



HOLD TIGHT  
AND RELEASE.

REACTION-FREE  
AND SECURE.



## THE STORY OF AN AMAZING IDEA.

### Cylindrical? We clamp it!

Sometimes it's the same great story: Great ideas start in a garage. In this case, it was located in Stuttgart-Botnang in the Swabian region of Germany and was used by the engineer Peter A. Kostyrka to make his vision a reality. It involved developing a friction-type shaft hub connection that effectively supports the operation cycle of modern machines.

### The road to success

As early as 1969, Peter A. Kostyrka developed clamping elements with the goal of being able to transmit high forces, open and close fast, as well as being as compact as possible. Hydraulic oil presented itself as the ideal pressure medium. The load transmission element was to be a flexible metallic cylinder.

Unfortunately, a solid metal design turned out to be too inflexible and a plastic jacket alone was not resistant enough. Only the combination of a suitable synthetic material with a longitudinally slotted metal cylinder resulted in the desired success – the KOSTYRKA® clamping sleeve.



*The prototype clamping sleeve from 1969.  
In the background: Engineer Peter A. Kostyrka's hand-sketched drawing.*

**To succeed and ensure success**

Today, the original KOSTYRKA® clamping sleeve has a market share of 75% in mechanical engineering. They are used for both standard requirements and individual solutions. These individual solutions are developed by the KOSTYRKA engineers together with the customers and implemented right up to commissioning.

Partnership, trust and goal-oriented creativity are the values that have defined the company and ensured its success from the outset.

**The development continues**

The KOSTYRKA principle is employed today in a wide range of solutions. KOSTYRKA brand clamping sleeves with or without flange ring, expanding sleeves, clamping rings, clamping strips and clamping discs ensure worldwide that moving machine elements are held in place and released again securely and reaction-free.



Original KOSTYRKA® clamping sleeves were used from the beginning where high holding forces were required, as shown by the example of a 2,500 tons press.



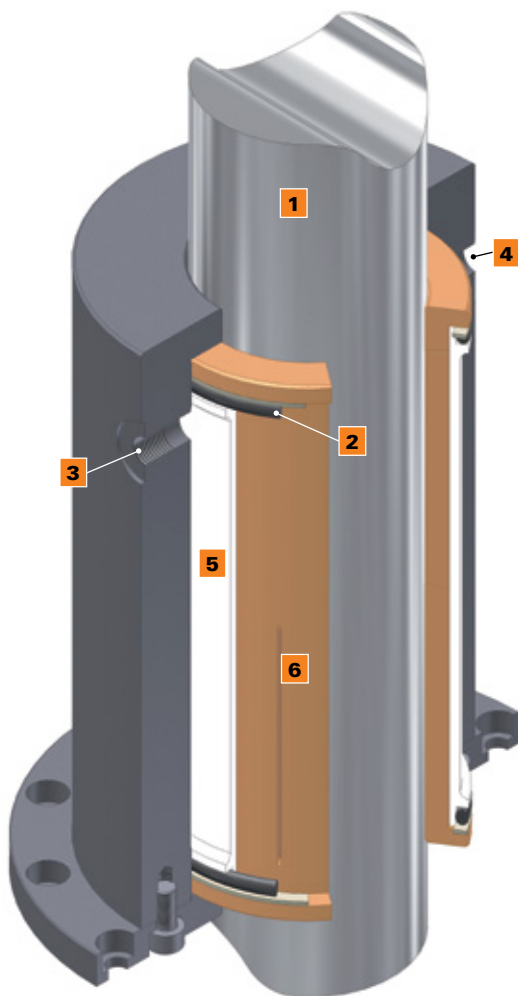
Today small installation spaces and extremely short cycle times are also required, as with TRUMPF punching machines.

Normblatt Zeichnung-Nr.	Werkstoff	Lfd Nr.	Holzzeug Modell Nr., Gezank Nr.	Part. Gew. Kp./Stk.	Bemerkungen
<b>Hülse</b>					
Tag	Name		5300.30.00		
Gez.	26.4.73				
Gepr.					
Norm					
Maßstab					
Probieren Toleranz- ang. nach					

## THE ORIGINAL KOSTYRKA® CLAMPING SLEEVE WITHOUT FLANGE RING. MADE-TO-ORDER FOR EVERY APPLICATION.

### The principle: Brilliantly simple, simply brilliant

The main items of every KOSTYRKA® clamping sleeve are flexible bushes made from a metal-plastic composite. They are axially held in housings and surround the part and clamp it by applying pressure oil to the sleeve jacket. Especially interesting: The oil pressure is converted loss- and reaction-free into a radially acting clamping force. The sleeves spring back elastically to their starting position after the oil pressure is removed, and the previously clamped part is released again. The surfaces of the clamped parts are not damaged with this friction-type form of power transmission.



