



Selection

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# Guideway protection systems

Perfect protection for guideways on machine tools



## Telescopic covers

Perfect protection for guideways on machine tools

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## Way wipers

The cleanup crew

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## Link apron covers

Solutions for limited spaces

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## Bellows

Guideway protection solutions with very little compression

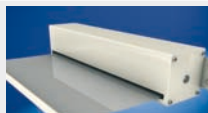
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## Conical spring covers

Protection under extreme conditions

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## Roll-up covers

Protection in a minimum of space

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## Telescopic covers

### Perfect protection for guideways on machine tools

Wherever guideways on machines have to be protected, we have a suitable solution. Our guideway protection systems boast a high degree of operational reliability, a long service life, and make use of innovative technical solutions.

### Every production machine requires protection for its guideway

Today, modern machine tools process workpieces at ever-greater cutting and travel speeds. The protection of guideways, measuring systems, drive elements and other vulnerable parts is absolutely essential.

Accelerations and speeds of machines are constantly increasing. Telescopic covers must also be able to cope with these challenges. This is where telescopic covers with harness mechanisms are used.

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■ Telescopic cover for lathes



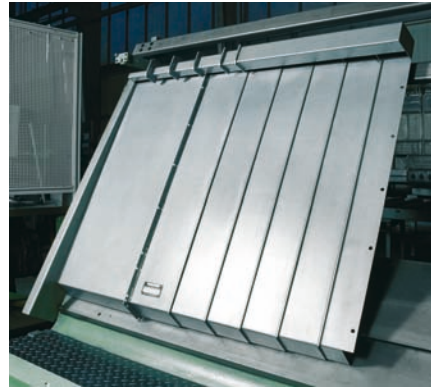
■ Telescopic cover at a milling machine

### From individual manufacture to series production – we have a solution

The number of varieties is immense – no cover for a machine is exactly the same as any other.



■ Telescopic cover with flat shape on a boring machine



■ Special form of an inclined bed cover on a test framework

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## Designs and areas of application

Until the 1970s, telescopic covers seldom moved in speed ranges any greater than 15 m/min.

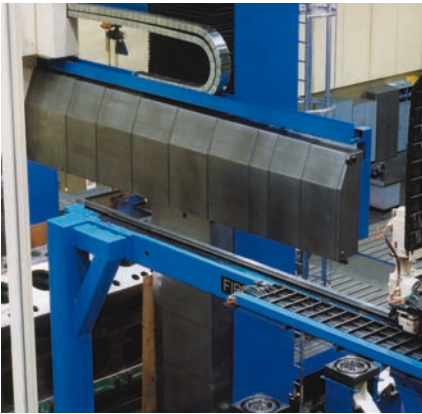
The expansion and compression of the individual boxes took place sequentially. Due to the low speed, there was hardly any impact pulse that caused interfering vibrations.

Over the years, however, improvements in drive technology have increased the travel speeds of the machines and thus also the speeds of the cover.

At high running speeds the impact pulses affecting the covers are enormous. This creates high impact noise and machine vibration. Furthermore extreme mechanical stress is exerted on the telescopic cover.

The landscape for telescopic covers has changed greatly in the last few years.

“Old” designs are less and less in demand, with modern concepts such as covers with differential drives taking their place.



■ Cross-beam cover at a milling machine



■ Telescopic cover for wheel grinders

Telescopic covers are generally produced from cold-rolled uncoated thin plates in thicknesses from 1 to 3 mm.

In case of extremely aggressive environmental conditions (e.g. aggressive cooling lubricants), corrosion-resistant stainless steel plates may also be used.

**KABELSCHLEPP telescopic covers also allow the use of semi-finished products with surface finishings such as:**

- Plates with pure zinc coatings
- Plates with zinc/nickel coatings
- Plates with lead/zinc coatings

This ensures substantial protection against corrosion.

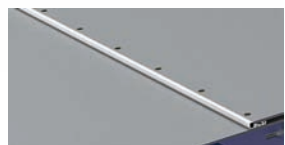
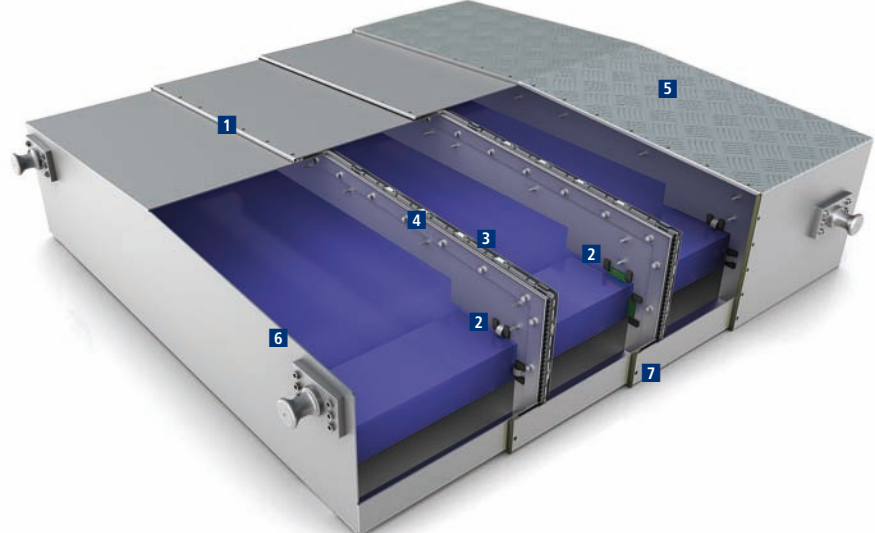
# Telescopic covers

## The speed is decisive

At speeds below 15 m/min a telescopic cover can still be built in the conventional form of box synchronization. At high running speeds the inevitable impact pulses lead to vibrations and clearly audible impact noise.

So-called differential drives serve to synchronize the boxes and eliminate impact pulses. KABELSCHLEPP has decided on the tried and proven harness mechanism principle for which special materials are used.

