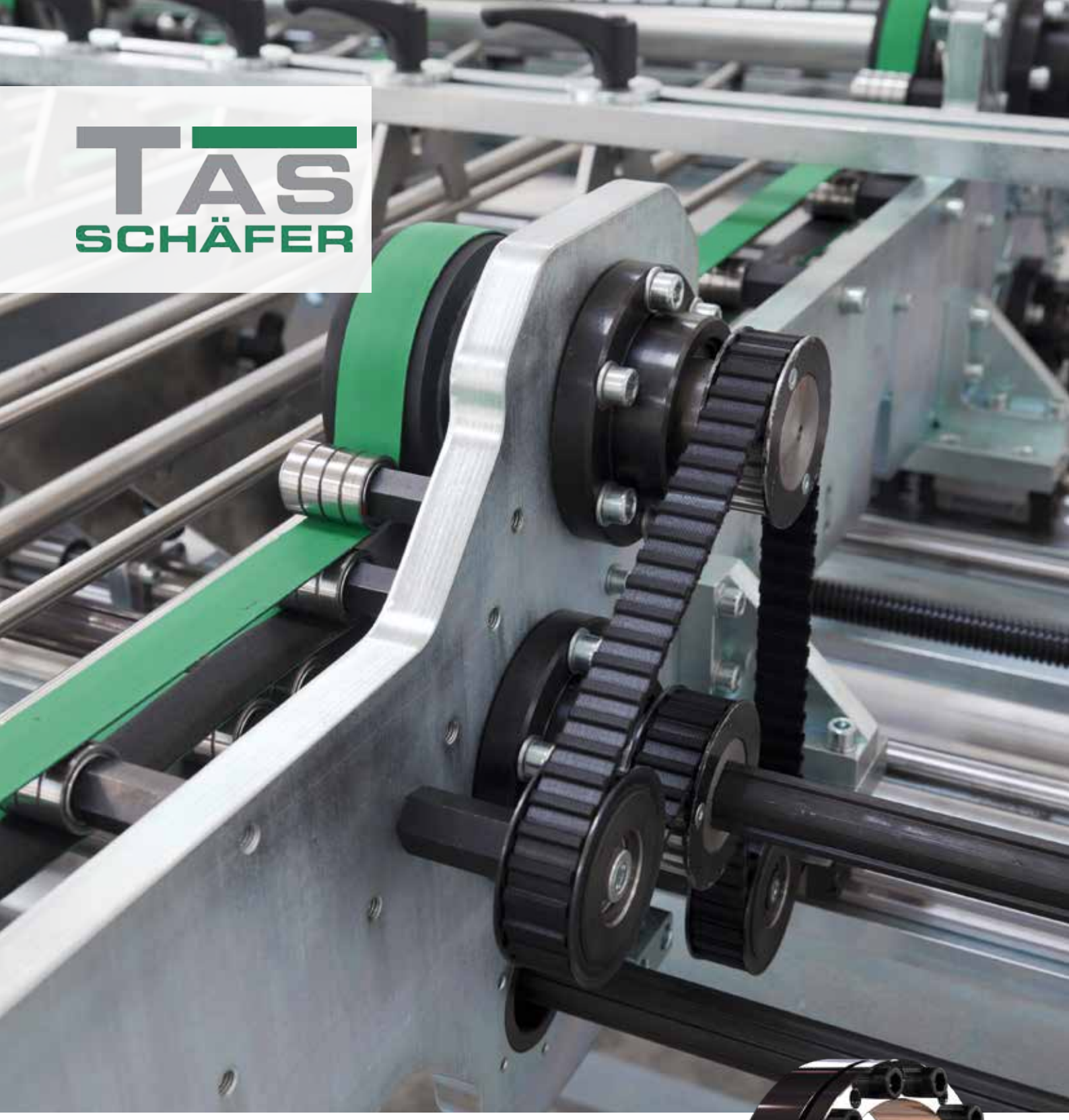
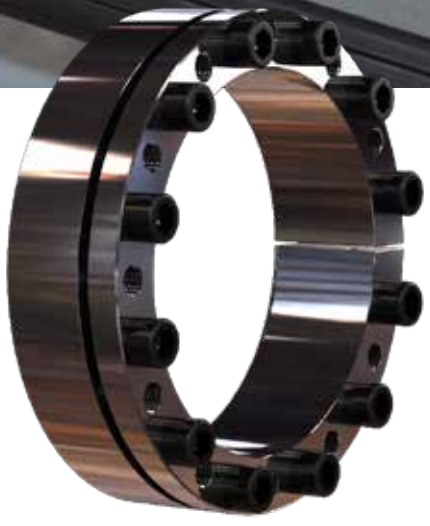
TAS SCHÄFER



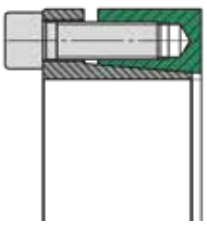


# Internal Locking Devices

**Shaft-Hub-Connection**

# Product overview

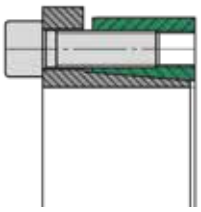
## Shaft/ Hub-connections



### 3003 plus / 3003

For low torque transmission.
For medium bending moments
Short installation lenght

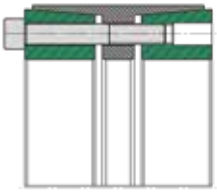
**Page 124**



### 3006 plus / 3006

For medium torque transmission.
For medium bending moments
Short installation lenght

**Page 128**



### 3012

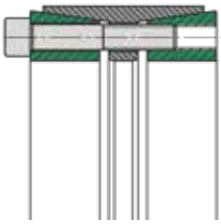
For very high torque transmission.
For high bending moments
Wide installation lenght

