

The wetting characteristics and active nature of S-Bond™ permits a wide range of ceramics to be joined, either with other ceramics or with metals, providing:

- Direct wetting to ceramics
- No pre-metallization steps
- Clean interfaces
- Ductile / tough joints



### Electronics

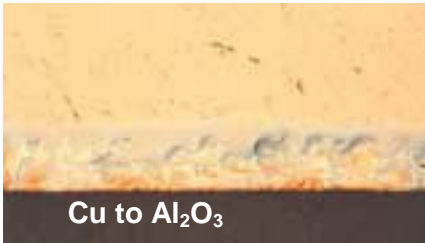
New, high power electronics require thermally conductive, yet insulative substrates, AlN in the new material of choice, however, joining WAS a problem which S-Bond™ now solves.

S-Bond™ joining offers :

- Direct wetting
- Good joint strength
- Excellent interfaces
- No substrate prep.

Examples include:

### Aluminum Oxide to Metals



#### Electronic Substrates

- Excellent bonds
- No pre-metallization
- No surface prep.



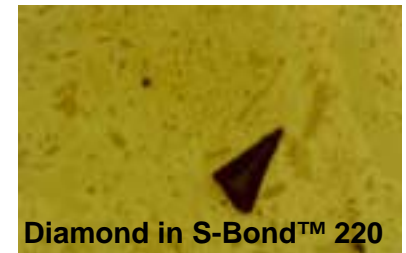
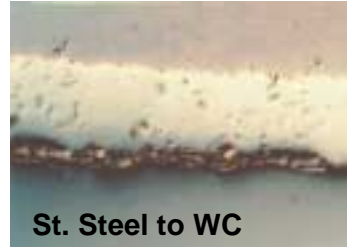
- Bonds Al to graphite
- Electronic & Composites materials
- Excellent wetting
- Ductile interfaces



#### Insulators

- Excellent interfaces
- Good strength
- High vacuum integrity

### Bonding for Carbides



S-Bond™ is compatible with many hard materials, and provided the strengths are sufficient, it can be used to bond cutting tool materials.

### Zirconium Oxide Bonding



#### Isolation Components

- Wets zirconia
- No deleterious phases
- Excellent interfaces
- Thermal cycle resistant

Many composites structures require the bonding of ceramics to metals, however the nature of the ceramic which has inert protective compounds at the surface.

S-Bond™, with its active characteristics, reacts with these inert compounds to facilitate wetting and bonding. S-Bond™ brazes at temperatures below 350 °C, making ceramic / metal joining environmentally safe, simple and economic. For metal joining see MRi Bulletin 14.2.1.1.

### Applications include:

#### Electronic

- |                 |                  |              |
|-----------------|------------------|--------------|
| - heat sinks    | - substrates     | - packaging  |
| - interconnects | - heat spreaders | - insulators |
| - feed-thrus    | - power elec.    | - shielding  |

#### Structures

- |              |                 |                     |
|--------------|-----------------|---------------------|
| - Composites | - Wear tiles    | - Cutting tools     |
| - Pump parts | - Dies /tooling | - Chemical reactors |