

RIVKLE®

Automatic setting machines for RIVKLE®
blind rivet nuts

Kel
BULGARIA

BÖLLHOFF

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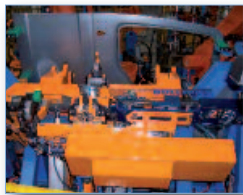
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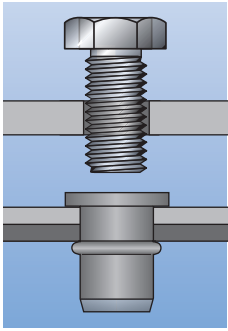
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RIVKLE® - Principal and mechanical characteristics

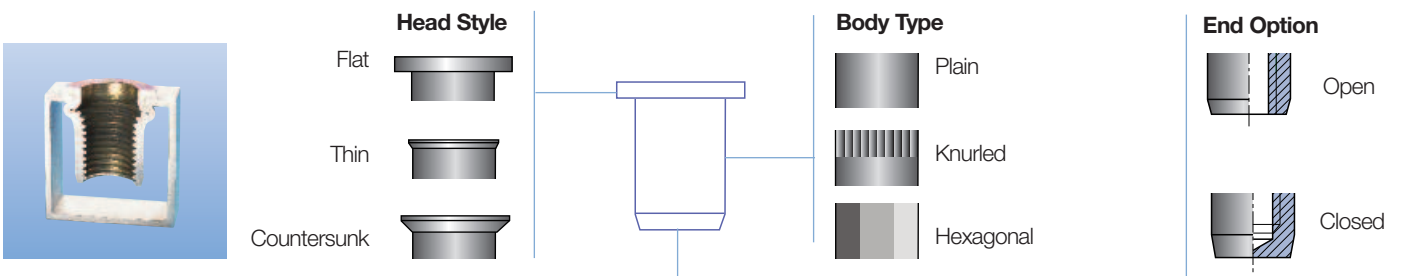


When installed into the workpiece, RIVKLE® blind rivet nuts have two functions:

- A RIVET function allows two or more sheets to be permanently joined
- A NUT function which provides a deep, strong reusable thread for assembly of a threaded joint where access is from one side only.

RIVKLE® blind rivet nuts can be installed in many types of workpiece (metal, plastic, composite, etc.) without surface damage to painted or pre-treated panels.

The RIVKLE® blind rivet nuts are available in a wide variety of combinations:

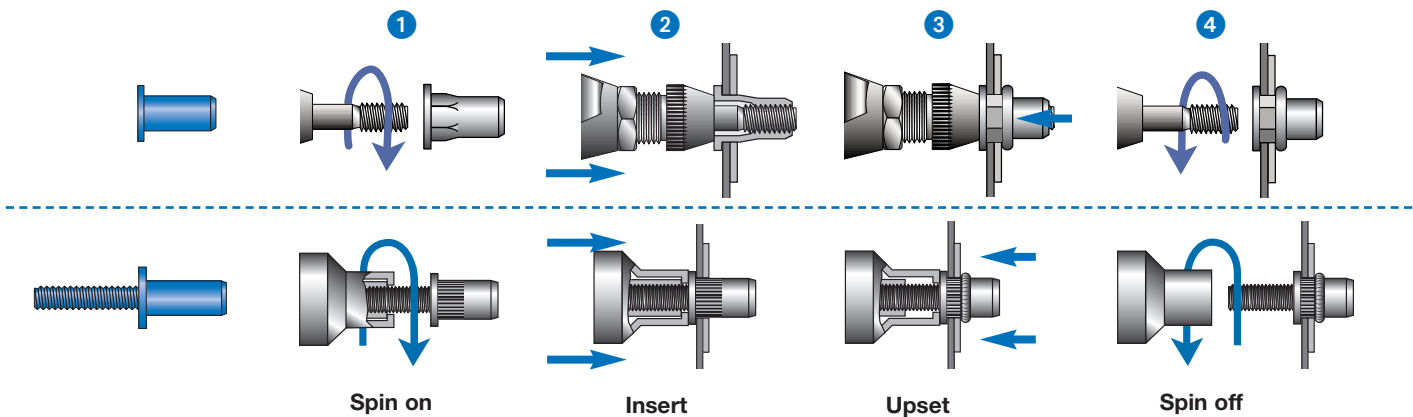


RIVKLE® blind rivet nut - Setting methods

The recommended setting methods are the “pulling method” and the “setting using a press”.

