## Telescopic Steel Covers

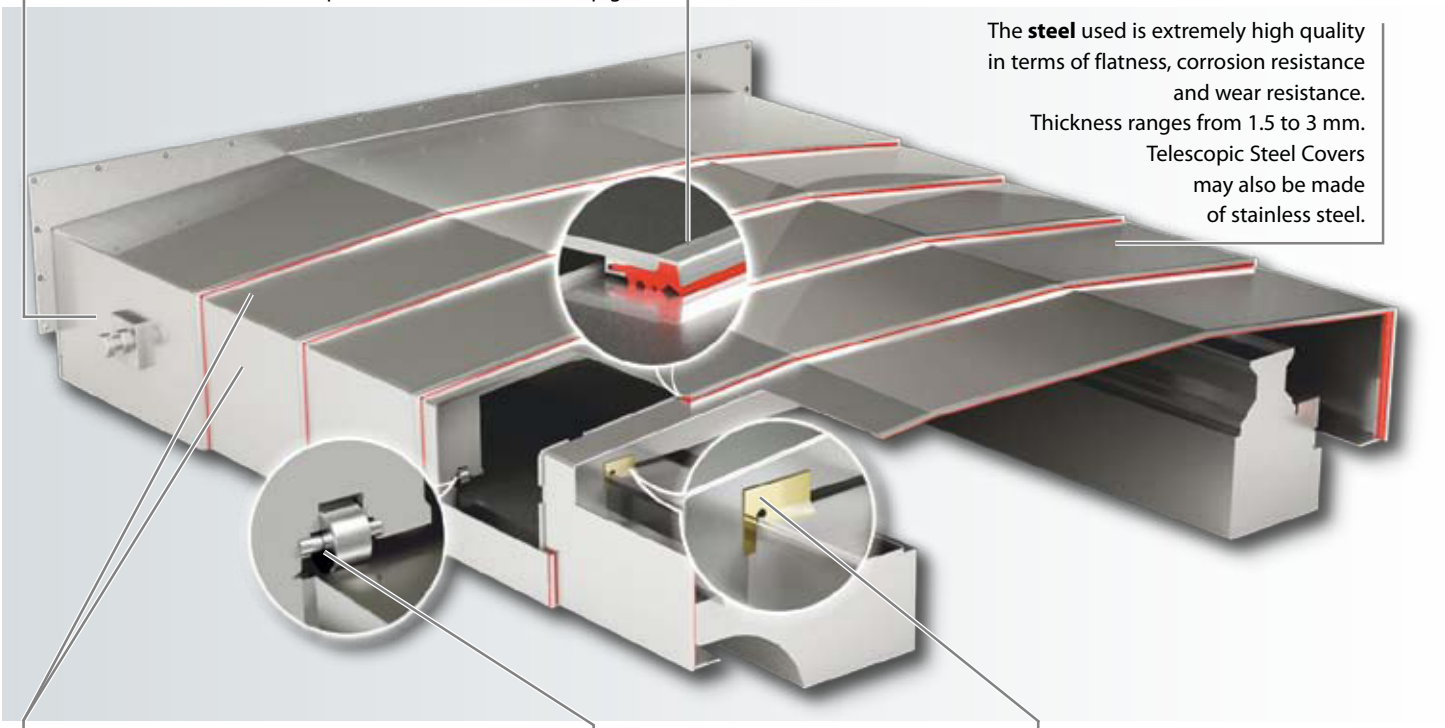
There are many companies throughout the world who manufacture or sell **Telescopic Steel Covers**. Our company has achieved production levels - in terms of volume and quality standards - that place it at the top of the market.

Heavy investment in machinery and personnel training, under the guidance of highly qualified engineers have allowed us to face the latest challenge in the development of Machine Tools: the increase of the axis speeds.

For heavy covers:
a) over 110 kg
for horizontal covers
b) over 70 kg
for front or vertical covers.
Special **supports** are included for easy, secure lifting.

**Wipers** keep the surface clean and prevent chips and shavings from getting onto expensive rails.
They must be heat and coolant resistant, and thus are made of polyurethane, with or without a protective stainless steel chip guard.

Special anti-friction **brass guides** or **wipers** with polyurethane rubber are inserted on the sides of the Telescopic Steel Covers, at the discretion of the engineer based on speed, seal and dimensions.



The **steel** used is extremely high quality in terms of flatness, corrosion resistance and wear resistance.
Thickness ranges from 1.5 to 3 mm.
Telescopic Steel Covers may also be made of stainless steel.

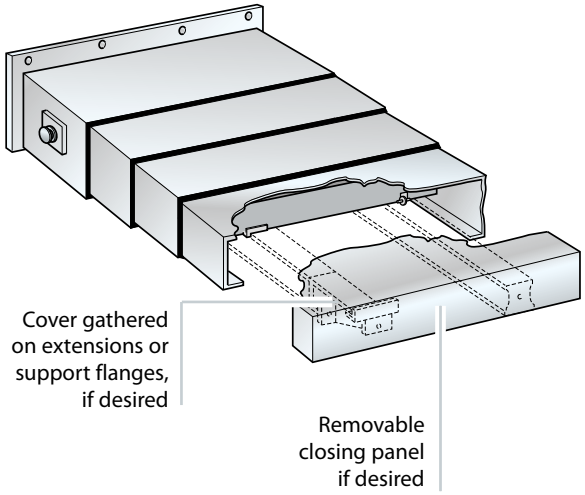
For high speeds, **P.E.I. shock absorbers** (patented) are inserted in these positions.
They are very effective in reducing impact between boxes during movement.
These shock absorbers allow working speeds considerably higher than those previously possible, while simultaneously reducing noise levels and wear.
This innovation, together with precision production methods, make it possible to accomodate even the fastest machine tools.

For high speeds or weights, special **bearings** are inserted for smooth, silent movement.
Telescopic Steel Covers with bearings require tempered or auxiliary guides.

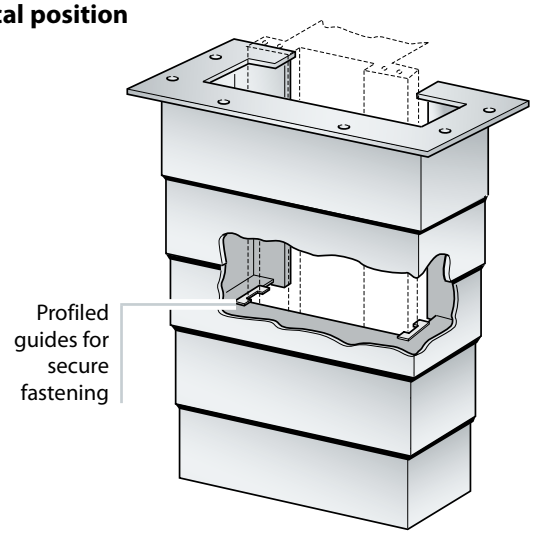
Compact, low-speed Telescopic Steel Covers are equipped with special anti-friction brass or non-metallic **guides**.

## Working Positions

### Horizontal position

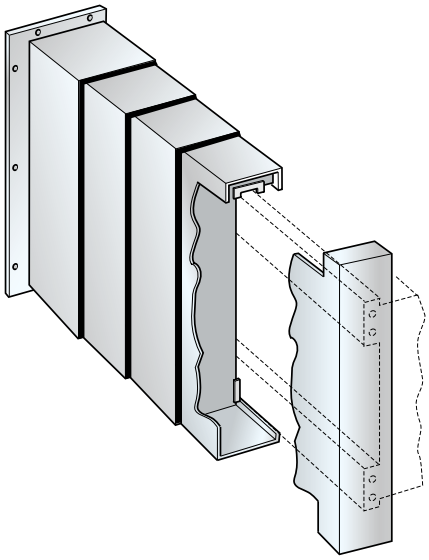



### Vertical position

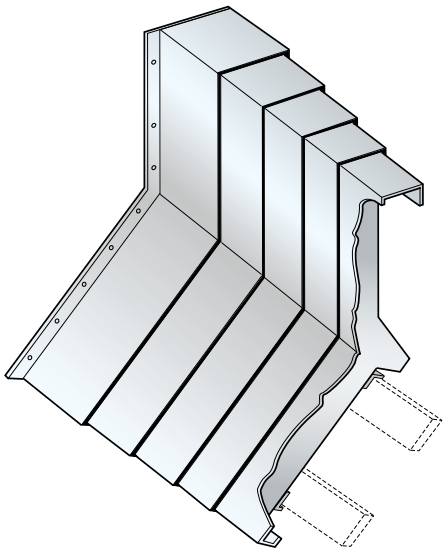



**Snap-on guides available upon request for rapid frontal installation**

### Transverse position

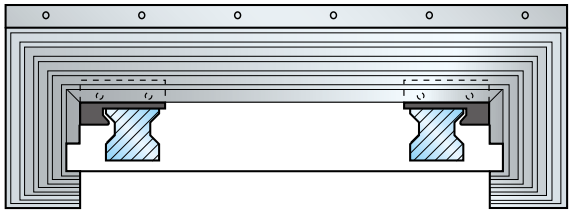


### Transverse LATHE cover

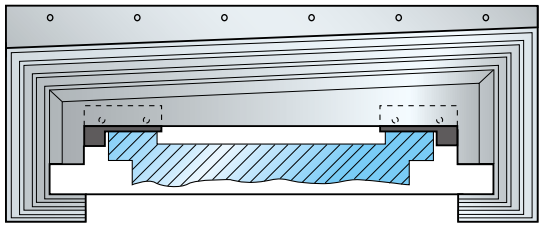


## Configurations

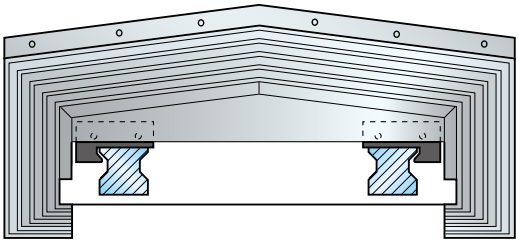
**Shape 1**



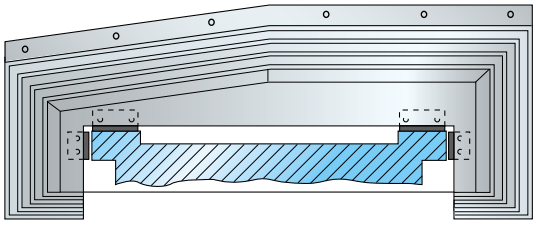
**Shape 2**



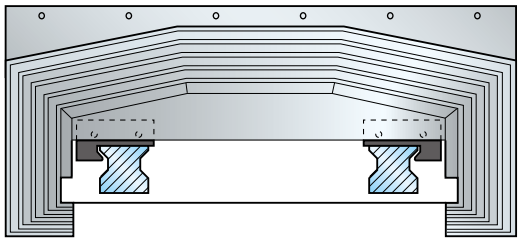
**Shape 3**



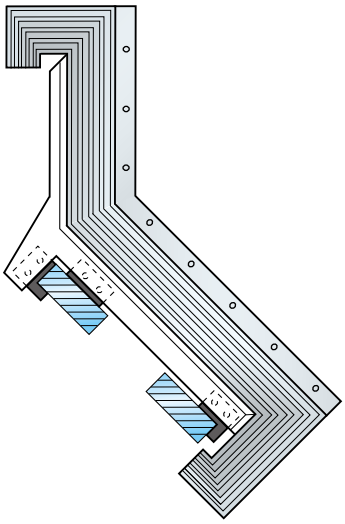
**Shape 4**



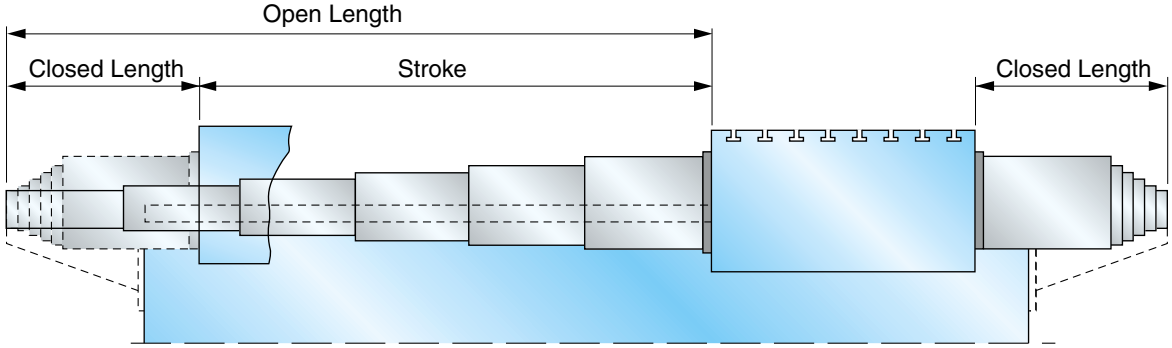
**Shape 5**



**Shape 6**



**NOTE:** Only a few standard configurations of Telescopic Steel Covers are shown above.

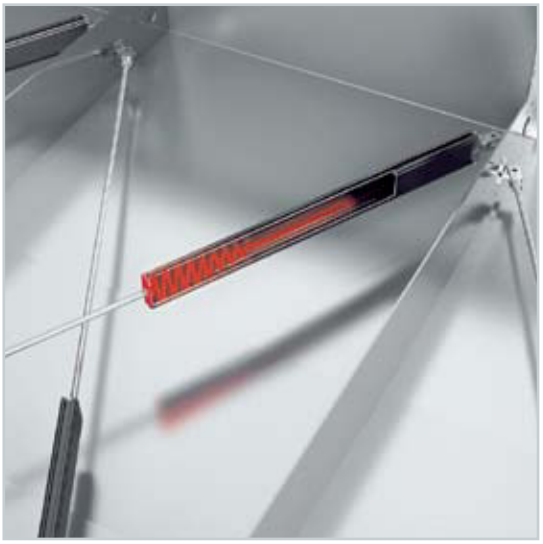


## DAMPER-SHELL

## The new generation viscoelastic shock absorber that effectively reduces impact noise in large scale telescopic covers

- **DAMPER-SHELL** is ideal for working speeds up to 80m/min and acceleration up to 1g.
- **DAMPER-SHELL** opens smoothly during expansion without causing friction on the boxes.
- **DAMPER-SHELL** is free from boost residue whether the telescopic cover is closed or in resting position.
- **DAMPER-SHELL** has an excellent dimension/cost ratio.
- **DAMPER-SHELL** is ideal for long strokes being a silent, durable and reliable solution.
- Telescopic covers equipped with **DAMPER-SHELL** require quick and simple maintenance.

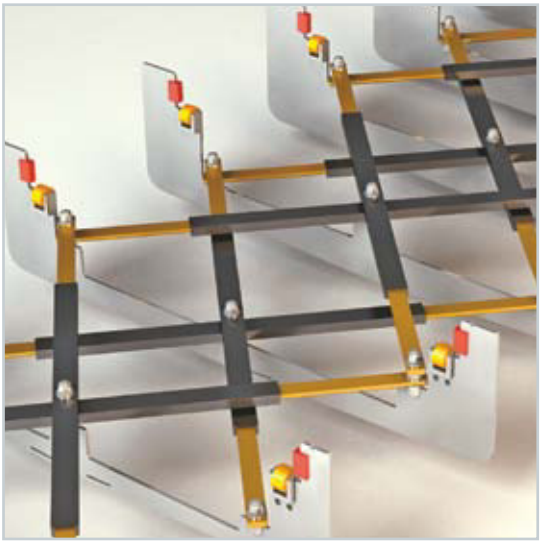
(Patent pending)



## SYNCHRO-TEL
## The mechanical brace system that synchronizes movement in telescopic covers

- **SYNCHRO-TEL** is a mechanical system which synchronizes the opening and closure of medium sized telescopic covers.
- **SYNCHRO-TEL** is ideal for working at high speeds and acceleration.
- The shaft mechanism of the **SYNCHRO-TEL** telescopic cover eliminates any collision between the boxes.
- **SYNCHRO-TEL** generates minimum stress on the pivots.
- Guaranteed stability of the telescopic shafts secured by three pivots to the boxes.
- Guaranteed minimum closed length.
- **SYNCHRO-TEL** is a convenient and cost saving solution.
- Mathematical testing and calculations prove **SYNCHRO-TEL** to be the most reliable and durable synchro system on the current market.

(Patent pending)



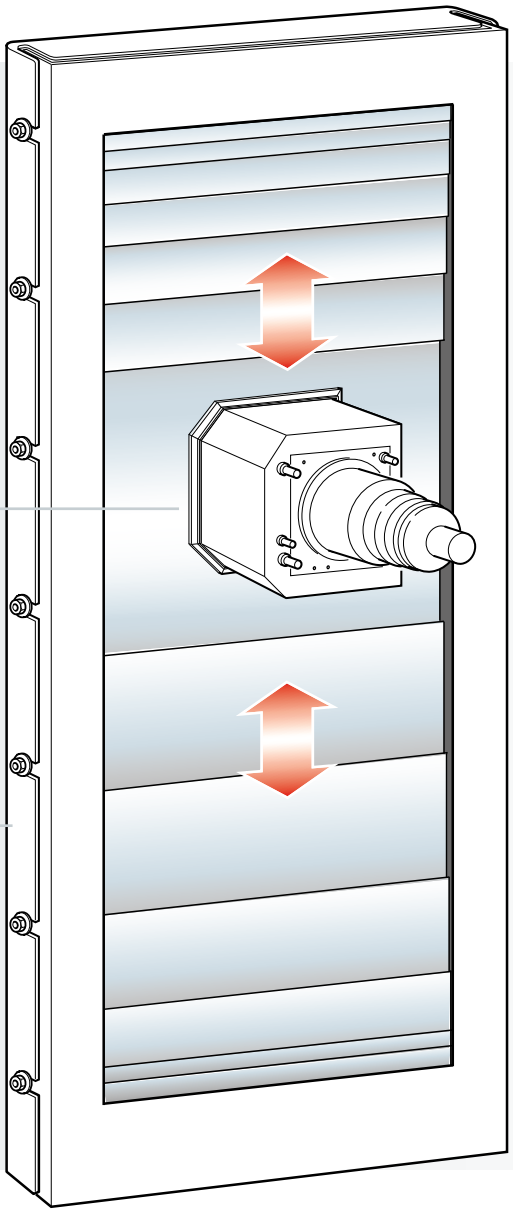
## PR4A
## The instantly replaceable wiper for Telescopic covers
## Attention: dissassembly not required!

- **WIPER PR4A** is a cutting-edge solution for replacing the wiper profile instantly and without stopping the machinery.
- **WIPER PR4A** is made of 3 independent elements:
  - firstly it has a solid metal profile on the telescopic cover box
  - secondly it has a removable metal profile
  - finally it has a seal designed to clean the cover.
- Telescopic covers equipped with **WIPER PR4A** allow the client to independently replace the wiper profile:
  - Release the removable part
  - Replace the removable metal profile ready-made for the new seal
  - **WIPER PR4A** offers a range of seals with different technical features depending on the working conditions it is subjected (e.g. a working environment that uses coolants or a dry working environment in the **PR4A D** version).

(Patent pending)

## SHEET-POCKET™

The **SHEET-POCKET™** Telescopic Steel Cover is the most effective solution for shielding the Y-axis (vertical) in horizontal machining centers. **It can achieve speeds up to 150 m/min. and accelerations of 2 g**. It is supplied in a fully enclosed frame that is independent from the machine structure. The self-contained sheet-pocket is easy to install and remove for maintenance or inspection.
The dimensions are defined by our technicians together with the customer's engineers to maximize the working area.



Spindle opening with edges guarded by **protected wipers**, with polyurethane profile.

Telescopic Steel Cover **casing** designed to allow easy installation and rapid disassembly for maintenance.

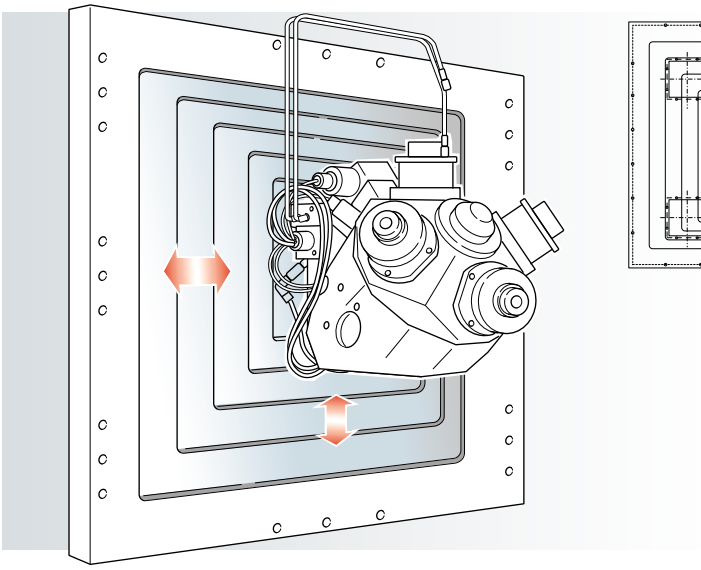
Sequence of **moving panels**, made of special high-resistance steel, fully adhering to one another to prevent shavings from penetrating inside.

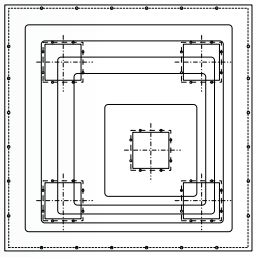
The **SHEET-POCKET™** Telescopic Steel Cover can be easily combined with **SURE-SPRING**® roll-up covers as shown on page 16 of this catalog.

(Patented)

## SQUARE SLIDING COVER ™

This family of **Telescopic Steel Cover**, was designed to meet special needs that frequently arise on SPECIAL or TRANSFER machines and small machining centers. This configuration is especially innovative thanks to the patent-pending method for moving each individual panel, thus allowing users to take greater advantage of the available space.



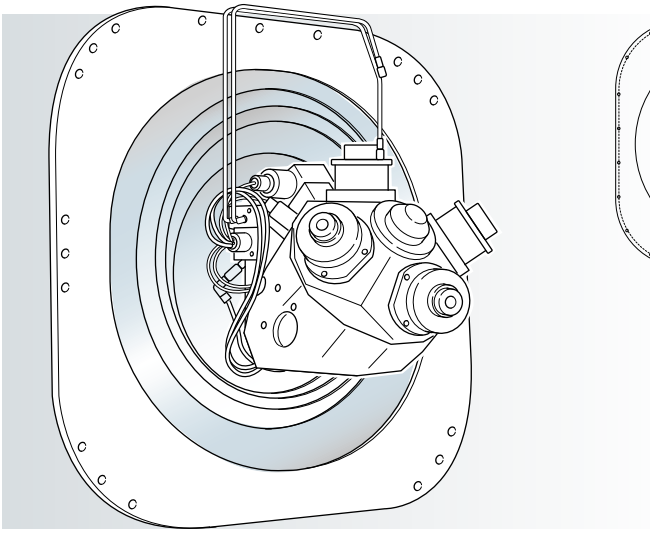


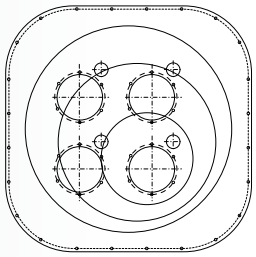
- **For dual-axis operation**
- **High speed**
- **Compact size**
- **Easy to install**
- **Maximum use of available space**

(Patented)

## ROUND SLIDING COVER ™

Like the **SQUARE SLIDING COVER,** this type of **Telescopic Steel Cover** was designed to meet special needs that frequently arise on SPECIAL or TRANSFER machines and small machining centers.
Since it has a wide range of applications, contact our Engineering Department to define the ideal sizing for the cover.





- **For dual-axis operation**
- **High speed**
- **Compact size**
- **Easy to install**

(Patented)

## METAL TELESCOPIC COVER REVISION


- Overhaul of ALL TYPES of telescopic covers for machine tools
- Revision or replacement of damaged sections
- Replace riders or guide rollers
- Replace brass wear strips
- Clean and buffed to original finish
- In case of too damaged telescopic covers, we can build them new.