## Telescopic cover with damping elements



1 Wiper systems in various designs



2 Rollers



2 Sliders



3 Gully in various designs



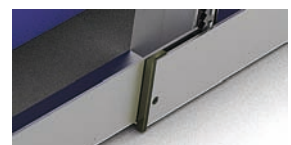
4 Damping systems in various designs



5 Structural metal plates to prevent slipping (on the largest box)



6 Lifting element



7 Locking system

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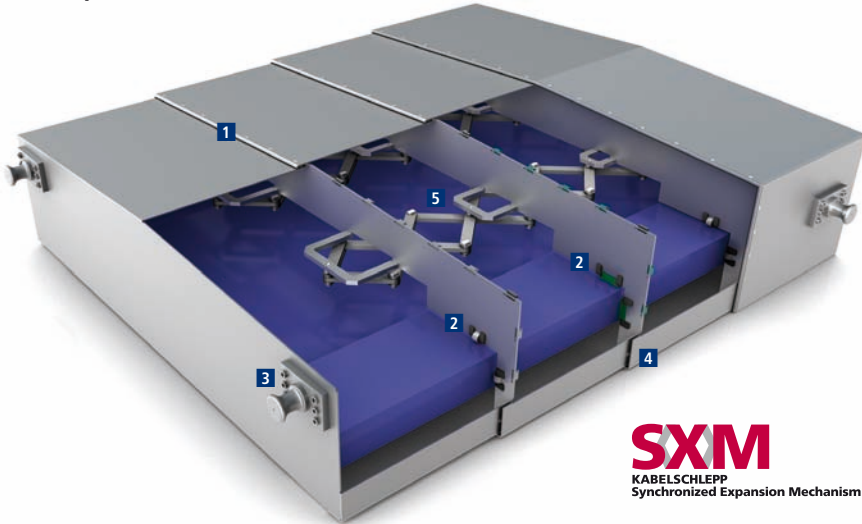
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Travel speed	Damper elements / harnesses
Up to 15 m/min	Not required
Up to 30 m/min	Damper elements
Up to 60 m/min	Damper elements / harnesses

The use of damping elements depends on the travel speed and the moving mass. The information in the table should therefore only be viewed as guide values.

## Telescopic cover with harness mechanism



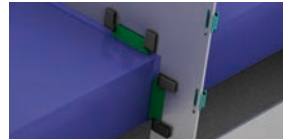
**SXM**  
KABELSCHLEPP  
Synchronized Expansion Mechanism



1 Wiper systems in various designs



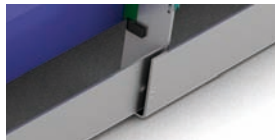
2 Rollers



2 Sliders



3 Lifting element



4 Locking system



5 Synchronising device (harnesses) for fast-running telescopic covers

## SXM – Mechanical elements with harnesses

### KABELSCHLEPP sets the mark

To ensure impact-free expansion / compression of telescopic covers, they are used with so-called synchronisers (harnesses).

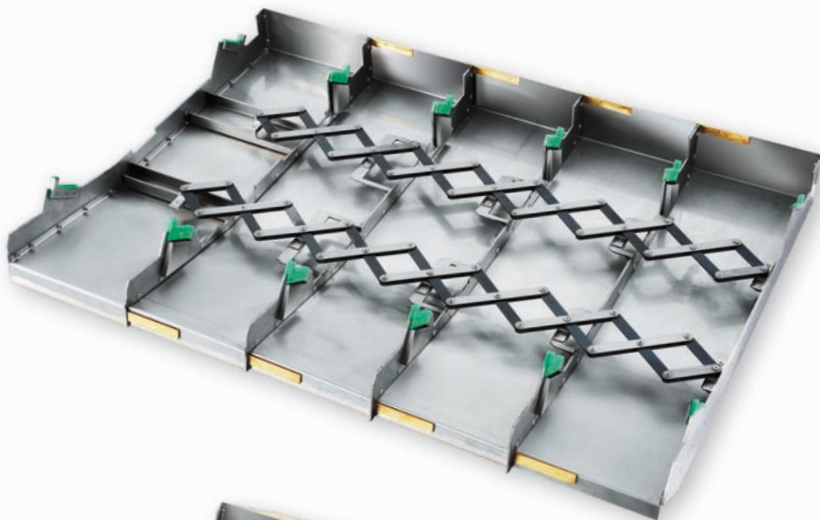
As a result, all of the cover boxes move evenly during expansion and compression. The individual boxes move relative to each other only at a differential speed.



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■ Telescopic cover with proven harness mechanism in various expansion states.

**SXM**  
KABELSCHLEPP  
Synchronized Expansion Mechanism

#### SXM – Synchronized Expansion Mechanism.

The KABELSCHLEPP harness technology is used wherever you find this symbol.

### Telescopic covers with harness mechanisms have many advantages:

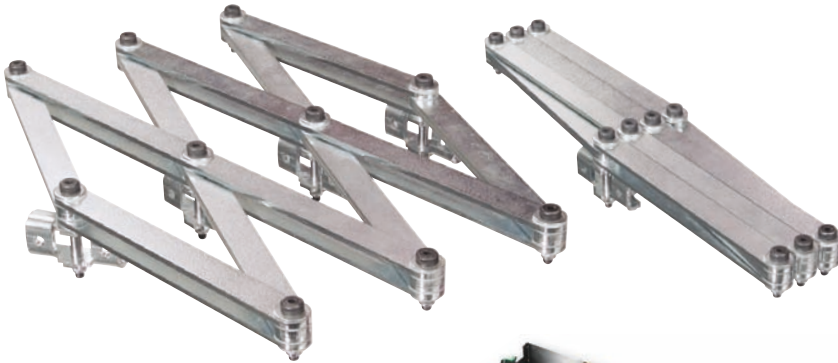
- High travel speeds up to 200 m/min are possible.
- **Acceleration forces** and speeds are **uniformly distributed across all the plates**. This also applies to the resultant inertial forces.
- The **force peaks** that would normally occur when the telescopic covers dashed against each other **do not occur**.
- The disruptive **impact pulse** of the boxes is **eliminated**.

## Cover with two harnesses

This solution has been developed for travel speeds greater than 100 m/min. Two harnesses ensure synchronization. In the example shown here the cover plates are made of 1 mm thick stainless steel.

The cover plates are riveted to the rear wall. Welding and the resulting heat effects have been avoided. Only the wiper is spot-welded.

**SXM**  
KABELSCHLEPP  
Synchronized Expansion Mechanism



■ Telescopic cover with proven harness mechanism

## Cover with one harness

This particularly lightweight solution has been developed for "small" machine tools. The cover plates are made of 1 mm thick normal steel.

The travel speed in this special application is only 30 m/min. The harness mechanism serves to ensure synchronization, however, and the reduced mass of all the elements means that it was possible to develop an especially cost-effective solution here.



■ Telescopic cover with only one harness





## Telescopic covers

Perfect protection for guideways on machine tools



Photograph: Heinrich Georg GmbH Maschinenfabrik

### Designs

Machine tools come in a wide variety of designs. That is why a modern lathe needs another type of telescopic cover than, for example, a large

bed-type milling machine. The following designs provide an overview of typical designs.