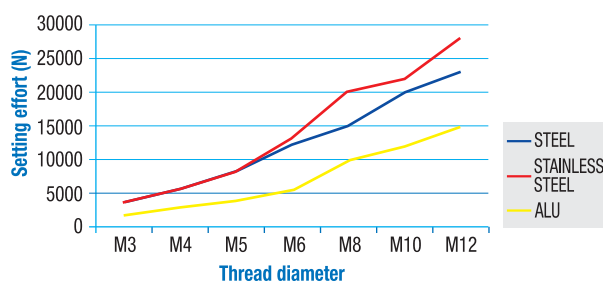
1 - Pulling method

The “pulling method” comprises Spin on, Insert, Upset and Spin off cycles.



We do not recommend the use of mechanical screw-drivers or spanners for assembly of blind rivet nuts as there is a risk of damage to the thread surface and thus a detrimental effect on the joint.

The setting force is dependent on the combination of RIVKLE® material and thread diameter.



	Steel	Stainless steel	Aluminium
M3	3 500	3 500	1 900
M4	5 500	5 500	3 000
M5	8 000	8 000	3 800
M6	12 000	13 000	5 500
M8	18 000	20 000	10 000
M10	21 000	22 000	12 000
M12	23 000	28 000	15 000

Unit: Newton

The setting forces indicated above represent the maximum load to properly set RIVKLE® blind rivet nuts. Higher force could damage the RIVKLE® thread or the setting tool mandrel.

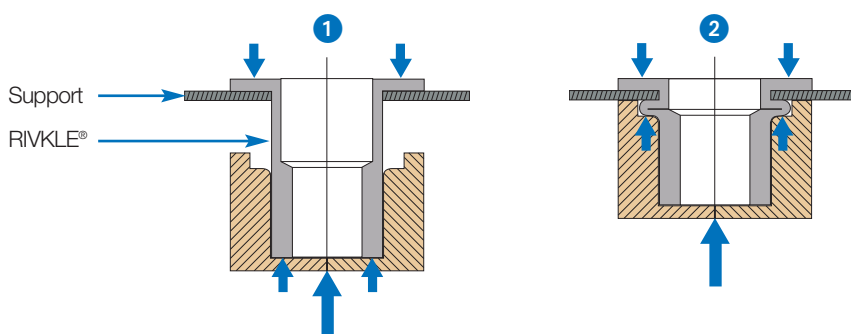
RIVKLE® blind rivet nut - Setting methods

2 - Setting by press

Setting using a press requires access to both sides of the workpiece. This type of setting method is interesting for applications where simultaneous and fast RIVKLE® setting is necessary.

Our technical department will be pleased to recommend suitable product and parameters to suit your potential “setting by press” projects. Please contact us early in your design program.

- Advantages:**
- Simultaneous and fast setting method
 - Reduced maintenance resulting from few wear parts



3 - Function

- **Stroke setting method:** control of the setting tool displacement distance

The main parameter is ‘setting stroke S’ that requires adjustment on the tool in accordance with the values shown in the RIVKLE® catalogue tables (Individual values for each RIVKLE® blind rivet nut).

