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**There are now  
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**CRM PURITY COPPER DISC AND ROD SETS**

available in SETS only, as grouped listed in mg/kg IMN CP: Disc 40 mm Ø x 23 mm IMN CS: Disc 40 mm Ø x 25 mm or Rod 6 mm Ø x 100 mm

| Number  | Ag   | As   | B      | Bi   | Cd   | Co   | Cr    | Fe   | Mn   | Ni   | P    | Pb   | S    | Sb   | Se   | Si     | Sn   | Te   | Zn   |
|---------|------|------|--------|------|------|------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|
| IMN CS1 | 53.1 | 2.0  | (1.1)  | 1.1  | 1.0  | 0.6  | (0.3) | 18.4 | 29.0 | 46.8 | 57.7 | 60.5 | 65.9 | 3.0  | 61.5 | (3.0)  | 52.9 | 2.1  | 24.1 |
| IMN CS2 | 45.6 | 7.4  | (2.8)  | 6.2  | 7.4  | 3.6  | 35.8  | 30.5 | 35.3 | 26.7 | 33.8 | 38.6 | 44.9 | 7.5  | 39.0 | (9.4)  | 33.7 | 5.6  | 8.9  |
| IMN CS3 | 38.9 | 13.8 | (4.2)  | 12.2 | 13.4 | 7.4  | 10.9  | 28.3 | 12.6 | 11.1 | 12.1 | 13.3 | 18.8 | 13.0 | 15.4 | (22.2) | 13.3 | 10.6 | 31.3 |
| IMN CS4 | 237  | 42.2 | (21.7) | 39.6 | 35.5 | 24.3 | 7.0   | 82.0 | 8.3  | 7.2  | 6.3  | 7.6  | 41.3 | 36.8 | 6.7  | (46.5) | 6.2  | 32.9 | 44.0 |
| IMN CS5 | 320  | 70.5 | (35.2) | 59.7 | 66.1 | 37.5 | 1.0   | 90.9 | 4.3  | 4.4  | 2.0  | 5.0  | 12.0 | 63.9 | 0.9  | (54.8) | 0.9  | 49.8 | 101  |
| IMN CP1 | 12   | 0.4  | .      | 1.0  | 0.6  | 0.2  | 0.3   | 10   | 1.3  | 3.4  | 2.0  | 1.7  | 6.3  | 11   | <1   | .      | 5.6  | 3.0  | 1.9  |
| IMN CP2 | 36   | 140  | .      | .    | 72   | 39   | 0.5   | 8.1  | 5.9  | 20   | 11   | 120  | 35   | 160  | 77   | (4)    | 4.8  | 12   | 92   |
| IMN CP3 | 60   | 63   | .      | 47   | 35   | 20   | 45    | 15   | 30   | 13   | 44   | 81   | 60   | 120  | 43   | (8)    | 17   | 46   | 33   |
| IMN CP4 | 110  | 14   | .      | 13   | 11   | 4.2  | 86    | 44   | 55   | 3.4  | 130  | 28   | 94   | 48   | 10   | (3)    | 40   | 75   | 17   |
| IMN CP5 | 31   | 65   | .      | 9.4  | 2.5  | 34   | 48    | 77   | 49   | 39   | 110  | 13   | 21   | 27   | 35   | (82)   | 2.1  | 7.8  | 38   |
| IMN CP6 | 20   | 0.85 | .      | .    | .    | <1   | 0.3   | 6.4  | 0.6  | 2.7  | 1.7  | 2.7  | 7.5  | 0.4  | <1   | .      | 0.7  | .    | 1.4  |

**CRM COPPER RODS**

analysis listed in mg/kg N.F. = Not Found CAN: rod 7.9 mm Ø x 300 mm IMN: 6 mm Ø x 100 mm

| Number    | Ag   | As   | B    | Bi   | Cd     | Co   | Cr   | Fe   | Mn  | Ni   | O     | P     | Pb    | S    | Sb   | Se   | Si   | Sn   | Te    | Zn   |
|-----------|------|------|------|------|--------|------|------|------|-----|------|-------|-------|-------|------|------|------|------|------|-------|------|
| CAN SSC-1 | 18.8 | 1.16 | .    | 1.15 | N.F.   | .    | .    | 39.2 | .   | 17.6 | 216.0 | .     | 65.3  | 19.6 | 2.64 | 7.28 | .    | 54.9 | 4.57  | 33.3 |
| IMN CS7 R | 13.7 | 0.9  | <0.5 | <0.5 | (0.02) | 0.09 | 19.7 | 4.9  | 2.2 | 4.4  | .     | (2.4) | (0.9) | 7.0  | 1.0  | <1.0 | <1.0 | 0.5  | <0.05 | 1.2  |

**CRM ELECTROLYTIC COPPER ROD SET**

available in SET/6 ONLY listed in mg/kg 3 or 6 mm Ø x 100 mm

| Number  | Ag   | As   | Bi      | Fe   | Ni    | Pb   | Sb   | Sn     | Zn   | Cu  |
|---------|------|------|---------|------|-------|------|------|--------|------|-----|
| IMN CF1 | 45.0 | 6.7  | 12.5    | 42.0 | 29.0  | 33.0 | 24.0 | 21.0   | 57.0 | Rem |
| IMN CF2 | 9.0  | 1.1  | .       | 2.8  | 0.7   | 0.6  | 1.4  | .      | 2.2  | Rem |
| IMN CF3 | 3.2  | 1.8  | .       | 20.0 | 6.4   | 8.9  | 2.2  | 3.2    | 3.4  | Rem |
| IMN CF4 | 18.0 | 43.0 | 1.2     | 3.7  | 7.8   | 1.1  | 11.0 | 1.0    | 31.0 | Rem |
| IMN CF5 | 12.0 | 2.3  | 0.25    | 98.0 | 3.0   | 3.2  | 1.9  | 1.3    | 4.7  | Rem |
| IMN CF6 | 12.0 | 0.32 | (0.012) | 1.0  | (0.4) | 1.8  | 0.2  | (0.06) | .    | Rem |

**COPPER WIRE FOR GLOBULE ARC WORK**

analysis listed in mg/kg These Reference Materials are in wire form, intended for globule arc work. 5 rods 3 mm Ø x 80 mm

| Number  | Ag   | As   | Bi   | Cd    | Co   | Cr     | Fe   | Mn      | Ni   | Pb     | Sb   | Se     | Sn     | Te     | Zn   | O   | P     | S   | Si   |
|---------|------|------|------|-------|------|--------|------|---------|------|--------|------|--------|--------|--------|------|-----|-------|-----|------|
| CRM     |      |      |      |       |      |        |      |         |      |        |      |        |        |        |      |     |       |     |      |
| 38X C1C | 11   | 0.19 | 0.10 | <0.01 | .    | <0.005 | 1.7  | (0.005) | 0.27 | (0.05) | 0.10 | (0.25) | (0.01) | (0.21) | <0.1 | 266 | <0.05 | 2.0 | <0.1 |
| RM      |      |      |      |       |      |        |      |         |      |        |      |        |        |        |      |     |       |     |      |
| 38X C6  | 104  | 98   | 22   | 32    | 33   | 1      | 107  | 0.3     | 166  | 111    | 45   | .      | 120    | 30     | 40   | .   | .     | .   | .    |
| 38X C4  | 21.0 | 19.0 | 5.0  | 8.0   | 3.0  | 3.0    | 19.0 | 2.7     | 29.0 | 23.0   | 9.0  | .      | 21.0   | 8.0    | 22.0 | .   | .     | .   | .    |
| 38X C1B | 13   | 0.8  | 0.1  | <0.01 | 0.03 | 0.06   | 1.2  | 1.2     | 1.0  | 0.8    | 0.6  | .      | <0.3   | 0.3    | 0.45 | .   | .     | .   | .    |
| 38X C1A | 8    | <1   | <1   | <1    | <1   | <1     | 3    | <1      | 1    | 0.3    | <1   | .      | <1     | <1     | <2   | .   | .     | .   | .    |

**CHILL CAST PHOSPHORUS DEOXIDIZED COPPER**

# = Class, where 1 = CRM and 2 = RM, typical analysis

| # | Number     | P      | Cu    | Ag     | Fe     | Al        | As     | Co      | Mn      | Ni      | Pb      | Sb      | Sn      | Zn      |
|---|------------|--------|-------|--------|--------|-----------|--------|---------|---------|---------|---------|---------|---------|---------|
| 2 | CURM 09.01 | 0.151  | 99.82 | 0.011  | 0.0019 | <0.0005   | <0.001 | <0.0003 | <0.0003 | <0.0003 | <0.0003 | <0.0005 | <0.0005 | 0.0008  |
| 2 | CURM 09.02 | 0.078  | 99.90 | 0.055  | 0.0042 | <0.0005   | <0.001 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.001  |
| 1 | SRM C1253a | 0.0561 | 99.46 | 0.0494 | 0.0290 | 0.0176    | 0.0436 | 0.0454  | 0.0357  | 0.0491  | 0.0243  | 0.0139  | 0.0499  | 0.0329  |
| 2 | CURM 09.03 | 0.056  | 99.82 | 0.012  | 0.0033 | <0.0003   | <0.001 | <0.0003 | <0.0003 | <0.0003 | <0.0005 | <0.0005 | <0.0005 | <0.001  |
| 1 | SRM C1251a | 0.0420 | 99.89 | 0.0080 | 0.0285 | (<0.0020) | 0.0016 | 0.00132 | 0.00046 | 0.00236 | 0.00235 | 0.00149 | 0.0016  | 0.0024  |
| 2 | CURM 09.04 | 0.0174 | 99.96 | 0.0033 | 0.0047 | <0.0005   | <0.001 | <0.0005 | <0.0005 | <0.0005 | <0.001  | <0.0005 | <0.001  | <0.001  |
| 1 | SRM C1252a | 0.0125 | 99.87 | 0.0158 | 0.0072 | (<0.0020) | 0.0118 | 0.0087  | 0.0043  | 0.0128  | 0.0060  | 0.0042  | 0.0120  | 0.00694 |

| Number     | Au      | Bi       | Cd        | Cr       | Mg        | S        | Se     | Si        | Te      | Units                 |
|------------|---------|----------|-----------|----------|-----------|----------|--------|-----------|---------|-----------------------|
| CURM 09.01 | .       | <0.0003  | .         | .        | .         | .        | .      | <0.001    | .       | 50 mm Ø x 10-12 mm    |
| CURM 09.02 | .       | <0.0005  | .         | .        | .         | .        | .      | <0.002    | .       | 50 mm Ø x 10-12 mm    |
| SRM C1253a | 0.0072  | (0.0056) | 0.0070    | 0.0260   | (0.0150)  | (0.0050) | 0.0136 | (0.0580)  | 0.0168  | 32 mm x 32 mm x 19 mm |
| CURM 09.03 | .       | <0.0003  | .         | .        | .         | .        | .      | <0.001    | .       | 50 mm Ø x 10-12 mm    |
| SRM C1251a | 0.00155 | 0.00037  | (<0.0003) | (0.0003) | (<0.0020) | (0.0035) | 0.0011 | (<0.0050) | 0.0016  | 32 mm x 32 mm x 19 mm |
| CURM 09.04 | .       | <0.0005  | .         | .        | .         | .        | .      | <0.002    | .       | 50 mm Ø x 10-12 mm    |
| SRM C1252a | 0.00339 | (0.0019) | 0.00169   | 0.0019   | (<0.0020) | (0.0070) | 0.0056 | (<0.0100) | 0.00546 | 32 mm x 32 mm x 19 mm |

COPPER

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

39X: 40-42 mm Ø x 15-17 mm      BS: 38 mm Ø x 12 mm      IARM: 31 mm Ø x 2 or 18 mm  
 BAM, BCR, ERM: 40 mm Ø x 30 mm      CTIF: 40 mm Ø x 18 mm      IMN: 40 mm Ø x 25-27 mm

| # | Number         | Al        | As        | Bi         | Cd         | Co        | Cr        | Fe       | Mg         | Mn       | Ni        | P         | Pb        | S         |
|---|----------------|-----------|-----------|------------|------------|-----------|-----------|----------|------------|----------|-----------|-----------|-----------|-----------|
| 1 | BAM 376        | (0.01815) | 0.01999   | 0.0200     | 0.01861    | 0.02079   | (0.0400)  | 0.02346  | 0.0124     | 0.02059  | 0.0209    | 0.0203    | 0.0236    | 0.0133    |
| 1 | 39X 17869      | 0.0109    | 0.0121    | 0.066      | 0.0037     | 0.0119    | 0.0290    | 0.057    | 0.0068     | 0.112    | 0.0174    | 0.0449    | 0.0455    | 0.0107    |
| 1 | 39X 17873      | 0.015     | 0.0209    | 0.0233     | 0.0052     | 0.0233    | 0.0231    | 0.019    | 0.011      | 0.0182   | 0.0173    | 0.078     | 0.065     | 0.0206    |
| 1 | 39X 17872      | 0.0118    | 0.0203    | 0.0240     | 0.0013     | 0.0102    | .         | (0.045)  | .          | 0.0055   | 0.0537    | 0.0045    | 0.293     | 0.0242    |
| 1 | BAM EB386      | 0.00365   | 0.00242   | 0.00096    | 0.00078    | 0.000520  | 0.00124   | 0.00647  | 0.00361    | 0.00133  | 0.00250   | 0.00072   | 0.00234   | 0.00219   |
| 1 | BAM EB385      | 0.00286   | 0.00114   | 0.000581   | 0.00058    | 0.000693  | 0.000981  | 0.00454  | 0.00291    | 0.00101  | 0.00119   | 0.00129   | 0.00113   | 0.00313   |
| 1 | IARM 279A      | (0.002)   | (0.002)   | (0.001)    | .          | (0.002)   | 0.86      | 0.025    | .          | (0.002)  | 0.014     | (0.005)   | (0.01)    | 0.0015    |
| 1 | BAM 384        | 0.00130   | 0.00050   | 0.000334   | 0.000395   | 0.000388  | 0.000653  | 0.00328  | 0.00146    | 0.000688 | 0.00057   | .         | 0.00057   | (0.00041) |
| 1 | BAM 370        | 0.00126   | .         | .          | .          | .         | .         | .        | .          | .        | .         | 0.00117   | 0.0016    | .         |
| 1 | 39X 17866      | 0.0011    | 0.0541    | 0.0056     | 0.0252     | 0.0395    | 0.0284    | 0.0102   | 0.0011     | 0.0047   | 0.0503    | 0.0102    | 0.0052    | 0.051     |
| 1 | 39X 17868      | 0.0002    | 0.0196    | 0.0202     | 0.0023     | 0.0002    | .         | 0.0015   | .          | 0.0023   | 0.0211    | (0.0020)  | 0.046     | 0.0056    |
| 1 | 39X 17870      | (0.0004)  | 0.0084    | 0.0334     | 0.0036     | 0.0025    | (0.0002)  | (0.0009) | (0.0001)   | 0.00013  | 0.0065    | 0.0014    | 0.0296    | 0.0044    |
| 1 | 39X 17867      | (0.0003)  | 0.0417    | 0.0122     | 0.0173     | 0.0003    | (0.0002)  | 0.0009   | (0.0002)   | 0.0003   | 0.0339    | (0.0012)  | 0.0058    | 0.0041    |
| 1 | BAM 383        | (0.00023) | 0.000193  | 0.000102   | 0.000148   | 0.000137  | 0.000103  | 0.00109  | 0.000237   | 0.000124 | 0.000359  | .         | 0.000131  | (0.00028) |
| 1 | BAM 382        | <0.00025  | (0.0053)  | 0.000053   | 0.000090   | 0.000073  | 0.000056  | 0.00060  | (0.0014)   | 0.000076 | 0.00017   | .         | 0.00010   | (0.00032) |
| 1 | IARM 278A      | <0.002    | (0.001)   | (0.001)    | .          | (0.001)   | (0.001)   | 0.004    | .          | (0.0004) | <0.005    | 0.011     | (0.003)   | 0.002     |
| 1 | BS 14500       | (<0.0006) | (<0.0005) | .          | .          | (<0.0001) | (<0.0001) | 0.0041   | (<0.0003)  | 0.00004  | (<0.0003) | 0.0075    | 0.0008    | 0.0033    |
| 1 | BS 110B        | <0.0002   | <0.0001   | .          | .          | <0.0001   | <0.0001   | 0.0005   | <0.0001    | <0.0001  | <0.0002   | <0.0006   | 0.00052   | 0.00030   |
| 1 | 39X 17871      | .         | 0.0288    | 0.069      | 0.0037     | 0.0040    | (0.0005)  | 0.0080   | (0.0005)   | 0.0007   | 0.0329    | (0.0005)  | 0.0131    | 0.0072    |
| 1 | IMN CT6        | .         | 0.0054    | 0.0040     | .          | 0.011     | .         | 0.014    | .          | .        | 0.011     | 0.011     | 0.0014    | 0.0069    |
| 1 | BAM 372        | .         | 0.00103   | .          | 0.000163   | .         | .         | .        | .          | 0.00114  | 0.0012    | .         | .         | .         |
| 1 | BAM 366        | .         | 0.000111  | (<0.00003) | 0.000027   | .         | .         | 0.00234  | .          | .        | 0.00032   | 0.0263    | 0.00108   | 0.00087   |
| 1 | IMN CS7 D      | .         | 0.00009   | <0.00005   | (0.000002) | 0.000009  | 0.00197   | 0.00049  | .          | 0.00022  | 0.00044   | (0.00024) | (0.00009) | 0.00070   |
| 1 | BCR 074A       | .         | 0.000078  | (0.000010) | <0.000002  | <0.000005 | <0.00001  | 0.000114 | .          | 0.000127 | 0.000104  | .         | 0.000097  | .         |
| 1 | IMN CS6        | .         | 0.00002   | <0.00005   | (0.000006) | (0.00002) | 0.00002   | 0.00208  | .          | 0.00007  | 0.00008   | (0.00015) | (0.00004) | 0.00054   |
| 1 | BAM 381        | .         | <0.0001   | <0.0001    | <0.00004   | <0.00004  | 0.000013  | 0.00028  | (0.000034) | 0.000027 | 0.000073  | .         | 0.00005   | (0.00029) |
| 1 | IARM 70B       | .         | (0.0001)  | <0.0002    | .          | <0.003    | .         | <0.001   | .          | <0.0003  | <0.0002   | 0.002     | (0.003)   | (0.0005)  |
| 1 | BCR 017A       | .         | .         | .          | .          | .         | .         | .        | .          | .        | .         | 0.00069   | .         | 0.00104   |
| 1 | BAM 369        | .         | .         | 0.00097    | .          | 0.00104   | 0.00092   | .        | 0.00036    | .        | .         | .         | .         | .         |
| 1 | BAM 371        | .         | .         | .          | .          | .         | .         | 0.0018   | .          | .        | .         | .         | .         | 0.0013    |
| 2 | CTIF CuCrZr 1* | .         | .         | .          | .          | .         | 0.75      | 0.06     | .          | 0.005    | 0.02      | 0.02      | .         | .         |

| # | Number | Al | As | Bi | Cd | Co | Cr | Fe | Mg | Mn | Ni | P | Pb | S |
|---|--------|----|----|----|----|----|----|----|----|----|----|---|----|---|
|---|--------|----|----|----|----|----|----|----|----|----|----|---|----|---|

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

| Number         | Sb       | Se         | Si        | Sn        | Te         | Ti         | Zn        | Zr       | Ag*  | Au*  | C*   | Be*   | Cu   | In*  | O*      | Other    |
|----------------|----------|------------|-----------|-----------|------------|------------|-----------|----------|------|------|------|-------|------|------|---------|----------|
| BAM 376        | 0.0202   | 0.0210     | .         | 0.02473   | 0.0215     | (0.00045)  | 0.02173   | 0.00422  | .    | .    | .    | 40.6  | .    | .    | .       | .        |
| 39X 17869      | 0.0416   | 0.030      | 0.045     | 0.0197    | 0.038      | .          | 0.160     | .        | 432  | 366  | .    | .     | .    | 158  | .       | .        |
| 39X 17873      | 0.0229   | 0.0114     | 0.030     | 0.0274    | 0.0070     | .          | 0.0231    | .        | 228  | .    | .    | .     | .    | 212  | .       | .        |
| 39X 17872      | 0.0217   | 0.0103     | .         | 0.180     | 0.0208     | .          | 0.107     | (0.0024) | 214  | (15) | .    | .     | .    | 241  | .       | .        |
| BAM EB386      | 0.00312  | 0.00116    | .         | 0.00283   | 0.00383    | 0.00331    | 0.00495   | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| BAM EB385      | 0.00191  | 0.00072    | .         | 0.00180   | 0.00100    | 0.000383   | 0.0058    | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| IARM 279A      | (0.004)  | .          | 0.020     | 0.021     | 0.53       | .          | (0.01)    | 0.012    | (30) | (20) | .    | .     | 99.1 | (10) | .       | .        |
| BAM 384        | 0.00120  | 0.000424   | (0.00050) | (0.00102) | 0.00070    | (0.000210) | (0.00127) | <0.0009  | .    | .    | .    | .     | .    | .    | .       | .        |
| BAM 370        | 0.0015   | .          | (0.0019)  | 0.00165   | .          | .          | .         | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| 39X 17866      | 0.0113   | 0.0030     | 0.0156    | 0.070     | 0.027      | .          | 0.268     | .        | 55   | 51   | (1)  | .     | 518  | .    | .       | .        |
| 39X 17868      | 0.020    | 0.0120     | .         | (0.0037)  | 0.024      | .          | (0.0024)  | .        | 323  | 1290 | .    | .     | .    | 9    | .       | .        |
| 39X 17870      | 0.0337   | 0.0208     | .         | 0.0044    | 0.0052     | .          | 0.0048    | .        | 456  | 484  | .    | .     | .    | 31   | .       | .        |
| 39X 17867      | 0.0145   | 0.0087     | 0.0010    | 0.0053    | 0.0104     | .          | (0.0010)  | .        | 117  | 120  | .    | .     | .    | 29   | .       | .        |
| BAM 383        | 0.000144 | (0.00016)  | <0.0010   | 0.00047   | 0.000140   | 0.000156   | (0.00078) | <0.0009  | .    | .    | .    | .     | .    | .    | .       | .        |
| BAM 382        | 0.00007  | 0.00006    | <0.0006   | 0.000429  | 0.000061   | (0.00006)  | 0.00060   | <0.0003  | 1.8  | .    | .    | .     | .    | .    | .       | .        |
| IARM 278A      | <0.005   | .          | (0.002)   | (0.001)   | 0.53       | .          | (0.002)   | .        | (10) | (30) | .    | .     | 99.5 | (4)  | .       | .        |
| BS 14500       | (<0.001) | .          | (<0.002)  | 0.0002    | 0.53       | .          | 0.004     | .        | (2)  | 5    | (<1) | 99.4  | .    | 7    | .       | .        |
| BS 110B        | <0.0005  | .          | <0.0004   | <0.0002   | <0.0002    | .          | <0.0003   | .        | <2   | 7    | <1   | 99.94 | .    | 363  | Ca*: <3 | .        |
| 39X 17871      | 0.0147   | 0.0360     | .         | 0.0119    | 0.0101     | .          | 0.028     | .        | 222  | 51   | .    | .     | .    | .    | .       | .        |
| IMN CT6        | 0.011    | 0.011      | .         | 0.013     | 0.012      | .          | 0.030     | .        | 39   | .    | .    | .     | .    | .    | .       | B*: 60   |
| BAM 372        | .        | 0.00076    | .         | .         | .          | .          | .         | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| BAM 366        | 0.000099 | (<0.00011) | .         | 0.0111    | (<0.00003) | .          | 0.00156   | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| IMN CS7 D      | 0.00010  | <0.00010   | <0.00010  | 0.00005   | <0.00005   | .          | 0.00012   | .        | 137  | .    | .    | .     | .    | .    | .       | B*: <0.5 |
| BCR 074A       | 0.000058 | 0.000037   | .         | <0.000007 | (0.000021) | .          | 0.000046  | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| IMN CS6        | 0.00010  | <0.00010   | .         | 0.00106   | <0.00005   | .          | 0.00014   | .        | 85   | .    | .    | .     | .    | .    | .       | B*: <0.5 |
| BAM 381        | <0.00015 | <0.0001    | <0.0005   | 0.00040   | .          | <0.00005   | 0.000522  | <0.0009  | .    | .    | .    | .     | .    | .    | .       | .        |
| IARM 70B       | (0.0002) | <0.0002    | <0.0005   | (0.0002)  | .          | .          | <0.001    | .        | .    | .    | .    | .     | 99.9 | .    | .       | .        |
| BCR 017A       | .        | .          | .         | .         | .          | .          | .         | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| BAM 369        | .        | .          | .         | .         | .          | .          | 0.0022    | .        | .    | .    | .    | .     | .    | .    | .       | .        |
| BAM 371        | .        | .          | .         | .         | 0.0014     | 0.00132    | .         | .        | .    | .    | .    | 11.5  | .    | .    | .       | .        |
| CTIF CuCrZr 1* | .        | .          | .         | .         | .          | .          | 0.01      | 0.06     | .    | .    | .    | .     | 99.2 | .    | .       | .        |

RM OXYGEN IN COPPER

analysis listed in mg/kg      40 mm Ø x 30 mm

| Part Number | BAM 379/1 | BAM 379/2 | BAM 379/3 |
|-------------|-----------|-----------|-----------|
| Oxygen      | 38        | 212       | 378       |

## BERYLLIUM-COBALT ALLOY

# = class, where 1 = CRM and 2 = RM  
F = Form, where w = wrought and c = cast

36X: 40-41 mm Ø x 15-17 mm

CTIF: 60 mm Ø x 5 mm

BS: 38 mm Ø x 12 mm  
IARM: 31 mm Ø x 2 or 18 mm

| # | F | Number      | Be    | Co      | Cu     | Al     | Cr     | Fe     | Mn      | Ni     | Pb      | Si     | Sn       | Zn      | mass % except * = ppm                   |
|---|---|-------------|-------|---------|--------|--------|--------|--------|---------|--------|---------|--------|----------|---------|---|
| 2 | c | CTIF 4868   | 2.92  | 0.246   | 96.15  | 0.044  | .      | 0.203  | 0.019   | 0.038  | 0.023   | 0.211  | 0.022    | 0.056   |   |
| 2 | c | CTIF 4584   | 2.53  | 0.04    | 97.05  | 0.033  | .      | 0.120  | (0.002) | 0.015  | (0.002) | 0.166  | 0.022    | 0.022   |   |
| 2 | c | CTIF 4872   | 1.93  | 0.400   | 97.00  | 0.059  | (0.04) | 0.106  | 0.008   | 0.103  | 0.019   | 0.16   | 0.044    | 0.119   |   |
| 2 | w | BS 172 Be-1 | 1.89  | 0.206   | 97.68  | (0.02) | 0.003  | 0.052  | 0.001   | 0.039  | (0.002) | 0.055  | 0.033    | 0.007   |   |
| 1 | w | 36X CBC4    | 1.865 | 0.207   | 97.46  | 0.018  | .      | 0.026  | .       | 0.004  | 0.318   | 0.041  | 0.003    | 0.005   | Mg: 0.0070                              |
| 1 | w | 36X CBC3    | 1.840 | 0.209   | 97.77  | 0.019  | .      | 0.046  | .       | 0.007  | 0.0025  | 0.039  | 0.0021   | 0.004   | Mg: 0.0040                              |
| 1 | w | IARM 71B    | 1.84  | 0.21    | 97.7   | 0.040  | 0.0030 | 0.042  | 0.0010  | 0.021  | 0.006   | 0.060  | 0.005    | 0.005   | C: 0.003 P: 0.004                       |
| 2 | c | CTIF 4766   | 1.58  | 0.64    | 96.83  | 0.027  | (0.2)  | 0.165  | 0.007   | 0.203  | 0.053   | 0.11   | 0.100    | 0.070   |   |
| 2 | c | CTIF 4583   | 0.84  | (0.002) | 96.35  | 0.029  | .      | (0.15) | 0.064   | 2.02   | 0.084   | 0.08   | 0.25     | 0.094   |   |
| 2 | c | CTIF 4640   | 0.69  | 1.36    | 95.67  | 0.099  | (0.1)  | 0.125  | 0.063   | 1.07   | 0.056   | 0.166  | 0.053    | 0.055   | Ag: 0.495                               |
| 1 | w | 36X CBC 2   | 0.450 | 2.47    | 96.96  | 0.0231 | 0.0044 | 0.0208 | 0.0015  | 0.0472 | 0.0099  | 0.0205 | 0.009    | 0.0103  | Ag: 20*                                 |
| 1 | w | BS 17500    | 0.43  | 2.31    | (97.1) | 0.0210 | 0.0015 | 0.0262 | 0.081   | 0.095  | 0.0005  | 0.0641 | (0.0002) | 0.0065  | Ca: 54* C: 20* P: 31*<br>Mg: 76* Sb: 1* |
| 1 | w | 36X CBC 5   | 0.32  | 0.14    | 97.6   | 0.021  | 0.006  | 0.028  | (0.001) | 1.69   | 0.009   | 0.036  | 0.01     | 0.038   |   |
| 2 | c | CTIF 4873   | 0.17  | 0.98    | 98.40  | 0.094  | 0.105  | 0.078  | (0.002) | 0.049  | (0.003) | 0.088  | (0.007)  | (0.003) |   |
| 2 | c | CTIF 4594   | 0.129 | 2.96    | 95.55  | 0.029  | 0.066  | (0.12) | .       | 0.055  | (0.005) | 0.114  | (0.003)  | (0.006) | Ag: 0.978                               |

## CRM

## CADMIUM ALLOY

30 mm Ø x 15 mm

| Number   | Ag       | Cd   | Sn     | Zn       |
|----------|----------|------|--------|----------|
| 36X CCD1 | (0.0014) | 1.01 | <0.001 | (0.0017) |
| 36X CCD2 | (0.0012) | 1.18 | 0.200  | (0.0019) |
| 36X CCD3 | (0.0011) | 1.10 | 0.473  | (0.0018) |

## CHROMIUM COPPER

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

| # | Number    | Cr    | Ag     | Al      | Fe     | Mn     | Ni     | Pb     | Si     | Sn     | Zn     | Zr    | Cu    |
|---|-----------|-------|--------|---------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| 1 | IARM 158C | 1.04  | (0.01) | 0.002   | 0.090  | 0.019  | 0.32   | 0.01   | 0.02   | 0.01   | 0.014  | .     | 98.5  |
| 1 | 36X CCR1  | 0.948 | 0.0016 | (0.001) | 0.0378 | 0.0010 | 0.0035 | 0.0017 | 0.015  | 0.0049 | 0.008  | 0.067 | 98.95 |
| 1 | IARM 158B | 0.85  | (0.01) | 0.002   | 0.090  | 0.019  | 0.32   | 0.01   | 0.02   | 0.01   | 0.014  | .     | 98.5  |
| 1 | 36X CCZ   | 0.667 | 0.0019 | 0.0003  | 0.033  | 0.0008 | 0.0084 | 0.0023 | 0.0031 | 0.0045 | 0.0076 | 0.049 | 99.22 |

| Number    | As      | Bi | C       | Cd     | Co     | Mg     | N       | O     | P      | S      | Sb    | Units                |
|-----------|---------|----|---------|--------|--------|--------|---------|-------|--------|--------|-------|----------------------|
| IARM 158C | (0.001) | .  | 0.002   | .      | 0.002  | .      | <0.0005 | 0.002 | 0.005  | 0.003  | 0.002 | 31 mm Ø x 2 or 18 mm |
| 36X CCR1  | .       | .  | .       | .      | .      | 0.0015 | .       | .     | .      | 0.0018 | .     | 50 mm Ø x 17 mm      |
| IARM 158B | (0.001) | .  | 0.002   | .      | 0.002  | .      | <0.0005 | 0.002 | 0.005  | 0.003  | 0.002 | 31 mm Ø x 2 or 18 mm |
| 36X CCZ   | .       | .  | (0.002) | 0.0027 | 0.0012 | .      | .       | .     | 0.0016 | 0.0010 | .     | 50 mm Ø x 17 mm      |

## RM

## CONTINUOUS CAST COPPER ALLOY

38 mm Ø x 12 mm

informational values

| Number  | Grade   | As    | Cu    | Fe    | Mn     | Ni   | P     | Pb  | S     | Sb    | Sn   | Zn   | Ag    | Al     | Si     |
|---------|---------|-------|-------|-------|--------|------|-------|-----|-------|-------|------|------|-------|--------|--------|
| BS 932E | CDA 932 | 0.048 | 82.15 | 0.029 | 0.0001 | 0.16 | 0.022 | 7.3 | 0.053 | 0.145 | 7.33 | 2.86 | 0.007 | <0.001 | <0.005 |

**CRM CONVERTER COPPER DISC AND ROD SETS**

| analysis listed in mass % |       |      |       |       |       |     |       |       |       |       |       |      |       |      |       |       | AVAILABLE IN SETS ONLY, AS GROUPED |       |      |       |       |       |     |       |       |       |       |       |      |       |      |       |       | IMN CT: 45 mm Ø x 12 or 27 mm |       |      |         |        |       |     |        |       |       |      |       |      |       |       |       |       | IMN CG, CH: 10 mm Ø x 100 mm |       |       |        |        |        |     |        |       |       |      |        |       |       |       |       |       |         |        |        |         |        |        |     |       |        |        |        |        |       |        |        |        |        |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |        |       |   |      |   |   |   |   |   |       |         |       |   |   |   |        |     |        |       |   |       |   |   |   |   |   |       |         |       |   |   |   |      |     |       |       |   |      |   |   |   |   |   |       |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |      |         |      |   |   |   |       |     |      |      |   |      |   |   |   |   |   |      |         |      |   |   |   |        |     |       |      |   |       |   |   |   |   |   |      |
|---------------------------|-------|------|-------|-------|-------|-----|-------|-------|-------|-------|-------|------|-------|------|-------|-------|------------------------------------|-------|------|-------|-------|-------|-----|-------|-------|-------|-------|-------|------|-------|------|-------|-------|-------------------------------|-------|------|---------|--------|-------|-----|--------|-------|-------|------|-------|------|-------|-------|-------|-------|------------------------------|-------|-------|--------|--------|--------|-----|--------|-------|-------|------|--------|-------|-------|-------|-------|-------|---------|--------|--------|---------|--------|--------|-----|-------|--------|--------|--------|--------|-------|--------|--------|--------|--------|---------|------|---|---|---|-------|-----|-------|-------|---|------|---|---|---|---|---|-------|---------|-------|---|---|---|-------|-----|-------|------|---|------|---|---|---|---|---|-------|---------|-------|---|---|---|-------|-----|--------|-------|---|------|---|---|---|---|---|-------|---------|-------|---|---|---|--------|-----|--------|-------|---|-------|---|---|---|---|---|-------|---------|-------|---|---|---|------|-----|-------|-------|---|------|---|---|---|---|---|-------|---------|------|---|---|---|-------|-----|-------|-------|---|------|---|---|---|---|---|-------|---------|-------|---|---|---|-------|-----|-------|------|---|------|---|---|---|---|---|------|---------|------|---|---|---|-------|-----|------|------|---|------|---|---|---|---|---|------|---------|------|---|---|---|--------|-----|-------|------|---|-------|---|---|---|---|---|------|
| Number                    | Ag    | As   | B     | Bi    | Co    | Cu  | Fe    | Ni    | P     | Pb    | S     | Sb   | Se    | Sn   | Te    | Zn    | Number                             | Ag    | As   | B     | Bi    | Co    | Cu  | Fe    | Ni    | P     | Pb    | S     | Sb   | Se    | Sn   | Te    | Zn    | Number                        | Ag    | As   | B       | Bi     | Co    | Cu  | Fe     | Ni    | P     | Pb   | S     | Sb   | Se    | Sn    | Te    | Zn    | Number                       | Ag    | As    | B      | Bi     | Co     | Cu  | Fe     | Ni    | P     | Pb   | S      | Sb    | Se    | Sn    | Te    | Zn    |         |        |        |         |        |        |     |       |        |        |        |        |       |        |        |        |        |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |        |       |   |      |   |   |   |   |   |       |         |       |   |   |   |        |     |        |       |   |       |   |   |   |   |   |       |         |       |   |   |   |      |     |       |       |   |      |   |   |   |   |   |       |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |      |         |      |   |   |   |       |     |      |      |   |      |   |   |   |   |   |      |         |      |   |   |   |        |     |       |      |   |       |   |   |   |   |   |      |
| IMN CT1                   | 0.057 | 0.32 | 0.024 | 0.018 | 0.051 | .   | 0.17  | 0.48  | 0.082 | 0.013 | 0.054 | 0.33 | 0.062 | 0.24 | 0.053 | 0.28  | IMN CT2                            | 0.042 | 0.22 | 0.033 | 0.013 | 0.033 | .   | 0.10  | 0.29  | 0.059 | 0.086 | 0.036 | 0.24 | 0.041 | 0.14 | 0.036 | 0.19  | IMN CT3                       | 0.026 | 0.11 | 0.00093 | 0.0067 | 0.013 | .   | 0.083  | 0.12  | 0.038 | 0.31 | 0.012 | 0.11 | 0.018 | 0.070 | 0.022 | 0.11  | IMN CT4                      | 0.016 | 0.050 | 0.0042 | 0.0043 | 0.011  | .   | 0.045  | 0.049 | 0.020 | 0.88 | 0.0060 | 0.049 | 0.011 | 0.025 | 0.011 | 0.045 | IMN CT5 | 0.0062 | 0.0056 | (0.011) | 0.0011 | 0.0061 | .   | 0.016 | 0.0095 | 0.0059 | (1.48) | 0.0024 | 0.010 | 0.0069 | 0.0070 | 0.0064 | 0.0098 | IMN CH6 | 0.18 | . | . | . | 0.18  | Rem | 0.028 | 0.40  | . | 0.50 | . | . | . | . | . | 0.19  | IMN CH7 | 0.40  | . | . | . | 0.11  | Rem | 0.11  | 0.18 | . | 1.01 | . | . | . | . | . | 0.047 | IMN CH8 | 0.039 | . | . | . | 0.020 | Rem | 0.0012 | 0.036 | . | 1.49 | . | . | . | . | . | 0.077 | IMN CH9 | 0.010 | . | . | . | 0.0060 | Rem | 0.0060 | 0.010 | . | 1.97  | . | . | . | . | . | 0.015 | IMN CG1 | 0.011 | . | . | . | 0.17 | Rem | 0.013 | 0.036 | . | 0.60 | . | . | . | . | . | 0.016 | IMN CG2 | 0.25 | . | . | . | 0.098 | Rem | 0.015 | 0.011 | . | 0.30 | . | . | . | . | . | 0.026 | IMN CG3 | 0.040 | . | . | . | 0.045 | Rem | 0.030 | 0.39 | . | 0.22 | . | . | . | . | . | 0.14 | IMN CG4 | 0.10 | . | . | . | 0.057 | Rem | 0.25 | 0.23 | . | 0.11 | . | . | . | . | . | 0.12 | IMN CG5 | 0.41 | . | . | . | 0.0079 | Rem | 0.069 | 0.10 | . | 0.053 | . | . | . | . | . | 0.18 |
| IMN CH6                   | 0.18  | .    | .     | .     | 0.18  | Rem | 0.028 | 0.40  | .     | 0.50  | .     | .    | .     | .    | .     | 0.19  | IMN CH7                            | 0.40  | .    | .     | .     | 0.11  | Rem | 0.11  | 0.18  | .     | 1.01  | .     | .    | .     | .    | .     | 0.047 | IMN CH8                       | 0.039 | .    | .       | .      | 0.020 | Rem | 0.0012 | 0.036 | .     | 1.49 | .     | .    | .     | .     | .     | 0.077 | IMN CH9                      | 0.010 | .     | .      | .      | 0.0060 | Rem | 0.0060 | 0.010 | .     | 1.97 | .      | .     | .     | .     | .     | 0.015 | IMN CG1 | 0.011  | .      | .       | .      | 0.17   | Rem | 0.013 | 0.036  | .      | 0.60   | .      | .     | .      | .      | .      | 0.016  | IMN CG2 | 0.25 | . | . | . | 0.098 | Rem | 0.015 | 0.011 | . | 0.30 | . | . | . | . | . | 0.026 | IMN CG3 | 0.040 | . | . | . | 0.045 | Rem | 0.030 | 0.39 | . | 0.22 | . | . | . | . | . | 0.14  | IMN CG4 | 0.10  | . | . | . | 0.057 | Rem | 0.25   | 0.23  | . | 0.11 | . | . | . | . | . | 0.12  | IMN CG5 | 0.41  | . | . | . | 0.0079 | Rem | 0.069  | 0.10  | . | 0.053 | . | . | . | . | . | 0.18  |         |       |   |   |   |      |     |       |       |   |      |   |   |   |   |   |       |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |      |         |      |   |   |   |       |     |      |      |   |      |   |   |   |   |   |      |         |      |   |   |   |        |     |       |      |   |       |   |   |   |   |   |      |
| IMN CG1                   | 0.011 | .    | .     | .     | 0.17  | Rem | 0.013 | 0.036 | .     | 0.60  | .     | .    | .     | .    | .     | 0.016 | IMN CG2                            | 0.25  | .    | .     | .     | 0.098 | Rem | 0.015 | 0.011 | .     | 0.30  | .     | .    | .     | .    | .     | 0.026 | IMN CG3                       | 0.040 | .    | .       | .      | 0.045 | Rem | 0.030  | 0.39  | .     | 0.22 | .     | .    | .     | .     | .     | 0.14  | IMN CG4                      | 0.10  | .     | .      | .      | 0.057  | Rem | 0.25   | 0.23  | .     | 0.11 | .      | .     | .     | .     | .     | 0.12  | IMN CG5 | 0.41   | .      | .       | .      | 0.0079 | Rem | 0.069 | 0.10   | .      | 0.053  | .      | .     | .      | .      | .      | 0.18   |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |        |       |   |      |   |   |   |   |   |       |         |       |   |   |   |        |     |        |       |   |       |   |   |   |   |   |       |         |       |   |   |   |      |     |       |       |   |      |   |   |   |   |   |       |         |      |   |   |   |       |     |       |       |   |      |   |   |   |   |   |       |         |       |   |   |   |       |     |       |      |   |      |   |   |   |   |   |      |         |      |   |   |   |       |     |      |      |   |      |   |   |   |   |   |      |         |      |   |   |   |        |     |       |      |   |       |   |   |   |   |   |      |

