

Hightech for sheet metal



Innovative Solutions

ARNOLD & SHINJO supplies innovative fastening solutions for sheet metal applications European service provider for the automotive industry System solution composed of punching and tooling elements reduces costs.

(Dörzbach) Mechanical fastening elements have established their position as a joining solution in sheet metal processing. In comparison with weld nuts and weld studs, processing is reliable, friendly to the environment and, just as importantly, economical regarding the overall process. Since its establishment in 1994, ARNOLD & SHINJO has followed the philosophy of introducing pressing and punching fastening techniques directly into sheet metal panels into the European market. And it has done this very successfully ARNOLD & SHINJO is supplying today nearly all the major manufacturers in the automotive industry, their subcontractors plus a wide range of companies in the sheet metal working industry.

The principle of the piercing nut or of the clinch stud is as easy as it is clever. The fastener is taken, by means of a standardised tool, to the desired place of installation and attached there accurately. In the case of the piercing nut, the punch collar punches a hole into the panel with

the sheet metal being clinched into the nut. The resulting waste material drops through a hole in the die. The clinch stud is fastened into the panel with a pre-punched hole. These processes are much cleaner than the classical variants of weld nut and weld stud and avoid in particular all the quality problems arising from



the thermal effects caused by the welding process.

Products befitting the job ARNOLD & SHINJO provides, for nearly every type of application, the most appropriate solution. The product range comprises piercing nuts and clinch studs, allowing fully automated processing of all fastening elements into all normal sheet metal grades.

All fastening elements can be supplied with the surface treatment requested by the customer.

The nut product range

The different versions of the piercing nuts are suitable for applications

PIAS PN® Piercing nut
Sheet thickness: 0,6-2,5 mm
Dimensions: M5 to M10
Property class: 8
Attribute: Moderate strength requirements

PIAS KP® Piercing nut
Sheet thickness: 0,6-2,5 mm
Dimensions: M5 to M12
Property class: 8 and 10
Attribute: Thin sheet, increased demand on torque

PIAS HN® Piercing nut
Sheet thickness: 2,5-4,0 mm
Dimensions: M5 to M12
Property class: 10
Attribute: High sheet strength

RXM® Piercing nut
Sheet thickness: 0,75-2,5 mm
Dimensions: M5 to M10
Property class: 10
Attribute: Nut of circular shape

0.75 millimetres and 5.0 millimetres is the range of application for the RX and SX clinch studs from ARNOLD & SHINJO.

While the RX series with its M5 to M10 dimensions of property classes 8 to 10 is recommended, particularly for the thickness range 0.75 millimetres to 2.5 millimetres, the SX variant is mainly intended for heavy loads and a higher panel thickness range from 2.5 millimetres to 5.0 millimetres. In both types, sizes M5 to M8 and property classes 8.8 and 10.9 are available.

High process reliability

In order to process the various types of piercing nuts and clinch studs in a reliable manner in the punching and press shop, as well as in assembly work and body assembly, ARNOLD & SHINJO provides a standardised range of tooling and equipment.

This system solution includes punch and clinch heads, dies and

with panel thickness ranges of between 0.6 and 4.0 millimetres. The PIAS range consists of the square PN, HN, and KP-E piercing nuts, which are designed for processing with the full range of sheet metal thickness from 0.6 millimetres to 4.0 millimetres. The KP version in particular is meeting increased demands in respect of torque. The dimensions extend from M5 to M12. The round RX piercing nut is available in sizes of M5 to M10 of property class 10, and is suitable for thickness ranges of 0.75 millimetres to 2.5 millimetres.

The stud product range

A sheet thickness between

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and also feeding devices including the necessary control systems.

Standardised components

The core competence of ARNOLD & SHINJO is focussed mainly on the development of punch and clinch heads. These are characterised by a straight-forward, modular, and assembly-friendly design. In addition to the standard heads, variations meeting specific customer requirements can be supplied for differing geometric component shapes. The multitude of applications, which are outstanding because of their high degree of economical efficiency, cover nearly the full spectrum of possible production tasks.

Intelligent feeding

The punch and clinch heads are supplied by means of ARNOLD-SHINTO feeding equipment with up to 20,000 fasteners capable of being ready for use in the hopper. The fasteners are positioned automatically in the correct position and fed through a feeding hose into the tool. The simple and intelligent design ensures reliable functioning of all components. The various alternatives available for the feeding technique allow use in both small series as well as in mass production.