- Advantage:**
- Fast and simple process

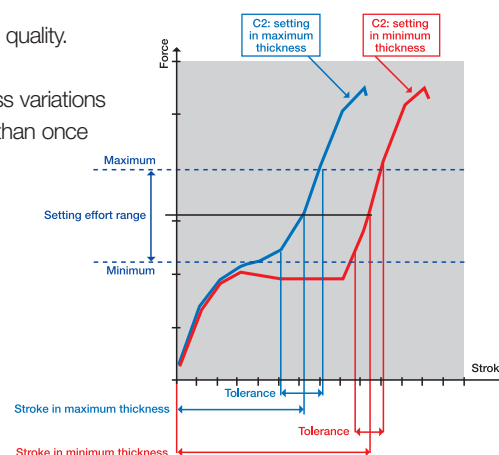
- **Pressure setting method:** control of the setting effort

In the stroke setting method, the tool delivers maximum and constant force over the full stroke of the mandrel. Where there is a wide variation of thickness of the workpiece there is a definite risk that a blind rivet nut may not set properly, or become damaged due to the setting mandrel stripping the RIVKLE® thread. In this situation there will be rapid and premature wear of the mandrel.




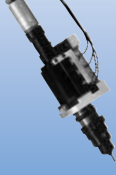


This phenomenon is eliminated with the pressure setting method as the setting force is controlled irrespective of the thickness of the workpiece.

This setting principle is particularly well suited to workpieces with variable thickness (plastic parts...) and provides consistent setting quality.

- Advantages:**
- Optimised setting into panels with thickness variations
 - Possibility to set the same RIVKLE® more than once
 - Extended mandrel life



RIVKLE® - Setting machines

		Semi-automatic tools		Automatic tools				
								
		EPK C	EPK HP	SAC 310	HSA	CFA	ESA	
Setting technology	Stroke			●		●		
	Force	●	●	●	●		●	
Drive		Pneumatic / Electric	Pneumatic / Electric	Pneumatic / Electric	Pneumatic / Electric	Pneumatic / Electric	Electric	
Accessibility		One side only	One side only	One side only	One side only	Both sides	One side only	
Setting force		min.	6 kN	20 kN	6 kN	6 kN	—	6 kN
		max.	22.5 kN	55 kN	26 kN	26 kN	20 kN	20 kN
Ø RIVKLE®	min.	Steel	M4	M10	M4	M4	M3	M4
		S. Steel	M4	M8	M4	M4	M3	M4
		Alu	M6	—	M6	M6	M3	M6
	max.	Steel	M10	M12	M12	M12	M8	M8
		S. Steel	M10	M12	M10	M10	M8	M8
		Alu	M12	M12	M12	M12	M12	M12
Control process		●	●	Option	●	●	●	
Use / integration	Manual (operator)	●	●					
	With robot				●	●	●	
	Special machine			●	●	●	●	
RIVKLE® feed system	Manual	●	●	●				
	"Pick & place"			●	●		●	
	Automatic				●	●	●	
RIVKLE® annual volume		++	+	++	+++	++	+++	
Cycle time (s)	Loading / speed	1	1.5	1	4	3	3.5	
	Setting	1	1.5	1	1	1	0.7	
	Spin off	1	1.5	1	1	—	0.7	
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RIVKLE® - Semi automatic setting tools - EPK Compact - EPK HP

Description

The EPK Compact is a manual setting tool with in-built quality control, dedicated to setting of RIVKLE® blind rivet nuts.

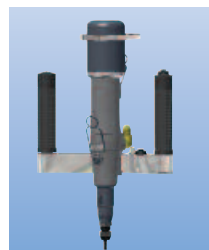
This equipment is easy to integrate into a manual work station.

It may also be connected to a standard PLC via the Harting connector. Two models of setting head are available.

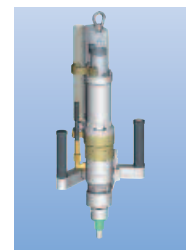
The EPK HP is a high pressure version of the EPK Compact.



