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## CRM ALUMINUM BASE CHIPS

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

Number	Si	Cr	Cu	Fe	Mg	Mn	Ni	Pb	Sn	Sr	Ti	V	Zn	Zr	Al	B*	Be	Cd	Ga	Units
RAM 201	13.20	.	0.009	0.18	0.0024	0.38	0.20	0.09	0.17	.	0.011	.	0.038	.	.	.	.	.	.	100 g
BCS 505	12.8	.	0.05	0.30	0.05	0.52	0.046	0.056	0.027	.	0.03	.	0.24	.	.	.	.	.	.	100 g
BCS 182/3	11.03	.	0.037	0.51	0.067	0.26	0.37	0.11	0.10	0.018	0.065	(0.014)	0.128	(0.003)	.	Ca:(0.002)	.	.	.	100 g
SRM 856a	9.21	0.060	3.50	0.85	0.063	0.35	0.046	0.11	0.10	0.018	0.065	(0.014)	0.96	(0.003)	.	Ca:(0.002)	.	.	.	30 g
SRM 855a	7.07	0.013	0.13	0.14	0.37	0.060	0.016	0.019	0.010	0.018	0.15	(0.012)	0.085	(0.003)	.	Ca:(0.001)	.	.	.	30 g
NGS HC28974-A1	7.03	.	3.73	0.51	0.071	0.062	0.048	0.093	0.057	.	0.005	<0.01	0.385	.	.	.	.	0.020	.	50 g
SRM 87a	6.24	0.11	0.30	0.61	0.37	0.26	0.57	0.093	0.057	.	0.18	.	0.16	.	.	.	.	.	.	75 g
NM 511	6.150	.	0.295	0.790	.	0.195	.	.	.	.	.	.	.	.	.	.	.	.	.	100 g
BCS 268/1	5.49	.	1.35	0.47	0.49	0.24	0.16	0.028	0.031	.	(0.008)	.	0.028	.	.	.	.	.	.	100 g
BCS 380/1	1.93	.	0.91	1.24	0.24	0.094	0.94	0.077	0.074	.	0.024	.	0.025	.	56.18	.	.	.	.	100 g
SRM 2426	1.925	.	.	0.454	.	.	.	.	.	.	.	.	38.92	.	.	.	.	.	.	40 g
BCS 349	1.19	<0.001	3.40	0.154	0.024	0.111	.	0.077	0.074	.	0.034	.	0.299	.	.	.	.	.	.	100 g
SRM 858	0.79	0.0011	0.84	0.078	1.01	0.48	0.0006	0.052	0.052	.	0.042	0.0030	1.04	.	.	<0.0001	.	.	.	35 g
BCS 216/3	0.74	0.110	5.45	0.77	0.76	0.76	0.24	0.052	0.052	.	0.20	.	0.214	0.086	.	.	.	.	.	100 g
BCS 343	0.52	0.14	0.28	0.39	0.70	0.69	0.24	0.052	0.052	.	0.024	.	0.028	.	.	.	.	.	.	100 g
BCS 181/3	0.30	0.04	2.48	0.72	1.57	1.10	2.00	0.101	.	.	0.058	.	2.52	.	.	.	.	.	.	100 g
SRM 853a	0.1810	<0.0005	0.1504	0.504	1.092	1.251	0.00429	<0.003	(0.0003)	<0.0001	0.0205	0.01842	0.0514	(0.0023)	.	.	.	0.0176	.	40 g
GBW 02202	0.18	.	0.095	0.38	0.021	1.38	0.013	0.032	0.032	.	0.036	.	0.10	.	.	.	.	.	.	100 g
BCS 262/1	0.16	(0.002)	0.039	0.20	10.75	0.084	0.071	(0.05)	(0.04)	.	0.005	.	0.085	.	.	<0.01	.	.	.	100 g
SRM 854a	0.1553	0.0340	0.0494	0.1990	4.474	0.3753	0.0195	.	.	(0.0002)	0.0335	0.0174	0.0505	.	.	.	(0.0006)	0.0185	.	40 g
BCS 300/1	0.14	0.13	1.27	0.24	2.74	0.33	.	0.014	.	.	0.09	.	5.87	0.18	.	.	.	.	.	100 g
RAM 300	0.14	0.216	0.040	0.198	2.68	0.018	.	.	.	.	0.012	.	0.128	.	.	.	.	.	.	100 g
BCS 263/2	0.14	0.074	0.019	0.26	4.67	0.36	.	.	.	.	0.022	.	0.056	.	.	<0.01	.	.	.	100 g
RAM 301	0.062	.	0.0018	0.054	0.0008	(0.001)	.	.	.	.	0.0046	0.0018	0.036	.	.	.	.	.	.	100 g
BCS 1959	0.035	.	0.001	0.080	2.21	0.001	.	.	.	.	0.0196	0.004	0.015	.	99.85	.	.	0.009	.	100 g
GBW 02222	0.0069	.	2.30	1.41	0.00094	0.000282	0.000173	.	.	.	0.000196	.	6.21	0.127	.	1.98	.	.	.	50 g
JSAC 0121-C	0.00110	0.000113	0.000348	0.00094	0.000282	0.000173	.	.	.	.	0.000196	.	0.000203	0.000202	.	.	.	.	.	50 g

ALUMINUM BASE CHIPS

# = class, where 1 = CRM and 2 = RM

typical analysis

Table with columns: #, Number, Si, Co, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Sn, Ti, V, Zn, Be, Bi, Cd, Ga, Li, Sb, Zr, Units. Lists various aluminum base chip grades and their typical chemical compositions.

Table with columns: Number, Si, Co, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Sn, Ti, V, Zn, Be, Bi, Cd, Ga, Li, Sb, Zr, Units. Continuation of aluminum base chip grades and their typical chemical compositions.

\* C54XG13H40 also contains Sr: 0.026

**RM ARSENIC**

Number	As	Units
BM As	99.999	50 g chips

**RM ANTIMONY**

Number	Sb	As	Fe	Pb	Si	Sn	Units
BM Sb	99.999	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	100 g chips

**RM BISMUTH**

Number	Bi	Ag	As	Co	Cu	Fe	Pb	Sb	Zn	Units
BM Bi	99.97	<0.0001	<0.0001	<0.003	<0.0001	<0.001	<0.02	<0.0002	<0.003	100 g chips

**RM CADMIUM**

Number	Cd	Cu	Fe	Pb	Ti	Zn	Units
BM Cd	99.96	<0.01	<0.002	<0.02	<0.003	<0.004	100 g chips

**CRM CHROMIUM**

analysis listed in mass %

BCS: 100 g powder

VS: 100 g chips

Number	Cr	Al	C	Cu	Fe	N	O	S	Si	Ti
VS F36	99.9	.	0.0027	0.00038	.	0.0026	(0.005)	0.0019	0.0039	0.0069 last
BCS 361	.	(0.083T)	0.0039	.	0.0920	0.0079	0.1010	0.0043	0.0449	.

**COBALT BASE CHIPS**

# = class, where 1 = CRM 100g and 2 = RM, typical analysis, 30g

Number	Cr	Co	C	Fe	Mn	Mo	N	Nb	Ni	Si	Ti	W
ECRM 378-1C	28.22	.	1.181	0.606	0.0579	0.0503	.	.	0.617	1.172	.	4.43
IARM 96B	20.54	49.4	0.132	2.29	1.39	1.17	0.007	0.046	10.04	0.16	0.007	14.52
BAM 328-1	20.54	41.65	0.390	2.40	1.395	4.41	0.027	3.61	20.54	0.629	.	4.16
SRM 862	20.0	51.5	0.120	1.80	1.59	.	0.026	.	9.74	0.017	.	15.1

Number	Al	B	Cu	Mg	O	P	S	Sn	Ta	V	Zr
ECRM 378-1C	.	.	.	.	.	(0.0023)	0.0055	.	.	.	.
IARM 96B	0.035	0.0021	0.047	(0.0005)	0.002	0.0063	0.0005	.	0.028	0.012	0.007
BAM 328-1	0.070	.	0.013	.	.	0.005	.	.	0.18	.	.
SRM 862	.	.	0.0010	.	.	0.002	0.0008	.	.	0.005	.

**CRM Co/Fe/V ALLOY PERMENDUR 2V**

analysis listed in mass %

31 mm Ø x 2 or 18 mm

Number	Co	Fe	V	Al	C	Mn	P	S	Si	Cu	Ni	Cr	Mo
IARM 326A	48.4	49.6	1.94	(0.003)	(0.002)	0.003	0.0013	0.0011	0.029	(0.002)	0.037	(0.002)	(0.002)

Number	As	B	Mg	N	Nb	O	Sn	Ta	Ti	W	Zr
IARM 326A	<0.005	(0.001)	(0.001)	0.0004	0.038	0.0082	<0.001	(0.01)	(0.002)	(0.001)	0.002

**CRM COPPER IN VARIOUS FORMS**

analysis listed in mg/g ERM-EB074A: disc 39 mm Ø x 30 mm ERM-EB074B: Rod 8 mm Ø x 100 mm ERM-EB074C: Chips 50 g five other trace elements

Ag	As	Au	Be	Bi	Cd	Co	Cr	Fe	In	Mg	Mn	Ni	P	Pb	S	Sb	Se	Sn	Te	Ti	Zn	Zr
1.03	1.23	0.52	0.31	0.51	0.40	0.83	0.37	5.8	0.49	2.03	0.93	0.61	1.53	2.7	(3.3)	0.57	0.55	(1.5)	0.50	0.97	2.2	(8.8)

**CRM COPPER CHIPS AND PINS**

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

IMN 001: 50 g of 0.31 g pins all others: chips as noted

Number Units	Ag	As	Au	Bi	Cd	Co	Cr	Cu%	Fe	Mn	Ni	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	
SRM 454	286	46	7.5	19	.	.	99.84	.	.	.	.	.	66	.	24	479	.	2.2	27	7	35 g
SRM 400	181	140	.	24.5	.	0.6	99.70	41	.	603	.	128	.	102	214	.	.	153	114	50 g	50 g
SRM 399	117	47	.	10.5	.	0.5	99.79	20.0	.	506	.	114	.	30	95	.	.	50	45	50 g	50 g
IMN 001	27.59	3.17	.	1.42	(0.11)	2.04	3.55	.	(13.9)	5.18	3.42	.	4.28	(6.0)	2.33	1.38	.	3.31	1.23	4.57	above
IMN 5	10	4.0	.	0.096	.	8.1	.	.	4.5	(1.3)	4.4	.	27	.	(0.92)	.	(2.6)	4.6	.	(13)	200 g
BCR 017B	.	.	.	.	.	.	.	.	.	.	.	6.9	.	10.4	.	.	.	.	.	.	50 g

**CRM COPPER CHIPS**

analysis listed in mass %

C39X: typical analysis 50 g

BAM, BCS, IARM: 100 g

IPT: 50 g

IMN: 200 g

Number	Cu	Ag	Al	As	Au	B	Be	Bi	C	Cd	Co	Cr	Fe	Mg
IPT 64	99.98	0.0010	(<0.0006)	(0.0002)	.	.	.	(<0.0001)	.	.	.	.	0.00045	.
IARM 278A	99.5	(0.001)	<0.002	(0.001)	.	.	.	(0.001)	(0.003)	.	(0.001)	(0.001)	0.004	.
IARM 279A	99.1	(0.003)	(0.002)	(0.002)	.	.	.	(0.001)	(0.002)	.	(0.002)	0.86	0.025	.
BCS 399	REM	.	.	(<0.001)	.	.	.	(0.001)	.	(0.003)	.	.	(0.006)	.
IMN 4	REM	0.21	.	0.054	.	.	.	(0.0011)	.	.	0.0010	<0.00005	0.0010	.
C39X 178700	.	0.0468	0.0012	0.0033	0.0009	.	.	0.0470	.	0.0305	0.0017	.	.	.
C39X 178710	.	0.025	<0.0005	0.029	0.0048	.	.	0.069	.	0.0031	0.0008	.	.	.
C39X 178680	.	0.0249	0.0072	0.0226	0.0101	.	.	0.0308	.	0.0130	0.0248	.	0.110	0.0085
C39X 178660	.	<0.001	<0.002	0.037	.	.	.	0.001	.	<0.001	0.003	0.002	<0.001	<0.001

Number	Mn	Ni	O	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)
IARM 278A	(0.0004)	<0.005	(0.0004)	0.011	(0.003)	0.002	<0.005	.	(0.002)	(0.001)	0.53	(0.002)
IARM 279A	(0.002)	0.014	(0.001)	(0.005)	(0.01)	0.0015	(0.004)	.	0.020	0.021	.	(0.01)
BCS 399	.	(0.002)	.	0.045	(0.002)	.	(<0.001)	.	.	(0.003)	.	(0.003)
IMN 4	<0.00003	0.078	.	.	0.20	.	(0.0041)	.	(0.00029)	0.00044	.	(0.0017)
C39X 178700	Ge:0.0076	0.0062	In:0.0078	0.0012	0.0447	0.0026	0.0478	0.0261	.	0.0031	0.0011	0.129
C39X 178710	0.0010	0.027	.	<0.0005	0.0092	0.0080	0.017	0.028	<0.0005	.	0.011	.
C39X 178680	0.0123	0.0222	.	0.0507	0.1040	0.022	0.0295	0.0133	.	0.103	0.0206	0.197
C39X 178660	<0.001	0.034	.	<0.002	<0.001	0.003	<0.001	.	<0.005	0.013	<0.001	0.005

**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

**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 %

CETEM: 160 g

VS: 50 g

Number	Cu	S.Cu	Al <sub>2</sub> O <sub>3</sub>	C	CaO	Cd	Fe	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	MgO	Mn	Na <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	Pb	S	SiO <sub>2</sub>	Zn	LOI
VS 2891-84	40.4	.	.	.	.	0.029	(5.78)	.	.	.	.	.	.	2.25	(15.98)	(21.74)	2.89	.
CETEM CBPA-2	27.9	(0.6)	1.57	(0.07)	1.21	(0.0004)	.	39.6	(0.22)	0.79	(0.0048)	0.35	(0.38)	0.0112	(30.6)	(6.3)	0.0096	(14.5)

continued analysis listed in mg/kg

Number	Ag	As	Au	Ce	Co	Cr	F	La	Mo	Ni	Re	Se	Sm	Sr	Th	Ti	U	Zr
VS 2891-94	7.077	.	.	.	.	.	.	.	.	.	28.2	.	.	.	.	.	.	.
CETEM CBPA-2	12	(9)	(8)	(43)	444	20	(322)	(21)	(54)	(2030)	.	(38)	(3.3)	(25)	(7)	(600)	(3.9)	(21)