#### Flat shape

The U-shaped design is generally used in a horizontal, lying position for milling table guides. With this design the maximum width of the telescopic cover should be limited to 1.5 m.



#### Roof shape, centric (eccentric)

This design is always advisable when cooling lubricants are used. The inclined surface allows the water – and naturally also the chips – to run off more easily. With large covers (> 3 m width) for reasons of stability, etc. at least three roof angles should be provided.





### Flattened roof shape

The flattened roof shape is a special construction method with two roof angles. Primarily for dry operation and widths > 3 m.



### Shape with incline to one side

The shape with incline to one side has a special roof shape. Depending on the possible incline, covers can be constructed with widths of up to 1.5 m. This shape is likewise a recommended solution when large amounts of coolant are present.

Depending on the angle of incline, this form also helps to discharge coolants / chips.



### Vertically-installed telescopic cover

Standing covers are used on larger machine tools, mostly in the area above and below the cross beam. They can take many different shapes.



### Blind cover

With blind telescopic covers, the cover plates move in separate guide rails, each of which is mounted on the machine at the sides. It is used exclusively in a vertical arrangement. The guide rails are generally made of brass.



### Cross-beam cover

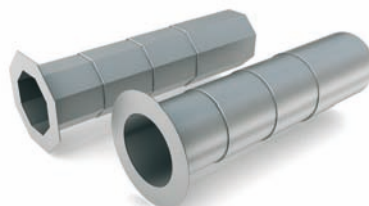
These covers are predominantly used on large gantry machine tools on a cross beam to the left and right of the support. The boxes are suspended vertically and protect the support guides from chips and cooling lubricants.



### Tubular cover, polygonal cover

Tubular covers or covering shafts, spindles, etc. They can be made either with a round or a polygonal shape.

The round shape is possible up to a tube diameter of 120 mm, for bigger diameters one should choose a polygonal guide. Subsequent installation on the spindle without disassembly is the advantage of the polygonal guide.



## Wipers on telescopic covers

Wipers on telescopic covers keep the cover boxes clean and prevent the penetration of dirt and chips.

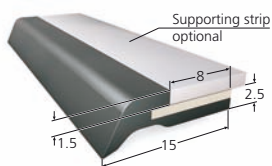
### Welded-on and riveted-on wipers

With these types the support profile is spot-welded or riveted to the cover box.

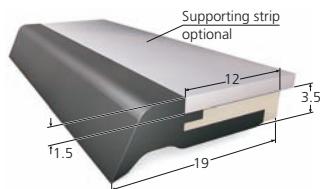
#### Type MA 8 / MA 12

These wipers consist of an NBR profile vulcanized onto a steel strip.

Necessary calculated distance of the cover plates 2.5 to 3.5 mm.



■ Wiper type MA 8

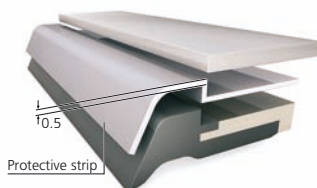


■ Wiper type MA 12

#### Type MA 8S / MA 12S

Wipers MA 8 and MA 12 are covered with a protective strip for protection against hot chips.

Necessary calculated distance of the cover plates 3.5 to 4 mm

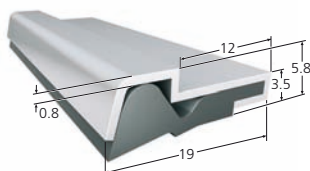


■ Wiper type MA -S

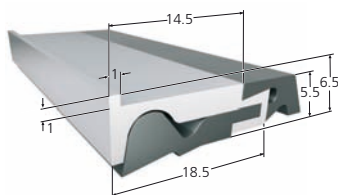
#### Type MA 12.1 / MA 18

A specially-milled steel plate profile is spot-welded to the boxes and a PUR wiper lip is inserted.

Necessary calculated distance of the cover plates 3.5 to 5.5 mm.



■ Wiper type MA 12.1



■ Wiper type MA 18

## Welded-on and riveted-on wipers

### Steel plate wiper made of spring band steel

A specially shaped, approximately 0.4 mm thick, approximately 25 mm wide band of stainless spring band steel is spot-welded to the cover plate. This wiper is recommended for dry machining.

Necessary calculated distance of the cover plates 1 mm.



## Types with replaceable wiper lips – the new generation

### The replaceable wiper with a PU lip

This new generation of wipers can be replaced directly on the machine, without disassembling the telescopic cover.

The wiper lips have good gliding characteristics and are also usable where little lubricant is generated, e.g. on machine tools.

Turn-lock fasteners fasten the wiper to the cover plates. With a 90° turn of the turn-lock fasteners the wiper is locked or released. In this way the system can be easily switched out for fresh parts.

Necessary calculated distance of the cover plates 4 mm (VA 12 G) and 6 mm (VA 17 G).



■ Wiper type VA 12 G



■ Wiper type VA 17 G



## Damping elements on telescopic covers

Telescopic covers with travel speeds greater than 15 m/min must be provided with dampers in order to reduce impact pulses.

### Wiper type MA 18 with damping

The support profile is made of aluminum and is screwed or riveted on. The wiper lip is identical to MA 12.1. The special damping profile can be installed in the rear aperture formed onto the support profile.

Necessary calculated distance of the cover plates 5.5 mm.



### Brass strips with damping

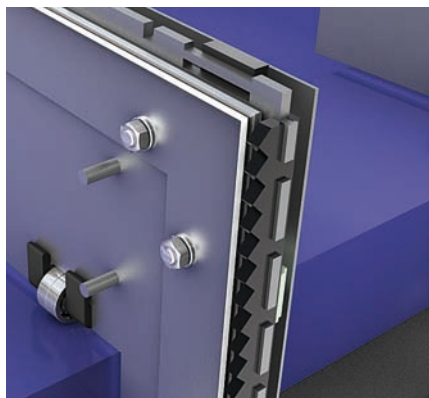
Brass strips are used primarily on standing covers. The damping profile described above can likewise be mounted on an appropriately drawn brass profile.

Necessary calculated distance of the cover plates 5.5 mm.



### Progressive damping element

In order to reduce impact pulses effectively, progressive damping elements can be installed in the rear walls of the covers. Depending on application and running speed the number of dampers is varied in order to achieve an optimal result.



## Splash- and hose-proof protection on telescopic covers

Over time cooling emulsion and fine chips can be “pumped” under the individual boxes and make it over the rear wall into the machinery space that is being protected. In many cases this is undesirable. Machine tools with hydrostatic bearings require “watertight” covers.

### Gullies for telescopic covers

In order to catch coolant and chips that make it over of the rear wall. This gully allows the fluids to be drained off to the sides.