EPK C head – gun type
Ref: 282 52 128 000

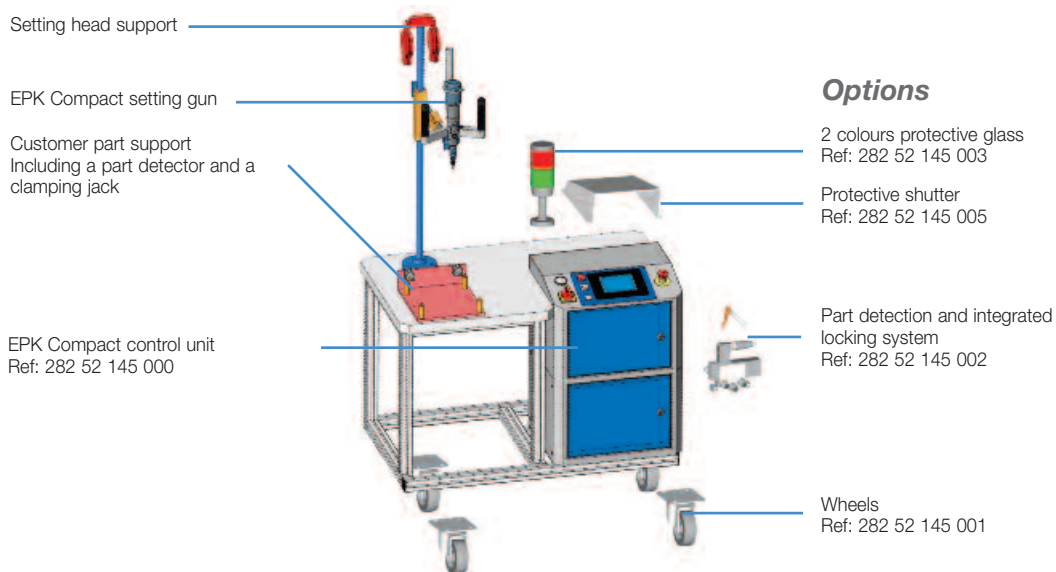


EPK head – double vertical handle
Ref: 282 52 142 000



EPK HP head
Ref: 282 52 194 000

Example of work station and options available:



- Setting head support
- EPK Compact setting gun
- Customer part support including a part detector and a clamping jack
- EPK Compact control unit
Ref: 282 52 145 000

Options

- 2 colours protective glass
Ref: 282 52 145 003
- Protective shutter
Ref: 282 52 145 005
- Part detection and integrated locking system
Ref: 282 52 145 002
- Wheels
Ref: 282 52 145 001

Advantages

- 100% setting control process
- Pressure setting method
- High production rate
- Multilingual touchscreen
- Adjustable alarm and security devices

Technical characteristics

Electrical supply	230V - 50Hz
Pneumatic supply	5.5 bar
Setting force	6 to 22.5kN - RIVKLE® M4 to M10 (EPK HP: 20 to 55kN - RIVKLE® M8 to M14)
Setting stroke	7 mm (EPK HP: 12mm)
Noise level	< 70dB (A)
Setting head weight "gun type"	2.3 kg
Setting head weight "vertical type"	2.5 Kg (EPK HP : 7.5 Kg)
Cycle time	3 to 4.5s
Air consumption	300NI/min
Power consumption	460 VA

(*) production rate depends on the operator and the ergonomy of the work station.

RIVKLE® - Automatic setting tool - SACCompact 310

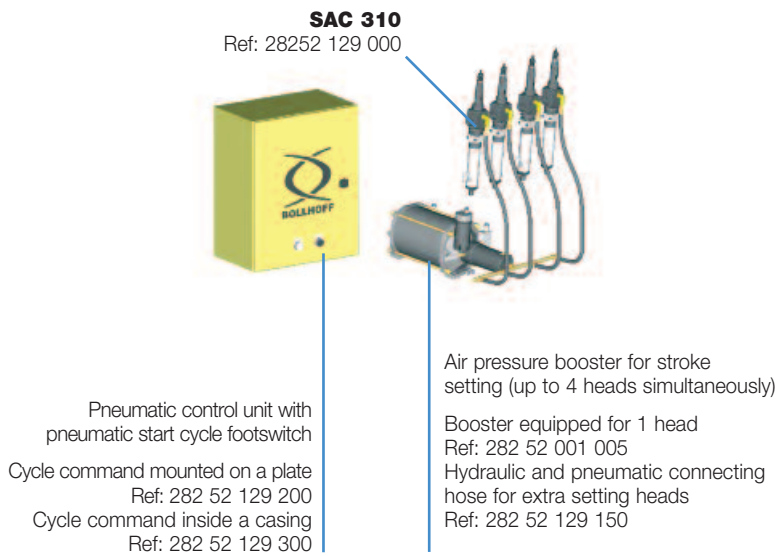
Description

When production rates increase, automation of the work station becomes necessary.