**CRM SEBILOY / ENVIROBRASS / FEDERALLOY CHIPS**

analysis listed in mass %

C32X: typical analysis

100 g units

Number	Bi	Se	Sn	Zn	Cu	As	Co	Fe	Ni	P	Pb	Sb	Si
C32X SEB10	5.77	0.895	3.83	11.57	(76.7)	0.051	0.0108	0.059	0.118	0.025	0.564	0.354	.
C32X SEB20	4.35	0.027	9.40	3.75	81.8	0.009	0.013	0.078	0.078	0.014	0.42	0.013	.
IARM 264A	3.6	(0.001)	3.03	5.33	(87.3)	(0.004)	(0.001)	0.048	0.54	0.027	0.057	0.074	0.003
IARM 263A	2.55	(0.002)	3.5	15.8	(78)	0.003	0.001	0.047	0.66	0.040	0.022	0.06	0.003
IARM 265A	2.4	(0.002)	4.4	2.45	(90)	(0.005)	(0.001)	0.013	0.69	0.024	0.011	0.015	0.003
IARM 266A	2.37	0.001	6.9	3.48	(87)	0.004	(0.001)	0.035	0.46	0.032	0.010	0.010	0.002
C32X SEB40	2.69	0.115	9.29	8.55	78.58	0.0011	0.476	0.365	0.0092	0.006	0.010	0.0055	.
IARM 227A	2.3	1.21	5.1	4.70	85.9	0.003	0.001	0.060	0.53	0.003	0.042	<0.01	0.002
IARM 226A	1.7	0.93	5.1	4.8	86.7	0.003	0.001	0.054	0.54	0.005	0.040	0.004	0.002
IARM 228A	1.53	0.67	4.1	4.1	89.0	0.003	0.001	0.052	0.45	0.032	0.026	0.010	0.002
C32X SEB50	1.17	0.512	5.28	6.64	85.5	0.0121	0.0048	0.360	0.308	0.183	0.0149	0.0344	.

Number	Ag	Al	B	C	Cd	Cr	Mn	N	O	S
C32X SEB10	.	.	.	.	.	.	.	.	.	.
C32X SEB20	.	.	.	.	.	.	.	.	.	.
IARM 264A	(0.005)	0.003	.	(0.004)	.	(0.002)	(0.002)	.	.	0.0013
IARM 263A	(0.006)	(0.002)	.	<0.005	.	(0.002)	(0.002)	.	.	(0.002)
IARM 265A	(0.002)	0.003	.	.	.	(0.001)	(0.002)	.	.	(0.002)
IARM 266A	(0.001)	0.002	.	(0.002)	.	(0.002)	(0.002)	.	.	(0.002)
C32X SEB40	.	.	0.0021	.	0.0004	.	.	.	.	.
IARM 227A	0.004	0.002	.	0.003	.	(0.001)	0.001	(0.0002)	0.0013	0.005
IARM 226A	0.004	0.002	.	0.003	.	(0.001)	0.002	<0.0005	(0.001)	0.005
IARM 228A	0.003	0.002	.	0.003	.	0.001	0.001	<0.0005	(0.002)	0.004
C32X SEB50	.	.	0.0028	.	0.0067	.	.	.	.	.

## COPPER BASE CHIPS

# = class, where 1 = CRM and 2 = RM C36X, DH: typical analysis 50 g GBW: 95 g SRM: 50 g others: 100 g

#	Number	Sn	Al	Fe	Mn	Ni	Pb	Zn	Be	Bi	Co	Se
2	DH 0209	11.92	.	.	.	0.265	0.542	.	.	.	.	.
1	BAM 228	9.76	(0.0001)	0.036	(<0.001)	0.109	1.24	3.32	.	0.0086	.	0.0012
2	DH 0201	8.84	0.022	0.677	0.035	0.795	1.17	6.30	.	0.006	.	.
2	DH 0208	4.78	4.15	2.54	0.711	2.82	1.31	1.85	.	.	.	.
2	DH 0206	2.78	0.059	1.79	0.044	0.221	0.891	10.89	.	.	.	.
2	DH 0203	2.17	12.50	5.76	0.057	.	0.59	1.36	.	.	.	.
2	DH 0204	2.16	12.51	5.70	0.057	.	0.58	1.36	.	.	.	.
2	DH 0205	2.14	12.53	5.66	0.056	.	0.76	1.36	.	.	.	.
2	DH 0207	0.74	.	0.936	0.027	0.174	2.16	30.20	.	.	.	.
2	DH 0202	0.381	.	0.911	0.007	0.034	0.139	0.229	.	.	.	.
1	C37X2180	0.018	0.0025	0.075	0.084	2.51	0.0025	0.029	.	.	.	.
2	C36XCBC40	0.01	0.06	0.09	0.003	0.04	0.30	0.02	1.82	.	2.44	.
1	IARM 158B	0.01	0.002	0.090	0.019	0.32	0.01	0.014	.	.	0.002	.
1	IARM 158C	0.01	0.002	0.090	0.019	0.32	0.01	0.014	.	.	0.002	.
1	SRM 460	0.006	0.048	0.098	.	0.031	0.258	0.004	1.86	.	0.217	.
1	SRM 459	0.005	0.044	0.079	.	0.039	0.001	0.002	1.82	.	0.221	.
1	IARM 71B	0.005	0.040	0.042	0.0010	0.021	0.006	0.005	1.84	.	0.21	.
1	SRM 458	0.004	0.030	0.060	.	1.60	0.002	0.002	0.360	.	0.076	.
2	C36XCBC20	0.004	0.03	0.02	(<0.01)	0.07	0.004	0.03	0.56	.	0.13	.
1	C37X2260	0.0032	0.0020	1.52	0.582	0.0024	(0.001)	2.82	.	.	.	.
2	C36XCBC10	0.002	0.02	0.03	(<0.01)	1.88	0.002	(<0.01)	0.42	.	0.23	.
2	IARM 160A	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	.	.	(<0.01)	.
2	IARM 159A	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	.	.	(<0.01)	.
2	C36XCBC30	(<0.002)	0.02	0.04	(<0.01)	0.02	0.003	0.02	1.81	.	.	.

Number	Ag	As	C	Cr	Mg	O	P	S	Sb	Si	Zr	Cu
DH 0209	.	.	.	.	.	.	.	.	.	.	.	87.07
BAM 228	.	0.024	.	.	.	.	0.019	0.036	0.078	.	.	85.34
DH 0201	.	0.076	.	.	.	.	0.046	.	0.104	.	.	81.84
DH 0208	.	.	.	0.009	.	.	0.027	.	0.083	0.052	.	81.67
DH 0206	.	0.025	.	.	.	.	0.017	0.059	0.060	0.043	.	83.05
DH 0203	.	.	.	.	.	.	.	.	0.329	0.23	.	76.88
DH 0204	.	.	.	0.009	.	.	0.007	.	0.336	0.22	.	77.00
DH 0205	.	.	.	.	.	.	0.008	.	0.350	0.22	.	76.82
DH 0207	.	.	.	.	.	.	.	.	0.014	.	.	65.66
DH 0202	.	.	.	0.003	.	.	.	0.037	0.008	.	.	98.15
C37X2180	.	.	(0.002)	0.033	.	.	0.0015	0.006	.	0.56	.	96.60
C36XCBC40	.	.	.	0.01	.	.	.	.	.	0.09	.	.
IARM 158B	(0.01)	(0.001)	0.002	0.85	.	0.002	0.005	0.003	0.002	0.02	.	98.5
IARM 158C	(0.01)	(0.001)	0.002	1.04	.	0.002	0.005	0.003	0.002	0.02	.	98.5
SRM 460	.	.	.	0.005	0.005	.	.	.	.	0.077	.	(97.5)
SRM 459	.	.	.	0.005	0.007	.	.	.	.	0.077	.	(97.7)
IARM 71B	(0.002)	.	0.003	0.0030	.	.	0.004	(0.0004)	(0.002)	0.060	.	97.7
SRM 458	.	.	.	0.004	0.003	.	.	.	.	0.035	.	(97.9)
C36XCBC20	.	.	.	0.005	.	.	.	.	.	0.05	.	.
C37X2260	.	.	0.006	0.003	.	.	0.0025	0.0005	.	3.54	.	91.58
C36XCBC10	.	.	.	0.005	.	.	.	.	.	0.04	.	.
IARM 160A	3.03	.	0.003	(<0.01)	.	.	(0.004)	(<0.003)	.	(<0.01)	0.40	.
IARM 159A	3.48	.	(0.002)	(<0.01)	.	.	(<0.01)	(<0.01)	.	(<0.01)	.	.
C36XCBC30	.	.	.	0.005	.	.	.	.	.	0.06	.	.

## CUPRO-NICKEL AND COPPER-NICKEL-SILVER CHIPS

# = class, where 1 = CRM and 2 = RM

100 g units

#	Number	Ni	Zn	Ag	Al	C	Co	Cr	Cu	Fe	Mg	Mn	P	Pb	S	Si
1	C36XCN60	33.46	0.026	.	(0.0024)	0.0180	0.0440	1.10	63.35	0.878	.	0.451	0.031	0.0066	0.0109	0.144
1	IARM 85C	31.3	0.057	<0.002	<0.01	0.008	0.016	0.002	67.3	0.63	0.01	0.65	(0.003)	0.004	(0.002)	0.01
1	BCS 180/2	30.35	.	.	.	0.04	.	.	68.12	0.68	.	0.75	.	(0.003)	0.006	(0.018)
2	C36XCN40	30.2	.	.	.	.	0.04	.	.	0.50	0.003	0.33	.	0.015	.	0.54
1	IARM 236A	30.0	0.002	.	0.003	0.010	0.004	0.002	66.7	0.91	.	1.04	0.003	0.004	0.003	0.19
1	C36XCN100	29.3	.	.	.	0.064	0.081	1.59	61.01	4.28	0.0026	0.262	(0.020)	0.004	0.055	1.02
2	C36XCN90	28.1	.	.	.	0.02	<0.01	2.19	.	0.93	.	1.20	0.016	0.05	0.002	0.56
1	SRM 880	18.13	27.3	.	.	.	.	.	54.51	(0.004)	.	<0.001	.	(0.002)	.	.
1	C34XNS50	17.16	(23)	0.0102	0.674	.	0.197	0.0014	55.11	0.717	0.704	0.127	0.067	1.29	.	0.158
1	GBW 02104	14.87	20.81	.	.	.	.	.	Rem	0.47	0.033	0.32	0.0048	0.019	.	0.146
2	C34XNS30	14.86	17.94	0.108	0.038	0.014	0.102	.	66.30	0.201	0.0011	0.129	0.013	0.155	0.063	0.018
1	SRM 875	10.42	0.11	.	.	(0.0035)	.	.	87.83	1.45	(0.0010)	<0.0007	0.0020	0.0092	(0.0011)	(0.0008)
1	SRM 874	10.18	(0.002)	.	.	(0.0023)	.	.	88.49	1.22	(0.0002)	0.0020	(0.002)	<0.0005	(0.0011)	(0.0006)
1	IARM 84B	10.03	0.082	0.005	(0.002)	(0.01)	0.013	(0.003)	87.9	1.30	.	0.62	0.004	0.008	0.008	0.01
2	C36XCN10	9.5	.	.	.	.	0.10	.	.	1.94	0.015	1.91	.	0.05	.	0.19
2	CURM 62.12	7.94	0.180	.	.	.	0.081	.	89.42	0.45	0.002	1.59	.	0.053	0.034	0.109
2	C34XNS10	7.67	29.0	.	.	.	.	.	.	0.05	.	0.02	0.010	0.05	<0.002	0.03

Number	As	B	Bi	N	Nb	O	Sb	Sn	Ti	Zr
C36XCN60	.	(0.0015)	0.0058	.	0.514	.	.	0.0307	0.0066	.
IARM 85C	0.0009	.	.	.	.	.	.	0.005	.	.
BCS 180/2	.	.	.	.	.	.	.	.	.	.
C36XCN40	.	.	.	.	.	.	.	.	.	.
IARM 236A	.	.	0.003	0.0002	.	0.002	<0.005	0.005	.	.
C36XCN100	.	0.0029	0.014	.	0.89	.	.	.	0.03	(0.055)
C36XCN90	.	0.005	<0.01	.	.	.	.	.	0.12	0.13
SRM 880	.	.	.	.	.	.	.	.	.	.
C34XNS50	.	.	.	.	.	.	.	0.194	.	.
GBW 02104	0.0098	.	0.0019	.	.	.	0.0020	.	.	.
C34XNS30	.	.	.	.	.	.	.	.	.	.
SRM 875	(0.0010)	.	(0.003)	Cd: 0.0022	(0.14)	<0.001	(0.009)	(0.0002)	Se: (0.0004)	.
SRM 874	(0.0006)	.	<0.0002	Cd: <0.0002	(0.06)	<0.001	0.007	(0.0001)	Se: 0.00015	.
IARM 84B	.	.	.	.	.	(0.002)	0.014	.	.	.
C36XCN10	.	.	.	.	.	.	.	.	.	.
CURM 62.12	.	.	.	.	.	.	.	0.111	.	.
C34XNS10	.	.	.	.	.	.	.	.	.	.