- **SHORT DELIVERY TIME**

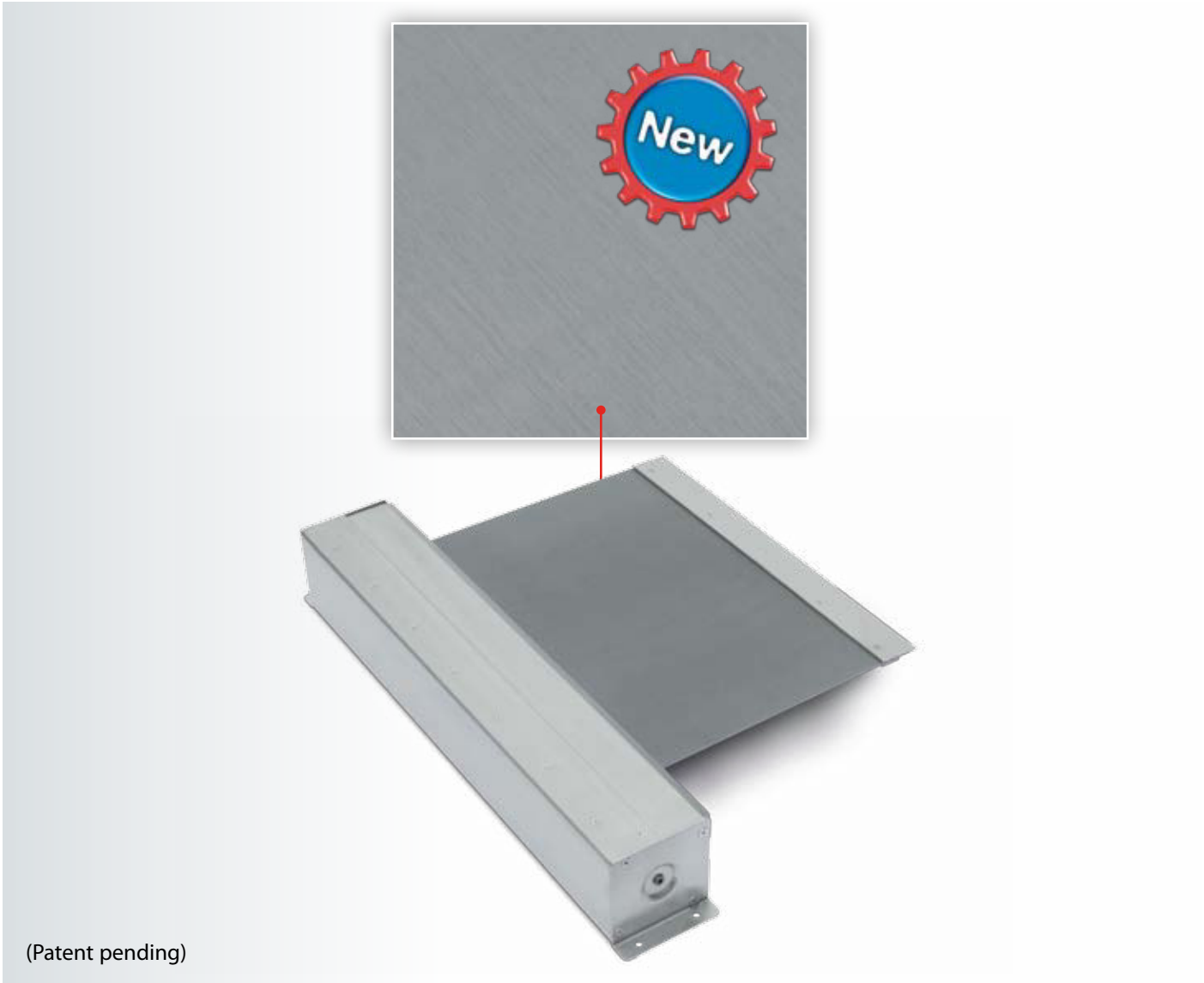
## Roll-up Covers

P.E.I. Roll-up Covers are normally equipped with our patented system of multiple springs. This offers countless advantages:

- **Reliability**
- **Extremely high speeds**
- **Resistance to high and low temperatures**
- **1,000,000 movements guaranteed**
- **Compact size**
- **Easy installation**
- **Constant tensioning**
- **Special roll-up covers for machine tools**

## STEEL-TEX

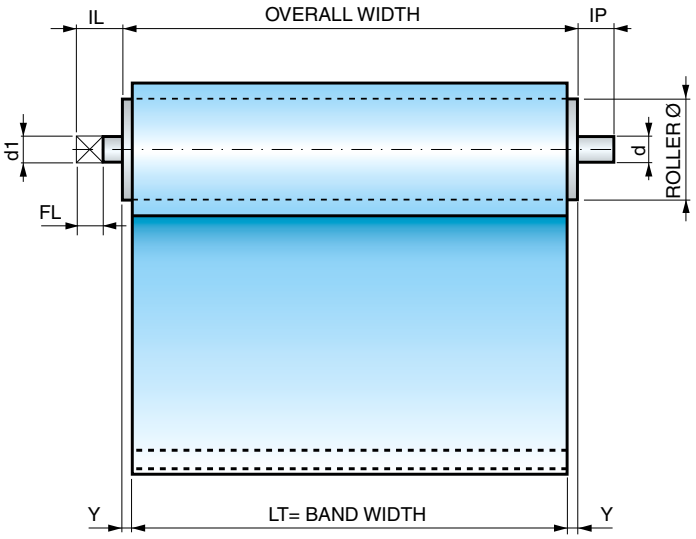
**STEEL-TEX**: the stainless steel band specially studied for roll-up covers.

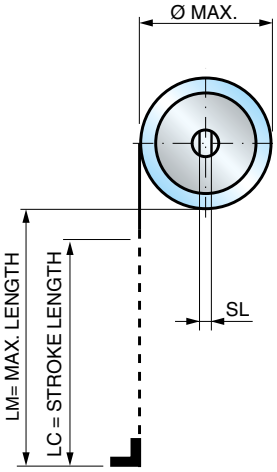



(Patent pending)

- **STEEL-TEX** is a the stainless steel roll-up cover with polyurethane.
- **STEEL-TEX** is cut resistant on impact with incandescent and sharp metal shavings.
- **STEEL-TEX** offers exceptional resistance during dry working or with coolants.
- **STEEL-TEX** is compact, weighs 0.9 kg per sq.m and is 0.8mm thick.
- **STEEL-TEX** can be installed on the entire range of P.E.I. roll-up covers.

## Roll-up Covers without Canister




| LM | | 2 . Y = |
|---|---|---|
| Da | a | |
| 0 | 400 | 4 |
| 401 | 600 | 5 |
| 601 | 800 | 6 |
| 801 | 1200 | 8 |
| 1201 | 1600 | 10 |
| 1601 | 2400 | 14 |
| 2401 | 3000 | 18 |
| 3001 | 3850 | 22 |
| 3851 | 4700 | 26 |
| 4701 | 5550 | 32 |

### Shaft sizes

Standard Roll-up Covers

| Ø ROLLER | d1 | IL | FL | SL | d | IP |
|---|---|---|---|---|---|---|
| 30 | 6 | 8 | 8 | 2,6 | 7 | 8 |
| 40-50-60-70<br>80-90-100-120 | 10 | 15 | 12 | 4 | 10 | 10 |

For special working conditions, our engineering department can adjust these dimensions. Carefully review the drawing enclosed with the proposal.

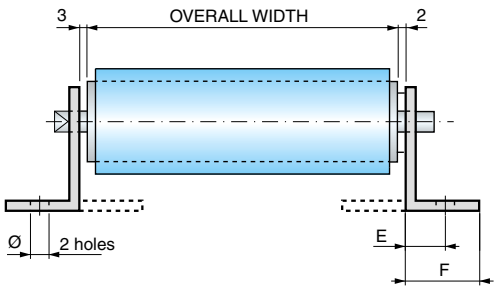
SURE-SPRING® Roll-up Covers

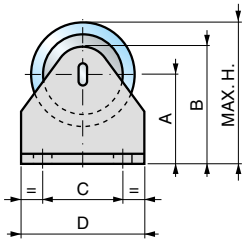
| Ø ROLLER | d1 | IL | FL | SL | d | IP |
|---|---|---|---|---|---|---|
| 39-52-71 | 10 | 15 | 12 | 4 | 10 | 10 |

**Formula for calculating the OVERALL WIDTH**

**OVERALL WIDTH = LT + 2Y**

Example:
LM = 1000 LT = 500 2Y = 8
OVERALL WIDTH = 508




### Measurements for standard supports

| Code | A | B | C | D | E | F | Ø | Hmax | Material |
|---|---|---|---|---|---|---|---|---|---|
| **033** | 33 | 45 | 26 | 40 | 11 | 18 | 6,5 | 59 | galvanized Fe 15/10 |
| **050** | 50 | 62 | 26 | 40 | 11 | 18 | 6,5 | 93 | galvanized Fe 15/10 |
| **060** | 60 | 76 | 36 | 50 | 15 | 22 | 6,5 | 112 | galvanized Fe 20/10 |
| **080** | 80 | 96 | 42 | 60 | 17 | 26 | 6,5 | 151 | galvanized Fe 25/10 |
| **119** | 119 | 136 | 54 | 106 | 37 | 70 | 10 | 225 | galvanized Fe 40/10 |

**Formula for calculating max. Ø**

$$Ø\ MAX. = 2 \cdot \sqrt{\frac{L \cdot s \cdot 1{,}20}{\pi} + r^2}$$

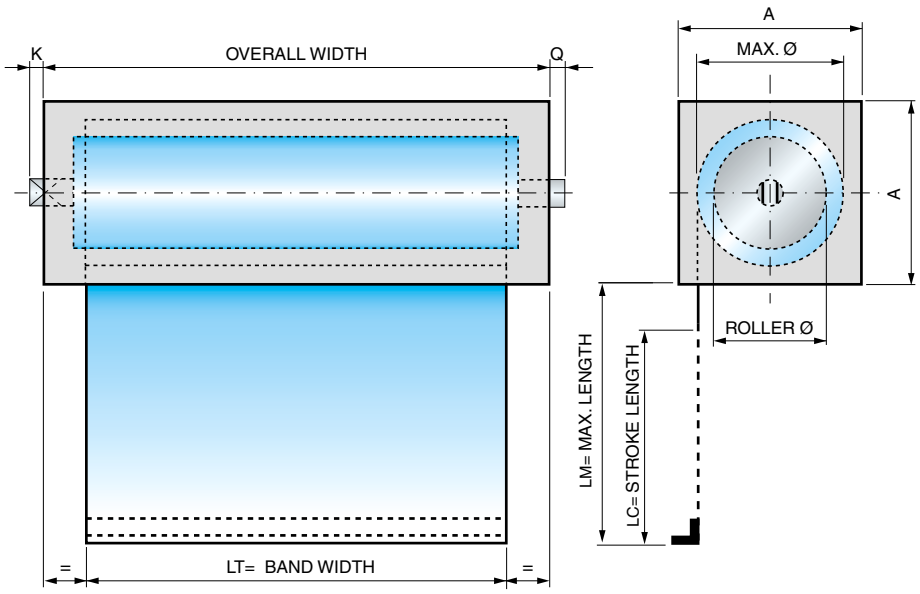
L = MAX. LENGTH TO WIND
s = BAND THICKNESS*
r = ROLLER Ø/2

(* see materials list on pages 52-53)

## Roll-up Covers with Canister

Enclosing the roller offers many advantages:

- **Protects roller from accidental impact**
- **Integral wiper keeps band clean**
- **Attractive appearance**
- **Wide variety of fastening systems**
- **Materials: Aluminum, Steel, Stainless Steel**
- **1,000,000 movements guaranteed**




| Canisters A x A |
|---|
| 40 x 40 |
| 50 x 50 |
| 60 x 60 |
| 70 x 70 |
| 80 x 80 |
| 90 x 90 |
| 100 x 100 |
| 110 x 110 |
| 120 x 120 |
| 130 x 130 |
| 140 x 140 |
| 150 x 150 |

| Canister material | K | Q | Z* |
|---|---|---|---|
| Aluminum | 3 | 1 | 25 |
| Steel | 10 | 7 | 13 |
| Stainless steel | 10 | 7 | 13 |

**Z*=** FIXED COEFFICIENT

### Recommended sizes

These tables list the recommended MAX. BAND LENGTH based on the OVERALL WIDTH.
The values shown are guaranteed at a MAX. SPEED of 40 m/min.
**For higher speeds and for sizes not indicated in the tables, contact our engineering department**

All the Roll-up Covers with or without Canister are manufactured to order.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ROLLER Ø30** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 300 | 500 | 650 | 800 | 1000 | 1200 | 1350 | 1500 |
| **ROLLER Ø40** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 400 | 600 | 900 | 1200 | 1500 | 1800 | 2000 | 2200 |
| **ROLLER Ø50** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 450 | 700 | 1050 | 1350 | 1650 | 2000 | 2250 | 2450 |
| **ROLLER Ø60** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 500 | 1000 | 1600 | 1900 | 2200 | 2500 | 2750 | 3000 |
| **ROLLER Ø70** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 550 | 1100 | 1750 | 2050 | 2350 | 2600 | 2900 | 3150 |
| **ROLLER Ø80** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 700 | 1300 | 2000 | 2350 | 2700 | 3100 | 3400 | 3700 |
| **ROLLER Ø90** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 750 | 1400 | 2150 | 2500 | 2850 | 3200 | 3550 | 3850 |
| **ROLLER Ø100** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 800 | 1500 | 2300 | 2650 | 3000 | 3300 | 3700 | 4000 |
| **ROLLER Ø120** | OVERALL WIDTH | 150 | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 850 | 1600 | 2450 | 2800 | 3150 | 3400 | 3850 | 4150 |

Size examples for SURE-SPRING® Roll-up Covers

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ROLLER Ø39** | OVERALL WIDTH | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 850 | 1250 | 1650 | 2000 | 2500 | 3000 | 3850 |
| **ROLLER Ø52** | OVERALL WIDTH | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 1000 | 1500 | 2000 | 2500 | 3000 | 3850 | 4700 |
| **ROLLER Ø71** | OVERALL WIDTH | 250 | 350 | 500 | 750 | 1000 | 1250 | 1500 |
| | MAX. LENGTH | 1400 | 2100 | 2400 | 2850 | 3700 | 4800 | 5550 |

**Formula for calculating the Minimum canister size = A**

**A = MAX Ø + 8**

**Formula for calculating the OVERALL WIDTH**

With Steel and Stainless Steel canister

**OVERALL WIDTH =**

$$LT + Z + 2Y^* + \left(\frac{LM}{100}\right)$$

Example with Steel canister:
LT= 500 2Y= 8 LM =1000
LM/100 =10 Z= 13

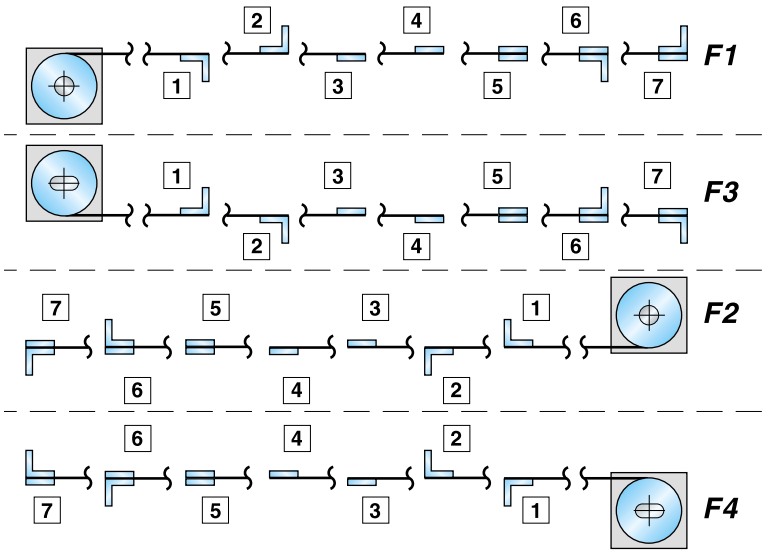
OVERALL WIDTH = 531
(* see 2Y table on page 12)

## Installing Roll-up Covers

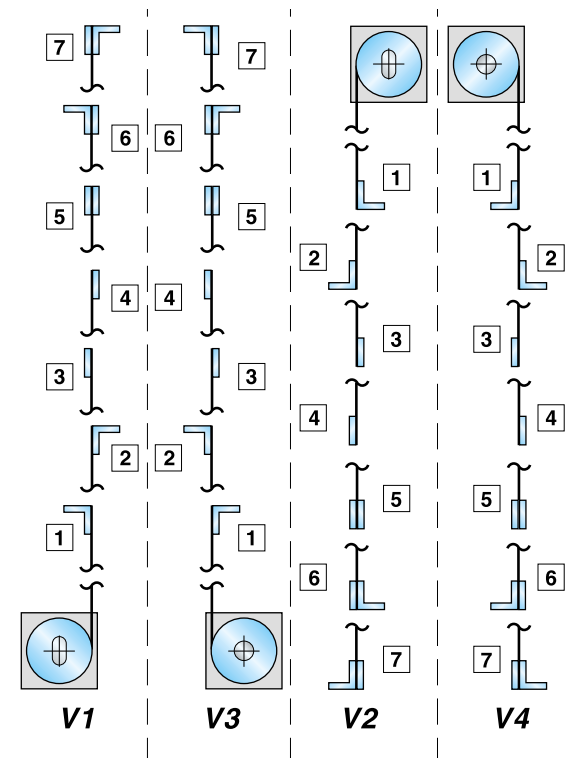
This diagram is valid for all Roll-up Covers, and shows:

- **Terminal type**
- **Terminal position on the band**
- **Band output direction**
- **View of shaft/tab**

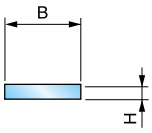
**Horizontal and frontal positions**



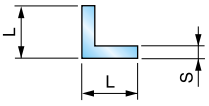

**Vertical positions**




**Terminal materials: Aluminum, Steel**

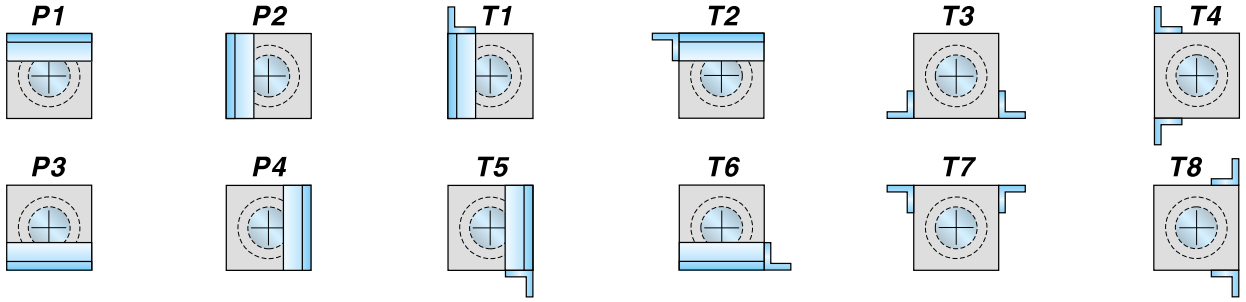



| B x H |
|---|
| 15 x 3 |
| 20 x 3 |
| 30 x 3 |

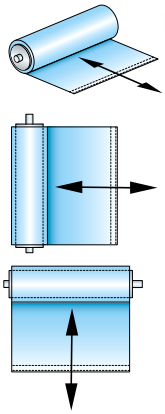



| L x L x S |
|---|
| 15 x 15 x 3 |
| 20 x 20 x 3 |
| 30 x 30 x 3 |

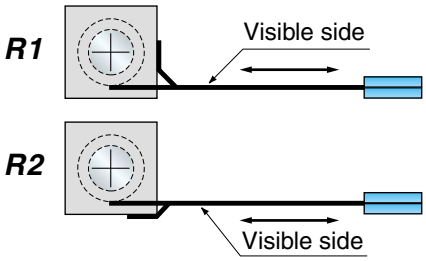
**Standard canister mounting systems:** To describe the canister attachment system, place one of the drawings below over the selected roll-up cover position, above. Do not rotate either drawing.



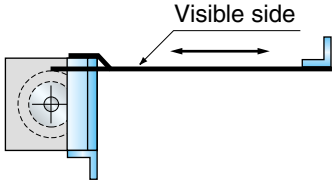

**Positions**




**Wiper:** This diagram shows the 2 ways to install the wiper to the canister.

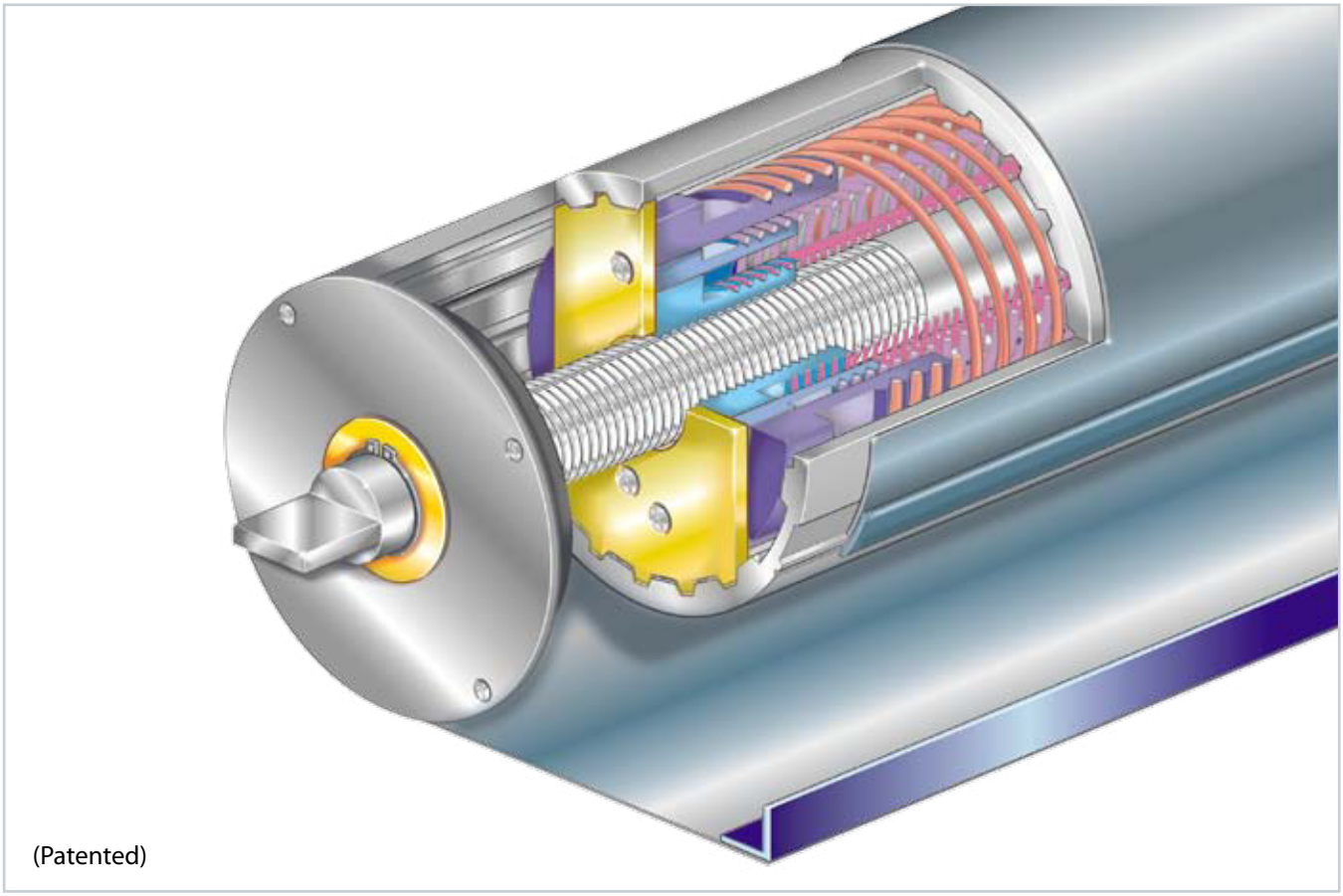



**Example assembling code**




| | |
|---|---|
| Working position | F1 |
| Terminal attachment | 2 |
| Canister attachment | T5 |
| Wiper position | R2 |

## SURE-SPRING®



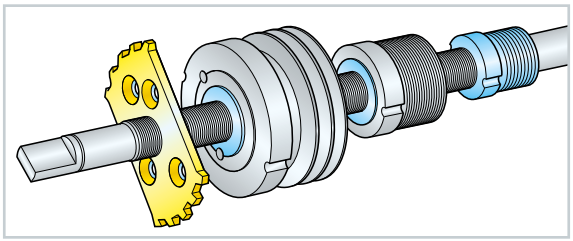
(Patented)

The P.E.I. **Patented design** known as **SURE-SPRING®** represent the most advanced level of technical innovation in the field of roll-up covers.
The spring mechanism design takes into account the intrinsic defects in other rollers available on the market, and overcomes them by means of a radical new design of the spring mechanism.
The second major innovation consists of the mechanical system to fasten the band to the tube.
No adhesives are needed for this roll-up cover!!
In addition to those of standard P.E.I. roll-up covers, P.E.I. **SURE-SPRING®** roll-up covers offer the following advantages:

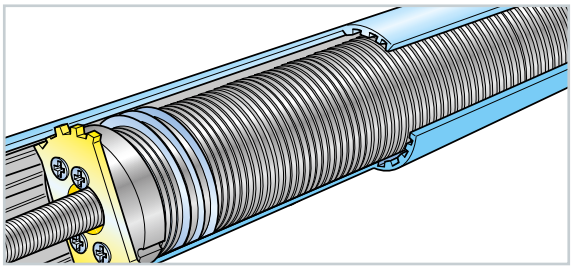
- **Suitable for HIGH SPEED operation**
- **The multiple springs remain COAXIAL**
- **The springs NEVER INTERSECT**
- **REDUCED overall diameters**
- **EXCELLENT reliability**
- **Advancement speeds of up to 150 m/min**
- **Acceleration of up to 2 g**
- **2,000,000 movements guaranteed**
- **SECURE attachment of the band to the tube, because NO adhesive products are used**
- **PRACTICAL maintenance, since the band can be replaced quickly and easily**
- **Also suitable for use in work environments where STRONGLY AGGRESSIVE chemicals are used**
- **HEALTHY for the environment.**

## SURE-SPRING® Technical Specifications

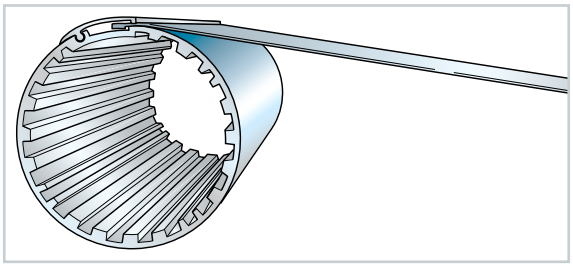
**Transmission**
The rotary movement of the tube in relation to the fixed central shaft is transmitted by a sliding spline. This system compensates for the elongation of the multiple springs by moving the spring mounting point axially along a threaded shaft.



