.047	0.009	0.0018	0.006	0.001	0.014	0.0160	.	50 g
C73XSC40	3.05	.	0.008	0.514	0.017	0.011	6.02	0.005	0.218	0.052	0.042	0.005	0.011	0.0035	.	50 g
C72XSA50R	0.018	.	0.035	0.08	.	(0.004)	4.93	0.015	0.006	0.05	.	.	.	.	.	50 g

**CRM TIN-LEAD SOLDER CHIPS**

Number	Sn	Sb	Bi	Cu	As	Ag	Fe	Zn	Cd	Ni	Au	In	Te	Units
C91XS63 PR20	62.6	0.614	0.162	0.052	0.080	0.057	0.030	0.007	0.0168	0.0073	0.090	0.019	0.009	100 g
C91XS63 PR40	66.8	0.093	0.030	0.021	<0.002	0.030	<0.005	<0.001	0.021	<0.005	0.05	0.014	0.006	100 g
C91XS63 PR10	63.0	0.28	0.06	0.009	0.007	0.01	0.003	<0.001	0.006	0.001	0.046	.	.	100 g
C91XS63 PR00	59.8	0.013	0.007	0.023	0.008	0.010	(0.002)	<0.001	0.012	<0.005	0.018	0.01	<0.001	100 g
C91XS30 PR30	30.88	0.269	0.294	0.102	0.0126	0.024	0.0016	(0.003)	0.0115	0.0269	0.0063	0.0085	.	100 g

**CRM TITANIUM BY POWDER METALLURGY**

available in 2 forms: (disc) 090A: 40 mm Ø x 20 mm or (cubes) 090B: 0.2g cubes, approx. 25g

Number	Al	B	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Sn	V	W	Zr
BCR 090	(0.074)	0.00282	0.0501	0.0533	0.0513	0.0563	0.0314	0.0488	(0.0492)	0.0667	(0.071)	(0.057)	(0.050)	(0.0436)

**TITANIUM BASE CHIPS**

Number	Al	V	Cr	Mo	Fe	Er	C	N	Si	Cu	Ni	Zr	Sn	Nb	Units
CRM															
GBW 02501	6.42	.	1.55	2.53	0.473	0.276	0.013	0.010	0.28	.	.	.	.	.	50 g
GBW 02502	6.33	.	.	3.40	0.057	1.71	0.0123	0.021	0.275	.	.	.	.	.	50 g
BCS 356 *	6.25	4.05	0.0112	0.0020	0.124	.	(0.0085)	0.0103	(0.0200)	0.0055	0.0070	.	.	.	50 g
BCS 357 *	5.46	3.53	0.0521	0.053	0.202	.	(0.0072)	0.0148	(0.0500)	0.0537	0.0511	.	.	.	50 g
RM typical analysis															
C101P8110	7.97	1.02	.	0.97	0.08	.	.	.	.	.	.	.	.	.	50 g
C101P3180	6.5	4.08	.	.	0.19	.	.	.	.	.	.	.	.	.	50 g
C101P6850	6.11	.	.	0.48	0.02	.	.	.	0.21	.	.	5.05	.	.	50 g
C101P8290	5.62	.	.	0.25	0.02	.	.	.	0.28	.	.	2.98	3.49	0.97	50 g
C101P5510	4.04	.	.	3.8	0.05	.	.	.	0.48	.	.	.	3.89	.	50 g
C101P6790	2.35	.	.	1.0	0.02	.	.	.	0.2	.	.	4.88	10.88	.	50 g

\* Certificate of Analysis also gives uncertified values for Sn, W, H, O, B, Zr and Y.

**RM TITANIUM BASE CHIPS**

Number	Grade	Al	C	Cr	Cu	Fe	H	Mo	N	Ni
IARM 174A	TI-CP Grade 4	0.013	0.009	(<0.01)	(<0.01)	0.15	0.0057	(<0.01)	0.0089	.
IARM 177A	TI-6-2-4-2	5.87	0.008	(<0.01)	<0.01	0.045	0.0060	2.00	0.0084	0.007

Number	O	Si	Sn	V	Zr	Units
IARM 174A	0.30	(<0.01)	(<0.01)	.	(<0.01)	100 g
IARM 177A	0.15	0.089	1.97	0.006	4.05	100 g

**CRM TUNGSTEN POWDER**

analysis listed in mg/kg except % which is mass %

Number	Al	Bi%	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Mo	Na	Ni	P	Si	Sn	WO <sub>3</sub> %	Units
BAM S002	29.4	.	46	45	47.0	28.4	53	40.0	38.8	16.7	59	41	29	(7.2)	106	42	.	100 g
VS 1710-79	.	0.146	.	.	.	.	.	.	.	.	.	.	.	.	.	.	71.6	100 g

**CRM TUNGSTEN ALLOY CHIPS**

analysis listed in mass %

Number	Co	Fe	Mn	Ni	Units
NCS HC55905	0.502	3.22	0.060	6.01	50 g
NCS HC55904	0.400	2.43	0.050	4.50	50 g
NCS HC55903	0.302	1.63	0.040	3.00	50 g
NCS HC55902	0.102	0.813	0.030	1.51	50 g