## GUN METAL CHIPS

# = class, where 1 = CRM and 2 = RM

C33X: typical analysis

100 g units

#	Number	Sn	Ni	Pb	Zn	Cu	Ag	Al	As	Bi	Cr	Fe	Mn	P	S	Sb	Si
1	BCS 207/2	9.74	0.28	0.70	1.60	87.35	.	0.013	0.066	0.04	.	0.029	.	(0.018)	.	0.10	0.016
1	C33XGM70	9.23	0.36	0.78	2.06	.	.	0.03	0.12	0.08	.	0.05	0.18	0.067	0.001	0.06	0.09
1	C33XGM60	7.31	1.069	3.11	2.99	84.46	0.0114	0.136	0.175	0.037	0.0019	0.131	0.0912	0.0566	0.07	0.258	0.124
1	BCS 183/4	7.27	1.30	3.15	3.47	84.08	.	(0.002)	0.13	0.005	.	0.056	(0.01)	0.090	0.11	0.23	(0.01)
2	CURM 71.32	6.46	0.70	4.43	6.52	80.48	0.34	0.12	0.25	0.051	0.05	0.35	0.046	0.016	0.08	0.26	0.022
1	C33XGM290	6.12	0.029	0.052	4.27	89.30	0.0025	(0.0004)	0.0017	0.0020	0.0004	0.011	0.0005	0.136	0.002	0.0015	0.0030
1	CURM 71.33	4.96	0.938	6.84	3.60	83.60	<0.002	<0.001	<0.001	<0.002	<0.0005	0.018	<0.0005	<0.001	<0.001	<0.002	<0.005
1	C33XGM50	4.47	0.697	4.81	5.80	83.38	0.0419	0.084	0.0342	0.0493	cd: 0.0034	0.254	Co: 0.0453	0.042	0.0697	0.0505	0.0283
2	CURM 71.31	4.06	1.98	6.07	3.98	83.00	0.046	0.023	0.110	0.030	0.039	0.118	0.037	0.060	0.059	0.128	0.020
2	C33XGM80	4.03	0.115	6.78	6.21	82.3	0.105	0.0067	.	0.0138	.	0.298	0.0010	0.0213	0.0055	.	(0.0010)
1	C33XGM240	3.85	0.010	3.39	3.67	88.82	0.004	0.0001	0.0008	0.0008	0.0014	0.008	(0.0002)	0.190	0.003	0.0015	0.003
1	C33XRB20	3.19	0.255	3.85	9.14	82.67	0.0029	0.0362	0.0211	0.101	0.0017	0.493	0.0028	0.0208	0.078	0.019	0.0116
1	C33XGM40	2.50	2.05	5.20	7.17	82.6	0.0062	<0.002	0.021	0.041	.	0.051	(0.0019)	<0.005	0.33	0.042	<0.005
1	C33XRB10	2.137	0.0539	5.02	7.95	83.25	0.0174	0.0048	0.0030	0.0029	0.0013	0.928	0.0167	0.020	0.0044	0.432	0.063



## BRASS CHIPS

# = class, where 1 = CRM and 2 = RM

C31X: typical analysis

GBW: 50-100 g

all others: 100 g

#	Number	Zn	Al	As	Bi	Cu	Fe	Mn	Ni	P	Pb	S	Sb	Si	Sn
1	GBW 02101	Rem	0.26	.	0.0024	58.00	0.89	0.73	.	0.0076	0.19	.	0.0091	.	0.54
1	BAM 224	39.40	0.0012	0.0025	0.0006	57.40	0.136	1.70	0.038	0.0112	1.13	0.0004	0.0026	(0.002)	0.066
1	IPT 40	39.1	0.010	.	.	58.10	0.007	.	0.0012	.	2.45	.	0.023	.	0.18
1	IARM 74B	38.9	0.003	<0.01	(<0.005)	60.4	0.011	<0.01	0.006	(0.008)	0.017	(0.003)	0.003	0.003	0.70
1	BAM 223	38.82	(<0.002)	0.0084	0.0018	58.74	0.091	(<0.001)	0.0214	0.0003	2.13	0.0021	0.0040	(<0.003)	0.089
1	BCS 390	38.6	0.83	.	.	57.1	0.83	1.30	0.033	.	1.04	.	.	(0.023)	0.34
1	IARM 74A	38.14	<0.01	(<0.01)	.	.	0.01	<0.01	0.01	0.006	0.02	0.001	<0.01	(<0.01)	0.50
1	IARM 75B	38.0	(0.005)	(0.004)	(0.001)	60.63	0.06	(0.003)	0.02	0.003	0.63	(0.001)	(0.004)	(0.003)	0.59
1	BAM 229	36.63	.	0.00217	.	63.334	0.01061	.	0.01114	(0.00106)	0.0192	.	0.00072	.	0.00485
1	BAM 179/2	35.8	2.22	(0.008)	.	58.5	1.02	0.86	0.56	.	0.35	.	.	0.044	0.70
2	CURM 48.01	32.6	<0.001	0.067	0.038	66.98	0.049	<0.001	0.134	0.016	0.106	.	0.047	0.041	0.002
2	CURM 48.02	32.58	0.013	0.025	0.004	67.16	0.053	0.067	<0.001	0.012	0.084	0.007	0.037	0.010	0.035
2	CURM 48.05	31.0	<0.002	<0.001	<0.0005	68.69	0.066	0.016	<0.117	0.007	<0.003	0.013	<0.0005	0.026	0.083
1	C31X B40	28.39	.	0.046	0.0076	71.10	0.026	0.0074	0.0571	(0.023)	0.064	0.0091	0.0076	0.025	0.073
2	CURM 48.04	26.99	<0.001	0.034	0.014	72.68	0.008	0.012	0.096	0.006	0.043	0.011	0.026	0.004	0.018
1	IARM 313A	21.3	(0.001)	0.0010	(0.001)	75.4	0.011	(0.001)	(0.002)	0.09	0.042	0.0016	0.014	3.09	0.006
1	C31X B70	14.51	0.0015	0.0030	0.060	85.17	0.100	0.0010	0.0251	.	0.0338	.	0.0089	0.013	0.0876
1	IARM 151B	12.94	0.002	(0.002)	.	84.0	0.025	0.002	0.011	0.003	0.013	<0.001	(0.001)	3.11	0.009
1	C31XB80	9.52	(0.0013)	0.0081	0.031	90.28	0.0267	0.0012	0.0083	.	0.072	.	0.0108	0.0051	0.035
2	C31XB950	.	(0.001)	(0.01)	(0.01)	95.0	(0.01)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.01)	0.5

Number	Ag	B	C	Cd	Co	Cr	Se
GBW 02101	.	.	.	.	.	.	.
BAM 224	.	.	.	.	.	.	.
IPT 40	0.002	.	.	0.049	.	.	.
IARM 74B	(0.005)	.	.	.	.	.	.
BAM 223	.	.	.	.	.	.	.
BCS 390	.	.	.	(0.011)	.	.	.
IARM 74A	(0.002)	.	(0.012)	.	.	.	.
IARM 75B	(0.005)	.	(0.004)	.	(0.003)	.	.
BAM 229	.	.	.	.	.	0.0034	.
BCS 179/2	.	.	.	(0.003)	.	.	.
CURM 48.01	.	.	.	<0.0003	.	.	.
CURM 48.02	.	.	.	<0.0005	.	0.004	.
CURM 48.05	.	.	.	<0.0003	.	.	.
C31XB40	.	.	.	0.0330	0.033	0.087	.
CURM 48.04	.	.	.	<0.0003	.	.	.
IARM 313A	0.0017	0.0008	(0.002)	(0.0003)	(0.004)	(0.001)	(0.001)
C31X B70	.	0.0029	.	0.0011	0.0124	0.0006	.
IARM 151B	(0.01)	.	0.005	.	.	(0.003)	.
C31XB80	.	0.0021	.	.	.	.	.
C31XB950	.	.	.	.	.	.	.

## BRASS CHIPS

# = class, where 1 = CRM and 2 = RM

C31X: typical analysis

100 g units

#	Number	Cu	Zn	Al	Fe	Mn	Ni	Pb	Sn	As	Bi	Sb	Si
2	CURM 30.09	89.53	<10.47	<0.001	0.0005	<0.0003	<0.003	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
2	CURM 43.02	76.21	20.82	2.40	0.128	0.035	0.068	0.064	0.060	0.083	<0.001	<0.001	0.038
2	CURM 43.01	74.36	22.44	2.75	0.008	0.064	0.121	<0.002	0.116	0.118	<0.002	<0.001	0.063
1	NM 421	70.48	29.39	.	0.07	.	.	.	.	.	.	.	.
1	BCS 344	68.98	30.98	.	.	.	.	.	.	.	.	.	.
2	CURM 30.18	63.66	32.33	3.28	0.006	<0.001	<0.001	<0.005	0.58	<0.005	<0.001	<0.001	0.131
2	CURM 30.20	61.46	35.71	2.32	<0.005	<0.001	<0.001	<0.002	0.40	<0.001	<0.002	<0.002	0.17
2	CURM 30.15	60.66	<38.88	<0.001	0.50	<0.001	<0.001	<0.005	0.002	<0.005	<0.001	<0.001	<0.005
2	CURM 30.16	60.53	<38.33	<0.001	1.14	<0.001	<0.001	<0.005	0.002	<0.005	<0.001	<0.001	<0.005
1	C31XB20	60.3	.	0.19	0.10	0.31	0.22	0.31	0.18	0.14	0.04	0.10	0.01
2	CURM 30.11	59.86	<38.17	<0.001	0.002	0.23	1.70	0.005	0.002	<0.001	<0.002	<0.001	<0.001
2	CURM 30.24	58.33	<38.32	<0.001	0.001	<0.001	<0.001	3.31	0.002	<0.001	<0.002	<0.001	<0.001
2	CURM 30.21	56.23	40.08	1.44	0.003	<0.001	<0.001	0.004	2.01	<0.001	.	<0.002	0.213
2	DSZU MCX01	Rem	36.3	.	0.01	no uncertainties	.	0.005	0.0002	0.0001	.	0.0005	.

## LEADED AND MANGANESE BRASS CHIPS

# = class, where 1 = CRM and 2 = RM

C31X: typical analysis

100 g units

#	Number	Pb	Mn	Zn	Al	As	Fe	Ni	P	Sb	Si	Sn	Cu
2	CURM H30.24	3.02	<0.001	37.92	<0.001	<0.001	0.005	<0.001	.	<0.001	<0.001	<0.001	58.87
1	IARM 73C	2.97	(0.003)	35.1	(0.001)	(0.005)	0.199	0.095	(0.003)	0.008	(0.003)	0.256	61.3
1	C31X 783510	2.91	.	35.20	0.0146	0.0011	0.134	0.144	0.0197	0.0047	0.053	0.407	60.96
1	NM 412	2.56	.	38.99	.	.	0.09	.	.	.	.	0.12	58.18
1	BCS 385	2.24	(<0.005)	38.5	(<0.005)	.	0.15	0.13	.	(<0.01)	.	0.27	58.7
2	C31X 783520	2.08	.	32.88	0.199	0.046	0.077	0.0088	0.0149	0.053	.	0.202	64.34
1	C31X 783550	1.64	.	6.23	0.077	0.104	0.126	0.249	0.018	0.114	.	0.116	91.25
1	IARM 87B	1.58	0.006	36.1	0.20	0.007	0.29	0.095	0.008	0.014	0.004	0.78	60.9
2	C31X MNB10	1.44	0.188	29.37	0.596	.	0.268	0.053	.	.	.	0.105	67.77
1	C31X 783530	1.376	.	37.51	0.163	0.110	0.170	0.251	0.0391	0.084	0.038	0.121	60.07
1	C31X 783540	1.03	.	30.09	0.561	0.206	0.020	0.492	0.125	0.188	.	0.046	67.11
1	C31X MNB20	1.02	2.23	32.19	0.268	.	0.66	0.118	.	.	0.233	0.319	63.02
1	C31X MNB50	0.127	0.243	37.91	3.35	.	0.56	1.31	.	.	0.49	1.75	54.14

Number	Ag	B	Bi	C	Cd	Co	Cr	S	Se
C31X 783510	.	0.0005	0.0141	.	.	0.029	.	(0.001)	(0.0045)
IARM 73C	(0.006)	(0.0004)	0.011	(0.003)	0.0014	(0.002)	0.001	(0.002)	.
CURM H30.24	.	.	<0.001	.	.	.	.	0.02	.
NM 412	.	.	.	.	.	.	.	.	.
BCS 385	.	.	.	.	.	.	.	.	.
C31X 783520	.	.	.	.	.	.	.	.	.
C31X 783550	.	.	.	.	.	.	.	.	.
IARM 87B	(0.01)	.	0.003	0.003	.	0.007	(0.002)	(0.001)	.
C31X MNB10	.	.	.	.	.	.	.	.	.
C31X 783530	.	(0.0015)	0.0116	.	0.0039	0.0064	.	.	0.004
C31X 783540	.	.	.	.	.	.	.	.	.
C31X MNB20	.	.	.	.	.	.	.	.	.
C31X MNB50	.	.	.	.	.	.	.	.	.