**Innovative features**
This new system allows the multiple springs to work according to an ideal geometry, keeping their coils properly spaced.



**Mechanical system attaching the band to the tube**
This is the most reliable system for insuring a secure attachment between the band to the tube.





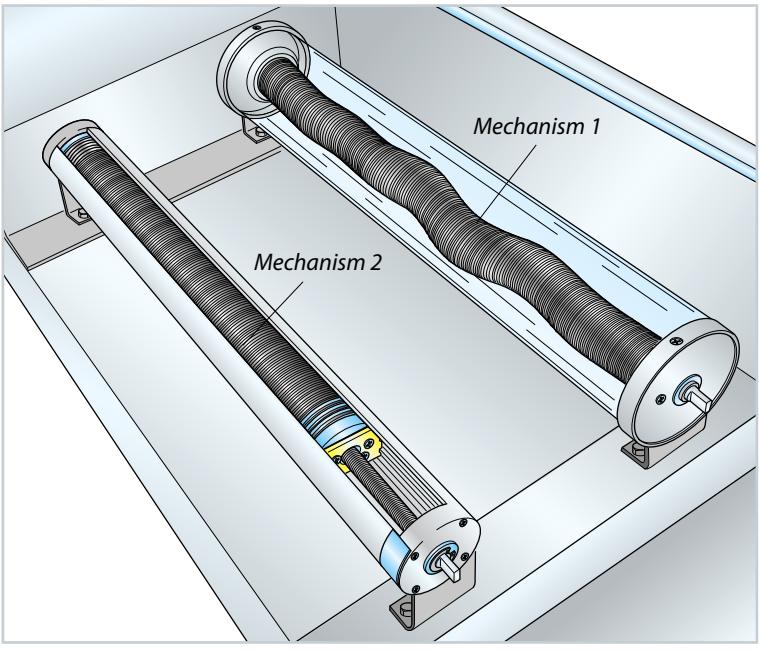
## SURE-SPRING® Operating diagram

This illustration clearly highlights the different behavior of the spring mechanisms during operation:

- In Mechanism 1 (traditional system) the springs are rigidly attached to the fixed caps at the ends of the shaft.
  In this system the springs helically twist and snake while winding or unwinding, causing obvious problems of friction and wear between the coils as well as between the coils and the central shaft.

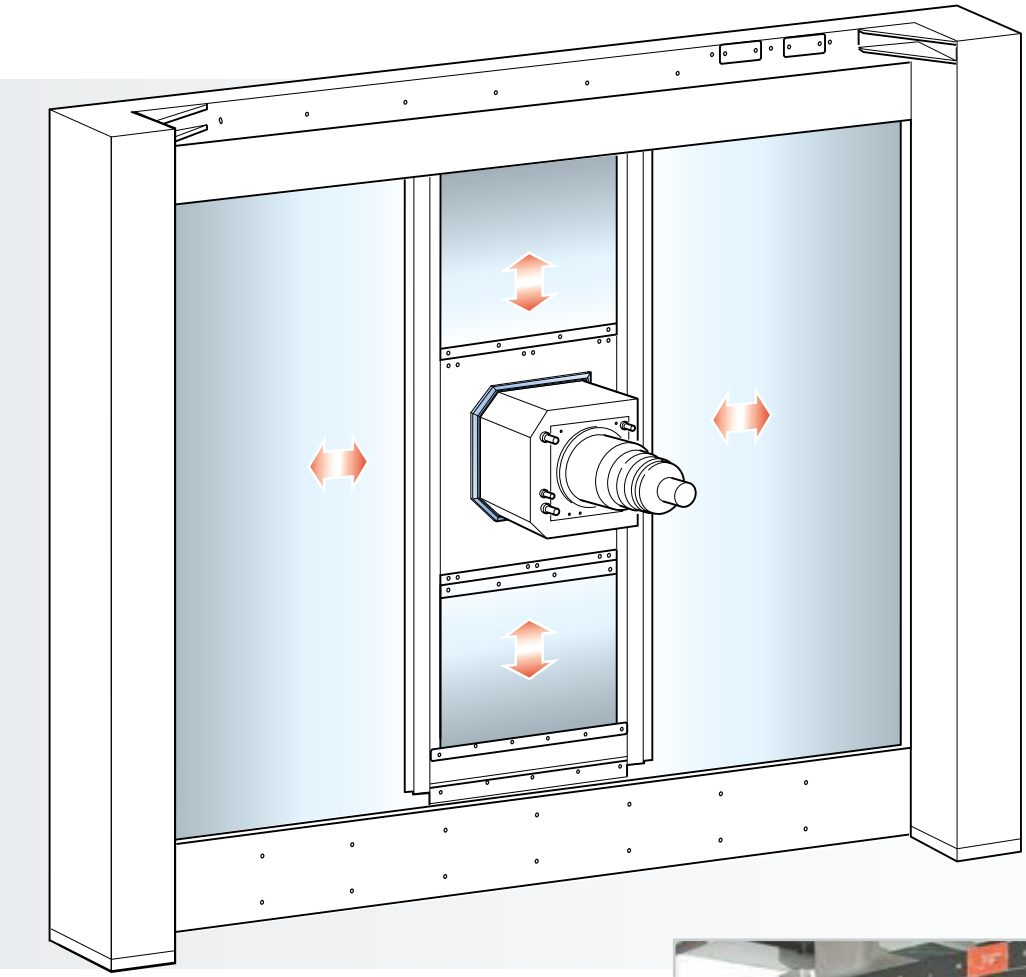
- In Mechanism 2 (**SURE-SPRING**® system) the springs are attached to a special moving cap, which slides lengthwise while winding and unwinding, keeping the spring coils packed and concentric at all times. This spring configuration avoids most of the wear mentioned above, allowing better performance and a much longer operating life-span for the spring mechanism.

For recommended dimensions see page 13.



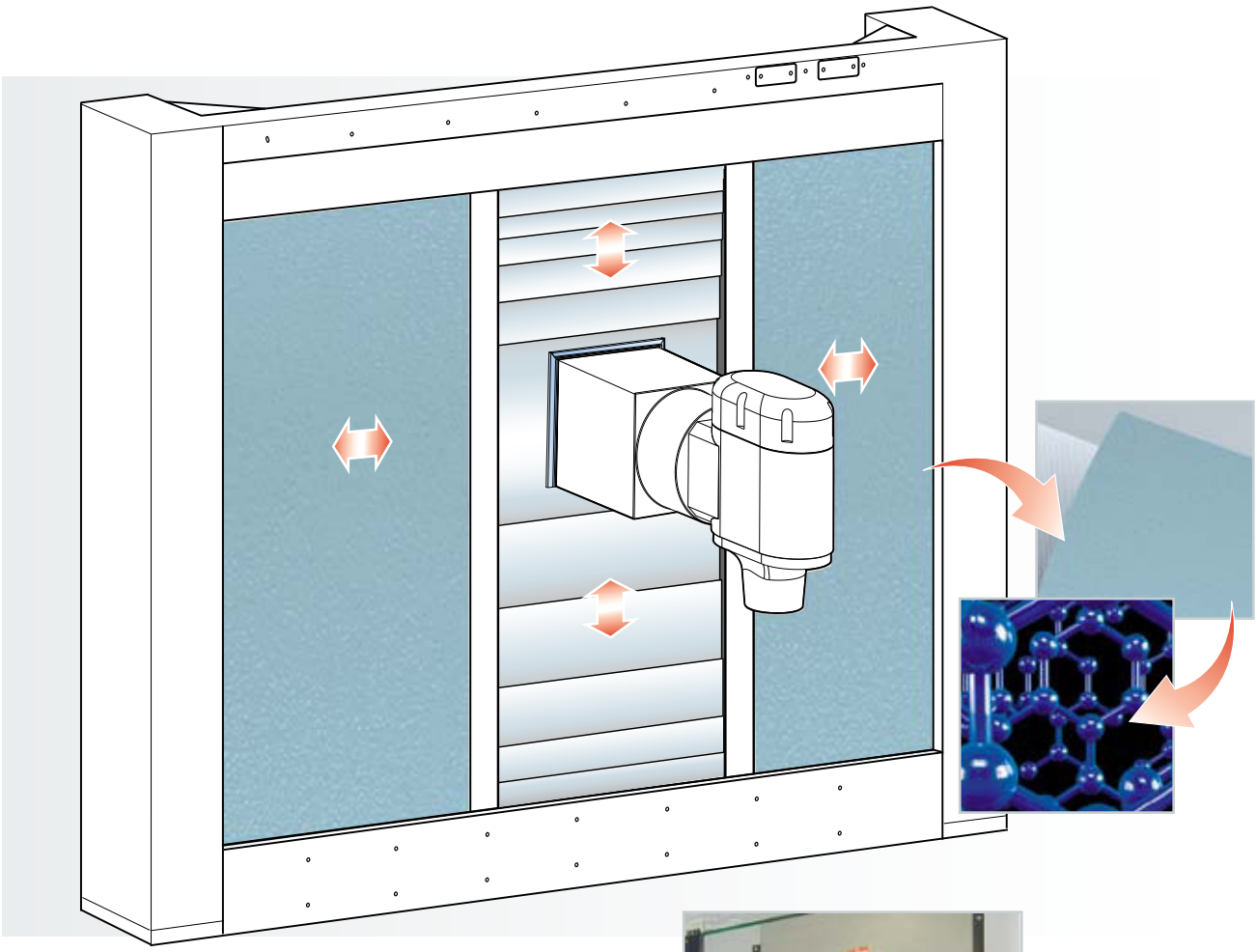

*Mechanism 1*: Traditional system
*Mechanism 2*: P.E.I. **SURE-SPRING**® system

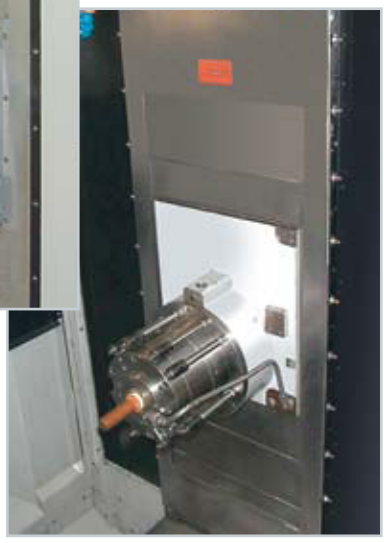
## X-Y 4R SHIELD



- The **X-Y 4R SHIELD** is a truly effective solution to the problem that occurs in horizontal machining centers when separating the tool working area from the motor area.
  The protective wall of the **X-Y 4R SHIELD** encloses and seals the machine, while at the same time allowing the spindle to move freely in all directions.
- The **X-Y 4R SHIELD** uses four **SURE-SPRING**® roll-up covers, making the system very sturdy and reliable, even for the fastest machine tools on the market.
- **X-Y 4R SHIELDS** are designed for acceleration up to 1.5 g and speeds up to 90 m/min.
  Special designs are required for higher accelerations and speeds.
- The modular system is designed to the customer's specifications, allowing rapid assembly of the machine.
  Its simple design makes maintenance and inspection easy.

## X-Y SP-2R SHIELD





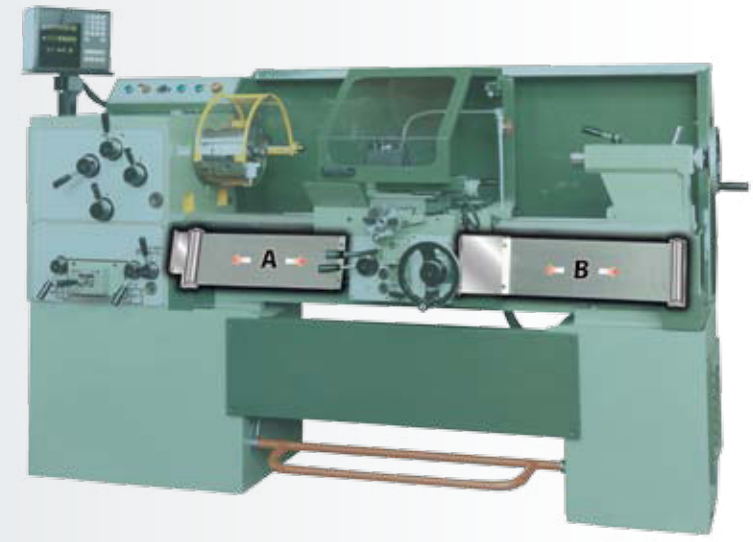
- The **X-Y Sheet-Pocket™-2R SHIELD** offers all the advantages of **X-Y 4R SHIELD**.
  It represents the most reliable system for protecting the work area, on the horizontal and vertical machining centers, in an environment where a large quantity of hot shavings is produced.
  As shown in the above picture, this system is mounted on a **SHEET-POCKET™** Steel Cover (patented - see page 9) on the Y-axis and two rollers on X-axis with **Ceramix** bands:
  - ✔ **CERAMIX** is a very resistant band covered by a high ceramic polymer coating.
  - ✔ **CERAMIX** is very reliable and ensures excellent resistance against the impact of hot shavings and is efficient also in cases of dry-working. It is very resistant against mineral oils too.
  - ✔ **CERAMIX** has an excellent abrasion resistance and excellent shear strength.
  - ✔ **CERAMIX** has a compact size and is light weight.
- We can guarantee this system up to accelerations of 1 g and speeds up 90 m/min.
  For higher applications, please contact our Engineering Department.
  (See Technical Characteristics of Ceramix band on pages 52-53 under code TEMAT180).

# ROLL-UP COVERS FOR LATHES

**P.E.I. ROLL-UP COVERS for LATHES** respond to the need to limit hazards caused by movement of the lead screw and/or spline shaft.

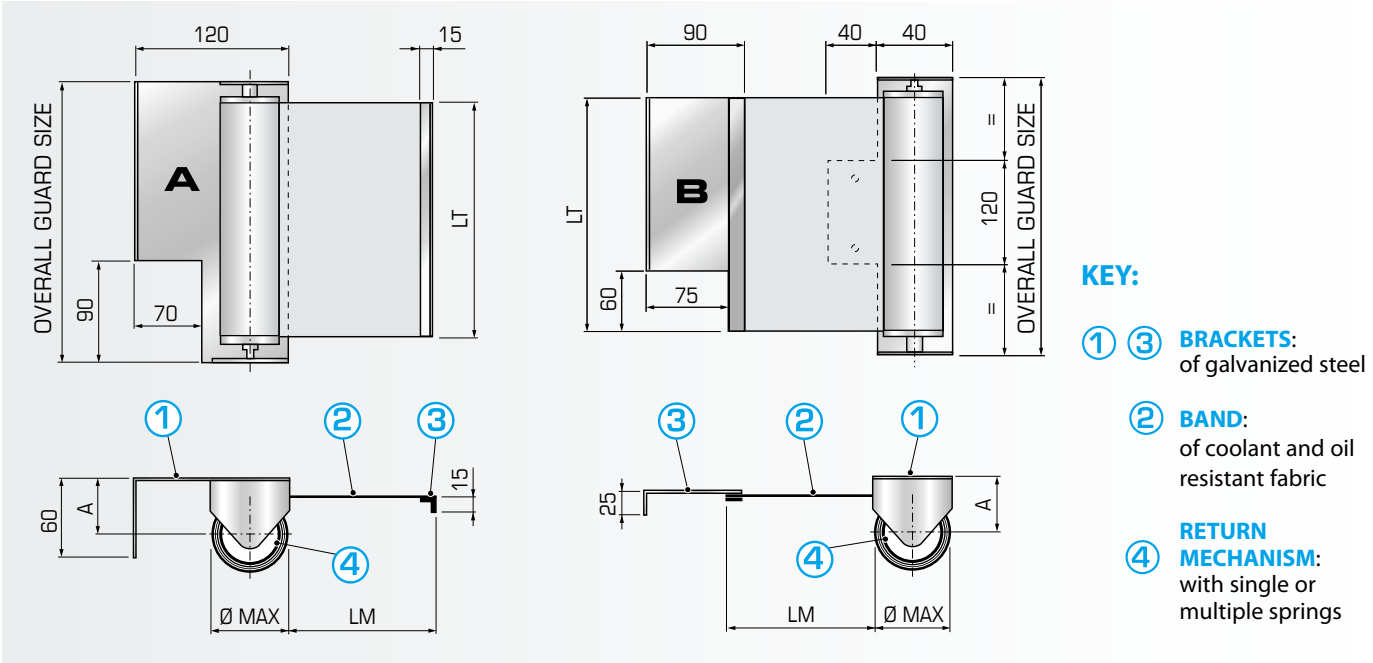
**P.E.I. ROLL-UP COVERS for LATHES** offer the following advantages:

- Ease of installation.
- Adaptable to any type of lathe.
- Compact size.
- Shatter-proof in case of accidental breakage.




**CHARACTERISTICS OF ROLL-UP COVERS:**

- BRACKET of galvanized steel for fastening to the machine.
- BAND of coolant and oil resistant fabric
- RETURN MECHANISM with single or multiple springs
- Contact our engineering department for housings and cover guards PER CUSTOMER DRAWINGS.




**KEY:**

① ③ **BRACKETS**: of galvanized steel

② **BAND**: of coolant and oil resistant fabric

④ **RETURN MECHANISM**: with single or multiple springs

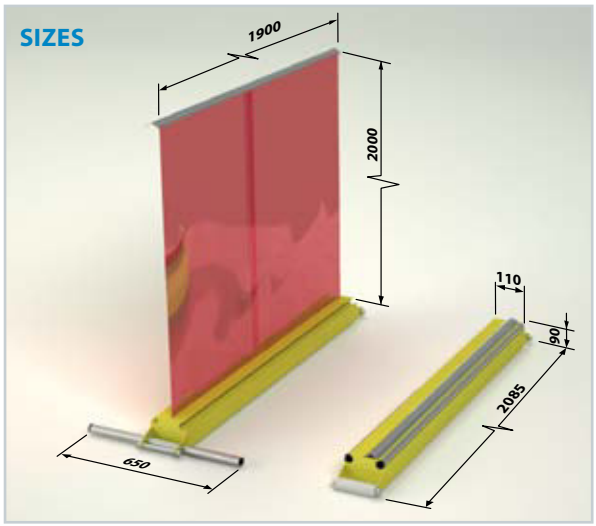
| STANDARD SIZE | | | | | |
|---|---|---|---|---|---|
| Code | Description | ID Code | | | |
| | | LT150LM1200 | LT200LM1500 | LT200LM2000 | LT250LM3000 |
| LT | Band Width | 150 | 200 | 200 | 250 |
| LM | Max. Length | 1200 | 1500 | 2000 | 3000 |
| Ø MAX | Max. Diameter | 48 | 52 | 62 | 83 |
| A | Distance between supports | 33 | 50 | 50 | 50 |

**Measurements in mm.**
**OVERALL GUARD SIZE = LT + 30**

## WELD SCREEN

**WELD SCREEN** is a protection screen for welding and grinding stations.

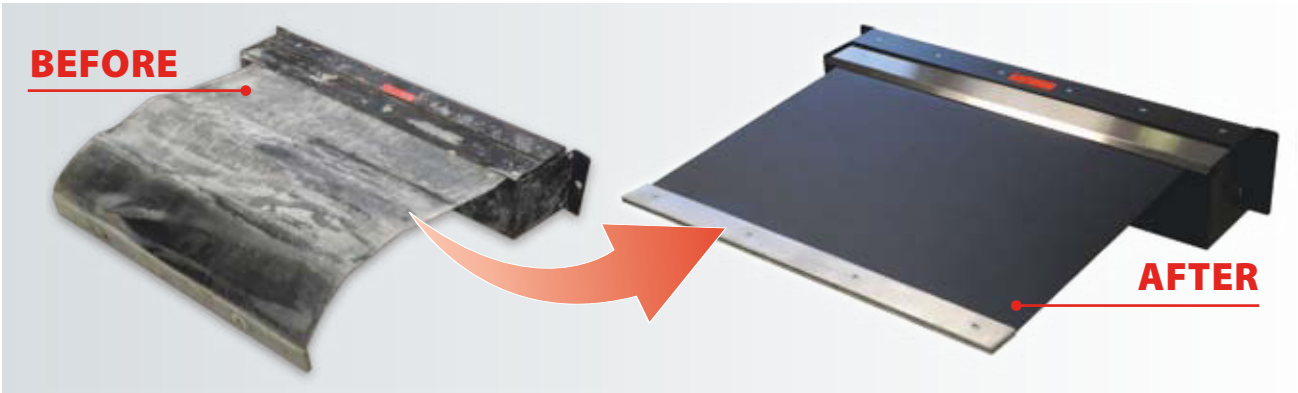
- **WELD SCREEN** offers protection to personnel who are in the vicinity of welding and grinding work areas. The semi-transparent screen protects personnel from contact with metal chips and sparks produced during the welding and grinding processes.
- **WELD SCREEN** is fitted with a mobile stand allowing the user to adjust the screen as required.
- **WELD SCREEN** is foldaway making it compact and portable.




**TECHNICAL DATA**

| | |
|---|---|
| ✔ **WEIGHT**: | 8,9 Kg |
| ✔ **REFERENCE STANDARD**: | UNI EN 1598<br>DL 626/94 DL 81/2008 |
| ✔ **AVAILABILITY**: | Immediate |

## Roll-up covers REVISION



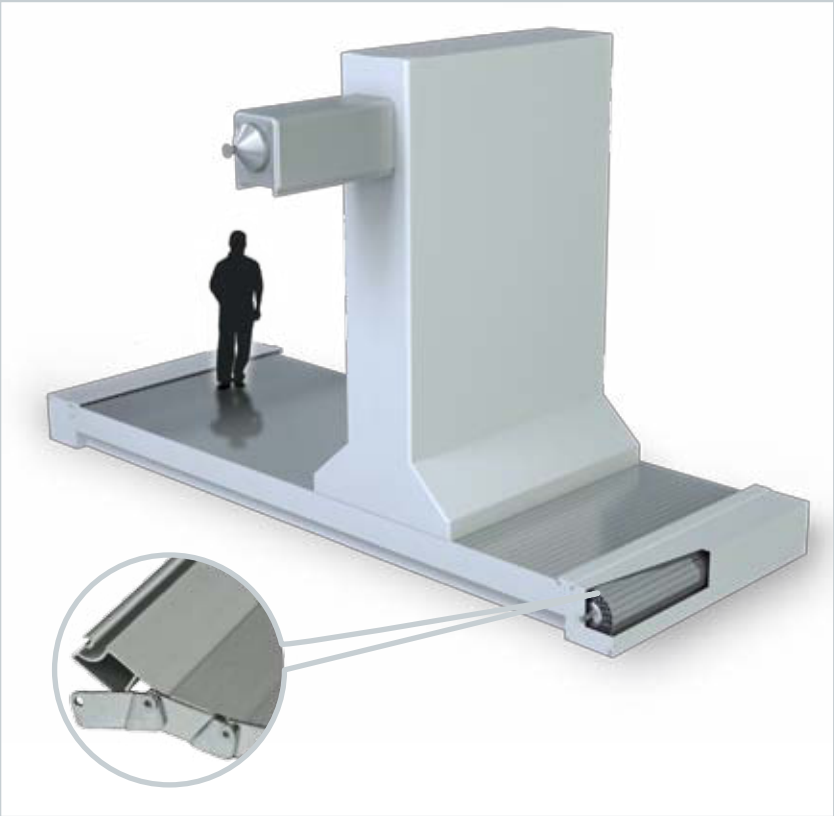

- Overhaul of ALL TYPES of ROLL-UP COVERS AND SHUTTERINGS WITH OR without Canister
- Replacement of the damaged FLEXIBLE COVER, SHUTTERING or BAND
- Replacement of the MECHANISM
- Replacement of WIPERS or other COMPONENTS if worn-out
- Cleaning and buffing of ALL SURFACES to original finish
- If the roll-up cover should be too damaged, we can build a new one

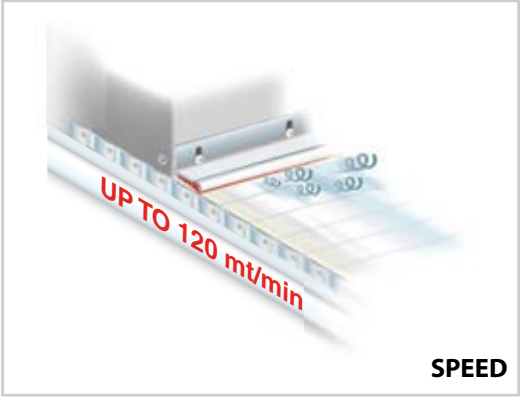
**SHORT DELIVERY TIME**

## Roll-up Covers with COVER TYPE J

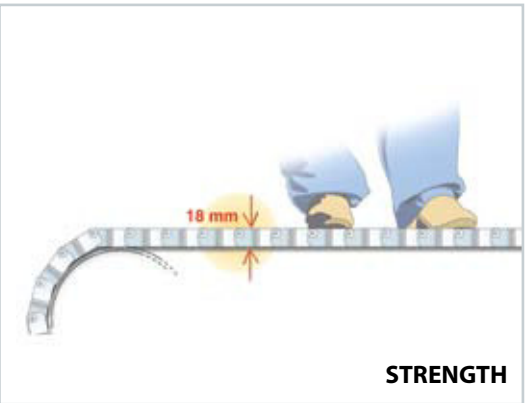
Roller protections equipped with **type-J SHUTTERING** are particularly suitable for covering large bases, pits or holes. These protections have the following characteristics:

- **SPEED**: suitable for high speed applications, both dry and coolant processing.
- **QUIET**: thanks to the mechanical roller system, there is no noise caused by collisions or vibrations.
- **STRENGTH**: particularly suitable for walk-on applications.
- **CLEANING**: the belt slide on the side of the shaving conveyor has been designed to make the shaving fall in the conveyor without causing any clogging.
- **RAPID MAINTENANCE**: if some elements are damaged the belt does not need to be removed. The damaged elements can be removed simply by unscrewing lateral screws.



