



# BELLOWS AND COVERS



[www.joycedayton.com](http://www.joycedayton.com)

# BELLOWS AND COVERS



## REDUCE EXPENSIVE MAINTENANCE AND DOWN TIME

### Protect your Equipment Investment

When bellows and covers are fitted to machinery, expensive maintenance costs and down time can be reduced or eliminated. Choose to protect exposed lead screws, ball screws, splines, shafts and other machine components with Joyce bellows and covers.

Joyce provides a full line of standard and custom manufactured bellows and covers. These are sewn into round, square, rectangular, C or U shapes with collar or flange ends. Curtain bellows and platform skirts are also available. Bellows and covers are made from coated fabrics, and offer higher durability and greater abrasion resistance than molded boots. A wide variety of fabrics and coatings are available to withstand both machine and environmental conditions at temperatures up to 550° F.



## CONFIGURATIONS



### Round Bellows

Round bellows are available in sizes as small as  $\frac{3}{4}$ " ID x  $2\frac{1}{4}$ " OD up to 26" OD, and in lengths up to 20 feet or more. Materials are available to suit many environments. These bellows may be mounted to machinery using collar or flange end conditions sewn to customer's requirements. Typical applications include protection of screws, cylinder rods or guides. Options for round bellows include, zippers, sewn tabs, and stiffeners.



### Square/Rectangular Bellows

Square and rectangular bellows are available in almost any size beginning with a 2" x 2" inside dimension. Material choices are available to meet a variety of applications and environments. Bellows can be mounted to machinery using collars or flanges that are sewn to customer specifications. Typical applications include coverings for expansion joints, connections between ducts, protection of mechanical devices or protection for square or rectangular machine components. Options for square or rectangular bellows include zippers, sewn tabs, and stiffeners.



### U-Shaped Bellows and Way Covers

U-shaped covers are frequently used as machine way covers. They are available in almost any size or material to meet different application requirements and environments. Typically they are used to protect machined surfaces from the accumulation of dirt, chips, or other debris. U-shaped covers are normally mounted horizontally over machined surfaces and held in place with flange mounts that fit the mounting hole pattern specified by the customer.

## CONFIGURATIONS CONTINUED



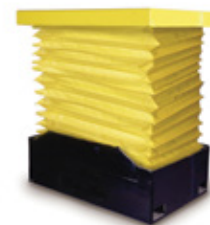
### C-Shaped Bellows and Way Covers

C-Shaped covers, available in almost any size or material, can be sewn to meet a variety of application requirements and environments. They typically include plastic stiffeners configured to the shape of the rails which they protect. These covers may be mounted vertically or in other positions where maintaining the correct position would otherwise be difficult. Flanges with customer-specified mounting hole patterns, or Velcro strips are used to mount these C-shaped bellows.



### Curtain Bellows

Curtain bellows are available in almost any size or material to meet a variety of applications or environments. Flat bellows may incorporate stiffeners to help hold their original shape and allow them to be mounted vertically or horizontally. Typical applications are to screen an area to prevent accumulation of debris in a recess or to provide protection in a single plane.



### Platform Skirt Bellows

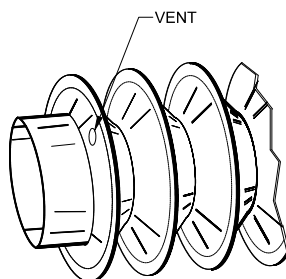
Platform skirts are large rectangular or square bellows that are mounted vertically around lift tables and other machinery to protect the area beneath from exposure to foreign objects. An added benefit of their use is the reduction of accumulated debris beneath the protected structure. Platform skirts are constructed of vinyl coated polyester and they typically include a flat mounting bar along the top edge and a weighted bar at the lower flange. Platform skirts may be specified in most sizes and with two, three, or four sides.

## OPTIONS



### Sewn Tabs

Sewn tabs are recommended as an option on bellows with long travel lengths. These tabs limit the flexing of individual convolutions and thus stabilize long bellows. They also limit stress to the seams between convolutions. Experienced Customer Service Representatives can help you determine if these sewn tabs would be a benefit for your application.