## ADMIRALTY &amp; NAVAL BRASS CHIPS

# = class, where 1 = CRM and 2 = RM

C31X: typical analysis

100 g units

#	Number	Sn	Pb	Zn	Cu	Al	As	Bi	Co	Fe	Mn	Ni	P	S	Sb	Si
2	CURM 42.25	2.72	0.0023	39.20	57.78	0.021	0.118	<0.001	.	0.003	0.169	<0.001	0.050	0.005	<0.001	<0.001
2	CURM 42.24	2.25	0.91	33.75	62.45	0.067	0.065	0.054	.	0.066	0.065	0.025	0.226	0.012	0.060	0.093
2	C42.25	2.2	<0.01	rem	58.5	0.02	0.10	<0.002	.	<0.005	0.13	<0.005	0.06	0.001	<0.005	<0.002
2	C31XNB40	2.07	0.09	.	63.8	0.29	0.025	0.09	.	0.11	0.02	0.16	0.20	0.002	0.39	0.22
2	CURM 42.23	1.63	0.575	22.13	74.36	0.008	0.168	0.034	.	0.354	0.019	0.168	0.128	0.045	0.356	0.015
2	CURM 42.22	1.10	1.10	26.32	70.46	0.042	0.217	0.046	.	0.23	0.122	0.061	0.177	<0.001	0.173	0.042
2	CURM 42.21	0.60	0.259	31.61	66.78	0.003	<0.003	0.013	.	0.119	<0.001	0.120	0.087	0.034	0.25	0.15
1	IARM 76C	0.66	1.6	37.2	60.4	(0.004)	(0.003)	.	.	0.013	(0.001)	0.003	0.003	(0.001)	(0.004)	(0.003)
2	C42.21	0.54	0.23	rem	66.1	0.005	<0.005	0.012	.	0.06	<0.005	0.096	0.081	0.007	0.19	0.081
1	C31X NB10	0.535	0.504	29.73	68.35	(0.0004)	0.161	0.0065	(0.0006)	0.0367	0.0508	0.520	0.0223	0.0024	0.0057	0.004

## SILICON BRASS CHIPS

# = class, where 1 = CRM and 2 = RM

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

100 g units

#	Number	Si	Zn	Cu	Al	Fe	Mn	Ni	Pb	Sn	As	Co	Cr	Mg	P	S	Sb	Bi*	Cd*
1	C31XWSB50	6.07	0.343	90.06	0.218	0.79	0.496	0.492	0.100	1.050	0.0284	0.057	0.0087	0.0012	0.080	0.0081	0.124	298	47
1	C31XWSB10	5.95	7.55	(82.7)	1.90	0.100	0.099	0.076	0.55	0.23	0.13	0.34	0.017	0.003	0.040	<0.002	0.03	.	.
1	C31XWSB40	4.40	5.61	86.09	0.290	0.592	1.45	0.228	0.204	0.802	0.0286	0.096	0.103	0.006	0.042	(0.002)	0.0335	318	12
1	C31XWSB40	4.58	5.05	85.7	0.48	0.77	1.85	0.25	0.168	0.80	0.040	0.109	0.045	(0.0007)	0.060	<0.005	0.067	.	.
2	C31XWSB60A	2.61	1.12	Rem	0.10	0.05	0.29	0.37	0.96	0.39	0.01	0.05	.	0.004	0.06	0.01	0.10	.	.
1	C31XWSB60D	2.48	0.881	94.74	0.059	0.032	0.248	0.117	0.95	0.056	0.0051	0.247	0.058	(0.001)	(0.020)	(0.002)	0.007	56	71

## BRONZE CHIPS

# = class, where 1 = CRM and 2 = RM

SRM: 150 g chips

all others: 100 g chips

#	Number	Sn	Al	Bi	Cu	Fe	Mn	Ni	P	Pb	Si	Zn
1	IARM 310A	10.56	0.0009	(0.001)	89.2	0.006	(0.001)	0.043	0.094	0.064	(0.001)	0.10
1	IARM 89C	9.14	(0.002)	(0.003)	87.5	0.004	(0.001)	0.008	0.004	0.17	(0.003)	3.0
1	IARM 91D	6.43	(0.001)	0.060	81.9	0.023	(0.001)	0.43	0.09	7.8	(0.0016)	3.21
1	IARM 211A	6.23	0.002	5.0	88.4	0.004	(0.003)	0.003	0.19	0.014	0.003	0.006
1	BAM 227	6.01	(<0.0001)	0.0088	85.57	0.129	.	0.284	(0.0002)	4.12	(<0.01)	3.46
1	IARM 267A	4.95	0.003	(0.005)	87.8	0.019	(0.002)	5.1	0.037	0.026	0.003	2.06
1	IARM 78B	4.73	(0.002)	(0.001)	87.7	0.02	(0.002)	0.077	0.19	3.87	<0.002	3.55
1	IARM 77B	4.66	(0.001)	(0.004)	95.2	0.002	(0.002)	0.002	0.148	0.016	(0.003)	0.007
1	SRM 158A	0.96	0.46	.	90.93	1.23	1.11	0.001	0.026	0.097	3.03	2.08
1	IARM 83B	0.85	0.002	.	58.7	0.97	0.13	0.010	0.004	0.017	(0.003)	39.3
1	IARM 72B	0.029	.	.	90.08	0.007	.	0.004	0.005	1.99	(0.002)	7.81
1	IARM 80B	0.018	10.19	<0.005	81.2	3.31	0.54	4.69	0.009	0.009	0.030	0.078
1	IARM 235A	0.018	8.9	.	81.2	4.07	1.17	4.44	0.012	0.012	0.061	0.083
1	IARM 79B	0.017	9.19	(0.003)	88.4	2.13	0.16	0.075	0.005	(0.003)	0.019	0.013
1	IARM 82B	0.017	0.002	.	95.3	0.080	1.04	0.011	0.004	0.011	3.22	0.38
1	IARM 79C	0.010	9.20	.	87.6	2.28	0.20	0.55	0.006	<0.005	0.033	0.014
2	IARM 94A	(<0.01)	10.63	.	.	4.04	0.16	4.37	<0.01	0.009	<0.01	0.09
1	IARM 93B	0.009	10.33	.	85.4	3.87	0.024	0.088	(0.002)	0.012	0.024	0.17
1	IARM 81B	0.008	6.70	<0.001	91.2	0.047	0.012	0.003	0.004	0.006	1.84	0.176
1	IARM 204A	0.005	10.55	.	83.3	3.87	0.052	1.95	0.007	0.004	0.034	0.22
1	IARM 94B	(0.003)	10.8	.	80.6	3.99	0.071	4.31	0.011	0.004	0.028	0.14

Number	Ag	As	C	Co	Cr	S	Sb
IARM 310A	0.0020	(0.002)	(0.005)	0.0011	(0.001)	0.0021	(0.002)
IARM 89C	0.005	0.004	(0.002)	(0.001)	(0.002)	0.0011	0.008
IARM 91D	0.020	0.008	(0.0020)	0.013	0.0007	0.018	0.112
IARM 211A	0.005	(0.01)	.	(0.001)	(0.002)	0.002	0.057
BAM 227	Se:0.0028	0.081	.	Te:0.0012	.	0.122	0.160
IARM 267A	(0.002)	(0.004)	(0.003)	(0.002)	(0.001)	0.0014	<0.03
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
SRM 158A	.	.	.	.	.	.	.
IARM 83B	(0.002)	.	0.003	(0.003)	(0.003)	(0.001)	(0.004)
IARM 72B	(0.002)	(0.003)	0.002	.	.	0.0015	0.006
IARM 80B	0.006	(0.004)	(0.01)	0.014	0.012	(0.001)	(0.004)
IARM 235A	<0.005	<0.005	0.009	0.01	0.01	0.002	(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 79C	<0.005	0.003	0.003	<0.005	(0.002)	<0.001	<0.005
IARM 94A	.	(<0.01)	(0.014)	0.01	.	(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 94B	0.017	<0.01	(0.006)	0.011	0.017	0.002	(0.011)

Cd: 0.0009 last of stock

Number	Ag	As	C	Co	Cr	S	Sb
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## ALUMINUM BRONZE CHIPS

# = class, where 1 = CRM and 2 = RM

C32X: typical analysis

#	Number	Al	Cu	Fe	Mn	Ni	P	Pb	Si	Sn	Zn	As	C	Cr	Mg	Sb	Units
1	C32XALB30	11.56	79.94	4.15	0.374	3.72	0.025	0.11	0.135	0.10	0.325	0.0060	.	0.0089	0.088	.	50 g
2	CURM 52.52	10.69	79.26	6.02	0.145	3.56	.	0.074	0.011	0.044	0.094	.	.	0.004	0.007	.	100 g
1	C32XALB10	10.3	(80.4)	3.00	0.094	5.90	0.016	0.218	0.132	0.025	0.035	(0.002)	.	0.011	0.0013	.	50 g
1	IARM 80C	10.1	80.5	3.86	0.58	4.71	0.004	(0.004)	0.077	0.003	0.096	0.006	0.008	0.008	Cr:0.013	O:0.0007	100 g
1	IARM 334B	9.91	80.8	3.7	0.60	4.70	0.005	0.006	0.075	0.019	0.122	(0.003)	0.005	(0.004)	(0.001)	(0.004)	100 g
1	IARM 334A	9.76	80.7	3.82	0.69	4.77	(0.005)	0.010	0.073	0.025	0.110	(0.004)	0.0058	(0.01)	(0.001)	0.004	100 g
1	BCS 304/1	9.71	80.23	4.64	0.12	4.82	.	0.010	0.08	0.03	0.31	.	.	.	(<0.01)	.	100 g
1	C32XALB20 *	9.6	(80.7)	4.1	0.055	4.6	0.045	0.26	0.29	0.095	0.25	0.007	0.01	0.003	0.003	.	50 g
2	CURM 51.14	8.42	88.57	0.72	0.55	0.219	0.12	0.003	0.286	0.113	0.656	0.44	.	.	.	.	100 g
1	C32XALB80	8.1	(75.3)	6.70	0.31	6.79	0.14	0.009	0.69	0.58	1.02	0.17	.	0.045	(0.002)	.	50 g
1	C32XALB60	8.05	81.98	2.53	0.904	5.31	0.0101	0.096	0.295	0.147	0.685	0.012	(0.0025)	0.0097	0.0019	.	50 g
1	C32XALB40	7.87	79.61	3.55	1.028	7.03	0.036	0.120	0.252	0.085	0.264	0.0130	.	0.022	0.153	.	50 g
2	CURM 52.54	7.85	81.59	3.31	1.20	5.40	.	0.086	0.022	0.135	0.39	.	.	<0.005	<0.005	.	100 g
2	C32XALB50	7.6	.	1.95	1.39	5.11	.	0.04	0.03	0.03	0.16	.	.	.	0.018	.	50 g
2	CURM 51.13	7.30	88.79	1.81	0.898	0.057	0.022	0.104	0.174	0.270	0.335	0.215	.	.	.	.	100 g
2	CURM 51.12	6.36	88.29	2.87	1.33	0.112	<0.001	0.219	0.005	0.196	0.45	0.111	.	.	.	.	100 g
2	CURM 51.11	5.27	93.95	0.060	<0.001	0.012	0.035	0.33	0.159	0.027	0.111	<0.001	.	.	.	.	100 g

\* Provisional Analysis

## LEADED BRONZE CHIPS

#=class, where 1=CRM and 2=RM

C32X: typical analysis 100 g chips

IPT 74: 60 g chips

IPT 10B: 80 g chips

all others: 100 g chips

#	Number	Pb	Sn	Zn	Cu	Al	As	Bi	Fe	Mn	Ni	P	S	Sb	Si	Other
1	IARM 184A	19.0	6.0	0.37	(74)	0.0016	0.010	(0.03)	(0.003)	(0.002)	0.30	0.008	0.021	0.27	(0.002)	.
1	GBW 02140	17.62	4.24	5.37	72.25	.	.	.	.	.	.	.	.	.	.	.
2	CURM 50.01	11.74	9.45	1.17	74.08	0.018	0.22	0.029	0.243	0.024	2.24	0.113	0.113	0.59	0.007	.
2	CURM 50.02	10.67	10.34	0.006	78.84	<0.001	<0.002	<0.0005	<0.001	<0.0005	<0.0005	0.046	<0.001	<0.0005	<0.002	.
2	CURM 50.04	9.94	11.30	0.66	76.11	0.014	0.06	0.10	0.10	0.028	1.10	0.035	0.14	0.50	0.011	.
1	C32XLB20	9.42	12.38	0.27	(76.8)	0.04	0.017	0.009	0.40	0.22	0.22	0.04	(0.001)	0.023	<0.01	.
2	C32XLB30	9.4	10.3	<0.01	.	<0.01	0.02	0.025	<0.01	<0.01	1.52	0.006	0.020	0.04	.	.
1	BCS 364	9.24	9.36	0.13	80.7	(<0.002)	(0.07)	(<0.01)	(<0.005)	.	0.28	0.057	(0.06)	0.18	(<0.005)	.
2	CURM 50.03	8.86	8.41	1.72	77.42	0.005	0.11	0.051	0.018	0.037	2.89	0.159	0.064	0.24	0.005	.
1	C32X LB130	7.59	5.80	0.520	84.87	0.0011	0.131	0.0721	0.0160	0.0005	0.828	0.0161	0.115	0.0186	(0.0035)	Ag: 0.0063
1	IPT 74	6.24	2.84	9.88	80.41	.	0.002	.	0.315	.	0.15	0.002	0.056	0.016	.	Cd: 0.013
1	GBW 02139	6.16	4.08	6.96	81.45	.	.	.	.	.	.	.	.	.	.	.
1	IARM 86D	5.4	4.9	4.6	(84.5)	(0.002)	0.007	0.042	0.035	0.0011	0.40	0.072	0.029	0.112	Ag:0.022	Co: 0.004
2	C32X SN10	5.15	11.75	0.804	79.96	(<0.002)	.	.	0.0034	0.0018	2.17	0.0025	0.0064	0.006	.	.
1	IPT 10B	4.74	4.61	4.73	85.2	.	0.019	.	0.211	.	0.33	0.003	0.068	0.114	.	.
1	C32X SN20	1.97	13.54	1.28	82.8	0.0004	.	.	0.0332	0.0043	0.104	0.082	0.0326	0.100	.	.
1	C32X SN40	1.059	18.80	0.342	77.88	0.034	0.0468	.	0.060	0.0065	0.556	0.988	0.040	0.102	(0.004)	Co: 0.151
1	C32X SN30	0.270	16.51	0.43	81.32	0.0004	.	.	0.0782	0.0026	0.513	0.297	0.096	0.260	.	.