**Page 132**

### 3014

For high torque transmission
For medium bending moments
Wide installation lenght

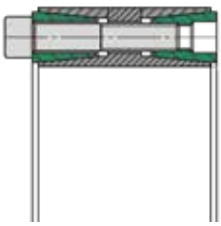
**Page 134**



### RB,3015,3015.1

For medium torque transmission.
For medium bending moments
Average installation lenght

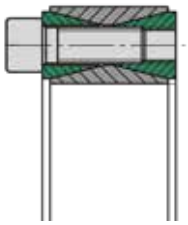
**Page 136**



### 3015 DK, 3015.1 DK

For high torque transmission.
For medium bending moments.
Average installation lenght

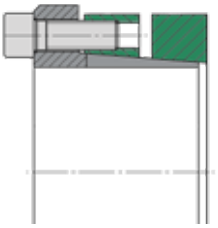
**Page 142**



### 3020

For high torque transmission
Low bending moment takes place via the hub Short installation lenght

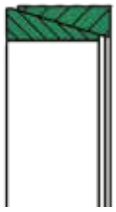
**Page 146**



### 4006

For very high torque transmission.
For very high bending moments.
Wide installation lenght (Especially for pulley)

**Page 150**



### 8006
### (Locking elements)

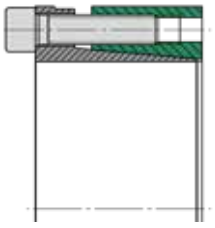
For low torque transmission
Small installation space

**Page 154**

### TAS 110

For medium torque transmission.
For medium bending moments.
Small hub diameter

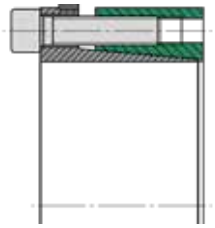
**Page 158**



### TAS 130

For medium torque transmission.
For medium bending moments.
Average installation lenght

**Page 160**



### TAS 131

For medium torque transmission.
For medium bending moments.
Average installation lenght

**Page 160**

# Description of function

## Locking devices of the types TAS ...

The main function of a locking assembly is the safe connection of a shaft to a hub by means of friction. For example, between a shaft and a gear hub. The locking assembly creates a play-free connection by expanding between the shaft and the hub. This type of connection is used mainly for transmitting torque.

It is installed by inserting the locking assembly between the components and the subsequent tightening of the screws. By using conical surfaces, the outer diameter increases and the inner diameter reduces. Radial pressure is built up. The clamping forces are provided and controlled by the screws (force-controlled). This allows the direct compensation of the clearance between shaft and hub.

The supplied locking devices are ready for installation.

To achieve proper operation with a sufficiently high coefficient of friction, the contact surfaces between shaft and hub must be clean and slightly oiled. Machine oil must be used as a lubricant. The functional surfaces of the locking assembly, threads and screw heads are prepared at the factory with oil film.

### Product data

A detailed installation manual is available on our Homepage.

**Data sheets**

Contact us if a data sheet for an individual product is required.

• For CAD data of couplings, contact us directly, please.

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or

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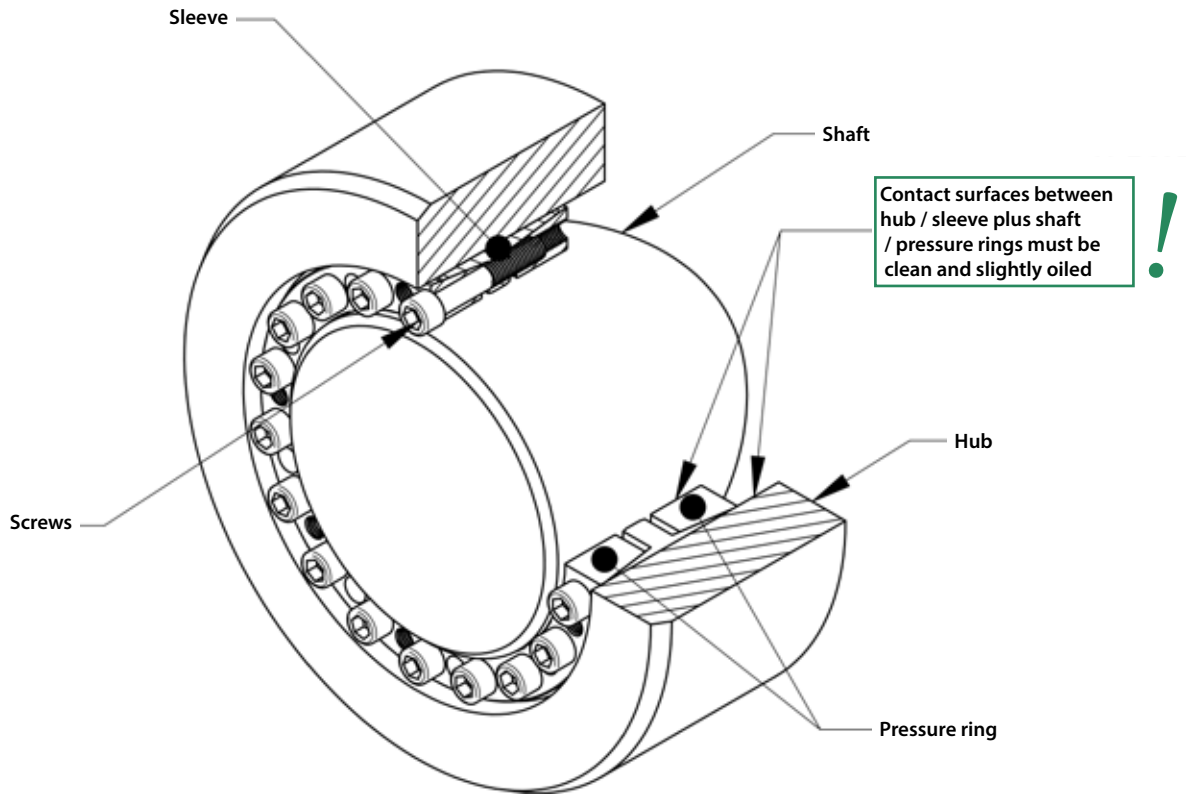


# Basic-Design

## Clamping length for locking devices

Pressure rings and bush of a locking device must be fully supported on the shaft and in the hub bore.

