

## Clamping Elements

### On-the-spot clamping and stopping in emergencies and other situations

**Clamping elements from the LOCKED series also serve the purpose of safety. These ACE products clamp and decelerate loads and are suitable for perfectly controlled holding, both linear and rotary, in all processes.**

Alongside ACE LOCKED solutions for conventional rail, rod or rotation clamping, special clamps with safety function for Z-axes, which reliably help secure axes with a gravitational load, are available in the LOCKED LZ-P series. The latter solution is available for both pneumatic operation and as an electric version. Whether Z-axes, linear guide, rod or rotation clamping, the choice is (typical of ACE) as large as the performance capacity of the products, which are compatible with the solutions of all standard manufacturers.



**LOCKED by ACE. After all, safe is safe.**

**Increased process reliability**

**Available as clamping and emergency stop brakes**

**Very short stop distances**

**Very high clamping forces**

**Compact designs**

**Ideal for all standard sizes**



## Rail Clamping

### For safe deceleration of rail-guided construction elements

Safe deceleration of a mass that is traversed with the help of a rail and guide rail and track carriage combination must be complied with and not only for safety reasons; reliable clamps in the production processes are also becoming increasingly important.

Both features can be taken care of by the clamping elements from ACE. All clamping elements work with the patented spring steel plate system.

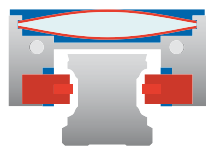
This system achieves braking and clamping forces of up to 10,000 N. The clamping elements are always individually adapted to the used linear guide. They are available for all rail sizes and profiles for all renowned manufacturers.

### Function of clamping elements LOCKED PL/SL/PLK/SLK

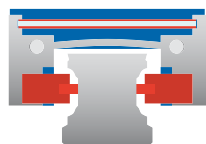
All process and safety clamps work with the reinforced spring steel plate system.

Compressed air is introduced between the two spring plates, which are connected with a surrounding rubber coating.

If pressure is applied, the clamping element can freely move; if the clamping element is vented clamping to the guide rail follows.



Clamping element ventilated



Clamping element vented

#### Released

The chamber filled with compressed air between the spring steel plates relaxes and thus releases the clamping/brake pads from the rail. The clamping element is now free to move.

#### Engaged

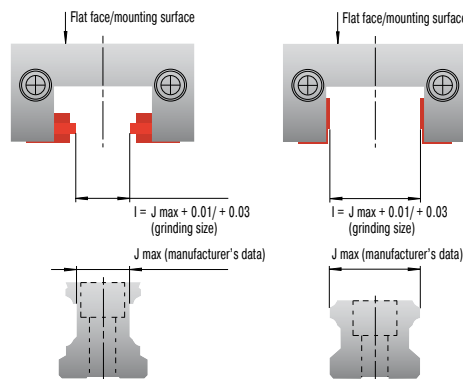
The clamping force of the mechanically pre-stressed spring steel plates is transferred to the clamping/brake pads as holding force. The clamping element is clamped on the guide rail.

### Slot dimensions between braking and clamping linings and linear guide rail

The internal dimension "I" between the linings of every LOCKED rail clamping is ground to an exact value.

This is always 0.01 to 0.03 mm greater than the upper limit J max. of the respective linear guide rail (see drawing), resulting from the manufacturer's directives.

The maximum holding force results at J max. and, in the most unfavorable case, holding force losses up to 30 % can occur (see table).



Air Gap Lining/Linear Guide Rail mm	Loss in Holding Force %
0.01	5
0.03	10
0.05	20
0.07	30

### Different brake pads for PL/PLK and for SL/SLK

The process clamps and safety clamps are available completely identical in their structure.

They differ only in the clamping and brake pads material.



Clamping



Braking

#### Position Clamping

The types of the LOCKED series PL and PLK are designed for clamping directly on the linear guide. The clamping linings are produced from tool steel and offer 100 % clamping force, even in the case of lubricated rails.

#### Position Clamping and Emergency Stop Braking

With the typical SL, SLK, low-wear sinter graphite linings are employed. These enable both a position clamping, as well as emergency stop braking on the linear guide. In case of lubricated rails, a stopping force of 60 % of the nominal stopping force should be considered.

## Rod Clamping

### The modular solution for exact holding at certain positions

Safe and reliable stopping at a position or an operating state is an important part of many production processes. This task can be performed by the clamping elements from ACE. If clamping on a rod is required, the clamping elements of the PN and PRK families are the right choice.

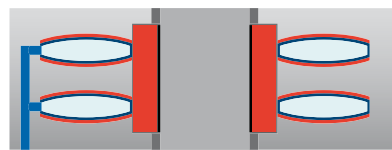
Thanks to the patented spring steel plate system the rod clamps transfer clamping forces of up to 36,000 N directly to the (piston) rod.