- 1** Part to be clamped
- 2** Seal
- 3** Oil feed
- 4** Venting
- 5** Plastic jacket
- 6** Slotted metal cylinder

*KOSTYRKA® Clamping sleeve without flange ring can be used for taking up forces in axial direction only (clamping effect to the inside).*

The development of modern machine tools was decisively influenced by the use of the KOSTYRKA® clamping sleeve. It enables extremely high holding forces, is designed for overall program-controlling, opens and closes at high speed and supports the designer with its unique compact concept. No wonder KOSTYRKA has delivered hundreds of thousands of clamping sleeves to machine and fixture manufacturers worldwide until today.

### Precise and non-wearing

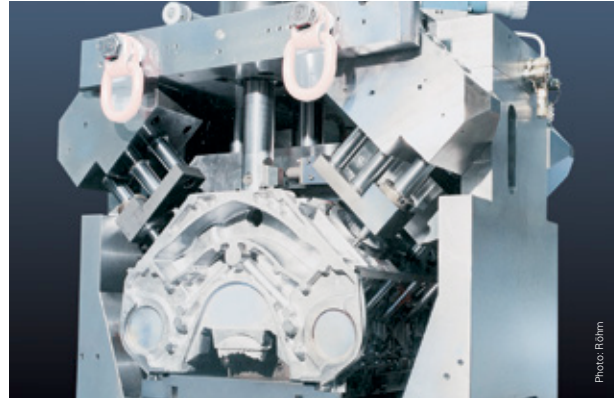
Precision and longevity of the KOSTYRKA® clamping sleeves are a prerequisite for smooth manufacturing. It's just not that easy to disassemble and reassemble a 2,500 tons press overnight for repairs. The high customer expectations for product quality ensure the use of modern manufacturing and control procedures. Then they can depend on reliable operation day after day and year after year.

### Diameter from 6 to over 2,000 mm, pressure up to 600 bar (8,700 psi)

KOSTYRKA® clamping sleeves without a flange ring are available with an inner diameter ranging from 6 to over 2,000 mm and lengths up to 900 mm and more for operating pressures up to 600 bar (8,700 psi). In addition, KOSTYRKA likes to move together with the customers in further dimensions.



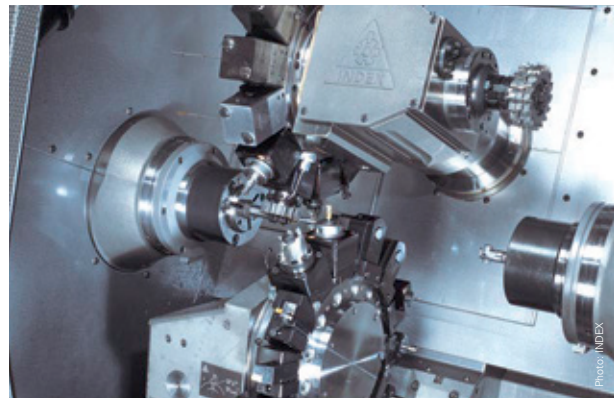
*KOSTYRKA® clamping sleeves are specially made – they can therefore be adapted for nearly any installation space.*



*A clamping fixture for engine production from the company Röhm. The four KOSTYRKA® clamping sleeves work independently of one another, enabling different engine sizes to be flexibly adapted.*



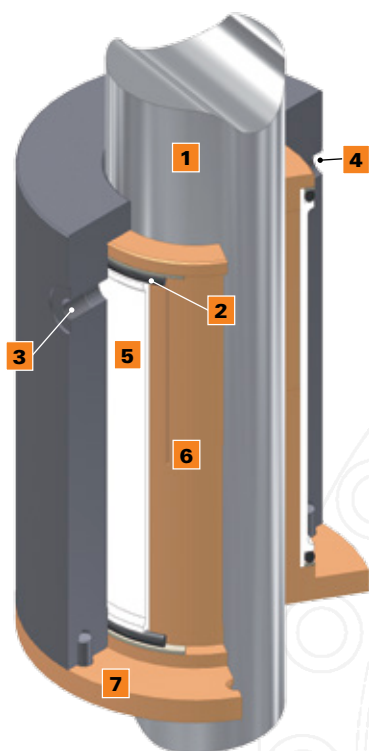
*Many KOSTYRKA® clamping sleeves of different sizes are in use for each of the Heller machining centres – very little installation space is available.*



*Numerous KOSTYRKA® clamps provide for the smooth implementation of short cycle times with little installation space in INDEX machine tools.*

