

Mechanical Activation

As MRi Technical Note 14.2.1 and 14.2.1.4 state, S-Bond™ alloys form a thin oxide (Sn-Ti) on melting that must be continually disrupted to enable the alloy to “wet” the substrate. S-Bond™ joining is “fluxless” and requires that, in the absence of chemical fluxes, the oxides forming on the molten surfaces must be disrupted by mechanical means to enable wetting and bonding. The mechanical activation at the tips of tools such as brushes, spreaders, vibrapen tools, or ultrasonic horns and/or soldering irons, are very effective for this.

Vibrapen Wetting

The figures to the right illustrates how these MRi “vibrapen” spreaders are used to apply and spread the S-Bond™ alloy onto surfaces in preparation for bonding.

First, heat the parts up to 250°C (480°F) +/- 10°C (~20°F). [for Alloy 400 use 420°C] The S-Bond™ alloy is typically applied / melted onto the part surfaces using the wire, foil or pellet forms. Once the S-Bond™ alloy is molten... it will sit as a pool and be held by its own surface tension... until mechanically “activated” using the tip of the vibrapen spreader. Using the edge of the spreader, turn the vibrapen tool to maximum intensity and press onto the molten surface of the S-Bond™ alloy pool. Then with a stroking action and firm pressure at the tip of the tool, spread and brush the molten alloy over the entire surface to be wetted. Make sure of 100% coverage with the tip of the tool since S-Bond™ will only wet and adhere to the surface areas that are mechanically disrupted (activated).



Once the S-Bond™ alloy is completely spread and wetted the sample is ready to be joined to a similarly wetted substrate surface. When the two surfaces are joined, they must be moved to sweep the oxides off the molten. The tip of the vibrapen tool, for small parts may be an effective tool for this as well... or MRi's ultrasonic tools may be employed for larger parts.