#### Aluminum gully type AL 19

This gully is an extruded aluminum profile which is screwed onto the rear walls of the cover. The cover plate is bent downwards so that it projects into the gully. This allows the coolant between the plates to flow into the moulded gully. Condensation water that forms under the cover plates is wiped off by a lip and drained into gullies to the front and back. This makes it possible to achieve a very high level of waterproofing.



#### Gully type ST 05

This gully is screwed onto the rear wall. This has the advantage of, among other things, meaning that galvanized metal plates can be used (no welding necessary).



#### Condensation gully type ST 05 K

This gully is based on the proven type ST 05. An upward extending sealing membrane made of flexible synthetic moves in both directions catching the condensation and directing it into the drain gutters. From there it flows automatically into the side drains.



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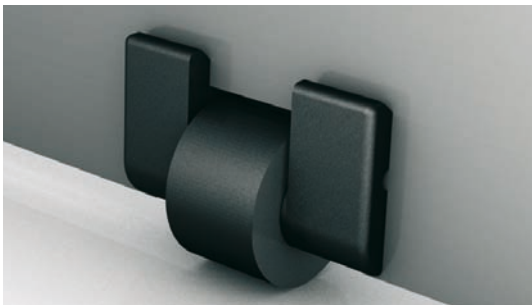


## Rollers and sliders on telescopic covers

The individual boxes of telescopic covers are supported by rollers or sliders on the guideways or corresponding supplementary guides. In addition, there are various solutions depending on the qualities of the way:

### Plastic rollers

- Gentle rolling on the guideway
- For low travel speeds



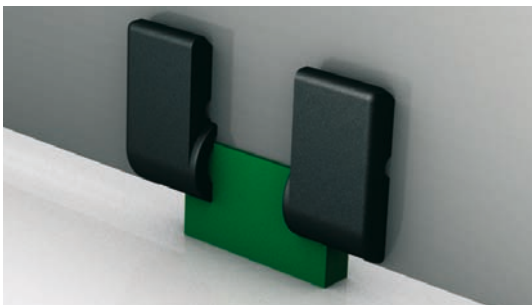
### Steel rollers

- For high support loads
- For high travel speeds



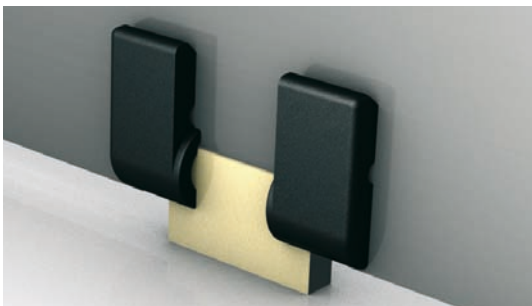
### Plastic sliders

- Good sliding characteristics on the guideway
- For high travel speeds
- Can also be used for linear guides



### Metal sliders

- For high support loads
- For low travel speeds



## CROSS-COVER covers

### Even longer service lives for horizontal machines

Wherever for example machining spindles of horizontal drilling machines move with high accelerations and speeds, horizontal and vertically moving cover elements are needed.

With the second CROSS-COVER generation you likewise receive a ready-to-install cover unit that is movable in two dimensions. They are adapted individually to your application and delivered ready to install.

Our reworking of its proven design has improved its dynamic characteristics and extended its service life.



### Re-Design CROSS-COVER

With the second CROSS-COVER generation the use of gliding and guide elements and the systematically weight-optimized design have made possible even higher travel speeds.

In addition to improvement of the dynamic characteristic values through reduction of the moving masses, the covers are even more durable. They provide the same high penetration resistance as the service-proven system.

#### Re-Design CROSS-COVER

- Higher travel speeds and accelerations possible
- Longer service life
- Lighter thanks to optimized design
- Protection against spray water according to IP X5
- Size selections available on short notice



■ CROSS-COVER in various expansion states



### SXM – Synchronized Expansion Mechanism

#### Impact-free travel of the cover elements

To ensure impact-free expansion / compression, synchronizers (harnesses) are also used in the revised design.

### Protection against spray water acc. to IP X5

The CROSS-COVER covers meet the requirements of protection class IP X5 (Ingress Protection – protection against hose water).



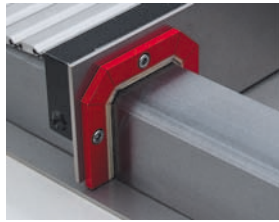
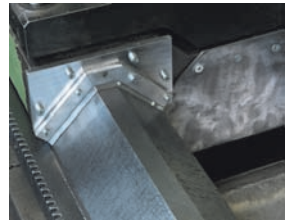
## Way wipers on guideways

### The cleanup crew

Way wipers are essential to keep the guideways in a proper functional state, and thus to keep the machine tool permanently in operation. Even if the guideways are already protected by a telescopic cover, it is necessary to wipe fine, penetrating particles off of the vulnerable ways.



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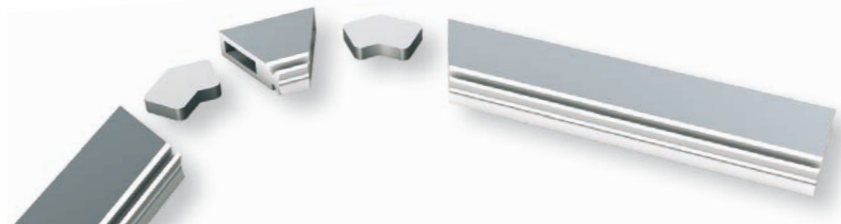
■ Harnessed way wipers



■ Cast wiper with steel support strip



■ Way wipers in a modular system



■ BAY-WIPE way wiper with optimised corner design.

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## Overview and delivery forms

### Harnessed way wipers – proven in millions of applications

Available in a wide variety of shapes, harnessed according to your specifications, in bar form or available ex-stock.

Further information can be found on page 482.



### Way wiper BA 65

Cast wiper with steel support strip, available ex-stock in bar form.

Further information can be found on page 484.



### Way wiper BA 115 – with extra-long lip

Highly-flexible cast wiper with steel support strip, available ex-stock in bar form.

Further information can be found on page 485.



### Way wipers in a modular system – the clever solution

The most economical alternative to cast wipers.