## THE KOSTYRKA PRINCIPLE.

### CLAMPING ELEMENTS FOR CIRCULAR GUIDES.



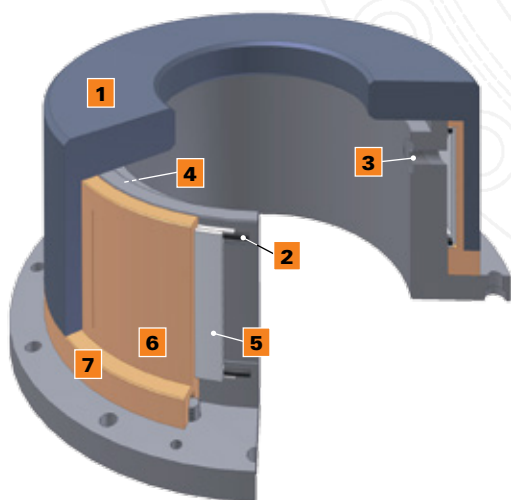
*KOSTYRKA® clamping sleeve with flange ring can be used for taking up forces in axial direction and torques (clamping effect to the inside).*

#### **Linear or rotary: Everything is clamped**

Torques that occur on spindles and shafts, for example, require clamping sleeves with an integrated flange ring. KOSTYRKA® clamping sleeves with flange ring are available in a wide variety of versions. KOSTYRKA® expanding sleeves with or without flange ring are used for clamping turntables and dividing heads.

#### **KOSTYRKA® clamping sleeves with flange ring**

Clamping sleeves with flange ring take up axial and tangential forces. Otherwise, the method of operation, materials used, operating conditions and tolerances correspond to classic clamping sleeves with flange ring. This means they clamp the parts without axial movement and they develop extremely high forces in a very small space. KOSTYRKA® clamping sleeves with flange ring are always made to meet particular customer requirements. KOSTYRKA currently makes over 2,000 versions.



*KOSTYRKA® expanding sleeve with or without flange ring can be used for taking up forces in axial direction and – in case – torques (clamping effect to the outside).*

- 1** Part to be clamped
- 2** Seal
- 3** Oil feed
- 4** Venting
- 5** Plastic jacket
- 6** Slotted metal cylinder
- 7** Flange

## KOSTYRKA® expanding sleeves with or without flange ring

Expanding sleeves are based on the inverse of the clamping sleeves' operating principle. The expanding sleeves' slotted jacket is expanded by oil pressure. As a result, the surrounding table is, for example, securely and tightly clamped from the inside. KOSTYRKA® expanding sleeves are individually designed and manufactured according to the required load capacity and the application conditions of the customer.

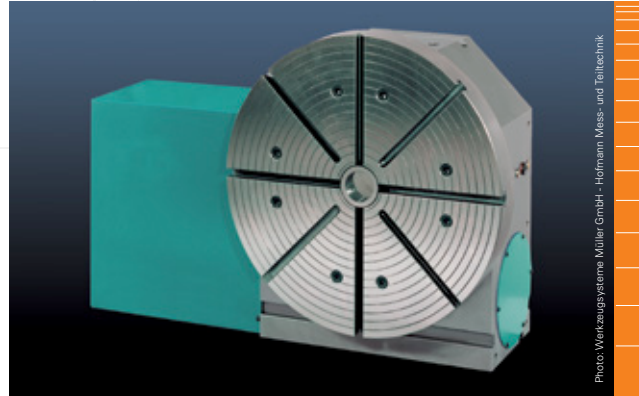


Photo: Werkzeugsysteme Müller GmbH - Hofmann Mess- und Teiltechnik

KOSTYRKA® clamping sleeves with flange ring meet the strictest criteria for torsional stiffness and reaction-free clamping in »Werkzeugsysteme Müller GmbH - Hofmann Mess- und Teiltechnik« indexing tables.



Photo: Bültmann

KOSTYRKA® clamping sleeves with flange ring with a diameter up to 1,800 mm are used in Bültmann peeling machines. They provide for the reduction of vibrations during the machining operation.



KOSTYRKA® clamping sleeve with flange ring and expanding sleeves with or without flange ring are custom-built – for this reason, they can be adapted to nearly every installation space.