## PHOSPHOR BRONZE CHIPS

# = class, where 1 = CRM and 2 = RM

mass % except \* which is mg/kg

C, CURM: typical analysis 100 g

GBW, BCS: 150 g

SRM: 100 g

#	Number	P	Sn	Zn	Cu	Al	As	C	Fe	Mg	Mn	Ni	Pb	S	Sb	Se*	Si
2	CURM 54.03	0.954	7.30	0.003	91.74	<0.001	0.006	.	0.005	<0.0003	<0.0005	0.0019	0.003	<0.001	0.0007	.	<0.002
2	C32XPB10	0.84	11.0	0.02	.	<0.01	0.05	.	<0.01	.	<0.01	0.12	0.37	.	0.07	.	0.01
1	C32XPB110	0.72	3.00	1.93	89.6	0.068	0.175	.	0.493	<0.002	0.80	1.01	1.02	0.016	0.54	.	0.52
1	BCS 374	0.59	9.80	0.006	89.5	(<0.005)	.	.	(<0.005)	.	.	0.014	0.064	0.012	(0.01)	.	(<0.005)
1	GBW 02133	0.423	5.79	.	93.72	.	.	.	.	.	.	.	.	.	.	.	100g
2	C32XPB120	0.42	4.64	0.49	(92.0)	<0.001	0.098	.	0.31	<0.001	0.39	0.51	0.47	(0.010)	0.024	55	0.01
1	GBW 02136	0.372	5.79	.	93.70	.	.	.	0.011	.	.	.	0.021	.	0.0058	.	0.0012
1	C32X PB230	0.319	7.56	0.0020	92.04	(0.0004)	0.0011	0.004	(0.0005)	.	(0.0006)	0.0033	0.0042	0.0015	0.0025	.	0.0016
1	SRM 872	0.26	4.16	4.0	87.36	.	.	.	(0.003)	.	.	.	4.13	.	.	.	.
1	GBW 02134	0.238	6.82	.	92.85	.	.	.	.	.	.	.	.	.	.	.	.
1	C32XPB130	0.22	6.96	0.27	(91.5)	<0.001	0.052	.	0.14	<0.001	0.096	0.26	0.25	(0.03)	0.12	.	<0.005
2	CURM 54.02	0.107	5.53	0.410	92.87	0.020	0.023	.	0.102	0.0020	0.101	0.109	0.663	0.030	0.026	.	0.012
1	GBW 02135	0.106	7.92	.	91.73	.	.	.	.	.	.	.	.	.	.	.	.
1	SRM 871	0.082	8.14	0.025	91.68	.	.	.	<0.001	.	.	.	0.010	.	.	.	.
2	CURM 54.01	0.053	3.17	0.346	95.42	0.040	0.044	.	0.028	0.008	0.158	0.348	0.307	0.023	0.070	.	0.039
1	C32XPB140	0.032	8.58	0.029	91.0	(0.001)	0.021	.	0.005	<0.001	<0.002	0.092	0.051	0.086	0.061	.	<0.005
2	C32XPB100	0.0236	11.93	0.037	87.70	(0.0008)	0.011	.	0.008	0.004	0.0010	0.057	0.055	0.018	0.0051	.	0.0015

**CRM LEAD ORE CONCENTRATE**

analysis listed in mass %

200 g units

Number	Pb	Ag	Al	As	Ca	Cd	Cu	Fe	Mg	Mn	Na	S	Sb	SiO <sub>2</sub>	Tl	Zn
CAN CPB-2	63.52	(0.03573)	0.074	(0.04)	(0.0776)	0.0167	0.1213	7.065	0.0683	(0.0395)	(0.01)	(18.02)	(0.423)	(0.652)	(0.0340)	6.04

**CRM LEAD**

analysis listed in mg/kg

Number	Type	Ag	As	Au	Bi	Cd	Cu	Ni	Sb	Se	Sn	Te	Tl	Zn	Units
VS 2036-2001	Powder	2322	.	32.6	.	.	.	.	.	.	.	.	.	.	100 g powder
VS 2038-81	Powder	415	.	0.21	.	.	.	0.410	.	.	.	.	.	.	100 g powder
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	160 g chips
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	160 g chips
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	160 g chips

**LEAD BASE CHIPS AND POWDER**

# = class, where 1 = CRM and 2 = RM

analysis listed in mass %

BCS: 100 g powder

SRM: 150-200 g powder

all others: 100 g chips

#	Number	Sn	Sb	Ag	As	Bi	Ca	Cd	Cu	Fe	In	Na	Ni	Se	Te	Zn	Other
1	SRM 1129	62.7	0.13	0.075	0.055	0.13	.	.	0.16	.	.	.	0.010	.	.	.	.
1	SRM 127b	39.3	0.43	0.01	0.01	0.06	.	.	0.011	.	.	.	0.012	.	.	.	.
1	C93XS30APR30	33.0	0.96	0.021	0.018	0.28	.	0.009	0.008	0.003	.	.	0.010	.	.	.	0.0053
1	C93XS30APR20	30.68	1.80	0.049	0.0178	0.168	.	0.0061	0.062	0.0026	0.0199	.	0.042	.	0.0102	0.028	
1	C93XS30APR10	28.58	2.54	0.0144	0.010	0.059	.	0.0014	0.192	(0.012)	0.0094	.	0.0010	.	0.0024	(0.004)	
1	GBW 02401	15.97	16.09	.	0.014	0.024	.	.	1.96	.	.	.	.	.	.	.	Pb: 65.72
2	C86XPSS40	10.69	16.97	(0.006)	0.278	0.120	.	0.047	0.328	*1	0.013	.	0.0031	.	.	*2	
2	C86XPSS20	6.33	8.16	0.004	1.42	0.054	.	0.069	0.118	*1	(0.002)	.	0.0080	.	.	*2	
1	SRM 53e	5.84	10.26	.	0.057	0.052	.	.	0.054	<0.001	.	.	0.003	.	.	.	
1	GBW 02402	5.69	15.02	.	0.012	0.0075	.	.	2.88	.	.	.	.	.	.	.	Pb: 76.22
1	BCS 177/2	5.07	10.1	.	0.05	0.028	.	.	0.12	.	.	.	0.007	.	.	.	Pb: 84.5
2	C85XSn20	1.87	0.023	0.002	*5	0.0093	.	*1	0.035	.	.	.	*1	0.0058	*1	*1	
1	C85X ANTH	1.45	6.05	0.0071	0.217	0.0194	.	0.0046	0.0291	0.010	.	.	0.0062	0.0149	0.0071	(0.0007)	
1	C85XHRH	0.874	1.13	0.247	0.74	0.092	.	(0.0002)	0.080	.	.	.	0.001	0.037	0.002	.	
1	C84XBA10	0.85	*1	0.0088	*1	0.0084	0.106	0.0016	0.0041	.	.	.	.	.	0.006	0.0007	
2	C84XBA20	0.51	0.002	0.008	*05	0.024	0.061	0.0052	0.003	.	.	.	.	.	*2	0.019	
1	C84XBA80	0.293	0.0009	0.0043	(0.0004)	0.019	0.157	0.0010	0.0007	.	.	.	.	.	<0.002	0.0013	Al: 0.021
2	C85Xsb120	0.21	11.4	0.0015	0.11	0.007	.	*1	0.30	*1	.	.	0.0016	*1	*5	0.087	
2	C83XPR70	0.189	0.795	0.290	0.051	0.479	.	0.455	0.176	(0.0008)	0.653	.	(0.0015)	0.0052	0.0097	(0.0006)	Pt: 0.0047
2	C85Xsb30	0.13	2.66	*2	0.14	0.010	.	*1	0.032	*1	.	.	0.0013	0.024	*2	(0.0002)	
2	C84XBA40	0.11	0.061	0.003	(0.0008)	0.074	(0.014)	0.010	0.031	.	.	.	0.0007	.	0.029	(0.0003)	
2	C85Xsb80	0.085	8.43	0.016	0.02	0.010	.	*1	0.032	*1	.	.	0.0014	0.0007	*5	(0.0002)	
2	C85Xsb100	0.080	10.2	0.0015	0.11	0.007	.	*1	0.14	*5	.	.	0.0013	*1	*2	0.014	
2	C85X0616Pb10	0.070	1.78	0.002	0.070	0.025	.	0.0023	0.048	*1	.	.	0.001	0.018	0.001	0.001	
2	C85Xsb50	0.057	5.14	0.0017	0.12	0.022	.	*1	0.007	*1	.	.	0.0025	0.0008	*1	*1	
1	C83XPR40	0.009	0.012	0.014	(0.002)	0.014	0.0026	0.010	0.015	.	0.005	0.001	0.013	0.003	0.025	0.005	Au: 0.002
1	C83XPR10	0.004	0.005	0.088	0.050	0.080	0.004	0.075	0.006	.	0.045	0.01	0.001	<0.002	0.003	0.002	Au: 0.008
2	BM Pb	<0.0005	(5ppm)	<0.0003	<0.0005	<0.004	.	.	<0.0005	.	.	.	<0.0001	.	.	<0.001	Pb: 99.99
#	Number	Sn	Sb	Ag	As	Bi	Ca	Cd	Cu	Fe	In	Na	Ni	Se	Te	Zn	Other

\* In the above chart, \* represents <0.00 so that, for example, \*1=<0.001  
C83X-86X, C93X: typical analysis

**LEAD-SILVER ALLOY CHIPS**

typical analysis

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

**RM LEAD BASE BATTERY ALLOY CHIPS**

typical analysis

100 g units

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

CRM	MAGNESIUM CHIPS														typical analysis	
	Number	Ag	Al	Be	Ca	Cd	Ce	Cu	Fe	La	Mn	Ni	Pb	Si	Sn	Zn
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

# = class, where 1 = CRM and 2 = RM

BCS: 100 g units

C: typical analysis 30 g units

#	Number	Al	RE	Ag	Mn	Zn	Be	Ca	Cd	Cu	Fe	Ni	Pb	Si	Sn	Zr	Other
1	C65XMgA50	8.01	.	0.0050	0.399	0.411	0.0013	0.013	0.0035	0.020	0.006	0.020	0.043	0.110	0.013	.	Sr: 0.00034
1	BCS 316	8.01	.	.	0.28	0.68	.	.	.	0.040	0.009	0.004	0.024	0.055	0.005	.	.
1	C65XMgA20	7.19	.	.	0.14	0.95	0.0007	(0.005)	.	0.112	0.011	0.003	0.006	0.13	0.050	.	Sr: 0.0005
1	C65XMgA10	5.45	.	0.012	0.060	1.26	0.006	0.029	0.013	0.221	0.021	0.021	0.012	0.20	0.072	(0.0015)	Ce: 0.009 La: 0.007
1	C65XMgB30	3.21	.	(0.002)	0.012	0.60	0.0030	0.029	0.011	0.021	0.007	0.0019	0.004	0.011	0.005	.	.
1	C65XMgB10	2.39	.	0.03	0.68	1.71	0.0007	0.41	0.07	0.20	0.016	0.012	0.01	0.17	0.011	.	Ce: 0.015 La: 0.013
2	C65XMgB20	2.32	.	.	0.44	0.95	.	0.008	.	0.096	0.015	0.005	0.012	0.06	0.012	.	.
2	C63XMgE20	0.056	.	.	1.58	0.04	.	(0.003)	.	0.058	0.009	0.012	0.013	0.035	0.011	.	.
2	C65XMgD30	0.041	0.008	0.005	0.28	1.97	0.0003	(0.07)	.	0.058	0.023	0.002	0.009	0.020	0.007	0.029	.
1	C63XMgE30	0.015	.	0.005	2.36	0.022	.	0.13	0.001	0.012	0.004	0.0023	0.005	0.01	0.0057	.	.
2	C67XMgF30	0.01	2.40	.	0.015	3.18	.	0.006	.	0.03	0.009	0.002	0.017	0.005	0.006	0.48	.
1	BCS 307	(0.008)	2.84	.	0.006	2.08	.	.	.	0.005	0.002	.	.	.	.	0.56	.
2	C66XMgC20	0.007	.	.	0.016	5.93	.	0.006	.	0.15	0.013	0.016	0.018	0.007	0.010	0.45	.
2	C66XMgD40	0.006	.	.	0.02	2.80	.	0.004	.	0.01	0.003	0.002	0.017	0.01	0.003	0.44	.
2	C68XMgH40	0.004	2.4	2.05	0.015	0.17	.	.	.	0.03	0.001	0.004	.	0.002	.	0.46	.
2	C68XMgL10	0.002	2.09	1.41	0.016	0.009	.	.	.	0.013	0.009	0.005	.	0.001	.	0.54	Th: 0.24
2	C67XMgG40	0.001	<0.01	.	0.015	5.47	.	0.001	.	0.06	0.003	0.007	0.009	0.003	0.005	0.72	Th: 1.85

RE = Total Rare Earths

## RM MANGANESE

Number	Mn	As	C	Co	Cu	Fe	Ni	P	Pb	S	Si	V	Units
RM Mn	99.9	<0.0001	<0.0005	<0.0001	<0.0002	<0.0020	<0.0001	<0.0002	<0.0001	0.00040	<0.0010	<0.0001	100 g chips

## NICKEL POWDER

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

Number	Ag	Al	Au	C	Cr	Cu	Fe	Ir	Mn	Mo	Ni%	Os	P	Pb	Pd	Pt	Rh	Ru	S	Si	Units
CRM - nickel ore																					
VS 1702-86	23.4	.	0.84	.	.	(3%)	.	0.11	.	.	5.4	0.06	.	.	30.0	8.6	0.98	0.34	.	.	200 g
RM - nickel powder																					
BS HPN-1	<0.1	70	.	268	22	2	202	.	2	3	.	.	5	0.2	.	.	.	.	4	6	100 g

continued informational values

Number	As	B	Ba	Be	Bi	Ca	Cd	Co	Ga	H	In	Mg	N	Na	O	Sb	Se	Sn	Te	Ti	Tl	V	Zn
VS 1702-86	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
BS HPN-1	<0.5	<2	<1	<1	<0.2	3	<0.1	<2	<0.5	70	<0.2	1	17	4	1400	<0.1	<0.2	<1	<0.2	<1	<0.1	<1	<1

## CRM NICKEL CHIPS

# = class, where 1 = CRM and 2 = RM

100 g units

#	Number	Ag	Al	As	B	Be	Bi	C	Ca	Cd	Co	Cr	Cu	Fe
2	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
2	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
2	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
2	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
2	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
1	BAM RS 4	<0.0001	<0.0001	<0.00005	(<0.0002)	.	(<0.00001)	0.00094	<0.0001	<0.00002	<0.0001	<0.00005	<0.0002	0.00042