### Vents

Vent holes placed in one or more sewn convolution allow the bellows to collapse more quickly in fast cycling applications. This simple addition to bellows permits air to escape or enter the bellows quickly.



### Zippers

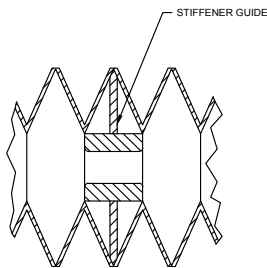
Zippered bellows make installation and replacement possible when machines cannot be disassembled. When these bellows are specified there is no need to detach the part that is being covered. Adding zippers to bellows increases the collapsed dimension compared to the non-zippered option. Typically, zippers are installed in a spiral to minimize this increase. Some material selections, like Teflon® coated fiberglass and Silicone coated fiberglass, exclude the possibility of zipper installation. Contact Joyce/Dayton with specific application requirements.

## OPTIONS CONTINUED



### Hose Clamps

Hose clamps are used to attach round bellows with collars to machine structures. All round bellows with collar ends are provided with appropriately sized stainless steel hose clamps.



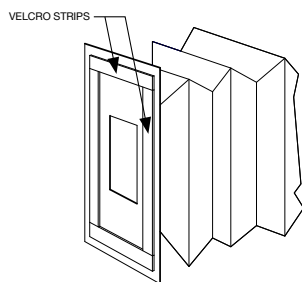
### Stiffener Guides

Stiffener guides are plastic elements used to provide additional stiffness and support to non-vertical bellows. These plastic supports are designed to prevent the bellows from contacting the internal diameter or surface that the bellows protect. Stiffener guides for round bellows are typically mounted on the inside and may increase the closed dimension of the bellows. Non-circular stiffener guides are sometimes used to support long horizontal way covers. These guides are fitted between sewn convolutions.



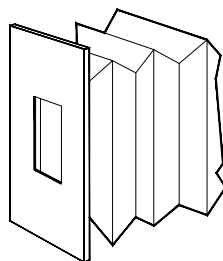
### Grommets

Long, horizontal installations may require a bellows with grommets to minimize contact between the bellows and the item being covered. External grommets can be threaded onto a guidewire for additional support. Contact Joyce/Dayton with your requirements for this custom option.



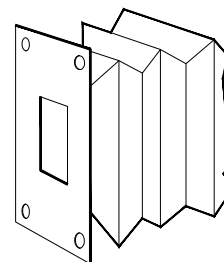
### Velcro® Strips

Velcro strips offer another option for mounting the flange ends of bellows and covers. These strips, which are attached to the flat face of flanges, are available in both cloth and plastic Velcro materials. Customers using Velcro strips do not need to specify a mounting hole pattern for flanges.



### Steel Back Up Flange

Steel back up flanges are sometimes used in addition to the flange ends of way covers and bellows. These steel flanges provide additional stiffness when mounting bellows and covers to machine elements. Customers may specify a mounting hole pattern to match that of the sewn fabric flange end on the bellows.



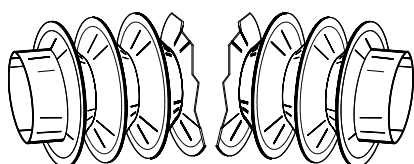
### Mounting Hole Pattern in Flange Ends

Customers may specify the mounting hole pattern they need on the sewn fabric flange end of bellows. These mounting holes permit easy installation of bellows onto the customer's machinery. If added mounting stiffness is required, customers may add as an option, steel back up flanges with coordinating hole patterns.