**CRM GILDING METAL**

| Number    | Cu   | Fe   | Ni    | P     | Pb    | Sn   | Zn  | method  | Units                 |
|-----------|------|------|-------|-------|-------|------|-----|---------|-----------------------|
| SRM 1114  | 96.4 | 0.01 | 0.021 | 0.009 | 0.012 | 0.02 | 3.4 | wrought | 31 mm Ø x 19 mm       |
| SRM C1114 | 96.4 | 0.01 | 0.021 | 0.009 | 0.012 | 0.02 | 3.4 | cast    | 31 mm x 31 mm x 19 mm |
| SRM 1113  | 95.0 | 0.04 | 0.057 | 0.008 | 0.026 | 0.06 | 4.8 | wrought | 31 mm Ø x 19 mm       |
| SRM C1113 | 95.0 | 0.04 | 0.057 | 0.008 | 0.026 | 0.06 | 4.8 | cast    | 31 mm x 31 mm x 19 mm |
| SRM 1112  | 93.3 | 0.07 | 0.10  | 0.009 | 0.057 | 0.12 | 6.3 | wrought | 31 mm Ø x 19 mm       |
| SRM C1112 | 93.3 | 0.07 | 0.10  | 0.009 | 0.057 | 0.12 | 6.3 | cast    | 31 mm x 31 mm x 19 mm |

**CRM GILDING METAL SET**

available in SET/5 only

wrought 40 mm Ø x 25 mm

| Number  | Ag     | Al     | As     | Be       | Bi      | Cd     | Cu    | Fe     | Mn     | Ni     | P      | Pb     | S      | Sb       | Si     | Sn     | Te     | Zn    |
|---------|--------|--------|--------|----------|---------|--------|-------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|-------|
| IMN MI1 | 0.0038 | 0.0400 | 0.0720 | 0.000091 | 0.00063 | 0.0230 | 95.69 | 0.2500 | 0.0030 | 0.0059 | 0.0280 | 0.0060 | 0.0430 | 0.000044 | 0.0032 | 0.1500 | 0.0065 | 3.57  |
| IMN MI2 | 0.0090 | 0.0550 | 0.0540 | 0.00085  | 0.00056 | 0.0160 | 93.35 | 0.1600 | 0.0081 | 0.0180 | 0.0220 | 0.0160 | 0.0490 | 0.0019   | 0.0120 | 0.1000 | 0.0110 | 6.19  |
| IMN MI3 | 0.0200 | 0.0150 | 0.0340 | 0.0019   | 0.0026  | 0.0110 | 91.46 | 0.0860 | 0.0350 | 0.0730 | 0.0150 | 0.0420 | 0.0230 | .        | 0.0310 | 0.0670 | 0.0031 | 8.01  |
| IMN MI4 | 0.0260 | 0.0079 | 0.0031 | 0.0065   | 0.0026  | 0.0054 | 88.35 | 0.0410 | 0.0500 | 0.1400 | 0.0073 | 0.0700 | 0.0120 | 0.0006   | 0.0600 | 0.0130 | 0.0021 | 11.13 |
| IMN MI5 | 0.0330 | 0.0021 | 0.0150 | 0.0072   | 0.0043  | 0.0012 | 94.71 | 0.0150 | 0.0690 | 0.2500 | 0.0026 | 0.0960 | 0.0019 | 0.0096   | 0.0820 | 0.0040 | .      | 4.44  |

**GUN METAL**

C, CURM: 50 mm Ø x 10 - 12 mm

GM24: wrought 44 mm Ø x 17 mm

GM29: wrought 33 mm Ø x 19 mm

other GM: chill cast 40-42 mm Ø x 15-18 mm

| Number     | Zn               | Sn   | Pb    | Ni     | Fe     | Cu    | Ag     | Al       | As     | Bi     | Cr         | Mn       | P      | S      | Sb     | Si       |
|------------|------------------|------|-------|--------|--------|-------|--------|----------|--------|--------|------------|----------|--------|--------|--------|----------|
| CRM        |                  |      |       |        |        |       |        |          |        |        |            |          |        |        |        |          |
| 33X GM4    | 7.13             | 2.56 | 4.69  | 1.795  | 0.053  | 82.96 | 0.0265 | (0.001)  | 0.287  | 0.084  | Co: 0.259  | 0.0007   | 0.0088 | 0.112  | 0.0261 | (0.0006) |
| 33X GM8    | 5.45             | 4.13 | 6.11  | 0.148  | 0.098  | 83.81 | 0.097  | 0.0005   | 0.0159 | 0.0248 | (0.0004)   | 0.0008   | 0.0029 | 0.0119 | 0.0146 | (0.001)  |
| 33X GM5    | 4.19             | 5.22 | 5.13  | 1.008  | 0.136  | 83.98 | 0.0099 | (0.007)  | 0.059  | 0.0225 | Co: 0.0662 | 0.0018   | 0.0112 | 0.061  | 0.093  | (0.0005) |
| 33X GM7    | 2.29             | 9.97 | 0.97  | 0.500  | 0.0278 | 85.49 | 0.0574 | 0.051    | 0.133  | 0.085  | 0.0146     | 0.151    | 0.034  | 0.0139 | 0.111  | 0.065    |
| 33X GM6    | 2.01             | 6.56 | 3.90  | 0.833  | 0.0338 | 85.99 | 0.0065 | 0.0098   | 0.180  | 0.0313 | Co: 0.0056 | 0.0307   | 0.0406 | 0.093  | 0.279  | 0.069    |
| RM         | typical analysis |      |       |        |        |       |        |          |        |        |            |          |        |        |        |          |
| CURM 71.32 | 6.52             | 6.46 | 4.43  | 0.70   | 0.35   | 80.48 | 0.34   | 0.12     | 0.25   | 0.051  | 0.05       | 0.046    | 0.016  | 0.08   | 0.26   | 0.022    |
| CURM 71.31 | 4.27             | 4.38 | 6.44  | 2.07   | 0.098  | 82.30 | 0.052  | 0.045    | 0.11   | 0.027  | <0.01      | 0.010    | 0.060  | 0.050  | 0.11   | 0.006    |
| 33X GM29   | 4.23             | 6.12 | 0.050 | 0.0289 | 0.0102 | 89.36 | 0.0026 | (0.0004) | 0.0017 | 0.0019 | (0.0004)   | (0.0005) | 0.138  | 0.0024 | 0.0015 | 0.0027   |
| 33X GM24   | 3.67             | 3.85 | 3.35  | 0.0087 | 0.0083 | 88.88 | 0.0046 | (0.0001) | 0.0010 | 0.0009 | (0.0013)   | <0.0005  | 0.190  | 0.003  | 0.0012 | 0.0028   |
| CURM 71.33 | 3.60             | 4.96 | 6.84  | 0.938  | 0.018  | 83.60 | <0.002 | <0.001   | <0.001 | <0.002 | <0.0005    | <0.0005  | <0.001 | <0.001 | <0.002 | <0.005   |
| C71.34     | 1.55             | 8.20 | 2.47  | <0.01  | 0.29   | .     | 0.025  | 0.007    | 0.18   | 0.029  | 0.03       | 0.05     | 0.020  | 0.16   | 0.071  | 0.04     |
| Number     | Zn               | Sn   | Pb    | Ni     | Fe     | Cu    | Ag     | Al       | As     | Bi     | Cr         | Mn       | P      | S      | Sb     | Si       |

\* Provisional Analysis

**CRM MANGANESE ALLOY SET**

AVAILABLE IN SET/6 ONLY

40 mm Ø x 13 mm

| Number  | Ag     | As     | Fe    | Mn   | Ni    | P      | Pb     | Sb     | Si     | Sn     | Zn    |
|---------|--------|--------|-------|------|-------|--------|--------|--------|--------|--------|-------|
| IMN CK1 | 0.012  | 0.013  | 0.029 | 1.06 | 0.44  | 0.0011 | 0.0021 | 0.0049 | 0.049  | 0.13   | 0.24  |
| IMN CK2 | 0.0094 | 0.010  | 0.11  | 1.51 | 0.38  | 0.0022 | 0.0062 | 0.0015 | 0.091  | .      | 0.14  |
| IMN CK3 | 0.0066 | 0.0095 | 0.17  | 1.78 | 0.27  | 0.0043 | 0.0098 | 0.0026 | 0.033  | 0.075  | 0.095 |
| IMN CK4 | 0.0041 | 0.0055 | 0.26  | 1.91 | 0.13  | 0.0056 | 0.017  | 0.0041 | 0.0025 | 0.042  | 0.065 |
| IMN CK5 | .      | 0.0015 | 0.29  | 2.30 | 0.011 | .      | .      | 0.0051 | 0.011  | 0.0048 | 0.033 |
| IMN CK6 | 0.0012 | 0.0039 | 0.40  | 2.64 | 0.073 | 0.013  | .      | 0.0052 | 0.21   | 0.025  | 0.034 |

**CRM MAGNESIUM ALLOY**

cast

36 - 40 mm Ø x 15 mm

| Number    | Ag    | Al     | Co      | Cr      | Mg    | P     | S      |
|-----------|-------|--------|---------|---------|-------|-------|--------|
| 36X CMG12 | 0.192 | 0.0076 | 0.089   | 0.074   | 1.16  | 0.09  | 0.0020 |
| 36X CMG11 | 0.151 | 0.043  | (0.001) | <0.0005 | 0.771 | 0.079 | 0.0019 |
| 36X CMG10 | 0.076 | 0.024  | 0.042   | 0.038   | 0.379 | 0.027 | 0.0024 |

## NICKEL ALLOY

| # | Number       | Ni    | Ag      | Al       | Bi        | Co     | Cr       | Cu     | Fe     | Mn      | Nb      | P        | Pb      | S        | Si       | Sn       | Zn      |
|---|--------------|-------|---------|----------|-----------|--------|----------|--------|--------|---------|---------|----------|---------|----------|----------|----------|---------|
| 1 | 36X CN6      | 33.46 | .       | (0.0023) | 0.0058    | 0.0440 | 1.10     | 63.34  | 0.878  | 0.451   | 0.51    | 0.031    | 0.0066  | 0.0109   | 0.144    | 0.0307   | 0.026   |
| 1 | 36X CN5      | 32.26 | .       | 0.006    | .         | 0.018  | 0.118    | 65.1   | 0.791  | 0.090   | 0.441   | 0.041    | 0.027   | 0.074    | 0.80     | 0.015    | 0.232   |
| 1 | IARM 85C     | 31.3  | <0.002  | <0.01    | .         | 0.016  | 0.002    | 67.3   | 0.63   | 0.65    | .       | (0.003)  | 0.004   | (0.002)  | 0.01     | 0.005    | 0.057   |
| 1 | SRM 1276a    | 30.8  | (0.004) | .        | (<0.0001) | 0.045  | (0.0002) | 67.5   | 0.56   | 1.01    | .       | 0.006    | 0.004   | (0.008)  | (0.001)  | 0.023    | 0.038   |
| 1 | 36X CN8      | 30.61 | .       | 0.0009   | 0.103     | 0.104  | 1.28     | 65.51  | 0.86   | 0.881   | 0.18    | 0.046    | 0.095   | 0.022    | 0.132    | 0.046    | 0.159   |
| 2 | BS 715A      | 30.22 | .       | (0.01)   | .         | .      | .        | 68.0   | 0.61   | 0.82    | .       | 0.006    | (0.007) | 0.001    | 0.10     | 0.008    | 0.10    |
| 1 | IARM 236A    | 30.0  | .       | 0.003    | 0.003     | 0.004  | 0.002    | 66.7   | 0.91   | 1.04    | .       | 0.003    | 0.004   | 0.003    | 0.19     | 0.005    | 0.002   |
| 1 | 36X CN7      | 29.95 | .       | .        | (0.014)   | 0.108  | 1.51     | 65.58  | 1.021  | 0.659   | 0.58    | (0.021)  | 0.028   | 0.0151   | 0.304    | 0.039    | 0.203   |
| 2 | C62.11       | 29.9  | .       | .        | .         | <0.002 | .        | 66.30  | <0.005 | 0.33    | .       | 0.01     | <0.002  | <0.002   | 0.32     | .        | .       |
| 2 | CTIF CN 33   | 29.75 | .       | (0.01)   | 0.0212    | .      | .        | 87.1   | 1.6    | 0.45    | 0.06    | 0.02     | 0.053   | 0.013    | 0.47     | (0.003)  | 0.37    |
| 1 | IARM 85B     | 29.60 | .       | (<0.01)  | .         | 0.034  | .        | 65.9   | 0.53   | 0.53    | .       | 0.007    | 0.005   | 0.010    | (<0.01)  | 0.014    | 0.12    |
| 1 | 36X CN10     | 29.3  | .       | 1.23     | 0.014     | 0.081  | 1.59     | 61.01  | 4.28   | 0.262   | 0.89    | (0.020)  | 0.004   | 0.055    | 1.02     | (0.009)  | 0.026   |
| 1 | 36X CN9      | 28.90 | .       | (0.094)  | .         | 0.323  | 1.84     | 64.96  | 0.722  | 1.019   | 1.40    | 0.008    | 0.020   | 0.0130   | 0.413    | 0.0291   | 0.060   |
| 2 | C62.15       | 27.5  | .       | .        | .         | 0.008  | .        | 65.9   | 1.5    | 0.43    | .       | 0.01     | 0.01    | 0.009    | 0.06     | .        | .       |
| 1 | 36X CN4      | 27.49 | .       | 0.0013   | 0.0077    | 0.052  | 0.022    | 69.48  | 2.67   | 0.164   | 0.0139  | 0.0078   | (0.023) | 0.0076   | 0.025    | 0.009    | 0.041   |
| 1 | BAM 389      | 24.7  | .       | .        | 0.0044    | 0.0770 | 0.0153   | 74.3   | 0.107  | 0.415   | .       | 0.0093   | 0.0098  | .        | .        | 0.0262   | 0.1125  |
| 2 | C62.14       | 20.8  | .       | .        | 0.05      | 0.072  | 0.050    | 76.3   | 1.54   | 0.76    | .       | 0.008    | 0.008   | 0.03     | 0.03     | .        | .       |
| 1 | 36X CN3      | 19.95 | .       | 0.0055   | .         | 0.072  | 0.050    | 76.3   | 1.07   | 0.920   | 0.15    | 0.032    | 0.053   | 0.029    | 0.490    | 0.063    | 0.80    |
| 2 | C65.30       | 19.8  | .       | .        | .         | 0.09   | .        | 55.0   | 1.0    | 0.09    | .       | 0.05     | 0.25    | 0.04     | 0.10     | 0.04     | Rem     |
| 1 | 34X NS5      | 17.16 | 0.0102  | 0.674    | .         | 0.197  | 0.0014   | 55.11  | 0.717  | 0.127   | .       | 0.067    | 1.29    | .        | 0.158    | 0.194    | (23.1)  |
| 1 | 34X NS4      | 16.96 | 0.0298  | .        | .         | 0.222  | 0.0005   | 66.71  | 0.351  | 0.0100  | .       | 0.0099   | 0.152   | 0.012    | (0.0009) | 0.020    | 15.58   |
| 2 | C65.29       | 16.8  | .       | .        | .         | .      | .        | 58.9   | 0.39   | 0.17    | .       | 0.07     | 0.11    | 0.06     | 0.02     | 0.08     | Rem     |
| 1 | 36X SP2      | 15.72 | 0.0181  | 0.0003   | (0.0027)  | 0.119  | .        | 74.91  | (0.09) | 0.0019  | .       | (0.0006) | 0.026   | 0.0030   | (0.0023) | 8.92     | 0.029   |
| 1 | 36X CN2      | 15.47 | .       | 0.005    | 0.0045    | 0.264  | 0.240    | 80.78  | 1.70   | 1.26    | (0.032) | 0.015    | 0.048   | 0.035    | 0.044    | 0.061    | 0.0358  |
| 1 | 36X CN24     | 15.41 | 0.0466  | (0.0010) | .         | 0.0096 | 0.0065   | 52.56  | 0.127  | 23.60   | .       | 0.0037   | 0.0056  | .        | .        | (0.0023) | 8.00    |
| 2 | C65.28       | 15.3  | .       | .        | .         | .      | .        | 56.9   | 0.13   | 0.57    | .       | 0.06     | 0.06    | 0.03     | 0.01     | 0.15     | Rem     |
| 1 | 36X CN11     | 14.96 | .       | 1.457    | .         | 0.0049 | 0.380    | 77.56  | 0.992  | 4.34    | 0.124   | (0.002)  | (0.003) | 0.0012   | 0.083    | (0.002)  | (0.006) |
| 1 | 34X NS3      | 14.86 | 0.111   | 0.038    | .         | 0.102  | 0.0022   | 66.30  | 0.201  | 0.129   | .       | 0.013    | 0.155   | 0.063    | 0.018    | 0.031    | 17.99   |
| 1 | 36X CN23     | 14.38 | 0.042   | 0.007    | .         | 0.0509 | 0.0029   | 70.22  | 0.140  | 0.0095  | .       | 0.0299   | 0.115   | 0.01     | 0.08     | 0.102    | 14.88   |
| 2 | C62.13       | 13.9  | .       | .        | .         | 0.04   | .        | 66.30  | 0.93   | 1.2     | .       | .        | 0.01    | 0.05     | 0.08     | .        | .       |
| 2 | C65.27       | 13.9  | .       | .        | .         | .      | .        | 57.0   | 0.26   | 0.13    | .       | 0.02     | 0.04    | 0.03     | <0.002   | 0.01     | Rem     |
| 1 | 34X NS2      | 13.39 | 0.0026  | .        | .         | 0.0118 | (0.001)  | 61.09  | 0.085  | 0.0013  | .       | 0.0091   | 0.063   | (0.020)  | (0.003)  | 0.019    | 25.31   |
| 2 | C65.26       | 11.9  | .       | .        | .         | .      | .        | 56.7   | <0.01  | 0.70    | .       | 0.11     | 0.06    | 0.0006   | <0.002   | <0.01    | Rem     |
| 2 | CTIF CN4     | 11.2  | .       | (0.02)   | .         | .      | .        | 84.0   | 1.8    | 1.5     | 0.7     | .        | 0.006   | (0.001)  | (0.01)   | 0.058    | 0.07    |
| 2 | BS 706B      | 10.9  | .       | <0.003   | .         | 0.005  | .        | 87.00  | 1.56   | 0.61    | .       | 0.009    | 0.006   | 0.009    | <0.002   | 0.006    | 0.054   |
| 2 | BS 706       | 10.49 | .       | <0.005   | .         | .      | .        | (87.3) | 1.61   | 0.55    | .       | 0.005    | <0.01   | 0.015    | <0.01    | 0.016    | 0.08    |
| 2 | BS 706A      | 10.18 | .       | (0.002)  | .         | 0.007  | .        | 87.80  | 1.30   | 0.66    | .       | 0.006    | 0.008   | 0.012    | <0.005   | 0.011    | 0.13    |
| 1 | 36X CN1      | 10.11 | .       | 0.006    | .         | 0.154  | 0.0258   | 84.90  | 2.15   | 1.80    | .       | 0.0436   | 0.160   | 0.0070   | 0.089    | 0.0578   | 0.412   |
| 2 | CTIF CuNi 10 | 10.08 | .       | .        | .         | .      | .        | 87.4   | 1.69   | 0.70    | .       | .        | 0.0027  | (0.002)  | .        | (<0.01)  | 0.033   |
| 1 | IARM 84B     | 10.03 | 0.005   | (0.002)  | .         | 0.013  | (0.003)  | 87.9   | 1.30   | 0.62    | .       | 0.004    | 0.008   | 0.008    | 0.01     | 0.014    | 0.082   |
| 1 | BAM 367      | 9.72  | .       | .        | .         | 0.0498 | .        | 87.88  | 1.443  | 0.723   | .       | 0.0124   | 0.0298  | .        | .        | 0.0105   | 0.0715  |
| 1 | 36X CN1      | 9.31  | .       | <0.001   | .         | 0.131  | 0.118    | 85.3   | 2.41   | 2.27    | (0.019) | 0.008    | 0.008   | 0.010    | 0.058    | 0.006    | 0.331   |
| 2 | CTIF CN3 *   | 9     | .       | 0.1      | .         | .      | .        | 87.5   | 0.7    | 1.5     | 0.6     | .        | 0.02    | 0.01     | 0.2      | <0.01    | 0.1     |
| 1 | 36X SP1      | 8.33  | 0.005   | 0.0020   | 0.0039    | 0.057  | .        | 84.90  | 0.45   | 0.084   | (0.031) | (0.003)  | 0.0115  | 0.005    | 0.004    | 5.75     | 0.344   |
| 2 | C62.12       | 8.3   | .       | .        | .         | <0.002 | .        | 84.90  | 1.5    | 1.8     | .       | .        | 0.02    | 0.08     | 0.04     | .        | .       |
| 2 | CURM 62.12   | 7.94  | .       | .        | .         | 0.081  | .        | 89.42  | 0.45   | 1.59    | .       | .        | 0.053   | 0.034    | 0.109    | 0.111    | 0.180   |
| 1 | 34X NS1      | 7.81  | 0.069   | (0.003)  | .         | 0.052  | 0.0003   | 58.63  | 0.064  | 0.0009  | .       | 0.0140   | 0.0141  | (0.0004) | (0.002)  | 0.0110   | 33.41   |
| 2 | CTIF CN2     | 7.80  | .       | (0.012)  | .         | .      | .        | 88.40  | 1.68   | 1.19    | (0.007) | .        | 0.055   | 0.028    | 0.26     | (0.0065) | 0.515   |
| 1 | 36X CN21     | 5.50  | 0.0064  | 1.95     | .         | 0.0079 | 0.0050   | 92.17  | 0.316  | 0.0391  | .       | 0.053    | 0.051   | .        | .        | 0.038    | 0.0203  |
| 1 | 36X 274      | 2.54  | .       | 0.0013   | .         | 0.0028 | 0.531    | 96.23  | 0.0779 | 0.0148  | .       | 0.0011   | 0.0021  | 0.0035   | 0.594    | 0.0140   | 0.0395  |
| 1 | 37X 218      | 2.52  | .       | 0.0022   | .         | 0.0013 | 0.032    | 96.57  | 0.074  | 0.0883  | .       | 0.0014   | 0.0025  | 0.007    | 0.58     | 0.015    | 0.027   |
| 1 | 36X CN22     | 1.806 | 0.0196  | 6.09     | .         | 0.0231 | 0.0144   | 91.80  | 0.088  | (0.016) | .       | 0.0178   | 0.0260  | .        | .        | 0.0371   | 0.0175  |

| Number       | As       | B        | Be       | C        | Cd     | Mg       | Sb      | Te     | Ti       | Zr      | Units                |
|--------------|----------|----------|----------|----------|--------|----------|---------|--------|----------|---------|----------------------|
| 36X CN6      | .        | (0.0016) | .        | 0.0180   | .      | .        | .       | .      | 0.0066   | 0.004   | 40 mm Ø x 15 mm      |
| 36X CN5      | .        | 0.0091   | 0.011    | 0.0253   | .      | 0.014    | .       | .      | .        | .       | 40 mm Ø x 15 mm      |
| IARM 85C     | 0.0009   | .        | .        | 0.008    | .      | 0.01     | .       | .      | .        | .       | 31 mm Ø x 2 or 18 mm |
| SRM 1276a    | (<0.001) | (0.0001) | .        | 0.002    | 0.002  | 0.12     | 0.0004  | 0.005  | (0.0002) | .       | 32 mm Ø x 19 mm      |
| 36X CN8      | .        | 0.0025   | .        | 0.0225   | .      | 0.021    | .       | .      | .        | .       | 40 mm Ø x 15 mm      |
| BS 715A      | (0.0014) | .        | .        | 0.03     | .      | .        | (0.003) | .      | .        | .       | 38 mm Ø x 12 mm      |
| IARM 236A    | .        | .        | .        | 0.010    | .      | .        | <0.005  | .      | .        | .       | 31 mm Ø x 2 or 18 mm |
| 36X CN7      | .        | (0.004)  | .        | 0.0106   | 0.0024 | 0.0041   | .       | .      | (0.037)  | (0.003) | 40 mm Ø x 17 mm      |
| C62.11       | .        | .        | .        | .        | .      | <0.002   | .       | .      | .        | .       | 60 mm Ø x 10 mm      |
| CTIF CN 33   | .        | .        | .        | 0.02     | 0.006  | <0.06    | .       | 0.0224 | .        | .       | 60 mm Ø x 5 mm       |
| IARM 85B     | .        | .        | .        | 0.011    | .      | .        | (<0.01) | .      | .        | .       | 31 mm Ø x 2 or 18 mm |
| 36X CN10     | .        | 0.0029   | .        | 0.064    | .      | 0.0026   | .       | .      | .        | (0.055) | 40 mm Ø x 15 mm      |
| 36X CN9      | .        | 0.0065   | .        | 0.0098   | .      | .        | .       | .      | 0.150    | 0.0019  | 40 mm Ø x ~15 mm     |
| C62.15       | .        | .        | .        | .        | .      | <0.002   | .       | .      | .        | .       | 60 mm Ø x 10 mm      |
| 36X CN4      | .        | .        | .        | 0.0053   | .      | (0.0004) | .       | .      | (0.004)  | .       | 40 mm Ø x 17 mm      |
| BAM 389      | .        | .        | .        | .        | 0.0016 | 0.067    | 0.0046  | .      | 0.0660   | 0.098   | 40 mm Ø x 30 mm      |
| C62.14       | .        | .        | .        | .        | .      | 0.002    | .       | .      | .        | .       | 60 mm Ø x 10 mm      |
| 36X CN3      | .        | 0.0064   | 0.0163   | 0.035    | .      | 0.012    | .       | .      | .        | .       | 40 mm Ø x 15 mm      |
| C65.30       | .        | .        | .        | .        | .      | 0.01     | .       | .      | .        | .       | 50 mm Ø x 10 - 12 mm |
| 34X NS5      | .        | .        | .        | .        | .      | 0.704    | .       | .      | .        | .       | 42 mm Ø x 17 mm      |
| 34X NS4      | .        | .        | .        | .        | .      | <0.0001  | .       | .      | .        | .       | 42 mm Ø x 17 mm      |
| C65.29       | .        | .        | .        | .        | .      | <0.01    | .       | .      | .        | .       | 50 mm Ø x 10 - 12 mm |
| 36X SP2      | .        | 0.0005   | .        | .        | .      | 0.0002   | 0.006   | .      | (0.0008) | .       | 40 mm Ø x 15 mm      |
| 36X CN2      | .        | .        | .        | 0.004    | .      | 0.0006   | .       | .      | 0.0102   | .       | 40 mm Ø x 17 mm      |
| 36X CN24     | (0.0011) | .        | .        | 0.0436   | .      | .        | .       | .      | .        | .       | 38 mm x 13 mm x 13   |
| C65.28       | .        | .        | .        | .        | .      | 0.01     | .       | .      | .        | .       | 50 mm Ø x 10 - 12 mm |
| 36X CN11     | .        | .        | .        | (0.001)  | .      | 0.0241   | .       | .      | .        | .       | 40 mm Ø x ~17 mm     |
| 34X NS3      | .        | .        | .        | 0.014    | .      | 0.0011   | .       | .      | .        | .       | 42 mm Ø x 18 mm      |
| 36X CN23     | 0.047    | .        | .        | .        | 0.0021 | .        | .       | .      | .        | .       | 40 mm Ø x ~17 mm     |
| C62.13       | .        | .        | .        | .        | .      | 0.006    | .       | .      | .        | .       | 60 mm Ø x 10 mm      |
| C65.27       | .        | .        | .        | .        | .      | <0.01    | .       | .      | .        | .       | 50 mm Ø x 10 - 12 mm |
| 34X NS2      | .        | .        | .        | .        | .      | <0.0005  | .       | .      | .        | .       | 42 mm Ø x 17 mm      |
| C65.26       | .        | .        | .        | .        | .      | <0.01    | .       | .      | .        | .       | 50 mm Ø x 10 - 12 mm |
| CTIF CN4     | .        | .        | .        | (0.001)  | .      | .        | .       | .      | .        | .       | 60 mm Ø x 5 mm       |
| BS 706B      | <0.0005  | .        | .        | (0.004)  | .      | .        | <0.002  | .      | .        | .       | 38 mm Ø x 12 mm      |
| BS 706       | <0.005   | .        | .        | (0.003)  | .      | .        | <0.005  | .      | .        | .       | 38 mm Ø x 12 mm      |
| BS 706A      | <0.0005  | .        | .        | 0.004    | .      | .        | 0.0006  | .      | .        | .       | 38 mm Ø x 12 mm      |
| 36X CN1      | .        | 0.0013   | .        | (0.0026) | .      | .        | .       | .      | .        | .       | 40 mm Ø x ~17 mm     |
| CTIF CuNi 10 | .        | .        | .        | (0.009)  | .      | .        | .       | .      | .        | .       | 40 mm Ø x 18 mm      |
| IARM 84B     | .        | .        | .        | (0.01)   | .      | .        | (0.002) | .      | .        | .       | 31 mm Ø x 2 or 18 mm |
| BAM 367      | .        | .        | .        | .        | .      | 0.0347   | .       | .      | .        | .       | 40 mm Ø x 30 mm      |
| 36X CN1      | .        | (0.0008) | (0.0001) | 0.008    | .      | (0.0003) | .       | .      | .        | .       | 40 mm Ø x 15 mm      |
| CTIF CN3 *   | .        | .        | .        | 0.05     | .      | .        | .       | .      | .        | .       | 60 mm Ø x 5 mm       |
| 36X SP1      | .        | 0.0007   | .        | .        | .      | .        | 0.0177  |        |          |         |                      |

## CRM NICKEL ALLOY SETS

| available in SETS only, as grouped |       | analysis listed in mass % |        |         |          |        |        |       |        |        |        | NA: 28 mm Ø x 25 mm |        | MN: 35 mm Ø x 30 mm<br>NB: 40 mm Ø x 25 mm |         | N: 35 mm Ø x 30 mm<br>NC: 40 mm Ø x 12 mm |        |        |
|------------------------------------|-------|---------------------------|--------|---------|----------|--------|--------|-------|--------|--------|--------|---------------------|--------|--|---------|---|--------|--------|
| Number                             | Ni    | Al                        | As     | Bi      | C        | Cd     | Co     | Cu    | Fe     | Mg     | Mn     | P                   | Pb     | S  | Sb      | Si  | Sn     | Zn     |
| IMN NC1                            | 23.17 | .                         | 0.0056 | 0.0011  | 0.0320   | 0.0142 | 0.0062 | .     | 0.0501 | 0.0016 | 0.552  | 0.0147              | 0.0025 | 0.0709                                     | 0.0024  | 0.0854                                    | 0.0374 | 0.776  |
| IMN NC2                            | 24.21 | 0.0219                    | 0.0104 | 0.0046  | (0.0026) | 0.0189 | 0.0115 | .     | 0.290  | 0.0024 | 0.413  | .                   | 0.0021 | 0.0837                                     | 0.0049  | 0.196                                     | 0.0457 | 0.508  |
| IMN NC3                            | 24.68 | 0.229                     | 0.0167 | 0.0077  | (0.0036) | 0.0120 | 0.0282 | .     | 0.106  | 0.0561 | 0.148  | 0.0312              | 0.0027 | (0.0202)                                   | 0.0084  | 0.0609                                    | 0.0171 | 0.244  |
| IMN NC4                            | 25.39 | 0.332                     | 0.0251 | 0.0117  | 0.0500   | 0.0049 | 0.101  | .     | 0.426  | 0.0170 | 0.0172 | 0.0113              | 0.0120 | 0.0022                                     | 0.0113  | 0.0197                                    | 0.0087 | 0.0099 |
| IMN NC5                            | 25.82 | 0.0749                    | 0.0427 | 0.0213  | 0.0050   | 0.0018 | 0.151  | .     | 0.369  | 0.0861 | 0.0623 | 0.0222              | 0.0409 | .  | 0.0161  | 0.0198                                    | 0.0044 | 0.0152 |
| IMN NB1                            | 23.77 | 0.071                     | 0.024  | 0.011   | 0.040    | 0.016  | 0.010  | 75.71 | 0.11   | 0.017  | 0.029  | 0.025               | 0.011  | 0.0019                                     | 0.0025  | 0.093                                     | 0.0038 | 0.052  |
| IMN NB2                            | 24.38 | 0.043                     | 0.0045 | 0.0082  | 0.019    | 0.0053 | 0.023  | 74.73 | 0.085  | 0.0059 | 0.46   | 0.030               | 0.014  | 0.0084                                     | 0.0036  | 0.13                                      | 0.014  | 0.037  |
| IMN NB3                            | 25.87 | 0.12                      | 0.0076 | 0.0070  | 0.034    | 0.0082 | 0.017  | 73.20 | 0.14   | 0.013  | 0.23   | 0.019               | 0.011  | 0.011                                      | 0.0057  | 0.068                                     | 0.040  | 0.20   |
| IMN NB4                            | 25.78 | 0.013                     | 0.0097 | 0.0040  | 0.018    | 0.0064 | 0.013  | 73.45 | 0.21   | 0.028  | 0.015  | 0.0085              | 0.0084 | 0.015                                      | 0.0092  | 0.024                                     | 0.065  | 0.33   |
| IMN NB5                            | 24.94 | 0.0014                    | 0.011  | 0.0010  | 0.012    | 0.0012 | 0.0067 | 73.42 | 0.28   | 0.036  | 0.57   | 0.0036              | 0.0060 | 0.028                                      | 0.012   | 0.0057                                    | 0.10   | 0.57   |
| IMN N1                             | 25.38 | .                         | .      | .       | .        | .      | 0.0050 | Rem   | 0.0056 | .      | 0.0018 | .                   | 0.0019 | .  | .       | 0.0070                                    | 0.0089 | 0.019  |
| IMN N2                             | 24.28 | .                         | .      | .       | .        | .      | 0.023  | Rem   | 0.35   | .      | 0.21   | .                   | 0.011  | .  | .       | 0.025                                     | 0.012  | 0.16   |
| IMN N3                             | 22.57 | .                         | .      | .       | .        | .      | 0.055  | Rem   | 0.77   | .      | 0.50   | .                   | 0.020  | .  | .       | 0.062                                     | 0.023  | 0.33   |
| IMN N4                             | 21.39 | .                         | .      | .       | .        | .      | 0.080  | Rem   | 1.07   | .      | 0.71   | .                   | 0.039  | .  | .       | 0.13                                      | 0.038  | 0.47   |
| IMN NA1                            | 7.19  | .                         | .      | .       | (0.020)  | .      | .      | Rem   | 2.52   | .      | 1.51   | .                   | 0.081  | (0.081)                                    | .       | .   | .      | 0.80   |
| IMN NA2                            | 9.05  | .                         | .      | .       | (0.023)  | .      | .      | Rem   | 2.03   | .      | 1.03   | .                   | 0.056  | (0.065)                                    | .       | .   | .      | 0.55   |
| IMN NA3                            | 10.35 | .                         | .      | .       | (0.019)  | .      | .      | Rem   | 1.15   | .      | 0.60   | .                   | 0.035  | (0.036)                                    | .       | .   | .      | 0.30   |
| IMN NA4                            | 12.15 | .                         | .      | .       | (0.012)  | .      | .      | Rem   | 0.50   | .      | 0.21   | .                   | 0.0066 | (0.0069)                                   | .       | .   | .      | 0.019  |
| IMN MN1                            | 3.21  | .                         | 0.0007 | 0.00011 | .        | .      | .      | Rem   | 0.0041 | .      | .      | (0.00027)           | 0.0062 | .  | 0.00019 | .   | .      | .      |
| IMN MN2                            | 4.50  | .                         | 0.0011 | 0.00071 | .        | .      | .      | Rem   | 0.033  | .      | .      | 0.010               | 0.012  | .  | 0.00078 | .   | .      | .      |
| IMN MN3                            | 5.29  | .                         | 0.0017 | 0.0012  | .        | .      | .      | Rem   | 0.062  | .      | .      | 0.016               | 0.016  | .  | 0.0013  | .   | .      | .      |
| IMN MN4                            | 5.90  | .                         | 0.0038 | 0.0018  | .        | .      | .      | Rem   | 0.083  | .      | .      | 0.026               | 0.024  | .  | 0.0019  | .   | .      | .      |