Number	Ga	Mg	Mn	Mo	N	Ni	O	P	Pb	S	Sb	Se
IARM 190A	<0.00005	(0.0006)	0.00018	(<0.0001)	(0.0001)	.	(0.0019)	0.0034	0.00093	0.00033	0.0011	0.00065
IARM 189A	<0.00005	(0.0008)	0.00019	(<0.0001)	(0.0001)	.	(0.0018)	0.00037	0.00029	0.00018	0.00039	0.00021
IARM 188A	<0.00005	(0.0004)	0.00023	<0.0001	(0.0001)	.	(0.0017)	0.00014	0.00010	0.00018	0.00011	0.00007
IARM 187A	<0.00005	(0.0002)	0.00030	(<0.0001)	(0.0001)	.	(0.0014)	<0.00010	0.000015	0.00019	<0.00005	<0.00001
IARM 191A	<0.00005	(0.0002)	0.00031	(<0.0001)	(0.0002)	.	(0.0030)	<0.00010	0.00003	0.00021	<0.00005	0.00019
BAM RS 4	<0.00002	<0.00008	<0.00005	(<0.00002)	0.00025	99.995	(0.0029)	.	<0.0001	(<0.0002)	<0.00002	<0.0001

Number	Si	Sn	Te	Ti	Tl	V	W	Zn
IARM 190A	0.0028	0.00062	0.00089	(0.0006)	0.00058	(<0.00005)	.	0.00081
IARM 189A	0.0019	0.00022	0.00017	(0.0003)	0.00023	(<0.00005)	.	0.00028
IARM 188A	0.0018	0.00011	0.00008	(0.0002)	(0.00009)	(<0.00005)	.	0.00023
IARM 187A	(0.0018)	0.00004	<0.00001	(0.0003)	<0.00002	(0.00008)	.	<0.00005
IARM 191A	(0.0005)	0.00004	<0.00001	(<0.0001)	<0.00002	(<0.00005)	.	0.00019
BAM RS 4	(<0.0002)	<0.00003	(<0.00002)	.	<0.00002	(<0.00002)	(<0.00001)	<0.0004

## NICKEL ALLOY CHIPS

# = class, where 1 = CRM and 2 = RM

#	Number	Al	C	Co	Cr	Cu	Fe	Mg	Mn	Mo	Nb	Ni	Si	Ti	V	W
1	IARM 283A	6.05	0.114	9.8	8.05	(0.01)	0.044	0.0033	(0.001)	5.94	0.020	64.4	0.019	0.98	0.0058	0.056
1	SRM 882	2.85	(0.006)	(0.007)	(0.0001)	31.02	(0.009)	(0.001)	0.0007	.	.	65.25	(0.006)	0.57	(0.0001)	.
1	IARM 63B	0.31	0.0025	0.019	0.47	0.012	1.68	0.005	0.61	27.3	(0.001)	69.6	0.019	0.003	(0.010)	0.060
1	VS N2/3	0.20	0.018	.	5.59	0.083	Rem	.	0.84	.	.	76.3	1.40	.	.	.
1	IARM 55B	0.09	0.004	0.036	8.25	0.013	1.12	0.011	0.323	24.62	0.08	65.4	0.021	0.002	0.005	0.12
2	IARM 202A	0.080	0.13	0.020	0.008	32.3	1.31	0.024	1.03	(<0.01)	.	64.8	0.046	0.005	(<0.01)	(<0.01)
2	IARM 203A	0.066	0.005	12.88	0.72	0.05	40.6	(<0.002)	0.023	0.090	5.00	38.44	0.41	1.58	(<0.01)	(0.02)
1	BCS 363/1	0.027	0.140	0.032	(0.05)	31.90	1.86	.	1.26	.	.	64.7	0.028	(0.03)	.	.
1	BCS 371	.	0.30	0.39	.	.	.	0.060	.	.	.	.	0.34	.	.	.
1	VS N10/4	.	0.0074	.	.	(0.005)	0.399	.	0.237	27.04	.	.	0.093	0.085	1.57	.
1	VS N3/4	.	0.0064	.	2.16	4.98	Rem	.	0.424	.	.	.	0.264	.	.	.
1	VS N4/3	.	0.0057	.	0.070	5.65	5.80	.	0.762	4.87	.	.	0.81	.	.	.
1	NCS HC20502	.	0.0015	0.043	0.466	0.027	Rem	.	0.983	4.13	.	80.07	0.317	0.004	.	.

Number	B	N	O	P	Pb	S	Sn	Zr	Units
IARM 283A	0.014	0.0003	0.0004	0.003	Ta:4.3	0.0006	(0.0002)	0.053	100 g
SRM 882	(0.0001)	.	.	.	(0.0006)	0.0014	(0.003)	(0.0005)	100 g
IARM 63B	(<0.002)	0.0041	0.0010	0.004	.	(0.0004)	.	(0.002)	100 g
VS N2/3	.	.	.	0.0034	.	0.0025	.	.	100 g
IARM 55B	0.002	0.016	0.0009	0.005	.	0.0010	.	(0.005)	100 g
IARM 202A	(<0.002)	0.0004	(0.0018)	0.011	.	0.032	.	0.010	100 g
IARM 203A	(0.002)	.	.	0.006	.	0.0009	.	<0.01	100 g
BCS 363/1	.	.	.	.	.	(0.002)	.	.	100 g
BCS 371	.	.	.	.	.	0.013	.	.	100 g
VS N10/4	.	.	.	0.0022	.	0.0028	.	.	100 g
VS N3/4	.	.	.	.	.	0.0018	.	.	100 g
VS N4/3	.	.	.	0.0019	.	.	.	.	100 g
NCS HC20502	.	.	.	0.0007	.	0.0024	.	.	100 g

Ag:(0.0004) As:(0.0001) Se:(0.0002)

last of stock

## NICKEL BASE CHIPS WITH Cr &gt; 10 % CONTINUED ON THE NEXT PAGE

# = class, where 1 = CRM and 2 = RM

#	Number	Cr	Mo	Al	C	Co	Cu	Fe	Mn	Nb	Ni	Si	Ti	W
1	IARM 67C	28.9	4.93	0.14	0.0058	1.75	1.24	13.48	1.01	0.36	45.8	0.14	0.005	1.97
1	VS N11/3	27.04	.	2.83	0.057	.	.	0.47	0.147	.	.	0.263	.	.
1	VS N14/3	24.35	1.32	0.164	0.012	.	0.0082	2.16	0.385	.	57.0	0.67	0.40	13.47
1	SRM 867	23.4	2.73	(0.062)	(0.021)	0.089	1.74	26.6	0.39	(0.45)	43.5	0.32	0.75	(0.006)
1	IARM 272A	21.98	9.34	1.16	0.082	12.89	0.015	1.10	0.067	0.015	52.68	0.07	0.50	0.061
1	SRM 865	21.9	8.6	0.21	0.037	(0.072)	0.36	4.5	0.18	3.5	59.5	0.41	0.28	(0.007)
1	IARM 59E	21.9	2.72	0.067	0.0073	0.27	1.70	31.6	0.502	0.20	39.7	0.232	0.81	0.17
1	IARM 69C	21.6	8.32	0.11	0.068	1.11	0.069	18.3	0.47	0.09	48.7	0.35	0.017	0.62
1	IARM 65D	21.5	13.1	0.29	0.0021	1.22	0.050	3.66	0.28	0.033	56.8	0.035	0.005	2.81
1	IARM 69D	21.13	8.78	0.21	0.090	1.67	0.075	17.7	0.72	0.204	48.1	0.63	0.004	0.49
1	VS N16/2	21.12	0.49	0.90	0.049	.	0.011	1.11	0.224	0.367	.	0.267	2.71	.
1	IARM 274A	21.0	8.06	0.26	0.007	0.143	0.10	7.60	0.08	3.48	57.5	(0.02)	1.55	0.06
1	NCS HC41501	20.69	8.37	0.016	0.043	(0.011)	.	3.50	0.124	3.19	63.72	0.071	0.011	.
1	NCS HC23501	20.30	.	1.09	0.042	.	0.059	.	0.345	.	.	0.37	2.89	.
1	NCS HC23504	20.30	2.06	0.635	0.059	.	.	.	0.442	.	.	0.631	0.613	.
1	IARM 347A	20.14	4.16	0.016	0.023	0.083	1.34	47.4	1.24	(0.01)	24.88	0.56	0.007	0.020
1	SRM 866	20.1	0.36	0.29	0.082	0.075	0.49	46.1	0.92	(0.09)	30.8	0.17	0.31	(<0.002)
1	VS N5/3	20.03	.	.	0.076	.	.	0.53	0.274	.	.	0.60	0.28	.
1	VS N6/4	20.0	.	0.8	0.008	.	0.8	0.2	.	.	.	0.1	2.7	.
1	IARM 58B	19.6	0.01	0.45	0.073	0.02	0.011	47.7	0.51	0.01	30.7	0.282	0.50	0.01
#	Number	Cr	Mo	Al	C	Co	Cu	Fe	Mn	Nb	Ni	Si	Ti	W
1	BCS 310/1	19.45	.	1.06	0.068	17.0	.	0.25	0.35	.	58.6	0.46	2.43	.
1	SRM 349a	19.3	4.25	1.23	0.035	12.46	(0.007)	1.15	0.019	(0.05)	58.1	0.018	3.06	(0.06)
1	BCS 351/1	19.14	3.04	0.554	0.0255	0.145	0.0222	17.20	0.0562	5.31	53.35	0.080	0.938	0.0209
1	NCS HC41502	18.56	3.28	0.635	0.027	0.111	0.023	18.54	0.057	5.15	52.27	0.080	1.03	.
1	IARM 325A	18.52	9.98	1.56	0.067	10.46	(0.003)	0.07	(0.004)	(0.007)	56.1	0.012	3.16	(0.03)
1	VS N13/4	17.89	4.39	2.83	0.0097	5.52	.	0.268	0.203	.	.	0.407	1.12	6.50
1	VS N9/4	17.44	2.88	1.33	0.0102	.	0.0122	7.63	0.010	0.83	.	0.096	2.10	3.09
1	BAM 326-1	16.37	(0.025)	.	0.092	0.223	(0.027)	.	0.406	.	61.16	1.46	.	.
1	SRM 864 **	15.74	0.204	0.252	(0.063)	0.0602	0.255	9.63	0.288	(0.126)	73.09	(0.114)	(0.251)	(<0.002)
1	VS N12/3	15.49	16.12	.	0.012	.	.	0.085	0.440	.	.	0.107	.	4.08
1	VS N7/3	14.4	2.9	1.2	0.007	.	0.2	2.0	0.04	1.83	.	0.1	2.0	.
1	IARM 277A	14.35	4.22	4.38	0.080	14.5	0.004	0.16	0.01	0.034	58.9	0.037	3.40	0.047
1	NCS HC23505	14.28	.	1.88	0.038	.	.	0.28	.	37.83	0.19	2.89	5.87	.
1	VS N8/3	14.06	4.30	.	0.0103	.	0.011	0.61	0.010	.	.	0.421	2.18	6.05
1	BCS 350	13.50	4.30	6.00	0.14	0.30	.	1.5	0.030	2.0	Rem	0.010	0.80	.
1	BCS 387	12.46	5.83	0.24	0.030	0.21	0.032	36.0	0.08	.	41.9	0.28	2.95	.
1	BCS 387/1	11.50	6.00	0.20	0.050	0.020	0.020	38.00	0.020	.	41.0	0.050	3.00	.
1	VS N15/3	10.0	5.6	4.0	0.05	15.04	0.02	0.5	0.05	.	.	0.2	2.6	5.5
#	Number	Cr	Mo	Al	C	Co	Cu	Fe	Mn	Nb	Ni	Si	Ti	W

