# KOSTYRKA

## Cylindrical Clamping Sleeves

## Flange Type Clamping Sleeves

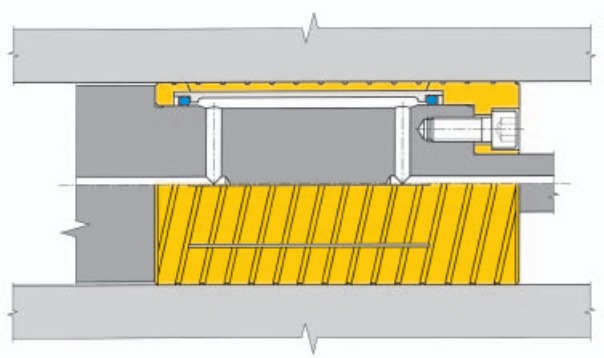
## Expanding Sleeves

Product Information

# 4 KOSTYRKA® Expanding Sleeves and Table Clamps

KOSTYRKA® expanding sleeves were developed specially for clamping turntables and dividing units. Based on the inverse of the clamping sleeves' functional principle, the expanding sleeve's slotted jacket is expanded by oil pressure. Thus the surrounding table, for example, is gripped from inside.

As with all the KOSTYRKA® clamping sleeves, an important feature here is that the table has no rotational movement as clamping is applied.



### 4.1 Dimensions

As KOSTYRKA® expanding sleeves are designed with dimensions derived from the required loads and various application conditions, it is not possible to keep standard sizes in stock. Please make an inquiry.

### 4.2 Calculating the Holding Force "F" of Expanding Sleeves

KOSTYRKA® expanding sleeves clamp on their **outer circumference**, in contrast to the versions described so far. Therefore, in the formula already known from paragraph 2.2.1, "Calculating the Holding Force of Special Sleeves"

$$F\,[daN] = d\,[cm] \cdot (L - 2a)\,[cm] \cdot \pi \cdot p\,[bar] \cdot \mu$$

or

$$F\,[lbs] = d\,[in.] \cdot (L - 2a)\,[in.] \cdot \pi \cdot p\,[psi] \cdot \mu$$

the **outer diameter** must be substituted for d in [cm] or [in.]!

The coefficient of friction, μ, again varies here from 0.07-0.12, depending on the properties of the clamping surfaces, lubricant and operating pressure.

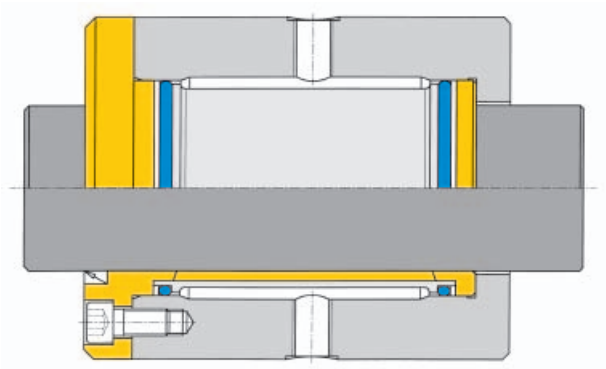
# 3 KOSTYRKA® Flange Type Clamping Sleeves

If KOSTYRKA® clamping sleeves are to be used not only to transmit axial forces but also to transmit torque, they must be provided with a flange ring. The method of operation, materials, operating conditions and general tolerances of the flange type clamping sleeves correspond to those of the cylindrical clamping sleeves.

### 3.1 Dimensions

KOSTYRKA® flange type clamping sleeves are only made to meet particular requirements, and are not produced as standard series. Our copyable inquiry data sheet (Para. 9) gives you the opportunity to precisely specify the necessary dimensions and the working and application conditions when you make your inquiry.

KOSTYRKA® flange type clamping sleeves are currently made in over 1.600 different versions, having clamping diameters up to 1.200 mm (47 in.) and total lengths of up to 750 mm (29 in.).



### 3.2 Calculation of the Transmissible Torque "Md"

The transmissible torque "Md" for any given flange type clamping sleeve can be obtained by multiplying the holding force "F" by the interior sleeve radius "d/2":

$$Md\ [daNm] = d\ [cm] \cdot (L - 2a)\ [cm] \cdot \pi \cdot p\ [bar] \cdot \mu \cdot d/2\ [cm] / 100$$

or

$$Md\ [lb.ft.] = d\ [in.] \cdot (L - 2a)\ [in.] \cdot \pi \cdot p\ [psi] \cdot \mu \cdot d/2\ [in.] / 12$$

The coefficient of friction "μ" varies from 0.07 to 0.12 depending on the properties of the clamped surfaces, the lubricant and the operating pressure.

**Note**: the length "L" is the flange type clamping sleeve's fitting length, i.e. the full length excluding the flange thickness.