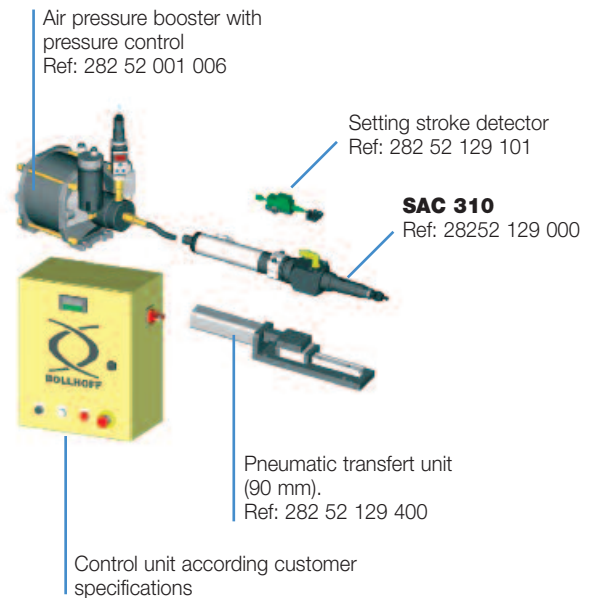
The SACCompact 310 automatic setting head has been developed to provide a flexible production tool which is based upon combination of standard modules for a cost-effective solution.

Two types of integration are possible:

■ **Stroke setting**

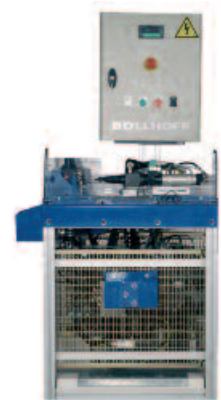


■ **Pressure setting**



Advantages

- Reduced investment cost
- Lightweight with small footprint
- Stroke or pressure setting
- Options to set up to 4 RIVKLE® simultaneously
- Stroke control is possible with pressure setting cycles



