Self Piercing Riveting Systems
Jointing of dissimilar materials for contributing to lightening
Aluminum + aluminum; aluminum + steel; aluminum + magnesium; steel + steel; etc.

In many industrial fields including automobile and electricity, lightening is prevailing, and lighter and stronger materials are desired for jointing work. These lighter materials are especially desired in automobile industries, where steel materials have been replaced with materials made of aluminum, magnesium, CFRP and so on. As such, jointing of dissimilar materials, such as aluminum, magnesium, CFRP and high-tension steel plates, has increased in the automobile industry, and the proportion of automobiles with welding difficulties has also increased. As an alternating welding method, work with self-piercing rivets (SPR) has prevailed as a superior method for jointing as no pilot hole is required for dissimilar materials. In addition, the SPR jointing method is eco-friendly as no heat or gas is produced, differentiating it from the case of welding.

Jointing results with stable quality under various conditions
Jointing of thick and thin plates or high-tension steel plates

In the SPR jointing method, SPR rivet pressurized by a tool penetrates the upper material without any workpiece hole, and the tip of the rivet opens in the lower material to form a shape matching a die, thereby enabling jointing plural workpieces. Due to a riveted cross section, internal locking is created to ensure jointing of the workpieces.

Motorized SPR system optimized for fully automated production lines
Operation speed= max. 200 mm/s; jointing speed= max. 100 mm/s; max. jointing load= 80 kN

Our motorized SPR jointing system is configured by a tool on a C-frame, a feeder unit, a control unit and a die, and can be combined with a robot. The system is equipped with a quality confirmation monitor screen on the control unit, on which a riveting load and displacement are displayed as a riveting curve. Thickness of workpieces and rivet length are also measured and judged during the rivet jointing process.
Monitor screen for displaying and recording jointing results
Equipped with a quality monitoring function

All data including driving load, plate thickness and rivet length per jointing are displayed on the monitor screen, and in the case of erroneous jointing not meeting a particular strength, a warning message is displayed. When plate thickness of a workpiece or SPR rivet length is outside a control value, the system stops operation prior to the actual SPR rivet piercing process, thereby enabling prevention of jointing defects.

Projection allowance control by proprietary technology
Plus-minus zero control of rivet projection allowance (patent #4216505)

Plus-minus zero rivet projection allowance is established when the tip of the punch pressing a rivet and the tips of the nosepiece and the receiver fixing a workpiece are controlled to be flush. Only our equipment adopts the same value feedback control. The punch position measurement system and the nosepiece plus receiver position measurement system are independently provided and feedback control is established under cooperative operation thereof.

From plate checking to after-sales service

Plate checking: Best-suited rivet and die are selected after receiving a subject set of plates and actually jointing them with SPR.
Design and manufacture: Designing and manufacturing parts and equipment important for SPR jointing, such as die, rivet and C-frame, are performed.
From delivery and installation of the equipment to after-sales service: Engineers who are well aware of the production line are involved at stages from review and discussion of equipment up to after-sales service.
Proven history of implementation in broad areas: The system has been adopted in many areas including automobile parts (such as aluminum-made doors, trunk lids and hoods), snow mobiles, window frames (houses) and elevators.
Overseas network: The network of Stanley Engineered Fastening Group spread worldwide is utilized.

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