### 3.3 Torsional Stiffness

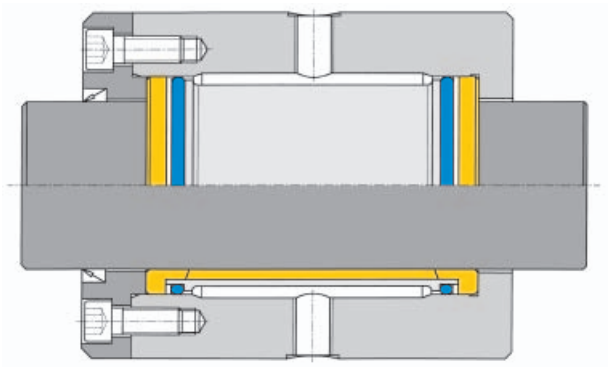
A formula for calculation of the torsional stiffness can not be given. Essentially, the rotational stiffness of a system using KOSTYRKA® flange type clamping sleeves becomes larger as the fitting length is reduced and the operating pressure is increased.

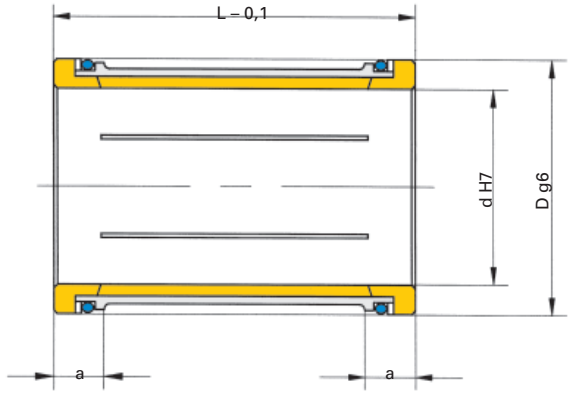
The following experimental result can serve as a guide:
A KOSTYRKA® flange type clamping sleeve with a clamp diameter of 280 mm (11 in.) and a fitting length of 75 mm (3 in.) was subjected to a torque of 6.000 Nm (4,500 lb.ft) with a clamping pressure of 210 bar (3,000 psi.). The clamped part, a turntable, was displaced by 0° 0' 9" (9 angular seconds). When the torque was maintained, no "creeping" could be observed. With the torque removal, the turntable sprang elastically back to its initial position.

# 2 KOSTYRKA®
# Cylindrical Clamping Sleeves

## 2.1 Standard Dimensions

The table below gives the dimensions of the 20 sizes which are supplied in the standard range.

