

Tin Bronze & P. Bronze

Indian Standard (IS)

| Tin Bronze | | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | Bi | Cr | Imp |
|------------|------------------|-----|---------|------|------|------|------|----------|------|----|------|-----|----|----|-----|
| Tin Bronze | Ph. Bronze Class | Rem | 6-8 | 0.5 | 0.5 | 0.3 | | 0.4-0.6 | 0.01 | | | 0.1 | | | 0.6 |
| IS 28 1985 | PB Grade 1 | Rem | 6-8 | 0.25 | 0.5 | 0.3 | 0.7 | 0.3-0.5 | 0.01 | | 0.02 | 0.1 | | | 1.2 |
| | PB Grade 2 | Rem | 10min | 0.25 | 0.05 | 0.1 | 0.1 | 0.5 min | 0.01 | | 0.02 | | | | 0.6 |
| | PB Grade 3 | Rem | 6.5-8.5 | 2-5 | 2 | | 1 | 0.3 min | | | | | | | 0.5 |
| | PB Grade 4 | Rem | 9-11 | 0.25 | 0.05 | | 0.25 | 0.15 | | | | | | | 0.8 |
| | PB Grade 5 | Rem | 11-13.1 | 0.5 | 0.3 | 0.15 | 0.5 | 0.15 min | 0.01 | | 0.02 | | | | 0.2 |

British Standard (BS)

| Tin Bronze | | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Bi | Imp |
|------------|-------------|---------|----------|---------|-----------|------|-----------|---------|------|-----|------|-----|------|------|------|
| Tin Bronze | CT 1 | Rem | 9-11 | 0.25 | 0.05 | | 0.25 | 0.15 | | | | | | | 0.8 |
| | CT 2 | 85-87.3 | 11.2-13 | 0.2 | 0.4 | 0.15 | 1.5-2 | 0.05 | 0.01 | 0.2 | 0.01 | 0.1 | 0.05 | | 0.8 |
| | G1(88:10:2) | Rem | 9.5-10.5 | 1.5 | 1.75-2.75 | 0.15 | 1 | | 0.01 | | 0.02 | 0.2 | | 0.03 | 0.50 |
| | G3 | Rem | 6.5-7.5 | 0.1-0.5 | 1.5-3.0 | | 5.25-5.75 | 0.02 | 0.01 | 0.2 | 0.01 | 0.2 | | 0.02 | 0.50 |
| | G3WP | Rem | 6.5-7.5 | 0.1-0.5 | 1.5-3 | | 5.25-5.75 | 0.5 | 0.01 | 0.2 | 0.01 | 0.2 | | 0.02 | 0.50 |
| | PB 1 | Rem | 10min | 0.25 | 0.05 | 0.1 | 0.1 | 0.5min | 0.01 | | 0.02 | | | | 0.60 |
| | PB 2 | Rem | 11-13 | 0.5 | 0.30 | 0.15 | 0.5 | 0.15min | 0.01 | | 0.02 | | | | 0.20 |
| | PB4 | Rem | 9.5min | 0.75 | 0.5 | | 0.5 | 0.4min | | | | | | | 0.5 |

Japanese Industrial Standard (JIS)

| Tin Bronze | | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | Bi | Cr | Imp |
|------------|---------|-----------|-----------|-----|---------|-----|-----|------|-------|----|-------|----|----|----|------|
| Tin Bronze | BC 2 | 86.0-90.0 | 7.0-9.0 | 1.0 | 3.0-50 | 0.2 | 0.8 | 0.03 | 0.005 | | 0.005 | | | | 0.2 |
| | BC 3 | 86.5-89.5 | 9.0-11.0 | 1.0 | 1.0-3.0 | 0.2 | 0.8 | 0.03 | 0.005 | | 0.005 | | | | 0.2 |
| | PBC 2 | 87.0-91.0 | 9.0-12.0 | | 0.3 | 0.2 | 0.5 | 0.1 | 0.005 | | 0.005 | | | | 0.05 |
| | PBC 3 B | 84.0-88.0 | 12.0-15.0 | | 0.3 | 0.2 | 0.5 | 0.1 | 0.005 | | 0.005 | | | | 0.05 |