**CRM ZINC PELLETS**

Number	Pb	Cd	Fe	Cu	As	Sb	Sn	Units
GBW 02703	0.309	0.0733	0.0301	0.0021	0.0052	0.0106	0.0025	50 grams of 3 mm Ø pellets
GBW 02702	0.0142	0.0103	0.0097	0.00099	.	.	.	50 grams of 3 mm Ø pellets
GBW 02701	0.0030	0.0010	0.0010	0.00010	.	.	.	50 grams of 3 mm Ø pellets

**CRM ZINC POWDER**

150 g units

Number	Zn	Pb	Fe	CaO	S	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	MgO	Cd
IMN KC7	61.93	1.81	0.57	1.31	31.06	0.023	0.08	0.68	0.45
IMN KC5	61.23	1.91	1.14	1.23	31.63	0.053	0.10	0.075	0.42
IMN KC3	60.57	1.92	1.07	1.22	31.15	0.049	0.021	0.46	0.42
IMN KC8	59.52	2.20	0.88	2.37	29.58	0.029	0.14	1.21	0.40
IMN KC9	57.79	1.97	0.96	2.87	29.27	0.038	0.15	1.64	0.40
IMN KC4	56.10	2.41	1.35	3.31	28.85	0.053	0.14	0.46	0.40
IMN KC10	54.49	2.59	1.47	4.35	28.23	0.05	0.24	2.54	0.40
IMN KC2	37.45	3.95	1.74	11.40	25.42	0.11	0.63	0.69	0.28
IMN KC6	12.89	6.18	2.87	21.74	19.25	0.25	1.43	0.69	0.11

**CRM ZINC POWDER**

Number	As	Ag	Ca	Cd	Co	Cu	Fe	Hg	Mn	Pb	S	Sb	Zn	Units
CAN CZN-3	0.039	0.0045	0.058	0.248	0.685	0.009	9.97	(0.0005)	(0.0096)	0.113	31.6	(0.0010)	50.92	200 g

**CRM ZINC ALLOY CHIPS**

Number	Cu	Al	Fe	Pb	Sn	Cd	Mg	Zn	Units
CAN NZA-6	3.17	7.54	(0.105)	0.0005	0.0051	0.0147	0.00037	REM	50 g
CAN NZA-2	3.00	23.81	0.021	0.0076	0.0045	0.0047	0.029	REM	50 g
CAN NZA-4	2.45	26.65	0.027	0.0064	0.0087	0.0029	0.0106	REM	50 g
CAN NZA-3	2.00	25.89	0.066	0.0045	0.0034	0.0064	0.049	REM	50 g
CAN NZA-1	1.51	28.70	0.046	0.0030	0.0069	0.00098	0.020	REM	50 g
CAN NZA-5	1.04	10.85	(0.016)	0.0029	0.0017	0.0095	0.021	REM	50 g
GBW 02704	0.935	4.09	0.019	0.0050	0.00099	0.0024	0.040	REM	50 g
FNE U3C	0.80	1.03	0.0056	2.45	1.56	0.49	.	REM	100 g
FNE U1C	0.80	.	1.29	2.54	1.53	0.49	.	REM	100 g
FNE U4C	0.41	0.52	0.0016	1.03	0.82	0.210	.	REM	100 g
FNE U2C	0.41	.	0.56	1.07	0.84	0.210	.	REM	100 g
CAN NZA-7	0.212	13.17	(0.016)	0.0147	0.0116	0.00020	0.052	REM	50 g
FNE U5C	0.198	0.20	0.23	0.50	0.40	0.096	.	REM	100 g
FNE GDD	0.143	2.92	0.0082	0.0068	0.0011	0.0025	0.018	REM	100 g
FNE U7C	0.038	0.060	0.065	0.121	0.091	0.024	.	REM	100 g
FNE U8C	0.020	0.021	0.026	0.054	0.043	0.010	.	REM	100 g