## CRM PHOSPHORUS ALLOY SET

| cast    |       | SOLD IN SET/4 ONLY |         |       |        |        |       |       |          |          |       | 40 mm Ø x 25 mm |  |
|---------|-------|--------------------|---------|-------|--------|--------|-------|-------|----------|----------|-------|-----------------|--|
| Number  | P     | As                 | Bi      | Fe    | Ni     | Pb     | Sn    | Sb    | Se       | Te       | Zn    | Cu              |  |
| IMN CO2 | 11.60 | 0.0050             | 0.0049  | 0.096 | 0.013  | 0.070  | 0.35  | 0.065 | (0.0045) | (0.0055) | 0.15  | REM             |  |
| IMN CO5 | 9.45  | 0.0023             | 0.00095 | 0.11  | 0.0082 | 0.0044 | 0.55  | 0.034 | (0.0015) | (0.0023) | 0.061 | REM             |  |
| IMN CO3 | 8.56  | 0.011              | 0.015   | 0.11  | 0.10   | 0.10   | 0.037 | 0.14  | (0.0073) | (0.0080) | 0.24  | REM             |  |
| IMN CO4 | 5.54  | 0.016              | 0.0086  | 0.29  | 0.25   | 0.29   | 0.13  | 0.092 | (0.010)  | (0.012)  | 0.029 | REM             |  |

## CRM SEBILOY / ENVIROBRASS / FEDERALLOY

| Number      | Sn   | Zn   | Bi    | Se      | As      | Co      | Fe     | Ni     | P       | Pb     | Sb     | Cu     |
|-------------|------|------|-------|---------|---------|---------|--------|--------|---------|--------|--------|--------|
| 32X SEB2    | 9.34 | 3.73 | 4.36  | 0.026   | 0.0094  | 0.0121  | 0.078  | 0.028  | 0.013   | 0.424  | 0.0120 | (81.8) |
| 32X SEB4    | 9.26 | 8.60 | 2.65  | 0.105   | 0.0012  | 0.48    | 0.366  | 0.0091 | (0.006) | 0.011  | 0.0056 | 78.6   |
| 32X SEB6    | 7.14 | 4.55 | 0.615 | 0.322   | 0.083   | 0.231   | 0.151  | 0.860  | 0.0118  | 0.0463 | 0.235  | 85.66  |
| IARM 266A   | 6.9  | 3.48 | 2.37  | 0.001   | 0.004   | (0.001) | 0.035  | 0.46   | 0.032   | 0.010  | 0.010  | (87)   |
| 32X SEB5    | 5.28 | 6.64 | 1.17  | 0.512   | 0.0121  | 0.0048  | 0.360  | 0.308  | 0.183   | 0.0149 | 0.0344 | 85.5   |
| IARM 226A   | 5.1  | 4.8  | 1.7   | 0.93    | 0.003   | 0.001   | 0.054  | 0.54   | 0.005   | 0.040  | 0.004  | 86.7   |
| IARM 227A   | 5.1  | 4.70 | 2.3   | 1.21    | 0.003   | 0.001   | 0.060  | 0.53   | 0.003   | 0.042  | <0.01  | 85.9   |
| IARM 265A   | 4.4  | 2.45 | 2.4   | (0.002) | (0.005) | (0.001) | 0.013  | 0.69   | 0.024   | 0.011  | 0.015  | (90)   |
| 32X SEB1    | 4.23 | 8.79 | 5.31  | 0.97    | 0.043   | 0.0089  | 0.0293 | 0.101  | 0.0054  | 0.209  | 0.355  | 79.6   |
| IARM 228A   | 4.1  | 4.1  | 1.53  | 0.67    | 0.003   | 0.001   | 0.052  | 0.45   | 0.032   | 0.026  | 0.010  | 89.0   |
| IARM 263A   | 3.5  | 15.8 | 2.55  | (0.002) | 0.003   | 0.001   | 0.047  | 0.66   | 0.040   | 0.022  | 0.06   | (78)   |
| 32X SEB7    | 3.20 | 4.42 | 3.58  | 1.19    | 0.038   | 0.119   | 0.074  | 1.165  | 0.0206  | 0.343  | 0.262  | 85.46  |
| IARM 264A   | 3.03 | 5.33 | 3.6   | (0.001) | (0.004) | (0.001) | 0.048  | 0.54   | 0.027   | 0.057  | 0.074  | (87.3) |
| 32X SEB3 ** | 2.07 | 0.85 | (5.4) | 1.42    | 0.0161  | 0.025   | 0.082  | 1.52   | 0.040   | 0.109  | 0.054  | (88.4) |

  

| Number      | Ag      | Al      | B      | C       | Cd       | Cr  | Mn      | N        | O       | S       | Si    | Units                |
|-------------|---------|---------|--------|---------|----------|---|---------|----------|---------|---------|-------|----------------------|
| 32X SEB2    | .       | .       | .      | .       | .        | .   | .       | .        | .       | .       | .     | 40 mm Ø x 17 mm      |
| 32X SEB4    | .       | .       | 0.0021 | .       | 0.0004   | .   | .       | .        | .       | .       | .     | 42 mm Ø x 17 mm      |
| 32X SEB6    | .       | .       | .      | .       | 0.0036   | .   | .       | .        | .       | .       | .     | 40 mm Ø x 15 mm      |
| IARM 266A   | (0.001) | 0.002   | .      | (0.002) | .        | (0.002)                                       | (0.002) | .        | .       | (0.002) | 0.002 | 31 mm Ø x 2 or 18 mm |
| 32X SEB5    | .       | .       | 0.0028 | .       | 0.0067   | .   | .       | .        | .       | .       | .     | 40 mm Ø x 17 mm      |
| IARM 226A   | 0.004   | 0.002   | .      | 0.003   | .        | (0.001)                                       | 0.002   | <0.0005  | (0.001) | 0.005   | 0.002 | 31 mm Ø x 2 or 18 mm |
| IARM 227A   | 0.004   | 0.002   | .      | 0.003   | .        | (0.001)                                       | 0.001   | (0.0002) | 0.0013  | 0.005   | 0.002 | 31 mm Ø x 2 or 18 mm |
| IARM 265A   | (0.002) | 0.003   | .      | .       | .        | (0.001)                                       | (0.002) | .        | .       | (0.002) | 0.003 | 31 mm Ø x 2 or 18 mm |
| 32X SEB1    | .       | .       | .      | .       | (0.0002) | .   | .       | .        | .       | 0.0011  | .     | 40 mm Ø x 17 mm      |
| IARM 228A   | 0.003   | 0.002   | .      | 0.003   | .        | 0.001   | 0.001   | <0.0005  | (0.002) | 0.004   | 0.002 | 31 mm Ø x 2 or 18 mm |
| IARM 263A   | (0.006) | (0.002) | .      | <0.005  | .        | (0.002)                                       | (0.002) | .        | .       | (0.002) | 0.003 | 31 mm Ø x 2 or 18 mm |
| 32X SEB7    | .       | .       | .      | .       | 0.0074   | .   | .       | .        | .       | 0.067   | .     | 42 mm Ø x 17 mm      |
| IARM 264A   | (0.005) | 0.003   | .      | (0.004) | .        | (0.002)                                       | (0.002) | .        | .       | 0.0013  | 0.003 | 31 mm Ø x 2 or 18 mm |
| 32X SEB3 ** | .       | .       | 0.0021 | .       | 0.0016   | ** Bi and Cu are inhomogeneous in this sample | .       | .        | .       | .       | .     | 40 mm Ø x 17 mm      |

**RM SILVER ALLOY**

31 mm Ø x 2 or 18 mm

| Number  | Ag   | C       | P       | S        | Zr   |
|---|------|---------|---------|----------|------|
| IARM 159A   | 3.48 | (0.002) | (<0.01) | (<0.01)  | .    |
| IARM 160A   | 3.03 | 0.003   | (0.004) | (<0.003) | 0.40 |
| Al, Co, Cr, Fe, Mn, Ni, Pb, Si, Sn, and Zn: (<0.01) |      |         |         |          |      |

**RM COPPER-TIN BINARIES**

cast typical analysis

| Number    | Sn   | Units                |
|-----------|------|----------------------|
| 32X 14957 | 9.30 | 40 mm Ø x 15 mm      |
| C 11.04   | 9.3  | 50 mm Ø x 10 - 12 mm |
| 32X 14956 | 7.35 | 40 mm Ø x 15 mm      |
| C 11.03   | 7.3  | 50 mm Ø x 10 - 12 mm |
| C 11.02   | 5.4  | 50 mm Ø x 10 - 12 mm |
| 32X 14955 | 5.25 | 40 mm Ø x 15 mm      |
| C 11.01   | 3.3  | 50 mm Ø x 10 - 12 mm |
| 32X 14954 | 3.15 | 40 mm Ø x 15 mm      |
| 32X 14953 | 1.37 | 40 mm Ø x 15 mm      |

**CRM TIN COPPER**

available in SET/5 only

40 mm Ø x 30 mm

| Number  | Ag     | As      | Bi      | Cu  | Fe     | Ni     | P      | Pb     | Sb     | Sn   | Zn     |
|---------|--------|---------|---------|-----|--------|--------|--------|--------|--------|------|--------|
| IMN CM1 | 0.010  | 0.0098  | 0.010   | Rem | 0.019  | 0.0086 | 0.0088 | 0.012  | 0.012  | 0.61 | 0.021  |
| IMN CM2 | 0.0061 | 0.0068  | 0.0072  | Rem | 0.0064 | 0.0055 | 0.0058 | 0.0067 | 0.0068 | 0.84 | 0.0061 |
| IMN CM3 | 0.0029 | 0.0036  | 0.0033  | Rem | 0.012  | 0.0031 | 0.0041 | 0.0038 | 0.0040 | 1.06 | 0.0060 |
| IMN CM4 | 0.0011 | 0.0011  | 0.00093 | Rem | 0.0042 | 0.0011 | 0.0009 | 0.0023 | 0.0019 | 1.30 | 0.0020 |
| IMN CM5 | .      | (0.015) | 0.014   | Rem | 0.0094 | 0.014  | 0.015  | 0.019  | 0.018  | 1.14 | 0.013  |

## CRM BRASS SETS

wrought available in SETS only, as grouped MB: 40 mm Ø x 18 mm MD, WC: 40 mm Ø x 12 mm ME, MG: 40 mm Ø x 30 mm

| Number  | Cu    | Zn    | Al       | As        | Bi        | Fe     | Mn      | Ni     | P        | Pb     | Sb        | Si     | Sn     |
|---------|-------|-------|----------|-----------|-----------|--------|---------|--------|----------|--------|-----------|--------|--------|
| IMN MG1 | 91.14 | Rem   | 0.040    | .         | 0.00058   | 0.0081 | 0.0013  | 0.048  | (0.0019) | 0.049  | 0.00077   | .      | 0.0062 |
| IMN MG2 | 90.08 | Rem   | (0.0026) | .         | 0.00039   | 0.0067 | 0.0007  | 0.0022 | 0.0012   | 0.0048 | (0.00084) | .      | 0.018  |
| IMN MG3 | 93.19 | Rem   | 0.020    | .         | 0.0014    | 0.062  | 0.0096  | 0.013  | 0.018    | 0.015  | 0.0026    | .      | 0.033  |
| IMN MG4 | 94.00 | Rem   | .        | .         | 0.0017    | 0.091  | 0.024   | 0.0042 | 0.012    | 0.008  | 0.0045    | .      | 0.023  |
| IMN MG5 | 95.09 | Rem   | 0.0011   | .         | 0.0026    | 0.149  | 0.0036  | 0.0021 | 0.0069   | 0.0054 | 0.0061    | .      | 0.013  |
| IMN MG6 | 92.27 | Rem   | 0.0067   | .         | 0.00088   | 0.028  | 0.045   | 0.030  | 0.0026   | 0.031  | 0.0015    | .      | 0.053  |
| IMN WC1 | 75.10 | Rem   | 0.0034   | 0.0043    | 0.0028    | 0.031  | .       | .      | 0.015    | 0.046  | 0.0034    | 0.26   | 0.0032 |
| IMN WC2 | 75.05 | Rem   | 0.0016   | 0.0024    | 0.0020    | 0.015  | .       | .      | 0.011    | 0.031  | 0.0023    | 0.41   | 0.0025 |
| IMN WC3 | 75.28 | Rem   | 0.0018   | 0.0011    | 0.00093   | 0.021  | .       | .      | 0.0058   | 0.0085 | 0.0010    | 0.89   | 0.0011 |
| IMN WC4 | 75.32 | Rem   | 0.00096  | .         | 0.00047   | 0.0067 | .       | .      | 0.0048   | 0.0051 | 0.00080   | 0.76   | 0.0010 |
| IMN WC5 | 75.03 | Rem   | 0.00084  | 0.0022    | 0.0019    | 0.18   | .       | .      | .        | 0.0055 | 0.0011    | 0.48   | 0.0044 |
| IMN WC6 | 75.32 | Rem   | 0.0019   | 0.00097   | 0.0012    | 0.051  | .       | .      | 0.0037   | 0.0036 | 0.00057   | 0.58   | 0.0028 |
| IMN MD1 | 67.92 | Rem   | .        | 0.0015    | 0.0026    | 0.043  | 0.097   | 0.021  | 0.0082   | 0.19   | 0.0096    | 0.078  | 0.0013 |
| IMN MD2 | 68.99 | Rem   | .        | 0.072     | 0.0025    | 0.18   | 0.082   | 0.050  | 0.0061   | 0.015  | 0.0011    | 0.059  | 0.0054 |
| IMN MD3 | 69.43 | Rem   | .        | 0.055     | 0.0018    | 0.085  | 0.062   | 0.070  | 0.0043   | 0.010  | 0.012     | 0.097  | 0.010  |
| IMN MD4 | 71.53 | Rem   | .        | 0.038     | 0.00053   | 0.018  | 0.015   | 0.091  | .        | 0.054  | 0.0038    | 0.0066 | 0.21   |
| IMN MD5 | 71.06 | Rem   | .        | 0.018     | (0.00004) | 0.081  | 0.017   | 0.064  | 0.00089  | 0.0023 | 0.0065    | 0.016  | 0.021  |
| IMN MD6 | 70.77 | Rem   | .        | (0.00022) | 0.000044  | .      | 0.00073 | 0.039  | .        | 0.044  | 0.00058   | .      | 0.019  |
| IMN ME2 | 71.29 | Rem   | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | 0.87   |
| IMN ME3 | 70.70 | Rem   | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | 1.11   |
| IMN ME4 | 69.40 | Rem   | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | 1.21   |
| IMN ME5 | 68.53 | Rem   | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | 1.42   |
| IMN MB1 | 60.66 | 39.39 | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |
| IMN MB2 | 67.17 | 32.80 | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |
| IMN MB3 | 73.26 | 26.67 | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |
| IMN MB4 | 78.77 | 21.20 | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |
| IMN MB5 | 84.25 | 15.63 | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |
| IMN MB6 | 90.07 | 9.95  | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |
| IMN MB7 | 95.00 | 4.99  | .        | .         | .         | .      | .       | .      | .        | .      | .         | .      | .      |

## RM TRACE ELEMENTS IN BRASS

cast 50 mm Ø x 10 - 12 mm

| Number     | Cu    | Zn    | Al     | As     | Bi     | Fe     | Mn      | Ni      | Pb     | Sb     | Si     | Sn     |
|------------|-------|-------|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|
| C30.10     | 95.3  | rem   | <0.002 | .      | .      | <0.005 | <0.005  | <0.01   | <0.01  | .      | <0.005 | <0.01  |
| C30.09     | 89.5  | rem   | <0.002 | <0.005 | <0.002 | <0.005 | <0.005  | <0.01   | <0.01  | <0.005 | <0.005 | <0.01  |
| C30.08     | 85.1  | rem   | <0.002 | .      | .      | <0.005 | <0.005  | <0.01   | <0.01  | .      | <0.005 | <0.01  |
| C30.07     | 79.8  | rem   | <0.002 | .      | .      | <0.005 | <0.005  | <0.01   | <0.01  | .      | <0.005 | <0.01  |
| C30.06     | 75.0  | rem   | <0.005 | .      | .      | <0.005 | <0.005  | <0.01   | 0.05   | .      | <0.005 | <0.01  |
| CURM 30.05 | 69.48 | 30.53 | <0.001 | <0.001 | <0.003 | <0.003 | <0.0005 | <0.0005 | 0.002  | <0.005 | 0.001  | <0.001 |
| C30.19     | 67.4  | rem   | 5.0    | .      | .      | <0.005 | <0.005  | <0.01   | <0.01  | .      | <0.005 | 1.0    |
| C30.04     | 64.8  | rem   | <0.005 | .      | .      | <0.005 | <0.005  | <0.005  | 0.005  | .      | <0.005 | <0.005 |
| CURM 30.04 | 64.34 | 35.62 | <0.001 | <0.001 | <0.003 | 0.009  | <0.001  | <0.001  | 0.003  | <0.005 | 0.016  | 0.009  |
| C30.17     | 61.7  | rem   | <0.002 | .      | .      | 1.6    | <0.005  | <0.01   | <0.01  | .      | <0.005 | <0.01  |
| C30.12     | 61.3  | rem   | <0.002 | .      | .      | <0.005 | 1.0     | 0.52    | <0.005 | .      | <0.005 | <0.005 |
| C38.01     | 61.0  | rem   | 0.003  | 0.03   | <0.001 | 0.01   | 0.009   | 0.01    | 0.20   | 0.02   | <0.001 | 0.20   |
| C38.02     | 61.0  | rem   | 0.005  | 0.06   | 0.005  | 0.09   | 0.14    | 0.03    | 0.10   | 0.06   | 0.01   | 0.09   |
| C38.03     | 61.0  | rem   | 0.06   | 0.08   | 0.008  | 0.05   | 0.07    | 0.13    | 0.05   | 0.08   | 0.07   | 0.05   |
| C38.04     | 61.0  | rem   | 0.02   | 0.04   | 0.008  | 0.04   | 0.22    | 0.06    | 0.02   | 0.12   | 0.12   | 0.02   |
| C38.05     | 61.0  | rem   | 0.12   | 0.01   | 0.01   | 0.008  | 0.02    | 0.18    | 0.01   | 0.01   | 0.14   | 0.01   |
| C38.06     | 61.0  | rem   | <0.001 | <0.001 | <0.001 | <0.005 | <0.001  | <0.005  | 0.002  | <0.002 | <0.001 | <0.005 |
| C30.16     | 61.2  | rem   | <0.002 | <0.005 | <0.002 | 0.90   | <0.005  | <0.01   | <0.01  | <0.005 | <0.005 | <0.01  |
| C30.15     | 60.6  | rem   | <0.002 | <0.005 | <0.002 | 0.55   | <0.005  | <0.01   | <0.01  | <0.005 | <0.005 | <0.01  |
| C30.13     | 60.6  | rem   | <0.002 | .      | .      | <0.005 | 1.9     | <0.01   | <0.01  | .      | <0.005 | <0.01  |
| C30.03     | 60.2  | rem   | 0.002  | .      | .      | <0.005 | <0.005  | 0.01    | <0.01  | .      | <0.005 | <0.01  |
| C30.14     | 59.6  | rem   | <0.002 | .      | .      | <0.005 | 2.6     | 0.99    | <0.01  | .      | <0.005 | <0.01  |
| C30.22     | 58.1  | rem   | <0.002 | .      | .      | <0.005 | <0.005  | <0.01   | 1.0    | .      | <0.005 | <0.01  |
| C30.02     | 55.6  | rem   | <0.002 | .      | .      | <0.005 | <0.005  | <0.01   | <0.01  | .      | <0.005 | <0.01  |
| C30.01     | 51.5  | rem   | <0.001 | .      | .      | 0.05   | <0.001  | <0.001  | <0.001 | .      | <0.001 | <0.001 |

## RM BRASS MUSHROOMS

chill cast typical analysis

60 mm Ø x 5 mm

| Number     | Zn    | Cu    | Al    | As     | Be    | Fe    | Ni    | Mg   | Mn     | P      | Pb    | Sb    | Si     | Sn    |
|------------|-------|-------|-------|--------|-------|-------|-------|------|--------|--------|-------|-------|--------|-------|
| CTIF L 7   | 42.45 | 55.6  | 0.308 | .      | .     | 0.031 | 0.020 | .    | 0.62   | .      | 0.71  | .     | 0.13   | 0.038 |
| CTIF L 1-1 | 39.7  | 59.60 | 0.015 | .      | .     | 0.017 | 0.106 | .    | .      | 0.080  | 0.062 | .     | 0.36   | 0.046 |
| CTIF L 2   | 35.55 | 61.55 | 0.485 | .      | .     | 0.216 | 0.71  | .    | 0.350  | .      | 0.408 | .     | 0.202  | 0.48  |
| CTIF L 4-1 | 34.55 | 61.75 | 0.100 | .      | .     | 0.466 | 0.227 | .    | 0.109  | .      | 2.017 | .     | 0.12   | 0.693 |
| CTIF L 3   | 32.70 | 62.35 | 0.91  | .      | .     | 0.36  | 0.90  | .    | 0.205  | .      | 1.02  | .     | 0.034  | 1.50  |
| CTIF L 5-1 | 31.5  | 60.9  | 0.64  | 0.13   | .     | (1.0) | 0.494 | .    | 0.50   | (0.15) | 2.99  | 0.174 | (0.47) | 0.88  |
| CTIF L 6   | 30.26 | 66.55 | 0.139 | .      | .     | 0.085 | 1.21  | .    | 0.055  | .      | 0.205 | .     | 1.25   | 0.250 |
| CTIF L 23  | 17.90 | 81.20 | .     | 0.051  | .     | 0.246 | 0.033 | .    | .      | 0.05   | 0.058 | .     | 0.280  | 0.20  |
| CTIF UZ 52 | 16.90 | 81.18 | .     | .      | 0.014 | 0.32  | 0.084 | 0.04 | 0.002  | 0.068  | 0.11  | 0.08  | 0.12   | 1.06  |
| CTIF UZ 53 | 16.67 | 82.60 | .     | 0.01   | .     | 0.255 | 0.025 | .    | <0.001 | 0.055  | 0.025 | .     | 0.145  | 0.205 |
| CTIF L 21  | 15.40 | 82.50 | .     | 0.103  | .     | 0.086 | 0.156 | .    | 0.004  | 0.05   | 0.209 | 0.10  | 0.036  | 1.5   |
| CTIF L 22  | 15.0  | 84.3  | <0.02 | <0.006 | .     | 0.20  | 0.10  | .    | <0.01  | .      | 0.10  | .     | <0.05  | 1.0   |
| CTIF L 20  | 13.10 | 85.55 | 0.008 | 0.122  | .     | 0.115 | 0.205 | .    | 0.043  | .      | 0.27  | .     | 0.035  | 0.56  |



## ALUMINUM BRASS

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

| # | Number      | Al    | Zn      | Cu     | As     | Bi     | Fe     | Mn     | Ni      | P       | Pb       | Sb      | Si     | Sn      | Units              |
|---|-------------|-------|---------|--------|--------|--------|--------|--------|---------|---------|----------|---------|--------|---------|--------------------|
| 2 | CTIF LH 1-1 | 7.99  | 16.75   | 65.05  | .      | .      | 4.48   | 5.18   | 0.0944  | 0.079   | 0.022    | 0.081   | 0.205  | (0.007) | 60 mm Ø x 5 mm     |
| 2 | CTIF LH 2   | 6.20  | 21.95   | 61.98  | .      | .      | 2.98   | 3.65   | 3.00    | .       | 0.080    | .       | 0.086  | 0.055   | 60 mm Ø x 5 mm     |
| 2 | CTIF LH 6-1 | 6.09  | 18.98   | 63.18  | .      | .      | (3.1)  | 4.54   | 3.19    | .       | 0.25     | .       | 0.20   | 0.257   | 60 mm Ø x 5 mm     |
| 1 | BAM 388     | 4.972 | 4.81    | 89.27  | .      | .      | 0.0303 | 0.0512 | 0.00736 | .       | 0.000969 | .       | .      | 0.857   | 40 mm Ø x 30 mm    |
| 2 | CTIF LH 5-1 | 3.65  | 25.72   | 66.0   | .      | .      | 1.26   | 1.37   | 1.57    | .       | 0.110    | .       | 0.114  | 0.141   | 60 mm Ø x 5 mm     |
| 2 | CTIF LH 7   | 3.16  | (26.85) | 63.40  | .      | .      | (2.35) | 2.96   | 0.70    | .       | 0.327    | .       | 0.055  | 0.227   | 60 mm Ø x 5 mm     |
| 2 | C30.18      | 2.91  | rem     | 64.36  | <0.005 | <0.003 | <0.005 | <0.005 | <0.005  | .       | <0.01    | <0.005  | 0.10   | 0.65    | 50 mm Ø x 10-12 mm |
| 2 | CURM 43.01  | 2.75  | 22.44   | 74.36  | 0.118  | <0.002 | 0.008  | 0.064  | 0.121   | .       | <0.002   | <0.001  | 0.063  | 0.116   | 50 mm Ø x 10-12 mm |
| 2 | CTIF LH 10  | 2.66  | 28.90   | 59.05  | .      | .      | (1.0)  | 3.57   | 1.49    | .       | 1.76     | .       | 1.30   | 0.203   | 60 mm Ø x 5 mm     |
| 2 | CURM 43.02  | 2.40  | 20.82   | 76.21  | 0.083  | <0.001 | 0.128  | 0.035  | 0.068   | .       | 0.064    | <0.001  | 0.038  | 0.060   | 50 mm Ø x 10-12 mm |
| 2 | CTIF LH 13  | 2.00  | 31.8    | 55.75  | .      | .      | (2.00) | 3.14   | 3.22    | .       | 0.67     | .       | 0.21   | 1.19    | 60 mm Ø x 5 mm     |
| 2 | C43.03      | 1.6   | rem     | 79.7   | <0.005 | <0.005 | 0.07   | <0.002 | <0.005  | .       | 0.10     | <0.01   | <0.005 | <0.005  | 50 mm Ø x 10-12 mm |
| 1 | BAM 368 *   | 1.972 | rem     | 77.049 | 0.0246 | .      | 0.0193 | 0.0203 | 0.0258  | 0.00899 | 0.01313  | (0.002) | .      | 0.0147  | 40 mm Ø x 30 mm    |
| 2 | C30.21      | 1.44  | rem     | 56.0   | <0.005 | .      | <0.005 | <0.005 | <0.005  | .       | <0.005   | <0.01   | 0.18   | 1.96    | 50 mm Ø x 10-12 mm |
| 2 | CTIF LH 12  | 1.13  | 33.15   | 62.75  | .      | .      | (1.2)  | 0.125  | 0.505   | .       | 0.21     | .       | (0.06) | 0.83    | 60 mm Ø x 5 mm     |
| 2 | CTIF LH 11  | 0.46  | 26.20   | 66.80  | .      | .      | 0.36   | 0.71   | 2.91    | .       | 1.26     | .       | 0.88   | 0.44    | 60 mm Ø x 5 mm     |

\* BAM 368 also contains 62.1 ppm Mg

## CRM ALUMINUM BRASS SET

available in SET/4 only

40 mm Ø x 35 mm

| Number  | Al   | As    | Bi     | Cd     | Cr      | Cu    | Fe    | Mg      | Mn    | Ni     | P      | Pb    | Sb      | Si    | Sn     | Zn  |
|---------|------|-------|--------|--------|---------|-------|-------|---------|-------|--------|--------|-------|---------|-------|--------|-----|
| IMN W01 | 1.33 | 0.056 | 0.0003 | 0.013  | 0.013   | 78.85 | 0.13  | 0.00060 | 0.014 | 0.0043 | 0.0023 | 0.15  | 0.0083  | 0.044 | 0.011  | Rem |
| IMN W02 | 1.76 | 0.041 | 0.0014 | 0.032  | 0.0098  | 77.80 | 0.050 | 0.0066  | 0.16  | 0.031  | 0.0090 | 0.098 | 0.00098 | 0.013 | 0.056  | Rem |
| IMN W03 | 2.15 | 0.015 | 0.0047 | 0.039  | 0.0027  | 77.58 | 0.029 | 0.0055  | 0.051 | 0.11   | 0.0062 | 0.054 | 0.0035  | 0.007 | 0.0071 | Rem |
| IMN W04 | 2.50 | 0.030 | 0.0098 | 0.0063 | 0.00034 | 76.20 | 0.022 | 0.013   | 0.074 | 0.077  | 0.015  | 0.020 | 0.0058  | 0.001 | 0.13   | Rem |

## CRM BISMUTH BRASS

cast and chill cast

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

40-42 mm Ø x ~15-18 mm

| Number   | Bi    | Zn    | Cu    | Al     | As     | B* | Cd* | Fe    | Mn     | Ni    | P      | Pb     | S*   | Sb     | Se     | Si     | Sn    |
|----------|-------|-------|-------|--------|--------|----|-----|-------|--------|-------|--------|--------|------|--------|--------|--------|-------|
| 31X BIB3 | 4.05  | 32.46 | 62.48 | 0.0298 | 0.057  | .  | 29  | 0.099 | 0.243  | 0.098 | 0.0175 | 0.149  | (5)  | 0.0417 | 0.003  | 0.061  | 0.111 |
| 31X BIB1 | 1.948 | 36.67 | 59.93 | 0.0718 | 0.0282 | .  | 82  | 0.113 | 0.0479 | 0.313 | 0.0637 | 0.211  | (10) | 0.0154 | 0.0064 | 0.099  | 0.488 |
| 31X BIB4 | 0.980 | 36.89 | 60.88 | 0.358  | .      | 8  | 5   | 0.148 | 0.0039 | 0.175 | 0.0064 | 0.091  | (7)  | 0.0144 | 0.0162 | 0.0018 | 0.400 |
| 31X BIB2 | 0.921 | 33.85 | 62.05 | 0.411  | 0.084  | .  | 20  | 0.379 | 0.0451 | 0.466 | 0.0358 | 0.0617 | (14) | 0.119  | 0.0142 | 0.322  | 1.186 |

## RM CARTRIDGE BRASS

cast typical analysis listed in mass %

50 mm Ø x 10 - 12 mm

| Number     | Zn    | Cu    | Al     | As     | Bi    | Cd      | Cr     | Fe    | Mg     | Mn     | Ni     | P      | Pb     | S      | Sb    | Sn     | Si     |
|------------|-------|-------|--------|--------|-------|---------|--------|-------|--------|--------|--------|--------|--------|--------|-------|--------|--------|
| CURM 48.01 | 32.6  | 66.98 | <0.001 | 0.067  | 0.038 | <0.0003 | *      | 0.049 | 0.0008 | <0.001 | 0.134  | 0.016  | 0.106  | <0.001 | 0.047 | <0.002 | 0.041  |
| CURM 48.02 | 32.58 | 67.16 | 0.013  | 0.025  | 0.004 | .       | 0.004  | 0.053 | *      | 0.067  | <0.001 | 0.012  | 0.084  | 0.007  | 0.037 | 0.035  | 0.010  |
| CURM 48.05 | 31.0  | 68.69 | <0.002 | <0.001 | *     | <0.0003 | *      | 0.066 | *      | 0.016  | 0.117  | 0.007  | <0.003 | 0.013  | *     | 0.083  | 0.026  |
| C48.03     | Rem   | 70.4  | 0.003  | 0.04   | 0.006 | .       | 0.001  | 0.01  | 0.003  | 0.04   | 0.02   | <0.001 | 0.05   | 0.006  | 0.07  | 0.05   | <0.001 |
| C48.06     | Rem   | 71.6  | 0.002  | 0.008  | 0.004 | .       | 0.0006 | 0.01  | 0.001  | 0.006  | 0.11   | 0.002  | 0.02   | 0.006  | 0.006 | 0.02   | 0.006  |
| CURM 48.04 | 26.99 | 72.68 | <0.001 | 0.034  | 0.014 | <0.0003 | <0.002 | 0.008 | 0.0005 | 0.012  | 0.096  | 0.006  | 0.043  | 0.011  | 0.026 | 0.018  | 0.004  |

\* For the above chart, \* indicates a value of &lt;0.0005

## CRM CARTRIDGE BRASS SET

available in SET/5 only

remainder is Zinc

wrought 40 mm Ø x 25 mm

| Number  | Ag     | Al     | As     | Be      | Bi     | Cd     | Cu    | Fe     | Mn     | Ni     | P      | Pb     | S      | Sb     | Si     | Sn     | Te     |
|---------|--------|--------|--------|---------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| IMN MH1 | 0.0029 | 0.0010 | 0.0670 | 0.0088  | 0.0037 | 0.0260 | 65.93 | 0.0170 | 0.0350 | 0.2600 | 0.0160 | 0.0065 | 0.0034 | 0.0004 | 0.0740 | 0.1400 | 0.0004 |
| IMN MH2 | 0.0110 | 0.0190 | 0.0410 | 0.0015  | 0.0022 | 0.0180 | 68.25 | 0.0270 | 0.0110 | 0.2200 | 0.0055 | 0.0210 | 0.0055 | 0.0240 | 0.0540 | 0.0970 | 0.0015 |
| IMN MH3 | 0.0065 | 0.0081 | 0.0160 | 0.0003  | 0.0011 | 0.0089 | 71.28 | 0.0810 | 0.0850 | 0.1000 | 0.0035 | 0.0780 | 0.0090 | 0.0130 | 0.0310 | 0.0240 | 0.0046 |
| IMN MH4 | .      | 0.0027 | 0.0011 | 0.0045  | 0.0006 | 0.0029 | 69.94 | 0.1300 | 0.0017 | 0.0520 | 0.0022 | 0.3300 | 0.0043 | 0.0170 | 0.0160 | 0.0110 | 0.0035 |
| IMN MH5 | 0.0250 | 0.0140 | 0.0038 | 0.00004 | .      | 0.0012 | 72.87 | 0.1900 | 0.0720 | 0.0072 | 0.0011 | 0.2000 | 0.0180 | 0.0035 | 0.0039 | 0.0021 | 0.0047 |

**CRM CARTRIDGE BRASS SETS**

available in SETs only, as grouped

40 mm Ø x ~28 mm

| Number   | Cd       | Cr      | Cu      | Se      | Zn  | Zr      |
|----------|----------|---------|---------|---------|-----|---------|
| IMN MJ1  | 0.00355  | 0.0120  | 67.77   | 0.00062 | Rem | .       |
| IMN MJ2  | 0.00377  | 0.00440 | 66.40   | 0.00037 | Rem | .       |
| IMN MJ3  | 0.00165  | 0.00158 | 67.39   | 0.00035 | Rem | .       |
| IMN MJ4  | 0.00130  | 0.00374 | 68.06   | 0.0124  | Rem | .       |
| IMN MJ5  | 0.000360 | 0.00065 | (67.82) | 0.00288 | Rem | .       |
| IMN MJJ1 | .        | .       | 67.82   | .       | Rem | 0.0454  |
| IMN MJJ2 | .        | .       | (68.03) | .       | Rem | 0.00017 |
| IMN MJJ3 | .        | .       | 67.87   | .       | Rem | 0.00070 |
| IMN MJJ4 | .        | .       | 67.75   | .       | Rem | 0.0074  |

**CRM FREE CUTTING BRASS SET**

available in SET/5 only

40 mm Ø x 25 mm

| Number  | Al       | As    | Bi     | Cu    | Fe     | Mn     | Ni     | P      | Pb   | Sb     | Si       | Sn    | Zn  |
|---------|----------|-------|--------|-------|--------|--------|--------|--------|------|--------|----------|-------|-----|
| IMN WN1 | 0.33     | 0.035 | 0.023  | 58.44 | 0.23   | 0.57   | 0.29   | 0.031  | 0.51 | 0.099  | 0.16     | 1.00  | Rem |
| IMN WN2 | 0.24     | 0.011 | 0.035  | 60.38 | 0.29   | 0.73   | 0.19   | 0.051  | 1.58 | 0.10   | 0.22     | 0.68  | Rem |
| IMN WN3 | 0.14     | 0.032 | 0.020  | 62.32 | 0.062  | 0.39   | 0.098  | 0.034  | 2.62 | 0.020  | 0.12     | 0.39  | Rem |
| IMN WN4 | 0.047    | 0.021 | 0.0094 | 57.97 | 0.11   | 0.13   | 0.050  | 0.014  | 0.86 | 0.061  | 0.036    | 0.13  | Rem |
| IMN WN5 | (0.0004) | 0.030 | 0.0028 | 64.36 | 0.0085 | 0.0020 | 0.0049 | 0.0051 | 3.78 | 0.0035 | (0.0013) | 0.019 | Rem |