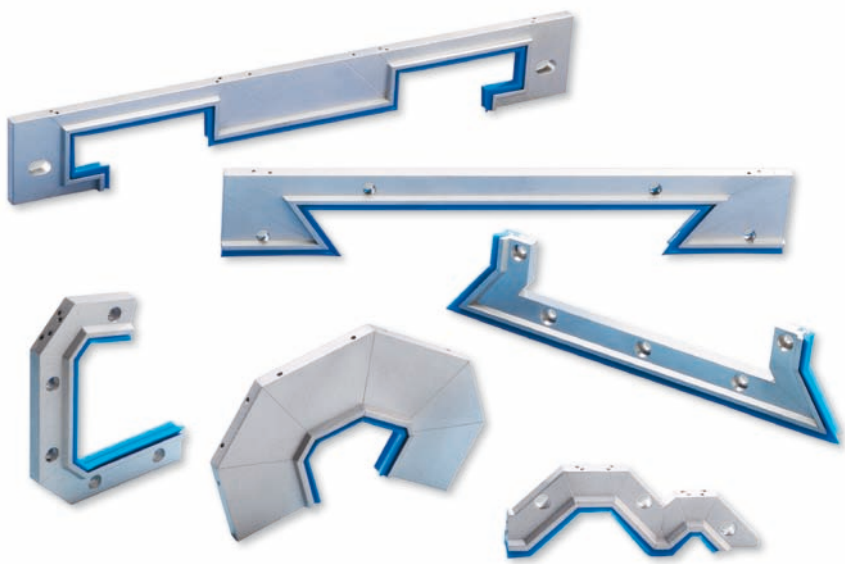
Further information can be found on page 486.



## Way wiper types BA and BAS

The original!

Wipers of this type have a replaceable lip and guarantee high form stability and mechanical loading capacity. They are manufactured in custom forms according to your specifications. Available as bar material ex-stock.



**Note: Reduce costs**  
With types BA and BAS the wiper lip is replaceable. In case of wear, only the lip has to be exchanged; the support profile can remain in use.

### Properties

- Temperature range – 40 °C to 100 °C
- Support material: Aluminum
- Wiper lip material: Polyurethane
- Largely resistant to oils, greases, alkalis and water
- Pretension approx. 2 mm
- Replaceable wiper lip
- Standard length of bar material: 1000 mm



■ Inside or outside wiping forms are possible



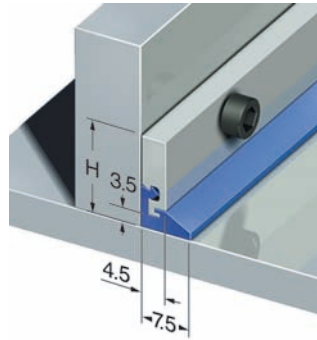
## Dimensions and types

### Type BA

Way wipers of this type are used mainly in those cases where installation conditions are restrictive, or where the wipers are additionally protected by means of a telescopic cover, a bellows, a link apron cover, or where no chips occur.

Type	Installation height H (clamped in position)
BA 18	17.5
BA 25	23.5

Standard length: 1000 mm

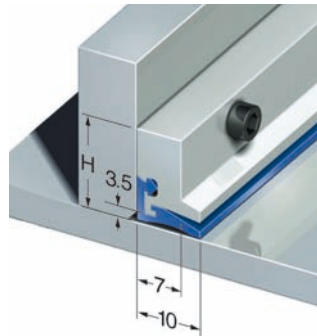


### Type BAS

In this type series, the light metal support provides protection for the wiper lip. It is used primarily in the case of direct incidence of chips (no hot chips).

Type	Installation height H (clamped in position)
BAS 18	17.5
BAS 25	23.5
BAS 40	39.5

Standard length: 1000 mm



#### Pre-wiper for protection of the guideway

To protect the wiper lip from hot chips, and to remove coarse and stubborn dirt from the guideway, the way wiper must be fitted with a pre-wiper made from stainless spring steel or brass.

The pre-wiper and its corresponding light metal clamping strip are affixed to the machine component with the fastening screws of the wiper.

For straight way wipers with a corresponding hole pattern (distance between holes  $\leq 80$  mm), the clamping strip is not required.

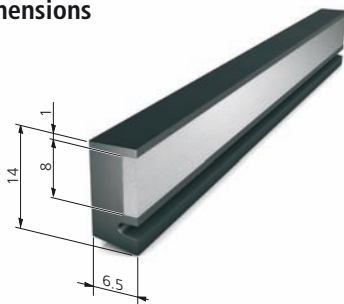
## Way wiper BA 65 – bar material

Wipers of this type are compact and are notable for high shape accuracy and dimensional accuracy. It is manufactured in various forms, thus guaranteeing high repeatability.

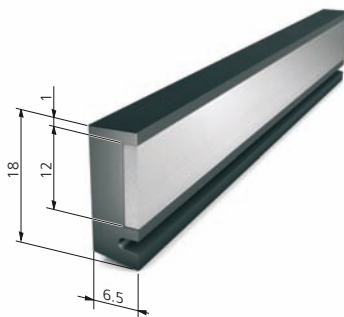
### Properties

- Temperature resistance – 40 °C to + 100 °C, briefly up to 140 °C
- Support material: Steel
- Wiper lip material: Abrasion-resistant synthetic rubber (NBR)
- Resistant to standard oils, greases, acids and bases
- Resistant to microorganisms

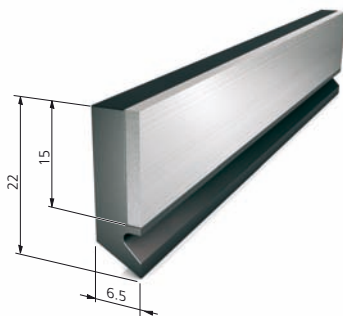
### Dimensions



■ Way wiper BA 65-14



■ Way wiper BA 65-18



■ Way wiper BA 65-22



■ Way wiper BA 65-25

Type	Pretension (max.)
BA 65-14	1 mm
BA 65-18	1 mm
BA 65-22	2 mm
BA 65-25	1 mm

Length: 500 mm



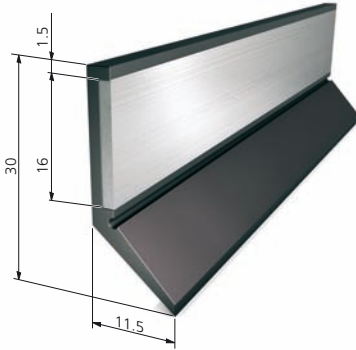
## Way wiper BA 115 – bar material

Highly flexible wiper with a max. pretension of 4 mm.  
It is likewise manufactured in various forms, guaranteeing high repeatability.