European Standard (EN)

| Tin Bronze | | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Bi | Cr |
|------------|-----------|-----------|----------|------|------|------|---------|-------|------|------|------|------|------|----|----|
| Tin Bronze | CuSn10 | 88.5-90.5 | 9.3-11 | 0.8 | 0.5 | 0.15 | 1.8 | 0.05 | 0.01 | 0.1 | 0.01 | 0.15 | 0.04 | | |
| | CuSn11P | 87-89.3 | 10.2-115 | 0.25 | 0.05 | 0.1 | 0.1 | 0.6-1 | 0.01 | 0.05 | 0.01 | 0.05 | 0.05 | | |
| | CuSn12 | 85.5-88.5 | 11.2-13 | 0.6 | 0.4 | 0.15 | 2 | 0.2 | 0.01 | 0.2 | 0.01 | 0.15 | 0.05 | | |
| | CuSn12Ni2 | 84-87 | 11.3-13 | 0.2 | 0.3 | 0.15 | 1.5-2.4 | 0.05 | 0.01 | 0.1 | 0.01 | 0.05 | 0.04 | | |

German Standard (DIN)

| Tin Bronze | | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Cr | Imp |
|------------|-----------|-----------|---------|---------|-------|------|-------|----------|------|-------|------|------|-------|----|-----|
| Tin Bronze | CuNi44Mn1 | Rem | | 0.01 | | 0.2 | 43-45 | | | 0.5-2 | | | 0.02 | | 0.1 |
| | CuSn10 | 88.5-90.5 | 9.3-11 | 0.8 | 0.5 | 0.15 | 1.8 | 0.05 | 0.01 | 0.1 | 0.01 | 0.15 | 0.04 | | |
| | CuSn4 | Rem | 3.5-4.5 | 0.02 | 0.2 | 0.1 | 0.2 | 0.01-0.4 | | | | | | | 0.2 |
| | CuSn5 | Rem | 4.5-5.5 | 0.02 | 0.2 | 0.1 | 0.2 | 0.01-0.4 | | | | | | | 0.2 |
| | CuSn5Pb1 | Rem | 3.5-5.5 | 0.5-1.5 | 0.3 | 0.1 | 0.2 | 0.01-0.4 | | | | | | | 0.2 |
| | CuSn6 | 86-89.5 | 5.7-6.5 | 1.2-2 | 3.2-5 | 0.25 | 1 | 0.03 | 0.01 | | 0.01 | | 0-0.8 | | |
| | CuSnPb2p | Rem | 3.5-4.5 | 1.5-2.5 | 0.3 | 0.1 | 0.2 | 0.2-0.4 | | | | | | | 0.2 |

German Standard (DIN)

| Tin Bronze | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Cr | Imp |
|------------|-----------|---------|-------|-----|------|---------|------|------|-----|------|------|------|----|-----|
| GbCuSn12 | 86-88 | 11.3-13 | 0.8 | 0.5 | 0.15 | 1.8 | 0.05 | 0.01 | 0.1 | 0.01 | 0.15 | 0.04 | | |
| GbCuSn12Ni | 84-87 | 11.3-13 | 0.15 | 0.3 | 0.15 | 1.5-2.4 | 0.05 | 0.01 | 0.1 | 0.01 | 0.05 | 0.04 | | |
| G-CuSn10Zn | 86-88.5 | 9.2-11 | 1.3 | 1-3 | 0.2 | 1.8 | 0.03 | 0.01 | 0.1 | | 0.25 | 0.06 | | |
| G-CuSn12Pb | 84.3-87.3 | 11.3-13 | 1.2-2 | 0.5 | 0.15 | 1.8 | 0.05 | 0.01 | 0.1 | 0.01 | 0.15 | 0.04 | | |
| G-SnBz10 | 89-91 | 9-11 | | | | | | | | | | | | |
| G-SnBz12 | 87-89 | 11-13 | | | | | | | | | | | | |
| G-SnBz14 | 85-87 | 13-15 | | | | | | | | | | | | |
| G-SnBz20 | 78-80 | 20-22 | | | | | | | | | | | | |
| RG-10 | 85-87 | 9-11 | | 4 | | | | | | | | | | |

US Standard (ASTM)