ZINC ALLOY CHIPS

50 g units

Number	Pb	Mg	Al	Cd	Fe	Sn	Cu	Ni	Mn	Cr	In	Tl	Sb	Bi	Other
CRM															
C41X4380Z70	1.25	0.0028	0.137	0.015	(0.0044)	0.0047	0.012	0.012	.	0.0045	.	.	0.090	.	Ti: 0.009
C41X0336Z10	0.95	0.0049	0.014	0.0056	0.0124	0.005	0.007	(0.0006)	0.0035	.	.	.	.	.	.
C41X4380Z40	0.325	0.126	0.144	0.094	0.056	0.038	0.0022	0.0040	0.0007	.	.	.	0.017	0.011	Ti: 0.005
C41X4380Z10	0.068	0.0012	0.055	0.376	0.01	0.049	0.175	0.0029	0.0015	0.002	.	.	0.002	0.0017	Si: 0.006
C41XZ50	0.0235	0.012	0.13	0.024	(0.02)	0.0213	0.023	0.0116	0.004	.	0.004	0.003	0.006	.	.
C43XZ120	0.0133	0.027	10.05	0.0114	0.047	0.0089	0.796	0.0035	0.0059	0.0023	.	.	0.0039	.	Ti: 0.0054
C43XZ30	0.0132	0.0143	3.64	0.0132	0.061	0.0125	1.59	0.0061	0.0125	0.004	.	.	0.003	0.018	Si: 0.005
C41X0336Z30	0.019	0.134	0.43	0.341	0.270	0.111	0.361	.	0.0058	.	.	.	.	.	.
C43XZ130	0.012	0.020	9.58	0.0102	0.06	0.011	0.977	0.011	0.007	.	.	.	0.009	.	.
C42XZ40	0.011	0.057	3.55	0.008	0.01	0.006	0.063	0.017	0.008	.	0.001	0.003	0.002	.	Ce: 0.020 La: 0.019
C42XZ70	0.0097	0.0095	4.39	0.030	0.027	0.012	0.0249	0.0067	0.0045	.	.	.	.	.	Ce: 0.053 Si: 0.006 La: 0.047
C41XZ40	0.0092	0.0019	0.0096	0.0066	0.003	0.0070	0.0047	0.0069	0.0012	.	0.0015	0.003	.	.	Ti: <0.0005
C41XGLV30	0.0080	.	0.32	0.021	0.012	0.006	0.019	0.030	.	.	.	.	0.048	0.0011	As: <0.001
C41XZ30	0.0052	0.0009	0.0083	0.0044	0.002	0.0039	0.0019	0.0031	0.0007	.	0.0007	0.002	.	.	Ti: 0.0012
C42XZ50	0.0047	0.073	4.22	0.0021	0.029	0.002	0.100	0.019	0.0070	0.0017	0.0050	0.0056	0.005	0.006	Ce: 0.011 La: 0.009
C41XGLV40	0.0038	.	0.201	(0.0001)	0.017	<0.005	0.0009	0.049	.	.	.	.	0.025	0.0051	As: <0.002
C43XZ60	0.0016	0.0256	4.02	0.0016	0.019	0.0053	2.72	0.029	0.0006	0.0006	.	.	0.0045	0.049	Ti: 0.0013
C41XZ10	0.0015	0.0003	0.0002	0.0001	0.0004	<0.0001	0.0006	0.0001	0.0002	.	<0.001	0.0003	0.0004	.	.
RM															
C41X0336Z40	2.87	0.179	1.39	0.638	(0.018)	2.38	0.874	0.0074	0.038	.	.	.	0.048	0.027	Ag: 0.0023 As: 0.0005
C41X4380Z80	0.73	0.007	0.225	0.0079	0.003	0.011	0.020	0.024	0.0015	0.0019	.	.	0.016	0.011	Ti: 0.012
C41XGLV20	0.214	.	0.070	0.0026	0.048	0.003	0.0053	0.0071	.	.	.	.	0.007	0.017	As: <0.001
C41XGLV10	0.056	.	0.115	0.0093	0.059	0.010	0.0028	0.0141	.	.	.	.	<0.001	0.0025	As: <0.001
C41XGLV50	0.019	.	0.014	0.014	0.077	0.020	0.0116	0.0029	.	.	.	.	0.163	0.0105	As: 0.004
C43XZ110	0.015	0.05	11.2	0.014	0.008	0.02	0.47	0.006	0.01	.	.	.	.	.	.
C43XZ20	0.008	0.042	3.2	0.01	0.02	0.01	0.89	0.003	0.008	.	.	.	.	.	.
C43XZ210	0.007	0.06	24.9	0.01	0.05	0.01	2.05	0.002	0.009	.	.	.	.	.	.
C42XZ30	0.0060	0.0287	3.74	0.0048	(0.047)	0.0030	0.159	0.0102	0.0256	0.0020	.	.	0.003	.	Si: 0.015
C43XZ150	0.003	0.01	8.1	0.002	0.004	0.004	1.37	0.006	0.002	.	.	.	.	.	.
C43XZ40	(0.0022)	0.044	4.79	0.0025	(0.064)	(0.0023)	3.22	0.0286	0.088	0.0063	.	.	0.005	0.012	Ti: 0.0020
C43XZ230	0.002	0.01	29.8	0.002	0.008	0.003	2.73	0.003	0.002	.	.	.	.	.	.
C42XZ10	0.002	<0.001	4.3	<0.001	0.002	0.002	0.003	0.001	<0.001	.	.	.	.	.	.

RM ZINC SPELTER CHIPS

50 g units

Number	Pb	Al	Fe	Sb	Cu	Sn
BS SPD	0.038	0.25	0.060	0.006	<0.0005	<0.001
BS SPB	0.021	0.141	0.025	0.061	<0.002	<0.001
BS SPC	0.005	0.185	0.041	0.031	<0.0005	<0.001
BS SPA	0.003	0.051	0.011	0.099	<0.0005	<0.001

CRM ZIRCALOY-4 CHIPS

analysis listed in mg/kg

10 g units

Number	Cr	Fe	Hf	Sn
BCR 098	906	2143	77.6	14600