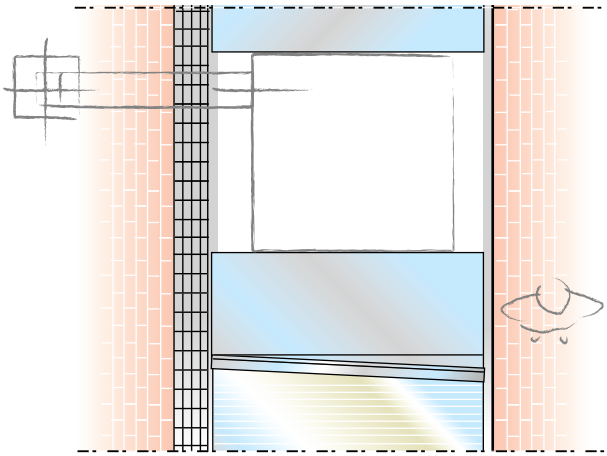


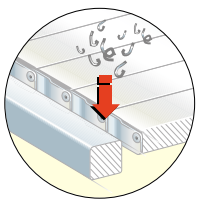

SPEED



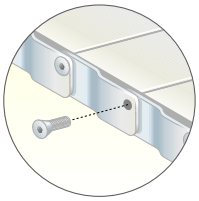

STRENGTH

The wiper is slightly angled relative to the travel direction of the cover so as to force the chips and coolant towards the chip conveyor trough side.

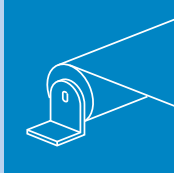




CLEANING



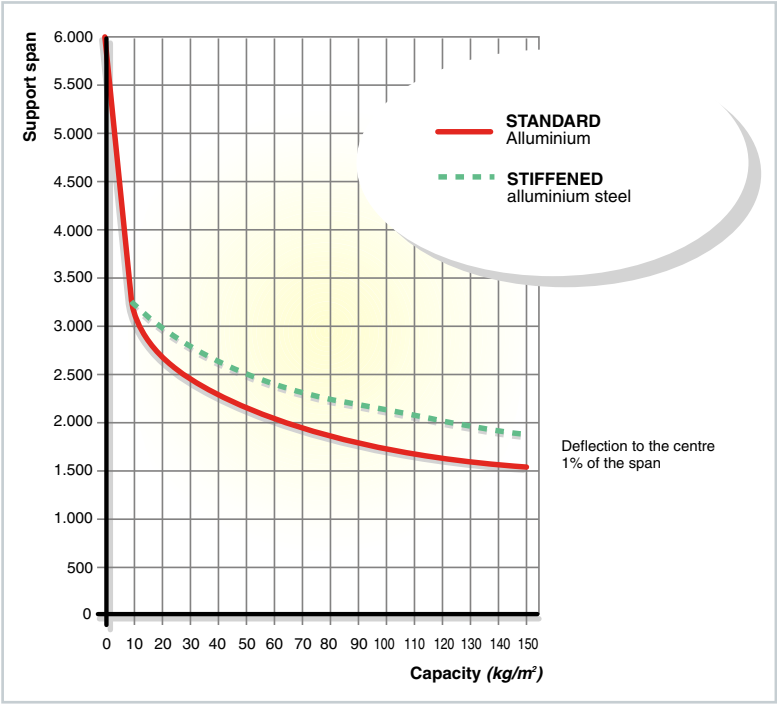
RAPID MAINTENANCE



## Roll-up Covers with COVER TYPE J

### TECHNICAL DATA FOR COVER TYPE J

- **Entirely** made of metal
- Perfect **flatness** of the side exposed to chips
- Cleaning **wiper** on the side exposed to chips
- **Shielded** joint with integrated labyrinth to prevent coolant from getting trough
- High **bending resistance**. See graphic of Span/Capacity
- **Reinforced version** with steel profiles
- Highly resistant to tensile stress. Minimum guaranteed **2 KN/m of width**
- Steel lateral caps with **chain** joint
- Thickness of the carpet: **18 mm**
- Take-up in both directions on a **150 mm** diameter
- Reduced weight: **12.5 kg/sqm** **(29 kg/sqm** for the reinforced version)
- **Modular** system with individual interchangeable elements
- Operating speeds up to **120 m/min**
- Life guaranteed: **1.000.000** movements



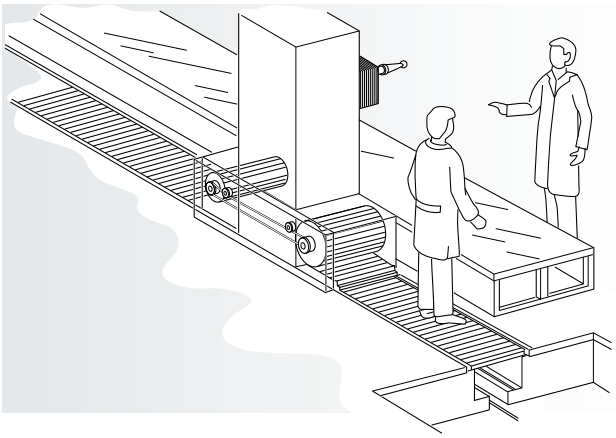

P.E.I. manufactures these moving walkway/pit covers for horizontal, mobile surfaces, to meet accident prevention and safety regulations. These units cover the upper part of the machine pit whose base is below the walking surface and allow the crossing of the pit by anyone, thus avoiding possible accidents or damage to people or equipment which could occur with the pit uncovered.

The variable speed drive system, which allows for mechanical speed control, makes the drive system independent from the general machine control system. Size and speed are established by the customer and studied by our technical staff in order to obtain optimal operation.



## Special Product: Roll-up Covers with Chain Movement

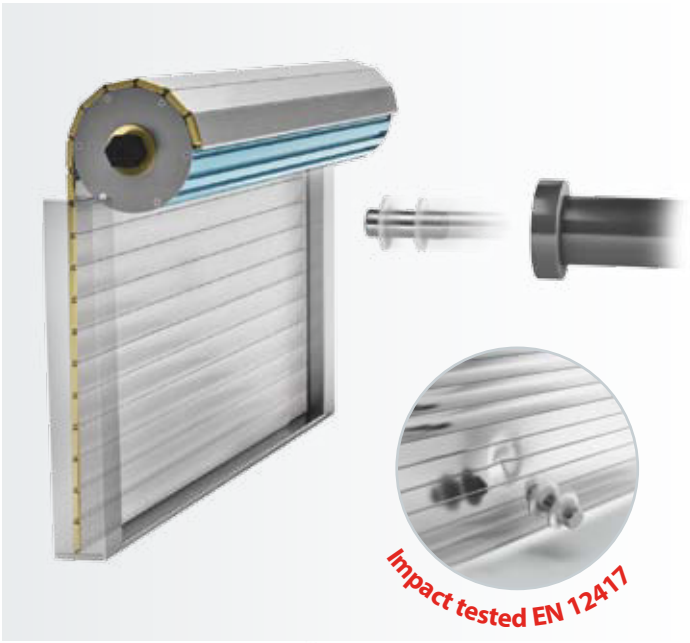
P.E.I.'s patented system of **ROLL-UP COVERS WITH CHAIN MOVEMENT** have the essential feature of keeping the strip perfectly fixed while the machine is running.



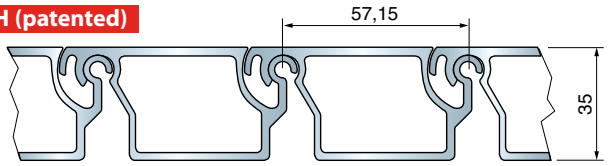
- The band is fixed relative to the floor, allowing people to cross the machine trench at any time even while the machine is in operation.
- During operation, the special interconnecting chain causes the unwinding action of one roll to automatically wind-up the opposite roll. Our patented compensating mechanism keeps the system in balance, even though the diameters of rolls continously change.
- The patented compensating mechanism is very compact and is mounted to the machine column in its own canister.
- The patented design insures a perfectly functional and reliable design.
- Upon request, we can design a system using DC or pneumatic motors.
- The dimensions, layout, and speed of travel are developed for each order and can meet your exact needs.

# FLEXIBLE ALUMINUM COVERS

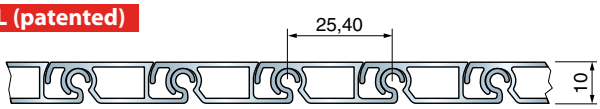
All the **FLEXIBLE ROLL-UP COVERS of "J" RANGE** are **IMPACT TESTED** according to **EN 12417.**



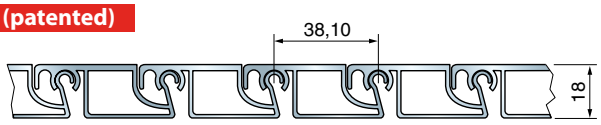

**JH (patented)**



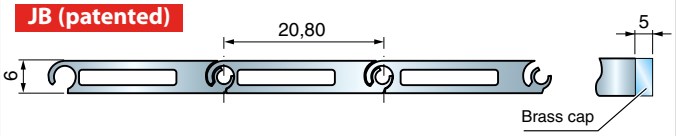

**JL (patented)**



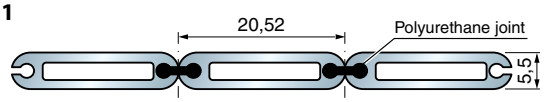

**J (patented)**



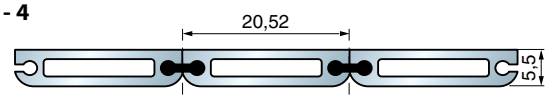

**JB (patented)**




**AKS - 1**

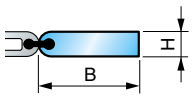



**AKS - 4**

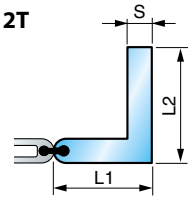



**Standard end mount profiles:**

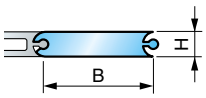
**1T**



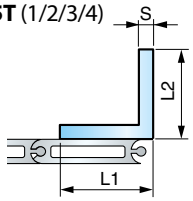

**2T**




**3T**




**5T** (1/2/3/4)

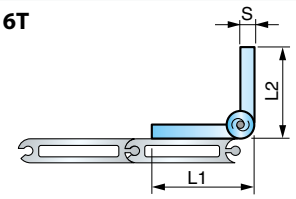



| CODE | Minimum winding diameter: With upper roller mm | Minimum winding diameter: With lower roller mm | Cover weight Kg/m² | Cover cleaning | Bending strength, support distance*: (90 Kg) mm | Bending strength, support distance*: (150 Kg) mm | Max. charge permitted kg each wheel Ø100 Kg | Impact tested EN12417 Joule | Anti-slip treatment |
|---|---|---|---|---|---|---|---|---|---|
| **JH** | 200 | 200 | 25,0 | Wiper | 4500 | 4000 | 75 | 250 | Upon request |
| **JL** | 100 | 100 | 12,2 | Wiper | 1200 | 1000 | 50 | 90 | Upon request |
| **J** | 150 | 150 | 12,5 | Wiper | 2200 | 1750 | 50 | 150 | Upon request |
| **JB** | / | 60 | 9,5 | Wiper | 750 | 600 | 50 | 150 | Not available |
| **AKS1** | 50 | 50 | 9,0 | Brush | 750 | 600 | / | - | Not available |
| **AKS4** | / | 50 | 9,0 | Wiper | 750 | 600 | 10 | - | Not available |

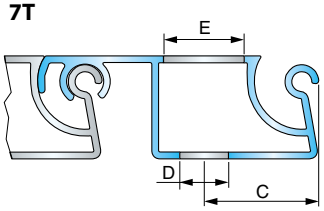
**MATERIAL**: Anodized grey aluminum
**MAX. FEASIBLE WIDTH**: 6000 mm

* Max. bending 1% of the support distance

**6T**




**7T**

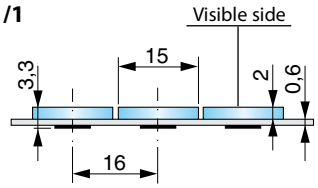



| Terminal CODE | L1xL2xS | BxH | C | D | E | Material | Description | Cover CODE |
|---|---|---|---|---|---|---|---|---|
| **1T** | | 25x5,5 | | | | Al | Flat | AKS-1/AKS-4 |
| **2T** | 20x30x5,5 | | | | | Al | Corner | AKS-1/AKS-4 |
| **3T** | | 20x6 | | | | Al | Cover | JB |
| **5 T/1** | 15x15x3 | | | | | Al-Stl | Corner | JB |
| **5 T/2** | 20x20x3 | | | | | Al-Stl | Corner | JB |
| **5 T/3** | 30x30x3 | | | | | Al-Stl | Corner | J / JB / JL |
| **5 T/4** | 40x40x5 | | | | | Stl | Corner | J / JH |
| **6T** | 30x30x2 | | | | | Stl | Hinged | AKS-1/AKS-4 J/JL/JH/JB |
| **7T** | Drilling upon request only | | 18<br>20<br>35 | ø 5,50<br>ø 8,50<br>ø 13 | ø 10<br>ø 14<br>ø 20 | Al | Cover | JL<br>J<br>JH |

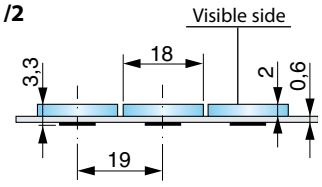
**Al = Aluminum Stl = Steel**

We can provide end mountings to match customer drawings upon request.

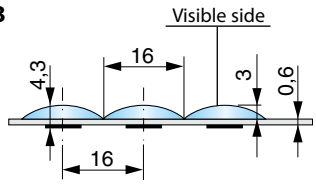

**1001/1**



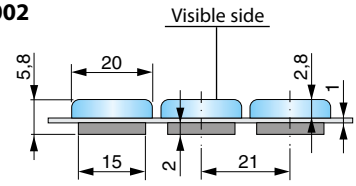

**1001/2**



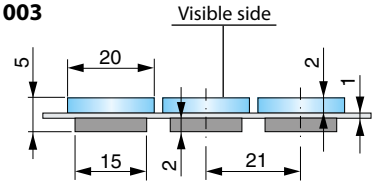

**1001/3**



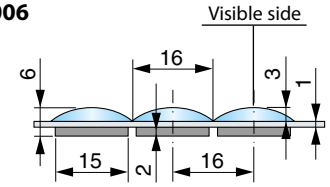

**1002**




**1003**



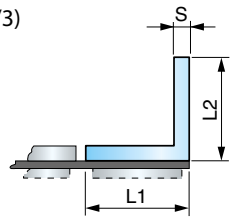

**1006**



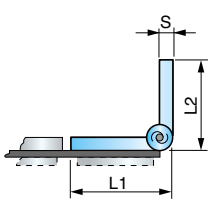

| CODE | Possible combinations of materials | | Minimum winding diameter (mm) | | Max. feasible width (mm) |
|---|---|---|---|---|---|
| | Upper elements | Lower elements | With upper roller | With lower roller | |
| **1001/1** | Al-Stl-Br | | 50 | 30 | 2000 |
| **1001/2** | Al-Stl-Br | | 70 | 30 | 2000 |
| **1001/3** | Al | | 70 | 30 | 2000 |
| **1002** | Al | Al-Stl-Br | 40 | 40 | 2000 |
| **1003** | Al-Stl-Br | Al-Stl-Br | 70 | 40 | 2000 |
| **1006** | Al | Al-Stl-Br | 70 | 50 | 2000 |
| **Al= Aluminum Stl= Steel Br= Brass** | | | | | |

**Standard end mount profiles:**

**5 T** (1/2/3)




**6 T**



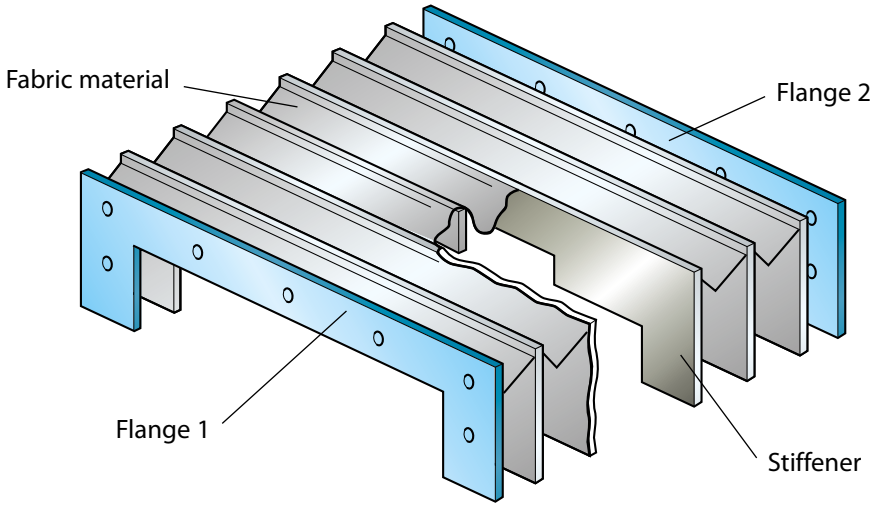

| Code | L1xL2xS | Material |
|---|---|---|
| **5T/1** | 15x15x3 | Al - Ac |
| **5T/2** | 20x20x3 | Al - Ac |
| **5T/3** | 30x30x3 | Al - Ac |
| **6T** | 30x30x2 | Stl hinge |

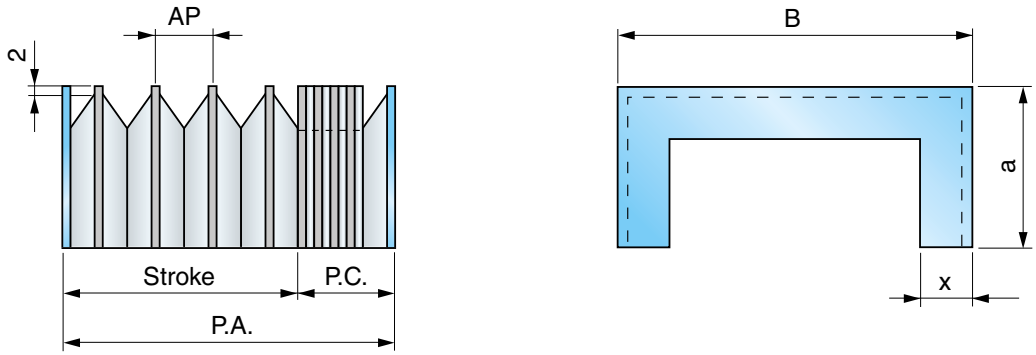
We can provide end mounts to match customer drawings upon request.

## X-Y LM SHIELD with Thermic-Welded Covers and Movable Plates

- The **X - Y LM SHIELD** composed of thermic-welded bellows with steel laminations, represents the cheapest solution for protecting the working area in horizontal spindle machining centers where there is a large production of hot shavings.
  This system consists of No. 2 horizontal bellows and No. 2 vertical bellows, protected by movable stainless steel plates guaranteeing a very functional product for Quality/Price.
- Accelerations up to 1 G
- Speeds up 120 m/min.
- The thermic-welded protection bellows are largely used on every kind of machine tool. They are frequently used in machining centers and chip-removing machines. In order to protect the bellow exposed to hot shavings, a shielding made by metal elements, called "plates" will be necessary. The steel laminations are fixed by special clamps keeping the plates adherent and loaded one on the other to prevent contaminants and shavings from entering.

## THERMIC-WELDED COVERS




**P.A.** = Open length
**P.C.** = Closed length
**Stroke** = Open length - closed length

**B** = Outside width
**a** = Outside height
**x** = Fold height

**Formula for calculating the CLOSED LENGTH**

**AP** = Opening of 1 fold = $x \cdot 2 - 8$

**SM** = Fabric thickness *

**SS** = Stiffener thickness *

**SF** = Flange thickness *

**NP** = Number of folds = $\frac{P.A.}{AP} + 2$

**P. C.**= $(SM \cdot 8 + SS) \cdot NP + (SF \cdot 2)$

* See materials list on page 31.

This data sheet shows only one type of Thermic-Welded Cover that we manufacture.
Contact our engineering department for other types.

**Example:**

Given that: Fold height = 15 mm
Open length = 1000 mm

Opening of 1 fold = 15 x 2 - 8 = 22

Number of folds = $\frac{1000}{22} + 2 = 48$

Closed length = (0,25* x 8 + 1**) x 48 + (2*** x 2)

Closed length = 3 x 48 + 4 = 148

**Closed length = 148 mm**

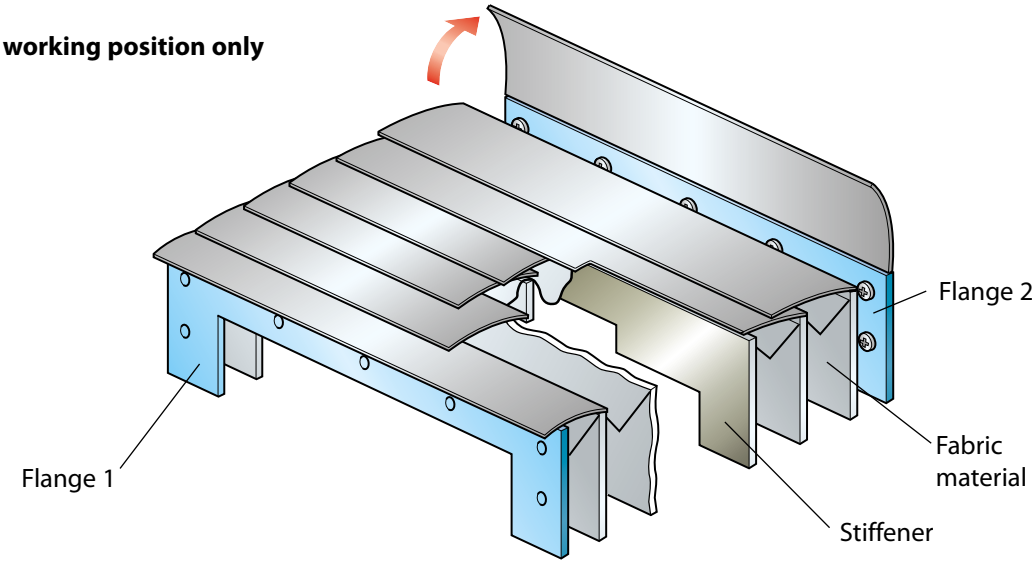
* We hypothesize the fabric material with code "TEMAT015" (see materials list on page 32)

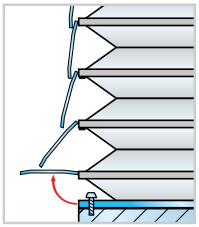
** We hypothesize that the stiffener is 1 mm thick

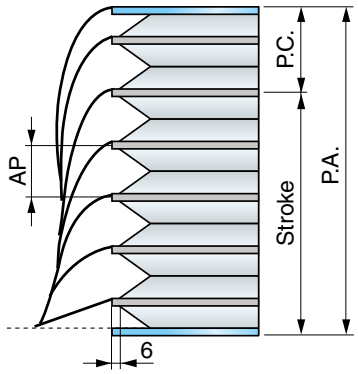
*** We hypothesize that the flange is 2 mm thick (see materials list on page 31)

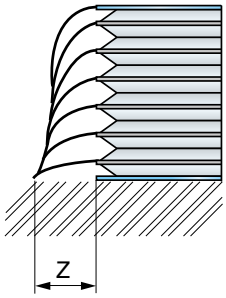
## THERMIC-WELDED COVER WITH FLEXIBLE LAMINATIONS

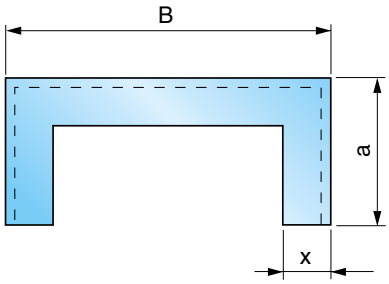
**Vertical working position only**






**P.A.** = Open length
**P.C.** = Closed length
**Stroke** = Open length - closed length

**B** = Outside width
**a** = Outside height
**x** = Fold height

| **x**(mm) | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
|---|---|---|---|---|---|---|---|
| **Z**(mm) | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

**Formula for calculating the CLOSED LENGTH**

Opening of 1 fold = (x·2) - 16

**SM** = Fabric thickness *

**SS** = Stiffener thickness *

**SF** = Flange thickness *

**NP** = Number of folds = $\frac{\text{P.A.}}{\text{AP}} + 2$

**P. C.** = (SM · 8 + SS) · NP + (SF · 2)

* See materials list on page 31

This data sheet shows only one type of Thermic-Welded Cover that we manufacture.
Contact our engineering department for other types.