### Tightening torque of the clamping screws

The tightening torque values for screws given in the tables are based on a friction $\mu_{ges}$= 0,14. Basically the specified tightening torque $M_A$ can be reduced to $M_{Agew}$ , to reduce the stresses in the components. When using soft materials, as well as bored shafts, it might become necessary. By reducing $M_A$ , the pressures of $P_N$ and $P_W$ and the transmittable torque $M_t$ are also reduced. The ratio is approximately proportional and can be converted accordingly (approximately):

$$M = \frac{M_{Agew}}{M_A} M_t \quad \text{and} \quad p_{N,W} = \frac{M_{Agew}}{M_A} p_{N,w}$$

The tightening torques can not be reduced arbitrary, therefore apply the following limits:

$$M_{Agew} \geq \left| \begin{array}{l} \text{Class } 8.8 : 0{,}85\ M_A \\ \text{Class } 10.9 : 0{,}70\ M_A \\ \text{Class } 12.9 : 0{,}60\ M_A \end{array} \right| \leq M_A$$

Locking assemblies of type RB, 3015.1 and 3015.1 DK are excluded because they are already provided with reduced values.

### Tolerances and surfaces

The values found in the product data, base on surface quality and tolerances according to the tables there. These values are given as recommendations.

Higher surface roughness reduces the transmissible torque and promote unwanted settlings. Larger clearance also reduces the transmissible torque.

In case of significantly differnt values, please contact us!

The calculation of the values, given in the catalog, are based on the following assumptions and simplification:

### Transmissible torque

A connection by locking assembly is capable of transmitting torque, bending moment and axial force. Alternatively, the transmissible torque Mmax is specified in the product data. If such loads occur simultaneously, they must be added vectorially to form a resultant moment Mres. For the resultant moment applies:

$$M_{res} \leq M_{max}$$

At different load cases, these are individually checked against $M_{max}$!

$M_{res}$ is determined for combined load as follows:

$$M_{res} = \sqrt{M_T^2 + 2M_B^2 + (F_{AX} \frac{d_W}{2})^2}$$

*Basically the maximum bending moment corresponds to the maximum transmissible torque. A limitation is due to the change of the surface pressure at the edges of the connection, or by the higher loading of the locking assembly itself. Appropriate limits are found under each product. (See also under „bending moment“)

### This results in the following relationships:

**Torque only:**
The maximum torque is equivalent to $M_{max}$ .

**Bending moment only:**
The Bending moment coresponds with the indicated portion of $M_T$ , on the product page.

**Axial force only:**
The maximum axial force is $M_{max} \frac{2}{d_W}$ .

**Depending on the application, additional safety factors need to be considered for the individual loads!**



**TAS Schäfer GmbH** • Osterfeldstraße 75 • 58300 Wetter

# Basics-Calculation

**Radial Force:**

Radial forces cause a change in pressure at the contact surface. In the force direction, the pressure increases on one side and is reduced accordingly on the other side. This depends on the amount of radial forceand the rigidity of the parts. The following equation can be used to approximate the pressure change:

$$\Delta p_W = 0{,}75 \frac{F_{AX}}{d_W \, l_K}$$

The modified pressures $p_{Wmin,\,max}$ results from the following equation:

$$p_{W_{min,\,max}} = p_W \pm \Delta p_W$$

The minimum pressure $p_{Wmin}$ should be at least 30 N/mm² to avoid gap corrosion. In addition, the material must be selected for a maximum pressure $p_{Wmax}$ .

**Bending moment**

Here the situation is similar to the radial forces. The pressure is greatest at the ends of the connection in this case. Again, the amount and stiffness are important. This leads to the following approximation:

$$\Delta p_{W,\,N} = 4{,}5 \frac{M_B}{d_W \, l_K^2}$$

As before, the modified pressures results from:

$$p_{W,\,N\,min,\,max} = p_{W,\,N} \pm \Delta p_{W,\,N}$$

The conditions for minimum and maximum pressure are the same as before. It should be noted that there could be a change in pressure due to radial force!

**Shaft and hub calculation**

The catalogue contains information about the generated surface pressure of each locking assembly. Due to the generated radial pressure the hub is deformed, whereupon resilience of the shaft and surface smoothing still has to be added. For solid shafts resilience is negligible but has to be considered for hollow shafts. They are showing greater deformation and therefore greater stresses. This should be considered in addition to the other loads.

The equivalent stresses in the hub can be determined according to various hypotheses such as GEH. On the following pages you will find tables showing required hub sizes, taking pressure, shape and yield strength of hub material into consideration. The shown values for hub sizes are only valid for a solid hub cross-section! The calculation is simplified, includes no additional safety and covers the range of static loads only. Various calculation methods for different cases can be found in mechanical-engineering literature. Specialized software allows the same. For complex geometry reliable results can be determined only by verified FEA.

The minimum yield strength of solid shafts should be at least 2 * PW , the yield point of hub material at least 1 * PN. These values are for orientation only, represent minimum requirements and cannot replace calculations for each application! They also do not release from doing so!

**Notch effect**

Generally there is a notch effect on the components, caused by the radial pressure of the locking device. This depends mainly on the applied pressure. On the shaft the notch effect is usually much higher than at the hub, as the pressure is higher here. The factors are in the range of 1.2 to 1.8 at the shaft. This can, for example, be mitigated by appropriate design details, such as relief notches.

**Bore in the shaft (Hollow shaft)**

A large bore $d_B$ in the shaft or use of a hollow shaft, reduces the stiffness of this component against radial pressure. Basically, a bore should not be greater than 0,3 $d_W$.