The PN and PRK rod clamps can absorb both axial and rotary forces.

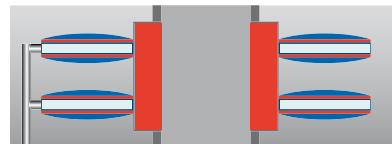
### Function of clamping elements LOCKED PN and PRK

Consisting of a deck plate, one to four clamping units and a base plate, all rod clamps work with the reinforced spring steel plate system.

Through that, both axial and rotary forces can be absorbed.



Clamping element is released



Clamping element is engaged

#### Released

The membrane filled with compressed air relaxes the spring steel plate system and releases the clamping sleeve.

#### Engaged

The clamping force of the mechanically pre-stressed spring steel plates system is transferred as a holding force into the clamping sleeve. The rod or shaft is engaged.

### Intelligent component system solution

By connecting up to four clamping units between the base and deck plates, it is possible to easily increase the clamping force.



Modular construction

### Component tolerances for LOCKED PN and PRK

Design-related, the addition of the individual component tolerances leads to an elastic axial tolerance allowance. This axial tolerance allowance can be up to 500 µm in the clamped status, according to implementation!

The axis/shaft/rod must be machined with at least h9-fit (or better) above h5. Deviations from the prescribed tolerance can lead to reduction of the stopping force, or functional failure.



Rod clamping

## Rotational Clamping

### The reliable protection against twisting

Reliable holding and securing against a rotation of a position are important elements in many production processes.

This task can be performed by means of the clamping elements of the Locked R family. The rotational clamps can, thanks to the patented spring steel plate system, transfer holding torques of up to 4,680 Nm to the shaft.

The spring accumulator can immediately clamp the axis during a power failure.

### Function of clamping elements LOCKED R

The reinforced spring steel plate system transfers holding torques in the shortest possible time.



Clamping element is released

#### Released

The membrane filled with compressed air relaxes the spring steel plate system and releases the clamping ring. The shaft is free to move.



Clamping element is engaged

#### Engaged

The clamping force of the membrane/spring steel plates systems is transferred to the holding force of the clamping ring. The shaft is clamped.

### Function of clamping elements LOCKED R-Z with additional air

If higher holding torques are required, the rotational clamps with an additional air function are used.

With the same size, significantly higher holding torques are achieved.



Increased clamping force with additional air

#### Engaged with additional air

By filling the outer membrane chamber with additional compressed air (4 or 6 bar), there is the possibility to increase the clamping force. The clamping element is engaged in this condition.

## Clamping Elements



### LOCKED PL

Process Clamping for Rail Systems

**High clamping power for all rail profiles**

tool machines, transport systems, feeder installations, positioning tables



### LOCKED PLK

Process Clamping for Rail Systems, Compact

**High clamping power for all compact design rail profiles**

tool machines, transport systems, feeder installations, positioning tables



### LOCKED SL

Safety Clamping for Rail Systems

**Combined clamping and braking**

tool machines, transport systems, feeder installations, positioning tables



### LOCKED SLK

Safety Clamping for Rail Systems, Compact

**Combined compact design clamping and braking**

tool machines, transport systems, feeder installations, positioning tables



### LOCKED LZ-P

Rail Clamping for Z-Axes

**Certified safety clamping**

Z-axes, vertical conveyor systems, jacking applications



### LOCKED PN

Pneumatic Rod Clamping

**Rod clamping with maximum clamping force**

jacking systems, light presses, punching/stamping machines, stacking units



### LOCKED PRK

Pneumatic Rod Clamping, Compact

**Rod clamping with maximum clamping force in a compact size**

jacking systems, light presses, punching/stamping machines, stacking units



### LOCKED R

Pneumatic Rotational Clamping

**Strong holding force on the shaft**

drive shafts, torque motors, conveyor systems

## Application Examples

### SL

#### Special LOCKED SL elements for emergency stops

In order to secure the processing position of a special lathe in both the horizontal and the vertical axis, ACE LOCKED elements of the type SL35-1-6B are installed. They have the further advantage of preventing slippage through the vertical axis in the case of a malfunction. The products used in the SL-series not only have the correct track width and offer very high process clamping forces of up to 10,000 N, but can also apply the same force as an emergency-stop braking function. This is due to the specially integrated brake linings made of low-wear sintered metal.