**CRM LEADED BRASS**

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

| # | Number     | Pb    | Sn     | Zn    | Cu     | Al      | As      | Bi      | Co      | Fe    | Mn      | Ni     | P         | Sb      | Si      |
|---|------------|-------|--------|-------|--------|---------|---------|---------|---------|-------|---------|--------|-----------|---------|---------|
| 1 | IARM 250A  | 7.2   | 2.46   | 9.7   | 80.2   | (0.002) | .       | 0.02    | (0.002) | 0.17  | <0.002  | 0.33   | 0.003     | 0.052   | 0.003   |
| 2 | BS 836A-1  | 5.32  | 4.59   | 4.52  | 84.64  | (0.001) | 0.008   | .       | .       | 0.023 | (0.002) | 0.46   | 0.08      | 0.068   | 0.003   |
| 1 | IARM 86C   | 5.03  | 4.37   | 5.38  | 84.6   | 0.002   | <0.005  | (0.01)  | <0.005  | 0.24  | 0.002   | 0.27   | 0.003     | 0.143   | 0.003   |
| 1 | 33X RB1    | 5.02  | 2.137  | 7.95  | 83.25  | 0.0048  | 0.0030  | 0.0029  | 0.0558  | 0.928 | 0.0167  | 0.0539 | 0.020     | 0.432   | 0.063   |
| 1 | 33X RB2    | 3.85  | 3.19   | 9.14  | 82.67  | 0.0362  | 0.0211  | 0.101   | 0.0352  | 0.493 | 0.0028  | 0.255  | 0.0208    | 0.019   | 0.0116  |
| 1 | BAM 375    | 2.90  | 0.2090 | 38.02 | 58.32  | 0.0270  | 0.0231  | 0.00686 | 0.01964 | 0.207 | 0.0222  | 0.1053 | (0.00086) | 0.0122  | 0.0211  |
| 2 | BS 360B    | 2.77  | 0.15   | 35.7  | (61.2) | (0.001) | 0.002   | .       | (0.002) | 0.117 | 0.0094  | 0.040  | (0.002)   | 0.017   | 0.002   |
| 1 | 31X 7835-1 | 2.75  | 0.382  | 34.04 | 62.30  | 0.067   | 0.0161  | 0.0118  | 0.0154  | 0.135 | .       | 0.136  | 0.0221    | 0.0207  | 0.029   |
| 1 | 31X 7835-7 | 2.29  | 0.137  | 7.50  | 88.87  | 0.0084  | .       | 0.048   | 0.0120  | 0.030 | .       | 0.943  | 0.080     | 0.0327  | 0.039   |
| 1 | 31X 7835-2 | 2.08  | 0.211  | 31.86 | 64.03  | 0.172   | 0.0225  | 0.0084  | 0.0279  | 0.094 | .       | 1.35   | 0.0276    | 0.0240  | 0.0217  |
| 1 | 31X 7835-5 | 1.64  | 0.116  | 6.23  | 91.25  | 0.078   | 0.104   | .       | .       | 0.126 | .       | 0.249  | 0.018     | 0.114   | .       |
| 1 | IARM 87B   | 1.58  | 0.78   | 36.1  | 60.9   | 0.20    | 0.007   | 0.003   | 0.007   | 0.29  | 0.006   | 0.095  | 0.008     | 0.014   | 0.004   |
| 1 | 31X 7835-6 | 1.498 | 0.080  | 38.05 | 59.67  | 0.546   | 0.0006  | 0.0026  | 0.0005  | 0.091 | .       | 0.0173 | <0.0005   | 0.0127  | (0.001) |
| 1 | 31X 7835-3 | 1.38  | 0.121  | 37.51 | 60.07  | 0.163   | 0.110   | 0.0116  | 0.0064  | 0.170 | .       | 0.251  | 0.0391    | 0.084   | 0.038   |
| 2 | BS 857B-1  | 1.22  | 1.14   | 34.91 | 61.3   | 0.35    | (0.001) | .       | .       | 0.30  | 0.003   | 0.61   | 0.004     | (0.002) | 0.004   |
| 1 | 31X 7835-4 | 1.03  | 0.046  | 30.09 | 67.11  | 0.561   | 0.206   | .       | .       | 0.020 | .       | 0.492  | 0.125     | 0.188   | .       |

| Number     | Ag      | B        | Be      | C       | Cd      | Cr       | Mg     | O      | S        | Se      | Te      | Units                       |
|------------|---------|----------|---------|---------|---------|----------|--------|--------|----------|---------|---------|-----------------------------|
| IARM 250A  | 0.02    | .        | .       | <0.005  | .       | <0.003   | .      | .      | 0.046    | .       | .       | 31 mm Ø x 2 or 18 mm        |
| BS 836A-1  | 0.023   | .        | .       | .       | .       | .        | .      | .      | 0.042    | .       | .       | cont. cast 38 mm Ø x 12 mm  |
| IARM 86C   | (0.02)  | .        | .       | 0.003   | .       | .        | .      | .      | 0.035    | .       | .       | 31 mm Ø x 2 or 18 mm        |
| 33X RB1    | 0.0174  | .        | .       | .       | .       | 0.0013   | 0.0153 | .      | 0.0044   | .       | .       | chill cast 42 mm Ø x 17 mm  |
| 33X RB2    | 0.0029  | .        | .       | .       | .       | 0.0017   | 0.0008 | .      | 0.078    | .       | .       | chill cast 42 mm Ø x 17 mm  |
| BAM 375    | 0.0166  | .        | .       | .       | 0.00859 | .        | .      | .      | .        | .       | 0.00538 | wrought 40 mm Ø x 30 mm     |
| BS 360B    | 0.006   | .        | (0.001) | (0.002) | .       | (0.0001) | .      | 0.0007 | (0.0005) | .       | (0.002) | 38 mm Ø x 12 mm             |
| 31X 7835-1 | .       | 0.0011   | .       | .       | 0.0018  | .        | .      | .      | .        | (0.003) | .       | chill cast 42 mm Ø x 17 mm  |
| 31X 7835-7 | .       | .        | .       | .       | 0.0047  | .        | .      | .      | 0.0075   | .       | .       | chill cast 40 mm Ø x ~15 mm |
| 31X 7835-2 | .       | (0.0016) | .       | .       | 0.0026  | .        | .      | .      | .        | 0.003   | .       | chill cast 42 mm Ø x 18 mm  |
| 31X 7835-5 | .       | .        | .       | .       | .       | .        | .      | .      | .        | .       | .       | chill cast 42 mm Ø x 18 mm  |
| IARM 87B   | (0.01)  | .        | .       | 0.003   | .       | (0.002)  | .      | .      | (0.001)  | .       | .       | 31 mm Ø x 2 or 18 mm        |
| 31X 7835-6 | .       | 0.0005   | .       | .       | 0.0010  | .        | .      | .      | 0.0017   | 0.0007  | .       | chill cast 42 mm Ø x 18 mm  |
| 31X 7835-3 | .       | (0.0015) | .       | .       | 0.0039  | .        | .      | .      | .        | (0.004) | .       | chill cast 42 mm Ø x 18 mm  |
| BS 857B-1  | (0.002) | .        | .       | .       | .       | .        | .      | .      | .        | .       | .       | cont. cast 38 mm Ø x 12 mm  |
| 31X 7835-4 | .       | .        | .       | .       | .       | .        | .      | .      | .        | .       | .       | chill cast 40 mm Ø x 15 mm  |

**CRM LEADED BRASS SET**

available in SET/6 only

40 mm Ø x 30 mm

| Number  | Al        | Bi     | Cu    | Fe     | Mn       | Ni     | P     | Pb   | Sb       | Si       | Sn       | Zn  |
|---------|-----------|--------|-------|--------|----------|--------|-------|------|----------|----------|----------|-----|
| IMN WG1 | 0.096     | 0.0013 | 60.99 | 0.0084 | 0.16     | 0.20   | 0.029 | 0.71 | (0.062)  | (0.0046) | 0.29     | Rem |
| IMN WG2 | (0.00095) | 0.016  | 56.99 | 0.42   | (0.0024) | 0.0051 | .     | 2.66 | (0.0024) | (0.021)  | (0.0025) | Rem |
| IMN WG3 | 0.041     | 0.0057 | 58.20 | 0.31   | 0.037    | 0.029  | 0.013 | 2.29 | 0.018    | (0.014)  | 0.091    | Rem |
| IMN WG4 | 0.073     | 0.014  | 60.05 | 0.10   | 0.12     | 0.16   | 0.020 | 1.41 | (0.042)  | (0.016)  | 0.21     | Rem |
| IMN WG5 | 0.058     | 0.0094 | 59.32 | 0.18   | 0.074    | 0.078  | 0.016 | 1.66 | 0.034    | (0.022)  | 0.14     | Rem |
| IMN WG6 | 0.020     | 0.023  | 60.67 | 0.18   | 0.21     | 0.29   | 0.044 | 3.70 | (0.0078) | (0.019)  | 0.40     | Rem |

**MANGANESE BRASS**

# = class, where 1 = CRM and 2 = RM chill cast analysis listed in mass % except \* which is mg/kg CTIF: 60 mm Ø x 5 mm  
31X: 40-42 mm Ø x 15-18 mm

| # | Number      | Mn    | Zn    | Cu    | Al    | Fe    | Ni     | Pb     | Si    | Sn    | As     | Co     | P      | Sb      | Ag* | Bi* | Cd* | Cr* |
|---|-------------|-------|-------|-------|-------|-------|--------|--------|-------|-------|--------|--------|--------|---------|-----|-----|-----|-----|
| 1 | 31X MNB12   | 17.88 | 22.12 | 56.16 | 0.749 | 0.335 | 0.491  | 1.99   | 0.013 | 0.231 | 0.0022 | 0.0012 | 0.019  | 0.0056  | .   | 21  | 12  | 38  |
| 1 | 31X MNB11   | 11.99 | 22.85 | 57.36 | 1.19  | 0.337 | 4.46   | 1.610  | 0.071 | 0.161 | 0.0010 | 0.0046 | 0.0186 | 0.0051  | .   | 21  | 9   | 46  |
| 2 | CTIF UZHR 9 | 5.90  | 27.70 | 60.20 | 3.85  | 2.20  | <0.005 | <0.005 | 0.01  | .     | .      | .      | .      | .       | .   | .   | .   | .   |
| 1 | 31X MNB4    | 4.14  | 27.12 | 58.95 | 2.16  | 1.73  | 3.23   | 0.640  | 0.90  | 1.080 | 0.0068 | 0.057  | 0.0252 | (0.006) | 171 | .   | .   | .   |
| 1 | 31X MNB3    | 2.77  | 24.10 | 68.20 | 0.98  | 1.306 | 0.208  | 0.458  | 1.36  | 0.549 | 0.0052 | 0.048  | 0.0170 | 0.0054  | 103 | .   | .   | .   |
| 1 | 31X MNB2    | 2.23  | 32.19 | 63.02 | 0.268 | 0.66  | 0.118  | 1.02   | 0.233 | 0.319 | .      | .      | .      | .       | .   | .   | .   | .   |
| 1 | 31X MNB1    | 0.188 | 29.37 | 67.77 | 0.599 | 0.268 | 0.053  | 1.44   | 0.128 | 0.105 | .      | .      | .      | .       | .   | .   | .   | .   |
| 1 | 31X MNB5    | 0.175 | 37.11 | 55.14 | 3.24  | 0.898 | 1.32   | 0.157  | 0.528 | 1.228 | 0.0021 | 0.066  | 0.0399 | (0.006) | 195 | .   | .   | 116 |

**CRM MANGANESE BRASS DISC AND ROD SETS**

available in SETS ONLY, as grouped IMN MA: 10 mm Ø x 100 mm IMN WF: 44 mm Ø x 30 mm

| Number  | Al   | As     | Bi      | Cu    | Fe    | Mn   | Ni    | P        | Pb    | Sb      | Si    | Sn    | Zn  |
|---------|------|--------|---------|-------|-------|------|-------|----------|-------|---------|-------|-------|-----|
| IMN MA1 | 1.51 | 0.085  | 0.0020  | 55.50 | 0.073 | 3.37 | 0.39  | 0.10     | 0.16  | 0.0061  | 0.071 | 1.04  | Rem |
| IMN MA2 | 3.35 | 0.0081 | 0.0029  | 60.88 | 1.27  | 1.30 | 0.011 | 0.015    | 0.020 | 0.0019  | 0.042 | 0.41  | Rem |
| IMN MA3 | .    | 0.029  | 0.028   | 57.04 | 0.55  | 0.78 | 0.13  | 0.040    | 0.049 | 0.14    | 0.50  | 0.74  | Rem |
| IMN MA4 | 0.33 | .      | .       | 57.40 | 0.20  | 2.75 | 0.69  | 0.15     | .     | 0.20    | 0.27  | 0.015 | Rem |
| IMN MA5 | 1.04 | 0.11   | 0.020   | 58.51 | 0.70  | 1.97 | 1.01  | 0.062    | 1.20  | 0.072   | 0.65  | 0.046 | Rem |
| IMN MA6 | 2.15 | 0.013  | 0.0072  | 60.45 | 1.72  | 0.90 | 0.056 | 0.019    | 0.60  | 0.016   | 0.013 | 0.13  | Rem |
| IMN WF1 | .    | .      | 0.00059 | 56.47 | 0.097 | 2.16 | 0.010 | (0.0012) | 0.010 | 0.00058 | .     | 0.012 | Rem |
| IMN WF2 | .    | .      | 0.00091 | 57.66 | 0.21  | 1.79 | 0.040 | (0.0032) | 0.040 | 0.0018  | .     | 0.045 | Rem |
| IMN WF3 | .    | .      | 0.0015  | 58.66 | 0.29  | 1.36 | 0.10  | 0.0075   | 0.070 | 0.0036  | .     | 0.072 | Rem |
| IMN WF4 | .    | .      | 0.0021  | 60.50 | 0.42  | 0.57 | 0.15  | 0.0095   | 0.10  | 0.0045  | .     | 0.11  | Rem |
| IMN WF5 | .    | .      | 0.0030  | 58.77 | 0.68  | 0.52 | 0.18  | 0.014    | 0.14  | 0.0061  | .     | 0.16  | Rem |
| IMN WF6 | .    | .      | 0.00095 | 59.78 | 0.05  | 0.98 | 0.074 | 0.0020   | 0.026 | .       | .     | 0.028 | Rem |

**NAVAL BRASS**

# = class, where 1 = CRM and 2 = RM 31X NB: 42 mm Ø x 17-18 mm BS: 38 mm Ø x 12 mm CURM: 50 mm Ø x 10-12 mm IARM 74: 31 mm Ø x 2 or 18 mm

| # | Number     | Sn    | Pb     | Zn    | Cu    | Al       | As      | Bi      | Fe     | Mn      | Ni     | P       | S        | Sb      | Si      | Ag      | B      | Co       |
|---|------------|-------|--------|-------|-------|----------|---------|---------|--------|---------|--------|---------|----------|---------|---------|---------|--------|----------|
| 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  | .       | .      | .        |
| 1 | 31X NB 4   | 2.01  | 0.067  | 32.57 | 63.71 | 0.178    | 0.062   | 0.104   | 0.235  | 0.0053  | 0.230  | 0.230   | (0.0032) | 0.450   | 0.203   | .       | 0.0009 | .        |
| 1 | 31X NB 3   | 1.67  | 0.197  | 24.64 | 72.45 | 0.094    | 0.074   | 0.093   | 0.113  | 0.0166  | 0.0299 | 0.150   | (0.006)  | 0.265   | 0.145   | .       | 0.0026 | .        |
| 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   | .       | .      | .        |
| 1 | 31X NB 2   | 1.06  | 0.293  | 28.82 | 68.93 | 0.085    | 0.105   | 0.052   | 0.095  | 0.116   | 0.065  | 0.091   | <0.002   | 0.115   | 0.096   | .       | .      | .        |
| 1 | IARM 74B   | 0.70  | 0.017  | 38.9  | 60.4  | 0.003    | <0.01   | .       | 0.011  | <0.01   | 0.006  | (0.008) | (0.003)  | 0.003   | 0.003   | .       | .      | .        |
| 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) | (0.002) | .      | .        |
| 2 | BS 482A    | 0.65  | 0.50   | 38.8  | 60.0  | (0.003)  | <0.002  | 0.020   | <0.002 | (0.007) | <0.003 | <0.002  | 0.0012   | (0.002) | .       | .       | .      | .        |
| 2 | BS 464A    | 0.62  | 0.056  | 38.73 | 60.6  | (0.001)  | <0.002  | 0.013   | 0.0002 | 0.004   | 0.012  | 0.001   | (0.001)  | <0.01   | .       | .       | .      | .        |
| 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    | .       | .      | .        |
| 2 | BS 464     | 0.61  | 0.034  | 39.0  | Rem.  | <0.005   | <0.005  | 0.08    | <0.005 | 0.02    | 0.009  | (0.001) | 0.007    | <0.005  | .       | .       | .      | .        |
| 1 | IARM 75B   | 0.59  | 0.63   | 38.0  | 60.63 | (0.005)  | (0.004) | (0.001) | 0.06   | (0.003) | 0.02   | 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 | 31X NB 1   | 0.535 | 0.504  | 29.73 | 68.35 | (0.0004) | 0.161   | 0.0065  | 0.037  | 0.051   | 0.520  | 0.0223  | 0.0024   | 0.0057  | 0.004   | .       | .      | (0.0006) |
| 1 | IARM 74A   | 0.50  | 0.02   | 38.14 | .     | <0.01    | .       | .       | 0.01   | <0.01   | 0.01   | 0.006   | 0.001    | <0.01   | .       | .       | .      | .        |

**CRM NAVAL BRASS SET**

available in SET/5 only 40 mm Ø x 25 mm

| Number  | Al     | Bi     | Cu    | Fe     | Mn     | Ni     | P      | Pb     | Sb     | Si     | Sn   | Zn  |
|---------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|------|-----|
| IMN WK1 | 0.11   | 0.014  | 59.97 | 0.28   | 0.13   | 0.28   | 0.030  | 0.17   | 0.024  | 0.30   | 0.11 | Rem |
| IMN WK2 | 0.080  | 0.011  | 60.54 | 0.16   | 0.088  | 0.21   | 0.017  | 0.33   | 0.018  | 0.29   | 1.34 | Rem |
| IMN WK3 | 0.045  | 0.0088 | 62.09 | 0.066  | 0.046  | 0.13   | 0.017  | 0.11   | 0.012  | 0.16   | 0.49 | Rem |
| IMN WK4 | 0.013  | 0.0052 | 63.28 | 0.085  | 0.020  | 0.070  | 0.010  | 0.050  | 0.0056 | 0.082  | 1.04 | Rem |
| IMN WK5 | 0.0042 | 0.0011 | 64.92 | 0.0092 | 0.0056 | 0.0055 | 0.0056 | 0.0062 | 0.0027 | 0.0064 | 0.47 | Rem |

**CRM NICKEL AND PHOSPHOR BRASS**

analysis listed in mass %

| Number  | Ni    | P    | Cu    | Zn    | Al    | Cd     | Cr    | Fe     | Mn     | Pb      | Sn      | Units            |
|---------|-------|------|-------|-------|-------|--------|-------|--------|--------|---------|---------|------------------|
| 31X B29 | 4.11  | 3.33 | 67.08 | 24.75 | 0.219 | 0.0144 | 0.062 | 0.144  | 0.0625 | 0.146   | 0.0328  | 40 mm Ø x ~15 mm |
| BAM 387 | 5.020 | .    | 75.18 | 19.57 | .     | .      | .     | 0.0617 | 0.0796 | 0.00108 | 0.00301 | 40 mm Ø x 30 mm  |

**CRM NICKEL BRASS SETS**

available in SETS ONLY, as grouped analysis listed in mass % except \* which is mg/kg IMN WH, WM: 40 mm Ø x 25 mm IMN WP: 40 mm Ø x 30 mm

| Number  | Ni    | Zn    | Cu    | Al     | As      | Bi      | C*   | Cd      | Co     | Fe     | Mg      | Mn     | P      | Pb     | S        | Sb      | Si      | Sn     |
|---------|-------|-------|-------|--------|---------|---------|------|---------|--------|--------|---------|--------|--------|--------|----------|---------|---------|--------|
| IMN WP1 | 5.45  | Rem   | 67.15 | 0.020  | 0.0012  | 0.00080 | .    | 0.0019  | .      | 0.020  | .       | 0.0069 | 0.020  | 0.52   | .        | 0.0010  | (0.01)  | 0.0042 |
| IMN WP2 | 7.79  | Rem   | 65.08 | 0.0090 | 0.0049  | 0.0052  | .    | 0.0052  | .      | 0.12   | .       | 0.040  | 0.0067 | 0.82   | .        | 0.0052  | (0.009) | 0.11   |
| IMN WP3 | 10.24 | Rem   | 63.05 | 0.0020 | 0.011   | 0.012   | .    | 0.011   | .      | 0.20   | .       | 0.15   | 0.0079 | 1.52   | .        | 0.012   | (0.03)  | 0.18   |
| IMN WP4 | 12.38 | Rem   | 60.91 | 0.039  | 0.015   | 0.016   | .    | 0.016   | .      | 0.31   | .       | 0.35   | 0.011  | (2)    | .        | 0.015   | (0.04)  | 0.26   |
| IMN WP5 | 15.63 | Rem   | 58.70 | 0.049  | 0.021   | 0.021   | .    | 0.026   | .      | 0.026  | .       | 0.49   | 0.0027 | (1.8)  | .        | 0.028   | (0.03)  | 0.33   |
| IMN WP6 | 4.27  | Rem   | 69.37 | .      | .       | .       | .    | .       | .      | .      | .       | .      | .      | 2.41   | .        | .       | .       | .      |
| IMN WM1 | 5.03  | 25.35 | 69.06 | 0.083  | 0.00026 | 0.011   | 44   | 0.0046  | 0.021  | 0.011  | 0.0054  | 0.38   | 0.0018 | 0.018  | 0.017    | 0.00098 | 0.0026  | 0.0036 |
| IMN WM2 | 6.66  | 24.18 | 68.41 | 0.050  | 0.0030  | 0.014   | 52   | 0.022   | 0.017  | 0.022  | 0.019   | 0.53   | 0.023  | 0.011  | 0.0058   | 0.013   | 0.0067  | 0.11   |
| IMN WM3 | 6.09  | 23.57 | 69.85 | 0.033  | 0.0053  | 0.0055  | 58   | 0.0024  | 0.011  | 0.077  | 0.0042  | 0.19   | 0.0052 | 0.0073 | 0.0073   | 0.0043  | 0.037   | 0.098  |
| IMN WM4 | 5.36  | 23.19 | 71.10 | 0.0080 | 0.0072  | 0.0029  | 72   | 0.0021  | 0.0099 | 0.13   | 0.0027  | 0.011  | 0.0057 | 0.0044 | 0.0058   | 0.0059  | 0.071   | 0.075  |
| IMN WM5 | 4.68  | 25.90 | 68.99 | 0.0012 | 0.0089  | 0.0007  | 90   | 0.00077 | 0.0021 | 0.22   | 0.00056 | 0.0024 | 0.016  | 0.0020 | 0.0030   | 0.0068  | 0.094   | 0.035  |
| IMN WH1 | 5.70  | Rem   | 68.16 | .      | .       | .       | (46) | .       | 0.0061 | 0.0052 | .       | 0.56   | 0.0029 | .      | (0.0055) | .       | 0.010   | .      |
| IMN WH2 | 6.34  | Rem   | 69.14 | .      | .       | .       | (58) | .       | 0.017  | 0.038  | .       | 0.36   | 0.0072 | .      | (0.0071) | .       | 0.038   | .      |
| IMN WH3 | 3.44  | Rem   | 70.18 | .      | .       | .       | (70) | .       | 0.031  | 0.11   | .       | 0.25   | 0.013  | .      | (0.011)  | .       | 0.072   | .      |
| IMN WH4 | 4.14  | Rem   | 71.15 | .      | .       | .       | (75) | .       | 0.048  | 0.13   | .       | 0.11   | 0.015  | .      | (0.017)  | .       | 0.12    | .      |
| IMN WH5 | 4.89  | Rem   | 72.28 | .      | .       | .       | (87) | .       | 0.028  | 0.22   | .       | 0.011  | 0.017  | .      | (0.021)  | .       | 0.17    | .      |

**SILICON BRASS**

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

| Number       | Si   | Zn    | Cu    | Al     | Pb      | Fe    | Mn      | Ni      | P       | Sb     | Sn     |
|--------------|------|-------|-------|--------|---------|-------|---------|---------|---------|--------|--------|
| 1 31X WSB5   | 6.07 | 0.343 | 90.06 | 0.218  | 0.100   | 0.79  | 0.496   | 0.492   | 0.080   | 0.124  | 1.05   |
| 2 CTIF LS2   | 4.91 | 11.60 | 79.60 | 0.156  | 0.886   | 1.022 | 0.220   | 1.110   | 0.064   | 0.0103 | 0.338  |
| 1 31X WSB1   | 4.58 | 6.14  | 84.61 | 0.957  | 0.435   | 0.557 | 0.964   | 0.229   | 0.044   | 0.048  | 0.525  |
| 1 31X WSB4   | 4.40 | 5.61  | 86.09 | 0.290  | 0.204   | 0.592 | 1.45    | 0.228   | 0.042   | 0.0335 | 0.802  |
| 2 CTIF LS1   | 4.35 | 16.3  | 77.7  | (0.02) | 0.213   | 0.448 | 0.039   | 0.55    | 0.128   | .      | 0.243  |
| 1 31X WSB7   | 4.25 | 7.58  | 72.74 | 3.87   | 0.025   | 1.95  | 3.39    | 3.03    | 0.188   | 0.636  | 1.93   |
| 1 31X WSB2   | 3.92 | 13.94 | 79.22 | 0.760  | 0.621   | 0.393 | 0.330   | 0.154   | 0.021   | 0.0202 | 0.402  |
| 1 37X 226    | 3.55 | 2.82  | 91.58 | 0.0020 | (0.001) | 1.51  | 0.577   | 0.0024  | 0.0022  | .      | 0.0030 |
| 1 31X WSB3   | 3.44 | 11.96 | 81.14 | 0.509  | 0.397   | 0.22  | 1.06    | 0.371   | 0.033   | 0.028  | 0.607  |
| 2 CTIF LS3   | 3.3  | 19    | 76    | 0.43   | 0.58    | 0.10  | 0.15    | 0.11    | 0.011   | 0.107  | 0.15   |
| 1 IARM 151B  | 3.11 | 12.94 | 84.0  | 0.002  | 0.013   | 0.024 | 0.002   | 0.011   | 0.003   | .      | 0.009  |
| 1 IARM 313 * | 3.09 | 21.4  | 75.4  | .      | 0.04    | 0.011 | (0.001) | (0.004) | 0.09    | 0.016  | 0.006  |
| 1 31X WSB6   | 2.48 | 0.881 | 94.74 | 0.059  | 0.95    | 0.032 | 0.248   | 0.117   | (0.020) | 0.007  | 0.056  |

| Number     | As     | Bi     | C     | Cd     | Co     | Cr      | Mg      | S        | Zr       | Units                                       |
|------------|--------|--------|-------|--------|--------|---------|---------|----------|----------|---|
| 31X WSB5   | 0.0284 | 0.030  | .     | 0.0047 | 0.057  | 0.0087  | 0.0012  | 0.0081   | .        | 43 mm Ø x 20 mm                             |
| CTIF LS2   | .      | .      | .     | .      | .      | .       | .       | .        | .        | 60 mm Ø x 5 mm                              |
| 31X WSB1   | 0.063  | 0.0387 | .     | 0.0115 | 0.210  | 0.184   | 0.0258  | .        | .        | 42 mm Ø x 17 mm                             |
| 31X WSB4   | 0.0286 | 0.0318 | .     | 0.0012 | 0.096  | 0.103   | 0.006   | (0.002)  | .        | 43 mm Ø x 20 mm                             |
| CTIF LS1   | .      | .      | .     | .      | .      | .       | .       | .        | .        | 60 mm Ø x 5 mm                              |
| 31X WSB7   | 0.103  | 0.190  | .     | 0.0077 | 0.0118 | 0.0145  | .       | .        | .        | 42 mm Ø x ~17 mm                            |
| 31X WSB2   | 0.077  | 0.0102 | .     | 0.0015 | 0.174  | 0.096   | 0.0098  | (0.0011) | .        | 43 mm Ø x 20 mm                             |
| 37X 226    | .      | .      | 0.006 | .      | .      | 0.0023  | .       | 0.0005   | (0.0002) | 57 mm Ø x 17 mm                             |
| 31X WSB3   | 0.053  | 0.0195 | .     | 0.0028 | 0.129  | 0.0480  | (0.004) | (0.0024) | .        | 43 mm Ø x 20 mm                             |
| CTIF LS3   | .      | .      | .     | .      | .      | .       | .       | .        | .        | 60 mm Ø x 5 mm                              |
| IARM 151B  | .      | .      | .     | .      | .      | (0.003) | .       | <0.001   | .        | 31 mm Ø x 2 or 18 mm                        |
| IARM 313 * | .      | .      | .     | .      | .      | (0.001) | .       | (0.001)  | .        | 31 mm Ø x 2 or 18 mm * Provisional Analysis |
| 31X WSB6   | 0.0051 | 0.0056 | .     | 0.0071 | 0.247  | 0.058   | (0.001) | (0.002)  | .        | 43 mm Ø x 20 mm                             |

**CRM SILICON BRASS SET**

available in SET/7 only OES only, small holes bad for XRF

40 mm Ø x 28 mm

| Number  | Al     | As     | Bi     | Cu    | Fe    | Mn    | Ni     | P       | Pb     | Sb     | Si   | Sn     | Zn  |
|---------|--------|--------|--------|-------|-------|-------|--------|---------|--------|--------|------|--------|-----|
| IMN WB1 | 0.062  | 0.013  | 0.0076 | 78.41 | 0.049 | 0.69  | 0.032  | 0.00098 | 0.20   | 0.025  | 4.80 | 0.13   | Rem |
| IMN WB2 | 0.072  | 0.043  | 0.0094 | 78.97 | 0.13  | 0.64  | 0.096  | 0.0084  | 0.42   | 0.055  | 3.86 | 0.0041 | Rem |
| IMN WB3 | 0.035  | 0.026  | 0.0029 | 79.45 | 0.28  | 0.44  | 0.025  | 0.023   | 0.23   | 0.010  | 3.55 | 0.22   | Rem |
| IMN WB4 | 0.083  | 0.020  | 0.0056 | 80.48 | 0.35  | 0.14  | 0.051  | 0.060   | 0.099  | 0.031  | 3.06 | 0.018  | Rem |
| IMN WB5 | 0.018  | 0.0075 | 0.0023 | 80.88 | 0.46  | 0.050 | 0.019  | 0.083   | 0.012  | 0.0038 | 2.79 | 0.27   | Rem |
| IMN WB6 | 0.0075 | 0.0043 | 0.0011 | 81.11 | 0.66  | 0.011 | 0.0068 | 0.12    | 0.0037 | 0.0025 | 1.99 | 0.049  | Rem |
| IMN WB7 | 0.041  | 0.052  | 0.0084 | 77.69 | 0.033 | 0.88  | 0.068  | 0.017   | 0.098  | 0.031  | 3.95 | 0.39   | Rem |

**CRM HIGH TENSILE BRASS**

| Number   | Cu    | Zn    | Al     | Fe     | Mn   | Si    | As     | C     | Ni     | P      | Pb    | S        | Sb       | Sn     | Units           |
|----------|-------|-------|--------|--------|------|-------|--------|-------|--------|--------|-------|----------|----------|--------|-----------------|
| 31X HT31 | 66.67 | 18.19 | 6.70   | 2.90   | 5.27 | 0.041 | 0.0006 | 0.006 | 0.196  | 0.0032 | 0.020 | (0.0003) | (0.0011) | 0.0149 | 50 mm Ø x 18 mm |
| 31X HT37 | 60.33 | 34.69 | 0.0004 | 0.0344 | 2.88 | 1.38  | 0.0011 | 0.003 | 0.0105 | 0.003  | 0.623 | <0.0005  | 0.0007   | 0.0116 | 40 mm Ø x 18 mm |
| 31X HT38 | 58.77 | 36.66 | 0.960  | 0.0530 | 2.60 | 0.869 | 0.0008 | 0.003 | 0.0242 | 0.0024 | 0.051 | (0.001)  | (0.0006) | 0.039  | 50 mm Ø x 18 mm |

**RM BRONZE MUSHROOMS**

chill cast typical analysis 60 mm Ø x 5 mm

| Number     | Sn    | Zn   | Cu    | Al      | As     | Fe      | Mn       | Ni      | P       | Pb     | S     | Sb       | Si      |
|------------|-------|------|-------|---------|--------|---------|----------|---------|---------|--------|-------|----------|---------|
| CTIF B 1   | 15.15 | 0.92 | 82.90 | 0.072   | .      | 0.088   | .        | 0.063   | 0.037   | 0.202  | 0.030 | 0.444    | 0.055   |
| CTIF B 2   | 13.55 | 0.11 | 85.90 | (0.002) | .      | 0.041   | .        | (0.003) | 0.17    | 0.0206 | 0.048 | (<0.002) | 0.17    |
| CTIF B 3   | 12.8  | 2.2  | 80.2  | 0.1     | .      | 0.2     | 0.20     | 1.5     | 0.45    | 1.6    | 0.04  | 0.2      | 0.07    |
| CTIF B 4   | 11.10 | 1.34 | 83.75 | .       | .      | 0.021   | .        | 0.57    | 0.52    | 2.53   | 0.019 | 0.10     | 0.015   |
| CTIF B 14  | 10.75 | 0.15 | 87.00 | <0.01   | 0.04   | 0.11    | 0.02     | 0.30    | 0.64    | 0.50   | 0.02  | 0.08     | 0.075   |
| CTIF B 13  | 10.05 | 1.09 | 86.35 | 0.016   | 0.065  | 0.250   | 0.046    | 0.50    | 0.210   | 0.99   | 0.070 | 0.243    | 0.085   |
| CTIF B 5   | 9.90  | 0.42 | 85.95 | 0.039   | .      | 0.18    | 0.082    | 2.28    | 0.041   | 0.48   | 0.067 | 0.47     | 0.049   |
| CTIF B 30  | 9.80  | 1.05 | 77.45 | 0.063   | .      | 0.115   | 0.150    | 0.97    | 0.063   | 10.0   | 0.048 | 0.22     | 0.066   |
| CTIF B 12  | 9.57  | 0.61 | 85.65 | 0.120   | 0.111  | 0.162   | 0.235    | 2.63    | 0.525   | 0.201  | 0.013 | 0.117    | 0.050   |
| CTIF B 11  | 8.04  | 2.10 | 84.75 | .       | .      | 0.170   | .        | 2.0     | 0.057   | 1.93   | 0.09  | 0.70     | 0.14    |
| CTIF B 31  | 7.65  | 0.79 | 78.65 | (0.031) | .      | (0.015) | .        | 0.489   | .       | 11.79  | 0.028 | 0.475    | (0.047) |
| CTIF B 23  | 7.18  | 1.46 | 83.45 | 0.020   | .      | (0.040) | .        | 0.086   | 0.070   | 7.20   | 0.019 | 0.384    | 0.025   |
| CTIF B 10  | 6.95  | 2.75 | 83.65 | 0.205   | 0.0075 | 0.165   | (0.0045) | 1.01    | 0.014   | 4.07   | 0.050 | 1.14     | .       |
| CTIF B 30  | 6.35  | 3.77 | 83.35 | 0.040   | .      | 0.165   | .        | 0.51    | 0.072   | 5.10   | 0.115 | 0.520    | 0.055   |
| CTIF B 22  | 5.92  | 1.17 | 74.80 | 0.075   | 0.0056 | 0.11    | .        | 1.49    | 0.039   | 16.10  | 0.027 | 0.13     | 0.070   |
| CTIF B 21  | 5.13  | 6.17 | 83.05 | 0.13    | .      | 0.285   | .        | 1.21    | (0.004) | 3.79   | 0.047 | 0.18     | .       |
| CTIF B 22  | 3.5   | 4.0  | 83.0  | .       | .      | <0.10   | .        | 2.5     | .       | 6.0    | 0.03  | 0.05     | <0.1    |
| CTIF UN 3S | 0.215 | 1.62 | 92.65 | 0.11    | .      | 0.30    | 0.073    | 3.45    | .       | 0.20   | .     | .        | 1.24    |
| Number     | Sn    | Zn   | Cu    | Al      | As     | Fe      | Mn       | Ni      | P       | Pb     | S     | Sb       | Si      |

**CRM BRONZE SETS**

AVAILABLE IN SETS ONLY, as grouped

IMN: 40 mm Ø x ~30 mm

VS: 40 mm x 40 mm x 25 mm

| Number     | Al      | Be   | Bi      | Cu     | Fe      | Ni      | P       | Pb      | S      | Sb      | Se        | Si    | Sn      | Zn      |
|------------|---------|------|---------|--------|---------|---------|---------|---------|--------|---------|-----------|-------|---------|---------|
| IMN BM1    | 0.596   | .    | 0.538   | Rem    | 1.08    | 0.518   | 0.00443 | 0.0241  | 0.0630 | 0.00431 | 0.0125    | 1.40  | 0.00551 | 0.351   |
| IMN BM2    | 0.188   | .    | 0.201   | Rem    | 0.507   | 1.27    | 0.00973 | 0.0163  | 0.191  | 0.549   | 0.0956    | 0.985 | 0.0162  | 0.0565  |
| IMN BM3    | 0.109   | .    | 0.104   | Rem    | 0.00679 | 2.18    | 0.0941  | 0.00784 | 0.480  | 0.110   | 0.454     | 0.565 | 0.104   | 0.0198  |
| IMN BM4    | 0.00840 | .    | 0.0110  | Rem    | 0.102   | 2.93    | 0.213   | 0.00231 | 0.0201 | 0.200   | 0.200     | 0.398 | 0.196   | 0.119   |
| IMN BM5    | 0.00276 | .    | 0.00658 | Rem    | 0.0107  | 3.67    | 0.578   | 0.00134 | 0.0104 | 0.0152  | (0.00554) | 0.105 | 0.539   | 0.281   |
| VS 3152-85 | (0.19)  | 1.71 | .       | (97.5) | 0.036   | 0.092   | .       | 0.0028  | .      | .       | .         | 0.086 | 0.18    | (0.035) |
| VS 3153-85 | (0.11)  | 1.92 | .       | (97.2) | 0.084   | 0.19    | .       | 0.0045  | .      | .       | .         | 0.14  | 0.104   | 0.049   |
| VS 3154-85 | (0.064) | 2.44 | .       | (96.7) | 0.28    | 0.23    | .       | 0.0023  | .      | .       | .         | 0.12  | 0.033   | 0.041   |
| VS 3155-85 | (0.027) | 2.64 | .       | (96.2) | 0.079   | 0.35    | .       | 0.0060  | .      | .       | .         | 0.23  | 0.083   | 0.13    |
| VS 3156-85 | (0.054) | 3.2  | .       | (95.4) | 0.14    | (0.081) | .       | 0.011   | .      | .       | .         | 0.30  | 0.061   | 0.23    |