### Properties

- Temperature resistance – 40 °C to + 100 °C, briefly up to 140 °C
- Support material: Steel
- Wiper lip material: Abrasion-resistant synthetic rubber (NBR)
- Resistant to standard oils, greases, acids and bases
- Resistant to microorganisms

### Dimensions



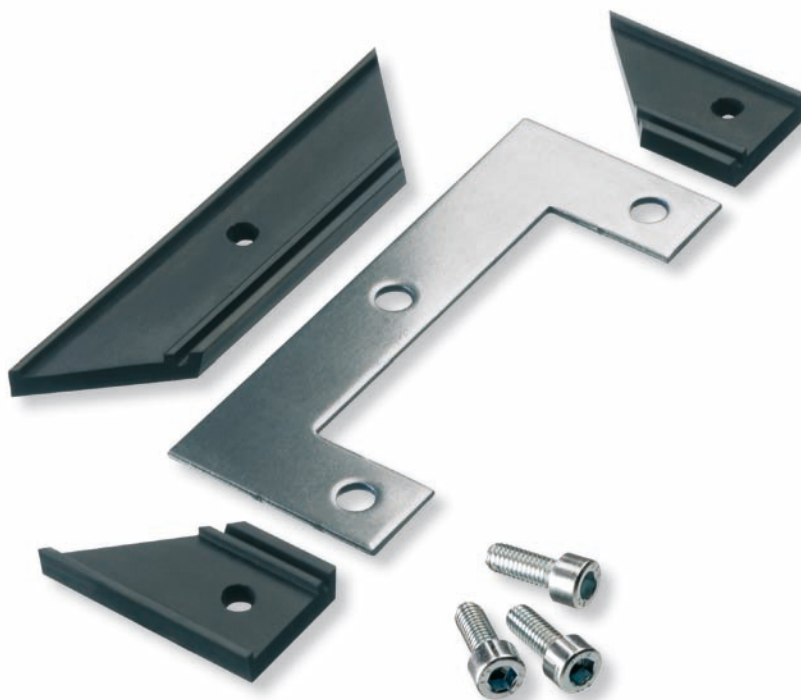
■ Way wiper BA 115-30

Type	Pretension (max.)
BA 115-30	4 mm

Length: 500 mm

## Way wiper BA 65 VARIO

The most economical alternative to cast wipers – even for small quantities. On request we also manufacture them according to your specifications – custom tailored for your application. BA 65 VARIO way wipers are optionally available as complete wipers, or as individual wiper lips in bar form for your own harnessing.



So-called “cast wipers” are wipers consisting of a piece of neoprene rubber vulcanised onto a steel support profile. They are produced in specially-manufactured injection moulds. Larger quantities are essential, as the tool costs must be offset by the number of parts produced.

For the wiper system **BA 65 VARIO** no special tools are required: A pre-finished profile of synthetic rubber is custom-tailored. The support profile – usually made from metal – can be produced on a laser or nibbling machine.

**Thus, smaller quantities can be produced in this way at a reasonable cost.**

### Properties

- Temperature resistance – 40 °C to + 100 °C, briefly up to 140 °C
- Support material: Steel, stainless steel
- Wiper lip material: Abrasion-resistant synthetic rubber (NBR)
- Resistant to standard oils, greases, acids and bases
- Pretension of the wiper lip: max. 1 mm
- Resistant to microorganisms



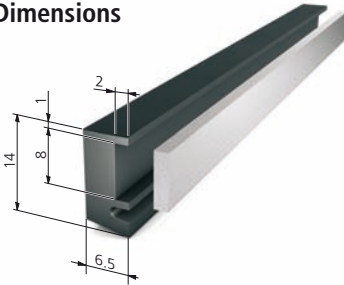
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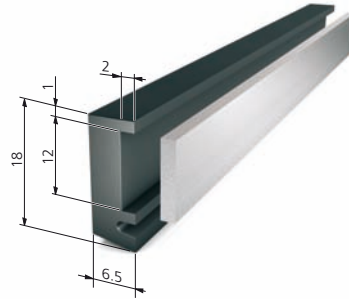
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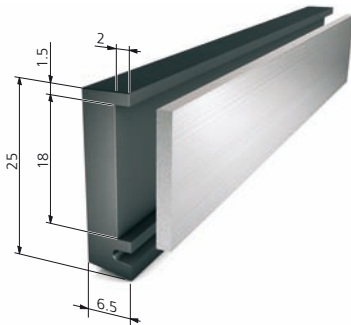
## Dimensions



■ Way wiper BA 65-14 VARIO



■ Way wiper BA 65-18 VARIO



■ Way wiper BA 65-25 VARIO

Type	Pretension (max.)
BA 65-14	1 mm
BA 65-18	1 mm
BA 65-25	1 mm

Length: 500 mm

## Delivery options

### 1. Construction set as individual parts

The support material and wiper lips are produced according to your specifications, and put together as a construction set.



■ Easy assembly of the individual parts

### 2. Ready-to-install wiper system

All parts are supplied affixed to the support profile.



■ Ready-to-install wiper system

### 3. Separate wiper lip

If your production department can produce the required support plates itself, you can order the wiper lip from us separately. The delivery length is 500 mm.

It can be ordered as follows:

- ....pcs. wiper lip BA 65-14 material no. 79000
- ....pcs. wiper lip BA 65-18 material no. 79001
- ....pcs. wiper lip BA 65-25 material no. 79003



■ Wiper lip bar material



## Way wiper BAY-WIPE

### Wiper with double action

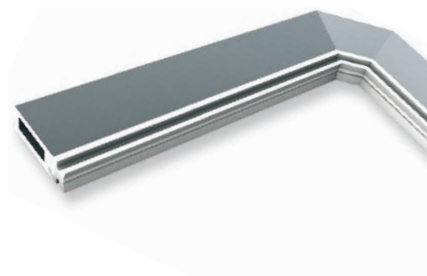
BAY-WIPE by KABELSCHLEPP does what didn't seem possible up to now: A way wiper system that serves to wipe off oil inside while simultaneously removing foreign particles and coolants outside. In this way it protects particularly hydrostatic guideways by preventing the escape of lubricants.

Many wiper systems have problems at the point where a hydrostatic guideway goes round a corner. Rounded or bevelled corners on guideways are often problem areas, because the wiper elements cannot follow the profile closely enough.

Our BAY-WIPE system now has these problem areas perfectly under control. Thanks to its optimised corner elements, which follow the contours of the path exactly, the guideway is wiped clean in both directions.