\* Provisional Analysis

\*\* SRM 864 also contains, in mg/kg, Pb: 2.27 Tl:0.0029



## NICKEL BASE CHIPS WITH Cr &gt; 10 % CONTINUED FROM THE PREVIOUS PAGE

Number	Ag	B	Mg	N	O	P	S	Sn	Ta	V	Zr	Units	Other
IARM 67C	.	(0.001)	0.0068	0.035	0.0016	0.011	0.0006	0.0014	(0.006)	0.031	(0.002)	100 g	
VS N11/3	.	.	.	.	.	0.0016	0.003	.	.	.	.	100 g	
VS N14/3	.	.	.	.	.	0.0020	0.0029	.	.	.	.	100 g	
SRM 867	(<0.0001)	(0.002)	.	(0.017)	(0.006)	(0.018)	(0.002)	.	(0.001)	(0.047)	.	100 g	
IARM 272A	(0.0001)	0.003	(0.002)	0.0049	0.0007	(0.003)	0.0002	(0.0003)	(0.01)	(0.005)	(0.002)	100 g	
SRM 865	(0.0002)	(<0.001)	.	(0.066)	(0.004)	(0.012)	(0.001)	.	(<0.01)	(0.019)	.	150 g	
IARM 59E	(0.00004)	0.0027	(0.0001)	0.010	0.0033	0.015	0.0009	0.0031	(0.004)	0.049	(0.002)	100 g	
IARM 69C	(0.00004)	0.0034	0.0030	0.0180	0.0017	0.011	0.0005	(0.002)	.	0.033	0.004	100 g	
IARM 65D	.	(0.001)	0.007	0.019	0.0005	0.008	0.0004	(0.001)	(0.01)	0.012	(0.002)	100 g	
IARM 69D	0.00012	0.0044	0.0021	0.029	0.0012	0.012	0.0003	0.002	.	0.033	0.0074	100 g	Pb: 1.0 ppm
VS N16/2	.	0.0066	.	.	.	0.0028	0.0019	.	.	0.030	.	100 g	Sb: 0.00014
IARM 274A	.	0.002	0.0019	0.007	0.0006	0.007	0.0004	0.001	(0.002)	0.019	(0.001)	100 g	
NCS HC41501	.	.	.	.	.	0.0023	0.0006	.	(0.001)	.	.	100 g	
NCS HC23501	.	.	.	.	.	0.011	0.006	.	.	.	.	100 g	
NCS HC23504	.	.	.	.	.	0.0182	0.0107	.	.	.	.	100 g	
IARM 347A	Pb:0.0003	0.0020	0.0008	0.062	0.0026	0.023	0.0009	0.011	(0.005)	0.078	(0.002)	100 g	
SRM 866	(<0.0001)	(<0.001)	.	(0.018)	(0.004)	(0.017)	(0.001)	.	(<0.001)	(0.040)	.	100 g	
VS N5/3	.	.	.	.	.	0.0014	0.0033	.	.	.	.	100 g	
VS N6/4	.	.	.	.	.	0.002	0.003	.	.	.	.	100 g	Pb: 0.004
IARM 58B	.	(0.0003)	(0.001)	0.010	0.001	0.010	0.001	(0.002)	.	0.035	<0.005	100 g	
Number	Ag	B	Mg	N	O	P	S	Sn	Ta	V	Zr	Units	Other
BCS 310/1	.	.	.	.	.	.	.	.	.	.	.	100 g	
SRM 349a	.	(0.005)	.	.	.	(0.003)	0.0024	.	.	(0.12)	(0.053)	150 g	
BCS 351/1	.	0.0035	0.0016	0.0077	.	0.0045	0.00037	0.00033	0.0033	0.0181	0.0017	100 g	Sb: 0.00024
NCS HC41502	.	0.0025	.	.	.	0.0033	0.0005	.	(0.008)	.	.	100 g	
IARM 325A	(0.00001)	0.0082	0.0044	0.0016	0.0005	(0.003)	0.0003	(0.0002)	(0.003)	0.01	(0.002)	100 g	
VS N13/4	.	0.0098	.	.	.	0.0018	0.0020	.	.	.	.	100 g	Ce: 0.0047
VS N9/4	.	0.0049	.	.	.	.	.	.	.	.	.	100 g	
BAM 326-1	.	.	.	.	.	.	0.0028	.	.	.	0.129	100 g	
SRM 864 **	(<0.0001)	0.00283	0.01383	(0.01)	(0.004)	(0.011)	(0.0028)	(0.00074)	(<0.001)	0.0327	(0.00037)	100 g	
VS N12/3	.	.	.	.	.	0.0021	0.0027	.	.	.	.	100 g	
VS N7/3	.	.	.	.	.	0.002	0.002	.	.	.	.	100 g	
IARM 277A	.	0.015	0.0021	0.0017	0.0005	0.002	0.0010	<0.003	(0.02)	0.011	0.010	100 g	
NCS HC23505	.	.	.	.	.	0.008	.	.	.	.	.	100 g	
VS N8/3	.	0.020	0.0015	.	.	0.0023	0.0016	.	.	0.58	.	100 g	
BCS 350	.	.	.	.	.	.	0.003	.	.	.	.	100 g	
BCS 387	.	0.016	.	.	.	0.007	0.003	.	Clearance Sale Item		.	100 g	
BCS 387/1	.	.	.	.	.	0.005	0.005	.	.	.	.	100 g	
VS N15/3	.	0.02	.	.	.	0.002	.	.	.	0.3	.	100 g	
Number	Ag	B	Mg	N	O	P	S	Sn	Ta	V	Zr	Units	Other

\* Provisional Analysis

\*\* SRM 864 also contains, in mg/kg, Pb: 2.27 Tl:0.0029

**CRM IN 100 TYPE NICKEL ALLOY CHIPS**

analysis listed in mass %

Number	Al	Co	Cr	Mo	Ti	V	B	C	Zr	Units
BCS 345	5.58	14.70	9.93	3.01	4.74	1.00	0.019	0.153	0.044	100 g
BCS 346	(5.5)	(15)	(10)	(3)	(5)	(1)	.	(0.15)	.	100 g

continued analysis listed in mg/kg

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

**CRM TRACE ELEMENTS IN SUPERALLOY CHIPS**

analysis listed in mg/kg

100 g units

Number	Ag	As	B	Bi	Ca	Cd	Ce	Cu	Hf	Ga	Ge	In	P	Mg	Pb	Sb	Sc	Se	Sn	Te	Tl	Zn
NCS HCl1529	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 HCl1522	5.3	15	(90)	0.4	11	1.8	(110)	.	.	108	.	30	(40)	15	11	59	.	11	72	2.1	51	105
NCS HCl1521	4.6	11	(100)	0.4	21	4.6	(40)	.	.	32	.	2.6	(40)	16	4.1	95	.	16	53	11	22	32
NCS HCl1528	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 HCl1520	3.5	17	(100)	4.2	42	7.3	(30)	.	.	29	.	11	(40)	82	12	204	.	43	103	3.0	8.5	24
NCS HCl1527	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 HCl1526	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 HCl1525	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
NCS HCl1524	0.7	72	(100)	3.4	5.3	1.6	(10)	.	.	63	.	9.2	(40)	111	91	6.2	.	53	92	83	8.1	6.0
NCS HCl1523	0.3	72	(100)	0.5	32	1.9	(10)	.	.	28	.	0.4	(40)	53	2.2	7.4	.	43	1040	0.5	83	20

**CRM TRACE ELEMENTS IN SUPERALLOY CHIPS**

analysis listed in mg/kg

analysis listed in mass %

35 g units

Number	Bi	Pb	Se	Te	Tl	Al	B	C	Co	Cr	Hf	Nb	Ni	Ta	Ti	W	Zr
SRM 897	(0.5)	11.7	9.1	1.05	0.51	(2)	(0.01)	(0.12)	(8.5)	(12)	(1.2)	(0.9)	Rem	(1.75)	(2)	(1.75)	(0.1)
SRM 899	(0.3)	3.9	9.5	5.9	0.252	(2)	(0.01)	(0.12)	(8.5)	(12)	(1.2)	(0.9)	Rem	(1.75)	(2)	(1.75)	(0.1)

**RM TIN CHIPS**

analysis listed in mass %				analysis listed in mg/kg								100 g chips		
Number	C	Sn	Melting Point °C	As	Bi	Cd	Cu	Fe	In	Ni	Pb	S	Sb	Zn
RM Sn	.	99.9999	.	.	<0.5	.	<0.1	<0.1	.	<0.1	<0.3	.	.	<0.4
BCS 192h	0.001	99.998	231.9	<1	<1	<1	<1	<1	<1	<1	6	2	<5	<1

**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

**TIN CHIPS AND POWDER**

# = class, where 1 = CRM and 2 = RM      BCS: 100 g powder      GBW: 100 g chips      SRM: 170 g powder      all others: typical analysis 50 g chips

#	Number	Sb	Ag	Cd	Cu	Ni	Pb	Sn	Zn	Al	As	Au	Bi	Co	Fe	In	Te
2	C73XSC70	14.01	0.006	0.0018	6.51	0.008	0.356	.	(0.003)	0.001	0.047	.	0.009	0.0160	0.046	0.014	.
1	GBW 02302	11.81	.	.	6.72	.	1.20	80.27	.	.	0.020	.	0.012	.	.	.	.
2	C73XSC110	11.7	0.06	1.63	10.7	0.48	0.04	.	0.066	<0.005	0.30	.	0.53	.	0.07	.	.
1	BCS 178/2	9.45	(0.002)	0.14	4.58	0.17	3.18	82.2	0.040	.	0.15	.	0.11	.	0.024	.	.
2	C73XSC90	8.18	0.004	0.078	8.47	0.008	0.20	.	(0.003)	<0.001	0.53	.	0.066	0.0030	0.037	0.010	.
1	GBW 02301	7.87	.	.	4.06	.	1.32	86.61	.	.	0.018	.	0.014	.	.	.	.
1	SRM 54d	7.04	0.0032	.	3.62	0.0027	0.62	88.57	.	.	0.088	.	0.044	.	0.027	.	.
2	C73XSC40	6.02	0.042	0.052	3.05	0.017	0.514	.	0.008	0.005	0.005	.	0.218	0.0035	0.011	0.011	.
1	C74XHB	5.00	0.070	0.011	4.75	1.12	0.058	.	0.018	.	0.026	.	0.008	.	0.12	.	.
2	C72XSA50R	4.93	.	0.05	0.018	.	0.08	.	0.035	.	0.015	.	0.006	.	(0.004)	.	.
1	C71XSR30	0.14	0.007	0.022	0.10	0.002	0.28	.	0.015	0.003	0.077	0.003	0.10	.	0.001	0.030	0.008
1	C71XSR20	0.063	0.029	0.042	0.055	0.005	0.13	.	0.010	0.003	0.057	0.008	0.057	.	<0.001	0.051	0.023
1	C71XSR10 *	0.0156	0.0121	0.0104	0.0111	0.0041	0.0324	.	0.0146	(0.0016)	0.0102	0.0014	0.0107	.	(0.0021)	0.0120	0.0112

\* C71XSR10 also contains Ga: 0.0049 and Hg: 0.0142

**CRM TIN-LEAD SOLDER CHIPS AND POWDER**

BAM, BCS: powder													all others: typical analysis chips			
Number	Sn	Pb	Ag	As	Au	Bi	Cd	Cu	Fe	In	Ni	Sb	Te	Zn	Units	
C91XS63 PR40	66.8	Rem	0.030	<0.002	0.05	0.030	0.021	0.021	<0.005	0.014	<0.005	0.093	0.006	<0.001	100 g	
BAM BNM 010	63.40	36.47	(0.014)	(0.012)	(<0.001)	0.0245	0.0016	0.0417	(0.0020)	(<0.001)	0.0021	0.0488	.	(<0.0001)	100 g	
C91XS63 PR10	63.0	Rem	0.01	0.007	0.046	0.06	0.006	0.009	0.003	.	0.001	0.28	.	<0.001	100 g	
BCS 347	62.6	Rem	0.099	(0.02)	0.037	0.080	0.004	0.169	(0.002)	.	0.0072	0.191	.	0.0015	100 g	
C91XS63 PR20	62.6	Rem	0.057	0.080	0.090	0.162	0.0168	0.052	0.030	0.019	0.0073	0.614	0.009	0.007	100 g	
C91X S63 PR00 *	60.0	Rem	0.01	0.01	0.015	0.007	0.010	0.02	0.002	0.005	0.002	0.02	0.003	<0.001	100 g	
C91XS30 PR30	30.88	Rem	0.024	0.0126	0.0063	0.294	0.0115	0.102	0.0016	0.0085	0.0269	0.269	.	(0.003)	100 g	

\* Provisional Analysis

**RM TITANIUM POWDER**

typical analysis															powder 50 g	
Number	Ti	Al	Co	Cr	Cu	Fe	Mn	Mo	Ni	P	Pb	Si	W	Zn	Zr	
DH SL2701	98.52	0.018	0.00123	0.046	0.001	0.174	0.009	.	0.029	.	.	0.021	0.011	0.00027	0.00010	
DH SL2703	98.42	0.024	0.00190	0.059	0.002	0.238	0.017	0.016	0.031	<0.006	0.00030	.	0.015	0.00067	0.00020	last
DH SL2702	97.60	0.036	0.00380	0.066	0.002	0.363	0.035	0.018	0.036	0.005	.	0.042	0.029	0.00100	0.00020	last

**CRM TITANIUM**

Number	Al	B	C	Co	Cr	Cu	Fe	H	Mn	Mo	N	Nb	Ni
IARM 311A	0.32	.	0.009	.	0.013	0.0013	0.060	0.0021	0.0013	0.0012	0.012	(0.002)	0.014
BCR 090	(0.074)	0.00282	.	0.0501	0.0533	0.0513	0.0563	.	0.0314	0.0488	.	(0.0492)	0.0667
IARM 312A	0.006	.	0.004	(0.001)	(0.002)	(0.002)	0.028	0.0049	(0.001)	(0.002)	0.0023	.	(0.002)

BCR produced by HIP; 090A: 40 mm Ø x 20 mm; 090B: 25 g of 0.2 g cubes IARM: 65 g

Number	O	Pd	S	Si	Sn	V	W	Y	Zr
IARM 311A	0.083	.	.	0.005	0.0020	0.004	(0.002)	(0.0002)	0.012
BCR 090	.	.	.	(0.071)	(0.057)	(0.050)	(0.050)	(0.0436)	
IARM 312A	0.066	(0.004)	(0.001)	0.006	0.0012	(0.002)	.	(0.0004)	(0.001)