32 with a single stroke

The ARNOLD & SHINJO multi-feeder in particular

allows the implementation of projects in the press shop in which many nuts must be fastened. The device distributes the necessary nuts in one stroke to the punch heads. It is possible to supply up to eight heads from one multi-feeder. All fasteners are installed simultaneously. By means of this system, the number of



interfaces to the tool is clearly reduced and set-up times are minimised. Only one feeding hose to the tool is required for each multi-feeder. Activation of individual punch heads can be blocked mechanically or electrically. When the process is completed the customer has a completely finished sheet metal part with up to 32 fasteners installed.

Monitored process

ARNOLD & SHINJO produces the complete control and monitoring system in order to provide complete reliability of the system. It is standard to monitor punching unit, tool and feeding device by

RXS® Clinch stud

Sheet thickness: 0,75 - 2,5 mm
Dimensions: M5 to M10
Property class: 8 and 10
Attribute:
for lower sheet thickness

means of a PLC control system. In the PLC several programs can be stored affording a high degree of flexibility of the piercing nut

SX® Clinch stud

Sheet thickness: 2,5 - 5,0 mm
Dimensions: M5 to M10
Property class: 8 and 10
Attribute: for higher sheet thickness range

tool, can bring to bear its advantages to the fullest extent, because processing of the fasteners is integrated into the manufacturing process of the sheet metal parts.

The fastener is connected to the panel in one operation. The pressing-in process and punching process result in a totally clean working environment, where production of scrap is prevented to a large extent.

system. The software is programmed individually for the respective application. Connections can be made either by conventional wiring or by bus.

Efficient processing variants

Processing of self-piercing nuts and clinch studs directly in the press and punching shops of the automotive, domestic appliance, or the subcontracting industries has been known for years. But now there is a growing trend to use these fastening systems in body assembly and other assembly work. Application in the press tool In the punch and press shop the system solution, consisting of fastener and

A rapid cycle frequency is ensured while at the same time the number of operations can be reduced. At the end, a complete finished sheet metal part containing the required fasteners is the result.

Processing in body assembly

For processing the fasteners in the assembly area, ARNOLD & SHINJO offers several user-oriented solutions. In the centre of these is the C-Frame press with fully automatic feeding system. Beyond that, there are also partly automated solutions and manually operated systems. All system variants have found their place in various

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applications at well-reputed **manufacturers and can be integrated into existing production facilities.**

Engineering competence

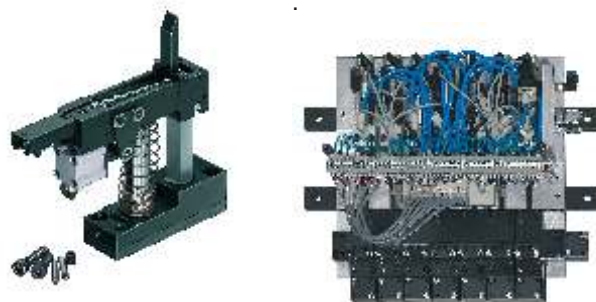
Just as innovative as the comprehensive approach to sheet metal processing is the service offer by ARNOLD & SHINJO. The company, which is part of the global Würth group, offers integrated solutions comprising fastener, tool component, and service.

Correspondingly wide is the scope of activities of the ARNOLD & SHINJO fastener specialists. As a leading manufacturer in the field of "fastening systems", so important in the production process, ARNOLD & SHINJO offers in addition to the "hardware" a wide range of services. For the development, design, and production of punching and clinching elements, the company employs an experienced team of engineers and designers. They give support to the customer from tool and process development to prototype production. Test and commissioning are also part of the profile of services, as well as employee training and after-sales activities.

As a technical service provider, ARNOLD & SHINJO can help most by being involved at an early stage in the development and design process of new products. Such early

involvement in the design process for the piercing and pressing-in fasteners will allow the customer better economic advantages in the long term: Investment in expensive and maintenance-intensive welding plant can be eliminated completely, and this applies also to the welding filler material. The process does not involve any vapours harmful to the

Arnold&Shinjo is a 100 percent subsidiary of the global Würth Group with 54,900 employees and 375 companies in 83 countries and global sales of over 7.74bn Euro.



environment or noise and leaves a clean work area afterwards. Cost reductions of up to 30 percent have already been achieved.

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