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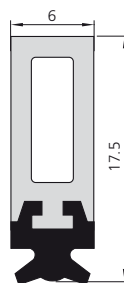


### Properties

- Aluminum support profile with PUR wiper lip
- Wiper with double action: Wipes inside and outside
- Has separation effect by wiping on both sides
- Extremely low oil loss
- Prevents the invasion of foreign material
- Optimal regularity of pressure through minimum form deviation (die casting)
- Also provides seal at guideway protection bevel by conforming to shape
- Simple production, few parts

### Dimensions

- Pretension: 0.4 mm
- Length: 516 mm



### Intelligently designed, individually produced

The wiper lip of the BAY-WIPE was developed at the Institute for Machine Elements (IMA) at the University of Stuttgart. KABELSCHLEPP participated in this research project, and put the results into practice in a consistent manner.

A wiper lip that works in both directions is affixed directly to the support profile by means of a plastic injection moulding process. The straight sections of this profile, which have been cut to length, are then non-positively joined with pre-assembled corner elements. This allows a wiper system to be created from the individual parts, exactly suited to the contours of the guideway.

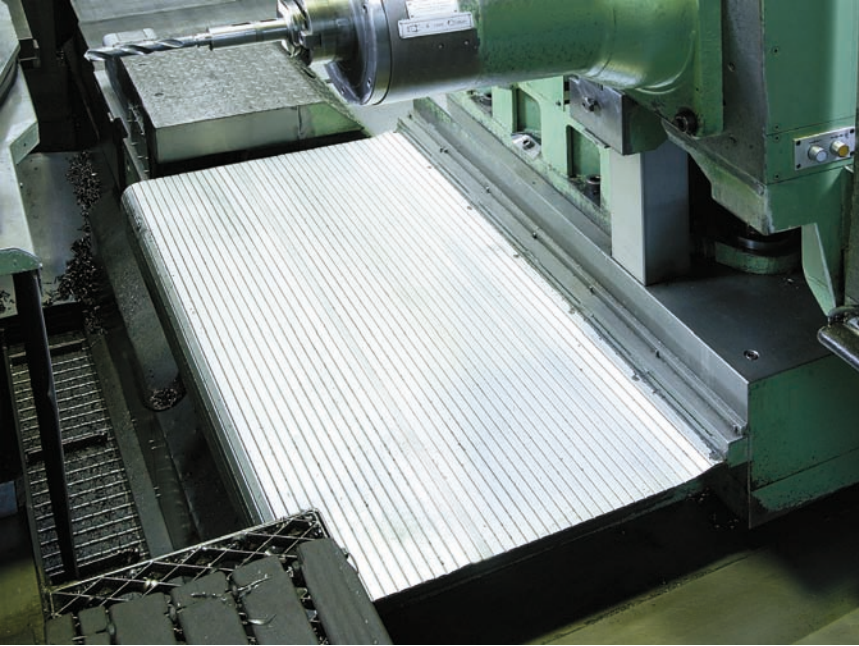


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## Link apron covers

### Solutions for limited spaces

Link apron covers can be used anywhere where, for reasons of space, it is not possible to use telescopic covers. They lie directly on the guideways and can hang down freely at the end of the path, or be screwed on or wound around without any special guides.



### Properties

- Small space requirement
- Protection against chips and lubricant
- Splash- and hose-proof
- Low weight
- Long service life
- Heat-resistant to 100 °C over extended periods
- Customized end attachment
- All link apron covers can be supplied with a roller device
- Lateral guides are not necessary
- Short delivery time
- Attractive price/performance ratio





## Link apron covers

### Solutions for limited spaces

#### Designs

##### Design 1

Lightweight, highly flexible solid profile link apron covers, thin design.

$B_{\min} = 100 \text{ mm}$

$B_{\max} = 950 \text{ mm}$

$R_{\min} = 25 \text{ mm}$

Weight = 5.6 kg/m<sup>2</sup>

Solid aluminum profile 19 x 3.0 mm  
with PU connecting elements



##### Design 2N

Lightweight, stable hollow profile link apron covers, extremely stress-resistant, even in large widths.

$B_{\min} = 100 \text{ mm}$

$B_{\max} = 2950 \text{ mm}$

$R_{\min} = 50 \text{ mm}$

Weight = 10 kg/m<sup>2</sup>

Hollow aluminum profile 20 x 5.5 mm  
with PU connecting elements



##### Design 3

Flexible solid metal link apron cover, with hinges and one-sided bend radius.

$B_{\min} = 100 \text{ mm}$

$B_{\max} = 2000 \text{ mm}$

$R_{\min} = 60 \text{ mm}$

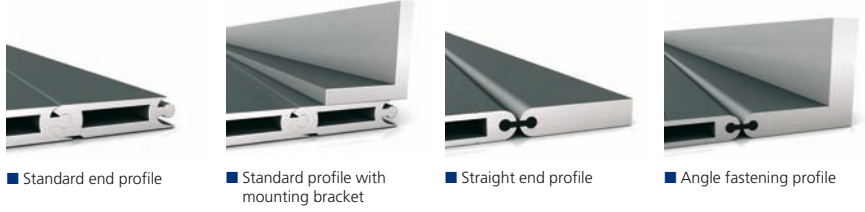
Weight = 16.5 kg/m<sup>2</sup>

Hollow aluminum profile 18.5 x 6.8 mm  
with integrated hinge

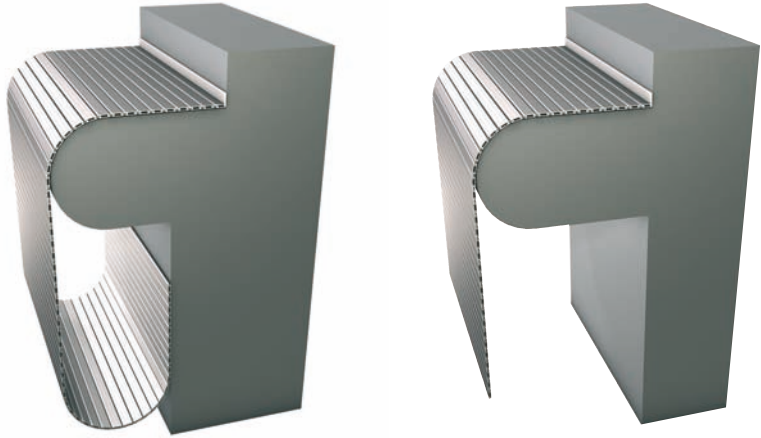


## Fastenings / connecting elements

### Examples of fastening profiles



## Installation variants



## Roller devices

All link apron covers can be rolled up like a window blind. They can be driven with spring or electric motors.





## Bellows

### Guideway protection solutions with very little compression

KABELSCHLEPP bellows are used on all kinds of machine to provide protection for guideways and spindles, in those cases where no hot chips are present and accessibility is not a requirement.

Bellows can be individually produced from a range of different materials, depending on your specific requirements.