# Hub-Calculation

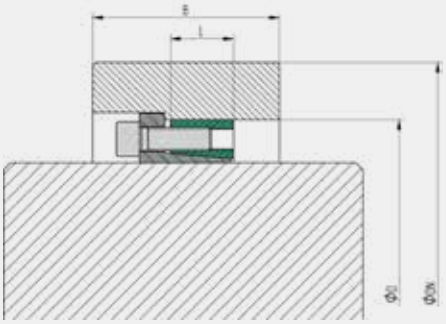
## The K-Values can directly be taken from the tables or can be calculated as follows:

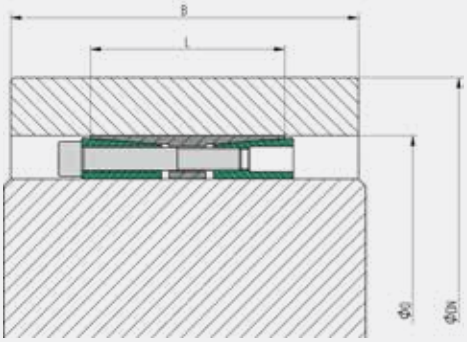
When using TAS Locking assemblies a tension is generated by the surface pressure PN between locking assembly and hub. The required hub diameter is calculated using the same formula, as used for thick-walled hollow cylinder. The real tensions depend on the hub length and shape with respect to the length L of the locking assemblies. Depending on the type of hub, the factor C is taken into account for calculation.

$$D_N \geq D \cdot K \qquad K = \sqrt{\frac{\sigma_{02} + (C \cdot p_n)}{\sigma_{02} - (C \cdot p_n)}}$$