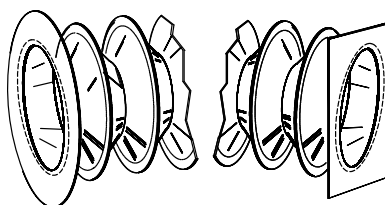
# BELLOWS AND COVERS

## END CONDITIONS



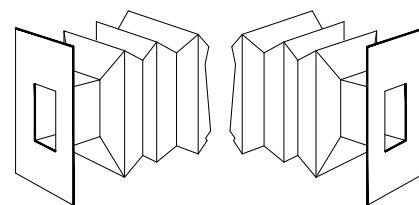
### Mounting Collars

Mounting collars sewn to the ends of the bellow or cover can be provided in the length and diameter dictated by the specific application. Stainless steel hose clamps are provided for all bellows specified with mounting collars. Contact Joyce/Dayton with questions about best practices for specifying collar dimensions.



### Flange Ends

Flanges or flat panels sewn to the end of bellows on one or both ends are frequently used to mount bellows into the machine assembly. Flanges can be provided in all sizes with a hole pattern specified by the customer. They may also be mounted using Velcro® strips.



### Flange-Collar Ends

Flange-collar ends consist of flanges added to the collar ends on bellows. This allows them to be mounted using fasteners that attach the flat face of the flange to the machine element.

## BELLOWS AND COVERS MATERIAL SPECIFICATIONS

- Standard bellows and covers are made of neoprene coated nylon material which is suitable for temperatures ranging from -60° F to 250° F.
- Standard platform skirts are made of vinyl coated polyester.

Coating (Color)	Base Mat'l	Nominal Thickness	Temperature Range	Properties	Limitations
Neoprene (Black)	Nylon	.020" (.51 mm)	-60° F to 250° F (-51° C to 121° C)	Resistant to moderate chemicals, acids, oils, fats, grease and many solvents. Good weathering and physical properties, flame retardant.	Attacked by strong oxidizing acids, esters, ketones, chlorinated aromatic and nitro hydrocarbons.
Hypalon (Black or Green)	Nylon	.023" (.53 mm) to .024" (.61 mm)	-60° F to 300° F (-51° C to 149° C)	Well suited for use in corrosive chemical environments. Offers additional resistance particularly against oxidizing agents like sulfuric acid, hypochlorites, high ozone, moderate chemicals, acids, oils, fats, grease and many solvents. Good weathering and physical properties, flame retardant.	Attacked by concentrated oxidizing acids, esters, ketones, chlorinated aromatic and nitro hydrocarbons.
Aluminum (Silver)	Fiberglass	.020" (.51 mm)	-100° F to 550° F (-73° C to 288° C)	Excellent heat resistance and is not combustible. Will not rot or decay. Resistant to many solvents, weather and corrosive vapors. Has a 95% reflective heat property.	Man-made material whose main constitute is silica sand. Begins to melt at 750° F.
Silicone (Red)	Fiberglass	.022" (.55 mm)	-100° F to 450° F (-73° C to 232° C)	Resistant to moderate or oxidizing chemicals, ozone and concentrated sodium hydroxide.	Attacked by many solvents, oils, concentrated acids and diluted sodium hydroxide.
Teflon® (Brown)	Fiberglass	.010" (.25 mm)	-100° F to 500° F (-73° C to 260° C)	Very good chemical inertness and resistance to a wide range of fluids. Only a few rare fluids will attack Teflon.	Very stiff material that is not easily adapted for very small bellows.
Vinyl (Yellow)	Polyester	.039" (.58 mm)	-30° F to 158° F (-34° C to 70° C)	Good resistance to mildew and weather. Water repellent.	Not suited for extremely low temperatures. Bulky, best used for platform skirts.

# SELECTION GUIDE WORKSHEET

## BELLOWS AND COVERS



Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_ Project \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Standard bellows are available for Joyce/Dayton Jacks and Actuators. If you need additional information contact Joyce/Dayton.