### Properties

- Simple installation
- High travel speed
- Minimal compression
- High quality

### Installation variants

- Horizontal, lying
- Horizontal, hanging
- Vertical

### Delivery options

- For travel speeds of up to 1.5 m/s
- Customized production
- Available in a wide range of shapes
- Available in many different materials



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## Bellows

Guideway protection solutions with very little compression

### Designs

#### U-bellows design

- Variable dimensions
- Customized in the guide
- Economically priced



■ U-bellows design

#### Box bellows design

- Covering for movable machine elements
- High form stability



■ Box bellows design

#### U-bellows design with lamellas

- Reliable protection against heavy chip generation
- Rust-resistant and acid-resistant telescopic plates
- Can be made coolant-proof upon request
- Rigid or movable design of the telescopic plates is possible



■ U-bellows design with lamellas

Additional shapes and designs are available on request.



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## Conical spring covers

### Protection under extreme conditions

Conical spring covers protect spindles, columns, shafts, threads and rod guides reliably against contamination, chips and mechanical damage. They provide a good sealing function, and are self-cleaning if installed in a suitable position. High temperature resistance and resistance to chemicals guarantee reliable protection even under extreme operating conditions.



The springs are made of hardened high-quality spring band steel. The optimized design means that the horizontal bending and vertical deflection is very

low. Thus, even in the extended state KABELSCHLEPP conical spring covers guarantee excellent protection against dirt and mechanical influences.

### Properties

- Accident prevention for operating personnel from revolving spindles and shafts
- Reduction in downtimes resulting from contamination
- Increased machine service life
- Some conical spring covers are also available for retrofitting



# Conical spring covers

## Protection under extreme conditions

### Installation positions

The conically wound conical spring covers automatically follow the motions of the machine. Made of high-quality blue polished steel or alternatively of stainless steel, they can be used in vertical, horizontal and inclined positions.



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#### Vertical installation

When installed vertically, conical spring covers are mounted with the larger diameter at the top. This way the overlapping of the individual coils makes the conical spring covers self-cleaning.



#### Horizontal installation

When installed horizontally, conical spring covers are mounted with the larger diameter in the direction of the chip generation. In horizontal installation with larger diameters or longer expansion, the maximum expansion is reduced to 60 % of the value for vertical installation.

Moreover, a slight sag appears in the conical spring cover, which is about 2 – 5 % of the maximum expansion.



#### Installation in inclined position

In addition to vertical and horizontal installation, installation in an inclined position is also possible. For small angles of incline above the horizontal the same conditions apply as in horizontal installation.



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## Installation of several conical spring covers in series

By connecting several conical spring covers in series it is possible to deal with special requirements, such as extra-long traversing distances.

We would be happy to advise you regarding such applications and can supply you with the necessary special flanges.



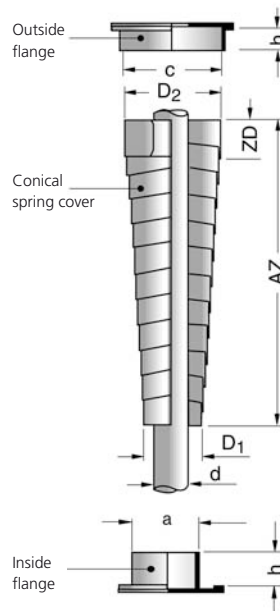
## Retrofitting

Many conical spring covers are also available for retrofitting.

## Selection

Selection of the conical spring cover suitable for your specific application is generally based on the following criteria:

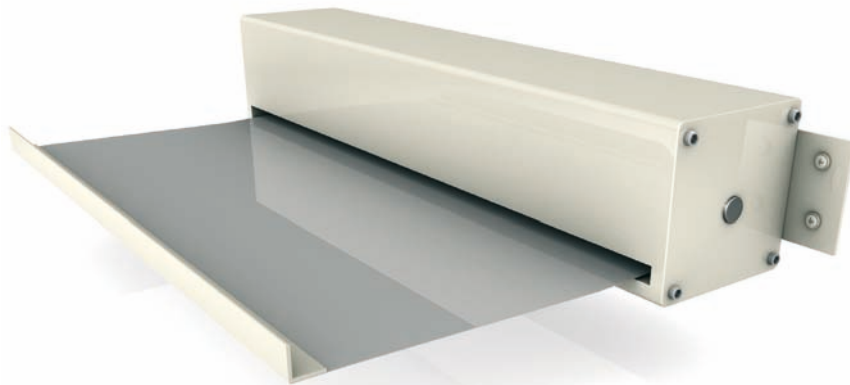
- Internal diameter D1
- Expansion AZ (vertical / horizontal)
- Compression ZD



## Roll-up covers

### Protection in a minimum of space

KABELSCHLEPP roll-up covers serve to protect contact surfaces and guideways on all kinds of machine.



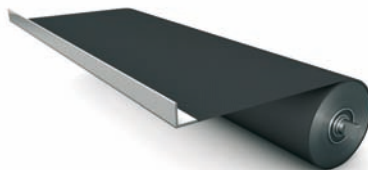
### Properties

- For high travel speeds
- Minimal space required
- Customized production
- Simple installation
- Long service life
- Cost-effective

### Designs

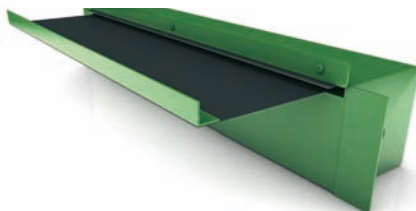
#### Roll-up cover without housing

Roll-up covers without a housing are suitable for areas with limited space, and facilitate optimal integration into the machine enclosure.



#### Roll-up cover with housing

Roll-up covers with an additional housing made of steel or aluminum protect the standard roll-up cover and allow simple installation or retrofitting.



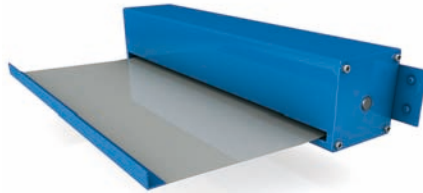
## Roll-up covers with plastic band

- Reliable protection against cutting waste, oil and cooling emulsions
- Particularly suitable for high travel speeds thanks to its low own weight
- Minimal space required
- Very resistant to tearing due to plastic layered special fabric
- Various materials are possible



## Roll-up covers with steel band

- Very good protection against cutting waste, oil and cooling emulsions
- Rust-resistant and acid-resistant spring band steel with thickness from 0.2 to 0.4 mm
- Suitable for high travel speeds and greater mechanical loads
- Only available with housing

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