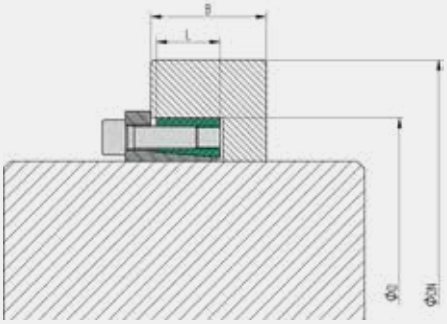
B = ≥ 2 L

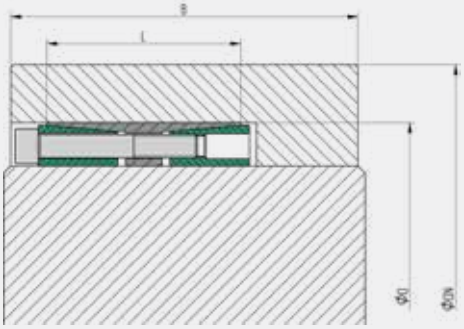
C = 0,6





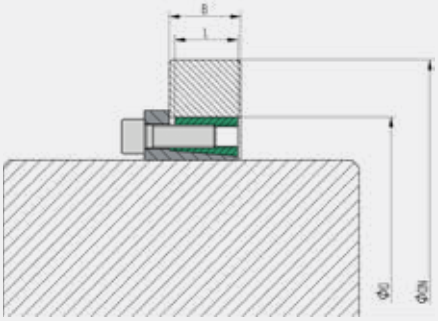
C = 0,8

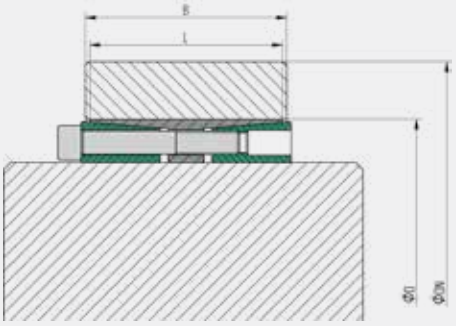




B = ≥ L

C = 1,0





# Hub Outside Diameter

| $p_N$ N/mm² | K-Factor for hubtype with C = 0,6<br>Yield strength hubmaterial (N/mm²) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 150 | 180 | 210 | 240 | 270 | 300 | 330 | 360 | 390 | 420 | 450 |
| 50 | 1,225 | 1,184 | 1,155 | 1,134 | 1,119 | 1,106 | 1,096 | 1,088 | 1,081 | 1,075 | 1,070 |
| 55 | 1,251 | 1,204 | 1,172 | 1,149 | 1,131 | 1,117 | 1,106 | 1,097 | 1,089 | 1,082 | 1,077 |
| 60 | 1,278 | 1,225 | 1,190 | 1,164 | 1,144 | 1,129 | 1,116 | 1,106 | 1,097 | 1,090 | 1,084 |
| 65 | 1,305 | 1,247 | 1,207 | 1,179 | 1,157 | 1,140 | 1,127 | 1,115 | 1,106 | 1,098 | 1,091 |
| 70 | 1,334 | 1,269 | 1,225 | 1,194 | 1,170 | 1,152 | 1,137 | 1,125 | 1,115 | 1,106 | 1,099 |
| 75 | 1,363 | 1,291 | 1,244 | 1,209 | 1,184 | 1,164 | 1,148 | 1,134 | 1,123 | 1,114 | 1,106 |
| 80 | 1,394 | 1,315 | 1,262 | 1,225 | 1,197 | 1,176 | 1,158 | 1,144 | 1,132 | 1,122 | 1,114 |
| 85 | 1,425 | 1,339 | 1,282 | 1,241 | 1,211 | 1,188 | 1,169 | 1,154 | 1,141 | 1,130 | 1,121 |
| 90 | 1,458 | 1,363 | 1,301 | 1,258 | 1,225 | 1,200 | 1,180 | 1,164 | 1,150 | 1,139 | 1,129 |
| 95 | 1,492 | 1,389 | 1,322 | 1,274 | 1,240 | 1,213 | 1,191 | 1,174 | 1,159 | 1,147 | 1,136 |
| 100 | 1,528 | 1,415 | 1,342 | 1,291 | 1,254 | 1,225 | 1,202 | 1,184 | 1,168 | 1,155 | 1,144 |
| 105 | 1,565 | 1,442 | 1,363 | 1,309 | 1,269 | 1,238 | 1,214 | 1,194 | 1,177 | 1,164 | 1,152 |
| 110 | 1,604 | 1,469 | 1,385 | 1,327 | 1,284 | 1,251 | 1,225 | 1,204 | 1,187 | 1,172 | 1,160 |
| 115 | 1,645 | 1,498 | 1,407 | 1,345 | 1,299 | 1,264 | 1,237 | 1,215 | 1,196 | 1,181 | 1,168 |
| 120 | 1,688 | 1,528 | 1,430 | 1,363 | 1,315 | 1,278 | 1,249 | 1,225 | 1,206 | 1,190 | 1,176 |
| 125 | 1,733 | 1,559 | 1,453 | 1,382 | 1,331 | 1,291 | 1,261 | 1,236 | 1,215 | 1,198 | 1,184 |
| 130 | 1,780 | 1,591 | 1,478 | 1,402 | 1,347 | 1,305 | 1,273 | 1,247 | 1,225 | 1,207 | 1,192 |
| 135 | 1,830 | 1,624 | 1,502 | 1,421 | 1,363 | 1,319 | 1,285 | 1,258 | 1,235 | 1,216 | 1,200 |
| 140 | 1,883 | 1,659 | 1,528 | 1,442 | 1,380 | 1,334 | 1,298 | 1,269 | 1,245 | 1,225 | 1,208 |
| 145 | 1,940 | 1,695 | 1,554 | 1,462 | 1,397 | 1,348 | 1,310 | 1,280 | 1,255 | 1,234 | 1,217 |
| 150 | - | 1,733 | 1,582 | 1,484 | 1,415 | 1,363 | 1,323 | 1,291 | 1,265 | 1,244 | 1,225 |
| 155 | - | 1,772 | 1,610 | 1,506 | 1,433 | 1,378 | 1,336 | 1,303 | 1,276 | 1,253 | 1,234 |
| 160 | - | 1,813 | 1,639 | 1,528 | 1,451 | 1,394 | 1,350 | 1,315 | 1,286 | 1,262 | 1,242 |
| 165 | - | 1,856 | 1,669 | 1,551 | 1,469 | 1,409 | 1,363 | 1,327 | 1,297 | 1,272 | 1,251 |
| 170 | - | 1,902 | 1,700 | 1,575 | 1,489 | 1,425 | 1,377 | 1,339 | 1,308 | 1,282 | 1,260 |
| 175 | - | 1,950 | 1,733 | 1,599 | 1,508 | 1,442 | 1,391 | 1,351 | 1,318 | 1,291 | 1,269 |
| 180 | - | - | 1,766 | 1,624 | 1,528 | 1,458 | 1,405 | 1,363 | 1,329 | 1,301 | 1,278 |
| 185 | - | - | 1,801 | 1,650 | 1,548 | 1,475 | 1,420 | 1,376 | 1,341 | 1,311 | 1,287 |
| 190 | - | - | 1,838 | 1,677 | 1,569 | 1,492 | 1,434 | 1,389 | 1,352 | 1,322 | 1,296 |
| 195 | - | - | 1,876 | 1,704 | 1,591 | 1,510 | 1,449 | 1,402 | 1,363 | 1,332 | 1,305 |
| 200 | - | - | 1,915 | 1,733 | 1,613 | 1,528 | 1,464 | 1,415 | 1,375 | 1,342 | 1,315 |
| 205 | - | - | 1,957 | 1,762 | 1,636 | 1,546 | 1,480 | 1,428 | 1,387 | 1,353 | 1,324 |
| 210 | - | - | - | 1,792 | 1,659 | 1,565 | 1,496 | 1,442 | 1,399 | 1,363 | 1,334 |
| 215 | - | - | - | 1,824 | 1,683 | 1,584 | 1,512 | 1,455 | 1,411 | 1,374 | 1,344 |
| 220 | - | - | - | 1,856 | 1,707 | 1,604 | 1,528 | 1,469 | 1,423 | 1,385 | 1,353 |
| 225 | - | - | - | 1,890 | 1,733 | 1,624 | 1,545 | 1,484 | 1,435 | 1,396 | 1,363 |
| 230 | - | - | - | 1,926 | 1,759 | 1,645 | 1,562 | 1,498 | 1,448 | 1,407 | 1,373 |
| 235 | - | - | - | 1,962 | 1,785 | 1,666 | 1,579 | 1,513 | 1,461 | 1,419 | 1,383 |
| 240 | - | - | - | - | 1,813 | 1,688 | 1,597 | 1,528 | 1,474 | 1,430 | 1,394 |
| 245 | - | - | - | - | 1,842 | 1,710 | 1,615 | 1,543 | 1,487 | 1,442 | 1,404 |
| 250 | - | - | - | - | 1,871 | 1,733 | 1,633 | 1,559 | 1,500 | 1,453 | 1,415 |