**Example**

Given that: Fold height = 30 mm
Open length = 1000 mm

Opening of 1 fold = (30 x 2) - 16 = 44

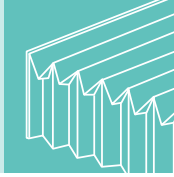
Number of folds = $\frac{1000}{44} + 2 = 25$

Closed length = (0,25* x 8 + 1**) x 25 + (2*** x 2)

Closed length = 3 x 25 + 4 = 79

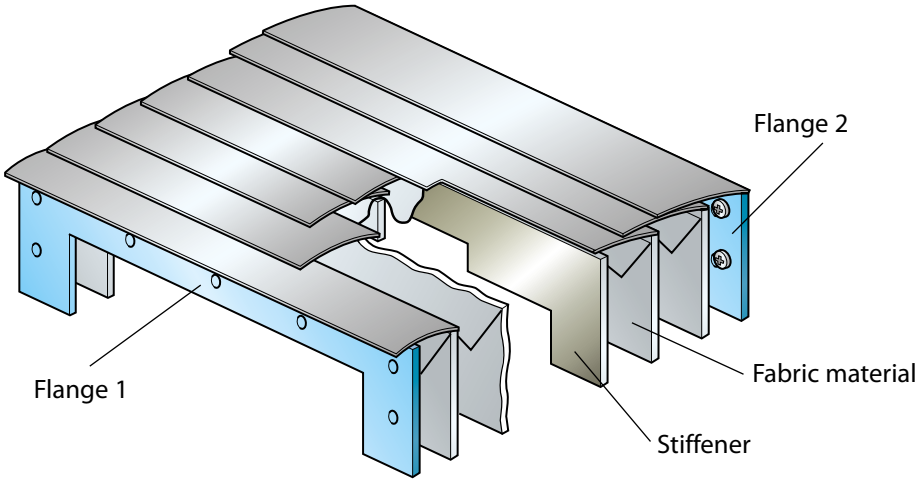
**Closed length = 79 mm**

* We hypothesize the fabric material with code "TEMAT015" (see materials list on page 32)
** We hypothesize that the stiffener is 1 mm thick
*** We hypothesize that the flange is 2 mm thick
(see materials list on page 31)

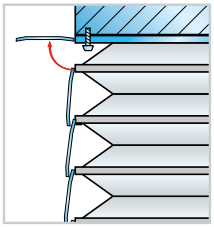


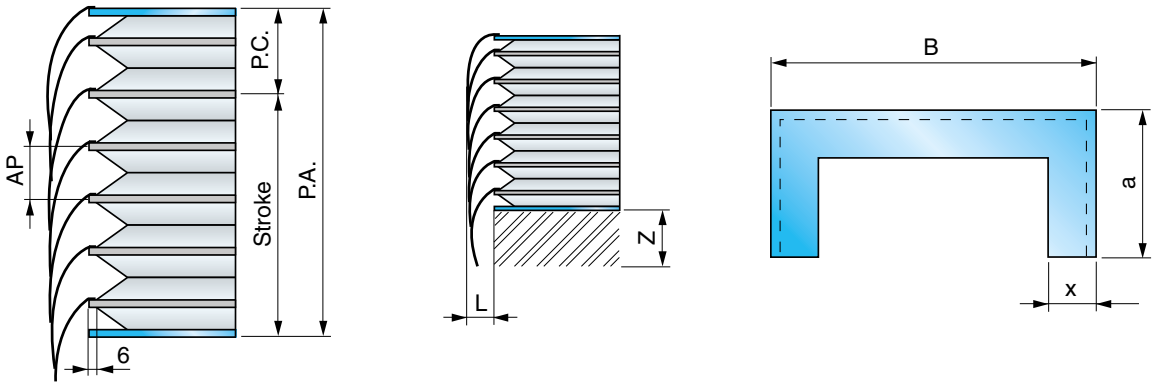
# THERMIC-WELDED COVER WITH FIXED LAMINATIONS

**Working position:**
**Horizontal**
**Vertical**
**Frontal**




Possible special fixing to facilitate the mounting of the first steel lamination






| | |
|---|---|
| **P.A.** | = Open length |
| **P.C.** | = Closed length |
| **Stroke** | = Open length - closed length |
| **B** | = Outside width |
| **a** | = Outside height |
| **x** | = Fold height |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **x**(mm) | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| **L**(mm) | 16 | 21 | 26 | 33 | 43 | 48 | 56 |
| **Z**(mm) | 45 | 55 | 65 | 75 | 85 | 95 | 105 |

**Formula for calculating the CLOSED LENGTH**

**AP** = Opening of 1 fold = $x \cdot 2 - 16$

**SM** = Fabric thickness *

**SS** = Stiffener thickness *

**SF** = Flange thickness *

**NP** = Number of folds= $\frac{P.A.}{AP} + 2$

**P. C.** = $(SM \cdot 8 + SS) \cdot NP + (SF \cdot 2)$

* See materials list on page 31

This data sheet shows only one type of Thermic-Welded Cover that we manufacture.
Contact our engineering department for other types.

**Example**

Given that: Fold height = 45 mm
Open length = 1800 mm

Opening of 1 fold = 45 x 2 - 16 = 74

Number of folds = $\frac{1800}{74} + 2 = 27$

Closed length = (0,35* x 8 + 1**) x 27 + (3*** x 2)

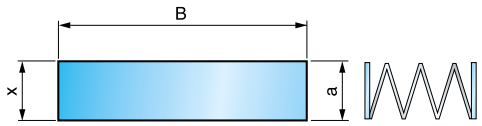
Closed length = 3,8 x 27 + 6 = 109

**Closed length = 109 mm**

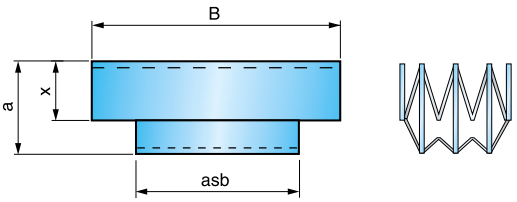
* We hypothesize the fabric material with code "TEMAT151" (see materials list on page 32)
** We hypothesize that the stiffener is 1 mm thick
*** We hypothesize that the flange is 3 mm thick (see materials list on page 31)

## Standard Shapes

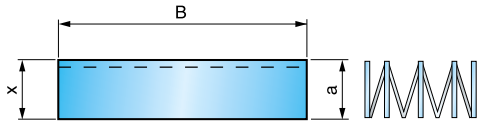
**UL-OS**



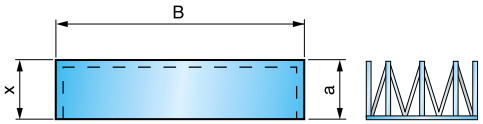

**UL-2ST**



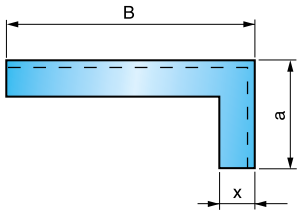

**UL-1S**



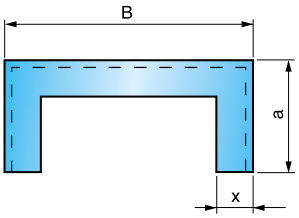

**UL-3S**



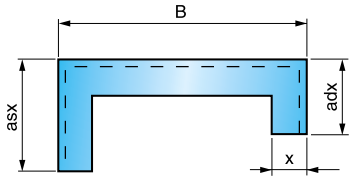

**DL-DXC**



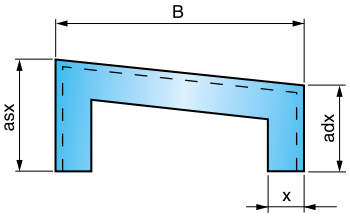

**TL-SIM**



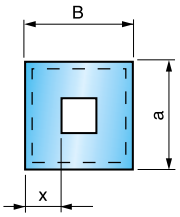

**TL-DXC**



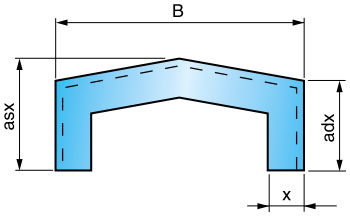

**TL-DXI**



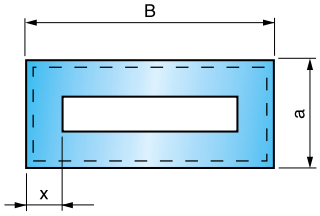

**QL-QUAD**



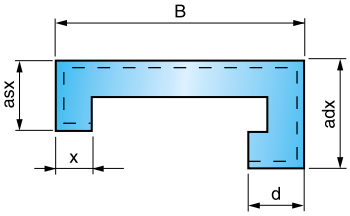

**QL-CAP**



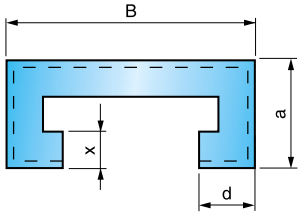

**QL-RETT**



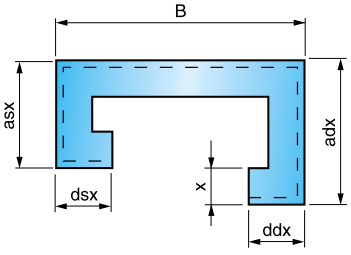

**QL-ASI**



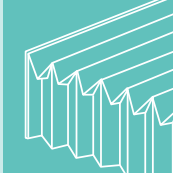

**CL-SIM**




**CL-ASI**




**NOTE**: The above are only the standard shapes of Thermic-Welded Covers.
Other shapes available upon request.



## Thermic-Welded Cover materials

| Fabric material code | Description | | | Thickness (mm) | Heat resistance | | | Primary resistance characteristics |
|---|---|---|---|---|---|---|---|---|
| | Visible side | Fabric insert | Internal side | | Momentary contact °C | Continuous min. °C | Continuous max. °C | |
| **TEMAT 091** | PVC | Fiberglass | PVC | 0,44 | +300 | -30 | + 80 | Fabric suitable for minor welding splatter. Also appropriate around acids. **Self-extinguishing**. |
| **TEMAT 106** | Ptfe | Polyester | Polyurethane | 0,30 | +200 | -30 | +120 | Excellent resistance to oils and chemical products. No adhesive surface. Low friction coefficient. Excellent chemical inertia. Excellent resistance to abrasion and bending strength. **Mainly used in grinding machines.** |
| **TEMAT 015** | Polyurethane | Polyester | Polyurethane | 0,25 | +200 | -30 | + 90 | Excellent resistance to petroleum products, oils and heavy abrasion. Excellent bending strength. |
| **TEMAT 151** | Polyurethane | Polyester | Polyurethane | 0,35 | +200 | -30 | + 90 | |
| **TEMAT 164** | Polyurethane | Kevlar* | Polyurethane | 0,35 | +350 | -30 | +180 | Excellent resistance to petroleum products, oils and heavy abrasion. Excellent bending strength. Excellent mechanical strength. Kevlar also has excellent shear strength. Normally used when there is heavy mechanical stress, a large amount of sharp shavings, and at high temperatures. |
| **TEMAT 165** | Polyurethane | Nomex* | Polyurethane | 0,36 | +300 | -30 | +130 | Excellent resistance to petroleum products, oils and heavy abrasion. Excellent bending strength. Excellent mechanical strength. Good resistance to minor welding splatter or hot material. Widely used in laser cutting machines. **Self-extinguishing**. |
| **TEMAT 169** | Polyurethane | Panox*/Kevlar | Polyurethane | 0,33 | +300 | -30 | +130 | Excellent resistance to petroleum products, oils and heavy abrasion . Excellent bending strength. Excellent mechanical strength. Good resistance to minor welding splatter or hot material. **It may be considered as the best fabric on the market for use in laser cutting machines. Self-extinguishing.** |
| **TEMAT 017** | PVC | Polyester | PVC | 0,36 | +100 | -30 | + 70 | Mainly used around heavy ambient dust, minor splatters of coolant and oil. Also suitable for use around acids. |
| **TEMAT 020** | PVC | Polyester | PVC | 0,25 | +100 | -30 | + 70 | |

## Stiffener materials

| Stiffener material code | Description | Thickness (mm) | Notes |
|---|---|---|---|
| **PVC 05** | PVC | 0,50 ** | Outside width (B) up to 300 mm |
| **PVC 10** | PVC | 1,00 | Outside width (B) from 301 up to 700 mm |
| **PVC 15** | PVC | 1,50 | Outside width (B) from 701 up to 1500 mm |

## Flange materials

| Flange material code | Description | Thickness (mm) |
|---|---|---|
| **AL** | Aluminum | 2,0 - 3,0 |
| **AC** | Steel | 2,0 - 3,0 - 4,0 |
| **PVC** | PVC | 2,0 - 3,0 |

## Lamination materials

| Lamination material code | Description | Primary applications |
|---|---|---|
| **AL** | Aluminum (Baked Enamel Finish) | For use around welding splatter, small and medium-sized hot shavings. Especially suitable for use around continuous sparks. Appropriate where lightweight materials are necessary. |
| **INOX** | | In work environments with large shavings. Especially suitable for use around acids. |

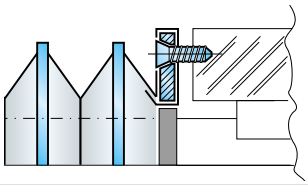
* Kevlar and Nomex are registered Dupont trademarks ** NOT recommended for Thermic-Welded Covers with laminations.

Contact our engineering department for other materials and applications.

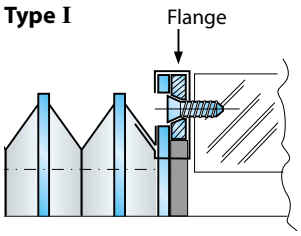
## Flange Fastening Systems

- Solution with sheet steel, aluminum or PVC flange
- Shape and holes per customer drawings

**Type A**

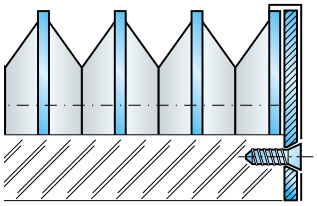


**Type I**

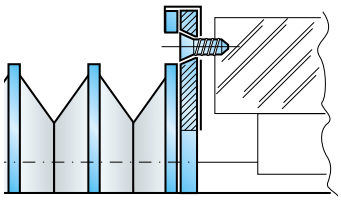



- Solution with sheet steel, aluminum or PVC flange
- Shape and holes per customer drawings
- Solution with connector flange protruding from the cover profile, made of sheet steel, aluminum or PVC

**Type B1**

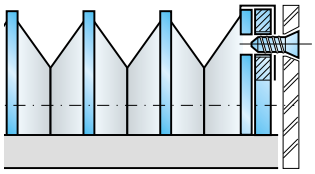


**Type B2**



- Solution with sheet steel flange
- Shape and holes per customer drawings
- Threaded flange holes

**Type C**

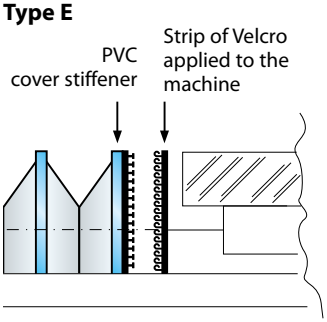


Solution with rapid VELCRO connection.
A PVC support acts as a flange, with VELCRO strips applied to the stiffener and directly to the machine.
This solution offers:

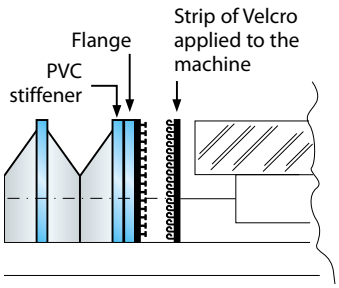
- Rapid application and removal of the cover
- Low cost

**Recommended for dry work environments**

**Type E**




**Type H**

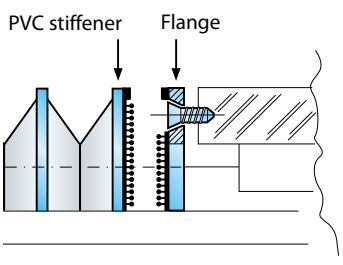



Solution with STRONG HOLD rapid connection.
A PVC support and flange act as a flange, to which the STRONG HOLD rapid connection is applied. The flange is made of sheet steel, aluminum or PVC, shape and holes per customer drawings. This solution offers:

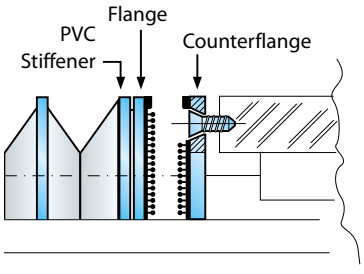
- Rapid application and removal of the cover
- Foam gasket strip provides a tight seal around the connection

**Recommended for wet work environments**

**Type F**

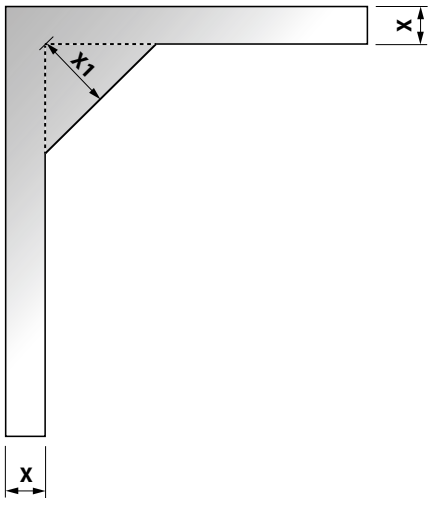



**Type G** **Entire fold in PVC**



## THERMIC-WELDED COVER: EVER-CLEAN

- The **construction of the corner** is the main feature of this thermic-welded bellow.
- The bellow is guaranteed to be **free from chips and sludge**, there are no creases in the fabric which obstruct the chip conveyor.
- The **closed length** of the bellow is **smaller** than traditional thermic-welded bellows due to the absence of folds of fabric in the corners.
- The **range of geometry** possible for manufacture **has increased**.
- **Structural rigidity** has increased in applications where only one bellow must cover the crossbar and roof of the machinery.


**Formula for calculating the CLOSED LENGTH**

**Closed Length** = Fabric thickness x 4,5

**Formula for calculating X1**

**X1** = **X** x 2

**For this type of bellow consult our technical office.**

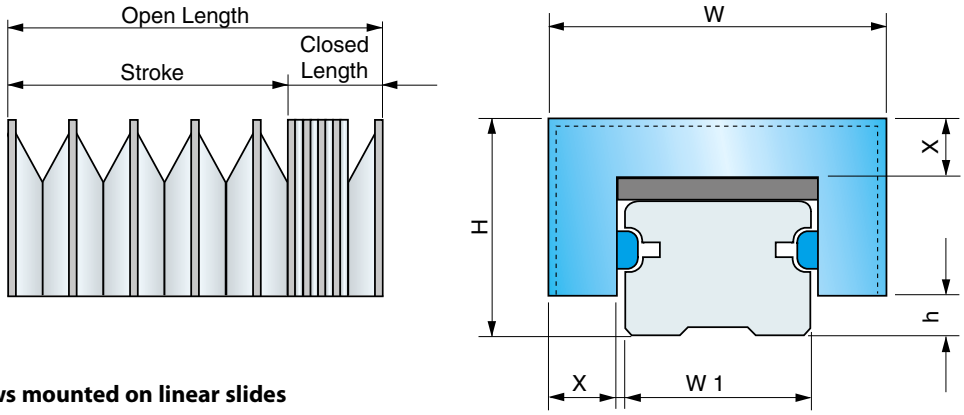
## THERMIC-WELDED COVER WITH LAMINATIONS: MULTI-STEEL

- Thermic-welded bellows with laminations on many sides are the ideal solution for **complete protection of the roof and crossbar** in multi-shaft working centres.
- The corners are closed and steel inox laminations applied with a **perfect 90° fold** in merit of the elastic deformation of the material and a special geometry.
- **More than two sides** can be covered and **with different angles**.

(Patent pending)

**For this type of bellow consult our technical office.**

## Thermic-Welded Covers for Linear Slides




**Example of bellows mounted on linear slides**

## List of Standard Material

| Type of material | Stiffener | Fabric material | Closed length for 1000 mm of open length |
|---|---|---|---|
| **S1** | PVC 0,50 | PVC + Polyester + PVC 0,25 (TEMAT020) | 90 |
| **P1** | PVC 0,50 | Polyurethane + Polyester + Polyurethane 0,25 (TEMAT015) | 90 |
| **LX** | PVC 1,00 | Polyurethane Panox/Kevlar + Polyurethane 0,33 (TEMAT169) | 150 |

## Standard Thermic-Welded Covers Size

| Slide nominal value **W1** | Ply height **X** | Bellow width **W** | Total height **H** | Slide deviation **h** |
|---|---|---|---|---|
| 15 | 19 | 56 | 36 | 5 |
| 20 | 19 | 61 | 40,5 | 5 |
| 25 | 19 | 67 | 43 | 7,5 |
| 30 | 19 | 72 | 51 | 8 |
| 35 | 19 | 76,5 | 51 | 9 |
| 45 | 19 | 87,5 | 61 | 10 |
| 55 | 25 | 108 | 73 | 15 |
| 65 | 32 | 132 | 90 | 15 |

**NOTE: For the W1 slide over size 65, please contact our Technical Dept.**

## Example of the identification code of a Thermic-Welded Cover for Linear Slides complete with flange

| | |
|---|---|
| **Slide manufacturer** | **THK** |
| **Slide model** | **HSR** |
| **Slide nominal value (W1)** | **35** |
| **Open length (stroke + closed length)** | **1500** |
| **Type of material** | **P1** |
| **Flange fixing system** | **A-A** (see page 37) |

## Questionnaire for Thermic-Welded Covers for Linear Slides

**! Slide Manufacturer** .....

**! Slide Model** .....

**! Slide Nominal Value (W1)** ❑ 15 ❑ 20 ❑ 25 ❑ 30 ❑ 35 ❑ 45 ❑ 55 ❑ 65

**! Open length (Stroke + Closed length)** .....**mm**

**! Fabric type** ❑ S1 ❑ P1 ❑ LX

**! Fastening system on guide top** ❑ Solution A with clamps ❑ Solution B1 with flange in PVC

**! Fastening system to table** ❑ Solution A with clamps ❑ Solution B2 with flange in PVC

**! Company name** .....

**Phone:** .....

**E-mail:** .....

**Quantity:** .....

**Annual demand:** .....

.....

**Date:** .....

**Notes:** .....

.....

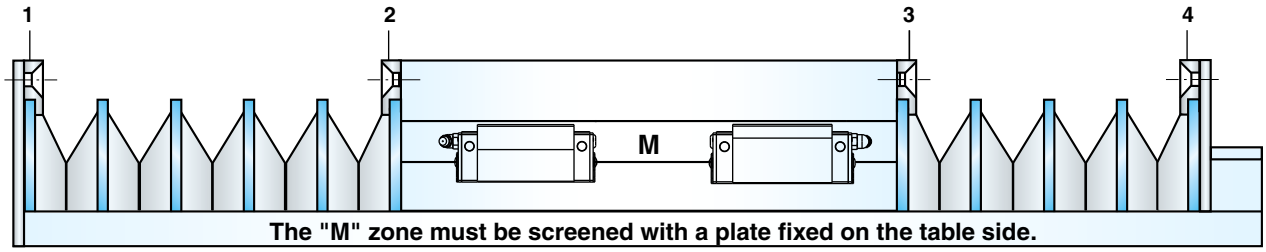
.....

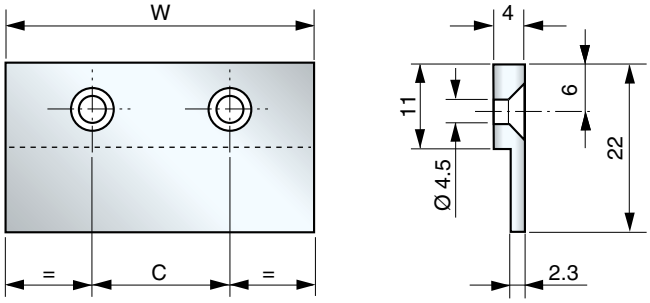
**NOTE: The data fields and/or tables marked by ! are the least ones to be filled in order to give you a quotation. Please send an e-mail to info@pei.eu or a fax to +39 051 6464840.**

# Thermic-Welded Covers Standard Systems for Linear Slides

## Solution A: Fastening holdfast

**Bellows-fastening standard systems for linear slides**



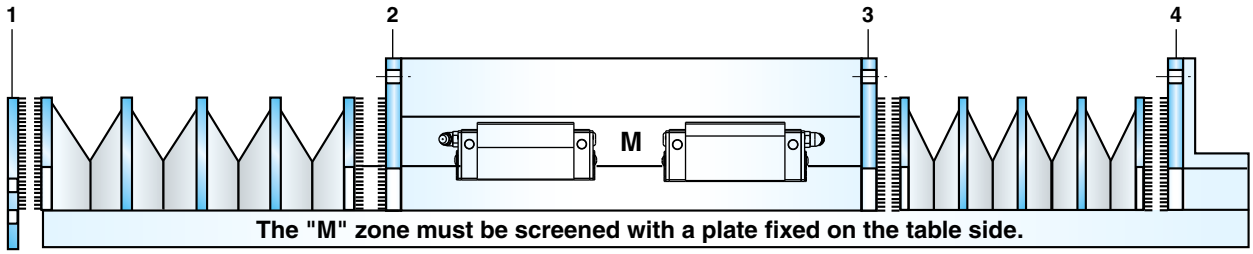




Suitable for bellows fastening in positions 1 - 2 - 3 - 4, with angular or plate supports provided by customers

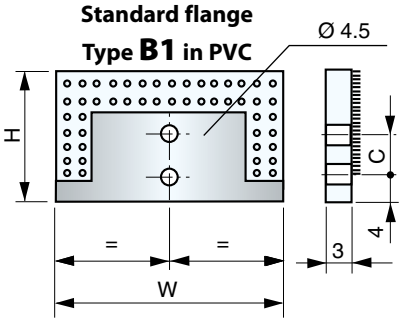
| SLIDE | W | C | N. HOLES |
|---|---|---|---|
| 15 | 52 | 26 | 2 |
| 20 | 57 | 29 | 2 |
| 25 | 63 | 32 | 2 |
| 30 | 68 | 34 | 2 |
| 35 | 72 | 36 | 2 |
| 45 | 83 | 28 | 3 |
| 55 | 104 | 35 | 3 |
| 65 | 128 | 32 | 4 |

## Solution B: Velcro flange fastening (B1 and B2)

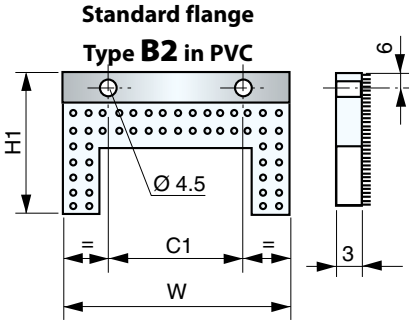
**Suitable for dry working places**




Standard flange Type **B1** in PVC




Standard flange Type **B2** in PVC




| SLIDE | W | H | C | H1 | C1 | N. HOLES |
|---|---|---|---|---|---|---|
| 15 | 56 | 36 | 0 | 42 | 26 | 2 |
| 20 | 61 | 40,5 | 8 | 46,5 | 29 | 2 |
| 25 | 67 | 43 | 8 | 46,5 | 32 | 2 |
| 30 | 72 | 51 | 8 | 54 | 34 | 2 |
| 35 | 76,5 | 51 | 18 | 53 | 36 | 2 |
| 45 | 87,5 | 61 | 18 | 62 | 28 | 3 |
| 55 | 108 | 73 | 18 | 69 | 35 | 3 |
| 65 | 132 | 90 | 18 | 86 | 32 | 4 |

Pos.1 a) Fix the type 1 standard flange at the head of the slide.
b) Fix the bellows to the type 1 standard flange by pressing strongly.