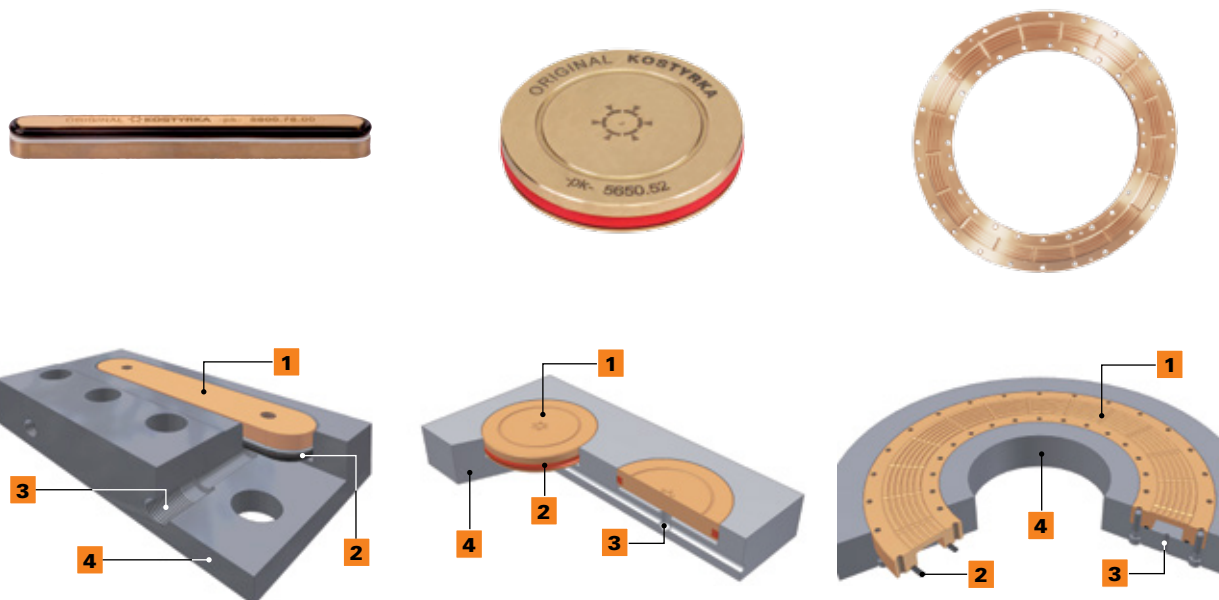


Photo: Hermle

KOSTYRKA® clamping sleeves with flange ring ensure the quick clamping and releasing of the swivelling tables on Hermle milling centres.

## THE KOSTYRKA PRINCIPLE.

### CLAMPING ELEMENTS FOR SLIDEWAYS.



*KOSTYRKA® clamping strips and cassettes for holding and releasing, e.g. slides.*

*KOSTYRKA® clamping discs and cassettes for holding and releasing, e.g. tailstocks.*

*KOSTYRKA® clamping rings and cassettes for holding and releasing, e.g. rotary tables.*

- 1** Clamping strip
- 2** Seal
- 3** Oil feed
- 4** clamping cassette

- 1** Clamping disc
- 2** Seal
- 3** Oil feed
- 4** clamping cassette

- 1** Clamping ring
- 2** Seal
- 3** Oil feed
- 4** clamping cassette

### Instantaneously acting and powerful holding

KOSTYRKA® clamps for holding flat machine elements, such as pallets, slides, stands, supports, tailstocks and much more. They offer convincing arguments with very high clamping forces, very short reaction times, an unusually compact design and virtually no maintenance requirement. In short: KOSTYRKA® clamping strips, discs and cassettes are ideal for use in modern, particularly high-performance machine tools.



### **KOSTYRKA® clamping strips**

Clamping strips are forced out of their housing like a piston when pressure is applied. They contact the component to be clamped and then clamp it securely, as dictated by the amount of oil pressure. In the process, the O-ring is strongly press-fitted as the sealing part. The O-ring takes its original form again after the oil pressure is removed, and the clamping strip disengages from the clamping surface. The main advantages of this principle: Clamping strips respond immediately, clamp with high force and need a small space.

### **KOSTYRKA® clamping discs**

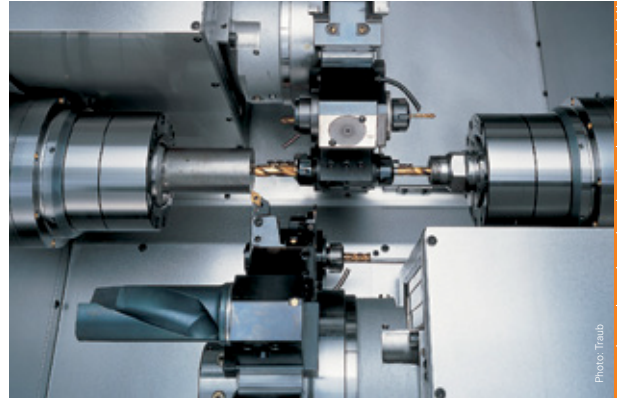
The functionality of clamping discs corresponds primarily to that of the clamping strips. However, the clamping discs „spring“ back approx. 0.01 mm after the removal of oil pressure. The seal in the location hole is not moved in the process. The convincing result: Practically no wear and tear and a nearly unlimited life time.

### **KOSTYRKA® clamping rings**

Clamping rings are made of bronze with particularly good elastic properties. Their special form enables their expansion by oil pressure. When the pressure is released, the clamping ring returns to its original position. Clamping rings are highly efficient and extremely compact constructional clamping elements.