# Hub Outside Diameter

| K-Factor for hubtype with C = 0,8 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $p_N$ | Yield strength hubmaterial (N/mm²) | | | | | | | | | | |
| N/mm² | 150 | 180 | 210 | 240 | 270 | 300 | 330 | 360 | 390 | 420 | 450 |
| 50 | 1,315 | 1,254 | 1,213 | 1,184 | 1,161 | 1,144 | 1,130 | 1,119 | 1,109 | 1,101 | 1,094 |
| 55 | 1,353 | 1,284 | 1,237 | 1,204 | 1,179 | 1,160 | 1,144 | 1,131 | 1,120 | 1,111 | 1,104 |
| 60 | 1,394 | 1,315 | 1,262 | 1,225 | 1,197 | 1,176 | 1,158 | 1,144 | 1,132 | 1,122 | 1,114 |
| 65 | 1,436 | 1,347 | 1,288 | 1,247 | 1,216 | 1,192 | 1,173 | 1,157 | 1,144 | 1,133 | 1,124 |
| 70 | 1,481 | 1,380 | 1,315 | 1,269 | 1,235 | 1,208 | 1,187 | 1,170 | 1,156 | 1,144 | 1,134 |
| 75 | 1,528 | 1,415 | 1,342 | 1,291 | 1,254 | 1,225 | 1,202 | 1,184 | 1,168 | 1,155 | 1,144 |
| 80 | 1,578 | 1,451 | 1,370 | 1,315 | 1,274 | 1,242 | 1,218 | 1,197 | 1,181 | 1,166 | 1,154 |
| 85 | 1,631 | 1,489 | 1,400 | 1,339 | 1,294 | 1,260 | 1,233 | 1,211 | 1,193 | 1,178 | 1,165 |
| 90 | 1,688 | 1,528 | 1,430 | 1,363 | 1,315 | 1,278 | 1,249 | 1,225 | 1,206 | 1,190 | 1,176 |
| 95 | 1,748 | 1,569 | 1,461 | 1,389 | 1,336 | 1,296 | 1,265 | 1,240 | 1,219 | 1,201 | 1,186 |
| 100 | 1,813 | 1,613 | 1,494 | 1,415 | 1,358 | 1,315 | 1,281 | 1,254 | 1,232 | 1,213 | 1,197 |
| 105 | 1,883 | 1,659 | 1,528 | 1,442 | 1,380 | 1,334 | 1,298 | 1,269 | 1,245 | 1,225 | 1,208 |
| 110 | 1,960 | 1,707 | 1,563 | 1,469 | 1,403 | 1,353 | 1,315 | 1,284 | 1,259 | 1,237 | 1,220 |
| 115 | 2,043 | 1,759 | 1,600 | 1,498 | 1,427 | 1,373 | 1,332 | 1,299 | 1,272 | 1,250 | 1,231 |
| 120 | 2,135 | 1,813 | 1,639 | 1,528 | 1,451 | 1,394 | 1,350 | 1,315 | 1,286 | 1,262 | 1,242 |
| 125 | 2,237 | 1,871 | 1,679 | 1,559 | 1,476 | 1,415 | 1,368 | 1,331 | 1,300 | 1,275 | 1,254 |
| 130 | 2,350 | 1,934 | 1,722 | 1,591 | 1,502 | 1,436 | 1,386 | 1,347 | 1,315 | 1,288 | 1,266 |
| 135 | 2,479 | 2,000 | 1,766 | 1,624 | 1,528 | 1,458 | 1,405 | 1,363 | 1,329 | 1,301 | 1,278 |
| 140 | 2,626 | 2,073 | 1,813 | 1,659 | 1,555 | 1,481 | 1,424 | 1,380 | 1,344 | 1,315 | 1,290 |
| 145 | 2,798 | 2,151 | 1,863 | 1,695 | 1,584 | 1,504 | 1,444 | 1,397 | 1,359 | 1,328 | 1,302 |
| 150 | - | 2,237 | 1,915 | 1,733 | 1,613 | 1,528 | 1,464 | 1,415 | 1,375 | 1,342 | 1,315 |
| 155 | - | 2,330 | 1,971 | 1,772 | 1,643 | 1,553 | 1,485 | 1,433 | 1,391 | 1,356 | 1,327 |
| 160 | - | 2,434 | 2,031 | 1,813 | 1,675 | 1,578 | 1,506 | 1,451 | 1,407 | 1,370 | 1,340 |
| 165 | - | 2,550 | 2,094 | 1,856 | 1,707 | 1,604 | 1,528 | 1,469 | 1,423 | 1,385 | 1,353 |
| 170 | - | 2,680 | 2,163 | 1,902 | 1,741 | 1,631 | 1,550 | 1,489 | 1,440 | 1,400 | 1,367 |
| 175 | - | 2,829 | 2,237 | 1,950 | 1,776 | 1,659 | 1,573 | 1,508 | 1,457 | 1,415 | 1,380 |
| 180 | - | - | 2,316 | 2,000 | 1,813 | 1,688 | 1,597 | 1,528 | 1,474 | 1,430 | 1,394 |
| 185 | - | - | 2,403 | 2,054 | 1,852 | 1,717 | 1,621 | 1,548 | 1,492 | 1,446 | 1,408 |
| 190 | - | - | 2,499 | 2,111 | 1,892 | 1,748 | 1,646 | 1,569 | 1,510 | 1,461 | 1,422 |
| 195 | - | - | 2,604 | 2,172 | 1,934 | 1,780 | 1,672 | 1,591 | 1,528 | 1,478 | 1,436 |
| 200 | - | - | 2,721 | 2,237 | 1,978 | 1,813 | 1,698 | 1,613 | 1,547 | 1,494 | 1,451 |
| 205 | - | - | 2,852 | 2,306 | 2,024 | 1,848 | 1,726 | 1,636 | 1,566 | 1,511 | 1,466 |
| 210 | - | - | - | 2,381 | 2,073 | 1,883 | 1,754 | 1,659 | 1,586 | 1,528 | 1,481 |
| 215 | - | - | - | 2,462 | 2,124 | 1,921 | 1,783 | 1,683 | 1,606 | 1,546 | 1,496 |
| 220 | - | - | - | 2,550 | 2,179 | 1,960 | 1,813 | 1,707 | 1,627 | 1,563 | 1,512 |
| 225 | - | - | - | 2,646 | 2,237 | 2,000 | 1,844 | 1,733 | 1,648 | 1,582 | 1,528 |
| 230 | - | - | - | 2,752 | 2,298 | 2,043 | 1,877 | 1,759 | 1,670 | 1,600 | 1,544 |
| 235 | - | - | - | 2,869 | 2,364 | 2,088 | 1,910 | 1,785 | 1,692 | 1,619 | 1,561 |
| 240 | - | - | - | - | 2,434 | 2,135 | 1,945 | 1,813 | 1,715 | 1,639 | 1,578 |
| 245 | - | - | - | - | 2,510 | 2,184 | 1,982 | 1,842 | 1,738 | 1,659 | 1,595 |
| 250 | - | - | - | - | 2,592 | 2,237 | 2,020 | 1,871 | 1,763 | 1,679 | 1,613 |