**CRM BRONZE**

| Number    | Cu   | Fe    | Ni    | P     | Pb    | Sn   | Zn   | method  | Units                 |
|-----------|------|-------|-------|-------|-------|------|------|---------|-----------------------|
| SRM 1115  | 87.9 | 0.13  | 0.074 | 0.005 | 0.013 | 0.10 | 11.7 | wrought | 31 mm Ø x 19 mm       |
| SRM C1115 | 87.9 | 0.13  | 0.074 | 0.005 | 0.013 | 0.10 | 11.7 | cast    | 31 mm x 31 mm x 19 mm |
| SRM 1116  | 90.3 | 0.046 | 0.048 | 0.008 | 0.042 | 0.04 | 9.4  | wrought | 31 mm Ø x 19 mm       |
| SRM 1117  | 93.0 | 0.014 | 0.020 | 0.002 | 0.069 | 0.02 | 6.8  | wrought | 31 mm Ø x 19 mm       |
| SRM C1117 | 93.0 | 0.014 | 0.020 | 0.002 | 0.069 | 0.02 | 6.8  | cast    | 31 mm x 31 mm x 19 mm |

ALUMINUM BRONZE

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

| # | Number     | Al    | Cu     | As       | Cr      | Fe    | Mg     | Mn     | Ni    | P        | Pb       | Si    | Sn      | Zn     |
|---|------------|-------|--------|----------|---------|-------|--------|--------|-------|----------|----------|-------|---------|--------|
| 1 | 32X ALB 9  | 13.86 | 79.24  | 0.0275   | (0.064) | 3.13  | 0.205  | 0.090  | 1.21  | (0.054)  | 0.377    | 0.282 | 0.061   | 1.17   |
| 1 | 32X ALB 10 | 11.25 | 74.28  | 0.017    | 0.0103  | 4.23  | 0.0029 | 1.73   | 7.58  | 0.040    | 0.107    | 0.169 | 0.202   | 0.315  |
| 1 | 32X ALB 3  | 11.20 | 80.31  | 0.0114   | 0.0060  | 3.97  | 0.0117 | 0.297  | 3.47  | 0.022    | 0.105    | 0.173 | 0.110   | 0.311  |
| 1 | IARM 94B   | 10.8  | 80.6   | <0.01    | 0.017   | 3.99  | .      | 0.071  | 4.31  | 0.011    | 0.004    | 0.028 | (0.003) | 0.14   |
| 2 | C52.53     | 10.7  | Rem    | .        | 0.19    | 5.5   | 0.07   | 0.38   | 4.1   | .        | 0.04     | 0.10  | 0.07    | 0.11   |
| 2 | CURM 52.52 | 10.69 | 79.26  | .        | 0.004   | 6.02  | 0.007  | 0.145  | 3.56  | .        | 0.074    | 0.011 | 0.044   | 0.094  |
| 2 | BS 955C    | 10.68 | 80.6   | (<0.002) | .       | 4.04  | .      | 0.06   | 4.31  | 0.012    | 0.003    | 0.025 | 0.003   | 0.15   |
| 1 | IARM 204A  | 10.55 | 83.3   | (<0.01)  | 0.008   | 3.87  | .      | 0.052  | 1.95  | 0.007    | 0.004    | 0.034 | 0.005   | 0.22   |
| 2 | BS 955 MOD | 10.37 | (74.9) | (<0.003) | .       | 5.46  | .      | 1.61   | 6.28  | (<0.002) | 0.035    | 0.054 | 0.096   | 1.05   |
| 1 | IARM 93B   | 10.33 | 85.4   | <0.01    | (0.007) | 3.87  | .      | 0.024  | 0.088 | (0.002)  | 0.012    | 0.024 | 0.009   | 0.17   |
| 2 | BS 955B    | 10.30 | 81.5   | (0.002)  | .       | 3.79  | .      | 0.12   | 4.11  | 0.017    | 0.051    | 0.05  | 0.024   | 0.052  |
| 2 | BS 954C    | 10.21 | 83.9   | (0.006)  | .       | 3.9   | .      | 0.29   | 1.38  | 0.011    | 0.050    | 0.07  | 0.08    | 0.09   |
| 2 | BS 954B    | 10.20 | 83.9   | (0.005)  | .       | 3.90  | .      | 0.27   | 1.38  | 0.012    | 0.047    | 0.07  | 0.07    | 0.10   |
| 1 | IARM 80B   | 10.19 | 81.2   | (0.004)  | 0.012   | 3.31  | .      | 0.54   | 4.69  | 0.009    | 0.009    | 0.030 | 0.018   | 0.078  |
| 2 | BS 954A    | 10.17 | 85.64  | (0.006)  | .       | 3.50  | .      | 0.10   | 0.20  | 0.012    | 0.016    | 0.029 | 0.033   | 0.30   |
| 2 | BS 630A    | 10.05 | 81.0   | (0.002)  | .       | 3.73  | .      | 0.11   | 4.81  | <0.01    | 0.0069   | 0.037 | 0.019   | 0.17   |
| 2 | C52.51     | 10.0  | Rem    | .        | <0.01   | 4.3   | <0.01  | <0.01  | 5.1   | .        | <0.01    | <0.01 | <0.01   | 0.02   |
| 1 | 32X CA 1   | 9.79  | 80.03  | .        | 0.0049  | 4.63  | 0.0003 | 0.296  | 4.94  | 0.003    | 0.007    | 0.090 | 0.0180  | 0.162  |
| 1 | 32X ALB 2  | 9.60  | 80.70  | 0.0066   | 0.0031  | 4.05  | 0.0035 | 0.056  | 4.53  | 0.048    | 0.266    | 0.295 | 0.103   | 0.247  |
| 1 | 32X CA 7   | 9.37  | 88.06  | .        | 0.0028  | 2.09  | 0.0004 | 0.151  | 0.234 | .        | (0.004)  | 0.017 | 0.0172  | 0.006  |
| 2 | C52.55     | 9.3   | Rem    | .        | 0.05    | 4.9   | 0.13   | 1.1    | 4.6   | .        | 0.14     | 0.03  | 0.03    | 0.10   |
| 2 | BS CC954   | 9.28  | 84.0   | 0.003    | .       | 3.61  | .      | 0.353  | 1.12  | 0.013    | 0.13     | 0.092 | 0.061   | 1.30   |
| 2 | BS 623     | 9.24  | (88.1) | <0.01    | .       | 2.25  | .      | 0.16   | 0.10  | 0.013    | <0.01    | 0.046 | 0.01    | 0.05   |
| 1 | IARM 79C   | 9.20  | 87.6   | 0.003    | (0.002) | 2.28  | .      | 0.20   | 0.55  | 0.006    | <0.005   | 0.033 | 0.010   | 0.014  |
| 1 | 32X CA23   | 9.19  | 81.05  | .        | 0.0018  | 3.63  | 0.0003 | 1.298  | 4.71  | 0.0011   | (0.0026) | 0.026 | 0.0164  | 0.031  |
| 1 | IARM 79B   | 9.19  | 88.4   | .        | (0.003) | 2.13  | .      | 0.16   | 0.075 | 0.005    | (0.003)  | 0.019 | 0.017   | 0.013  |
| 2 | BS 623A    | 9.12  | 88.13  | (0.006)  | .       | 2.19  | .      | 0.273  | 0.146 | <0.002   | 0.001    | 0.014 | 0.002   | 0.008  |
| 1 | 32X CA31   | 8.95  | 82.24  | .        | 0.0026  | 4.06  | 0.0008 | 0.336  | 4.28  | (0.003)  | (0.0024) | 0.036 | 0.0037  | 0.041  |
| 2 | C52.56     | 8.9   | Rem    | .        | 0.14    | 4.6   | 0.09   | 0.74   | 5.6   | .        | 0.17     | 0.15  | 0.11    | 0.28   |
| 1 | IARM 235A  | 8.9   | 81.2   | <0.005   | 0.01    | 4.07  | .      | 1.17   | 4.44  | 0.012    | 0.012    | 0.061 | 0.018   | 0.083  |
| 1 | 32X ALB11B | 8.85  | 80.38  | .        | .       | 3.99  | 0.072  | 1.290  | 4.44  | 0.0249   | 0.0316   | 0.015 | 0.0062  | 0.508  |
| 1 | 32X ALB 1  | 8.83  | 81.85  | 0.0083   | 0.0052  | 3.11  | 0.0092 | 0.057  | 5.74  | 0.0145   | 0.207    | 0.106 | 0.0314  | 0.0228 |
| 1 | 32X ALB11A | 8.80  | 80.58  | .        | .       | 3.81  | 0.075  | 1.13   | 4.33  | 0.045    | 0.118    | 0.069 | 0.0289  | 0.576  |
| 2 | CURM 51.14 | 8.42  | 88.57  | 0.44     | 0.0097  | 0.72  | .      | 0.55   | 0.219 | 0.012    | 0.003    | 0.286 | 0.113   | 0.656  |
| 1 | 32X ALB 6  | 8.05  | 81.98  | 0.012    | 0.0097  | 2.53  | 0.0019 | 0.904  | 5.31  | 0.0101   | 0.096    | 0.295 | 0.147   | 0.685  |
| 1 | 32X ALB 4  | 7.87  | 79.61  | 0.0130   | 0.022   | 3.55  | 0.153  | 1.028  | 7.03  | 0.036    | 0.120    | 0.252 | 0.085   | 0.264  |
| 2 | CURM 52.54 | 7.85  | 81.59  | <0.005   | <0.005  | 3.31  | <0.005 | 1.20   | 5.40  | .        | 0.086    | 0.022 | 0.135   | 0.39   |
| 2 | CURM 51.13 | 7.30  | 88.79  | 0.215    | .       | 1.81  | .      | 0.898  | 0.057 | 0.022    | 0.104    | 0.174 | 0.270   | 0.335  |
| 2 | C51.13     | 6.93  | Rem    | 0.21     | .       | 2.05  | .      | 0.77   | 0.053 | 0.021    | 0.12     | 0.16  | 0.19    | 0.30   |
| 1 | 32X ALB 5  | 6.91  | 84.61  | 0.064    | 0.0056  | 2.22  | 0.0176 | 1.21   | 4.14  | 0.048    | 0.093    | 0.086 | 0.062   | 0.487  |
| 1 | IARM 81B   | 6.70  | 91.2   | 0.058    | 0.002   | 0.047 | .      | 0.012  | 0.003 | 0.004    | 0.006    | 1.84  | 0.008   | 0.176  |
| 1 | 32X ALB 8  | 6.60  | 76.29  | 0.155    | 0.046   | 5.58  | 0.0152 | 1.67   | 6.50  | 0.218    | 0.359    | 0.736 | 0.699   | 1.051  |
| 2 | CURM 51.12 | 6.36  | 88.29  | 0.111    | .       | 2.87  | .      | 1.33   | 0.112 | <0.001   | 0.219    | 0.005 | 0.196   | 0.45   |
| 1 | 32X CA12   | 6.14  | 90.48  | .        | 0.0008  | 0.657 | 0.0005 | 0.0290 | 0.088 | .        | (0.0017) | 2.57  | 0.0157  | 0.0405 |
| 2 | C51.12     | 6.06  | Rem    | 0.11     | .       | 2.90  | .      | 1.25   | 0.11  | <0.005   | 0.25     | <0.01 | 0.18    | 0.42   |
| 2 | CURM 51.11 | 5.27  | 93.95  | <0.001   | .       | 0.060 | .      | <0.001 | 0.012 | 0.035    | 0.33     | 0.159 | 0.027   | 0.111  |
| 2 | C51.11     | 5.0   | Rem    | <0.01    | .       | 0.07  | .      | <0.005 | 0.15  | 0.03     | 0.31     | 0.11  | 0.025   | 0.07   |
| 1 | 32X ALB 7  | 4.01  | 84.40  | 0.056    | 0.061   | 4.82  | 0.0039 | 0.383  | 4.96  | 0.057    | 0.029    | 0.399 | 0.30    | 0.527  |

| Number     | Al      | Cu     | As    | Cr       | Fe       | Mg        | Mn       | Ni    | P     | Pb                   | Si | Sn | Zn |
|------------|---------|--------|-------|----------|----------|-----------|----------|-------|-------|----------------------|----|----|----|
| Number     | Ag      | Be     | Bi    | C        | Co       | S         | Sb       | Se    | Units |                      |    |    |    |
| 32X ALB 9  | 0.042   | .      | .     | (0.006)  | 0.0259   | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| 32X ALB 10 | .       | .      | .     | (0.0022) | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| 32X ALB 3  | .       | .      | .     | .        | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| IARM 94B   | 0.017   | .      | .     | (0.006)  | 0.011    | 0.002     | (0.011)  | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| C52.53     | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| CURM 52.52 | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| BS 955C    | 0.014   | .      | .     | .        | .        | .         | (<0.002) | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| IARM 204A  | 0.009   | .      | .     | 0.006    | 0.008    | (0.002)   | (<0.01)  | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| BS 955 MOD | .       | .      | .     | .        | .        | .         | (<0.003) | .     | .     | 40 mm Ø x 17 mm      |    |    |    |
| IARM 93B   | (0.004) | .      | .     | 0.007    | 0.006    | 0.002     | (0.012)  | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| BS 955B    | (0.009) | .      | .     | .        | .        | 0.002     | (0.002)  | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| BS 954C    | .       | .      | .     | (0.004)  | .        | (<0.0005) | <0.003   | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| BS 954B    | .       | .      | .     | (0.005)  | .        | (<0.0005) | (0.001)  | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| IARM 80B   | 0.006   | .      | .     | (0.01)   | 0.014    | .         | (0.004)  | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| BS 954A    | .       | .      | .     | 0.004    | .        | <0.0001   | 0.001    | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| BS 630A    | .       | .      | .     | 0.005    | .        | (0.001)   | <0.001   | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| C52.51     | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| 32X CA 1   | 0.0012  | .      | .     | (0.007)  | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| 32X ALB 2  | .       | .      | .     | .        | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| 32X CA 7   | 0.0009  | .      | .     | 0.0028   | 0.0003   | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| C52.55     | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| BS CC954   | .       | .      | .     | (0.007)  | .        | (0.002)   | 0.004    | .     | .     | 32 mm Ø x 17 mm      |    |    |    |
| BS 623     | .       | .      | .     | (0.002)  | .        | (0.001)   | <0.01    | .     | .     | 37 mm Ø x 12 mm      |    |    |    |
| IARM 79C   | <0.005  | .      | .     | 0.003    | <0.005   | <0.001    | <0.005   | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| 32X CA23   | 0.0008  | .      | .     | (0.0050) | (0.0036) | .         | .        | .     | .     | 50 mm Ø x 18 mm      |    |    |    |
| IARM 79B   | 0.002   | .      | .     | 0.002    | (0.002)  | (0.001)   | .        | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| BS 623A    | .       | .      | .     | (0.002)  | .        | (<0.0005) | <0.002   | .     | .     | 38 mm Ø x 12 mm      |    |    |    |
| 32X CA31   | 0.0008  | .      | .     | 0.006    | 0.0029   | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| C52.56     | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| IARM 235A  | <0.005  | .      | .     | 0.009    | 0.01     | 0.002     | (0.004)  | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
| 32X ALB11B | .       | 0.064  | 0.082 | .        | 0.0180   | .         | 0.203    | 0.007 | .     | 40 mm Ø x 15 mm      |    |    |    |
| 32X ALB 1  | .       | .      | .     | .        | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| 32X ALB11A | .       | 0.0194 | 0.120 | .        | 0.089    | .         | 0.093    | 0.006 | .     | 40 mm Ø x -15 mm     |    |    |    |
| CURM 51.14 | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| 32X ALB 6  | .       | .      | .     | (0.0025) | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| 32X ALB 4  | .       | .      | .     | .        | .        | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| CURM 52.54 | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| CURM 51.13 | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| C51.13     | .       | .      | .     | .        | .        | .         | .        | .     | .     | 50 mm Ø x 10 - 12 mm |    |    |    |
| 32X ALB 5  | .       | .      | .     | .        | 0.0307   | .         | .        | .     | .     | 42 mm Ø x 18 mm      |    |    |    |
| IARM 81B   | (0.004) | .      | .     | 0.002    | .        | <0.001    | 0.003    | .     | .     | 31 mm Ø x 2 or 18 mm |    |    |    |
|            |         |        |       |          |          |           |          |       |       |                      |    |    |    |

**CRM ALUMINUM BRONZE SETS**

available in SETS only, as grouped analysis listed in mass % except \* which is mg/kg 40 mm Ø x ~25 mm

| Number  | Al    | As      | Bi      | Cd      | Co     | Cr*  | Fe      | Mg* | Mn      | Ni      | P        | Pb        | S      | Sb      | Si        | Sn       | Zn    |
|---------|-------|---------|---------|---------|--------|------|---------|-----|---------|---------|----------|-----------|--------|---------|-----------|----------|-------|
| IMN BF1 | 10.90 | 0.061   | 0.00042 | .       | .      | .    | (6.2)   | .   | 0.0059  | 2.49    | (0.012)  | 0.23      | .      | (0.002) | 0.26      | 0.011    | 0.57  |
| IMN BF2 | 9.96  | 0.050   | 0.0025  | .       | .      | .    | (5.4)   | .   | 0.12    | 3.54    | 0.053    | 0.15      | .      | (0.013) | 0.25      | 0.081    | 0.40  |
| IMN BF3 | 9.58  | 0.038   | 0.0039  | .       | .      | .    | 4.50    | .   | 0.28    | 4.43    | 0.098    | 0.111     | .      | 0.028   | 0.20      | 0.17     | 0.27  |
| IMN BF4 | 9.12  | 0.022   | 0.0057  | .       | .      | .    | 3.25    | .   | 0.39    | 5.24    | 0.13     | 0.059     | .      | 0.037   | 0.097     | 0.25     | 0.10  |
| IMN BF5 | 8.35  | 0.0039  | 0.010   | .       | .      | .    | 2.44    | .   | 0.50    | 6.03    | 0.16     | 0.014     | .      | 0.048   | 0.028     | 0.35     | 0.018 |
| IMN B01 | 3.16  | 0.00033 | 0.00030 | 0.00035 | .      | 32.7 | 0.0158  | .   | 0.0167  | 0.00517 | (0.0004) | 0.00384   | .      | 0.00035 | (0.00471) | 2.54     | 7.10  |
| IMN B02 | 4.03  | 0.00199 | 0.00197 | 0.00182 | .      | 3.7  | 0.00569 | .   | 0.00102 | 0.00204 | 0.00227  | (0.00214) | .      | 0.00226 | 0.00979   | 1.83     | 6.26  |
| IMN B03 | 4.67  | 0.00662 | 0.00660 | 0.00570 | .      | 54.8 | 0.0752  | .   | 0.00884 | 0.0683  | 0.00550  | 0.0537    | .      | 0.00568 | 0.0552    | 1.17     | 5.07  |
| IMN B04 | 6.15  | 0.0115  | 0.0107  | 0.00881 | .      | 91   | 0.137   | .   | 0.00612 | 0.111   | 0.0100   | 0.102     | .      | 0.0104  | 0.0951    | 0.704    | 4.28  |
| IMN B05 | 7.02  | 0.0161  | 0.0152  | 0.0134  | .      | 145  | 0.218   | .   | 0.0772  | 0.0355  | 0.0155   | 0.0299    | .      | 0.0152  | 0.0135    | 0.117    | 3.08  |
| IMN B11 | 2.88  | 0.011   | 0.013   | 0.016   | 0.027  | .    | 0.011   | 58  | 0.60    | 6.97    | 0.0022   | 0.0025    | 0.021  | 0.0012  | (0.11)    | (0.11)   | 0.020 |
| IMN B12 | 2.46  | 0.0089  | 0.0095  | 0.011   | 0.020  | .    | 0.038   | 98  | 0.42    | 6.47    | 0.011    | 0.0043    | 0.014  | 0.0030  | (0.091)   | (0.080)  | 0.038 |
| IMN B13 | 1.97  | 0.0072  | 0.0071  | 0.0076  | 0.014  | .    | 0.12    | 65  | 0.21    | 5.87    | 0.014    | 0.0081    | 0.0082 | 0.0056  | (0.047)   | (0.049)  | 0.22  |
| IMN B14 | 1.50  | 0.0031  | 0.0042  | 0.0048  | 0.0076 | .    | 0.20    | 35  | 0.013   | 5.49    | 0.013    | 0.010     | 0.0049 | 0.0088  | (0.015)   | (0.014)  | 0.36  |
| IMN B15 | 1.09  | 0.0018  | 0.0013  | 0.00075 | 0.0024 | .    | 0.28    | 17  | 0.0030  | 5.00    | 0.019    | 0.017     | 0.0023 | 0.010   | (0.0071)  | (0.0034) | 0.51  |

**RM ALUMINUM BRONZE MUSHROOMS**

chill cast typical analysis 60 mm Ø x 5 mm

| Number      | Al    | Cu    | Fe   | Mn    | Ni    | Pb     | Si    | Sn     | Zn    | Bi    | Cd     | Cr    | Mg    |
|-------------|-------|-------|------|-------|-------|--------|-------|--------|-------|-------|--------|-------|-------|
| CTIF CA 36  | 12.60 | 77.25 | 2.93 | 0.131 | 6.33  | 0.0154 | 0.113 | 0.201  | 0.244 | 0.058 | .      | 0.041 | 0.130 |
| CTIF 2158-W | 11.95 | 85.00 | 2.53 | 0.26  | 0.10  | <0.005 | 0.015 | <0.01  | <0.01 | .     | .      | .     | .     |
| CTIF 4065-P | 11.85 | 81.20 | 3.40 | 0.075 | 3.18  | 0.03   | 0.034 | 0.18   | 0.03  | .     | .      | .     | .     |
| CTIF CA 35  | 11.4  | 75.6  | 6.1  | 1.6   | 3.80  | 0.10   | 0.25  | 0.30   | 0.55  | .     | .      | .     | .     |
| CTIF 2154-V | 11.25 | 85.00 | 3.05 | 0.12  | 0.41  | <0.005 | 0.015 | <0.01  | <0.01 | .     | .      | .     | .     |
| CTIF CA 13  | 11.20 | 82.45 | 3.82 | 1.22  | 0.50  | 0.0230 | 0.11  | (0.01) | 0.65  | .     | .      | .     | .     |
| CTIF CA 3   | 10.9  | 86.5  | 0.80 | 0.06  | 0.80  | 0.15   | 0.08  | 0.20   | 0.30  | .     | .      | .     | .     |
| CTIF CA 21  | 10.82 | 81.9  | 3.45 | 0.30  | 3.09  | 0.05   | 0.07  | 0.07   | 0.100 | .     | 0.0095 | .     | .     |
| CTIF CA 22  | 10.45 | 80.50 | 2.51 | 0.745 | 4.54  | 0.0243 | 0.32  | 0.30   | 0.605 | .     | .      | .     | .     |
| CTIF 3011-G | 10.35 | 84.80 | 1.98 | 0.165 | 2.00  | 0.10   | 0.16  | 0.125  | 0.25  | .     | .      | .     | .     |
| CTIF CA 27  | 10.25 | 81.1  | 2.81 | 1.195 | 3.88  | 0.11   | 0.127 | 0.054  | 0.428 | .     | 0.012  | .     | .     |
| CTIF CA 10  | 10.15 | 80.65 | 4.55 | 0.333 | 3.39  | 0.16   | 0.46  | 0.16   | 0.067 | .     | .      | .     | .     |
| CTIF 3299-J | 10.10 | 87.60 | 0.38 | 1.12  | 0.21  | 0.110  | 0.136 | 0.106  | 0.19  | .     | .      | .     | .     |
| CTIF 3297-Y | 10.00 | 87.45 | 1.88 | 0.03  | .     | 0.11   | 0.15  | 0.10   | 0.27  | .     | .      | .     | .     |
| CTIF 4149-G | 9.84  | 84.95 | 2.00 | 0.21  | 1.96  | 0.15   | 0.18  | 0.34   | 0.37  | .     | .      | .     | .     |
| CTIF 2152-S | 9.78  | 85.05 | 3.99 | 0.42  | 0.68  | <0.005 | 0.015 | .      | <0.01 | .     | .      | .     | .     |
| CTIF 2151-R | 9.43  | 84.75 | 4.48 | 0.73  | 0.56  | <0.005 | 0.015 | <0.01  | <0.01 | .     | .      | .     | .     |
| CTIF 3296-L | 9.40  | 88.55 | 0.07 | 0.37  | 0.41  | 0.30   | 0.20  | 0.06   | 0.62  | .     | .      | .     | .     |
| CTIF CA 31  | 9.15  | 76.5  | 3.18 | 3.27  | 7.51  | 0.020  | 0.064 | 0.063  | 0.145 | .     | .      | .     | 0.02  |
| CTIF CA 26  | 9.10  | 81.25 | 4.36 | 0.188 | 4.87  | 0.058  | 0.035 | 0.005  | 0.038 | .     | 0.034  | .     | .     |
| CTIF 3300-M | 8.73  | 89.5  | 0.45 | 0.165 | 0.205 | 0.205  | 0.415 | 0.205  | 0.085 | .     | .      | .     | .     |
| CTIF 3301-Z | 8.10  | 87.30 | 4.00 | 0.26  | 0.125 | 0.032  | 0.057 | 0.028  | 0.06  | .     | .      | .     | .     |
| CTIF 2794-H | 8.0   | 90.3  | 0.82 | <0.01 | 0.69  | <0.01  | 0.048 | 0.105  | <0.01 | .     | .      | .     | .     |
| CTIF CA 20  | 8.00  | 87.15 | 0.79 | 1.85  | 1.18  | 0.18   | 0.17  | 0.19   | 0.41  | .     | 0.05   | .     | .     |
| CTIF CA 12  | 8.0   | 84.1  | 2.77 | 3.09  | 1.385 | 0.047  | 0.058 | 0.036  | 0.45  | .     | .      | .     | .     |
| CTIF CA 25  | 7.97  | 79.12 | 6.10 | 0.51  | 5.74  | 0.03   | 0.084 | 0.177  | 0.252 | .     | .      | .     | .     |
| CTIF CA 30  | 7.55  | 81.6  | 5.2  | 2.05  | 3.10  | 0.142  | 0.15  | 0.099  | 0.066 | .     | .      | .     | .     |
| CTIF 3018-F | 7.25  | 81.90 | 4.45 | 1.57  | 4.50  | 0.02   | 0.085 | 0.06   | 0.06  | .     | .      | .     | .     |
| CTIF 3610-Q | 7.10  | 82.32 | 3.98 | 0.045 | 5.40  | 0.23   | 0.065 | 0.25   | 0.51  | .     | 0.090  | .     | .     |

**CRM BISMUTH BRONZE**

31 mm Ø x 2 or 18 mm

| Number    | Ag    | Al    | As     | Bi  | Co      | Cr      | Cu   | Fe    | Mn      | Ni    | P    | Pb    | S     | Sb    | Si    | Sn   | Zn    |
|-----------|-------|-------|--------|-----|---------|---------|------|-------|---------|-------|------|-------|-------|-------|-------|------|-------|
| IARM 211A | 0.005 | 0.002 | (0.01) | 5.0 | (0.001) | (0.002) | 88.4 | 0.004 | (0.003) | 0.003 | 0.19 | 0.014 | 0.002 | 0.057 | 0.003 | 6.23 | 0.006 |

**MANGANESE BRONZE**

# = class, where 1 = CRM and 2 = RM BS CC: 32 Ø x 20 mm other BS: 38 mm Ø x 12 mm IARM: 31 Ø x 2 or 18 mm

| # | Number   | Mn   | Al     | Fe   | Sn    | Zn    | Cu    | As     | C        | Ni    | P     | Pb    | S        | Sb      | Si      |
|---|----------|------|--------|------|-------|-------|-------|--------|----------|-------|-------|-------|----------|---------|---------|
| 1 | IARM 88B | 2.93 | 5.66   | 2.12 | 0.020 | 25.1  | 63.9  | .      | 0.003    | 0.065 | 0.011 | 0.066 | <0.001   | <0.005  | 0.09    |
| 2 | BS CC865 | 0.32 | 0.70   | 1.06 | 0.71  | 37.92 | 58.69 | 0.010  | (0.002)  | 0.28  | 0.004 | 0.46  | (0.002)  | 0.01    | 0.011   |
| 2 | BS 675A  | 0.32 | <0.002 | 1.12 | 0.8   | 39.1  | 58.5  | 0.003  | (0.0007) | 0.019 | 0.010 | 0.074 | (0.0005) | 0.0011  | (0.005) |
| 1 | IARM 83A | 0.22 | <0.01  | 0.99 | 0.57  | 39.81 | .     | .      | (0.007)  | 0.01  | 0.005 | 0.058 | 0.002    | 0.008   | <0.01   |
| 1 | IARM 83B | 0.13 | 0.002  | 0.97 | 0.85  | 39.3  | 58.7  | .      | 0.003    | 0.010 | 0.004 | 0.017 | (0.001)  | (0.004) | (0.003) |
| 2 | BS 675   | 0.11 | <0.01  | 0.73 | 0.92  | 39.7  | Rem.  | <0.005 | (0.0004) | <0.01 | <0.01 | <0.01 | (0.0013) | <0.01   | <0.02   |

**RM NICKEL BRONZE - XRF ONLY**

| Number  | Ni   | Cu   | Fe   | Pb   | Sn   | Zn   | Units           |
|---------|------|------|------|------|------|------|-----------------|
| 37X HK7 | 30.7 | 59.3 | 1.72 | 5.32 | 2.30 | 0.38 | 40 mm Ø x 10 mm |

**PHOSPHOR BRONZE**

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

| # | Number     | P       | Sn    | Zn     | Cu     | Mn       | Ni     | Pb      | Al       | As      | Fe     | Mg      | S      | Sb       | Si       |
|---|------------|---------|-------|--------|--------|----------|--------|---------|----------|---------|--------|---------|--------|----------|----------|
| 2 | CURM 54.03 | 0.954   | 7.30  | 0.003  | 91.74  | <0.005   | 0.0019 | 0.003   | <0.001   | 0.006   | 0.005  | <0.0003 | <0.001 | 0.0007   | <0.002   |
| 1 | 32X PB 11  | 0.799   | 3.75  | 1.43   | 90.55  | 0.111    | 0.768  | 0.900   | (0.001)  | 0.199   | 0.75   | 0.0022  | 0.007  | 0.502    | 0.099    |
| 2 | CURM 54.05 | 0.501   | 11.36 | 0.554  | 84.78  | 0.078    | 1.28   | 1.14    | 0.055    | 0.063   | 0.051  | 0.0021  | 0.063  | 0.111    | 0.006    |
| 1 | 32X PB 23  | 0.319   | 7.56  | 0.0020 | 92.04  | <0.005   | 0.0033 | 0.0042  | <0.005   | 0.0011  | <0.005 | .       | 0.0015 | 0.0025   | 0.0016   |
| 2 | CURM 54.04 | 0.250   | 9.47  | 1.09   | 86.54  | 0.419    | 0.536  | 0.79    | 0.074    | 0.106   | 0.316  | 0.0009  | 0.046  | 0.33     | 0.065    |
| 1 | 32X PB 20  | 0.196   | 4.55  | 0.007  | 95.22  | <0.005   | 0.0090 | 0.0045  | <0.005   | 0.0011  | 0.0013 | .       | 0.0030 | 0.0012   | 0.0046   |
| 1 | IARM 78B   | 0.19    | 4.73  | 3.55   | 87.7   | (0.002)  | 0.077  | 3.87    | (0.002)  | <0.003  | 0.02   | .       | 0.010  | 0.01     | <0.002   |
| 1 | 32X PB 4   | 0.178   | 9.75  | 0.107  | 88.4   | 1.17     | 0.081  | 0.114   | (0.0005) | <0.01   | 0.014  | .       | .      | (0.0032) | 0.099    |
| 1 | 32X PB 12  | 0.172   | 5.25  | 0.546  | 93.29  | 0.0110   | 0.221  | 0.102   | 0.0067   | 0.087   | 0.032  | 0.0033  | 0.0127 | 0.160    | 0.0099   |
| 1 | IARM 77B   | 0.148   | 4.66  | 0.007  | 95.2   | (0.002)  | 0.002  | 0.016   | (0.001)  | (0.001) | 0.002  | .       | 0.002  | 0.005    | (0.003)  |
| 1 | 32X PB 13  | 0.128   | 7.09  | 0.240  | 91.88  | 0.0300   | 0.111  | 0.104   | 0.039    | 0.081   | 0.057  | 0.0144  | 0.015  | 0.117    | 0.073    |
| 1 | IARM 77A   | 0.12    | 4.60  | 0.03   | .      | 0.01     | <0.01  | (0.011) | (<0.01)  | (<0.01) | 0.01   | .       | 0.003  | <0.01)   | <0.01    |
| 2 | BS 510A    | 0.11    | 4.6   | 0.21   | 95.10  | <0.002   | 0.020  | 0.016   | <0.002   | 0.0008  | 0.005  | .       | 0.008  | (0.003)  | <0.003   |
| 2 | CURM 54.02 | 0.107   | 5.53  | 0.410  | 92.87  | 0.101    | 0.109  | 0.663   | 0.020    | 0.023   | 0.102  | 0.0020  | 0.030  | 0.026    | 0.012    |
| 1 | 32X PB15   | 0.0873  | 2.21  | 0.76   | 96.07  | 0.125    | 0.212  | 0.174   | 0.045    | 0.123   | 0.116  | 0.0275  | .      | 0.026    | 0.043    |
| 2 | CURM 54.01 | 0.053   | 3.17  | 0.346  | 95.42  | 0.158    | 0.348  | 0.307   | 0.040    | 0.044   | 0.028  | 0.008   | 0.023  | 0.070    | 0.039    |
| 2 | C54.01     | 0.05    | 3.2   | 0.31   | rem    | 0.13     | 0.26   | 0.29    | 0.009    | 0.04    | 0.01   | <0.001  | 0.03   | 0.08     | 0.006    |
| 2 | BS 544A    | 0.021   | 4.42  | 3.42   | (88.4) | <0.002   | 0.16   | 4.16    | (0.0005) | 0.011   | 0.092  | .       | 0.038  | 0.040    | <0.002   |
| 1 | 32X PB 14  | (0.008) | 9.00  | 0.038  | 90.26  | (0.0002) | 0.144  | 0.048   | (0.0009) | 0.0331  | 0.0056 | 0.0003  | 0.065  | 0.055    | (0.0025) |
| 1 | 32X PB 10  | 0.003   | 11.87 | 0.0494 | 87.85  | 0.0005   | 0.054  | 0.067   | (<0.001) | 0.0138  | 0.014  | 0.004   | 0.0162 | 0.0201   | (0.0036) |

| Number     | Bi     | C        | Co     | Se     | Units                |
|------------|--------|----------|--------|--------|----------------------|
| CURM 54.03 | .      | .        | .      | .      | 50 mm Ø x 10-12 mm   |
| 32X PB 11  | 0.0065 | .        | 0.091  | .      | 40 mm Ø x 17 mm      |
| CURM 54.05 | .      | .        | .      | .      | 50 mm Ø x 10-12 mm   |
| 32X PB 23  | .      | 0.004    | .      | .      | 49 mm Ø x 17 mm      |
| CURM 54.04 | .      | .        | .      | .      | 50 mm Ø x 10-12 mm   |
| 32X PB 20  | .      | .        | .      | .      | 38 mm Ø x 17 mm      |
| IARM 78B   | .      | .        | .      | .      | 31 mm Ø x 2 or 18 mm |
| 32X PB 4   | .      | .        | .      | .      | 40 mm Ø x 15 mm      |
| 32X PB 12  | 0.057  | .        | 0.0142 | .      | 40 mm Ø x ~17 mm     |
| IARM 77B   | .      | 0.003    | .      | .      | 31 mm Ø x 2 or 18 mm |
| 32X PB 13  | 0.0137 | .        | 0.0052 | .      | 40 mm Ø x ~17 mm     |
| IARM 77A   | .      | .        | .      | .      | 31 mm Ø x 2 or 18 mm |
| BS 510A    | .      | (0.0006) | .      | .      | 38 mm Ø x 12 mm      |
| CURM 54.02 | .      | .        | .      | .      | 50 mm Ø x 10-12 mm   |
| 32X PB15   | .      | .        | 0.0509 | .      | 40 mm Ø x ~15 mm     |
| CURM 54.01 | .      | .        | .      | .      | 50 mm Ø x 10-12 mm   |
| C54.01     | .      | .        | .      | .      | 50 mm Ø x 10-12 mm   |
| BS 544A    | .      | (0.003)  | .      | .      | 38 mm Ø x 12 mm      |
| 32X PB 14  | 0.224  | .        | 0.0013 | .      | 40 mm Ø x 17 mm      |
| 32X PB 10  | 0.0128 | .        | .      | 0.0058 | 40 mm Ø x ~17 mm     |

**SILICON BRONZE**

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

BS: 38 mm Ø x 12 mm

IARM: 31 Ø x 2 or 18 mm

| # | Number   | Si   | Cu    | Al      | As     | C        | Cr    | Fe    | Mn   | Ni    | P       | Pb    | S        | Sb     | Sn    | Zn   |
|---|----------|------|-------|---------|--------|----------|-------|-------|------|-------|---------|-------|----------|--------|-------|------|
| 1 | IARM 82B | 3.22 | 95.3  | 0.002   | .      | .        | 0.004 | 0.080 | 1.04 | 0.011 | 0.004   | 0.011 | 0.003    | .      | 0.017 | 0.38 |
| 2 | BS 655A  | 3.14 | 95.74 | (0.002) | <0.002 | (0.0006) | .     | 0.075 | 0.91 | 0.008 | (0.004) | 0.008 | (0.0006) | <0.002 | 0.07  | 0.02 |