### **KOSTYRKA® clamping cassettes**

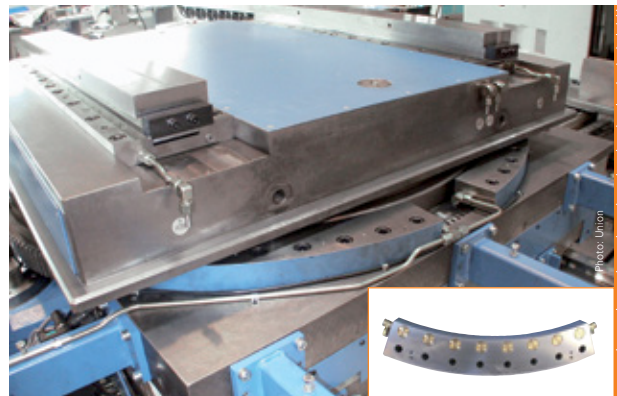
Clamping strips, disks and rings are parts integrated into the clamping cassettes. They also offer solutions for space limitations that make the direct installation of tightening and clamping elements difficult.



*The slide and tailstock clamps in Traub machining centres require clamping cycles up to 30 minutes and longer. Ready-to-install KOSTYRKA® clamping cassettes guarantee maintenance-free operation.*



*Oerlikon bevel gear cutting machines from Klingelberg. At Klingelberg KOSTYRKA® clamping strips and discs are used for an extremely broad range of duties.*



*The Union drilling and milling centres require the control of great forces during short cycle times. The working table is kept secure with KOSTYRKA® clamping discs, cycle after cycle.*

## KOSTYRKA® HYDRAULIC PRESSURE INTENSIFIER AND PRESSURE ACCUMULATOR FOR PRECISE PRESSURE SUPPLY.

### High pressure for clamping and supporting

In many cases, machine tools feature a hydraulic pressure that is not sufficient for clamping devices for circular and flat guides, or for clamping and support elements used in hydraulically actuated devices. In some cases no hydraulic supply is available at all, but instead only compressed air.

### Whether it's air-oil or oil-oil: There's a solution for everything

The solution to all pressure problems is the KOSTYRKA® hydraulic pressure intensifier. With a wide range of air-oil and oil-oil hydraulic pressure intensifiers and the different transmission ratios, it ensures that high-pressure oil is available wherever it's needed. And all this at low costs and without additional maintenance expenses. The KOSTYRKA® hydraulic pressure intensifier's compact design also enables installation where space is limited.

### The KOSTYRKA® pressure accumulator

The KOSTYRKA® pressure accumulator is especially designed to cooperate with the approved KOSTYRKA® clamping sleeves. Main element is a gas-pressurised spring which is used for generating the hydraulic pressure. Therefore the hydraulic pressure is available even if the primary energy is failed. So the pressure and thus the holding forces and torques of the KOSTYRKA® clamping elements will be kept. For releasing the pressure the KOSTYRKA® pressure intensifiers – oil-oil or air-oil – can be used.

### Pros

- Hydraulic pressure is available even in case of primary energy failure
- Saving of energy
- Can be refitted
- Custom made



*KOSTYRKA® air-oil hydraulic pressure intensifier*



*KOSTYRKA® oil-oil hydraulic pressure intensifier*



*KOSTYRKA® screw pump*



*KOSTYRKA®-pressure accumulator*

## KOSTYRKA® SUPPORT ELEMENTS.

### SAFELY MACHINE UNSTABLE COMPONENTS.

#### As flexible as the job demands

KOSTYRKA® support elements have been used reliably since 1969. They stabilise components during machining and contribute to minimising vibrations. The greater running smoothness means an increase in product quality as well as tool life.

KOSTYRKA® support elements are available as hydraulic support units in a wide range of versions. Hydraulic support units in compact cartridge form enable direct installation in a fixture frame. Standard hydraulic support units have supporting bolts with diameters from 10 to 40 mm, can withstand axial forces up to 28 kN and work with pressures from 50 to 450 bar.

#### Customer-specific solutions

Kostyrka support elements are of course also available as custom-made products.

#### Their operation is absolutely reliable

The main item of every KOSTYRKA® support element is the KOSTYRKA® clamping sleeve. It guarantees that the clamped supporting bolt is not axially displaced or twisted during the clamping operation. And regardless of whether the engagement of the supporting bolt to the component is pneumatic, hydraulic or via spring force: The special design of the KOSTYRKA® hydraulic support units always allows secure positive locking and friction-type connection from the clamped supporting bolt into the mounting plate.



*KOSTYRKA® support element in cartridge form*



*Universal version of KOSTYRKA® support element*



*KOSTYRKA® clamping sleeves in GABO QUALIMETER test control units are operated with KOSTYRKA® air-oil hydraulic pressure intensifiers, custom-built for this application.*

## KOSTYRKA SOLUTIONS FOR HOLDING FREE-FORM PARTS – THE HIGHLY FLEXIBLE WAY OF REDUCING COSTS.



### **KOSTYRKA® pin form elements**

The pin elements made by KOSTYRKA provide the possibility for fast and precise molding the outline of the part to be clamped into a clamping element. Within seconds a part specific element is being created. Therefore axial movable pins get in contact with the part and generate a form fit between the element and the part. In this position the pins will be locked hydraulically using approved KOSTYRKA® clamping sleeves. Side effect of this part specific element is a reduction of the required clamping force due to the form fit.