**TITANIUM ALLOY CHIPS**

# = class, where 1 = CRM and 2 = RM

\* Provisional Analysis

#	Number	Al	C	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Si	Sn	V	Zr
1	SRM 2433	7.63	.	.	.	0.063	.	0.99	.	.	.	.	0.98	.
1	IARM 175D	6.39	0.008	0.014	0.002	0.23	(0.003)	0.0030	(0.008)	0.016	0.008	0.007	3.99	(0.002)
1	BCS 356	6.25	(0.0085)	0.0112	0.0055	0.124	.	0.0020	.	0.0070	(0.0200)	.	4.05	.
1	SRM 173c	6.245	0.027	0.0165	0.0040	0.2130	(0.002)	0.0068	.	0.0203	(0.019)	(0.010)	4.154	0.0053
2	C101 P6850	6.11	.	.	.	0.02	.	0.48	.	.	0.21	.	.	5.05
1	IARM 336B	6.04	0.006	(0.001)	(0.002)	0.132	.	6.16	.	(0.002)	0.020	2.04	(0.004)	4.12
1	IARM 300A *	5.97	0.006	0.009	(0.003)	0.19	(0.001)	(0.001)	6.9	0.008	0.019	(0.01)	(0.01)	.
1	IARM 336A	5.9	0.005	(0.002)	(0.002)	0.115	.	6.16	.	(0.002)	0.019	2.03	0.005	3.92
1	SRM 647	5.88	0.006	(<0.01)	(<0.002)	0.075	(<0.01)	1.96	(<0.01)	(<0.004)	(0.04-0.07)	2.02	(<0.02)	3.90
1	SRM 2431	5.73	0.006	(0.001)	(0.001)	0.056	(<0.01)	6.01	.	(<0.01)	0.088	1.98	(<0.01)	4.06
1	IARM 337A	5.60	0.008	2.01	(0.002)	0.114	.	2.05	(0.004)	0.011	0.14	1.96	(0.003)	1.89
1	IARM 314B	5.57	0.010	3.08	0.002	0.39	(0.001)	4.88	0.009	0.0044	0.041	0.022	5.04	(0.002)
1	IARM 178D	5.49	0.028	0.031	0.52	0.550	(0.003)	0.10	(0.01)	0.067	0.053	1.84	5.47	0.026
1	BCS 357	5.46	(0.0072)	0.0521	0.0537	0.202	.	0.053	.	0.0511	(0.0500)	.	3.53	.
1	IARM 178C	5.44	0.022	0.014	0.61	0.66	0.002	0.012	<0.01	0.013	0.045	1.98	5.41	0.0038
1	SRM 648	5.13	0.011	3.84	(<0.01)	0.15	(<0.01)	3.75	.	(<0.005)	0.027	1.98	(<0.02)	1.84
1	IARM 345A	5.12	0.010	3.89	(0.002)	0.121	0.0009	4.09	(0.002)	0.015	0.013	1.99	0.005	1.90
1	IARM 280A	4.11	0.005	0.0055	0.003	0.044	(0.002)	4.01	(0.001)	0.012	0.47	2.07	0.023	(0.002)
1	IARM 344A	3.15	0.011	3.09	(0.002)	0.20	(0.003)	0.004	(0.005)	0.011	(0.03)	3.09	15.3	(0.002)
1	SRM 2432	3.15	0.008	(<0.01)	(<0.005)	1.77	(<0.01)	.	.	(<0.01)	0.029	.	10.00	(<0.01)
1	SRM 649	3.08	0.011	2.96	(<0.001)	0.133	(<0.01)	.	(<0.01)	(<0.01)	.	3.04	15.1	.
1	IARM 261E	3.05	0.012	0.016	0.0025	0.18	(0.001)	0.003	(0.005)	0.018	0.007	0.005	2.51	(0.003)
1	IARM 261C	3.05	0.011	0.014	0.003	0.180	(0.003)	0.004	(0.003)	0.016	0.007	0.006	2.46	0.003
1	IARM 261A	3.00	0.007	0.013	.	0.19	0.0011	(0.003)	.	0.006	0.012	0.008	2.48	(0.002)
1	IARM 261D	3.02	0.011	0.016	0.0028	0.185	(0.002)	0.003	(0.003)	0.018	0.008	0.005	2.50	0.003
1	IARM 261B	2.98	0.011	0.016	0.003	0.19	(0.003)	0.004	(0.002)	0.023	0.008	0.004	2.23	(0.002)
2	C101 P6790	2.35	.	.	.	0.02	.	1.0	.	.	0.2	10.88	.	4.88

Number	H	N	O	Pd	S	Units	Other
SRM 2433	.	.	.	.	.	50 g	
IARM 175D	0.0027	0.030	0.177	.	.	65 g	
BCS 356	.	0.0103	.	.	.	50 g	
SRM 173c	(0.006)	(0.028)	0.164	.	.	50 g	Ti: (89.15) last of stock
C101 P6850	.	.	.	.	.	50 g	
IARM 336B	0.0029	0.0016	0.101	.	(0.002)	65 g	
IARM 300A *	0.0019	0.004	0.16	.	.	65 g	
IARM 336A	0.0022	0.0015	0.102	.	(0.002)	65 g	
SRM 647	.	(<0.01)	(0.1)	.	.	50 g	
SRM 2431	.	.	.	.	.	50 g	
IARM 337A	0.005	0.0017	0.104	.	(0.001)	65 g	Co: 0.0011
IARM 314B	0.0057	0.0045	0.130	(0.003)	(0.001)	65 g	
IARM 178D	0.0016	0.017	0.17	(0.003)	(0.001)	65 g	Co: 0.005
BCS 357	.	0.0148	.	.	.	50 g	
IARM 178C	0.0025	0.011	0.168	(0.003)	(0.002)	65 g	B: 0.0010
SRM 648	.	(0.01)	.	.	.	50 g	
IARM 345A	0.0040	0.0025	0.120	(0.002)	(0.001)	65 g	
IARM 280A	0.0015	0.0014	0.19	(0.002)	(0.001)	65 g	
IARM 344A	(0.015)	0.005	0.107	(0.001)	(0.001)	65 g	B: 0.0011
SRM 2432	.	.	.	.	.	50 g	
SRM 649	.	(0.01)	.	.	.	50 g	Mg: (0.004)
IARM 261E	(0.0005)	0.006	0.084	(0.002)	(0.001)	65 g	
IARM 261C	0.001	0.005	0.085	(0.002)	(0.001)	65 g	
IARM 261A	0.0023	0.007	0.10	.	(0.001)	65 g	last of stock
IARM 261D	(0.0005)	0.0051	0.083	(0.002)	(0.001)	65 g	
IARM 261B	(0.001)	0.004	0.083	.	(0.0004)	65 g	
C101 P6790	.	.	.	.	.	50 g	last of stock

**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	.	.	.	.	.	.	.	.	.	.	.	.	.	.	71.96	100 g

**CRM TUNGSTEN ALLOY CHIPS**

analysis listed in mass %

Number	Co	Fe	Mn	Ni	Units
NCS HCS5905	0.502	3.22	0.060	6.01	50 g
NCS HCS5904	0.400	2.43	0.050	4.50	50 g
NCS HCS5903	0.302	1.63	0.040	3.00	50 g
NCS HCS5902	0.102	0.813	0.030	1.51	50 g

**CRM ZINC PELLETS**

Number	Cd	Cu	Fe	Pb	Units
GBW 02701	0.0010	0.00010	0.0010	0.0030	50 grams of 3 mm Ø pellets last of stock

**CRM ZINC PELLETS**

analysis listed in mg/kg

450g of 3mm Ø pellets

Number	Ag	Al	As	Au	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	In	Ir	K	Mg	Mn
SRM 728	1.08	(0.07)	(<0.005)	(<0.02)	(<0.005)	(0.02)	1.14	(1.0)	(<0.03)	5.68	1.84	(<0.05)	(0.05)	(<0.005)	(<0.005)	(<0.01)	(<0.001)	(0.07)

continued

Number	Mo	Na	Nb	Ni	Pb	Pd	Pt	Rh	Ru	Sb	Sc	Si	Sn	Ti	Tl	V	W	Zr
SRM 728	(<0.01)	(0.01)	(<0.01)	(0.45)	11.13	(<0.05)	(<0.01)	(<0.05)	(<0.01)	(0.5)	(<0.001)	(<0.01)	(0.02)	(0.04)	(0.2)	(<0.001)	(0.4)	(<0.01)

**CRM ZINC**

Number	Cd	Cu	Fe	Pb	Sn	Units
IMN 1	0.00066	0.00080	0.0012	0.011	0.00021	100 g chips

**RM ZINC**

Number	Zn	Al	As	Cd	Cu	Fe	Mg	Pb	Sn	Ti	Units
BM PZn	[99.995]	<0.001	.	<0.003	<0.001	<0.002	.	<0.003	<0.001	.	100 g chips
BM Zn ##	99.99	<0.0003	<0.0005	<0.004	<0.003	<0.004	<0.001	<0.003	<0.001	<0.001	100 g chips

## SUSPENDED FOR RETESTING 03/16

**ZINC SPELTER CHIPS**

BS: 50 g units SRM: 100 g units

Number	Al	Cu	Fe	Pb	Sb	Sn
RM BS SP-D	0.25	<0.0005	0.060	0.038	0.006	<0.001
CRM SRM 2139	0.2049	.	.	0.0302	.	.
RM BS SP-B	0.141	<0.002	0.025	0.021	0.061	<0.001
RM BS SP-C	0.185	<0.0005	0.041	0.005	0.031	<0.001
RM BS SP-A	0.051	<0.0005	0.011	0.003	0.099	<0.001

## ZINC ALLOY CHIPS, chart 1 of 2

# = class, where 1 = CRM and 2 = RM

C41X-43X: typical analysis

FNE: 100 g

NCS, SRM: 150 g

all others: 50 g units

#	Number	Al	Cu	Cd	Fe	Mg	Mn	Ni	Pb	Sb	Sn	Bi	Cr	Si	Ti
2	C43XZ230	29.8	2.73	0.002	0.008	0.01	0.002	0.003	0.002	.	0.003	.	.	.	.
1	CAN NZA-1	28.70	1.51	0.00098	0.046	0.020	.	.	0.0030	.	0.0069	.	.	.	.
1	CAN NZA-4	26.65	2.45	0.0029	0.027	0.0106	.	.	0.0101	.	0.0087	.	.	.	.
1	CAN NZA-3	25.99	2.00	0.0064	0.066	0.049	.	.	0.0045	.	0.0034	.	.	.	.
2	C43XZ210	24.9	2.05	0.01	0.05	0.06	0.009	0.002	0.007	.	0.01	.	.	.	.
1	CAN NZA-2	23.81	3.00	0.0047	0.021	0.029	.	.	0.0076	.	0.0045	.	.	.	.
1	CAN NZA-7	13.17	0.212	0.00020	(0.016)	0.052	.	.	0.0136	.	0.0116	.	.	.	.
2	C43XZ110	11.2	0.47	0.014	0.008	0.05	0.01	0.006	0.015	.	0.02	.	.	.	.
1	CAN NZA-5	10.85	1.04	0.0095	(0.016)	0.021	.	.	0.0012	.	0.0017	.	.	.	.
1	C43XZ20	10.05	0.796	0.0114	0.047	0.027	0.0059	0.004	0.0133	0.0039	0.0089	(0.002)	0.0023	(0.008)	0.0054
1	C43XZ130	9.58	0.977	0.0102	0.06	0.020	0.007	0.011	0.012	0.009	0.011	.	.	.	.
1	C43XZ140	8.24	1.23	0.0067	0.015	0.0026	0.0033	0.0052	0.0082	0.011	0.0053	0.010	0.0046	0.010	0.0012
1	CAN NZA-6	7.54	3.17	0.0147	(0.105)	0.00037	.	.	0.0109	.	0.0051	.	.	.	.
1	C43X Z150	7.36	1.53	0.0030	0.009	0.0024	0.0020	0.0019	0.0054	0.005	0.004	0.005	0.0025	(0.011)	0.0020
1	C42XZ80	7.03	0.0215	0.0003	0.013	0.0033	0.0014	0.0019	0.0025	.	(0.0023)	.	(0.0002)	0.013	.
1	NCSHC28974-Zn	4.85	.	.	.	0.083	.	.	.	.	.	.	.	.	.
1	C43XZ40	4.76	3.21	0.0025	(0.064)	0.0434	0.088	0.0286	(0.002)	0.0043	(0.0024)	0.012	0.0063	(0.0065)	0.0017
1	C42XZ70	4.39	0.0249	0.030	0.027	0.0095	0.0045	0.0067	0.0097	.	0.012	.	(0.001)	0.006	.
2	C42XZ10	4.3	0.003	<0.001	0.002	<0.001	<0.001	0.001	0.002	.	0.002	.	.	.	.
2	C42XZ50	4.22	0.098	0.0021	0.029	0.073	0.0068	0.0185	0.0048	(0.00055)	0.0022	0.006	0.0018	.	.
1	SRM 94c	4.07	1.01	0.002	0.018	0.042	0.014	0.006	0.006	.	0.006	.	.	.	.
1	C43XZ60	4.02	2.72	0.0016	0.019	0.0256	0.0006	0.029	0.0016	0.0045	0.0053	0.049	0.0006	0.012	0.0013
1	C42XZ30	3.72	0.159	0.0048	(0.047)	0.0288	0.0252	0.0102	0.0060	0.003	0.0030	.	0.0020	0.015	.
1	C43XZ30	3.64	1.59	0.0132	0.061	0.0143	0.0125	0.0061	0.0132	0.003	0.0125	0.018	0.004	0.005	.
1	C42XZ40	3.55	0.063	0.008	0.01	0.057	0.008	0.017	0.011	0.002	0.006	.	.	.	.
1	C43XZ50	3.05	6.05	0.0111	0.023	0.041	0.0030	0.0021	0.0045	.	0.0032	.	0.0010	0.003	0.0009
2	C43XZ20	3.2	0.89	0.01	0.02	0.042	0.008	0.003	0.008	0.008	0.01	.	.	.	.
2	C41X0336Z40	1.39	0.874	0.638	(0.018)	0.179	0.038	0.0074	2.87	0.048	2.38	0.027	.	.	.

#	Number	Ag	As	Ce	In	La	Tl
2	C43XZ230	.	.	.	.	.	.
1	CAN NZA-1	.	.	.	.	.	.
1	CAN NZA-4	.	.	.	.	.	.
1	CAN NZA-3	.	.	.	.	.	.
2	C43XZ210	.	.	.	.	.	.
1	CAN NZA-2	.	.	.	.	.	.
1	CAN NZA-7	.	.	.	.	.	.
2	C43XZ110	.	.	.	.	.	.
1	CAN NZA-5	.	.	.	.	.	.
1	C43XZ120	.	.	.	.	.	.
1	C43XZ130	.	.	.	.	.	.
1	C43XZ140	.	.	.	.	.	.
1	CAN NZA-6	.	.	.	.	.	.
1	C43X Z150	.	.	.	.	.	.
1	C42XZ80	.	.	0.0081	.	0.0079	.
1	NCSHC28974-Zn	.	.	.	.	.	.
1	C43XZ40	.	.	.	.	.	.
1	C42XZ70	.	.	0.053	.	0.047	.
2	C42XZ10	.	.	.	.	.	.
1	C42XZ50	.	.	0.011	0.0048	0.009	0.006
1	SRM 94c	.	.	.	.	.	.
1	C43XZ60	.	.	.	.	.	.
1	C42XZ30	.	.	(0.0003)	.	(0.0003)	.
1	C43XZ30	.	.	.	(0.0019)	.	(0.0035)
1	C42XZ40	.	.	0.020	0.001	0.019	0.003
1	C43XZ50	.	.	.	.	.	.
2	C43XZ20	.	.	.	.	.	.
2	C41X0336Z40	0.0023	0.0005	.	.	.	.