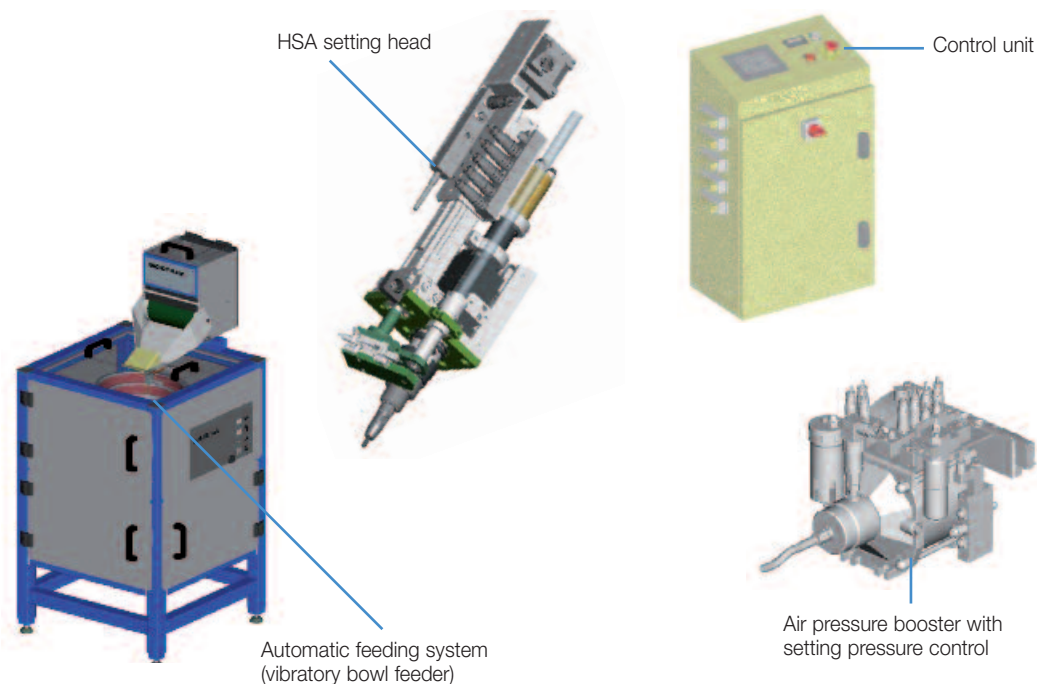
Technical characteristics

Electrical supply	To suit customer specification
Pneumatic supply	5 to 7 bar
Setting force	26 KN - RIVKLE® M3 to M12
Setting stroke	7 mm
Noise level	< 70dB (A)
Setting head weight	2 kg
Cycle time	3s (including spin on, setting, and spin off)
Transfer unit stroke	90mm (higher stroke on demand)
Air consumption	~ 10 L / cycle

RIVKLE® - Automatic setting tool - HSA

Description

The HSA automatic setting tool allows RIVKLE® to be set continuously thanks to its automatic loading system which brings the RIVKLE® blind rivet nuts to be set directly onto the mandrel. This equipment is compatible with several types of integration; either in a fixed or flexible position, or mounted onto a robot.



Advantages

- Robust and reliable setting unit
- Complete process control
- Integrated automatic loading system
- Designed to work in dynamic mode (mounted on a robot)
- Compliance systems available

Technical characteristics

Electrical supply	According to customer specification
Setting force	26 kN - RIVKLE® M4 to M10
Setting stroke	15 mm
Weight	15 kg
Loading time	3.5s
Spin on and spin off time	2,0s (movement of the robot and movement of the workpiece not included)

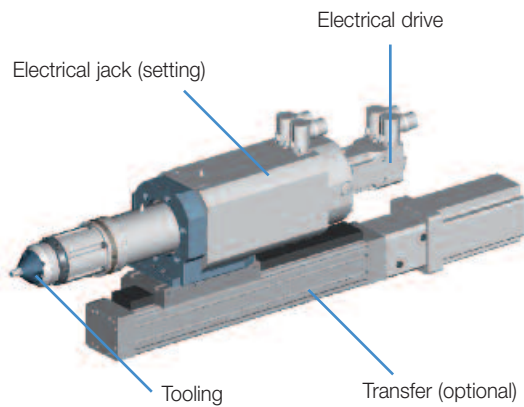
RIVKLE® - Automatic setting tool - ESA

Description

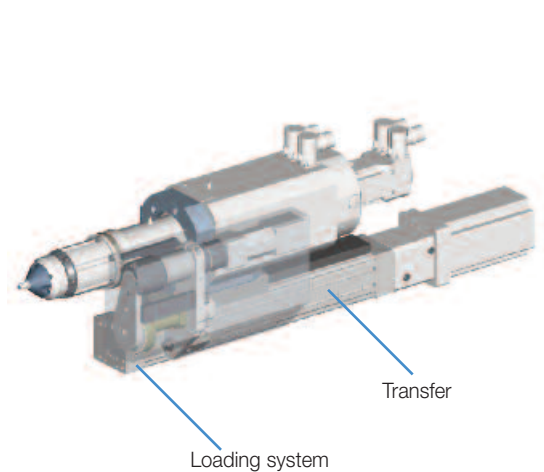
Our new ESA setting tool is exclusively electrical drive. There is no need for air supply and the noise level is significantly reduced. The compliance system directly integrated in the nose of the setting tool makes this equipment entirely independent.

