

THERMO-SENSITIVE MATERIALS

S-BOND®

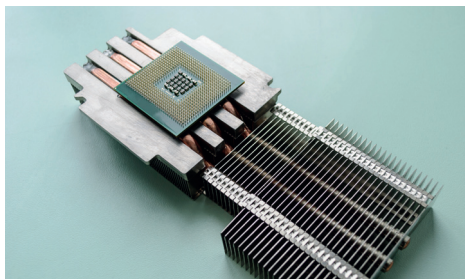
ULTRASONIC SOLDERING

Fluxless – Lead-free – Stressless

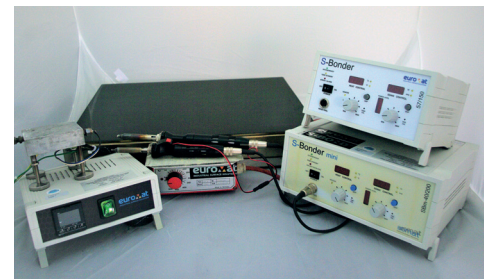
>> **Since 1995** Soldering and Metallization of Metals, Light Metals, Ceramics, Composites and Glasses without any Flux and unleaded Solders at Temperatures ranging from 120 °C up to 480 °C regarding RoHS-Rules. Process running at air atmosphere, inert gas shield or in vacuum. Suitable for many applications in the field of industrials, automotives, medicals, electronics, sensorics or crafts.



S-Bond® Solders Wires, Foils, Washers Powder, Ingots, Pellets Solder Kits



S-Bond® Engineering and Soldering Service



S-Bond® Soldering Machines, Heating Plates, Handlings and Accessories

Description of Ultrasonic-Soldering Technology

By the combination of heat and the high energy of the ultrasonic waves metallurgical joints with high strenght can be achieved. Beneath metals, copper and brass even difficult wettable materials like light alloys, ceramics or glasses can be soldered at temperatures starting with 120 °C. No flux is necessary.

- Soldering at air atmosphere, in inert gas atmosphere or in vacuum
- Hermetic seal and suitable for cryogenic temperatures and vaccum applications
- High thermal resistance with good electrical and thermal conductivity properties
- Exellent behaviour under stress of thermal mismatch
- High shear strenght of soldered joints made by metallurgical bondings
- Fluxfree soldering process means no corrosion of soldered joints
- Economic solution for metallization of materials which are difficult to wet
- Manifold solder materials are available for different applications and requirements
- Patented unleaded solder materials available regarding RoHS-Rules
- Ultrasonic soldering machines and processes can be adapted to individual applications
- Process runs automated or manually

Ultrasonic-Solderable Materials

The flux-free active solder together with the ultrasound exposure enables the direct wetting of materials that are otherwise difficult to solder, and among others provides for the following benefits:

- >> Light Metals (Al, Mg), Titanium, Nonferrous, Steels, Stainless Steel, Chromium, Copper, Tin, Zinc, Sintered Materials, Porous Materials
- >> Glasses (Lead, Soda), Metallized Glasses (e.g. ITO), Ceramics, Magnets,
- >> Superconductors, Semiconductors (e.g. Germanium), Silicium
- >> Composite Materials MMC/CMC (Al-SiC, Si-SiC), Metal/Light Metal/Ceramic-Foams
- >> Ceramics and ceramic-metals combinations

Why Soldering with S-Bond® Ultrasonic-Technology?

Environment friendly

- No contamination of the environment and people by flux-free processes and use of lead-free solders
- No subsequent cleaning of the assembly parts of flux residues necessary

Perfect Soldering

- Ultrasonic energy penetrates into the surfaces and causes metallurgical bonding with high strength of the joints by diffusion effects
- Manyfold materials are solderable such as metals, light metals, composites, ceramics, glasses
- Dense joints and no corrosion effects due to the fluxless process
- Easy local soldering or spot metallization

Economic process with a high potential for cost savings

- Cost savings through the avoidance of flux-based cleaning and disposal costs
- Metallization costs, are for example omitted in the case of aluminium materials
- Cost savings through material substitution, e.g. copper by aluminium
- Simple and automatable process

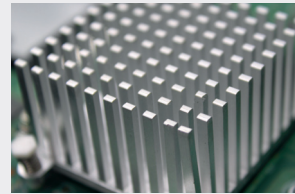
New Applications and Properties of Components

- Successful soldering of new materials in the areas of metals, light alloys, ceramics, composites and glasses allow new product developments and increase the degree of efficiency of the assembly part
- Numerous customers use the ultrasonic soldering technology in the areas of solar, battery technology, electronics, electrical engineering, engine construction, transformers, vacuum technology, filter technology, semiconductors, heat exchangers, ceramic applications, sensor technology and much more
- Repairing e.g. electronic parts or aluminum parts

Industrial Applications:

- Surface Metallization for Contact soldering or Casting
- Elektronic-Transformers-Contacts
- Optical Glasses, Glass Fibres
- Thermomanagement, Cooling Plates
- Light Weight Structures, Targets
- Vacuum Components, Thin Film Substrates, Sensors, Magnets, Sintering metals
- Semiconductors, Superconductors, Solar
- Remanufacturing

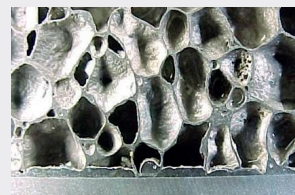
Product Information of Lead-Free S-Bond® Solders regarding RoHS-Rules



Al-Cooler



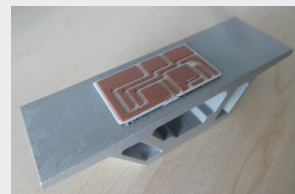
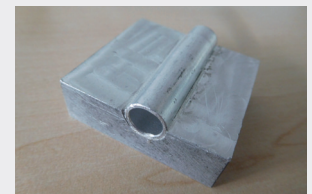
Pipe Joints Al-Al, Al-Cu



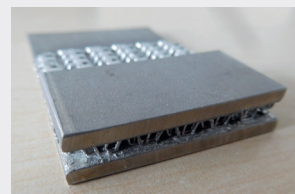
Heat Exchanger Al-Foam onto Al-Plate



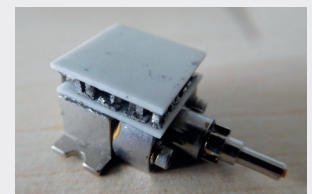
Invar/Kovar water connectors soldered to SiC-ceramic water cooler


Al₂O₃-ceramic soldered onto Al-cooler


Heat Exchanger Al-Al



Aluminum plates soldered onto stainless steel structured plate



Peltier-ceramic soldered onto stainless steel laser body for cooling



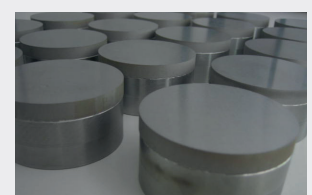
Elektronik Part AlN onto Al-Plate



Magnets onto Steel Wheel



Sensor Porous Ni into SS-Fitting



Tungsten soldered onto copper for PVD-target applications