These pin elements provide a wide range of different fields of application starting with the machining of cast part, free-form surfaces, prototypes to solutions for the assembly. Thereby these elements can be used as jaws for vices, as supports, in combination with robot grippers, in custom made solutions, etc.

### **Unique Features**

- Adaptable form fit elements
- No axial or radial pin movement while locking
- Complete enclosure (no chip penetration)
- Automation possible
- Almost unlimited number of pins
- Custom made elements
- Reduction of vibrations



### **KOSTYRKA® Universal Holding Fixture (UHF)**

When manufacturing free-form parts, part-dependant fixtures are often in use today. This means the complete fixture must be changed each time the part is changed. This in turn usually involves new design and production of the fixture, as well as storage, set-up and logistics costs. These are costs that can be saved in most cases.

When a part is changed, the KOSTYRKA® Universal Holding Fixture is adjusted to the new part by the computer-assisted repositioning of its support and clamping elements. Depending on the size and structure of the part, hundreds of individually customisable part supports can be used for positioning and clamping. Because with a KOSTYRKA® Universal Holding Fixture: The part is changed – the fixture remains. This also applies to thin-walled or unstable parts and to components that were previously difficult to clamp using conventional methods.

## Better solutions through direct communication

At Kostyrka, development and design form the interface to the customer. This is where machine builder meets machine builder and engineer meets engineer. And this is where a solution that fits is found in collaboration with the customer. Regardless of whether they come from the standard product range or, as is often the case, they must be developed from scratch.

## Accompanying the development processes

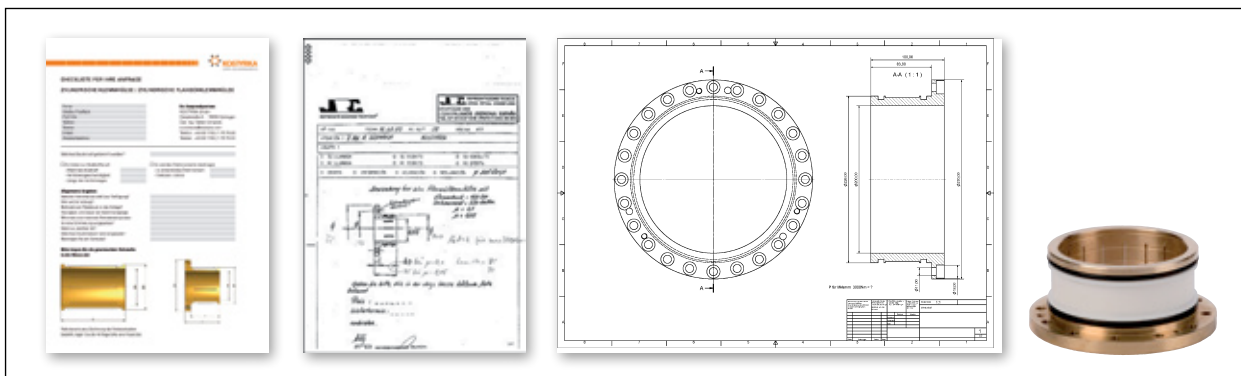
At KOSTYRKA, partnership with the customer means finding individual solutions and accompanying development processes right from the start – KOSTYRKA clamping technology is mostly customization. Your specifications such as holding forces and torques, the duration and frequency of the clamping operations, details of travel speeds and space limitations mark the initial phase of the process.

It doesn't matter whether you call the products clamping sleeves, spring collets, clamping bushes, retaining bushes, clamping mandrels or expansion mandrels. They all refer to the original KOSTYRKA® clamping sleeves.

## In accordance with customer's requirements

First of all, KOSTYRKA prepares an exact calculation of all parameters based on the customer's specifications. This is followed by 3D design. In addition to some standard sizes, KOSTYRKA makes almost any desired clamping sleeve – currently with inside diameters of between 6 and 2,000 mm, lengths over 900 mm and for an operating pressure of up to 600 bar (8,700 psi). We develop our solutions for a very wide range of installation situations. We are also happy to work out with you concepts for generating pressure.

Step by step towards a customer-oriented solution: KOSTYRKA accompanies the development process from the first drawing all the way to the individual clamping solution. For KOSTYRKA, customer service means being a creative partner with new ideas for our customers. KOSTYRKA perfects the products so that they optimally meet the customer's needs in order to fully exploit the potential.



Most KOSTYRKA products are custom solutions based on the customer's specifications. KOSTYRKA is the development partner right from the first drawing to the functional prototype to series production.

## THE KOSTYRKA QUALITY.

HOLD TIGHT AND RELEASE – DAY AFTER DAY, YEAR AFTER YEAR.

