

Clinching or resistance spot welding: Comparison of CO₂ footprint

The “greener point” – clinching beats welding

TOX-Clinching, also called “toxing”, has already earned its name all over the world as smart joining technology. But when thinking of joining technology, what first comes to mind for many is resistance spot welding (RSW). This procedure is known and often used in the industry. An examination conducted by the laboratory for materials engineering and joining technology of the University of Paderborn proved that this solution generates a lot of emissions. Clinching technology performs markedly better here.

The current challenges for manufacturing companies are complex. They must deliver high-quality products quickly and reliably and save costs at the same time. Furthermore, the pressure to reduce CO₂ is growing. The demand for sustainable production is passed on by those responsible in the value chain. They increasingly also expect energy-efficient solutions from their suppliers.

This puts sub-suppliers under pressure. TOX PRESSOTECHNIK recommends to take the CO₂ footprint into account when selecting the joining technology, and to favor energy-saving technologies.

Technology comparison

Resistance spot welding is a well-established joining process, which has been used by many companies for decades, without being aware of the negative energy footprint. The sustainable alternative is clinching – an efficient technology offered by TOX PRESSOTECHNIK to its customers. “This process is the technological solution for offering an energy-efficient joining process for the highly automated large-scale production as well as for single-item production at the manual workstation,” says Dr. Marcus Matzke, Head of Technology at TOX PRESSOTECHNIK. “Clinching is a key technology with which users can achieve their set CO₂ targets”, he adds.

To prove the advantages with regard to energy efficiency, TOX PRESSOTECHNIK commissioned the laboratory for materials engineering and joining technology of the University of Paderborn to perform an energy consumption measurement for resistance spot welding. The institute examined a pure steel and pure aluminum compound.

Winner when it comes to energy

The result: Clinching has the edge for both material combinations. Depending on the joint, between 80 and 90 percent of energy can be saved. “You can thus significantly reduce your CO₂ footprint with clinching instead of welding. Not only because during clinching, additional energy consumption in the form of ventilation or extraction can be fully dispensed with,” says Dr. Marcus Matzke.

But the process not only impresses with regard to energy consumption. Companies can also save elsewhere: As a clinch connection is solely created through forming of the joining parts, auxiliary joining parts such as screws, nuts or rivets are not needed. Investing in any feeding device is also unnecessary. Neither coolant nor gas must be fed, and there are no chemicals or other contaminants to be disposed of. Furthermore, no toxic fumes are generated during clinching, which might harm the operating personnel. And the noise level during operation is significantly lower.

“Concerning the financial expenditure, we expect 40 percent less investment, operating and tool costs for our customers based on a direct comparison,” says the Head of Technology.

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Meta title: Comparison of CO₂ footprint: Clinching vs. resistance spot welding

Meta description: Wanted: sustainable joining technology – TOX PRESSOTECHNIK commissions the laboratory for materials engineering and joining technology of the University of Paderborn to compare clinching and resistance spot welding.

Keywords: TOX PRESSOTECHNIK; clinching; resistance spot welding; RSW; joining technology; CO₂ footprint;

Captions:



Image 1: An examination conducted by the laboratory for materials engineering and joining technology of the University of Paderborn showed that there is significantly less energy consumption during clinching compared to resistance spot welding.

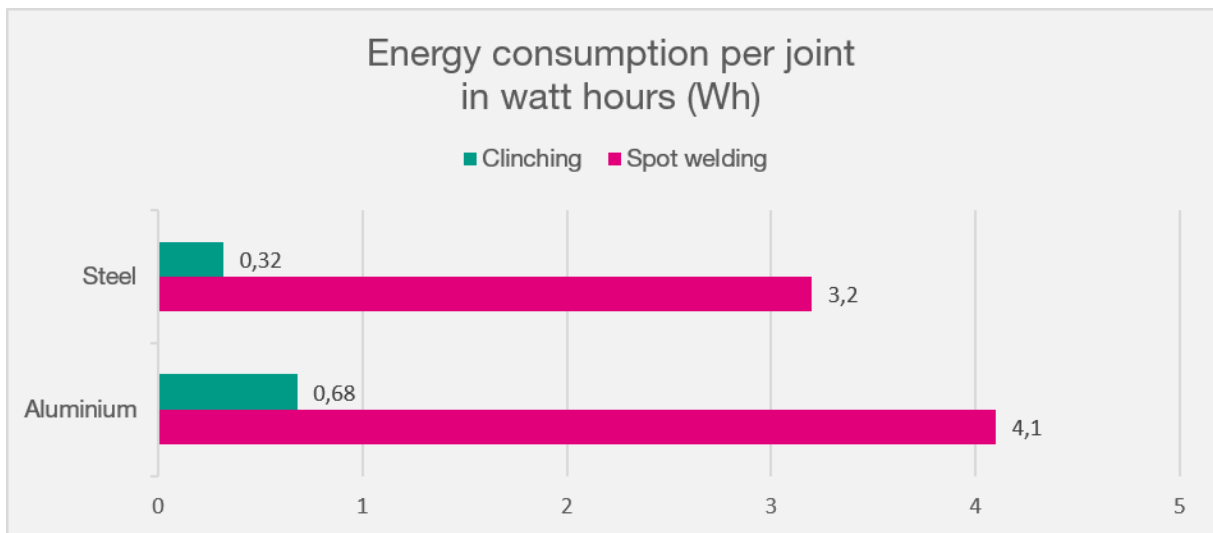


Image 2: Comparison of the energy necessary in watt-hours: Depending on the joint, between 80 and 90 percent of energy can be saved.