**CRM SILICON BRONZE SET**

available in SET/7 ONLY, as grouped

40 mm Ø x 25 mm

| Number  | Al    | As     | Bi     | Cu  | Fe    | Mg     | Mn   | Ni    | P      | Pb    | S      | Sb     | Si   | Sn    | Zn   |
|---------|-------|--------|--------|-----|-------|--------|------|-------|--------|-------|--------|--------|------|-------|------|
| IMN BH1 | 0.027 | 0.0047 | 0.018  | Rem | 1.67  | 0.0065 | 0.25 | 0.96  | 0.0047 | 0.74  | 0.012  | 0.066  | 4.77 | 0.044 | 2.03 |
| IMN BH2 | 0.079 | 0.015  | 0.014  | Rem | 1.28  | 0.0066 | 0.54 | 0.74  | 0.023  | 0.57  | 0.0092 | 0.042  | 4.14 | 0.21  | 2.99 |
| IMN BH3 | 0.14  | 0.022  | 0.0091 | Rem | 0.96  | 0.0075 | 1.00 | 0.53  | 0.039  | 0.40  | 0.0062 | 0.026  | 3.07 | 0.37  | 3.84 |
| IMN BH4 | 0.22  | 0.054  | 0.006  | Rem | 0.55  | 0.0057 | 1.46 | 0.28  | 0.059  | 0.24  | 0.0064 | 0.016  | 2.29 | 0.55  | 4.91 |
| IMN BH5 | 0.29  | 0.071  | 0.0019 | Rem | 0.093 | 0.0024 | 1.80 | 0.047 | 0.073  | 0.015 | 0.0055 | 0.0054 | 1.45 | 0.69  | 5.58 |
| IMN BH6 | 0.32  | 0.078  | 0.018  | Rem | 0.35  | 0.01   | 0.80 | 0.39  | 0.078  | 0.017 | 0.016  | 0.056  | 1.51 | 0.32  | 6.27 |



## CRM LEADED, TIN, AND LEADED TIN BRONZE DISC AND ROD SETS

available in SETS ONLY, as grouped

IMN BB: 10 mm Ø x 100 mm  
IMN BL: 40 mm Ø x 27 mmIMN BI, WL: 40 mm Ø x 25 mm  
VS: 40 mm x 40 mm x 25 mm

| Number     | Al       | As      | Bi      | C      | Cd     | Co     | Cu     | Fe     | Mg      | Mn      | Ni     | P       | Pb     | S        | Sb     | Si       | Sn    | Zn     |
|------------|----------|---------|---------|--------|--------|--------|--------|--------|---------|---------|--------|---------|--------|----------|--------|----------|-------|--------|
| IMN BL1    | 0.11     | 0.058   | 0.024   | .      | 0.060  | .      | Rem    | 0.38   | 0.051   | 0.062   | 0.25   | 0.49    | 0.25   | (0.0081) | 0.053  | 0.059    | 2.58  | 0.68   |
| IMN BL2    | 0.15     | 0.039   | 0.014   | .      | 0.040  | .      | Rem    | 0.21   | 0.11    | 0.055   | 0.37   | 0.29    | 0.14   | (0.0063) | 0.039  | 0.031    | 4.04  | 0.40   |
| IMN BL3    | 0.019    | 0.025   | 0.0099  | .      | 0.022  | .      | Rem    | 0.10   | .       | 0.026   | 0.13   | 0.084   | 0.065  | .        | 0.021  | 0.015    | 6.12  | 0.15   |
| IMN BL4    | .        | 0.0089  | 0.0058  | .      | 0.0092 | .      | Rem    | 0.014  | .       | 0.0092  | 0.015  | 0.010   | 0.013  | (0.022)  | 0.0095 | 0.011    | 8.38  | 0.017  |
| IMN BL5    | 0.00052  | 0.00057 | 0.0015  | .      | 0.0015 | .      | Rem    | 0.0061 | 0.0030  | 0.0011  | 0.0074 | 0.0042  | 0.0069 | 0.031    | 0.0039 | (0.0038) | 11.05 | 0.0078 |
| VS 2807-83 | (0.0029) | .       | (0.025) | .      | .      | .      | (78.7) | 0.062  | .       | .       | 0.81   | 0.55    | 12.5   | .        | 0.80   | (0.045)  | 6.3   | 1.17   |
| VS 2808-83 | (0.0034) | .       | (0.031) | .      | .      | .      | (79.7) | 0.100  | .       | .       | 0.50   | 0.30    | 10.6   | .        | 0.50   | (0.025)  | 7.3   | 0.71   |
| VS 2809-83 | (0.0049) | .       | (0.039) | .      | .      | .      | (81.1) | 0.209  | .       | .       | 0.31   | 0.20    | 9.0    | .        | 0.34   | (0.011)  | 8.3   | 0.38   |
| VS 2810-83 | (0.0084) | .       | (0.041) | .      | .      | .      | (81.9) | 0.35   | .       | .       | 0.21   | 0.088   | 7.3    | .        | 0.27   | (0.0017) | 9.4   | 0.26   |
| VS 2811-83 | (0.021)  | .       | (0.062) | .      | .      | .      | (83.0) | 0.60   | .       | .       | 0.110  | (0.059) | 5.4    | .        | (0.12) | (0.0021) | 10.5  | (0.14) |
| IMN BB1    | 0.019    | 0.086   | 0.032   | .      | .      | .      | 84.82  | 0.33   | .       | 0.081   | 0.061  | 0.055   | 1.55   | .        | 0.60   | 0.037    | 8.10  | 3.90   |
| IMN BB2    | 0.032    | 0.12    | 0.024   | .      | .      | .      | 84.09  | 0.28   | .       | 0.12    | 0.097  | 0.085   | 2.64   | .        | 0.49   | 0.055    | 7.11  | 4.70   |
| IMN BB3    | 0.0021   | 0.0079  | 0.0021  | .      | .      | .      | 80.88  | 0.037  | .       | 0.0012  | 2.42   | (0.014) | 6.73   | .        | 0.052  | 0.0044   | 3.36  | 6.23   |
| IMN BB4    | 0.0062   | 0.029   | 0.011   | .      | .      | .      | 81.32  | 0.086  | .       | 0.020   | 1.20   | 0.030   | 6.14   | .        | 0.21   | 0.018    | 2.58  | 8.11   |
| IMN BB5    | 0.015    | 0.051   | 0.018   | .      | .      | .      | 82.25  | 0.14   | .       | 0.054   | 0.49   | 0.037   | 5.18   | .        | 0.31   | 0.028    | 4.11  | 7.21   |
| IMN BB6    | 0.040    | 0.16    | 0.041   | .      | .      | .      | 83.54  | 0.31   | .       | 0.15    | 0.23   | 0.12    | 3.52   | .        | 0.62   | 0.083    | 5.47  | 5.40   |
| IMN BB7    | 0.011    | 0.016   | 0.0054  | .      | .      | .      | 82.24  | 0.095  | .       | 0.011   | 1.73   | 0.016   | 7.31   | .        | 0.098  | 0.012    | 4.92  | 3.26   |
| IMN BI1    | 0.15     | 0.14    | 0.12    | .      | .      | .      | Rem    | 0.42   | .       | 0.26    | 2.41   | 0.70    | 6.97   | (0.011)  | 0.58   | 0.23     | 3.19  | 3.55   |
| IMN BI2    | 0.077    | 0.11    | 0.070   | .      | .      | .      | Rem    | 0.31   | .       | 0.15    | 1.46   | 0.59    | 5.39   | (0.0055) | 0.43   | 0.13     | 4.18  | 5.73   |
| IMN BI3    | 0.034    | 0.052   | 0.028   | .      | .      | .      | Rem    | 0.17   | .       | 0.082   | 0.29   | 0.32    | 4.52   | (0.003)  | 0.24   | 0.075    | 5.01  | 7.16   |
| IMN BI4    | 0.0020   | 0.010   | 0.0030  | .      | .      | .      | Rem    | 0.083  | .       | 0.025   | 0.088  | 0.029   | 3.82   | (0.002)  | 0.075  | 0.014    | 7.69  | 10.22  |
| IMN WL1    | 0.082    | 0.0010  | 0.0093  | 0.0050 | 0.0017 | 0.0010 | 95.54  | 0.072  | 0.00036 | 0.0041  | 0.44   | 0.012   | 0.013  | 0.020    | .      | 0.057    | 0.22  | 3.52   |
| IMN WL2    | 0.057    | 0.0078  | 0.0073  | 0.0082 | 0.0023 | 0.0065 | 97.49  | 0.13   | 0.00097 | 0.0038  | 0.32   | 0.016   | 0.011  | 0.0070   | 0.0050 | 0.046    | 0.32  | 1.56   |
| IMN WL3    | 0.0034   | 0.020   | 0.0050  | 0.010  | 0.010  | 0.0096 | 96.51  | 0.20   | 0.0016  | 0.38    | 0.22   | 0.021   | 0.0083 | 0.0088   | 0.0085 | 0.0037   | 0.37  | 2.21   |
| IMN WL4    | .        | 0.0034  | 0.0026  | 0.0032 | 0.0068 | 0.013  | 96.41  | 0.012  | .       | .       | 0.019  | .       | 0.0066 | 0.0050   | .      | 0.0019   | 0.55  | 2.97   |
| IMN WL5    | 0.0014   | 0.0011  | 0.0011  | .      | 0.0038 | 0.019  | 97.62  | 0.0025 | .       | 0.00073 | 0.0014 | .       | 0.0030 | 0.0019   | 0.0006 | 0.0009   | 0.73  | 1.61   |
| IMN WL6    | 0.10     | 0.024   | 0.012   | 0.016  | 0.025  | 0.019  | 95.76  | 0.31   | 0.015   | 0.14    | 0.091  | 0.032   | 0.016  | 0.017    | 0.011  | 0.13     | 0.80  | 2.48   |

**RM COPPER ALLOY XRF SET**

Part Number: BS CU-22 Set of 19 samples, each 30 - 45 mm Ø x 7 mm discs

| CDA | Number     | Cu    | Al       | Fe    | Mn      | Ni      | Pb      | Si      | Sn     | Zn      | As       | C        | P       | S        | Sb      | Be   | Co    |
|-----|------------|-------|----------|-------|---------|---------|---------|---------|--------|---------|----------|----------|---------|----------|---------|------|-------|
| 110 | BS 110A    | 99.9  | 0.002    | 0.003 | <0.0003 | 0.002   | 0.003   | 0.001   | 0.002  | (0.001) | (0.001)  | 0.0018   | 0.001   | 0.0008   | 0.0004  | .    | .     |
| 172 | BS 172Be-1 | 97.68 | (0.02)   | 0.052 | 0.001   | 0.039   | (0.002) | 0.055   | 0.033  | 0.007   | (0.001)  | (0.001)  | 0.003   | .        | .       | 1.89 | 0.206 |
| 314 | BS 314A    | 89.75 | 0.002    | 0.019 | 0.001   | 0.009   | 1.47    | (0.006) | 0.0019 | 8.7     | <0.003   | 0.002    | <0.003  | 0.003    | <0.002  | .    | .     |
| 360 | BS 360A    | 61.42 | <0.001   | 0.151 | 0.0007  | 0.058   | 2.51    | <0.005  | 0.13   | 35.63   | 0.002    | (0.0032) | 0.001   | (0.0003) | 0.008   | .    | .     |
| 464 | BS 464A    | 60.6  | (0.001)  | 0.013 | 0.0002  | 0.004   | 0.056   | <0.01   | 0.62   | 38.73   | <0.002   | (0.0006) | 0.012   | 0.001    | (0.001) | .    | .     |
| 482 | BS 482A    | 60.0  | (0.003)  | 0.020 | <0.002  | (0.007) | 0.50    | (0.002) | 0.65   | 38.8    | <0.002   | (0.0015) | <0.003  | <0.002   | 0.0012  | .    | .     |
| 510 | BS 510A    | 96.10 | <0.002   | 0.005 | <0.002  | 0.020   | 0.016   | <0.003  | 4.6    | 0.21    | 0.0008   | (0.0006) | 0.11    | 0.008    | (0.003) | .    | .     |
| 544 | BS 544A    | 88.4  | (0.0005) | 0.092 | <0.002  | 0.16    | 4.16    | <0.002  | 4.42   | 3.42    | 0.011    | 0.003    | 0.021   | 0.038    | 0.040   | .    | .     |
| 623 | BS 623A    | 88.13 | 9.12     | 2.19  | 0.273   | 0.146   | 0.001   | 0.014   | 0.002  | 0.008   | (0.006)  | (0.002)  | <0.002  | <0.0005  | <0.002  | .    | .     |
| 630 | BS 630A    | 81.0  | 10.05    | 3.73  | 0.11    | 4.81    | 0.0069  | 0.037   | 0.019  | 0.17    | (0.002)  | 0.005    | <0.01   | (0.001)  | <0.001  | .    | .     |
| 642 | BS 642A    | 91.0  | 6.70     | 0.17  | 0.005   | 0.025   | 0.001   | 1.80    | 0.018  | 0.011   | <0.002   | 0.001    | 0.001   | <0.001   | <0.002  | .    | .     |
| 655 | BS 655A    | 95.74 | (0.002)  | 0.075 | 0.91    | 0.008   | 0.008   | 3.14    | 0.07   | 0.02    | <0.002   | (0.0006) | (0.004) | (0.0003) | <0.002  | .    | .     |
| 675 | BS 675A    | 58.5  | <0.002   | 1.12  | 0.32    | 0.019   | 0.074   | (0.005) | 0.80   | 39.1    | 0.003    | (0.0007) | 0.010   | (0.0005) | 0.0011  | .    | .     |
| 706 | BS 706A    | 87.60 | (0.002)  | 1.30  | 0.66    | 10.18   | 0.008   | <0.005  | 0.011  | 0.13    | <0.0005  | 0.004    | 0.006   | 0.012    | 0.0006  | .    | .     |
| 715 | BS 715A    | 69.0  | (0.01)   | 0.61  | 0.82    | 30.22   | (0.007) | 0.10    | 0.008  | 0.10    | (0.0014) | 0.03     | 0.006   | 0.001    | (0.003) | .    | .     |
| 863 | BS 863A    | 64.1  | 5.21     | 2.41  | 3.00    | 0.29    | 0.022   | 0.034   | 0.013  | 24.8    | 0.010    | 0.003    | (0.007) | <0.0005  | 0.003   | .    | .     |
| 903 | BS 903B    | 86.7  | (0.001)  | 0.049 | 0.0004  | 0.50    | 0.10    | 0.002   | 7.9    | 4.39    | 0.003    | (0.0004) | 0.073   | 0.006    | 0.003   | .    | .     |
| 932 | BS 932A    | 82.9  | <0.01    | 0.068 | <0.002  | 0.12    | 7.09    | <0.01   | 6.26   | 3.35    | 0.014    | (0.006)  | 0.005   | (0.05)   | 0.097   | .    | .     |
| 954 | BS 954A    | 85.64 | 10.17    | 3.50  | 0.10    | 0.20    | 0.016   | 0.029   | 0.033  | 0.30    | (0.006)  | 0.004    | 0.012   | <0.0001  | 0.001   | .    | .     |
| CDA | Number     | Cu    | Al       | Fe    | Mn      | Ni      | Pb      | Si      | Sn     | Zn      | As       | C        | P       | S        | Sb      | Be   | Co    |

| ALLOY   | NUMBER      | ALLOY   | NUMBER       | ALLOY              | NUMBER      |
|---------|-------------|---------|--------------|--------------------|-------------|
| 110     | IARM 70B    | 674     | 31X HT38     | 947                | IARM 267A   |
| 122     | BAM 366     | 675     | BS 675       | 952.2              | CTIF 2152-S |
| 122     | CURM 09.04  | 675     | BS 675A      | 953                | CTIF CA3    |
| 122.2   | CURM 09.03  | 675     | IARM 83A     | 954                | BS 954A     |
| 125     | CURM 09.01  | 675     | IARM 83B     | 954                | BS 954B     |
| 125     | CURM 09.02  | 687     | BAM 368      | 954                | BS 954C     |
| 145     | BS 14500    | 693     | IARM 313A    | 954                | BS CC954    |
| 145     | IARM 278A   | 697     | CTIF L3      | 954                | IARM 93B    |
| 162     | 36X CCD1    | 702.6   | 37X 218      | 954 MOD            | IARM 204A   |
| 162     | 36X CCD2    | 706     | BAM 367      | 955                | BS 955B     |
| 162     | 36X CCD3    | 706     | BS 706A      | 955                | BS 955C     |
| 170     | SRM C1122   | 706     | BS 706B      | 955                | IARM 94B    |
| 172     | BS 172Be-1  | 706     | CTIF CuNi 10 | 955 MOD            | BS 955 MOD  |
| 172     | CTIF 4872   | 706     | IARM 84B     | 955 MOD            | CTIF CA10   |
| 172     | IARM 71B    | 710     | 36X CN3      | 955.1 MOD          | CTIF CA22   |
| 175     | 36X CBC2    | 713     | BAM 389      | 955.2              | C52.53      |
| 175     | BS 17500    | 715     | 36X CN5      | 956                | 32X CA12    |
| 175.1   | 36X CBC5    | 715     | BS 715A      | 958                | IARM 235A   |
| 180     | 36X 274     | 715     | IARM 85B     | 958.2              | 32X CA1     |
| 181.5   | 36X CCZ     | 715     | IARM 85C     | 964                | IARM 236A   |
| 182     | 36X CCR1    | 715     | SRM 1276a    | 997.5              | 31X MNB12   |
| 182     | IARM 279A   | 762     | 34X NS2      | Coinage Alloy      | 36X CN21    |
| 210     | 31X B24     | 767     | C65.28       | Coinage Alloy      | 36X CN23    |
| 210     | 31X B9      | 812     | 39X 17869    | Envirobrass 2-1    | IARM 226A   |
| 240     | 31X B6      | 815     | IARM 158B    | Envirobrass 2-2    | IARM 227A   |
| 240     | C30.07      | 815     | IARM 158C    | Envirobrass 2-3    | IARM 228A   |
| 260     | C48.06      | 836     | 33X GM5      | Federalloy I-836   | IARM 265A   |
| 260     | CURM 48.04  | 836     | BS 836A-1    | Federalloy I-844   | IARM 264A   |
| 260 MOD | 31X B4      | 836     | IARM 86C     | Federalloy I-848A  | IARM 263A   |
| 261.3   | C48.03      | 838     | 33X GM8      | Federalloy III-932 | IARM 266A   |
| 268     | 31X B28     | 838.1   | 33X RB1      | NARloy-A           | IARM 159A   |
| 268     | 31X TB4     | 844     | IARM 250A    | NARloy-Z           | IARM 160A   |
| 270     | 31X B3      | 855     | 31X B2       | Red Brass          | 33X RB2     |
| 272     | C30.04      | 855     | 31X TB2      | Sebiloy 3          | 31X BIB2    |
| 274     | C38.06      | 855     | 31X TB3      | Spinodal Alloy     | 36X SP1     |
| 280     | C30.03      | 855     | C38.01       | Spinodal Alloy     | 36X SP2     |
| 280     | C30.12      | 855     | C38.02       |                    |             |
| 314     | BS 314B     | 855     | C38.03       |                    |             |
| 314     | IARM 72B    | 855     | C38.04       |                    |             |
| 316     | 31X 7835-7  | 855     | C38.05       |                    |             |
| 360     | BS 360B     | 857     | BS 857B-1    |                    |             |
| 370     | 31X B18     | 857     | IARM 87B     |                    |             |
| 371     | C30.22      | 862     | CTIF LH7     |                    |             |
| 377     | 31X B19     | 863     | IARM 88B     |                    |             |
| 464     | BS 464      | 865     | BS CC865     |                    |             |
| 464     | BS 464A     | 865.5   | 31X B11      |                    |             |
| 464     | IARM 74A    | 874     | 31X WSB2     |                    |             |
| 464     | IARM 74B    | 875     | 31X WSB3     |                    |             |
| 482     | BS 482A     | 875     | IARM 151B    |                    |             |
| 482     | IARM 75B    | 893.2   | IARM 211A    |                    |             |
| 485     | IARM 76C    | 902     | BAM 377      |                    |             |
| 510     | 32X PB20    | 903     | BS 903B      |                    |             |
| 510     | BS 510A     | 903     | IARM 89B     |                    |             |
| 510     | IARM 77A    | 905     | BS 905A-1    |                    |             |
| 510     | IARM 77B    | 905     | BS CC905     |                    |             |
| 521     | 32X PB23    | 907     | 32X PB10     |                    |             |
| 544     | BS 544A     | 910 MOD | CTIF B1      |                    |             |
| 544     | IARM 78B    | 922     | BS 922B-3    |                    |             |
| 615.5   | 36X CN22    | 922     | IARM 90B     |                    |             |
| 622     | CTIF 2154-V | 924 MOD | 33X GM7      |                    |             |
| 623     | 32X CA7     | 925     | CURM 54.05   |                    |             |
| 623     | BS 623A     | 927     | 32X LB11     |                    |             |
| 623     | IARM 79B    | 927.1   | 32X SN1      |                    |             |
| 623     | IARM 79C    | 931 MOD | C71.34       |                    |             |
| 624     | 32X ALB3    | 932     | BS 932E      |                    |             |
| 624     | C52.51      | 932     | IARM 91D     |                    |             |
| 624     | CTIF 3011-G | 932 MOD | CTIF B23     |                    |             |
| 624     | CTIF CA21   | 936     | CTIF B31     |                    |             |
| 630     | 32X CA23    | 937     | BS 937       |                    |             |
| 630     | BS 630A     | 937     | BS 937B-1    |                    |             |
| 630     | IARM 80B    | 937     | BS CC937     |                    |             |
| 632     | 32X CA31    | 937     | CURM 50.02   |                    |             |
| 642     | IARM 81B    | 937 MOD | 32X LB3      |                    |             |
| 647.5   | CTIF 4640   | 938     | BS 938-1     |                    |             |
| 655     | BS 655A     | 941     | IARM 184A    |                    |             |
| 655     | IARM 82B    | 944 MOD | 32X LB10     |                    |             |
| 673     | 31X HT37    | 945 MOD | CTIF B32     |                    |             |

Please use the Adobe Acrobat "search" function to find the complete chemistry of these samples listed within this catalog.

The best efforts have been made in the construction of this chart. Some samples do not perfectly fit the alloy specifications, but are considered acceptable for the purposes of calibration and type standardization.



| Alloy  | Notes                      | Cu     | Ag        | Al        | Fe        | Mn | Ni | P | Pb        | S | Sb | Si         | Sn        | Zn | As | Be        | Bi | Co | Cr | Mg | Ti | Zr |  |
|--------|----------------------------|--------|-----------|-----------|-----------|----|----|---|-----------|---|----|------------|-----------|----|----|-----------|----|----|----|----|----|----|--|
| 157.35 | Cu = Ag+Cu, O 0.28-0.37    | >99.24 |           | 0.33-0.37 | <0.01     |    |    |   | <0.01     |   |    |            |           |    |    |           |    |    |    |    |    |    |  |
| 157.6  | Cu = Ag+Cu, O 0.52-0.59    | >98.77 |           | 0.58-0.62 | <0.01     |    |    |   | <0.01     |   |    |            |           |    |    |           |    |    |    |    |    |    |  |
| 162    | Cu = Ag+Cu, CH 0.70-1.20   | rem    |           |           | <0.02     |    |    |   |           |   |    |            |           |    |    |           |    |    |    |    |    |    |  |
| 162.1  | Cu = Ag+Cu, CH 0.50-1.20   | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    |           |    |    |    |    |    |    |  |
| 164    | Cu = Fe, ALL, CH 0.60-0.90 | >99.80 |           |           | <0.02     |    |    |   |           |   |    |            | 0.20-0.40 |    |    |           |    |    |    |    |    |    |  |
| 165    | Cu = Ag+Cu, CH 0.60-1.00   | rem    |           | <0.20     | <0.02     |    |    |   |           |   |    | <0.20      | 0.50-0.70 |    |    | 1.60-1.78 |    |    |    |    |    |    |  |
| 170    | Cu = Ag+Cu, Ni+CO >0.20    | rem    |           | <0.20     |           |    |    |   |           |   |    | <0.20      |           |    |    | 1.80-2.00 |    |    |    |    |    |    |  |
| 172    | Cu = Ag+Cu, Ni+CO >0.20    | rem    |           | <0.20     |           |    |    |   | 0.20-0.60 |   |    | <0.20      |           |    |    | 1.80-2.00 |    |    |    |    |    |    |  |
| 173    | Cu = Ag+Cu, Ni+CO >0.20    | rem    |           | <0.20     |           |    |    |   |           |   |    | <0.20      |           |    |    | 1.80-2.00 |    |    |    |    |    |    |  |
| 174    | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.15-0.50 |    |    |    |    |    |    |  |
| 174.1  | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.05-0.50 |    |    |    |    |    |    |  |
| 174.2  | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.05-0.50 |    |    |    |    |    |    |  |
| 174.5  | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.15-0.50 |    |    |    |    |    |    |  |
| 174.55 | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.15-0.50 |    |    |    |    |    |    |  |
| 174.6  | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.15-0.50 |    |    |    |    |    |    |  |
| 174.65 | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.05-0.50 |    |    |    |    |    |    |  |
| 175    | Cu = Ag+Cu                 | rem    |           | <0.20     | <0.10     |    |    |   |           |   |    | <0.20      |           |    |    | 0.05-0.50 |    |    |    |    |    |    |  |
| 175.1  | Cu = Ag+Cu, Ni = Ni+CO     | rem    |           | <0.20     | <0.10     |    |    |   |           |   |    | <0.20      |           |    |    | 0.05-0.50 |    |    |    |    |    |    |  |
| 175.2  | Cu = Ag+Cu, Ni = Ni+CO     | rem    |           | <0.20     | <0.10     |    |    |   |           |   |    | <0.20      |           |    |    | 0.05-0.50 |    |    |    |    |    |    |  |
| 175.3  | Cu = Ag+Cu, Ni = Ni+CO     | rem    |           | <0.6      | <0.20     |    |    |   |           |   |    | <0.20      |           |    |    | 0.15-0.50 |    |    |    |    |    |    |  |
| 176    | Cu = Ag+Cu                 | rem    | 0.90-1.10 | <0.20     | <0.10     |    |    |   |           |   |    | <0.20      |           |    |    | 0.15-0.50 |    |    |    |    |    |    |  |
| 177    | Cu = Ag+Cu, Te 0.40-0.60   | rem    |           | <0.20     | <0.10     |    |    |   |           |   |    | <0.20      |           |    |    | 0.40-0.70 |    |    |    |    |    |    |  |
| 180    | Cu = Ag+Cu, Ni = Ni+CO     | rem    |           | <0.15     | <0.15     |    |    |   |           |   |    | 0.40-0.80  |           |    |    | 0.40-0.70 |    |    |    |    |    |    |  |
| 180.3  | Cu = Ag+Cu                 | >99.90 |           |           |           |    |    |   |           |   |    | 0.08-0.12  |           |    |    | 0.25-0.35 |    |    |    |    |    |    |  |
| 180.4  | Cu = Ag+Cu                 | >99.90 |           |           |           |    |    |   |           |   |    | 0.20-0.30  |           |    |    | 0.25-0.35 |    |    |    |    |    |    |  |
| 180.45 | Cu = Ag+Cu                 | >99.10 |           |           |           |    |    |   |           |   |    | <0.05      |           |    |    | 0.20-0.35 |    |    |    |    |    |    |  |
| 180.5  | Cu = Ag+Cu, Te 0.005-0.015 | >99.80 |           |           |           |    |    |   |           |   |    | 0.02-0.07  |           |    |    | 0.05-0.15 |    |    |    |    |    |    |  |
| 180.7  | Cu = Ag+Cu                 | >99.80 |           |           |           |    |    |   |           |   |    | 0.01-0.10  |           |    |    | 0.15-0.40 |    |    |    |    |    |    |  |
| 180.8  | Cu = Ag+Cu                 | rem    | 0.01-0.30 |           | 0.02-0.20 |    |    |   |           |   |    | 0.01-0.10  |           |    |    | 0.20-0.70 |    |    |    |    |    |    |  |
| 180.9  | Cu = Ag+Cu                 | >96.00 |           |           |           |    |    |   |           |   |    | 0.50-1.20  |           |    |    | 0.30-1.00 |    |    |    |    |    |    |  |
| 181    | Cu = Ag+Cu                 | >98.70 |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.4-1.0   |    |    |    |    |    |    |  |
| 181.35 | Cu = Ag+Cu, CH 0.20-0.60   | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.20-0.60 |    |    |    |    |    |    |  |
| 181.4  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.15-0.45 |    |    |    |    |    |    |  |
| 181.45 | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    | 0.005-0.05 |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    | 0.10-0.30 |    |    |    |    |    |    |  |
| 181.5  | Cu = Ag+Cu                 | rem    |           |           |           |    |    |   |           |   |    |            |           |    |    |           |    |    |    |    |    |    |  |

| Alloy | Notes   | Cu        | Ag | Al     | Fe        | Mn    | Ni      | P         | Pb        | S | Sb        | Si        | Sn        | Zn        | As        | Be | Bi | Co    | Cr    | Mg        | Ti      | Zr    |
|-------|---------|-----------|----|--------|-----------|-------|---------|-----------|-----------|---|-----------|-----------|-----------|-----------|-----------|----|----|-------|-------|-----------|---------|-------|
| 197.1 | Ni<0.10 | rem       |    |        | 0.30-1.20 | <0.05 | <0.05   | 0.10-0.40 | <0.05     |   |           |           | <0.02     | <0.20     |           |    |    | <0.05 |       | 0.01-0.20 |         |       |
| 197.2 | Ni<0.10 | rem       |    |        | 0.05-0.40 | <0.05 | <0.10   | 0.07-0.15 | <0.05     |   |           |           | <0.20     | <0.20     |           |    |    |       |       | 0.02-0.06 |         |       |
| 197.5 |         | rem       |    |        | 0.35-1.20 | <0.05 | <0.05   | 0.10-0.40 | <0.05     |   |           |           | 0.05-0.40 | <0.20     |           |    |    |       |       | 0.05-0.20 |         |       |
| 198   |         | rem       |    |        | 0.02-1.20 | <0.05 | <0.05   | 0.01-0.10 | <0.05     |   |           |           | 0.10-1.00 | 0.30-1.50 |           |    |    |       |       | 0.01-0.20 |         |       |
| 198.1 |         | rem       |    |        | 1.5-3.0   |       |         | <0.10     |           |   |           |           |           | 1.0-5.0   |           |    |    |       | <0.10 | <0.10     | 2.9-3.4 | <0.10 |
| 199   |         | >99.50    |    |        |           |       |         |           |           |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 205   |         | 97.0-98.0 |    |        | <0.05     |       |         |           | <0.02     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 210   |         | 94.0-96.0 |    |        | <0.05     |       |         |           | <0.03     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 220   |         | 89.0-91.0 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 226   |         | 86.0-89.0 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 230   |         | 84.0-86.0 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 230.3 |         | 81.5-85.5 |    |        | <0.05     |       |         |           | <0.05     |   |           | 0.20-0.40 |           | rem       |           |    |    |       |       |           |         |       |
| 234   |         | 81.0-84.0 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 240   |         | 78.5-81.5 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 240.8 |         | 78.0-82.0 |    | <0.10  | <0.05     |       |         |           | <0.20     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 250   |         | 74.0-76.0 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 256   |         | 71.0-73.0 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 260   |         | 68.5-71.5 |    |        | <0.05     |       |         |           | <0.07     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 261   |         | 68.5-71.5 |    |        | <0.05     |       |         | 0.02-0.05 | <0.05     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 261.3 |         | 68.5-71.5 |    |        | <0.05     |       |         |           | <0.05     |   |           |           |           | rem       | 0.02-0.08 |    |    |       |       |           |         |       |
| 262   |         | 67.0-70.0 |    |        | <0.05     |       |         |           | <0.07     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 263.8 |         | 68.0-72.0 |    | <0.10  | <0.05     |       |         |           | <0.30     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 268   |         | 64.0-68.5 |    |        | <0.05     |       |         |           | <0.15     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 270   |         | 63.0-68.5 |    |        | <0.07     |       |         |           | <0.10     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 272   |         | 62.0-65.0 |    |        | <0.07     |       |         |           | <0.10     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 274   |         | 61.0-64.0 |    |        | <0.05     |       |         |           | <0.10     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 280   |         | 59.0-63.0 |    |        | <0.07     |       |         |           | <0.30     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 282   |         | 58.0-61.0 |    | <0.005 | <0.05     |       |         | 0.12-0.22 | <0.03     |   |           |           | <0.05     | rem       |           |    |    |       |       |           |         |       |
| 285.8 |         | 49.0-52.0 |    | <0.10  | <0.10     |       |         |           | <0.50     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 298   |         | 49.0-52.0 |    | <0.10  | <0.10     |       |         |           | <0.50     |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 310   |         | 89.0-91.0 |    |        | <0.10     |       |         |           | 0.30-0.70 |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 312   |         | 87.5-90.5 |    |        | <0.10     |       | <0.25   |           | 0.7-1.2   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 314   |         | 87.5-90.5 |    |        | <0.10     |       | <0.7    |           | 1.3-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 316   |         | 87.5-90.5 |    |        | <0.10     |       | 0.7-1.2 | 0.04-0.10 | 1.3-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| Alloy | Notes   | Cu        | Ag | Al     | Fe        | Mn    | Ni      | P         | Pb        | S | Sb        | Si        | Sn        | Zn        | As        | Be | Bi | Co    | Cr    | Mg        | Ti      | Zr    |
| 320   |         | 83.5-86.5 |    |        | <0.10     |       | <0.25   |           | 1.5-2.2   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 325   |         | 72.0-74.5 |    |        | <0.10     |       |         |           | 2.5-3.0   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 325.1 |         | 69.0-72.0 |    |        | <0.07     |       |         |           | 0.30-0.70 |   |           |           |           | rem       | 0.02-0.06 |    |    |       |       |           |         |       |
| 330   |         | 65.0-68.0 |    |        | <0.06     |       |         |           | 0.25-0.70 |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 331   |         | 65.0-68.0 |    |        | <0.06     |       |         |           | 0.8-1.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 332   |         | 65.0-68.0 |    |        | <0.07     |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 335   |         | 62.0-65.0 |    |        | <0.15     |       |         |           | 0.25-0.70 |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 335.3 |         | 62.5-66.5 |    |        | <0.10     |       |         |           | 0.30-0.80 |   |           |           |           | rem       | 0.02-0.06 |    |    |       |       |           |         |       |
| 340   |         | 62.0-65.0 |    |        | <0.15     |       |         |           | 0.8-1.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 342   |         | 62.0-65.0 |    |        | <0.15     |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 344   |         | 62.0-66.0 |    |        | <0.10     |       |         |           | 0.50-1.00 |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 345   |         | 62.0-65.0 |    |        | <0.15     |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 347   |         | 62.5-64.5 |    |        | <0.10     |       |         |           | 1.0-1.8   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 348   |         | 61.5-63.5 |    |        | <0.10     |       |         |           | 0.40-0.80 |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 349   |         | 61.0-64.0 |    |        | <0.10     |       |         |           | 0.10-0.50 |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 350   |         | 60.0-63.0 |    |        | <0.15     |       |         |           | 0.8-2.0   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 353   |         | 60.0-63.0 |    |        | <0.15     |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 353.3 |         | 60.5-64.0 |    |        | <0.15     |       |         |           | 1.5-3.5   |   |           |           |           | rem       | 0.02-0.25 |    |    |       |       |           |         |       |
| 353.4 |         | 60.0-63.0 |    |        | 0.10-0.30 |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 356   |         | 60.0-63.0 |    |        | <0.15     |       |         |           | 2.0-3.0   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 360   |         | 60.0-63.0 |    |        | <0.35     |       |         |           | 2.5-3.7   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 362   |         | 60.0-63.0 |    |        | <0.15     |       |         |           | 3.5-4.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 365   |         | 58.0-61.0 |    |        | <0.15     |       |         |           | 0.25-0.70 |   |           |           | <0.25     | rem       |           |    |    |       |       |           |         |       |
| 366   |         | 58.0-61.0 |    |        | <0.15     |       |         |           | 0.25-0.70 |   |           |           | <0.25     | rem       | 0.02-0.06 |    |    |       |       |           |         |       |
| 367   |         | 58.0-61.0 |    |        | <0.15     |       |         |           | 0.24-0.70 |   | 0.02-0.10 |           |           | rem       |           |    |    |       |       |           |         |       |
| 368   |         | 58.0-61.0 |    |        | <0.15     |       |         | 0.02-0.10 | 0.25-0.70 |   |           |           | <0.25     | rem       |           |    |    |       |       |           |         |       |
| 370   |         | 59.0-62.0 |    |        | <0.15     |       |         |           | 0.8-1.5   |   |           |           | <0.25     | rem       |           |    |    |       |       |           |         |       |
| 371   |         | 58.0-62.0 |    |        | <0.15     |       |         |           | 0.6-1.2   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 377   |         | 58.0-61.0 |    |        | <0.30     |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 377.1 |         | 56.5-60.0 |    |        | <0.30     |       |         |           | 1.0-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 378   |         | 56.0-59.0 |    |        | <0.30     |       |         |           | 1.5-2.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 380   |         | 55.0-60.0 |    | <0.50  | <0.35     |       |         |           | 1.5-2.5   |   |           |           | <0.30     | rem       |           |    |    |       |       |           |         |       |
| 380.1 |         | 0.10-0.60 |    |        | <0.30     |       |         |           | 1.5-3.0   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| 385   |         | 55.0-59.0 |    |        | <0.35     |       |         |           | 2.5-3.5   |   |           |           |           | rem       |           |    |    |       |       |           |         |       |
| Alloy | Notes   | Cu        | Ag | Al     | Fe        | Mn    | Ni      | P         | Pb        | S | Sb        | Si        | Sn        | Zn        | As        | Be | Bi | Co    | Cr    | Mg        | Ti      | Zr    |

