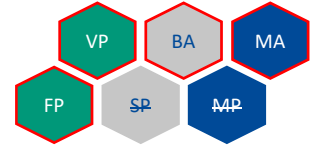


Optimum ultrasonic welding parameters for Al – Cu joints using design of experiments

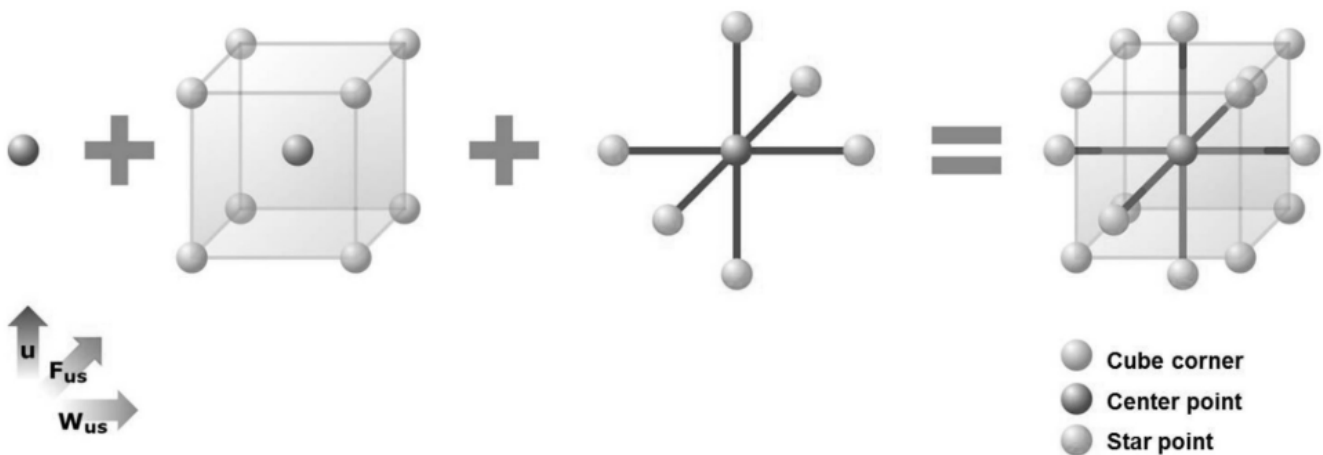
Experimental student work (FP+VP, BA, MA)*

Recommend for: M.Sc. Sustainable Systems Engineering, M.Sc. Sustainable Materials

Automotive battery packs are the key component in electric vehicles (EV), hybrid electric vehicles (HEV) or plug-in hybrid electric vehicles (PHEV) which consist of a large number of battery cells. These cells must be assembled with robust mechanical and electrical joints. In recent years, ultrasonic metal welding (USMW) is widely used in joining of battery cells as in Chevy Volt (GM), due to its advantages in joining dissimilar and conductive materials. Ultrasonic welding is a solid state welding technique, where the formation of the bond occurs as a result of a static welding force and a superimposed ultrasonic oscillation.



In USMW, welding force (F_{us}), oscillation amplitude (u) and welding energy (W_{us}) are the main process parameters. In this thesis, a systematic study on ultrasonic welding of Aluminum (Al) to copper (Cu) and optimization of the process parameters to maximize the weld strength using the design of experiments methodology (e.g. Fuzzy logic, Taguchi, Central composite circumscribed design ...) need to be performed.



[Materialwissenschaft und Werkstofftechnik (2012) 43(4) 286-292]

Starts: As soon as possible

Timeframe: According to examination regulations

More topics on request!

* Forschungspraktikum = FP, Vertiefungspraktikum = VP, Study Project = SP, Bachelor Project = BA, Master Project = MP, Master Thesis = MA

Contact

M.Sc.. Junqi Li

Junqi.li@inatech.uni-freiburg.de | 0761 / 203 54 283

Department of Sustainable Systems Engineering | INATECH

Walter und Ingeborg Herrmann Chair for Power Ultrasonics and Engineering of Functional Materials

Faculty of Engineering | University of Freiburg