# Hub Outside Diameter

| K-Factor for hubtype with C = 1,0 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $p_N$ | Yield strength hubmaterial (N/mm²) | | | | | | | | | | |
| N/mm² | 150 | 180 | 210 | 240 | 270 | 300 | 330 | 360 | 390 | 420 | 450 |
| 50 | 1,415 | 1,331 | 1,275 | 1,236 | 1,207 | 1,184 | 1,165 | 1,151 | 1,138 | 1,128 | 1,119 |
| 55 | 1,469 | 1,372 | 1,308 | 1,263 | 1,230 | 1,204 | 1,184 | 1,167 | 1,153 | 1,141 | 1,131 |
| 60 | 1,528 | 1,415 | 1,342 | 1,291 | 1,254 | 1,225 | 1,202 | 1,184 | 1,168 | 1,155 | 1,144 |
| 65 | 1,591 | 1,460 | 1,378 | 1,321 | 1,279 | 1,247 | 1,221 | 1,201 | 1,184 | 1,169 | 1,157 |
| 70 | 1,659 | 1,508 | 1,415 | 1,351 | 1,304 | 1,269 | 1,241 | 1,218 | 1,199 | 1,184 | 1,170 |
| 75 | 1,733 | 1,559 | 1,453 | 1,382 | 1,331 | 1,291 | 1,261 | 1,236 | 1,215 | 1,198 | 1,184 |
| 80 | 1,813 | 1,613 | 1,494 | 1,415 | 1,358 | 1,315 | 1,281 | 1,254 | 1,232 | 1,213 | 1,197 |
| 85 | 1,902 | 1,671 | 1,537 | 1,449 | 1,386 | 1,339 | 1,302 | 1,273 | 1,248 | 1,228 | 1,211 |
| 90 | 2,000 | 1,733 | 1,582 | 1,484 | 1,415 | 1,363 | 1,323 | 1,291 | 1,265 | 1,244 | 1,225 |
| 95 | 2,111 | 1,799 | 1,629 | 1,520 | 1,445 | 1,389 | 1,345 | 1,311 | 1,283 | 1,259 | 1,240 |
| 100 | 2,237 | 1,871 | 1,679 | 1,559 | 1,476 | 1,415 | 1,368 | 1,331 | 1,300 | 1,275 | 1,254 |
| 105 | 2,381 | 1,950 | 1,733 | 1,599 | 1,508 | 1,442 | 1,391 | 1,351 | 1,318 | 1,291 | 1,269 |
| 110 | 2,550 | 2,036 | 1,789 | 1,641 | 1,542 | 1,469 | 1,415 | 1,372 | 1,337 | 1,308 | 1,284 |
| 115 | 2,752 | 2,131 | 1,850 | 1,686 | 1,577 | 1,498 | 1,439 | 1,393 | 1,356 | 1,325 | 1,299 |
| 120 | 3,000 | 2,237 | 1,915 | 1,733 | 1,613 | 1,528 | 1,464 | 1,415 | 1,375 | 1,342 | 1,315 |
| 125 | 3,317 | 2,355 | 1,986 | 1,782 | 1,651 | 1,559 | 1,490 | 1,437 | 1,395 | 1,360 | 1,331 |
| 130 | 3,742 | 2,490 | 2,062 | 1,835 | 1,691 | 1,591 | 1,517 | 1,460 | 1,415 | 1,378 | 1,347 |
| 135 | 4,359 | 2,646 | 2,145 | 1,890 | 1,733 | 1,624 | 1,545 | 1,484 | 1,435 | 1,396 | 1,363 |
| 140 | 5,386 | 2,829 | 2,237 | 1,950 | 1,776 | 1,659 | 1,573 | 1,508 | 1,457 | 1,415 | 1,380 |
| 145 | 7,682 | 3,048 | 2,337 | 2,014 | 1,823 | 1,695 | 1,603 | 1,533 | 1,478 | 1,434 | 1,397 |
| 150 | - | 3,317 | 2,450 | 2,082 | 1,871 | 1,733 | 1,633 | 1,559 | 1,500 | 1,453 | 1,415 |
| 155 | - | 3,661 | 2,577 | 2,156 | 1,923 | 1,772 | 1,665 | 1,585 | 1,523 | 1,474 | 1,433 |
| 160 | - | 4,124 | 2,721 | 2,237 | 1,978 | 1,813 | 1,698 | 1,613 | 1,547 | 1,494 | 1,451 |
| 165 | - | 4,796 | 2,887 | 2,324 | 2,036 | 1,856 | 1,733 | 1,641 | 1,571 | 1,515 | 1,469 |
| 170 | - | 5,917 | 3,083 | 2,421 | 2,098 | 1,902 | 1,768 | 1,671 | 1,596 | 1,537 | 1,489 |
| 175 | - | 8,427 | 3,317 | 2,527 | 2,165 | 1,950 | 1,806 | 1,701 | 1,622 | 1,559 | 1,508 |
| 180 | - | - | 3,606 | 2,646 | 2,237 | 2,000 | 1,844 | 1,733 | 1,648 | 1,582 | 1,528 |
| 185 | - | - | 3,975 | 2,780 | 2,314 | 2,054 | 1,885 | 1,765 | 1,675 | 1,605 | 1,548 |
| 190 | - | - | 4,473 | 2,933 | 2,398 | 2,111 | 1,928 | 1,799 | 1,703 | 1,629 | 1,569 |
| 195 | - | - | 5,197 | 3,110 | 2,490 | 2,172 | 1,973 | 1,835 | 1,733 | 1,654 | 1,591 |
| 200 | - | - | 6,404 | 3,317 | 2,592 | 2,237 | 2,020 | 1,871 | 1,763 | 1,679 | 1,613 |
| 205 | - | - | 9,111 | 3,566 | 2,704 | 2,306 | 2,069 | 1,910 | 1,794 | 1,705 | 1,636 |
| 210 | - | - | - | 3,873 | 2,829 | 2,381 | 2,122 | 1,950 | 1,826 | 1,733 | 1,659 |
| 215 | - | - | - | 4,267 | 2,970 | 2,462 | 2,177 | 1,992 | 1,860 | 1,760 | 1,683 |
| 220 | - | - | - | 4,796 | 3,131 | 2,550 | 2,237 | 2,036 | 1,895 | 1,789 | 1,707 |
| 225 | - | - | - | 5,568 | 3,317 | 2,646 | 2,300 | 2,082 | 1,931 | 1,819 | 1,733 |
| 230 | - | - | - | 6,856 | 3,536 | 2,752 | 2,367 | 2,131 | 1,969 | 1,850 | 1,759 |
| 235 | - | - | - | 9,747 | 3,799 | 2,869 | 2,439 | 2,182 | 2,009 | 1,882 | 1,785 |
| 240 | - | - | - | - | 4,124 | 3,000 | 2,517 | 2,237 | 2,050 | 1,915 | 1,813 |
| 245 | - | - | - | - | 4,539 | 3,148 | 2,601 | 2,294 | 2,093 | 1,950 | 1,842 |
| 250 | - | - | - | - | 5,100 | 3,317 | 2,693 | 2,355 | 2,139 | 1,986 | 1,871 |