| Alloy  | Notes      | Cu        | Ag | Al | Fe        | Mn | Ni | P | Pb        | S | Sb    | Si | Sn        | Zn        | As | Be | Bi | Co | Cr | Mg | Ti | Zr |  |
|--------|------------|-----------|----|----|-----------|----|----|---|-----------|---|-------|----|-----------|-----------|----|----|----|----|----|----|----|----|--|
| 385.1  |            | 56.0-60.0 |    |    |           |    |    |   | 2.5-4.5   |   |       |    |           | rem       |    |    |    |    |    |    |    |    |  |
| 385.9  |            | <0.35     |    |    | <0.35     |    |    |   | 2.0-3.5   |   |       |    |           | rem       |    |    |    |    |    |    |    |    |  |
| 386    |            | <0.35     |    |    | <0.35     |    |    |   | 2.5-3.5   |   | <0.02 |    |           | rem       |    |    |    |    |    |    |    |    |  |
| 404    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.35-0.70 | 2.0-3.0   |    |    |    |    |    |    |    |    |  |
| 405    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.7-1.3   | rem       |    |    |    |    |    |    |    |    |  |
| 408    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 1.8-2.2   | rem       |    |    |    |    |    |    |    |    |  |
| 408.1  |            | 0.08-0.12 |    |    | 0.08-0.12 |    |    |   | <0.05     |   |       |    | 1.8-2.2   | rem       |    |    |    |    |    |    |    |    |  |
| 408.2  |            | >94.00    |    |    | >94.00    |    |    |   | <0.05     |   |       |    | 1.0-2.5   | 0.20-2.50 |    |    |    |    |    |    |    |    |  |
| 408.5  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 2.6-4.0   | rem       |    |    |    |    |    |    |    |    |  |
| 408.6  |            | 0.01-0.05 |    |    | 0.01-0.05 |    |    |   | <0.05     |   |       |    | 1.7-2.3   | rem       |    |    |    |    |    |    |    |    |  |
| 409    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.50-0.80 | rem       |    |    |    |    |    |    |    |    |  |
| 410    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 2.0-2.8   | rem       |    |    |    |    |    |    |    |    |  |
| 411    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 0.30-0.70 | rem       |    |    |    |    |    |    |    |    |  |
| 411.2  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.10     |   |       |    | 0.30-0.70 | rem       |    |    |    |    |    |    |    |    |  |
| 413    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 0.7-1.3   | rem       |    |    |    |    |    |    |    |    |  |
| 415    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 1.5-2.2   | rem       |    |    |    |    |    |    |    |    |  |
| 419    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 4.8-5.5   | rem       |    |    |    |    |    |    |    |    |  |
| 420    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 1.5-2.0   | rem       |    |    |    |    |    |    |    |    |  |
| 421    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 2.2-3.0   | rem       |    |    |    |    |    |    |    |    |  |
| 422    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.8-1.4   | rem       |    |    |    |    |    |    |    |    |  |
| 422.2  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 0.7-1.4   | rem       |    |    |    |    |    |    |    |    |  |
| 425    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 1.5-3.0   | rem       |    |    |    |    |    |    |    |    |  |
| 425.2  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 1.5-3.0   | rem       |    |    |    |    |    |    |    |    |  |
| 426    |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 2.5-4.0   | rem       |    |    |    |    |    |    |    |    |  |
| 430    | Ni = Ni+Co | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 1.7-2.7   | rem       |    |    |    |    |    |    |    |    |  |
| 432    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.40-0.60 | rem       |    |    |    |    |    |    |    |    |  |
| 434    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.40-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 435    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 0.6-1.2   | rem       |    |    |    |    |    |    |    |    |  |
| 436    |            | <0.05     |    |    | <0.05     |    |    |   | <0.10     |   |       |    | 0.20-0.50 | rem       |    |    |    |    |    |    |    |    |  |
| 438    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 1.0-1.5   | rem       |    |    |    |    |    |    |    |    |  |
| 442.5  |            | <0.20     |    |    | <0.20     |    |    |   | <0.07     |   |       |    | 0.50-1.50 | rem       |    |    |    |    |    |    |    |    |  |
| 443    |            | <0.06     |    |    | <0.06     |    |    |   | <0.07     |   |       |    | 0.8-1.2   | rem       |    |    |    |    |    |    |    |    |  |
| 444    |            | <0.06     |    |    | <0.06     |    |    |   | <0.07     |   |       |    | 0.8-1.2   | rem       |    |    |    |    |    |    |    |    |  |
| 445    |            | <0.06     |    |    | <0.06     |    |    |   | <0.07     |   |       |    | 0.8-1.2   | rem       |    |    |    |    |    |    |    |    |  |
| 454.5  |            | 0.20-0.40 |    |    | 0.20-0.40 |    |    |   | <0.10     |   |       |    | 0.10-0.30 | rem       |    |    |    |    |    |    |    |    |  |
| 462    |            | <0.10     |    |    | <0.10     |    |    |   | <0.20     |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 462.1  |            | <0.03     |    |    | <0.03     |    |    |   | <0.05     |   |       |    | <1.00     | rem       |    |    |    |    |    |    |    |    |  |
| 464    |            | <0.10     |    |    | <0.10     |    |    |   | <0.20     |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 464.2  |            | <0.10     |    |    | <0.10     |    |    |   | <0.20     |   |       |    | 1.0-1.4   | rem       |    |    |    |    |    |    |    |    |  |
| 465    |            | <0.10     |    |    | <0.10     |    |    |   | <0.20     |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 466    |            | <0.10     |    |    | <0.10     |    |    |   | <0.20     |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 467    |            | <0.10     |    |    | <0.10     |    |    |   | <0.20     |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 470    |            | <0.01     |    |    | <0.01     |    |    |   | <0.05     |   |       |    | 0.25-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 472    |            | <0.10     |    |    | <0.10     |    |    |   | <0.50     |   |       |    | 3.0-4.0   | rem       |    |    |    |    |    |    |    |    |  |
| 476    |            | <0.05     |    |    | <0.05     |    |    |   | 1.8-2.2   |   |       |    | 1.8-2.2   | rem       |    |    |    |    |    |    |    |    |  |
| 479.4  | Ni = Ni+Co | 0.10-1.00 |    |    | 0.10-1.00 |    |    |   | 1.0-2.0   |   |       |    | 1.2-2.0   | rem       |    |    |    |    |    |    |    |    |  |
| 482    |            | <0.10     |    |    | <0.10     |    |    |   | 0.40-1.00 |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 485    |            | <0.10     |    |    | <0.10     |    |    |   | 1.3-2.2   |   |       |    | 0.50-1.00 | rem       |    |    |    |    |    |    |    |    |  |
| 485.1  |            | <0.10     |    |    | <0.10     |    |    |   | 1.0-2.5   |   |       |    | 0.7-1.5   | rem       |    |    |    |    |    |    |    |    |  |
| 486    |            | <0.10     |    |    | <0.10     |    |    |   | 1.0-2.5   |   |       |    | 0.8-1.5   | rem       |    |    |    |    |    |    |    |    |  |
| 490.8  |            | <0.10     |    |    | <0.10     |    |    |   | <0.50     |   |       |    | 3.0-4.0   | rem       |    |    |    |    |    |    |    |    |  |
| 501    |            | <0.05     |    |    | <0.05     |    |    |   | <0.05     |   |       |    | 0.50-0.80 | rem       |    |    |    |    |    |    |    |    |  |
| 502    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 1.0-1.5   | rem       |    |    |    |    |    |    |    |    |  |
| 505    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 1.0-1.7   | rem       |    |    |    |    |    |    |    |    |  |
| 505.1  |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 1.0-1.5   | 0.10-0.25 |    |    |    |    |    |    |    |    |  |
| 505.8  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 1.0-1.7   | <0.30     |    |    |    |    |    |    |    |    |  |
| 505.9  |            | >97.00    |    |    | >97.00    |    |    |   | <0.02     |   |       |    | 0.5-1.5   | <0.50     |    |    |    |    |    |    |    |    |  |
| 507    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 1.5-2.0   | rem       |    |    |    |    |    |    |    |    |  |
| 507.05 |            | >96.50    |    |    | >96.50    |    |    |   | <0.02     |   |       |    | 1.5-2.0   | <0.50     |    |    |    |    |    |    |    |    |  |
| 507.1  |            | <0.10     |    |    | <0.10     |    |    |   | <0.02     |   |       |    | 1.7-2.3   | rem       |    |    |    |    |    |    |    |    |  |
| 507.15 |            | 0.05-0.15 |    |    | 0.05-0.15 |    |    |   | <0.02     |   |       |    | 1.7-2.3   | rem       |    |    |    |    |    |    |    |    |  |
| 507.25 |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.02     |   |       |    | 1.5-2.5   | 1.5-3.0   |    |    |    |    |    |    |    |    |  |
| 507.8  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 1.7-2.3   | <0.30     |    |    |    |    |    |    |    |    |  |
| 508    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 2.6-3.4   | rem       |    |    |    |    |    |    |    |    |  |
| 509    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 2.5-3.8   | <0.30     |    |    |    |    |    |    |    |    |  |
| 510    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 4.2-5.8   | <0.30     |    |    |    |    |    |    |    |    |  |
| 510.8  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 4.8-5.8   | <0.30     |    |    |    |    |    |    |    |    |  |
| 511    |            | <0.10     |    |    | <0.10     |    |    |   | <0.05     |   |       |    | 3.5-4.9   | <0.30     |    |    |    |    |    |    |    |    |  |
| 511.8  |            | 0.05-0.20 |    |    | 0.05-0.20 |    |    |   | <0.05     |   |       |    | 3.5-4.9   | <0.30     |    |    |    |    |    |    |    |    |  |
| 511.9  |            | 0.05-0.15 |    |    | 0.05-0.15 |    |    |   | <0.02     |   |       |    | 3.0-6.5   | rem       |    |    |    |    |    |    |    |    |  |
| Alloy  | Notes      | Cu        | Ag | Al | Fe        | Mn | Ni | P | Pb        | S | Sb    | Si | Sn        | Zn        | As | Be | Bi | Co | Cr | Mg | Ti | Zr |  |

| Alloy  | Notes               | Cu        | Ag        | Al        | Fe        | Mn        | Ni        | P         | Pb      | S | Sb | Si | Sn        | Zn        | As | Be | Bi | Co | Cr | Mg | Ti | Zr |       |
|--------|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---|----|----|-----------|-----------|----|----|----|----|----|----|----|----|-------|
| 518    |                     | rem       |           | <0.01     | <0.10     |           |           | 0.10-0.35 | <0.02   |   |    |    | 4.0-6.0   | <0.30     |    |    |    |    |    |    |    |    |       |
| 519    |                     | rem       |           |           | 0.05-0.20 |           |           | 0.03-0.35 | <0.05   |   |    |    | 5.0-7.0   | <0.30     |    |    |    |    |    |    |    |    |       |
| 521    |                     | rem       |           |           | <0.10     |           | 0.05-0.20 | 0.03-0.35 | <0.05   |   |    |    | 5.0-7.0   | <0.20     |    |    |    |    |    |    |    |    |       |
| 521.8  |                     | rem       |           |           | 0.05-0.20 |           | 0.05-0.20 | 0.02-0.10 | <0.05   |   |    |    | 7.0-9.0   | <0.30     |    |    |    |    |    |    |    |    |       |
| 524    |                     | rem       |           |           | <0.10     |           |           | 0.03-0.35 | <0.05   |   |    |    | 9.0-11.0  | <0.20     |    |    |    |    |    |    |    |    |       |
| 524.8  | Cu+Mn+P+Sb >99.5    | rem       |           |           | 0.05-0.20 |           | 0.05-0.20 | 0.02-0.10 | <0.05   |   |    |    | 9.0-11.0  | <0.20     |    |    |    |    |    |    |    |    |       |
| 526    |                     | rem       |           |           | <0.10     | 1.0-2.0   |           | 0.03-0.35 | <0.05   |   |    |    | 2.2-3.3   | <0.20     |    |    |    |    |    |    |    |    |       |
| 529    |                     | rem       |           |           | <0.10     | 1.0-2.0   |           | 0.03-0.35 | <0.05   |   |    |    | 7.0-9.0   | <0.20     |    |    |    |    |    |    |    |    |       |
| 532    |                     | rem       |           |           | <0.10     |           |           | 0.03-0.35 | 2.5-4.0 |   |    |    | 4.0-5.5   | <0.20     |    |    |    |    |    |    |    |    |       |
| 534    |                     | rem       |           |           | <0.10     |           |           | 0.03-0.35 | 0.8-1.2 |   |    |    | 3.5-5.8   | <0.30     |    |    |    |    |    |    |    |    |       |
| 544    |                     | rem       |           |           | <0.10     |           |           | 0.01-0.50 | 3.5-4.5 |   |    |    | 1.5-4.5   | <0.30     |    |    |    |    |    |    |    |    |       |
| 546    |                     | rem       |           |           | <0.10     |           |           | 0.01-0.50 | 3.5-4.5 |   |    |    | 1.5-4.5   | <0.30     |    |    |    |    |    |    |    |    |       |
| 548    | Cu+P+Fe+Sn+Zn >99.5 |           |           |           | <0.10     |           |           | 0.03-0.35 | 4.0-6.0 |   |    |    | 4.0-6.0   | <0.30     |    |    |    |    |    |    |    |    |       |
| 551.8  | Cu+P >99.85         | rem       |           |           |           |           |           | 4.8-5.2   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 551.81 | Cu+P >99.85         | rem       | 1.80-2.20 |           |           |           |           | 7.0-7.5   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 552.8  |                     | rem       | 4.80-5.20 |           |           |           |           | 6.8-7.2   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 552.81 |                     | rem       | 4.80-5.20 |           |           |           |           | 5.8-6.2   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 552.82 |                     | rem       | 4.80-5.20 |           |           |           |           | 6.5-7.0   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 552.83 |                     | rem       | 5.80-6.20 |           |           |           |           | 7.0-7.5   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 552.84 |                     | rem       | 14.5-15.5 |           |           |           |           | 4.8-5.2   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 552.85 |                     | rem       | 17.2-18.0 |           |           |           |           | 6.0-6.7   |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 566    |                     | rem       | 29-31     |           | <0.50     |           |           |           |         |   |    |    |           | 30-34     |    |    |    |    |    |    |    |    |       |
| 606    |                     | rem       |           | 4.0-7.0   |           |           |           |           |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 607    |                     | rem       |           | 2.3-2.9   |           |           |           |           | <0.01   |   |    |    | 1.7-2.0   |           |    |    |    |    |    |    |    |    |       |
| 608    |                     | rem       |           | 5.0-6.5   | <0.10     |           |           |           | <0.10   |   |    |    |           | 0.20-0.35 |    |    |    |    |    |    |    |    |       |
| 610    |                     | rem       |           | 6.0-8.5   | <0.50     |           |           |           | <0.02   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 613    |                     | rem       |           | 6.0-7.5   | 2.0-3.0   | <0.20     | <0.15     | <0.015    | <0.01   |   |    |    | 0.20-0.50 | <0.10     |    |    |    |    |    |    |    |    |       |
| 614    |                     | rem       |           | 6.0-8.0   | 1.5-3.5   | <1.00     | 1.8-2.2   | <0.015    | <0.01   |   |    |    |           | <0.20     |    |    |    |    |    |    |    |    |       |
| 615    | Cu = Ag+Cu          | rem       |           | 7.7-8.3   |           |           |           |           | <0.015  |   |    |    |           |           |    |    |    |    |    |    |    |    |       |
| 615.5  | Cu = Ag+Cu          | rem       |           | 5.5-6.5   | <0.20     |           | 1.5-2.5   |           | <0.02   |   |    |    |           | <0.80     |    |    |    |    |    |    |    |    |       |
| 618    | Cu = Ag+Cu          | rem       |           | 8.5-11.0  | 0.50-1.50 |           |           |           | <0.05   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 619    | Cu = Ag+Cu          | rem       |           | 8.5-11.0  | 3.0-4.5   |           |           |           | <0.02   |   |    |    |           | <0.80     |    |    |    |    |    |    |    |    |       |
| 622    | Cu = Ag+Cu          | rem       |           | 11.0-32.0 | 2.0-4.2   |           |           |           | <0.02   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 623    | Cu = Ag+Cu          | rem       |           | 8.5-10.0  | 2.0-4.0   | <0.50     | <1.0      |           | <0.02   |   |    |    |           | <0.25     |    |    |    |    |    |    |    |    |       |
| 624    | Cu = Ag+Cu          | rem       |           | 10.0-11.5 | 2.0-4.5   | <0.30     |           |           |         |   |    |    |           | <0.25     |    |    |    |    |    |    |    |    |       |
| 625    | Cu = Ag+Cu          | rem       |           | 12.5-13.5 | 3.5-5.0   | <2.00     |           |           | <0.02   |   |    |    |           | <0.04     |    |    |    |    |    |    |    |    |       |
| 625.8  | Cu = Ag+Cu          | rem       |           | 12.0-13.0 | 3.0-5.0   |           |           |           | <0.02   |   |    |    |           | <0.04     |    |    |    |    |    |    |    |    |       |
| 625.81 | Cu = Ag+Cu          | rem       |           | 13.0-14.0 | 3.0-5.0   |           |           |           | <0.02   |   |    |    |           | <0.02     |    |    |    |    |    |    |    |    |       |
| 625.82 | Cu = Ag+Cu          | rem       |           | 14.0-15.0 | 3.0-5.0   |           |           |           | <0.02   |   |    |    |           | <0.02     |    |    |    |    |    |    |    |    |       |
| 627.3  | Cu = Ag+Cu          | rem       |           | 8.5-11.0  | 4.0-6.0   | <0.50     | 4.0-6.0   |           | <0.05   |   |    |    |           | <0.40     |    |    |    |    |    |    |    |    | <0.05 |
| 630    | Cu = Ag+Cu          | rem       |           | 9.0-11.0  | 2.0-4.0   | <1.50     | 4.0-5.5   |           |         |   |    |    |           | <0.20     |    |    |    |    |    |    |    |    |       |
| 630.1  | Cu = Ag+Cu          | rem       |           | 9.7-10.9  | 2.0-3.5   | <1.50     | 4.5-5.5   |           |         |   |    |    |           | <0.30     |    |    |    |    |    |    |    |    |       |
| 630.2  | Cu = Ag+Cu          | rem       |           | 10.5-11.5 | 4.0-5.5   | <1.50     | 4.2-6.0   |           | <0.03   |   |    |    |           | <0.30     |    |    |    |    |    |    |    |    |       |
| 632    | Cu = Ag+Cu          | rem       |           | 8.7-9.5   | 3.5-4.3   | 1.2-2.0   | 4.0-4.8   |           | <0.02   |   |    |    |           | <0.15     |    |    |    |    |    |    |    |    | <0.20 |
| 632.3  | Cu = Ag+Cu          | 75.9-84.5 |           | 8.5-9.5   | 3.0-5.0   | <3.50     | 4.0-5.5   |           | <0.02   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 632.8  | Cu = Ag+Cu          | rem       |           | 8.5-9.5   | 3.0-5.0   | 0.6-3.5   | 4.0-5.5   |           | <0.02   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 633    | Cu = Ag+Cu          | rem       |           | 5.0-7.5   | 2.0-6.0   | 11.0-13.0 | 1.0-2.5   |           | <0.02   |   |    |    |           | <1.50     |    |    |    |    |    |    |    |    |       |
| 633.8  | Cu = Ag+Cu          | rem       |           | 7.0-8.5   | 2.0-4.0   | 11.0-14.0 | 1.5-3.0   |           | <0.02   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 634    | Cu = Ag+Cu          | rem       |           | 2.6-3.2   | <0.15     |           | <0.15     |           | <0.05   |   |    |    |           | <0.15     |    |    |    |    |    |    |    |    |       |
| 636    | Cu = Ag+Cu          | rem       |           | 3.0-4.0   | <0.15     | <0.10     | <0.15     |           | <0.05   |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 638    | Cu = Ag+Cu          | rem       |           | 2.5-3.1   | <0.20     | <0.10     | <0.20     |           | <0.05   |   |    |    |           | <0.80     |    |    |    |    |    |    |    |    |       |
| 641.1  | Cu = Ag+Cu          | rem       |           | 8.0-11.0  | <0.30     | <0.50     | 1.0-2.0   |           | 1.0-2.0 |   |    |    |           | <0.10     |    |    |    |    |    |    |    |    |       |
| 642    | Cu = Ag+Cu          | rem       |           | 6.3-7.6   | <0.30     | <0.10     | <0.25     |           | <0.05   |   |    |    |           | 1.5-2.2   |    |    |    |    |    |    |    |    |       |
| 642.1  | Cu = Ag+Cu          | rem       |           | 6.3-7.0   | <0.30     | <0.10     | <0.25     |           | <0.05   |   |    |    |           | 1.5-2.0   |    |    |    |    |    |    |    |    |       |
| 642.5  | Cu = Ag+Cu          | rem       |           | 5.5-7.5   | <1.00     | <0.50     | 1.6-2.2   |           | <0.05   |   |    |    |           | 1.5-3.0   |    |    |    |    |    |    |    |    |       |
| 644    | Cu = Ag+Cu          | rem       |           | 3.5-4.5   | <0.05     |           | 4.2-5.0   |           | <0.03   |   |    |    |           | <0.20     |    |    |    |    |    |    |    |    |       |
| 647    | Cu = Ag+Cu          | rem       |           |           | <0.10     |           | 1.6-2.2   |           | <0.10   |   |    |    |           | 0.40-0.80 |    |    |    |    |    |    |    |    |       |
| 647.1  | Cu = Ag+Cu          | >95.00    |           |           |           | <0.10     | 2.9-3.5   |           |         |   |    |    |           | 0.20-0.90 |    |    |    |    |    |    |    |    |       |
| 647.2  | Cu = Ag+Cu          | rem       |           |           |           |           | 1.6-2.2   |           |         |   |    |    |           | 0.10-0.40 |    |    |    |    |    |    |    |    |       |
| 647.5  | Cu = Ag+Cu          | rem       |           |           | <0.25     |           | 1.3-2.7   |           | <0.01   |   |    |    |           | 0.20-0.80 |    |    |    |    |    |    |    |    |       |
| 647.25 | Cu = Ag+Cu          | >95.00    | Cs <0.01  |           |           |           | 2.9-3.5   |           | <0.01   |   |    |    |           | 0.50-1.50 |    |    |    |    |    |    |    |    |       |
| 647.3  | Cu = Ag+Cu          | rem       |           |           |           | <0.10     | 1.0-2.0   |           | <0.01   |   |    |    |           | 1.0-1.5   |    |    |    |    |    |    |    |    |       |
| 647.4  | Cu = Ag+Cu          | >95.00    | Cs <0.01  |           |           |           | 1.0-3.0   |           | <0.01   |   |    |    |           | 0.20-0.50 |    |    |    |    |    |    |    |    |       |
| 647.5  | Cu = Ag+Cu          | rem       |           |           | <1.00     |           | 0.40-2.50 |           | <0.02   |   |    |    |           | 0.05-0.80 |    |    |    |    |    |    |    |    | <0.10 |
| 647.6  | Cu = Ag+Cu          | >93.50    |           |           | 0.10-0.40 |           |           |           | <0.02   |   |    |    |           | 0.05-0.60 |    |    |    |    |    |    |    |    |       |
| 647.8  | Cu = Ag+Cu          | >90.00    |           |           |           | 0.01-1.00 | 1.0-3.5   |           | <0.02   |   |    |    |           | 0.20-0.90 |    |    |    |    |    |    |    |    | <0.01 |
| 649    | Cu = Ag+Cu          | rem       |           | <0.10     | <0.10     |           | <0.10     |           | <0.05   |   |    |    |           | 0.8-1.2   |    |    |    |    |    |    |    |    |       |
| 651    | Cu = Ag+Cu          | rem       |           |           | <0.80     | <0.70     |           |           | <0.05   |   |    |    |           | 1.2-1.6   |    |    |    |    |    |    |    |    |       |
| 653    | Cu = Ag+Cu          | rem       |           |           | <0.80     |           |           |           | <0.05   |   |    |    |           | 0.8-2.0   |    |    |    |    |    |    |    |    |       |
| 654    | Cu = Ag+Cu          | rem       |           |           |           |           |           |           |         |   |    |    |           |           |    |    |    |    |    |    |    |    |       |

| Alloy | Notes                      | Cu        | Ag | Al        | Fe        | Mn        | Ni        | P           | Pb        | S | Sb | Si        | Sn        | Zn        | As        | Be | Bi | Co        | Cr | Mg | Ti | Zr        |  |
|-------|----------------------------|-----------|----|-----------|-----------|-----------|-----------|-------------|-----------|---|----|-----------|-----------|-----------|-----------|----|----|-----------|----|----|----|-----------|--|
| 655   | Cu = Ag+Cu                 | rem       |    | <0.01     | <0.80     | 0.50-1.30 | <0.6      |             | <0.05     |   |    | 2.8-3.8   |           | <1.50     |           |    |    |           |    |    |    |           |  |
| 656   | Cu = Ag+Cu                 | rem       |    |           | <0.50     | <1.50     |           |             | <0.02     |   |    | <1.50     | <1.50     | <1.50     |           |    |    |           |    |    |    |           |  |
| 656.2 | Cu = Ag+Cu                 | >90.00    |    |           | 1.0-2.0   | <1.00     |           | <0.10       | <0.05     |   |    | 2.4-4.0   |           | 1.5-4.0   |           |    |    |           |    |    |    |           |  |
| 658   | Cu = Ag+Cu                 | rem       |    |           | <0.25     | 0.50-1.30 | <0.6      |             | <0.05     |   |    | 2.8-3.8   |           | 1.5-4.0   |           |    |    |           |    |    |    |           |  |
| 661   | Cu = Ag+Cu                 | rem       |    |           | <0.25     | <1.50     |           |             | 0.20-0.80 |   |    | 2.8-3.5   |           | <1.50     |           |    |    |           |    |    |    |           |  |
| 662   | Cu = Ag+Cu                 | 86.6-91.0 |    |           | <0.05     |           | 0.30-1.00 | 0.05-0.20   | <0.05     |   |    |           | 0.20-0.70 | rem       |           |    |    |           |    |    |    |           |  |
| 663   | Cu = Ag+Cu                 | 84.5-87.5 |    |           | 1.3-1.7   |           | <0.05     | <0.02       | <0.015    |   |    | <0.05     | 1.5-3.0   | rem       |           |    |    | <0.20     |    |    |    |           |  |
| 664   | Cu = Ag+Cu                 | rem       |    | <0.05     | 1.8-2.3   |           | <0.05     | <0.02       | <0.015    |   |    | <0.05     | <0.05     | 11.0-12.0 | <0.05     |    |    | 0.30-0.70 |    |    |    |           |  |
| 664.2 | Cu = Ag+Cu                 | rem       |    |           | 0.50-1.50 |           |           |             |           |   |    |           |           | 12.7-17.0 |           |    |    |           |    |    |    |           |  |
| 667   | Cu = Ag+Cu                 | 68.5-71.5 |    |           | <0.10     | 0.8-1.5   |           |             | <0.07     |   |    |           |           | rem       |           |    |    |           |    |    |    |           |  |
| 668   | Cu = Ag+Cu                 | 60.0-63.0 |    | <0.25     | <0.35     | 2.0-3.15  | <0.25     |             | <0.05     |   |    | 0.50-1.50 | <0.30     | rem       |           |    |    |           |    |    |    |           |  |
| 669   | Cu = Ag+Cu                 | 62.5-64.5 |    |           | <0.25     | 11.5-12.5 |           |             | <0.01     |   |    |           |           | rem       |           |    |    |           |    |    |    |           |  |
| 669.5 | Cu = Ag+Cu                 | rem       |    | 1.0-1.5   | <0.50     | 14.0-15.0 |           |             | <0.01     |   |    |           |           | 14.0-15.0 |           |    |    |           |    |    |    |           |  |
| 670   | Cu = Ag+Cu                 | 63.0-68.0 |    | 3.0-6.0   | 2.0-4.0   | 2.5-5.0   |           |             | <0.20     |   |    |           | <0.50     | rem       |           |    |    |           |    |    |    |           |  |
| 671.3 | Cu = Ag+Cu                 | 56.0-59.0 |    | 0.10-1.00 | <0.50     | 0.50-1.50 | 0.50-1.50 |             | 0.50-1.50 |   |    |           | 0.50-1.50 | rem       |           |    |    |           |    |    |    |           |  |
| 671   | Cu = Ag+Cu                 | 58.0-63.0 |    | <0.25     | <0.50     | 2.0-3.15  | <0.25     |             | 0.40-3.00 |   |    |           | 0.50-1.50 | rem       |           |    |    |           |    |    |    |           |  |
| 674   | Cu = Ag+Cu                 | 55.0-60.0 |    | 0.50-2.00 | <0.35     | 2.0-3.15  | <0.25     |             | <0.50     |   |    |           | 0.50-1.50 | rem       |           |    |    |           |    |    |    |           |  |
| 674.1 | Cu = Ag+Cu                 | 55.5-59.0 |    | 1.3-2.3   | <1.00     | 1.0-2.4   | <2.0      |             | <0.8      |   |    | 0.7-1.3   | <0.50     | rem       |           |    |    |           |    |    |    |           |  |
| 674.2 | Cu = Ag+Cu                 | 57.0-58.5 |    | 1.0-2.0   | 0.15-0.55 | 1.5-2.5   | <0.25     |             | 0.25-0.80 |   |    | 0.25-0.70 | <0.35     | rem       |           |    |    |           |    |    |    |           |  |
| 675   | Cu = Ag+Cu                 | 57.0-60.0 |    | <0.25     | 0.8-2.0   | 0.05-0.50 |           |             | <0.20     |   |    |           | 0.50-1.50 | rem       |           |    |    |           |    |    |    |           |  |
| 676   | Cu = Ag+Cu                 | 57.0-60.0 |    |           | 0.40-1.30 | 0.05-0.50 |           |             | 0.50-1.00 |   |    |           | 0.05-1.50 | rem       |           |    |    |           |    |    |    |           |  |
| 676.2 | Cu = Ag+Cu                 | 55.0-57.0 |    |           | 0.50-1.30 | 1.0-2.0   |           |             | <0.07     |   |    |           |           | rem       |           |    |    |           |    |    |    |           |  |
| 677   | Cu = Ag+Cu                 | 55.5-58.0 |    |           | 0.7-1.5   | 0.05-0.30 | 1.5-2.3   |             | <0.05     |   |    |           |           | rem       |           |    |    |           |    |    |    |           |  |
| 678   | Cu = Ag+Cu                 | 56.0-59.0 |    | 0.50-1.50 | 0.7-1.5   | 0.20-0.60 |           |             | <0.30     |   |    |           | <0.20     | rem       |           |    |    |           |    |    |    |           |  |
| 678.1 | Cu = Ag+Cu                 | 56.5-59.5 |    | 0.40-1.60 | <1.00     | 0.40-1.80 | <1.5      |             | <1.0      |   |    | <0.60     | <0.50     | rem       |           |    |    |           |    |    |    |           |  |
| 678.2 | Cu = Ag+Cu                 | 56.5-59.5 |    | 0.30-1.30 | 0.50-1.20 | 0.30-2.00 | <1.5      |             | <0.10     |   |    | 0.30-1.00 | <0.30     | rem       |           |    |    |           |    |    |    |           |  |
| 681   | Cu = Ag+Cu                 | 56.0-60.0 |    | <0.01     | 0.25-1.25 | 0.01-0.50 | 0.20-0.80 |             | <0.05     |   |    | 0.04-0.15 | 0.75-1.10 | rem       |           |    |    |           |    |    |    |           |  |
| 681   | Cu = Ag+Cu                 | 56.0-60.0 |    | <0.01     | 0.25-1.25 | 0.01-0.50 | 0.20-0.80 |             | <0.05     |   |    | 0.04-0.15 | 0.75-1.10 | rem       |           |    |    |           |    |    |    |           |  |
| 682   | Cu = Ag+Cu                 | 58.0-60.0 |    |           | 0.25-1.25 | 0.01-0.50 |           |             | <0.05     |   |    | 0.07-0.15 |           | rem       |           |    |    |           |    |    |    |           |  |
| 682   | Cu = Ag+Cu                 | 58.0-60.0 |    |           | 0.25-1.25 | 0.01-0.50 |           |             | <0.05     |   |    | 0.07-0.15 |           | rem       |           |    |    |           |    |    |    |           |  |
| 686   | Cu = Ag+Cu                 | 56.0-60.0 |    | 0.30-1.50 | 0.50-1.20 | 0.30-2.00 |           |             | 0.50-1.50 |   |    |           | 0.20-1.00 | rem       |           |    |    |           |    |    |    |           |  |
| 687   | Cu = Ag+Cu                 | 76.0-79.0 |    | 1.8-2.5   | 0.06      |           |           |             | <0.07     |   |    |           |           | rem       |           |    |    |           |    |    |    |           |  |
| 688   | Cu = Ag+Cu                 | 3.0-3.8   |    |           | <0.20     |           |           |             | <0.05     |   |    |           |           | 21.3-24.1 | 0.02-0.06 |    |    | 0.25-0.55 |    |    |    |           |  |
| 690   | Cu = Ag+Cu                 | 72.0-74.6 |    | 3.0-3.8   | <0.05     |           | 0.50-0.80 |             | <0.025    |   |    |           |           | rem       |           |    |    |           |    |    |    |           |  |
| 690.5 | Cu = Ag+Cu                 | 70.0-75.0 |    | 3.0-4.0   |           |           | 0.50-1.50 |             |           |   |    | 0.10-0.60 |           | rem       |           |    |    |           |    |    |    | 0.01-0.20 |  |
| 691   | Cu = Ag+Cu                 | 81.0-84.0 |    | 0.7-1.2   | <0.25     | <0.10     | 0.8-1.4   |             | <0.05     |   |    | 0.8-1.3   | <0.10     | rem       |           |    |    |           |    |    |    |           |  |
| 694   | Cu = Ag+Cu                 | 80.0-83.0 |    |           | <0.20     |           |           |             | <0.30     |   |    | 3.5-4.5   |           | rem       |           |    |    |           |    |    |    |           |  |
| 694.3 | Cu = Ag+Cu                 | 80.0-83.0 |    |           | <0.20     |           |           |             | <0.30     |   |    | 3.5-4.5   |           | rem       | 0.03-0.06 |    |    |           |    |    |    |           |  |
| 694.4 | Cu = Ag+Cu                 | 80.0-83.0 |    |           | <0.20     |           |           |             | <0.30     |   |    | 3.5-4.5   |           | rem       |           |    |    |           |    |    |    |           |  |
| 694.5 | Cu = Ag+Cu                 | 80.0-83.0 |    |           | <0.20     | <0.40     |           | 0.03-0.06   | <0.30     |   |    | 3.5-4.5   |           | rem       |           |    |    |           |    |    |    |           |  |
| 697   | Cu = Ag+Cu                 | 75.0-80.0 |    |           | <0.20     | <0.40     |           |             | 0.50-1.50 |   |    | 2.5-3.5   |           | rem       |           |    |    |           |    |    |    |           |  |
| 697.1 | Cu = Ag+Cu                 | 75.0-80.0 |    |           | <0.20     | <0.40     |           |             | 0.50-1.50 |   |    | 2.5-3.5   |           | rem       | 0.03-0.06 |    |    |           |    |    |    |           |  |
| 697.2 | Cu = Ag+Cu                 | 75.0-80.0 |    |           | <0.20     | <0.40     |           |             | 0.50-1.50 |   |    | 2.5-3.5   |           | rem       |           |    |    |           |    |    |    |           |  |
| 697.3 | Cu = Ag+Cu                 | 75.0-80.0 |    |           | <0.20     | <0.40     |           | 0.03-0.06   | <0.8      |   |    | 2.5-3.5   |           | rem       |           |    |    |           |    |    |    |           |  |
| 698   | Cu = Ag+Cu                 | 66.0-70.0 |    |           | <0.4      |           | <0.50     |             |           |   |    | 0.7-1.3   |           | rem       |           |    |    |           |    |    |    |           |  |
| 699   | Cu=Ag+Cu; C, Cd            | <0.05     |    | 1.4-2.3   | <0.10     | 40.0-48.0 | <0.10     |             | <0.02     |   |    |           |           | <0.14     | <0.01     |    |    | <0.20     |    |    |    |           |  |
| 699.1 | Cu = Ag+Cu                 | rem       |    | 0.25-0.80 | 1.0-1.4   | 28.0-32.0 | <0.10     |             | <0.01     |   |    |           |           | 3.0-5.0   |           |    |    |           |    |    |    |           |  |
| 699.5 | Cu = Ag+Cu                 | 51.0-54.0 |    |           | <0.05     | 36.0-40.0 | 8.5-10.5  |             |           |   |    |           |           |           |           |    |    |           |    |    |    |           |  |
| 701   | Cu = Ag+Cu                 | rem       |    |           | <0.05     | <0.50     | 3.0-4.0   |             | <0.05     |   |    |           |           | <0.25     |           |    |    |           |    |    |    |           |  |
| 702   | Cu = Ag+Cu                 | rem       |    |           | <0.10     | <0.40     | 2.0-3.0   |             | <0.05     |   |    |           |           |           |           |    |    |           |    |    |    |           |  |
| 702.3 | Cu = Ag+Cu                 | rem       |    |           | <0.10     | <0.10     | 2.2-3.2   |             | <0.05     |   |    |           |           |           |           |    |    |           |    |    |    |           |  |
| 702.5 | Cu = Ag+Cu                 | rem       |    |           | <0.20     | <0.10     | 2.2-4.2   |             | <0.05     |   |    |           |           |           |           |    |    |           |    |    |    |           |  |
| 702.6 | Cu = Ag+Cu                 | rem       |    |           | <0.20     | <0.10     | 1.0-3.0   | <0.01       | <0.05     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 702.7 | Cu = Ag+Cu                 | rem       |    |           | 0.28-1.00 | <0.15     | 1.0-3.0   |             | <0.05     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 702.8 | Cu = Ag+Cu                 | rem       |    |           | <0.015    |           | 1.3-1.7   | 0.020-0.040 | <0.02     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 702.9 | Cu = Ag+Cu                 | rem       |    |           | <0.015    |           | 1.3-1.7   | 0.020-0.040 | <0.02     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 703   | Cu = Ag+Cu                 | >99.50    |    |           | <0.05     | <0.50     | 4.7-5.7   |             |           |   |    |           |           |           |           |    |    |           |    |    |    |           |  |
| 703.2 | Cu = Ag+Cu                 | rem       |    | 0.20-1.20 | 1.3-1.7   | 0.30-0.80 | 4.8-6.2   |             | <0.05     |   |    |           |           | <1.00     |           |    |    | 0.18-0.50 |    |    |    |           |  |
| 704   | Cu = Ag+Cu                 | rem       |    |           | 1.0-1.8   | 0.50-1.50 | 4.5-6.0   |             | <0.05     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 704.4 | Cu = Ag+Cu                 | rem       |    |           | 1.0-1.8   | 0.50-1.50 | 4.5-6.0   |             | <0.05     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 705   | Cu = Ag+Cu                 | rem       |    |           | <0.10     | <0.15     | 5.8-7.8   |             | <0.05     |   |    |           |           | <0.20     |           |    |    |           |    |    |    |           |  |
| 706   | Cu = Ag+Cu                 | rem       |    |           | 1.0-1.8   | 0.50-1.00 | 9.0-11.0  |             | <0.05     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 706.1 | Cu = Ag+Cu                 | rem       |    |           | 1.0-2.0   | 1.0-1.00  | 10.0-11.0 |             | <0.01     |   |    |           |           | <1.00     |           |    |    |           |    |    |    |           |  |
| 706.2 | Cu = Ag+Cu                 | >86.50    |    |           | 1.0-1.8   | <1.00     | 9.0-11.0  | <0.02       | <0.02     |   |    |           |           | <0.50     |           |    |    |           |    |    |    |           |  |
| 706.9 | Cu=Ag+Cu, C<0.03, H<0.0005 | rem       |    | <0.002    | <0.05     | <0.001    | 9.0-11.0  |             |           |   |    |           |           |           |           |    |    |           |    |    |    |           |  |