Pos.2-3 a) Fix the table or the mounting plate to the type 2 standard flange by means of screws.
b) Fix the bellows to the type 2 standard flange by pressing strongly.

Pos.4 a) Fix the type 2 standard flange to the angular support provided by the customer by means of screws.
b) Fix the bellows to the type 2 standard flange by pressing strongly.

**N.B. Fastening options showed in Pos. 1-4 are interchangeable**

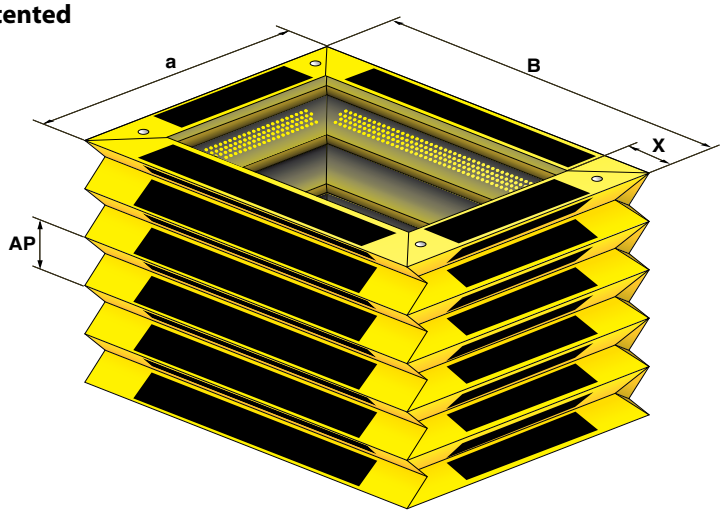
This technical card represents the standard systems used for the fastening of bellows for linear slides we can provide. For different sizes, please contact our technical department.

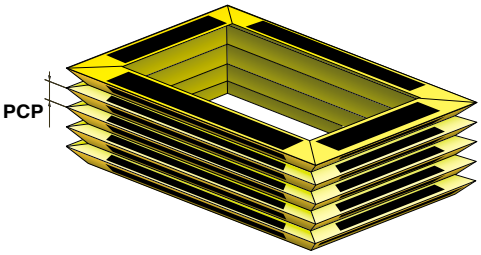
# BELLOWS FOR HOISTING PLATFORM

- Prevention of impediment of the hoist pantograph
- Protection from dust, dirt or foreign particles

## Bellows Duratite™

**Patented**




**Formula for calculating the CLOSED LENGTH**

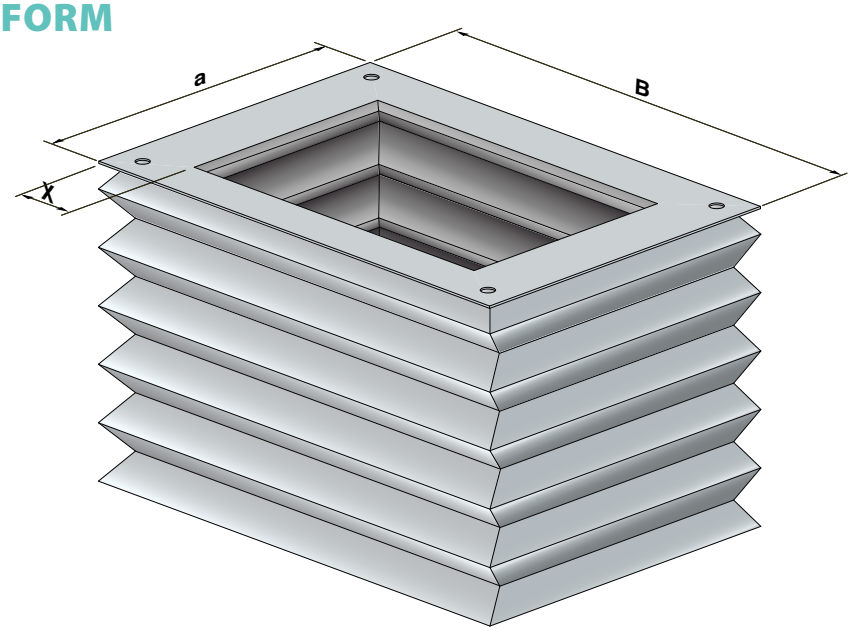
**P.C.** = NP · PCP + 10 mm

**NP** = Number of folds = $\frac{\text{P.A.}}{\text{AP}}$

| X | AP | PCP | Material | Color | Reference code |
|---|---|---|---|---|---|
| 38 | 55 | 10 | PVC/PU | Yellow/Black | DM-PU-G |
| | | | PVC/PU | Black | DM-PU-N |
| 67 | 100 | 10 | PVC | Yellow/Black | DM-PU-G |
| | | | PVC | Black | DM-PU-N |
| 89 | 125 | 10 | PVC | Yellow/Black | DM-PU-G |

# BELLOWS FOR HOISTING PLATFORM

## Thermic-welded Bellows
## Type QL-RETT

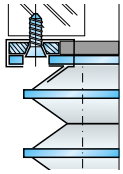



- **All calculation formulas are shown on page 27.**



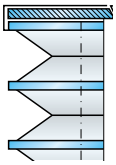
## Systems for fastening Bellows for Lift Tables

**I**



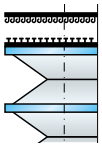
Solution with sheet steel, aluminum or PVC flange. Shape and holes per customer drawings.

**B**



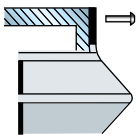
Solution with sheet steel, aluminum or PVC flange. Shape and holes per customer drawings.

**E**



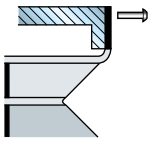
Solution with rapid VELCRO connection.
This solution offers:
- Rapid application and removal of the cover
- Low cost

**CI**



Bellows inner collar. Suitable for screw fastening.

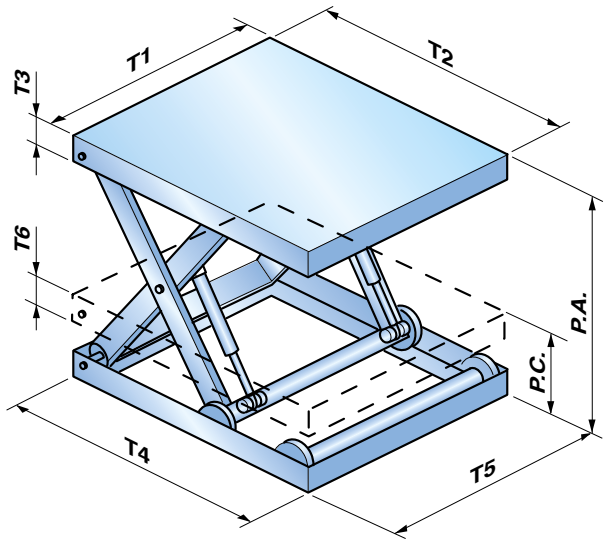
**CE**



Bellows outer collar. Suitable for screw fastening.

**EXAMPLES OF APPLICATION:**

- **Closing of upright doors**
- **Closing of storehouse rooms and interspaces**
- **Protection of level changing in assembly lines of the manufacturing industry**
- **Base protection of medical equipment**




**Questionnaire for hoisting platforms BELLOWS:**

**a =** ..... mm
**B =** ..... mm
**X =** ..... mm

**Questionnaire for HOISTING PLATFORMS:**

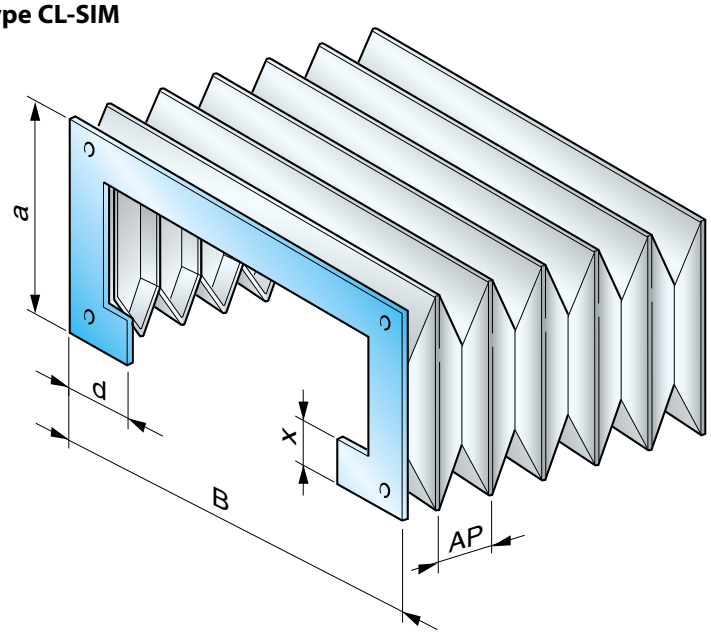
**T1 =** ..... mm
**T2 =** ..... mm
**T3 =** ..... mm
**T4 =** ..... mm
**T5 =** ..... mm
**T6 =** ..... mm
**P.A. =** ..... mm
**P.C. =** ..... mm
**NP =** ..... mm

**Upper side fastening** ❑ I ❑ B ❑ E ❑ C I ❑ CE
**Lower side fastening** ❑ I ❑ B ❑ E ❑ C I ❑ CE

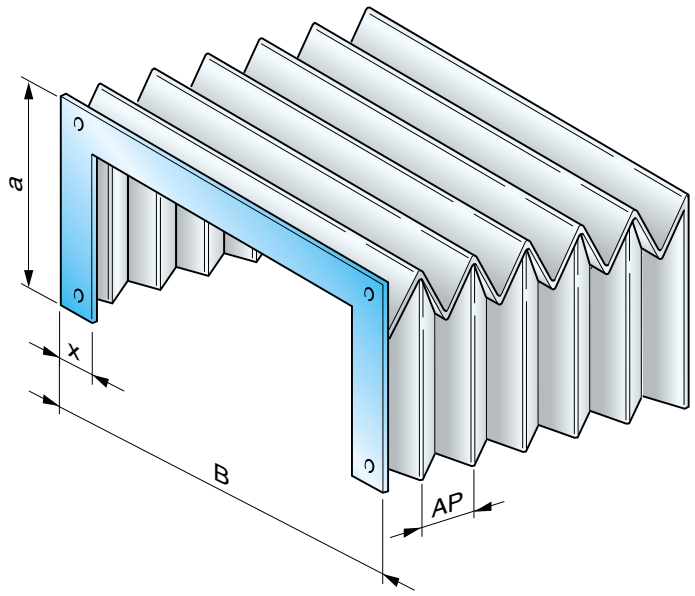
**NOTE: The data fields and/or tables marked by ! are the least ones to be filled in order to give you a quotation. Please send an e-mail to info@pei.eu or a fax to +39 051 6464840.**

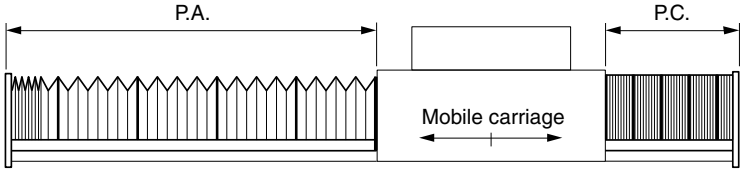
# FLAT COVERS GLUED AND SEWN

**Type CL-SIM**



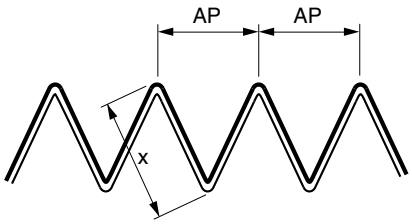

**Type TL-SIM**




Contact our engineering department for this type of cover.

**Glued style "A"**



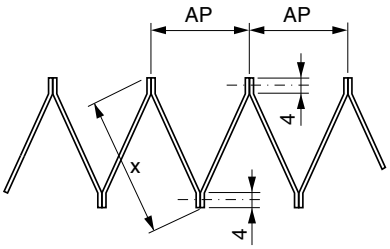

**Formula for calculating the CLOSED LENGTH**

**P. C.**= NP . 4 + flange thickness

**NP**= Number of folds = $\frac{\text{P.A.}}{\text{AP}}$ +2

**AP**= Opening of 1 fold = x · 1,41

**Sewn style "C"**




**Formula for calculating the CLOSED LENGTH**

**P. C.**= NP . 2,5 + flange thickness

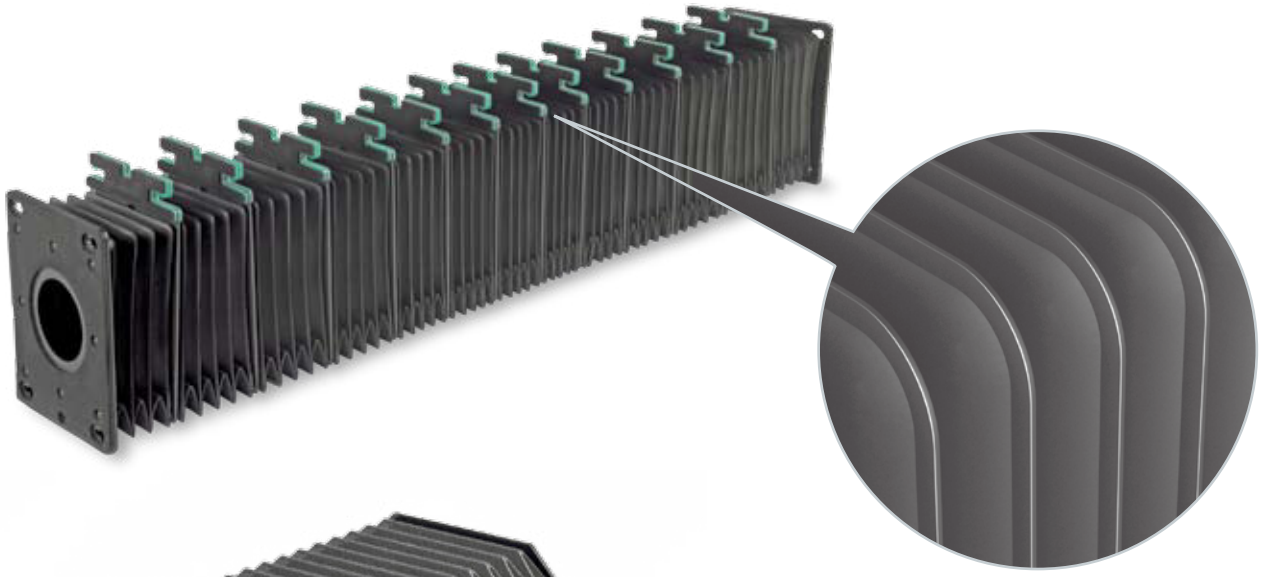
**NP**= Number of folds = $\frac{\text{P.A.}}{\text{AP}}$ +2

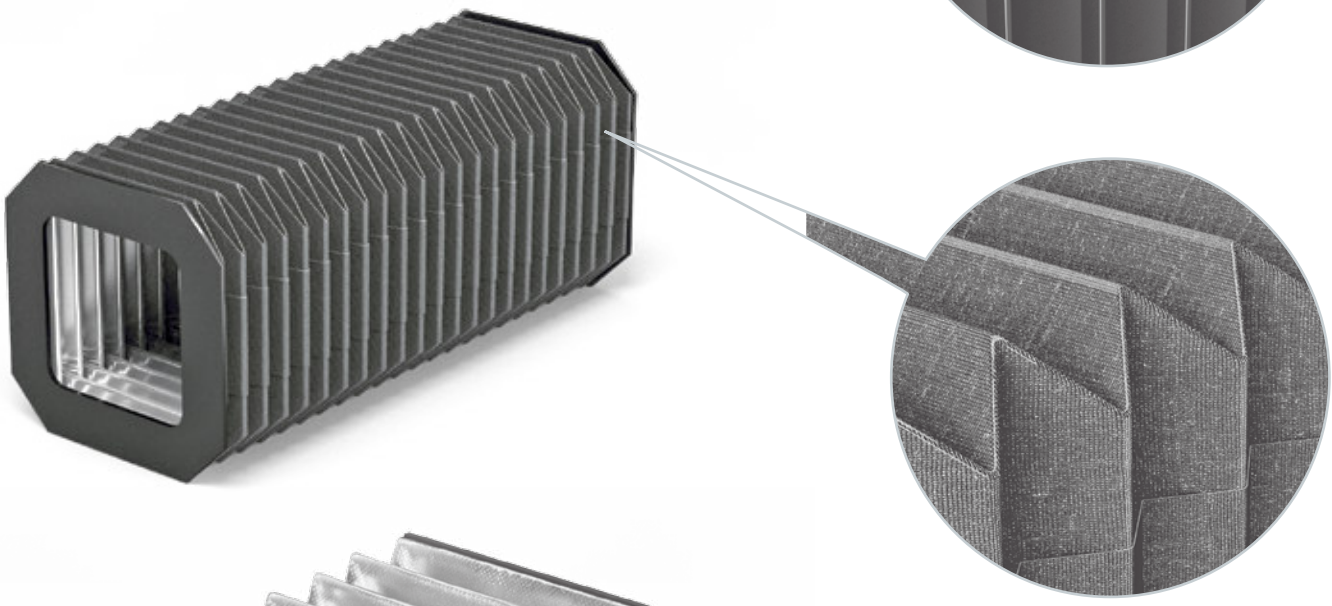
**AP**= Opening of 1 fold = (x-8) · 1,41

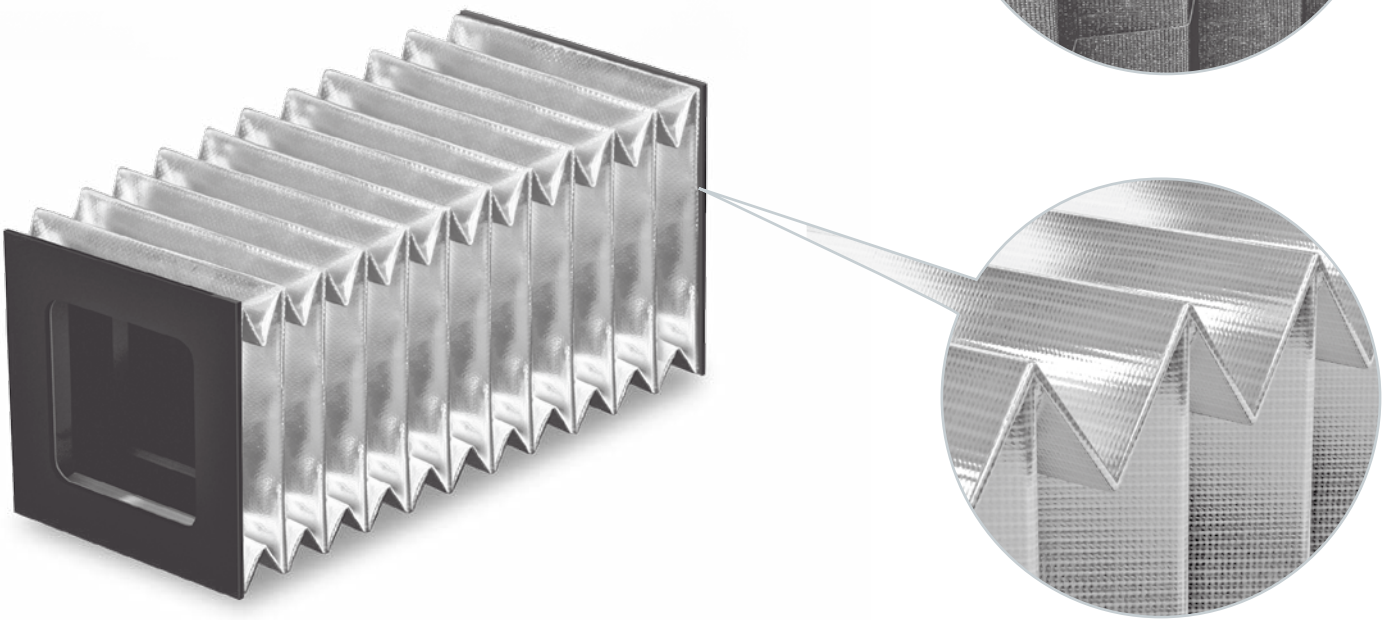
| Ref. | Description | Dim. | Type | Style |
|---|---|---|---|---|
| ! **P.A.** | Open length | | | |
| ! **P.C.** | Closed length | | | |
| ! **Stroke** | (P.A. - P.C.) | | | |
| ! **a** | Outside height | | | |
| ! **B** | Outside width | | | |
| ! **x** | Fold height | | | |
| ! **d** | Return dimension | | | |
| ! **AP** | Fold opening | | | |
| ! **NP** | Number of folds | | | |

**NOTE: The data fields and/or tables marked by ! are the least ones to be filled in order to give you a quotation. Please send an e-mail to info@pei.eu or a fax to +39 051 6464840.**

## BELLOWS FOR LASER AND PLASMA MACHINES

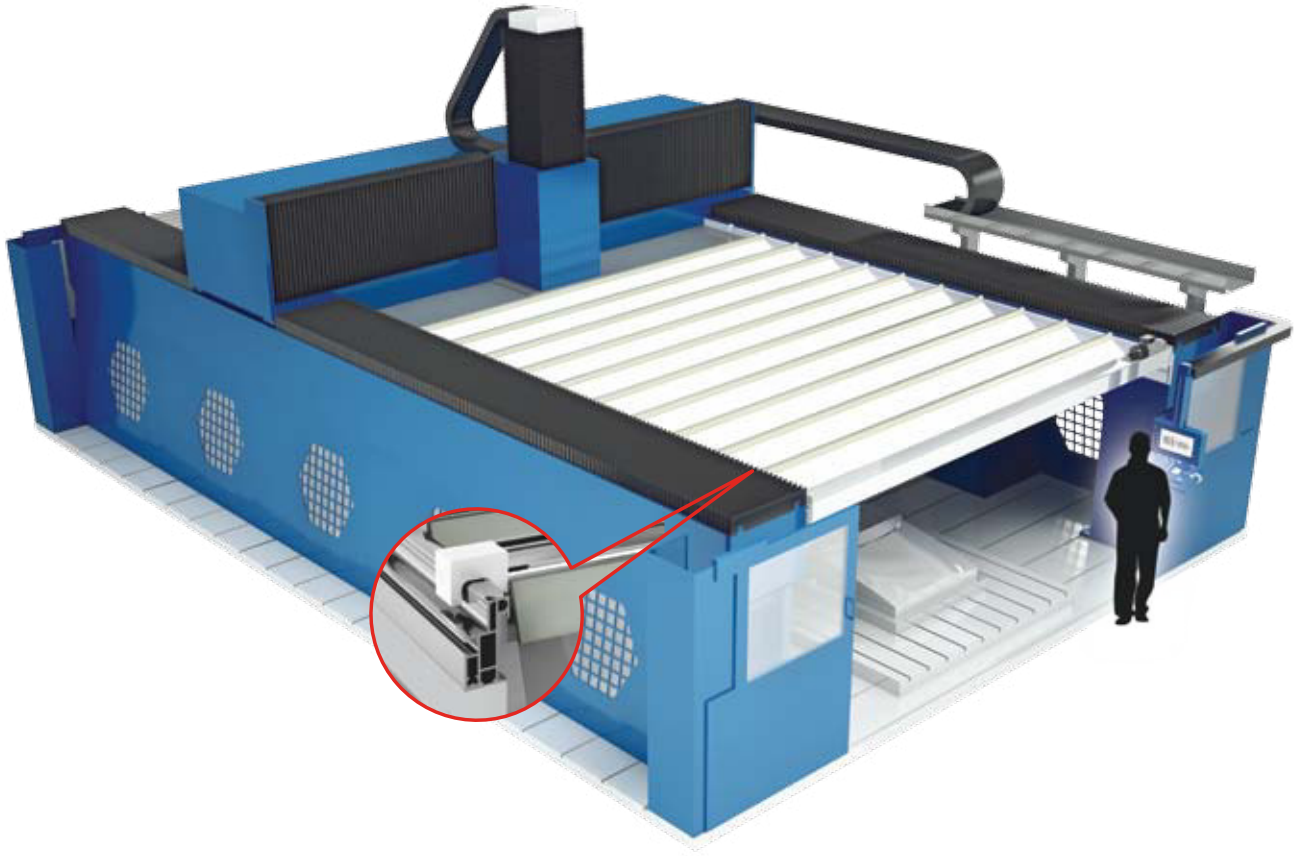






# BELLOWS FOR OVERHEAD PROTECTION FOR PORTAL MILLING MACHINES: WAVE SKY

- **WAVE SKY** is a bellow that limits the escape of fumes, dust and chips from the workstation area.
  **WAVE SKY** bellow reduces the suction force created during working: carbon fibres, composite materials and vaporised cooling lubricant.
  The special translucent fabric guarantees ample light in the work area.
  The motorised version makes for a quick opening and closing of the overhead apparatus.