### Bellows Shape

- |                                           |                                  |
|-------------------------------------------|----------------------------------|
| <input type="checkbox"/> Round            | <input type="checkbox"/> C-Shape |
| <input type="checkbox"/> Square/Rectangle | <input type="checkbox"/> U-Shape |
| <input type="checkbox"/> Curtain          |                                  |

### Bellows Will Be Used To Protect:

- |                                         |                                                 |
|-----------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Machine Screw  | <input type="checkbox"/> Hydraulic Cylinder Rod |
| <input type="checkbox"/> Ball Screw     | <input type="checkbox"/> Pneumatic Cylinder Rod |
| <input type="checkbox"/> Guide Rods     | <input type="checkbox"/> Other                  |
| <input type="checkbox"/> Slides or Ways |                                                 |

### Bellows Attachment First End

#### Mounting Shape

- ☐ Round  
☐ Square/Rectangle  
☐ Curtain  
☐ Other

#### Mounting Style

- ☐ Collar  
☐ Flange

#### Collar Details

- ☐ \_\_\_\_\_ Diameter  
☐ \_\_\_\_\_ Length

#### Flange Details

- ☐ \_\_\_\_\_ I.D. Dimension  
☐ \_\_\_\_\_ O.D. Dimension  
☐ \_\_\_\_\_ Bolt Circle  
☐ \_\_\_\_\_ Flange Plate

### Bellows Attachment Second End

#### Mounting Shape

- ☐ Round  
☐ Square/Rectangle  
☐ Curtain  
☐ Other

#### Mounting Style

- ☐ Collar  
☐ Flange

#### Collar Details

- ☐ \_\_\_\_\_ Diameter  
☐ \_\_\_\_\_ Length

#### Flange Details

- ☐ \_\_\_\_\_ I.D. Dimension  
☐ \_\_\_\_\_ O.D. Dimension  
☐ \_\_\_\_\_ Bolt Circle  
☐ \_\_\_\_\_ Flange Plate

### Diameter To Be Covered

- ☐ \_\_\_\_\_ inch  
☐ \_\_\_\_\_ mm

### Mounting Orientation

- ☐ Vertical  
☐ Horizontal

### Extended Dimension

- ☐ \_\_\_\_\_ inch  
☐ \_\_\_\_\_ mm

### Retracted Dimension

- ☐ \_\_\_\_\_ inch  
☐ \_\_\_\_\_ mm

### Environmental and Other Considerations

#### Temperature

- ☐ + \_\_\_\_\_ °F to - \_\_\_\_\_ °F  
☐ + \_\_\_\_\_ °C to - \_\_\_\_\_ °C

#### Environment

- |                                    |                                  |
|------------------------------------|----------------------------------|
| <input type="checkbox"/> Dust      | <input type="checkbox"/> Dirt    |
| <input type="checkbox"/> Sand      | <input type="checkbox"/> Water   |
| <input type="checkbox"/> Oil       | <input type="checkbox"/> Outdoor |
| <input type="checkbox"/> Wash Down |                                  |

#### Application Factors

- ☐ Vegetable or Animal Oils, Weather, Abrasion  
☐ Ozone, Acids, Vegetable or Animal Oils, Abrasion  
☐ Weather, Mildew  
☐ Weld Splatter, Flame  
☐ Most Chemicals

### Other Options

- |                                                                                                  |                                                                          |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <input type="checkbox"/> Tabs to stabilize long vertical bellows                                 | <input type="checkbox"/> Internal guides for long horizontal bellows     |
| <input type="checkbox"/> Zippered bellows for replacement or when access to machinery is limited | <input type="checkbox"/> Grommets for vertical or horizontal guide wires |

### Design Tips

Please include a drawing along with your worksheet submission.

1. Design and order equipment with the bellows in mind to maximize extended travel and minimize retracted distances.
2. Allow room for the retracted bellows in your overall design. Adding bellows increases the space required.
3. Zippered bellows will increase closed dimensions, but they make bellows replacement/installation possible when machines cannot be disassembled.