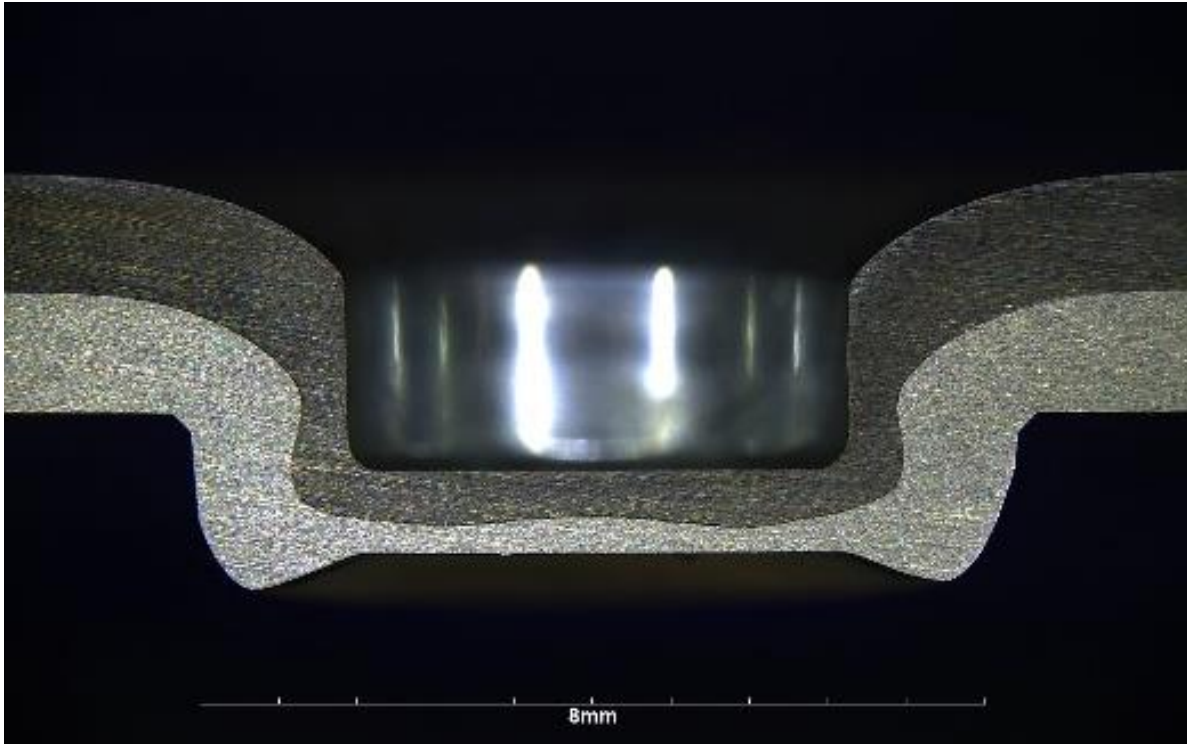


Image 3: With clinching, a push-button-like, positive locking joint of two or more layers is created in a single-level forming process.

Images: TOX PRESSOTECHNIK GmbH & Co. KG

About the company:

TOX® PRESSOTECHNIK is a supplier of presses, systems as well as components for sheet metal joining and assembly technology. Since its foundation in 1978, the family business has become a global player with more than 1400 employees worldwide, 550 of which are based at the headquarters in Weingarten near Ravensburg, Germany. The success story started with one pneumohydraulic drive – the TOX®-Powerpackage. The “Components” division now includes pneumohydraulic and electromechanical drives as well as controls, sensors and software for process monitoring and quality assurance. In addition to a large range of presses, the system range comprises manual, machine and robot tongs. Another mainstay are modern sheet metal joining procedures, also incorporating the TOX®-Clinching Technology, which makes the company today’s market leader.

Drives, processes and systems from TOX® PRESSOTECHNIK can be found at automotive manufacturers and their suppliers as well as at industrial businesses for household appliances, electronic components, furniture and much more. Special versions of the TOX®-Drives are also approved for the food industry.

TOX® PRESSOTECHNIK is represented worldwide: 18 subsidiaries, amongst others in the USA and South America, Europe and South Africa, India, China and the entire Pacific Region. 20 representatives in many other markets support and advise local customers.

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