ACE clamping and safety elements maintain a rock-solid hold on the axes in special lathes and secure the predetermined positions both horizontally and vertically

RASOMA Werkzeugmaschinen GmbH, 04720 Döbeln, Germany

### SLK

#### Secure rail clamping

ACE clamping elements secure machines in the tyre industry. The goods accumulator/compensator of a material dispenser carries meandering, coiled, highly tear resistant material strips, which are fed at high speed to a tyre-manufacturing machine. To prevent damaging the machine, innovative type SLK25-1-6B clamping elements are employed.

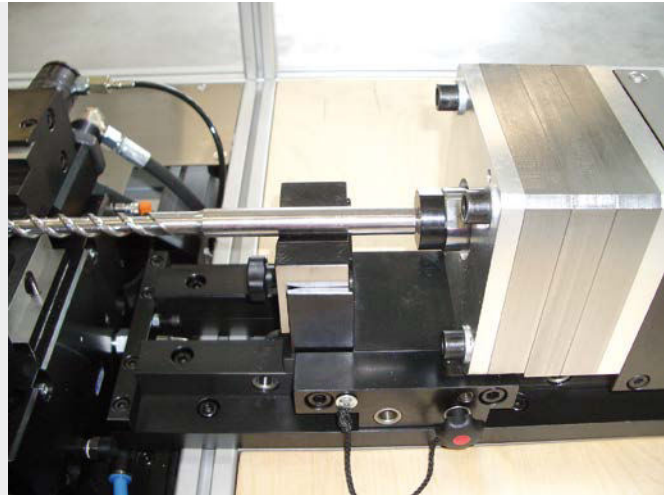


Secure material accumulator

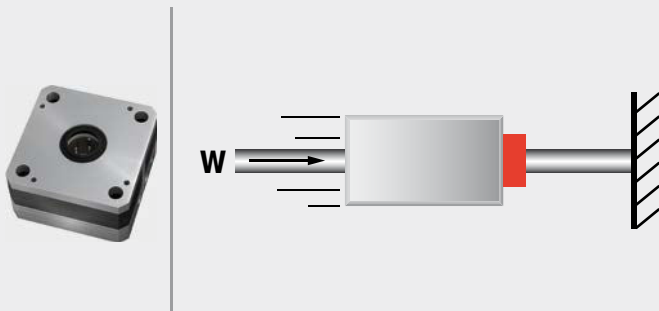
**PN**

### Clamping elements as a variable stop

ACE clamping elements are inserted, as a variable stop, during a joining process for the production of drilling tools. They meet the requirements for a precise positioning of the workpiece head and an adaptation of the length tolerance of up to 3 mm, ideally. ACE was awarded the contract because the clamping element is attached on a bar and its PN LOCKED series is specifically designed for this purpose. For clamping on linear guides, rails, axles and shafts, ACE offers a great range of high-performance models.



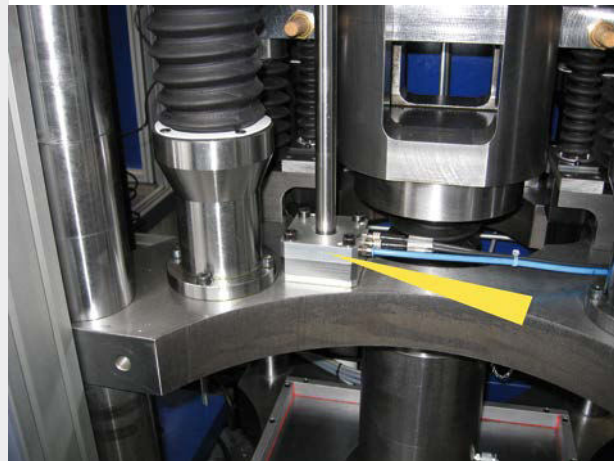
ACE clamping elements assist in the production of drilling tools: the LOCKED-P system clamps and at the same time absorbs the opposing forces of the joining process without difficulty  
 GRAF automation GmbH, 88214 Ravensburg, Germany



**PN**

### Secure rod clamping

Pneumatic rod clamping allows hydraulic presses to be used for any application. With the help of hydraulic presses, cut ceramic parts are manufactured during the week. So that the rods of the upper and lower stamping plate do not sag when the press is at a standstill over the weekend or during holidays and therefore have to be setup again on the next working day, PN80-25-2-6B type rod clamps are used.



Pneumatic rod clamping allows hydraulic presses to be used for any application  
 KOMAGE Gellner Maschinenfabrik KG, 54427 Kell am See, Germany





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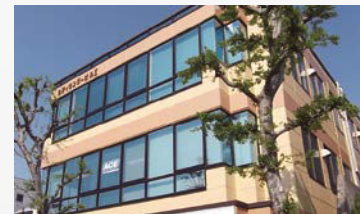
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