## TECHNICAL SPECIFICATIONS

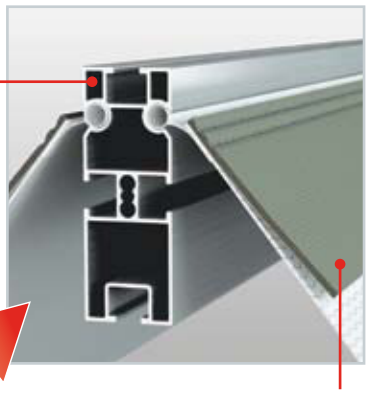
- ✔ **MAX SPEED:** 90 mt/min.
- ✔ **MAX ACCELERATION:** 1g
- ✔ **MAX WIDTH BETWEEN GUIDES:** 8.000 mm
- ✔ **MAXIMUM STROKE:** 25.000 mm
- ✔ **STANDARD FOLD HEIGHT:** 200 / 250 / 300 mm

## EXAMPLE OF APPLICATION

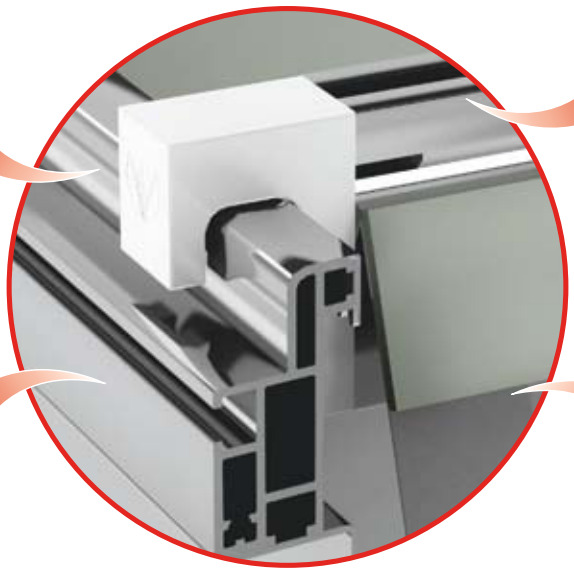
# BELLOWS FOR OVERHEAD PROTECTION FOR PORTAL MILLING MACHINES: WAVE SKY

**Sliding** along the aluminium guides is ensured by **rollers**

Structural **aluminium frames**

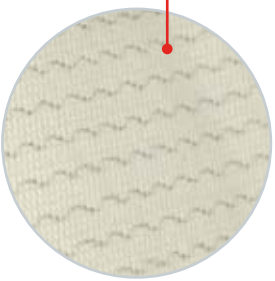


**Soundproof fabric** for damping at full stroke

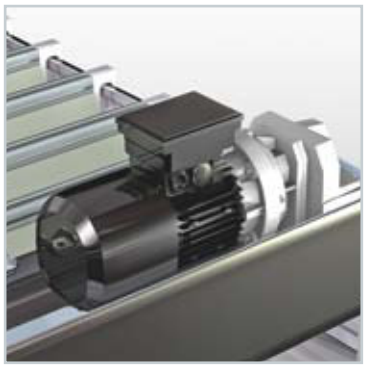


Lateral guides **modular** and **adjustable**

Bellow cover in **translucent** and **double weave fabric TEMAT 154**



**Guide cover casing**



**Automatic motorisation**
opening/closing available on request

| Code | Description of materials | | | Thickness | Heat resistance | | Primary resistance characteristics |
|---|---|---|---|---|---|---|---|
| | Visible side | Fabric insert | Hidden side | | Momentary contact °C | Continuous °C | |
| **TEMAT154** | Polyurethane | Polyester | Polyurethane | 0,9 | +130 | -30 +90 | Excellent resistance to petrol based products, oils and strong abrasion. The textile insert is made of a special fabric with high rigidity in the diagonal weave plus an aesthetically pleasing appearance. It is normally used in environments where there are large quantities of chips. **TRANSLUCENT and ANTI-STATIC.** |
| **TEMAT180** | CPT** | Polyester | - | 1,6 | +1200 | -25 +300 | **CERAMIX** has an excellent abrasion resistance and excellent shear strength. **CERAMIX** shows excellent resistance to mineral oils and hot temperatures. The two-ply fabric insert gives an high transverse rigidity and a very attractive appearance. In **WAVE-SKY** only **CERAMIX** is used in the bellow folds close to the working area, when large quantities of **ALUMINUM** hot and shearing shavings are produced, in cases of high speed chip-removing dry work environments. **ANTISTATIC-PROOF and SELF-EXTINGUISHING.** |

** Ceramic Polymer Technology

## THERMIC-WELDED TIGHT BELLOWS

**They are used when watertight protection of the components (i.e. screws, shafts, etc.) is necessary against the contamination made by coolants.**

- Economic bellows
- Good resistance to chemicals
- Resistance to heat compatible with the used materials (see characteristics on pages 52-53)
- They can be supplied in a variety of geometrical shapes, with low cost production of moulds (if not already present in our stock).

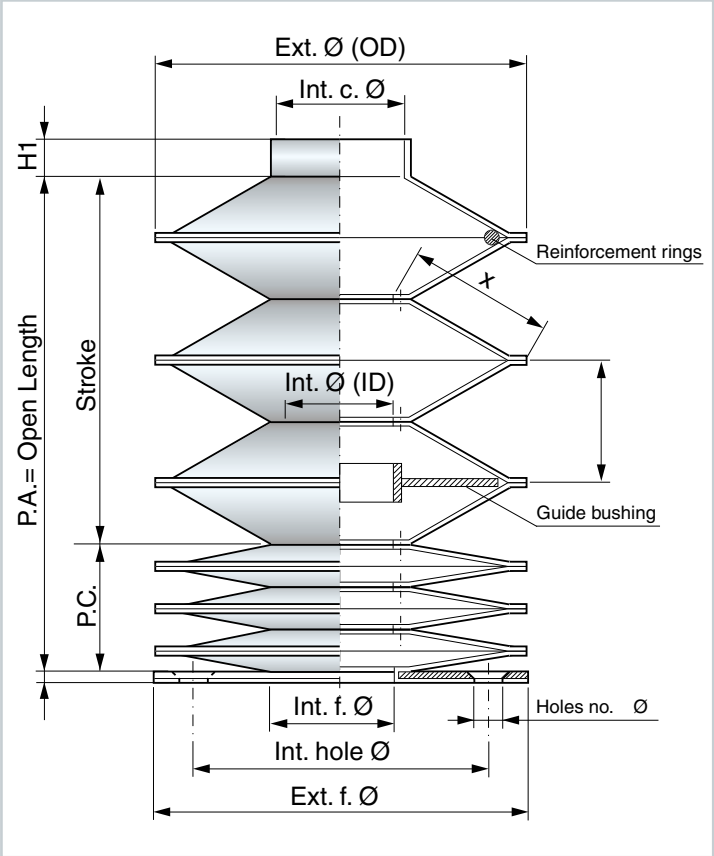
- **Materials available:**
  Code TEMAT 018
  Code TEMAT 019
  Code TEMAT 153

See the characteristics shown in the tables on pages 52-53.

# SEWN ROUND BELLOWS

**These are used when strong rotation resistance is required (for instance, to cover ball screws) and where a very compact closed pack is required.**

- Highly **reliable** bellows
- High resistance to mechanical and dynamic **stress**
- Resistance to **coolants and oils**
- Suitable for **high temperatures**
- Available with guide **bushings** and reinforcement **rings**
- No tooling **costs**
- With selected **edging** (in safety colors upon request)
- Minimum internal diameter **starting at 20 mm**
- **Any size** external diameter
- Good **price/quality** ratio




**Materials available:**

- Polyester coated with Neoprene* and Hypalon*
- Polyester coated with Nitril rubber
- Polyester coated with Polyurethane
- Polyester coated with PVC
- Kevlar* coated with Neoprene* and Hypalon*
- Kevlar* coated with Polyurethane
- Fiberglass coated with Silicone and Neoprene*
- Fiberglass coated with PVC
- Aluminum-coated fabrics

* Neoprene, Hypalon and Kevlar are registered Dupont trademarks

(see materials list on pages 52-53)

**Formula for calculating the CLOSED LENGTH**

**P.C.**= Closed Length = NP · SP*

$$\textbf{NP}= \text{Number of folds} = \frac{\text{P.A.}}{\text{AP}} + 1$$

* **SP**= Thickness of 1 fold; see materials list on page 52-53

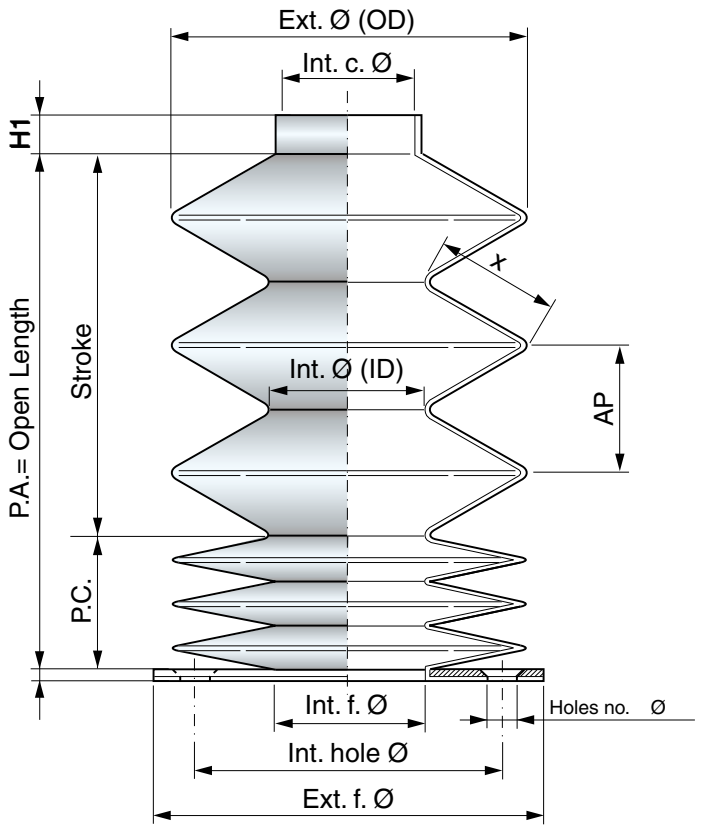
$$\textbf{AP}= \text{Opening of 1 fold} = \left(\frac{\text{Ø e. soff.} - \text{Ø i. soff.}}{2} - 6\right) \cdot 1{,}2$$

**Note:** When steel rings are required inside the folds, the **P.C.** is calculated by our engineering department.

## HEAT-FORMED BELLOWS

**These are used when high mechanical strength and heat resistance are required.**

- Excellent resistance to **mechanical stress**
- Also available cone-shaped
- Resistance to **coolants and oils**
- No tooling **costs**
- Available with guide **bushings** and **reinforcement rings** upon request
- Suitable for **high temperatures**



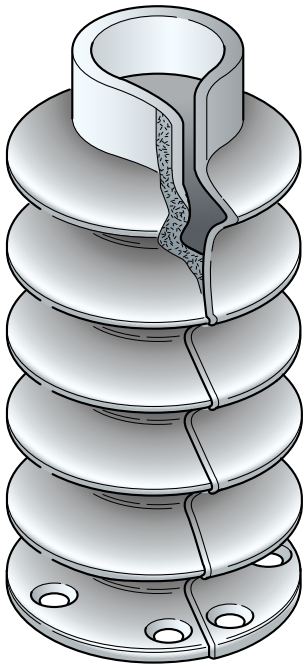

## OPEN HEAT-FORMED BELLOWS

**Materials available:**

- Polyester coated with Neoprene* and Hypalon*
- Polyester coated with Nitril rubber
- Polyester coated with Polyurethane
- Polyester coated with PVC
- Fiberglass coated with Silicone and Neoprene*

* Neoprene and Hypalon are registered Dupont trademarks

(see materials list on pages 52-53)



Upon request with
**longitudinal opening seam**
when the bellow must be disassembled
without dismantling the part to be protected

**Formula for calculating the CLOSED LENGTH**

**P.C.**= Closed Length = NP · SP*

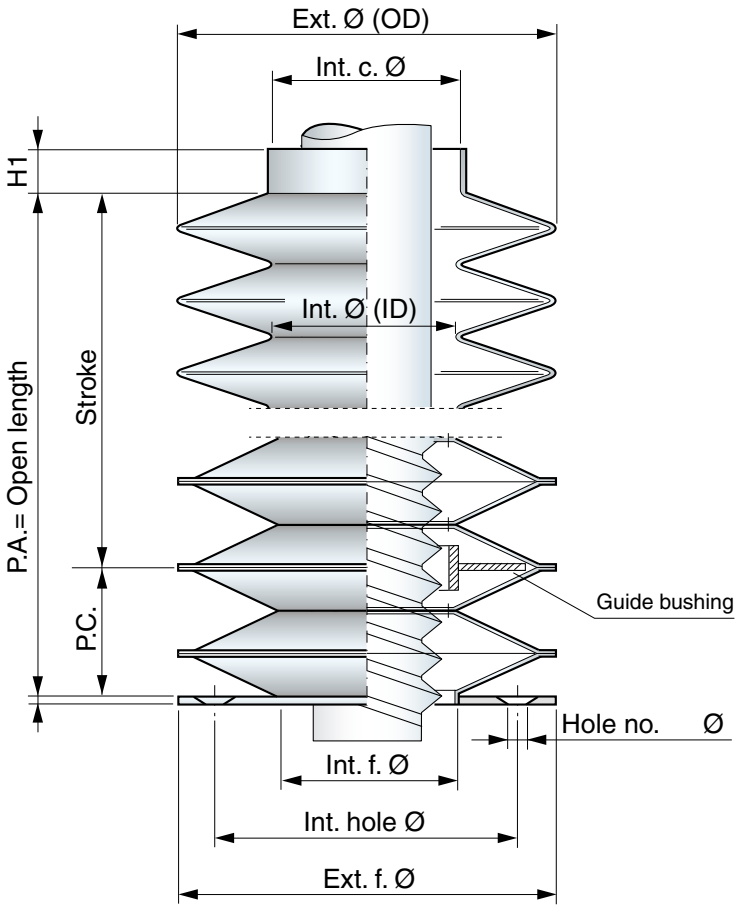
$$\textbf{NP}= \text{Number of folds} = \frac{\text{P.A.}}{\text{AP}} + 1$$

* **SP**= Thickness of 1 fold; see materials list on pages 52-53

$$\textbf{AP}= \text{Opening of 1 fold} = \left(\frac{\text{Ø e. soff.- Ø i. soff.}}{2}\right) \cdot 1{,}41$$

**Note:** When steel rings are required inside the folds, the **P.C.** is calculated by our engineering department.

# Questionnaire for Round Bellows



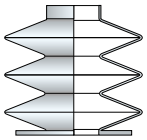

**! Bellows type**

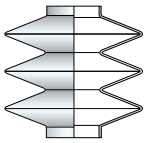
❑ Sewn

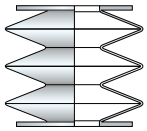
❑ Heat-formed

❑ Thermic-welded

**! Fastening system**

❑ A 

❑ B 

❑ C 

**! Type of machine on which the ROUND BELLOWS is to be installed:**

❑ METAL working machine
❑ MARBLE working machine
❑ GOLD working machine
❑ PAPER working machine
❑ FABRIC working machine
❑ GLASS working machine
❑ FOOD processing machine
❑ PHARMACEUTICAL processing machine
❑ AGRICULTURAL processing machine
❑ TANNING machinery
❑ CLAY working machine
❑ WOOD working machine

❑ Other .....

**! Type of material falling on the bellows:**

.....
.....
.....
.....

**! Liquids to which the bellows will be exposed:**

.....
.....
.....
.....
.....
.....

**! Working position:**

❑ Horizontal ❑ Vertical

**! Temperature of material falling on the bellows:**

..... °C

**! Part to be protected:**

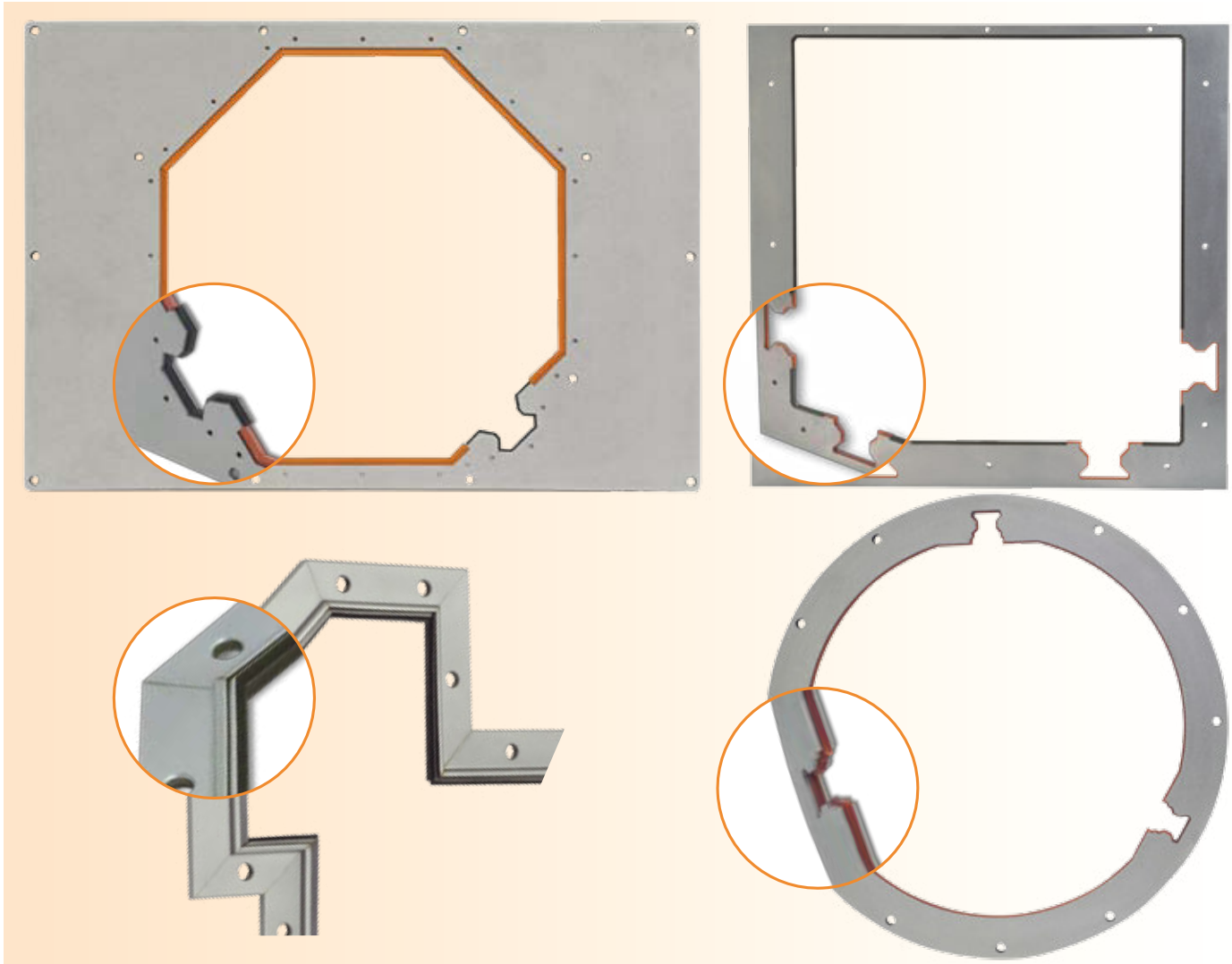
❑ Stem or shaft:
Diameter .....mm
❑ Screw:
Diameter .....mm
Pitch .....mm
❑ Ball screw:
Diameter .....mm
Pitch .....mm
RPM in rapid travel .....
❑ With longitudinal seam
❑ Other .....
.....
.....
.....
.....

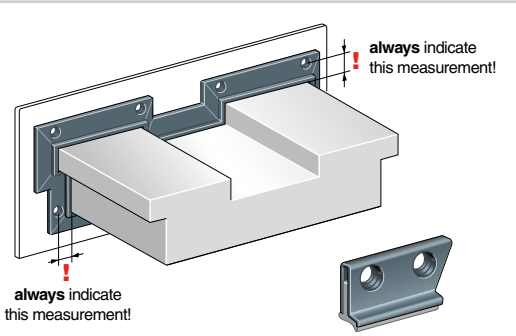
**! Company name:** .....
**Contact person:** .....
**Phone:** ..... **E-mail:** .....
**Quantity:** .....
**Annual demand:** .....
**Date:** .....
**Notes:** .....

**NOTE: The data fields and/or tables marked by ! are the least ones to be filled in order to give you a quotation. Please send an e-mail to info@pei.eu or a fax to +39 051 6464840.**

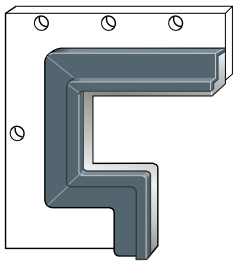
# PROFILED WIPERS FOR GUIDES

- **Resistant to oils, coolants and hot shavings**
- **Resistant to wear**
- **Wiper profile has durable flexibility**

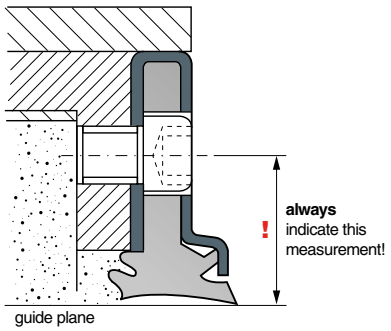





Example of guide mount



Example of flange mount



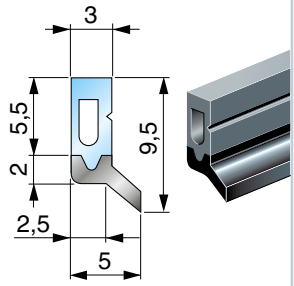

Possible method of fastening to guide

- For work environments with a heavy concentration of **sharp shavings**.
- Built to **drawings** in any shape or size.
- **Single pieces or large series** can be manufactured due to no equipment costs.
- **Polyurethane** profile resists abrasion and is easily replaced.
- We must have a drawing with measurements showing the profile of the **guides to wipe**.
- **Pre-loading is determined by our engineering department** based on the shape of the **wipe**.
- The wiper measurements refer to **free position without pre-load** and **it is ALWAYS necessary**. **to indicate the distance measurement** between **fastening bore** and **guide plane** to weap.
- For **fastening**, we recommend counter-sunk hex screws.

## BIPLASTIC WIPERS

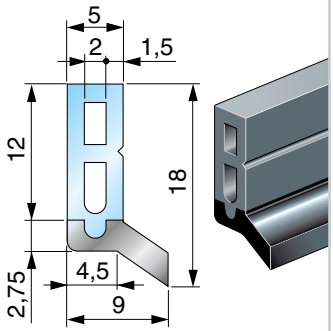
- PEI **Biplastic** Wipers are modelled on the client drawing.
- Strip-lengths are available in prompt delivery.

### RA 01 BP



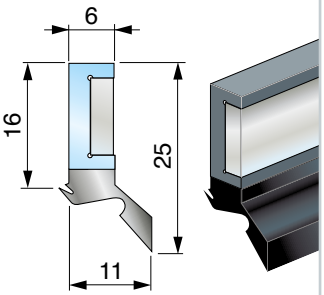

Profile:
**Polyurethane**
Length: **2000 mm.**
**Rigid polymer insert**

### RA 03 BP



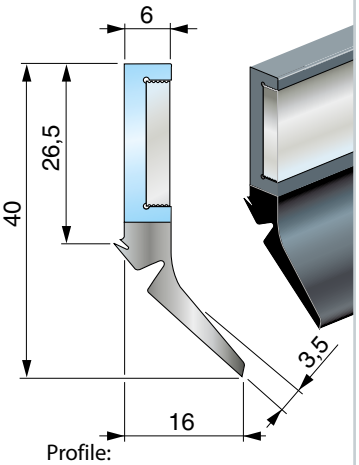

Profile:
**Polyurethane**
Length: **2000 mm.**
**Rigid polymer insert**

### RA 05 BP




Profile:
**Polyurethane**
Length: **2000 mm.**
**Steel insert 12x3**

### FB40FLEX

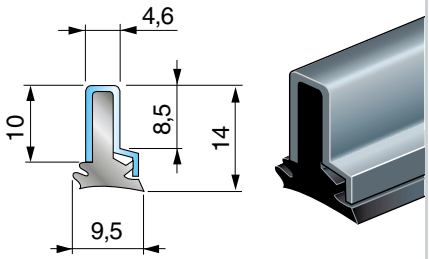



Profile:
**Polyurethane**
Length: **2000 mm.**
**Steel insert 18x3**

## FB WIPERS

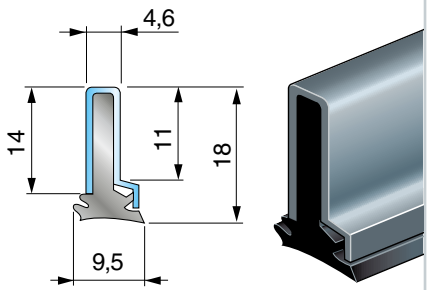
- **FB** Wipers are modelled on the client drawing or supplied in linear strips.