Two configurations are available:

■ **“Pick & place” configuration**



■ **Automatic feeding configuration**



Advantages

- Silent operation
- 100% spin on process control
- Low cycle time
- 100% electrical setting equipment
- Integrated compliance system

Technical characteristics

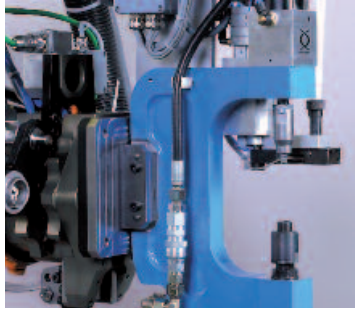
	Pick & place	Automatic loading system
Electrical supply	400 V - 50 Hz	
Setting force	20 kN	
Setting stroke	10 mm	
Transfer unit stroke	150 mm	
Spin on and spin off torque	2 Nm	
Weight	16 kg	28.5 kg
Loading time	3s (without transfer unit)	
Spin on and spin off cycle time	1.4s (movement of the transfer unit not included)	

RIVKLE® - Setting system by press - CFA

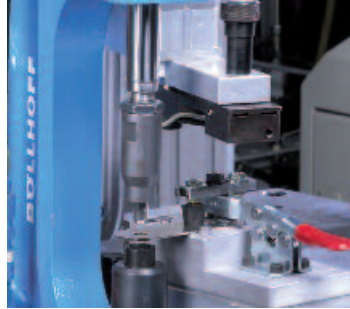
Description

The CFA setting equipment significantly improves the assembly process productivity thanks to full RIVKLE® blind rivet nut automatic setting cycle.

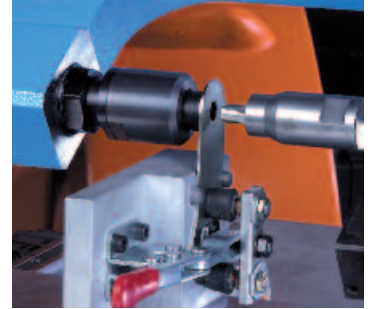
The introduction of RIVKLE® blind rivet nut can be done in 3 different methods:



Introduction via the C-frame

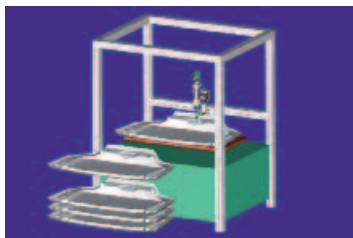


Vertical introduction

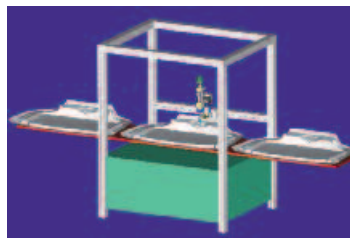


Horizontal introduction

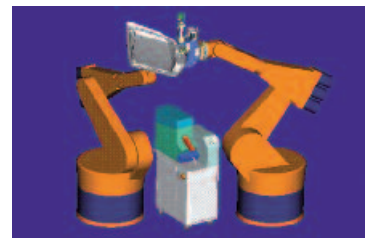
Three types of integration in the production process are possible:



Manual loading of the component



Automatic loading of the component



Loading via a robot

Advantages

- Low cycle time
- No mandrel wear
- No inactive time due to the exchange of the mandrel support
- Integrated quality control
- Optimized alignment

Technical characteristics

Maximum pressure	400 bar
Setting force	18 kN
Engine power	1.1 kW
Air supply	4 - 6 bar
Spin on and spin off torque	2 Nm
Capacity	M3 to M8
Cycle time	4s

RIVKLE® - Applications

Böllhoff is working in all fields of industrial activity and can propose an optimised solution for each type of application.

■ Automotive industry



■ Railway industry



■ Agricultural industry



■ And others...



Böllhoff service and expertise

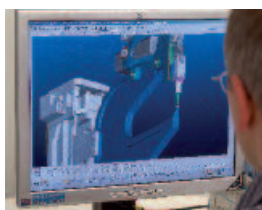
Specialist in fastening and assembly techniques and implemented in more than 25 countries, BÖLLHOFF is your ideal partner.

Our multi-skilled design department can develop the assembly solution that best fits to your need thanks to a high level of expertise and facilities.

We have modern well equipped technical facilities that enable us to create any kind of simulation or mechanical test.



■ A team of engineers listening to your needs...



■ The use of the best design and simulation software like Catia, Pro Engineer, Forge 3, etc.



■ A laboratory to test all our specific equipments (endurance tests, ...)

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