

## Common Elements

### Aluminum

Offers good corrosion resistance and good strength when alloyed with Zn or Si.

### Antimony

Increases tensile strength of solders. Poor conductor of heat and electricity.

### Bismuth

Low melting when alloyed with SnPb or In. Expands 3.32% on solidification. Non-toxic.

### Cadmium

Increases corrosion resistance of solders. Increases service temperature and strength of solder.

### Copper

When used in SnPb alloys, slight increase in spread rate, lowers melting temperature.

### Gallium

Has one of the longest liquid ranges for metals. Has low vapor pressure.

### Germanium

When alloyed with Au or Al, will reduce melting point and increase strength. Contributes to poor solder wettability.

### Gold

Highly conductive and corrosion resistant. High melting point is reduced when alloyed with Sn, Si, or Ge.

### Indium

Improves wetting of PbAg solders. Resists alkaline corrosion. Bonds glass, quartz, and glazed ceramics.

### Lead

Economical material, soft and ductile. Offers increased strength when alloyed with other elements. Toxic.

### Silicon

When used with Au or Al, will reduce melting point, increase strength, and improve wettability.

### Silver

Exhibits the highest electrical and thermal conductivity of all metals.

### Tin

Excellent wetting characteristics. Low strength when used alone but becomes stronger when alloyed.

### Zinc

When used in SnPb alloys, lowers spreading rate; when soldering to Al, used to reduce the electrical potential difference.

|    |    |    |    |    |
|----|----|----|----|----|
|    |    | 13 | 14 |    |
|    |    | Al | Si |    |
| 29 | 30 | 31 | 32 |    |
| Cu | Zn | Ga | Ge |    |
| 47 | 48 | 49 | 50 | 51 |
| Ag | Cd | In | Sn | Sb |
| 79 |    |    | 82 | 83 |
| Au |    |    | Pb | Bi |

APPLICATION NOTE

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Form No. 98557 R0

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