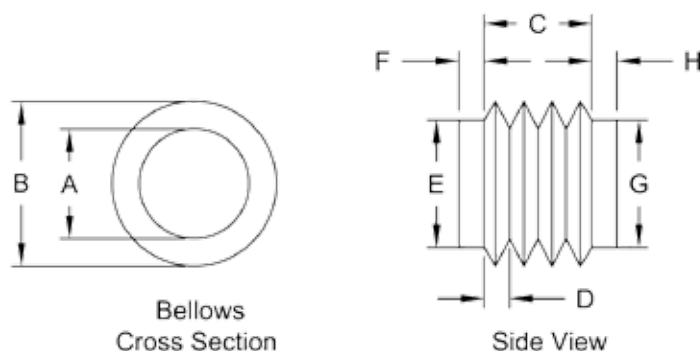


# SELECTION GUIDE WORKSHEET

## BELLOWS AND COVERS

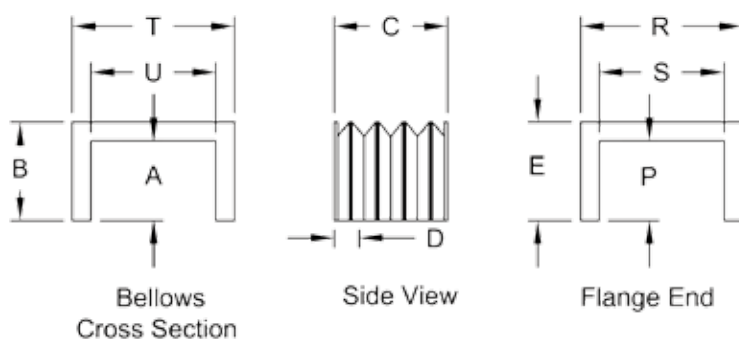
Select the style of bellows or cover needed and add dimensions to the corresponding chart. The diagrams below depict the common configurations but other options are available. To order C-shaped, curtain, or platform skirt bellows, contact Joyce/Dayton or visit us online. Custom bellows are also available.

### Round Bellows



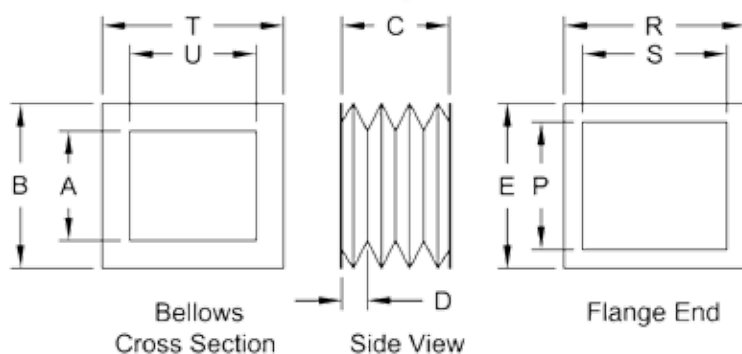
Round Bellows (Sewn Construction)					
(A)		Bellows I.D.	(E)		Collar ID
(B)		Bellows O.D.	(F)		Collar Length
(C)		Extended Length	(G)		Collar ID
(D)		Retracted Length	(H)		Collar Length

### U-Shaped Way Covers



U-Shaped Way Cover (Sewn Construction)					
(A)		Bellows Inside Height	(P)		Flange Inside Height
(B)		Bellows Outside Height	(R)		Flange Outside Width
(C)		Extended Length	(S)		Flange Inside Width
(D)		Retracted Length	(T)		Bellows Outside Width
(E)		Flange Outside Height	(U)		Bellows Inside Width

### Square or Rectangular Bellows



Square or Rectangular Bellows (Sewn Construction)					
(A)		Bellows Inside Height	(P)		Flange Inside Height
(B)		Bellows Outside Height	(R)		Flange Outside Width
(C)		Extended Length	(S)		Flange Inside Width
(D)		Retracted Length	(T)		Bellows Outside Width
(E)		Flange Outside Height	(U)		Bellows Inside Width



# PROTECT YOUR INVESTMENTS WITH JOYCE BELLOWS AND COVERS

## Typically Used to Cover:

- Guide Rods
- Hydraulic Cylinders
- Lead Screws and Nuts
- Machined Ways
- Gaps in Duct-work
- Screw Jacks and Actuators
- Exposed Machinery

## Keep Contamination Out

- Dirt
- Debris
- Weld Splatter
- Metal Chips
- Sawdust



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