### **Unmistakably secure, securely unmistakable**

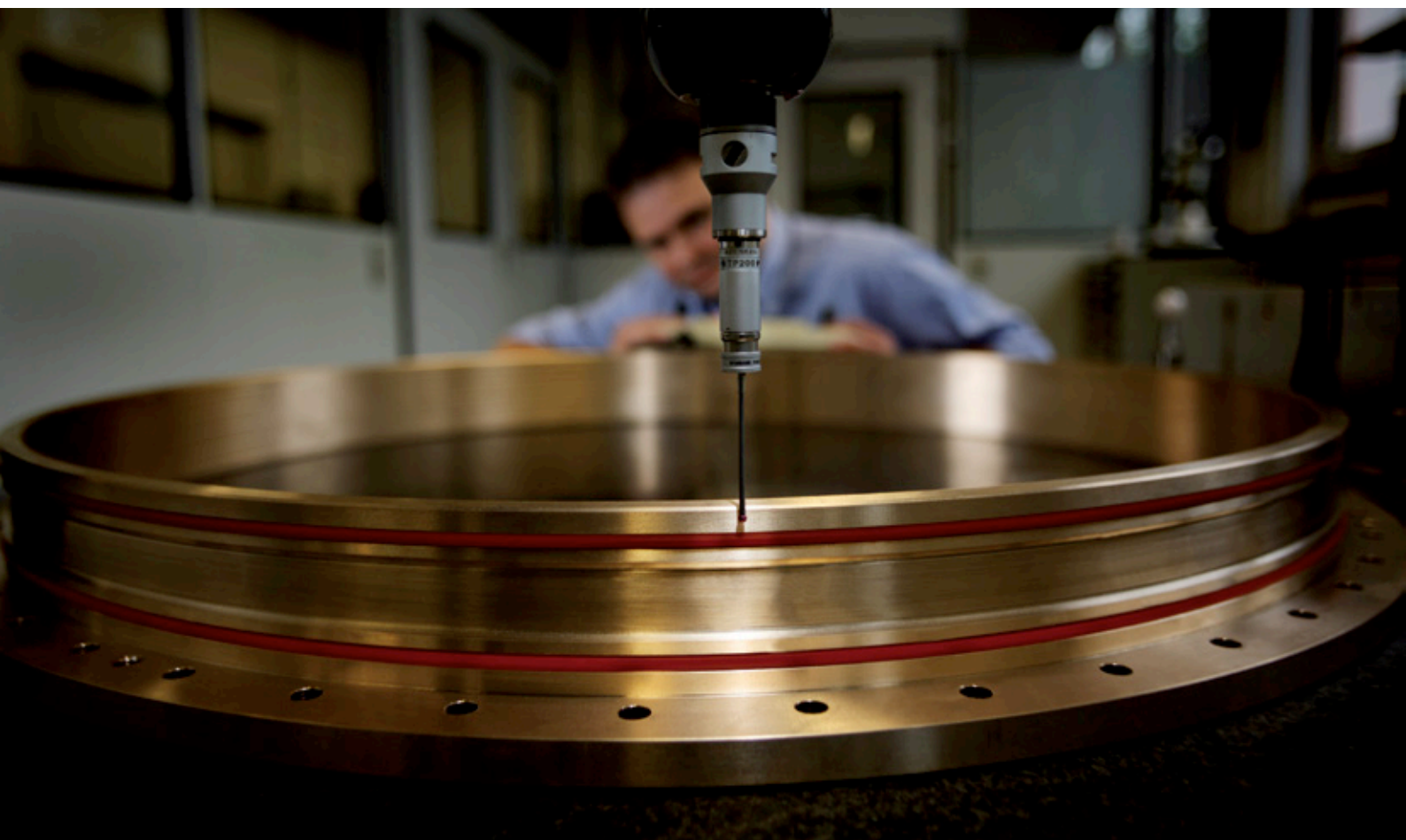
There is a very simple formula for KOSTYRKA quality: Install it and forget it. All KOSTYRKA products are designed to exceed the life cycle of the machines in which they ensure smooth operation.

### **Consistent individual part inspection**

The strict customer criteria for KOSTYRKA products are satisfied by the use of the most modern manufacturing and control procedures. As a result, KOSTYRKA can manufacture for tolerances up to 3 decimal places. And every part that leaves the machines will be checked by an individual inspection.



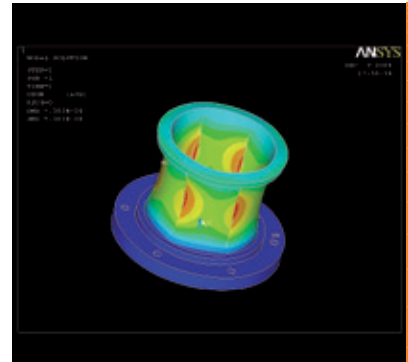
*A clamping sleeve is checked for presence of burrs and chips under a microscope.*



## Tested and distinguished

Quality is traceable at KOSTYRKA. All important geometrical characteristics of the clamping elements are checked via a 3-D measuring machine and recorded in a test certificate. An additional microscopic test inspects the parts for burrs and chips. And a cast iron leak test makes sure that a part can also withstand pressures up to 600 bar securely and lastingly. The end of the KOSTYRKA quality test is the labelling of every product. It's the visible proof that the part has passed all tests to reliably fulfil its respective tasks for years to come. Just like hundreds of thousands of KOSTYRKA clamping elements before.