| Tin Bronze | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Bi | Imp |
|------------|--------|---------|--------|---------|---------|-----------|-------------|------|----|----|----|---|----|-----|
| C40820 | 94 min | 1-2.5 | 0.02 | 0.2-2.5 | | 0.1-0.5 | 0.5 | | | | | | | |
| C50100 | Rem | 0.5-0.8 | 0.05 | | 0.05 | | 0.01-0.05 | | | | | | | |
| C50200 | Rem | 1-1.5 | 0.05 | | 0.1 | | 0.04 | | | | | | | |
| C50500 | Rem | 1-1.7 | 0.05 | 0.3 | 0.1 | | 0.03-0.35 | | | | | | | |
| C50510 | Rem | 1-1.5 | | .1-.25 | | 0.15-0.4 | 0.02-0.07 | | | | | | | |
| C50580 | Rem | 1-1.7 | 0.05 | 0.3 | .05-.2 | 0.05-0.2 | 0.01-0.35 | | | | | | | |
| C50590 | Rem | 0.5-1.5 | 0.02 | 0.5 | .05-.4 | | 0.02-0.15 | | | | | | | |
| C50700 | Rem | 1.5-2 | 0.05 | | 0.1 | | 0.3 | | | | | | | |
| C50705 | Rem | 1.5-2 | 0.02 | 0.5 | 0.1-0.4 | | 0.04-0.15 | | | | | | | |
| C5710 | Rem | 1.7-2.3 | | | | 0.1-0.4 | 0.15 | | | | | | | |
| C50715 | Rem | 1.7-2.3 | 0.02 | | .05-.15 | | 0.025-0.04 | | | | | | | |
| C50725 | Rem | 1.5-2.5 | 0.02 | 1.5-3 | .05-0.2 | | 0.02-0.06 | | | | | | | |
| C50780 | Rem | 1.7-2.3 | 0.05 | 0.3 | .05-.2 | 0.05-0.2 | 0.01-0.35 | | | | | | | |
| C50900 | Rem | 2.5-3.8 | 0.05 | 0.3 | 0.1 | | 0.03-0.3 | | | | | | | |
| C51000 | Rem | 4.2-5.8 | 0.05 | 0.3 | 0.1 | | 0.03-0.35 | | | | | | | |
| C51080 | Rem | 4.8-5.8 | 0.05 | 0.3 | .05-.2 | 0.05-0.2 | 0.01-0.35 | | | | | | | |
| C51100 | Rem | 3.5-4.9 | 0.05 | 0.3 | 0.1 | | 0.03-0.35 | | | | | | | |
| C51180 | Rem | 3.5-4.9 | 0.05 | 0.3 | .05-.2 | 0.05-0.2 | 0.01-0.35 | | | | | | | |
| C51190 | Rem | 3-6.5 | 0.02 | | .05-.15 | | 0.025-0.045 | | | | | | | |
| C51800 | Rem | 4-6 | 0.02 | | | | 0.10-0.35 | 0.01 | | | | | | |
| C51900 | Rem | 5-7 | 0.05 | 0.3 | 0.1 | | 0.3-0.35 | | | | | | | |
| C51980 | Rem | 5.5-7 | 0.05 | 0.3 | .05-.2 | 0.05-0.02 | 0.01-0.35 | | | | | | | |
| C52100 | Rem | 7-9 | 0.05 | 0.2 | 0.1 | | 0.03-0.35 | | | | | | | |
| C52180 | Rem | 7-9 | 0.05 | 0.3 | .05-.2 | 0.05-0.2 | 0.01-0.35 | | | | | | | |
| C52400 | Rem | 9-11 | 0.05 | 0.2 | 0.1 | | 0.03-0.35 | | | | | | | |
| C52480 | Rem | 9-11 | 0.05 | 0.3 | .05-.2 | 0.05-0.2 | 0.1-0.35 | | | | | | | |
| C53400 | Rem | 3.5-5.8 | 0.8-12 | 0.3 | 0.1 | | 0.03-0.35 | | | | | | | |

US Standard (ASTM)

