Spot Welding Aluminium with \textit{AluSPATZ+}

Technology Controller \textbf{SPATZ+}

The high-tech controller \textbf{SPATZ+} is a 1 kHz inverter power source with integrated servo-drive control. This new controller generation fulfills all demands for spot welding aluminium material. With its modular setup using a tandem inverter it delivers welding currents up to 60 kA.

Due to the fast response time and the integrated feedback of electrical and mechanical signals the \textbf{SPATZ+} runs the adaptive \textit{AluMASTER} control method. Deviations in the welding conditions like shunt effects or surface variations will be compensated automatically even within the short weld times.

Based on the material properties of aluminium spot welding the process must cope with:

- Low electrical resistance $\rightarrow$ High welding current
- High thermal conductivity $\rightarrow$ Short weld times
- Oxide surface layer $\rightarrow$ Variable start conditions
- Clean electrodes imperative $\rightarrow$ Regular cap cleaning

The \textbf{SPATZ+} series has the complete functional package for these demands!

\textbf{Weld Gun / Actuators \textit{AluGATOR}}

Servo-motoric weld guns like the \textit{AluGATOR} are the best choice for spot welding aluminium considering the need of high electrode forces. The weight optimised transformer fits best to the high \textbf{SPATZ+} inverter power.

This weld gun system ensures reliable mechanical signals for force and displacement measured during the weld time to achieve the best results for the adaptive \textit{AluMASTER} and the Quality control \textit{NUGGET Index}. 

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© 2018 : 2018-10-26
Electrode management

*CapClean*

As in welding of galvanized steel, the processing of aluminium entails the problem that the contact area of the copper electrodes is subjected to contamination. The accumulation with aluminium leads to deterioration of the conductivity and effects the heat generation till the increase of the development of impurity layers will make the electrodes unserviceable.

For reliable spot welding of aluminium it is, therefore, imperative to avoid any impurity layer. This is carried out with the “drive in and get cleaned” device by regular cleaning of the electrodes. The specific form grinding of the *CapClean* ensures up to 10,000 spots per set of cap with the right electrode contact geometry during the entire electrode lifetime.

Non-Destructive Testing *NUGGET* Index

During each weld the SPATZ+ controller records the curves for all electrical and mechanical signals. These data are imminently analysed and condensed to one single value, the *NUGGET* Index. This quality parameter displays the final result of each weld spot with regard to the spot diameter.

During the MASTER setup the related limits are automatically calculated. Therefore no statistical data are required to run the *NUGGET* Index as 100 % inline NDT system in the production. This helps to reduce the cost intensive destructive testing dramatically.

Since more than 25 years we have continuously advanced the resistance spot welding technology with considerable success. We have moved from a simple joining process to a reliable link in your production chain. Whether you are looking for steel or aluminium assembly, we are your best choice for all resistance welding tasks. We are looking forward to your questions, ideas and discussions. So please do not hesitate to contact us.