### FB 14



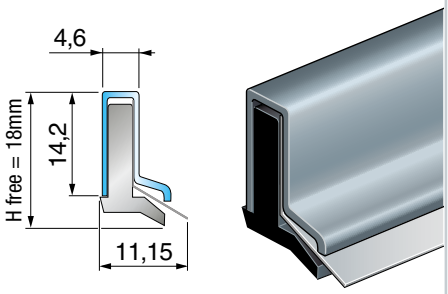

Profile: **Polyurethane** *
Length: **530 mm.**
**Stainless steel reinforcement**

### FB 18



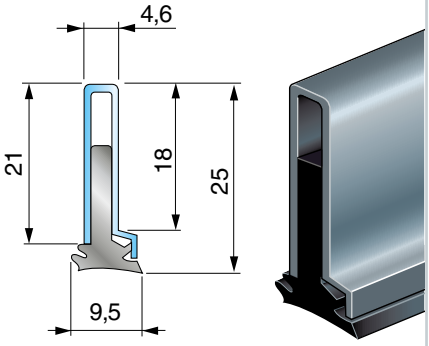

Profile: **Polyurethane** *
Length: **3000 mm.**
**Stainless steel reinforcement**

### FB 18L



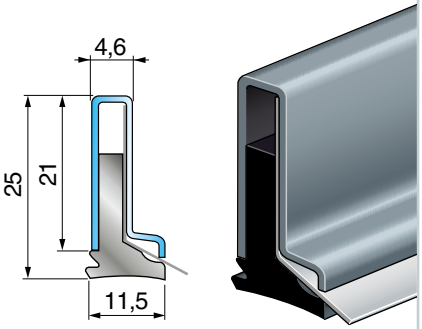

Profile: **Polyurethane** *
Length: **1000 mm.**
**Stainless steel reinforcement**
**Shielding in inox steel 301**

### FB 25



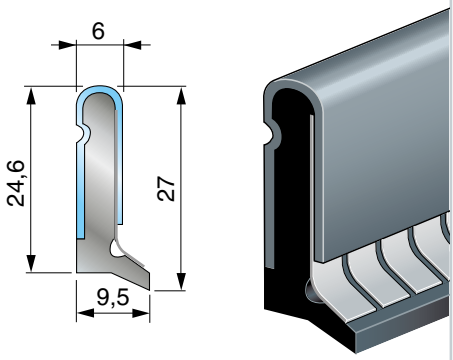

Profile: **Polyurethane** *
Length: **3000 mm.**
**Stainless steel reinforcement**

### FB 25L




Profile: **Polyurethane** *
Length: **1000 mm.**
**Stainless steel reinforcement**
**Shielding in inox steel 301**

### FB 27



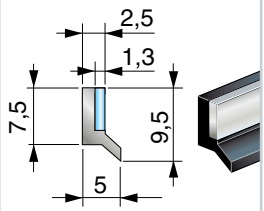

Profile: **NBR** *
Length: **500 mm.**
**Galvanized steel insert**
**Shielding in inox steel 301**

* **Prompt delivery**

## RA WIPERS

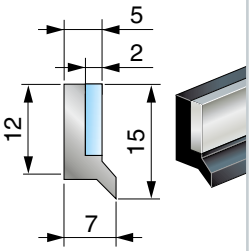
**RA** Wipers are modelled on the client drawing or supplied in linear strips.

### RA 01



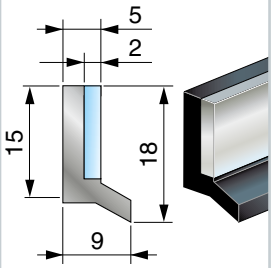

Profile:
**NBR** * or **Viton®** *
Length: **500 mm.**
**Steel insert**

### RA 02



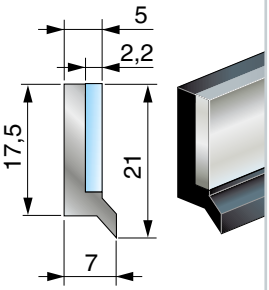

Profile:
**NBR** * or **Viton®** *
Length: **560 mm.**
**Steel insert**

### RA 03



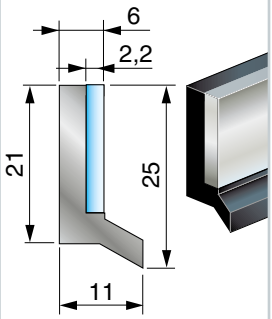

Profile:
**NBR** * or **Viton®**
Length: **560 mm.**
**Steel insert**

### RA 04



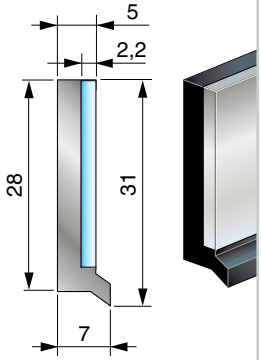

Profile:
**NBR** * or **Viton®**
Length: **560 mm.**
**Steel insert**

### RA 05




Profile:
**NBR** * or **Viton®** *
Length: **560 mm.**
**Steel insert**

### RA 06

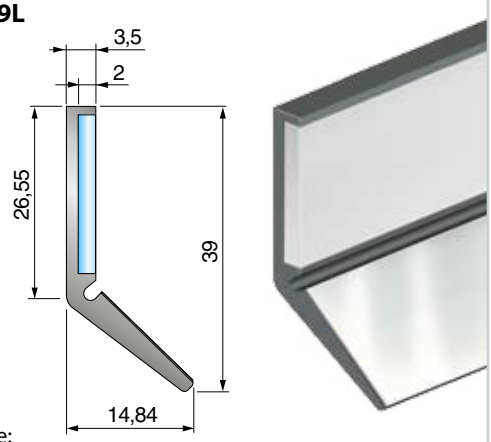



Profile:
**NBR** * or **Viton®**
Length: **560 mm.**
**Steel insert**

### RA 25L


Profile:
**NBR** *
Length: **800 mm.**
**Steel insert**
**Thin metal protective plate in inox steel 301**

### RA 39L



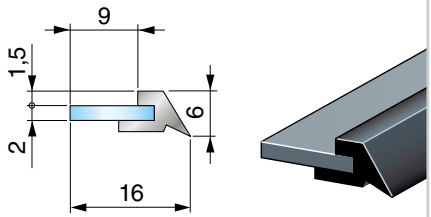

Profile:
**NBR** * or **Viton®**
Length: **800 mm.**
**Steel insert**
**Thin metal protective plate in inox steel 301**

* **Prompt delivery**

## RA B WIPERS

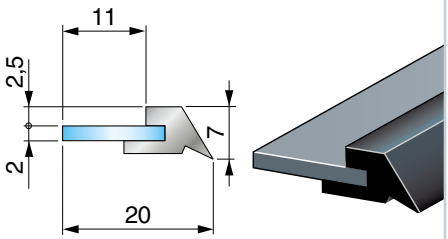
**RA B** Wipers are supplied exclusively in linear strips.

### RA B1



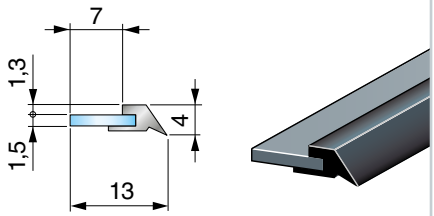

Profile: **NBR** * or **Viton®**
Length: **560 mm.**
**Steel insert**

### RA B2




Profile: **NBR** * or **Viton®** *
Length: **560 mm.**
**Steel insert**

### RA B3




Profile: **NBR** * or **Viton®**
Length: **560 mm.**
**Steel insert**

* **Prompt delivery**

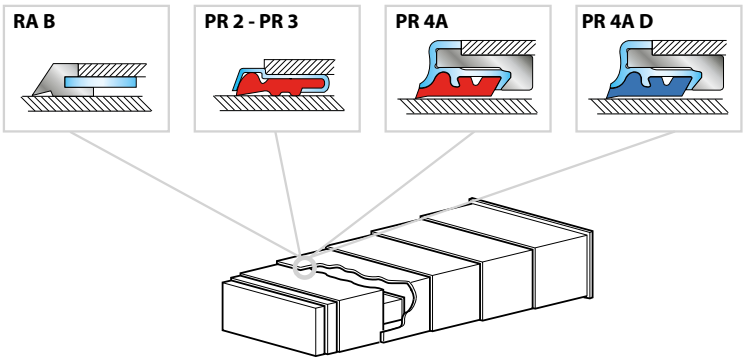
# WIPERS FOR TELESCOPIC STEEL COVERS

These types of wipers are normally applied to telescopic steel covers.

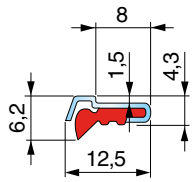
Codes **RA B** consists of a metal insert to which an NBR profile has been vulcanized.

Codes **PR 2** and **PR 3** has steel reinforcement and polyurethane profile.

Codes **PR 4A** and **D** can be instantly replaced on the telescopic cover, without disassembling the cover itself. They have a metal reinforcement with a seal designed to clean the cover.

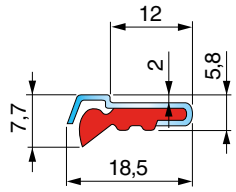



**PR 2**



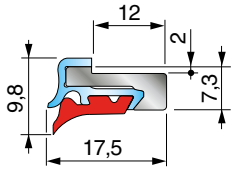

Profile: **Polyurethane** *
Length: **3000 mm.**
**Steel reinforcement**

**PR 3**




Profile: **Polyurethane** *
Length: **3000 mm.**
**Steel reinforcement**

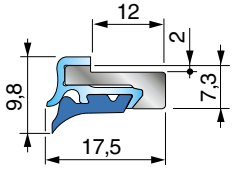
**PR 4A**




Profile: **Polymeric GM2319**
Length: **3000 mm.**
**Steel reinforcement**

**For working with COOLANTS**

**PR 4A D**




Profile: **Polymeric GM2357**
Length: **3000 mm.**
**Steel reinforcement**

**For DRY working**

- **Sold ONLY in standard strip-lengths.**
- **Easy replacement of wiper profile for codes PR 2, PR 3, PR4A and PR 4A - D.**
- **The polyurethane profile is delivered inserted in the steel reinforcement.**

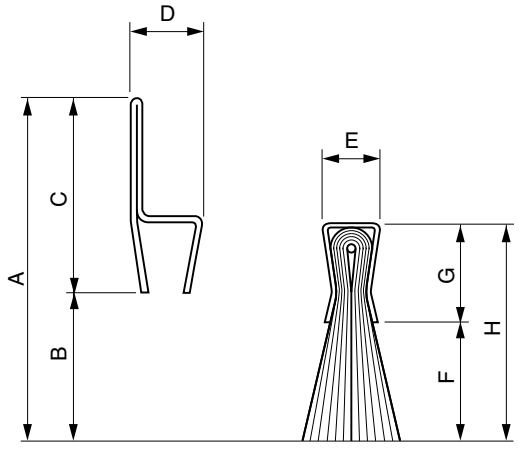
* **Prompt delivery in strips**

| MATERIALS | Heat Resistance | | Synthetic Oil Resistance | | | Mineral Oil Resistance | | | Vegetable Oil Resistance | | | Wear Resistance | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Momentary contact °C | Continuous °C | Excellent | Good | Poor | Excellent | Good | Poor | Excellent | Good | Poor | Excellent | Good | Poor |
| NBR | 250 | -20 ÷ +100 | | ● | | | ● | | | ● | | | ● | |
| Polyurethane | 200 | -30 ÷ +90 | ● | | | ● | | | | ● | | ● | | |
| VITON® | 1000 | -20 ÷ +280 | ● | | | ● | | | | ● | | | ● | |
| Polymeric GM2319 (red) for working with coolants | 200 | -30 ÷ +90 | ● | | | ● | | | | ● | | ● | | |
| Polymeric GM2357 (blue) for dry working | 280 | -30 ÷ +120 | | | | ● | | | | ● | | ● | | |

# LINEAR BRUSHES WITH SUPPORT FRAME

- **Special shapes** may be created
- **The brush** is easy to replace
- The **support frame** is made of **galvanized steel**
- **Prompt delivery** in strips

| Code | A | B | C | D | E | F | G | H | Length | Bristle |
|---|---|---|---|---|---|---|---|---|---|---|
| **SN1** | 32 | 11 | 21 | 17 | 14 | 9 | 9 | 18 | 1000 | Nylon Ø 0,15 |
| **SN2** | 42 | 22 | 20 | 9 | 6 | 26 | 5 | 31 | 2000 | Nylon Ø 0,15 |
| **SN3** | 72 | 40 | 32 | 15 | 10 | 40 | 10 | 50 | 2000 | Nylon Ø 0,25 |
| **SN4** | 92 | 60 | 32 | 15 | 10 | 60 | 10 | 70 | 2000 | Nylon Ø 0,50 |
| **SN5** | 112 | 80 | 32 | 15 | 10 | 80 | 10 | 90 | 2000 | Nylon Ø 0,50 |
| **SN6** | 132 | 100 | 32 | 15 | 10 | 100 | 10 | 110 | 2000 | Nylon Ø 0,50 |
| **S01** | 40 | 20 | 20 | 9 | 6 | 24 | 5 | 29 | 2000 | Brass Ø 0,15 |
| **S02** | 70 | 50 | 20 | 9 | 6 | 54 | 5 | 59 | 2000 | Brass Ø 0,15 |
| **S03** | 100 | 80 | 20 | 9 | 6 | 84 | 5 | 89 | 2000 | Brass Ø 0,15 |



# FABRIC MATERIAL LIST

| Code | Description of materials | | | Thickness | Heat resistance | | Roll-up Covers | | | Thermic welded flat covers | Sewn round bellows | | Heat-formed round bellows | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Visible side | Fabric insert | Hidden side | | Momentary contact °C | Continuous °C | Material suitable for cover without canister | Material suitable for cover with canister | Min winding diameter mm | Suitable material | Suitable material | Thickness of 1 fold (SP) mm | Suitable material | Thickness of 1 fold (SP) mm | With longitudinal seam thickness of 1 fold (SP) mm |
| **TEMAT001** | Neoprene* | Polyamide | Neoprene* | 0,3 | 250 | -20 +120 | • | • | 20 | | • | 1 | • | 1,5 | no |
| **TEMAT002** | Neoprene* | Polyester | Hypalon* | 0,5 | 250 | -20 +120 | • | • | 20 | | • | 1,5 | • | 2,5 | 5 |
| **TEMAT202** | Neoprene* | Polyester | Neoprene* | 0,5 | 250 | -20 +120 | • | • | 20 | | • | 1,5 | • | 2,5 | 5 |
| **TEMAT003** | Neoprene* | Polyester | Hypalon* | 0,6 | 250 | -20 +120 | • | • | 20 | | • | 1,8 | • | 3 | 5,5 |
| **TEMAT004** | Neoprene* | Polyester | Hypalon* | 0,8 | 250 | -20 +120 | • | • | 20 | | • | 2,4 | • | 4 | 6,5 |
| **TEMAT005** | Neoprene* | Polyester | Hypalon* | 1,0 | 250 | -20 +120 | • | • | 20 | | • | 3 | | | |
| **TEMAT006** | Neoprene* | Polyester | Hypalon* | 1,2 | 250 | -20 +120 | • | • | 50 | | • | 3,5 | | | |
| **TEMAT007** | Neoprene* | Kevlar* | Hypalon* | 1,15 | 350 | -20 +120 | • | • | 50 | | • | 3,5 | | | |
| **TEMAT008** | NBR | Polyester | NBR | 0,33 | 250 | -20 +100 | • | • | 20 | | • | 1,2 | • | 2 | 4,5 |
| **TEMAT009** | Silicon | Fiberglass | Neoprene* | 0,5 | 350 | -60 +250 | • | • | 20 | | • | 1,5 | • | 5 | 10 |
| **TEMAT091** | PVC | Fiberglass | PVC | 0,44 | 300 | -30 +80 | • | • | 20 | • | • | 1,5 | | | |
| **TEMAT102** | Ptfe | Fiberglass | Ptfe | 0,250 | 320 | -200 +260 | • | • | 20 | | | | | | |
| **TEMAT104** | Ptfe | Fiberglass | Ptfe | 0,7 | 320 | -200 +260 | • | • | 70 | | | | | | |
| **TEMAT106** | Ptfe | Polyester | Polyurethane | 0,32 | 200 | -30 +120 | • | • | 20 | • | | | | | |
| **TEMAT011** | Aluminium-carbon fabric | | | 0,7 | 2500 | -100 +260 | • | • | 20 | | • | 2,1 | | | |
| **TEMAT012** | AISI 301 Stainless steel | | | 0,2 | 1200 | -250 +400 | | • | 70 | | | | | | |
| **TEMAT013** | AISI 301 Stainless steel | | | 0,3 | 1200 | -250 +400 | | • | 90 | | | | | | |
| **TEMAT014** | AISI 301 Stainless steel | | | 0,4 | 1200 | -250 +400 | | • | 150 | | | | | | |
| **TEMAT122** | 304 Stainless steel | | Polyester | 0,8 | 1200 | -25 +300 | • | • | 52 | | | | | | |
| **TEMAT015** | Polyurethane | Polyester | Polyurethane | 0,25 | 200 | -30 +90 | • | • | 20 | • | | | | | |
| **TEMAT151** | Polyurethane | Polyester | Polyurethane | 0,35 | 200 | -30 +90 | • | • | 20 | • | | | | | |
| **TEMAT152** | Polyurethane | Polyester | Polyurethane | 0,8 | 200 | -30 +90 | • | • | 20 | | | | | | |
| **TEMAT153** | Polyurethane | - | - | 0,5 | 200 | -30 +70 | | | | • | | | | | |
| **TEMAT160** | Grey Polyurethane | Polyester | Fabric | 1,4 | 200 | -30 +90 | • | • | 70 | | | | | | |
| **TEMAT161** | Polyurethane | Polyester | Fabric | 0,8 | 200 | -30 +90 | • | • | 20 | | • | 2,5 | | | |
| **TEMAT162** | Polyurethane | Polyester | Fabric | 1,4 | 200 | -30 +90 | • | • | 70 | | | | | | |
| **TEMAT164** | Polyurethane | Kevlar* | Polyurethane | 0,35 | 350 | -30 +180 | • | • | 20 | • | • | 1,5 | | | |
| **TEMAT165** | Polyurethane | Nomex* | Polyurethane | 0,36 | 300 | -30 +130 | • | • | 20 | • | | | | | |
| **TEMAT169** | Polyurethane | Panox*/Kevlar* | Polyurethane | 0,33 | 300 | -30 +130 | • | • | 20 | • | | | | | |
| **TEMAT170** | Polyurethane | Polyester | Fabric | 1,6 | 200 | -30 +90 | • | • | 70 | | | | | | |
| **TEMAT180** | CPT** | Polyester | - | 1,6 | 1200 | -25 +300 | • | • | 70 | | | | | | |
| **TEMAT017** | PVC | Polyester | PVC | 0,36 | 100 | -30 +70 | • | • | 20 | • | | | | | |
| **TEMAT018** | PVC | Polyester | PVC | 0,7 | 100 | -30 +70 | • | • | 20 | | • | 2,1 | • | 3,5 | 6 |
| **TEMAT019** | PVC | Polyester | PVC | 0,5 | 100 | -30 +70 | • | • | 20 | | • | 1,5 | • | 2,5 | 5 |
| **TEMAT020** | PVC | Polyester | PVC | 0,25 | 100 | -30 +70 | • | • | 20 | • | | | | | |
| **TEMAT022** | PVC | Polyester Net | PVC | 1,4 | 100 | -30 +70 | • | • | 40 | | | | | | |

* Neoprene, Hypalon, Kevlar, Panox and Nomex are registered Dupont trademarks.
** Ceramic Polymer Technology

| Code | Primary resistance characteristics |
|---|---|
| **TEMAT001** | Resists water, oil, coolant, diluted acids, petroleum products, atmospheric agents and ozone. Fair shear strength and abrasion resistance. |
| **TEMAT002** | Resists water, oil, coolant, diluted acids, petroleum products, atmospheric agents and ozone. Good shear strength and abrasion resistance. Hypalon is especially resistant to sea water. |
| **TEMAT202** | |
| **TEMAT003** | |
| **TEMAT004** | |
| **TEMAT005** | |
| **TEMAT006** | |
| **TEMAT007** | Same characteristics as above (from 001 to 006). Kevlar has excellent shear strength. Normally used when there is heavy mechanical stress, heavy concentration of sharp shavings, and high temperatures. |
| **TEMAT008** | Excellent resistance to mineral and vegetable oils, hydrocarbons, water and gas. Good mechanical properties. Normally used in the food industry since appropriate for use around oil, grease, blood, etc. |
| **TEMAT009** | Especially suited to high and low temperatures. Fiberglass has strong temperature resistance, but poor mechanical strength. Silicone is an excellent anti-adhesive and resists chlorides, solvents, UV rays and ozone. |
| **TEMAT091** | Fabric appropriate for use around small weld splatter. Also suitable for use around acids. **Self-extinguishing.** |
| **TEMAT102** | Work areas with heavy concentration of acids. Highly anti-adhesive surface. Low friction coefficient. Chemically inert. Resists formation of mold and fungus. Non-toxic. Highly limited thermal expansion. Transparent to microwaves and UV rays. Teflon is suitable for all acids except SODIUM-POTASSIUM-FLUORIDE at temperatures beginning at 150°C. |
| **TEMAT104** | |
| **TEMAT106** | Excellent resistance to oils and chemical products. No adhesive surface. Low friction coefficient. Excellent chemical inertia. Excellent resistance to abrasion and bending resistance. **Mainly used in grinding machines.** |
| **TEMAT011** | **Self-extinguishing** by nature. Carbon fibers resist up to 2500°C for short periods. Excellent mechanical strength. The aluminum-coating reflects radiant heat. Resists heavy weld splatter and molten metal; mainly used in foundries. |
| **TEMAT012** | Used for harsh working environments with heavy concentrations of sharp shavings and high temperatures. Excellent resistance to acids. |
| **TEMAT013** | |
| **TEMAT014** | |
| **TEMAT122** | **STEEL-TEX is a the stainless steel roll-up cover with polyurethane. It is cut resistant on impact with incandescent and sharp metal shavings and offers exceptional resistance during dry working or with coolants. It is compact, weighs 0.9 kg per sq.m and is 0.8mm thick and can be installed on the entire range of P.E.I. roll-up covers.** |
| **TEMAT015** | Good resistance to petroleum products, oils and heavy abrasion. Excellent bending strength. |
| **TEMAT151** | |
| **TEMAT152** | |
| **TEMAT153** | Good resistance to petroleum products, oils and fair abrasion resistance. Used for manufacturing thermic-welded round bellows. |
| **TEMAT160** | Good resistance to petroleum products, oils and heavy abrasion. The two-ply fabric insert gives high transverse rigidity and attractive appearance. Normally used around large quantities of shavings. Not suitable for dry use with hot shavings. **Static-proof.** |
| **TEMAT161** | Good resistance to petroleum products, oils and heavy abrasion. Good transverse rigidity. Normally used around medium quantities of shavings. Not suitable for dry use with hot shavings. |
| **TEMAT162** | Good resistance to petroleum products, oils and heavy abrasion. The two-ply fabric insert gives high transverse rigidity and attractive appearance. Normally used around large quantities of shavings. Not suitable for dry use with hot shavings. **Static-proof.** |
| **TEMAT164** | Good resistance to petroleum products, oils and heavy abrasion. Excellent bending strength. Excellent mechanical strength; Kevlar has excellent shear strength. Normally used when there is heavy concentration of sharp shavings, and high temperatures. |
| **TEMAT165** | Good resistance to petroleum products, oils and heavy abrasion. Excellent bending strength. Excellent mechanical strength. Good resistance to small weld splatter or hot material. Widely used in laser cutting machines. **Self-extinguishing.** |
| **TEMAT169** | **Excellent resistance to petroleum products, oils and heavy abrasion; high abrasion resistance; excellent mechanical strength and bending strength. Good resistance to small weld splatter or hot material; at present considered the best commercial material to be used in laser cutting machines. Self-extinguishing.** |
| **TEMAT170** | **Excellent resistance to petroleum products, oils and heavy abrasion. The two-ply fabric insert gives a very high transverse rigidity and an attractive appearance. Normally used around large quantities of shavings. We recommend the constant use of coolant. SELF-EXTINGUISHING FABRIC.** |
| **TEMAT180** | **CERAMIX has an excellent abrasion resistance and excellent shear strength. CERAMIX shows excellent resistance to mineral oils and hot temperatures. The two-ply fabric insert gives an high transverse rigidity and a very attractive appearance. CERAMIX is used when large quantities of hot and shearing shavings are produced, in cases of high speed chip-removing in wet and dry work environments. ANTISTATIC-PROOF AND SELF-EXTINGUISHING.** |
| **TEMAT017** | Mainly used around heavy ambient dust, small splatter of coolant and oil. Also appropriate for use around acids. |
| **TEMAT018** | |
| **TEMAT019** | |
| **TEMAT020** | |
| **TEMAT022** | This material consists of high-strength polyester netting with a grid of 20 x 20 mm. It is used for special applications. We can provide other types of nettings with different thickness and/or grid. |