| Tin Bronze | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Bi | Imp |
|------------|---------|-----------|---------|---------|------|---------|----------|-------|------|-------|-----|------|----|-----|
| C53800 | Rem | 13.1-13.9 | 0.4-0.6 | 0.1 | 0.03 | 0.03 | | | 0.06 | | | | | |
| C90300 | 86-89 | 7.5-9 | 0.3 | 3-5 | 0.2 | 1 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90200 | 91-94 | 6-8 | 0.3 | 0.5 | 0.2 | 0.5 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90500 | 86-89 | 9-11 | 0.3 | 1-3 | 0.2 | 1 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90700 | 88-90 | 10-12 | 0.5B | 0.5B | 0.15 | 0.5 | 0.3 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90710 | Rem | 10-12 | 0.25 | 0.05 | 0.1 | 0.1 | 0.05-1.2 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90800 | 85-89c | 11-13 | 0.25 | 0.025 | 0.15 | 0.5 | 0.3 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90810 | Rem | 11-13 | 0.25 | 0.3 | 0.15 | 0.5 | 0.15-0.8 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C90900 | 86-89 | 12-14 | 0.25 | 0.25 | 0.15 | 0.5 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C91000 | 84-86 | 14-16 | 0.2 | 1.5 | 0.1 | 0.8 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C91100 | 82-85 | 15-17 | 0.25 | 0.25 | 0.25 | 0.5 | 1 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C91300 | 79-82 | 18-20 | 0.25 | 0.25 | 0.5 | 0.5 | 1 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C91600 | 86-89F | 9.7-10.3 | 0.25 | 0.25 | 0.2 | 1.2-2 | 0.3 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C91700 | 84-87F | 11.3-12.5 | 0.25 | 0.25 | 0.2 | 1.2-2 | 0.3 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C92200 | 86-90 | 5.5-6.5 | 1-2 | 3-5 | 0.25 | 1 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C92300 | 85-89 | 7.5-9 | 0.3-1 | 2.5-5 | 0.25 | 1 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C92310 | Rem | 7.5-8.5 | 0.3-15 | 3.5-4.5 | | 1 | | 0.005 | 0.03 | 0.005 | | | | |
| C92400 | 86-89 | 9-11 | 1-2.5 | 1-3 | 0.25 | 1 | 0.05 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C92500 | 85-88 | 10-12 | 1-1.5 | 0.5 | 0.3 | 0.8-1.5 | 0.3 | 0.005 | | 0.005 | 0.2 | 0.05 | | |
| C92600 | 86-88.5 | 9.3-10.5 | 0.8-1.5 | 1.3-2.5 | 0.2 | 0.7 | 0.03 | 0.005 | | 0.005 | 0.2 | 0.05 | | |

Italian Standard (UNI)

| Tin Bronze | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Cr | Imp |
|--------------|---------|-----------|---------|-----|---------|-----|---------|------|----|-----|-----|-----|----|-----|
| B 10 | UNI1698 | 88-92 | 8-12 | 1 | | 0.3 | 0.5 | 0.05 | | | 0.2 | | | |
| B 14 | UNI1698 | 84-88 | 12-16 | 1 | | 0.3 | 0.5 | 0.05 | | | 0.2 | | | |
| B 20 | UNI1698 | 78-81 | 18-21 | 1 | | 0.3 | 0.5 | 0.05 | | | 0.2 | | | |
| B Zn 2 | UNI1698 | 92-94 | 3-5 | 2 | Rem | 0.2 | 0.1 | 0.05 | | | 0.1 | | | |
| B Zn 4 | UNI1698 | 85-88 | 9-11 | 1 | Rem | 0.3 | 1 | 0.05 | | | 0.3 | | | |
| B Zn 6 | UNI1698 | 85.5-87.5 | 7.5-8.5 | 2.5 | Rem | 0.2 | 0.1 | 0.05 | | | 0.3 | | | |
| G-CuSn10 | UNI7013 | Rem | 9-11 | 0.8 | 0.5 | 0.2 | 0.7 | 0.05 | | 0.2 | 0.2 | 0.1 | | |
| G-CuSn10Zn2 | UNI7013 | Rem | 8.5-11 | 1.3 | 1-3 | 0.2 | 1 | 0.05 | | 0.2 | 0.3 | 0.1 | | 2 |
| G-CuSn10Zn21 | UNI7013 | Rem | 9-11 | 1 | 1.5-2.5 | 0.2 | 1.8-2.5 | 0.05 | | 0.2 | 0.3 | 0.1 | | 2 |
| G-CuSn12 | UNI7013 | Rem | 11-13 | 1 | 0.5 | 0.2 | 0.7 | 0.05 | | 0.2 | 0.2 | 0.1 | | 1.5 |

France Standard (NFA53)

| Tin Bronze | Cu | Sn | Pb | Zn | Fe | Ni | p | Al | Mn | Si | Sb | S | Cr | Imp |
|------------|---------|---------|-------|----|------|-----|----------|------|----|------|----|------|----|-----|
| Tin Bronze | | | | | | | | | | | | | | |
| CuSn12 | Rem | 10.5-13 | 2.5 | 2 | 0.25 | 2 | 0.3 | 0.01 | | 0.01 | | 0.05 | | 0.5 |
| CuSn12P | Rem | 11-13 | 1 | 1 | 0.2 | 2 | 0.05-0.4 | 0.01 | | 0.01 | | 0.05 | | 1.2 |
| CuSn14 | 83.5min | 12.5min | | 1 | | | | | | | | | | 1.5 |
| CuSn8 | Rem | 7-9 | 0.5-3 | 3 | 0.2 | 1.5 | | 0.01 | | 0.01 | | 0.1 | | 1 |