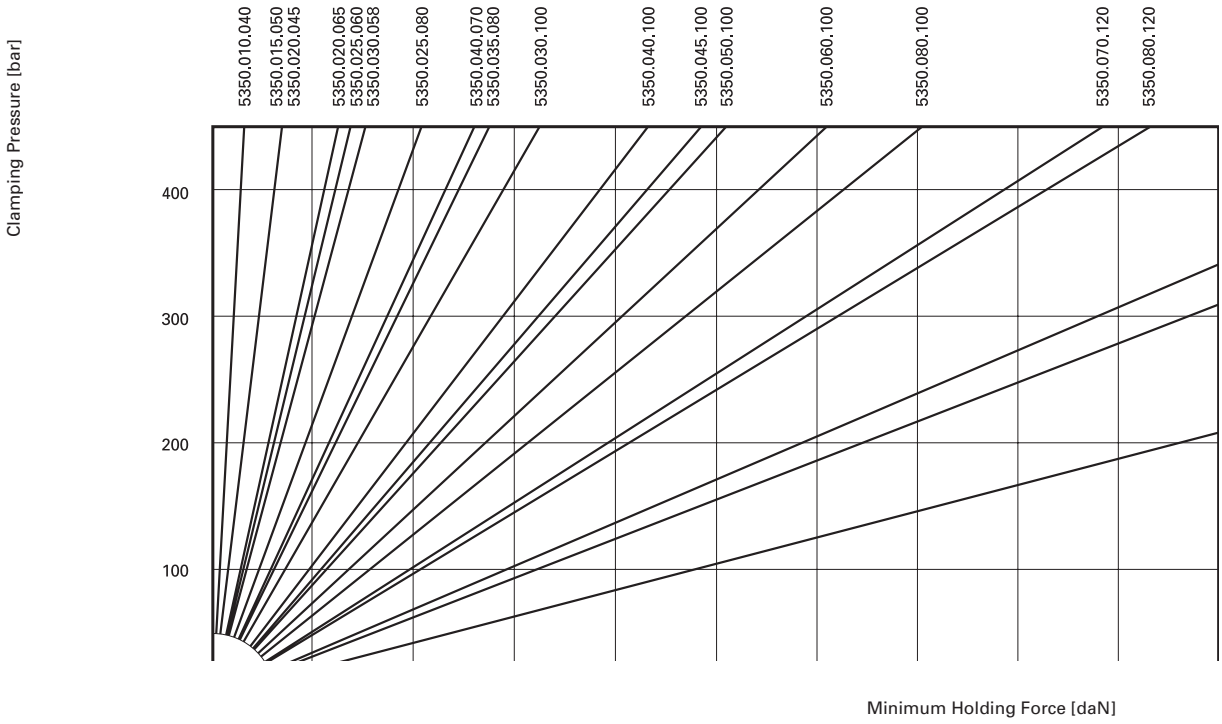





| Type | d | D | L | a | O-rings | Back-up rings |
|---|---|---|---|---|---|---|
| 5350.010.040 | 10 | 20 | 40 | 9,5 | 114 / 15,54 x 2,62 | SG – 15,5 x 020 x 1,4 – P |
| 5350.015.050 | 15 | 25 | 50 | 9,5 | 117 / 20,29 x 2,62 | SG – 20,5 x 025 x 1,4 – P |
| 5350.020.045 | 20 | 30 | 45 | 10,0 | 120 / 25,07 x 2,62 | SG – 25,5 x 030 x 1,4 – P |
| 5350.020.065 | 20 | 30 | 65 | 10,0 | 120 / 25,07 x 2,62 | SG – 25,5 x 030 x 1,4 – P |
| 5350.025.060 | 25 | 35 | 60 | 11,0 | 123 / 29,82 x 2,62 | SG – 30,5 x 035 x 1,4 – P |
| 5350.025.080 | 25 | 35 | 80 | 11,0 | 123 / 29,82 x 2,62 | SG – 30,5 x 035 x 1,4 – P |
| 5350.030.058 | 30 | 40 | 58 | 11,5 | 126 / 34,59 x 2,62 | SG – 35,5 x 040 x 1,4 – P |
| 5350.030.100 | 30 | 40 | 100 | 11,5 | 126 / 34,59 x 2,62 | SG – 35,5 x 040 x 1,4 – P |
| 5350.035.080 | 35 | 45 | 80 | 12,0 | 129 / 39,34 x 2,62 | SG – 40,5 x 045 x 1,4 – P |
| 5350.040.070 | 40 | 50 | 70 | 12,0 | 132 / 44,12 x 2,62 | SG – 45,5 x 050 x 1,4 – P |
| 5350.040.100 | 40 | 50 | 100 | 12,0 | 132 / 44,12 x 2,62 | SG – 45,5 x 050 x 1,4 – P |
| 5350.045.100 | 45 | 55 | 100 | 12,0 | 136 / 50,47 x 2,62 | SG – 50,5 x 055 x 1,4 – P |
| 5350.050.100 | 50 | 65 | 100 | 14,0 | 228 / 56,74 x 3,53 | SU – 58,8 x 065 x 1,4 – P |
| 5350.060.100 | 60 | 75 | 100 | 14,0 | 231 / 66,27 x 3,53 | SU – 68,8 x 075 x 1,4 – P |
| 5350.070.120 | 70 | 85 | 120 | 15,0 | 234 / 75,79 x 3,53 | SU – 78,8 x 085 x 1,4 – P |
| 5350.080.100 | 80 | 100 | 100 | 18,5 | 341 / 88,27 x 5,33 | SU – 90,6 x 100 x 1,7 – P |
| 5350.080.120 | 80 | 100 | 120 | 18,5 | 341 / 88,27 x 5,33 | SU – 90,6 x 100 x 1,7 – P |
| 5350.100.140 | 100 | 125 | 140 | 18,5 | 349 / 113,67 x 5,33 | SU – 115,6 x 125 x 1,7 – P |
| 5350.120.115 | 120 | 140 | 115 | 18,5 | 354 / 129,54 x 5,33 | SU – 130,6 x 140 x 1,7 – P |
| 5350.150.140 | 150 | 175 | 140 | 18,5 | 363 / 164,47 x 5,33 | SU – 165,6 x 175 x 1,7 – P |

### 2.1.1 Holding Force of Standard Sleeves (Diagram)

Minimum slippage resistances of round parts clamped with standard range KOSTYRKA® clamping sleeves as a function of clamping force. A constant coefficient of friction of μ = 0.1 is assumed for all operating pressures.




### 2.2 Special Dimensions

Application conditions and available space often call for the use of special clamping sleeves with unusual dimensions which are not listed in the above table. Our copyable inquiry data sheet (Para. 9) gives you the opportunity to precisely specify the necessary dimensions and the working and application conditions when you make your inquiry.

KOSTYRKA® clamping sleeves can currently be used to clamp parts with diameters of 8 - 1.200 mm (0.315 - 47 in.). The maximum clamping length depends on the production method, and is about 1.500 mm (59 in.).

### 2.2.1 Calculating the Holding Force "F" of Special Sleeves

The following fomulas apply to any KOSTYRKA® cylindrical clamping sleeve with a clamp diameter "d" and a length "L", fed by a hydraulic pressure "p":

$$F\,[daN] = d\,[cm] \cdot (L - 2a)\,[cm] \cdot \pi \cdot p\,[bar] \cdot \mu$$

or

$$F\,[lbs] = d\,[in.] \cdot (L - 2a)\,[in.] \cdot \pi \cdot p\,[psi] \cdot \mu$$

The coefficient of friction "μ" varies from 0.07 to 0.12 depending on the properties of the clamped surfaces, the lubricant and the operating pressure.

**Important**: KOSTYRKA® cylindrical clamping sleeves can only transmit force in the longitudinal direction. Clamping sleeves with flange rings are needed to transmit torque!