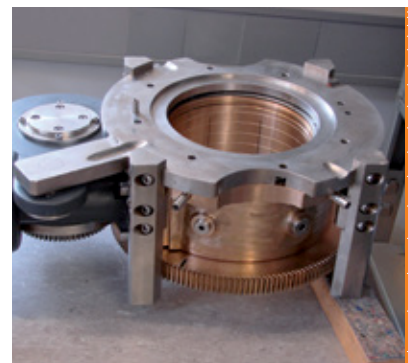
Test certificates of KOSTYRKA® clamping elements. KOSTYRKA customers benefit from many decades of experience in manufacturing and quality assurance.



FEM analysis (Finite Element Analysis) of a KOSTYRKA® clamping sleeve with flange ring.



Laser measurement processes make sure that the clamping sleeves meet the required tolerances.



Operation test bench for a Zeiss periscope clamp like those used in submarines. Continuous testing guarantees perfection.



KOSTYRKA® clamping sleeve with product and order number.

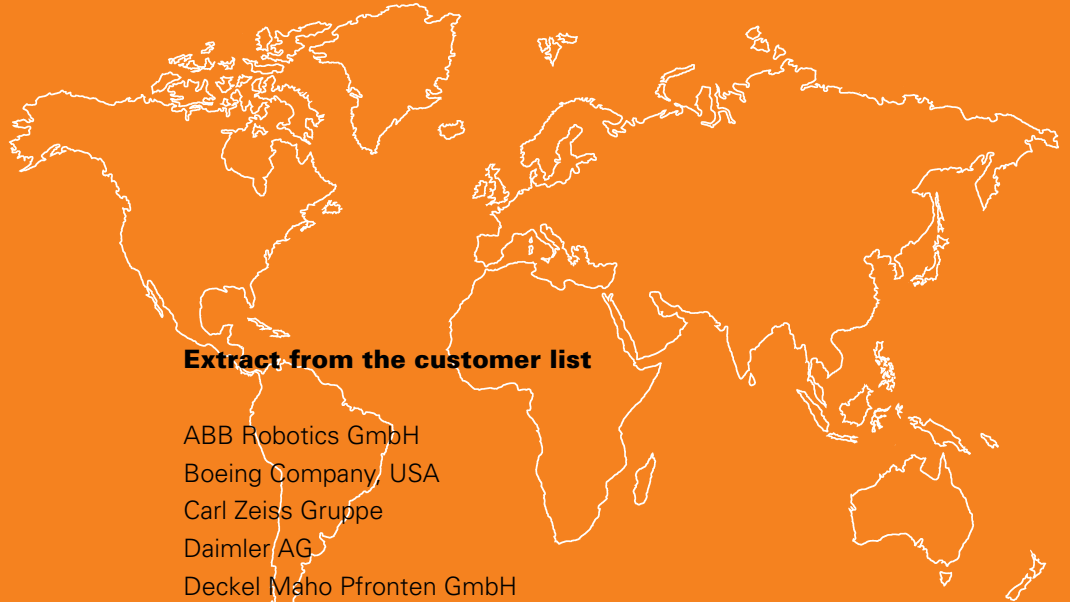
**Extract from the customer list**

ABB Robotics GmbH  
Boeing Company, USA  
Carl Zeiss Gruppe  
Daimler AG  
Deckel Maho Pfronten GmbH  
Dörries Scharmann Technologie GmbH  
Dr. Ing. h.c. F. Porsche AG  
F. Zimmermann GmbH  
FIBRO GmbH  
Gebr. Heller Maschinenfabrik GmbH  
General Electric Canada Inc., Kanada  
GKN Aerospace GmbH  
Hilti Aktiengesellschaft, Liechtenstein  
Hyundai Motor Company, Süd Korea  
INA Tooling Technique Pvt. Ltd., Indien  
INDEX-Werke GmbH & Co. KG Hahn & Tessky  
Israel Aerospace Industries Ltd., Israel  
Japan Machinery Company Ltd., Japan  
Lindauer DORNIER GmbH  
MAN Nutzfahrzeuge Vertrieb GmbH  
Maschinenfabrik Berthold Hermle AG  
Robert Bosch GmbH  
Romheld Automation Pty. Ltd., Australien  
Schott AG  
Siemens AG  
StarragHeckert GmbH  
Steinway & Sons Pianoforte-Fabrikanten  
Swarovski AG, Österreich  
ThyssenKrupp AG  
Traub Drehmaschinen GmbH & Co. KG  
TRUMPF GmbH + Co. KG  
Waldrich Siegen Werkzeugmaschinen GmbH  
ZF Friedrichshafen AG

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