

Induction Bonding Solar Panels

United Induction Heating Machine Limited

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Objective To heat the stainless steel substrate of a solar panel shingle in order to melt the polymer encapsulant, allowing two shingles to bond together with a 3 inch overlap.

Material 3" by 10.25" section of a 21" solar panel shingle

Temperature 130 °C

Frequency 166 kHz

Equipment Power of 20KW power supply equipped with a remote heat station containing one 0.66mF capacitor. A custom-made coil: 4 turns of 1/4" x 1/2" rectangular copper tubing, measuring 24" by 2 1/4".

Process Stationary heating – with the coil located on the topside of the sample – was utilized to achieve uniform melt and adhesion.

The shingles were overlapped according to requirements and placed on wood to simulate the installation on a roofing

surface. In addition, pressure was applied by pressing the water-cooled coil against the shingle to facilitate the bonding (illustration). Tests are performed at several time-voltage settings.

Results Tests resulted in excellent bond formation with the absence of encapsulant bubbling and only slight surface texture change.

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