| Alloy  | Notes | Cu        | Ag        | Al        | Fe        | Mn | Ni        | P         | Pb        | S     | Sb        | Si        | Sn        | Zn        | As        | Be | Bi | Co | Cr        | Mg    | Ti | Zr    |
|--------|-------|-----------|-----------|-----------|-----------|----|-----------|-----------|-----------|-------|-----------|-----------|-----------|-----------|-----------|----|----|----|-----------|-------|----|-------|
| 815    |       | >98.00    |           | <0.10     | <0.10     |    |           |           | <0.02     |       |           | <0.15     | <0.10     | <0.10     |           |    |    |    | 0.40-1.50 |       |    |       |
| 815.4  |       | >95.10    |           | <0.10     | <0.15     |    | 2.0-3.0   |           | <0.02     |       |           | 0.40-0.80 | <0.10     | <0.10     |           |    |    |    | 0.40-1.60 |       |    |       |
| 817    |       | >94.20    | 0.80-1.20 |           |           |    | 0.25-1.50 |           | <0.02     |       |           |           |           |           |           |    |    |    | 0.25-1.50 |       |    |       |
| 818    |       | >95.60    | 0.80-1.20 |           |           |    |           |           |           |       |           |           |           |           |           |    |    |    | 1.4-1.7   |       |    |       |
| 820    |       | >95.00    |           | <0.10     | <0.10     |    | <0.20     |           | <0.02     |       |           | <0.15     | <0.10     | <0.10     |           |    |    |    | 2.4-2.7   | <0.10 |    |       |
| 821    |       | >95.50    |           |           |           |    | 0.25-1.50 |           |           |       |           |           |           |           |           |    |    |    |           |       |    |       |
| 822    |       | >96.50    |           |           |           |    | 1.0-2.0   |           |           |       |           |           |           |           |           |    |    |    | 0.25-1.50 |       |    |       |
| 824    |       | >96.40    |           | <0.15     | <0.20     |    | <0.10     |           |           |       |           |           |           |           |           |    |    |    | 0.20-0.40 |       |    |       |
| 825    |       | >96.50    |           | <0.15     | <0.25     |    | <0.20     |           | <0.02     |       |           | 0.20-0.35 | <0.10     | <0.10     |           |    |    |    | 0.35-0.70 | <0.10 |    |       |
| 825.1  |       | >95.50    |           | <0.15     | <0.25     |    | <0.20     |           | <0.02     |       |           | 0.20-0.35 | <0.10     | <0.10     |           |    |    |    | 1.0-2.0   | <0.10 |    |       |
| 826    |       | >95.20    |           | <0.15     | <0.25     |    | 1.0-1.5   |           | <0.02     |       |           | 0.20-0.35 | <0.10     | <0.10     |           |    |    |    | 0.35-0.70 | <0.10 |    |       |
| 827    |       | >94.60    |           | <0.15     | <0.25     |    | 1.0-1.5   |           | <0.02     |       |           | 0.20-0.35 | <0.10     | <0.10     |           |    |    |    | 0.35-0.70 | <0.10 |    |       |
| 828    |       | >94.80    |           | <0.15     | <0.25     |    | <0.20     |           | 1.0-2.0   |       |           | 0.20-0.35 | <0.10     | <0.10     |           |    |    |    | 0.35-0.70 | <0.10 |    |       |
| 833    |       | 92.0-94.0 |           |           |           |    |           |           | 1.0-2.0   |       |           |           |           | 2.0-6.0   |           |    |    |    |           |       |    |       |
| 834    |       | 86.0-92.0 |           |           |           |    |           |           | <0.50     |       |           |           | <0.20     | 8.0-12.0  |           |    |    |    |           |       |    |       |
| 834.1  |       | 88.0-91.0 |           | <0.05     | <0.05     |    | <0.05     |           | <0.50     |       |           | <0.005    | 1.0-2.0   | rem       |           |    |    |    |           |       |    |       |
| 834.2  |       | 88.0-92.0 |           | <0.10     | <0.10     |    | 0.25-0.70 |           | <0.50     |       |           | 0.25-0.70 | rem       | rem       |           |    |    |    |           |       |    |       |
| 834.5  |       | 87.0-89.0 |           | <0.005    | <0.30     |    | 1.5-3.0   | <0.03     | 1.5-3.0   | <0.08 | <0.25     | <0.005    | 2.0-3.5   | 5.5-7.5   |           |    |    |    |           |       |    |       |
| 835.2  |       | 86.0-88.0 |           | <0.008    | <0.30     |    | 0.50-1.00 | <0.03     | 3.5-4.5   |       | <0.25     | <0.005    | 5.5-6.5   | 1.0-2.5   |           |    |    |    |           |       |    |       |
| 835.2  |       | rem       |           |           | <0.30     |    | <1.0      |           | 3.5-4.5   |       | <0.25     |           | 3.5-4.5   | 1.5-4.0   |           |    |    |    |           |       |    |       |
| 836    |       | 84.0-86.0 |           | <0.005    | <0.30     |    | <1.0      | <0.05     | 4.0-6.0   | <0.08 | <0.25     | <0.005    | 4.0-6.0   | 4.0-6.0   | 0.05-0.20 |    |    |    |           |       |    |       |
| 837    |       | 83.0-88.0 |           | <0.005    | <0.30     |    | <0.30     | <0.03     | 4.0-6.0   | <0.08 | <0.25     | <0.005    | <1.00     | rem       |           |    |    |    |           |       |    |       |
| 838    |       | 82.0-83.8 |           | <0.005    | <0.30     |    | <1.0      | <0.03     | 5.0-7.0   | <0.08 | <0.25     | <0.005    | 3.0-4.2   | 5.0-8.0   |           |    |    |    |           |       |    |       |
| 838.1  |       | 83.8      |           | <0.01     | <0.50     |    | <2.0      | <0.03     | 4.0-6.0   | <0.08 | <0.50     | <0.005    | 2.0-3.5   | 7.5-9.5   | <0.50     |    |    |    |           |       |    |       |
| 842    |       | 78.0-82.0 |           | <0.005    | <0.40     |    | <0.8      | <0.05     | 2.0-3.0   | <0.08 | <0.25     | <0.005    | 4.0-6.0   | 10.0-16.0 |           |    |    |    |           |       |    |       |
| 844    |       | 78.0-82.0 |           | <0.005    | <0.40     |    | <1.0      | <0.20     | 6.0-8.0   | <0.08 | <0.25     | <0.005    | 2.0-3.5   | 7.0-10.0  |           |    |    |    |           |       |    |       |
| 844.1  |       | 84.4      |           | <0.01     | <0.40     |    | <1.0      | <0.02     | 7.0-9.0   | <0.08 | <0.25     | <0.005    | 3.0-4.5   | 7.0-11.0  |           |    |    |    |           |       |    |       |
| 845    |       | 77.0-79.0 |           | <0.005    | <0.40     |    | <1.0      | <0.02     | 6.0-7.5   | <0.08 | <0.25     | <0.005    | 2.0-4.0   | 10.0-14.0 |           |    |    |    |           |       |    |       |
| 848    |       | 75.0-77.0 |           | <0.005    | <0.40     |    | <1.0      | <0.02     | 5.5-7.0   | <0.08 | <0.25     | <0.005    | 2.0-3.0   | 13.0-17.0 |           |    |    |    |           |       |    |       |
| 852    |       | 70.0-74.0 |           | <0.005    | <0.60     |    | <1.0      | <0.02     | 1.5-3.8   | <0.05 | <0.20     | <0.005    | 0.7-2.0   | 20.0-27.0 |           |    |    |    |           |       |    |       |
| 852.1  |       | 70.0-75.0 |           | <0.005    | <0.80     |    | <1.0      |           | 2.0-5.0   |       |           | <0.005    | 1.0-3.0   | rem       | 0.02-0.06 |    |    |    |           |       |    |       |
| 853    |       | 68.0-72.0 |           |           | <0.80     |    |           |           | <0.50     |       |           |           | <0.50     | rem       |           |    |    |    |           |       |    |       |
| 853.1  |       | 68.0-73.0 |           | <0.01     | <0.80     |    | <1.0      |           | 2.0-5.0   |       |           |           | <1.50     | rem       | 0.02-0.06 |    |    |    |           |       |    |       |
| 854    |       | 65.0-70.0 |           | <0.35     | <0.70     |    | <1.0      |           | 1.5-3.8   |       |           |           | 0.50-1.50 | 24.0-32.0 |           |    |    |    |           |       |    |       |
| 855    |       | 59.0-63.0 |           |           | <0.20     |    | <0.20     |           | <0.20     |       |           |           | <0.20     | rem       |           |    |    |    |           |       |    |       |
| Alloy  | Notes | Cu        | Ag        | Al        | Fe        | Mn | Ni        | P         | Pb        | S     | Sb        | Si        | Sn        | Zn        | As        | Be | Bi | Co | Cr        | Mg    | Ti | Zr    |
| 856    |       | 59.0-63.0 |           |           | <0.20     |    | <0.20     |           | <0.20     |       |           |           | <0.20     | rem       |           |    |    |    |           |       |    |       |
| 857    |       | 58.0-64.0 |           | <0.8      | <0.70     |    | <1.0      |           | <0.20     |       |           |           | <0.20     | rem       |           |    |    |    |           |       |    |       |
| 857.1  |       | 58.0-63.0 |           | 0.20-0.80 | <0.80     |    | <1.0      |           | 1.0-2.5   |       |           |           | <0.05     | 32.0-40.0 |           |    |    |    |           |       |    |       |
| 858    |       | >57.00    |           | <4.5-5.5  | <0.50     |    | <0.50     | <0.01     | <1.5      | <0.05 | <0.05     | <1.50     | <1.00     | 31.0-41.0 | <0.05     |    |    |    |           |       |    |       |
| 861    |       | 66.0-68.0 |           |           | 2.0-4.0   |    | 2.5-5.0   |           | <0.20     |       |           |           | <0.20     | rem       |           |    |    |    |           |       |    |       |
| 862    |       | 60.0-66.0 |           | 3.0-4.9   | 2.0-4.0   |    | 2.5-5.0   |           | <0.20     |       |           |           | <0.20     | 22.0-28.0 |           |    |    |    |           |       |    |       |
| 863    |       | 60.0-66.0 |           | 5.0-7.5   | 2.0-4.0   |    | 2.5-5.0   |           | <0.20     |       |           |           | <0.20     | 22.0-28.0 |           |    |    |    |           |       |    |       |
| 864    |       | 56.0-62.0 |           | 0.50-1.50 | 0.40-2.00 |    | 0.10-1.00 |           | 0.50-1.50 |       |           |           | 0.50-1.50 | 34.0-42.0 |           |    |    |    |           |       |    |       |
| 865    |       | 55.0-60.0 |           | 0.50-1.50 | 0.40-2.00 |    | 1.0-1.5   |           | <0.40     |       |           |           | <1.00     | 36.0-42.0 |           |    |    |    |           |       |    |       |
| 865.5  |       | >57.00    |           | 0.50-2.50 | 0.7-2.0   |    | 0.10-3.00 |           | <0.50     |       |           |           | <1.00     | rem       |           |    |    |    |           |       |    |       |
| 867    |       | 53.0-60.0 |           | 1.0-3.0   | 1.0-3.0   |    | 1.0-3.5   |           | 0.5-1.5   |       |           |           | <1.50     | 30.0-38.0 |           |    |    |    |           |       |    |       |
| 868    |       | 53.5-57.0 |           | <2.0      | 1.0-2.5   |    | 2.5-4.0   |           | <0.20     |       |           |           | <1.00     | rem       |           |    |    |    |           |       |    |       |
| 872    |       | >89.00    |           | <1.5      | <2.50     |    | <1.50     |           | <0.50     |       |           |           | <1.00     | <5.00     |           |    |    |    |           |       |    |       |
| 873    |       | >94.00    |           |           | <0.20     |    | 0.8-1.5   |           | <0.20     |       |           |           | <1.00     | <0.25     |           |    |    |    |           |       |    |       |
| 874    |       | >79.00    |           | <0.8      |           |    |           |           | <1.0      |       |           |           | 2.5-4.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 874.1  |       | >79.00    |           | <0.8      |           |    |           |           | <1.0      |       |           |           | 2.5-4.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 874.2  |       | >79.00    |           | <0.8      |           |    |           |           | <1.0      |       |           |           | 2.5-4.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 874.3  |       | >79.00    |           | <0.8      |           |    |           | 0.03-0.06 | <1.0      |       | 0.03-0.06 |           | 2.5-4.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 875    |       | >79.00    |           | <0.5      |           |    |           |           | <0.50     |       |           |           | 3.0-5.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 875.1  |       | >79.00    |           | <0.50     |           |    |           |           | <0.50     |       |           |           | 3.0-5.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 875.2  |       | >79.00    |           | <0.50     |           |    |           |           | <0.50     |       |           |           | 3.0-5.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 875.3  |       | >79.00    |           | <0.50     |           |    |           |           | <0.50     |       |           |           | 3.0-5.0   | 12.0-16.0 |           |    |    |    |           |       |    |       |
| 876    |       | >88.00    |           |           | <0.20     |    | <0.25     |           | <0.50     |       |           |           | 3.5-4.5   | 4.0-7.0   |           |    |    |    |           |       |    |       |
| 876.1  |       | >90.00    |           |           | <0.20     |    | <0.25     |           | <0.20     |       |           |           | 3.5-4.5   | 3.0-5.0   |           |    |    |    |           |       |    |       |
| 878    |       | >80.00    |           | <0.15     | <0.15     |    | <0.15     | <0.01     | <0.15     | <0.05 | <0.05     | 3.8-4.2   | <0.25     | 12.0-16.0 | <0.05     |    |    |    |           |       |    | <0.01 |
| 879    |       | >63.00    |           | <0.15     | <0.40     |    | <0.15     | <0.01     | <0.25     | <0.05 | <0.05     | 0.8-1.2   | <0.25     | 30.0-36.0 | <0.05     |    |    |    |           |       |    |       |
| 893.2  |       | 87.0-91.0 |           | <0.005    | <0.20     |    | <1.0      | <0.30     | <0.09     | <0.08 | <0.50     | <0.005    | 5.0-7.0   | <1.00     |           |    |    |    |           |       |    |       |
| 893.25 |       | 84.0-88.0 |           | <0.005    | <0.15     |    | <1.0      | <0.10     | <0.10     | <0.08 | <0.50     | <0.005    | 9.0-11.0  | <1.00     |           |    |    |    |           |       |    |       |
| 895.1  |       | 86.0-88.0 |           | <0.005    | <0.20     |    | <1.0      | <0.05     | <0.25     | <0.08 | <0.25     | <0.005    | 4.0-6.0   | 4.        |           |    |    |    |           |       |    |       |

| Alloy  | Notes | Cu        | Ag | Al       | Fe      | Mn | Ni        | P         | Pb        | S     | Sb    | Si     | Sn        | Zn       | As | Be | Bi      | Co | Cr | Mg | Ti | Zr |
|--------|-------|-----------|----|----------|---------|----|-----------|-----------|-----------|-------|-------|--------|-----------|----------|----|----|---------|----|----|----|----|----|
| 898.44 |       | 83.0-86.0 |    | <0.005   | <0.30   |    | <1.0      | <0.05     | <0.20     | <0.08 | <0.25 | <0.005 | 3.0-5.0   | 7.0-10.0 |    |    | 2.0-4.0 |    |    |    |    |    |
| 899.4  |       | 64.0-68.0 |    | 0.7-2.0  | 0.7-2.0 |    | 20.0-23.0 | 0.10-0.15 | 0.30-1.00 | <0.05 | <0.10 | <0.005 | 3.0-5.0   | 3.0-5.0  |    |    | 4.0-5.5 |    |    |    |    |    |
| 902    |       | 91.0-94.0 |    | <0.005   | 0.7-2.0 |    | <0.50     | <0.05     | 0.30-1.00 | <0.05 | <0.10 | <0.005 | 3.0-5.0   | 3.0-5.0  |    |    |         |    |    |    |    |    |
| 902.5  |       | 82.0-91.0 |    | <0.005   | <0.25   |    | <1.0      | <0.05     | <0.30     | <0.05 | <0.20 | <0.005 | 7.0-9.0   | 3.0-5.0  |    |    |         |    |    |    |    |    |
| 903    |       | 86.0-89.0 |    | <0.005   | <0.20   |    | <1.0      | <0.05     | <0.30     | <0.05 | <0.20 | <0.005 | 7.0-9.0   | 3.0-5.0  |    |    |         |    |    |    |    |    |
| 905    |       | 86.0-89.0 |    | <0.005   | <0.20   |    | <1.0      | <0.05     | <0.30     | <0.05 | <0.20 | <0.005 | 9.0-11.0  | 1.0-3.0  |    |    |         |    |    |    |    |    |
| 907    |       | 88.0-90.0 |    | <0.005   | <0.15   |    | <0.50     | <0.05     | <0.50     | <0.05 | <0.20 | <0.005 | 10.0-12.0 | <0.50    |    |    |         |    |    |    |    |    |
| 907.1  |       | <0.005    |    | <0.005   | <0.10   |    | <0.10     | 0.50-1.20 | <0.25     | <0.05 | <0.20 | <0.005 | 10.0-12.0 | <0.05    |    |    |         |    |    |    |    |    |
| 908    |       | 85.0-89.0 |    | <0.005   | <0.15   |    | <0.50     | 0.15-0.80 | <0.25     | <0.05 | <0.20 | <0.005 | 11.0-13.0 | <0.25    |    |    |         |    |    |    |    |    |
| 908.1  | rem   |           |    | <0.005   | <0.15   |    | <0.50     | 0.15-0.80 | <0.25     | <0.05 | <0.20 | <0.005 | 11.0-13.0 | <0.30    |    |    |         |    |    |    |    |    |
| 909    |       | 86.0-89.0 |    | <0.005   | <0.15   |    | <0.50     | <0.05     | <0.25     | <0.05 | <0.20 | <0.005 | 12.0-14.0 | <0.25    |    |    |         |    |    |    |    |    |
| 910    |       | 84.0-86.0 |    | <0.005   | <0.10   |    | <0.8      | <0.05     | <0.20     | <0.5  | <0.20 | <0.005 | 14.0-16.0 | <1.50    |    |    |         |    |    |    |    |    |
| 911    |       | 99.70     |    | <0.005   | <0.25   |    | <0.50     | <1.00     | <0.25     | <0.05 | <0.20 | <0.005 | 15.0-17.0 | <0.25    |    |    |         |    |    |    |    |    |
| 911    |       | 82.0-85.0 |    | <0.005   | <0.25   |    | <0.50     | <1.00     | <0.25     | <0.05 | <0.20 | <0.005 | 18.0-20.0 | <0.25    |    |    |         |    |    |    |    |    |
| 913    |       | 79.0-82.0 |    | <0.005   | <0.25   |    | <0.50     | <1.00     | <0.25     | <0.05 | <0.20 | <0.005 | 18.0-20.0 | <0.25    |    |    |         |    |    |    |    |    |
| 916    |       | 86.0-89.0 |    | <0.005   | <0.20   |    | 1.2-2.0   | <0.30     | <0.25     | <0.05 | <0.20 | <0.005 | 9.7-10.8  | <0.25    |    |    |         |    |    |    |    |    |
| 917    |       | 84.0-87.0 |    | <0.005   | <0.20   |    | 1.2-2.0   | <0.30     | <0.25     | <0.05 | <0.20 | <0.005 | 11.3-12.5 | <0.25    |    |    |         |    |    |    |    |    |
| 922    |       | 86.0-90.0 |    | <0.005   | <0.25   |    | <1.0      | <0.05     | 1.0-2.0   | <0.05 | <0.25 | <0.005 | 5.5-6.5   | 3.0-4.5  |    |    |         |    |    |    |    |    |
| 922.1  |       | 86.0-89.0 |    | <0.005   | <0.25   |    | 0.7-1.0   | 0.03      | 1.7-2.5   | <0.05 | <0.20 | <0.005 | 4.5-5.5   | 3.0-4.5  |    |    |         |    |    |    |    |    |
| 922.2  |       | 86.0-88.0 |    | <0.005   | <0.25   |    | 0.5-1.0   | <0.05     | 1.5-2.5   | <0.05 | <0.20 | <0.005 | 5.0-6.0   | 3.0-5.5  |    |    |         |    |    |    |    |    |
| 923    |       | 85.0-89.0 |    | <0.005   | <0.25   |    | <1.0      | <0.05     | 0.30-1.00 | <0.05 | <0.25 | <0.005 | 7.5-9.0   | 2.5-4.5  |    |    |         |    |    |    |    |    |
| 923.1  |       | <0.005    |    | <0.005   | <0.20   |    | <1.0      | <0.05     | 0.30-1.00 | <0.05 | <0.25 | <0.005 | 7.5-9.0   | 2.5-4.5  |    |    |         |    |    |    |    |    |
| 924    |       | 86.0-89.0 |    | <0.005   | <0.25   |    | <1.0      | <0.05     | 0.30-1.00 | <0.05 | <0.25 | <0.005 | 9.0-11.0  | 1.0-3.0  |    |    | <0.03   |    |    |    |    |    |
| 924.1  |       | 86.0-89.0 |    | <0.005   | <0.20   |    | <0.20     | <0.05     | 1.5-2.5   | <0.05 | <0.25 | <0.005 | 6.0-8.0   | 1.5-3.0  |    |    | <0.05   |    |    |    |    |    |
| 925    |       | 85.0-88.0 |    | <0.005   | <0.30   |    | 0.8-1.5   | <0.30     | 1.0-1.5   | <0.05 | <0.25 | <0.005 | 10.0-12.0 | <0.50    |    |    |         |    |    |    |    |    |
| 926    |       | 86.0-88.5 |    | <0.005   | <0.20   |    | <0.7      | <0.03     | 0.8-1.5   | <0.05 | <0.25 | <0.005 | 9.3-10.5  | 1.3-2.5  |    |    |         |    |    |    |    |    |
| 926.1  | rem   |           |    | <0.005   | <0.15   |    | <1.0      | <0.05     | 0.30-1.00 | <0.05 | <0.25 | <0.005 | 9.5-10.5  | 1.7-2.8  |    |    |         |    |    |    |    |    |
| 927    |       | <0.005    |    | <0.005   | <0.20   |    | <1.0      | <0.25     | 1.0-2.5   | <0.05 | <0.25 | <0.005 | 9.0-11.0  | <0.70    |    |    |         |    |    |    |    |    |
| 927.1  |       | <0.005    |    | <0.005   | <0.20   |    | <2.0      | <0.10     | 4.0-6.0   | <0.05 | <0.25 | <0.005 | 9.0-11.0  | <1.00    |    |    |         |    |    |    |    |    |
| 928    |       | 78.0-82.0 |    | <0.005   | <0.20   |    | <0.8      | <0.05     | 4.0-6.0   | <0.05 | <0.25 | <0.005 | 15.0-17.0 | <0.80    |    |    |         |    |    |    |    |    |
| 928.1  |       | 78.0-82.0 |    | <0.005   | <0.50   |    | 0.8-1.2   | <0.05     | 4.0-6.0   | <0.05 | <0.25 | <0.005 | 12.0-14.0 | <0.50    |    |    |         |    |    |    |    |    |
| 929    |       | 82.0-86.0 |    | <0.005   | <0.20   |    | 2.8-4.0   | <0.50     | 2.0-3.2   | <0.05 | <0.25 | <0.005 | 9.0-11.0  | <0.25    |    |    |         |    |    |    |    |    |
| 931    |       | 81.0-85.0 |    | <0.005   | <0.25   |    | <1.0      | <0.30     | 2.0-5.0   | <0.05 | <0.25 | <0.005 | 6.5-8.5   | <2.00    |    |    |         |    |    |    |    |    |
| 932    |       | 81.0-85.0 |    | <0.005   | <0.20   |    | <1.0      | <0.15     | 6.0-8.0   | <0.08 | <0.35 | <0.005 | 6.3-7.5   | 1.0-4.0  |    |    |         |    |    |    |    |    |
| 934    |       | 82.0-85.0 |    | <0.005   | <0.20   |    | <1.0      | <0.50     | 7.0-9.0   | <0.08 | <0.50 | <0.005 | 7.0-9.0   | <0.80    |    |    |         |    |    |    |    |    |
| Alloy  | Notes | Cu        | Ag | Al       | Fe      | Mn | Ni        | P         | Pb        | S     | Sb    | Si     | Sn        | Zn       | As | Be | Bi      | Co | Cr | Mg | Ti | Zr |
| 935    |       | 83.0-86.0 |    | <0.005   | <0.20   |    | <1.0      | <0.05     | 8.0-10.0  | <0.08 | <0.30 | <0.005 | 4.3-6.0   | <2.00    |    |    |         |    |    |    |    |    |
| 936    |       | 79.0-83.0 |    | <0.005   | <0.20   |    | <1.0      | <0.15     | 11.0-13.0 | <0.08 | <0.55 | <0.005 | 6.0-8.0   | <1.00    |    |    |         |    |    |    |    |    |
| 937    |       | 78.0-82.0 |    | <0.005   | <0.70   |    | <0.50     | <0.10     | 8.0-11.0  | <0.08 | <0.50 | <0.005 | 9.0-11.0  | <0.80    |    |    |         |    |    |    |    |    |
| 937.2  |       | >83.00    |    | <0.005   | <0.15   |    | <0.50     | <0.10     | 7.0-9.0   | <0.08 | <0.80 | <0.005 | 3.5-4.5   | <4.00    |    |    |         |    |    |    |    |    |
| 938    |       | 75.0-79.0 |    | <0.005   | <0.70   |    | <1.0      | <0.05     | 13.0-16.0 | <0.08 | <0.80 | <0.005 | 6.3-7.5   | <0.80    |    |    |         |    |    |    |    |    |
| 939    |       | 76.5-79.5 |    | <0.005   | <0.40   |    | <0.8      | <1.50     | 14.0-18.0 | <0.08 | <0.50 | <0.005 | 5.0-7.0   | <1.50    |    |    |         |    |    |    |    |    |
| 940    |       | 69.0-72.0 |    | <0.005   | <0.25   |    | 0.50-1.00 | <0.05     | 14.0-16.0 | <0.08 | <0.50 | <0.005 | 12.0-14.0 | <0.50    |    |    |         |    |    |    |    |    |
| 941    |       | 72.0-79.0 |    | <0.005   | <0.25   |    | <1.0      | <0.05     | 18.0-22.0 | <0.08 | <0.80 | <0.005 | 4.5-6.5   | <1.00    |    |    |         |    |    |    |    |    |
| 942    |       | 68.5-75.5 |    | <0.005   | <0.35   |    | <0.50     | <0.05     | 3.0-4.0   | <0.08 | <0.50 | <0.005 | 3.0-4.0   | <3.00    |    |    |         |    |    |    |    |    |
| 943    |       | 67.0-72.0 |    | <0.005   | <0.15   |    | <1.0      | <0.08     | 22.0-25.0 | <0.08 | <0.80 | <0.005 | 4.5-6.0   | <0.80    |    |    |         |    |    |    |    |    |
| 943.1  | rem   |           |    | <0.005   | <0.50   |    | 0.25-1.00 | <0.05     | 27.0-34.0 | <0.08 | <0.50 | <0.005 | 1.5-3.0   | <0.50    |    |    |         |    |    |    |    |    |
| 943.2  | rem   |           |    | <0.005   | <0.35   |    | <0.50     | <0.10     | 24.0-32.0 | <0.08 | <0.50 | <0.005 | 4.0-7.0   | <0.50    |    |    |         |    |    |    |    |    |
| 943.3  | rem   |           |    | <0.005   | <0.70   |    | <0.50     | <0.10     | 21.0-25.0 | <0.08 | <0.50 | <0.005 | 3.0-4.0   | <3.00    |    |    |         |    |    |    |    |    |
| 944    | rem   |           |    | <0.005   | <0.15   |    | <1.0      | <0.05     | 9.0-12.0  | <0.08 | <0.80 | <0.005 | 7.0-9.0   | <0.80    |    |    |         |    |    |    |    |    |
| 945    |       | <0.005    |    | <0.005   | <0.15   |    | <1.0      | <0.05     | 16.0-22.0 | <0.08 | <0.80 | <0.005 | 6.0-8.0   | <1.20    |    |    |         |    |    |    |    |    |
| 947    |       | 85.0-89.0 |    | <0.005   | <0.25   |    | 4.5-6.0   | <0.05     | <0.10     | <0.05 | <0.15 | <0.005 | 4.5-6.0   | 1.0-2.5  |    |    |         |    |    |    |    |    |
| 948    |       | 84.0-89.0 |    | <0.005   | <0.25   |    | 4.5-6.0   | <0.05     | 0.30-1.00 | <0.05 | <0.15 | <0.005 | 4.5-6.0   | 1.0-2.5  |    |    |         |    |    |    |    |    |
| 949    |       | 79.0-81.0 |    | <0.005   | <0.30   |    | <0.10     | <0.05     | 4.0-6.0   | <0.08 | <0.25 | <0.005 | 4.0-6.0   | 4.0-6.0  |    |    |         |    |    |    |    |    |
| 952    |       | >86.00    |    | 8.5-9.5  | 2.5-4.0 |    | <1.00     | <0.05     | <0.05     | <0.08 | <0.25 | <0.005 | 4.0-6.0   | 4.0-6.0  |    |    |         |    |    |    |    |    |
| 952.1  |       | >86.00    |    | 8.5-9.5  | 2.5-4.0 |    | <1.00     | <0.05     | <0.05     | <0.08 | <0.25 | <0.005 | 4.0-6.0   | 4.0-6.0  |    |    |         |    |    |    |    |    |
| 952.2  | rem   |           |    | 9.5-10.5 | 2.5-4.0 |    | <0.50     | <0.05     | <0.05     | <0.08 | <0.25 | <0.005 | 4.0-6.0   | 4.0-6.0  |    |    |         |    |    |    |    |    |
| 953    |       | >86.00    |    | 9.0-11.0 | 0.8-1.5 |    | <0.50     | &         |           |       |       |        |           |          |    |    |         |    |    |    |    |    |

| Alloy | Notes                 | Cu        | Ag    | Al        | Fe        | Mn        | Ni        | P      | Pb        | S       | Sb    | Si        | Sn        | Zn        | As        | Be | Bi      | Co    | Cr | Mg         | Ti        | Zr      |
|-------|-----------------------|-----------|-------|-----------|-----------|-----------|-----------|--------|-----------|---------|-------|-----------|-----------|-----------|-----------|----|---------|-------|----|------------|-----------|---------|
| 958.2 |                       | >77.50    |       | 9.0-10.0  | 4.0-5.0   | <1.50     | 4.5-5.8   |        | <0.02     |         |       | <0.10     | <0.20     |           |           |    |         |       |    |            |           |         |
| 959   |                       | rem       |       | 12.0-13.5 | 3.0-5.0   | <1.50     | <0.50     |        | <0.01     | <0.02   |       | <0.50     |           |           |           |    |         |       |    |            |           |         |
| 962   | C <0.10, No <1.00     | rem       |       | 1.0-1.8   | 1.0-1.8   | 1.0-1.8   | 9.0-11.0  | <0.02  | <0.01     | <0.02   |       | <0.50     |           |           |           |    |         |       |    |            |           |         |
| 963   | C <0.15, No 0.50-1.50 | rem       |       | 0.50-1.50 | 0.25-1.50 | 18.0-22.0 | 18.0-22.0 | <0.02  | <0.01     | <0.02   |       | <0.50     |           |           |           |    |         |       |    |            |           |         |
| 964   | C <0.15, No 0.50-1.50 | rem       |       | 0.25-1.50 | <1.50     | 28.0-32.0 | 28.0-32.0 | <0.02  | <0.03     | <0.02   |       | <0.50     |           |           |           |    |         |       |    |            |           |         |
| 966   |                       | rem       |       | 0.8-1.1   | 0.8-1.1   | <1.00     | 29.0-33.0 |        | <0.01     |         |       | <0.15     |           |           | 0.40-0.70 |    |         |       |    |            |           |         |
| 967   |                       | rem       |       | 0.7-1.0   | 0.7-1.0   | <0.70     | 29.0-33.0 |        | <0.01     |         |       | <0.15     |           |           | 1.10-1.20 |    |         |       |    |            | 0.01-0.20 | 0.1-0.2 |
| 968   | No 0.10-0.30, B <0.01 | rem       |       | <0.10     | <0.50     | 0.05-0.30 | 9.5-10.5  | <0.005 | <0.005    | <0.0025 | <0.02 | <0.05     | <1.00     | <0.50     |           |    | <0.001  |       |    | 0.005-0.15 | <0.01     |         |
| 969.5 | No <0.10              | rem       |       |           | <0.50     | 0.50-0.30 | 14.5-15.5 |        | <0.02     |         |       | <0.30     |           |           |           |    |         |       |    | <0.15      |           |         |
| 969.5 | No <0.10              | rem       |       |           | <0.50     | 0.05-0.40 | 11.0-15.5 |        | <0.02     |         |       | <0.30     |           |           |           |    |         |       |    | <0.15      |           |         |
| 973   |                       | 53.0-56.0 |       | <0.005    | <1.50     | <0.50     | 11.0-14.0 | <0.05  | 8.0-11.0  | <0.08   | <0.35 | <0.15     | 1.5-3.0   | 17.0-25.0 |           |    |         |       |    |            |           |         |
| 974   |                       | 58.0-61.0 |       |           | <1.50     | <0.50     | 15.5-17.0 |        | 4.5-5.5   |         |       | <0.15     | 2.5-3.5   | rem       |           |    |         |       |    |            |           |         |
| 976   |                       | 63.0-67.0 |       | <0.005    | <1.50     | <1.00     | 19.0-21.5 | <0.05  | 3.0-5.0   | <0.08   | <0.25 | <0.15     | 3.5-4.5   | 3.0-9.0   |           |    |         |       |    |            |           |         |
| 978   |                       | 64.0-67.0 |       | <0.005    | <1.50     | <1.00     | 24.0-27.0 | <0.05  | 1.0-2.5   | <0.08   | <0.20 | <0.15     | 4.0-5.5   | 1.0-4.0   |           |    |         |       |    |            |           |         |
| 982   |                       | 73.0-79.0 |       |           | <0.70     |           | <0.50     | <0.10  | 21.0-27.0 |         | <0.50 |           | 0.6-2.0   | <0.50     |           |    |         |       |    |            |           |         |
| 984   |                       | rem       | <1.50 |           | <0.70     |           | <0.50     | <0.10  | 26.0-33.0 |         | <0.50 |           | <0.50     | <0.50     |           |    |         |       |    |            |           |         |
| 986   |                       | 60.0-70.0 | <1.50 |           | <0.35     |           |           |        | 30.0-40.0 |         |       |           | <0.50     | <0.10     |           |    |         |       |    |            |           |         |
| 988   |                       | 56.5-62.5 | <5.50 |           | <0.35     |           |           | <0.02  | 37.5-42.5 |         |       |           | <0.25     |           |           |    |         |       |    |            |           |         |
| 988.4 |                       | rem       |       |           | <0.35     |           |           |        | 40.0-44.0 |         |       |           | 1.0-5.0   |           |           |    |         |       |    |            |           |         |
| 988.4 |                       | rem       |       |           | <0.35     |           |           |        | 44.0-56.0 |         |       |           | 1.0-5.0   |           |           |    |         |       |    |            |           |         |
| 993   | Incramet 800          | rem       |       | 10.7-11.5 | 0.40-1.00 |           | 13.5-16.5 |        | <0.02     |         |       | <0.02     | <0.05     |           |           |    | 1.0-2.0 |       |    |            |           |         |
| 993.5 |                       | rem       |       | 9.5-10.5  | <1.00     | <0.25     | 14.5-16.0 |        | <0.15     |         |       |           |           | 7.5-9.5   |           |    |         |       |    |            |           |         |
| 994   |                       | rem       |       | 0.50-2.00 | 1.0-3.0   | <0.50     | 1.0-3.5   |        | <0.25     |         |       | 0.50-2.00 |           | 0.50-5.00 |           |    |         |       |    |            |           |         |
| 995   |                       | rem       |       | 0.50-2.00 | 3.0-5.0   | <0.50     | 3.5-5.5   |        | <0.25     |         |       | 0.50-2.00 |           | 0.50-2.00 |           |    |         |       |    |            |           |         |
| 996   | C <0.05               | rem       |       | 1.0-2.8   | <0.20     | 39.0-45.0 | <0.20     |        | <0.02     |         |       | <0.10     | <0.10     | <0.20     |           |    |         | <0.20 |    |            |           |         |
| 997   | No 4.0-6.0            | >54.00    |       | 0.50-3.00 | <1.00     | 11.0-15.0 | 4.0-6.0   |        | <2.0      |         |       |           | <1.00     | 19.0-25.0 |           |    |         |       |    |            |           |         |
| 997.5 |                       | 55.0-61.0 |       | 0.25-3.00 | <1.00     | 17.0-23.0 | <5.0      |        | 0.50-2.50 |         |       |           | 0.50-2.50 | 17.0-23.0 |           |    |         |       |    |            |           |         |

These are specifications for reference purposes only, not samples for sale.