# 8006


## Used symbols

| | | |
|---|---|---|
| d | [mm] | Shaft diameter |
| D | [mm] | Hub inside diameter |
| L | [mm] | Lenght of the locking divece |
| l | [mm] | Width of inner ring and outer ring |
| At | [mm²] | Contact surface of the shaft |
| Fo | [N] | Pretension to eliminate tolerances (for unslitted version) |
| FA | [N] | Clamping force required to apply pressure of p = 100 N/mm² |
| T | [Nm] | Max. transmittable torque (at p = 100 N/mm²) Fax = 0 |
| Fax | [N] | Max. transmittable axial force (at p = 100 N/mm²) T = 0 |
| x | [mm] | Distance between clampings flange and hub in relation to the number of clamping elements |
| d1 | [mm] | inner diameter spacer bushing |
| D1 | [mm] | outer diameter spacer bushing |

## More properties

- axial displacement during assembly
- good self-centering
- no self-locking

## Recommended tolerances & surfaces

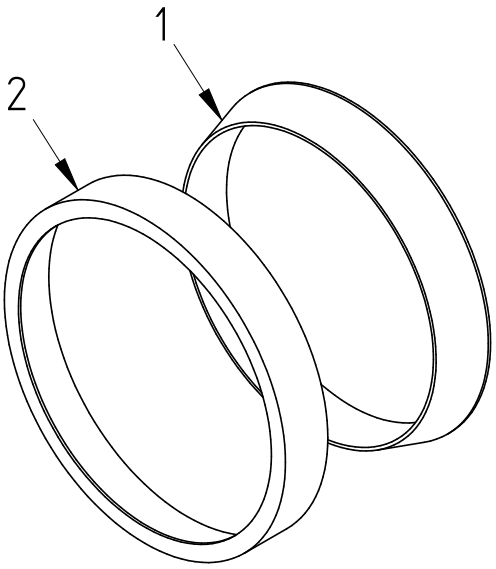
| | |
|---|---|
| Shaft | < d 38mm h6 / > d 40mm h8 / Rz10 |
| Hub | < d 38mm H7 / > d 40mm H8 / Rz10 |

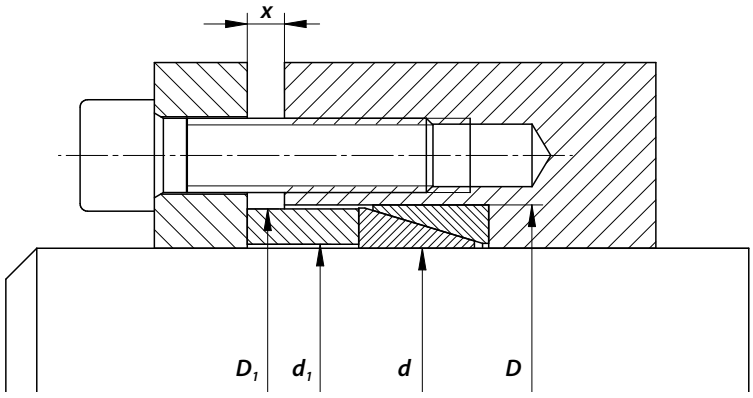
## Bending loads

Bending moment (share)
Depending on hub design and number of clamping elements

**Ordering information: TAS 8006/d/D** (z.B: TAS 8006/150/200 ...further sizes on request)
**TAS 8006/d/D slotted** (e.g: TAS 8006/150/200 slotted ... further sizes on request)

# 8006




**When arranging several elements, ensure that there is no mutual inhibition.**

| Pos. | Designation |
|---|---|
| 1 | Inner ring |
| 2 | Outter ring |

| d | | D | L | l | $A_t$ | $F_o$ | $F_A$ | T | $F_{ax}$ | x 1 | x 2 | x 3 | x 4 | Weight | $d_1$ | $D_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | | mm | mm | mm | mm² | N | N | Nm | N | Locking elements mm | | | | kg | mm | mm |
| 6 | x | 9 | 4,5 | 3,7 | 69 | - | 3240 | 2,16 | 720 | 2 | 2 | 3 | 3 | 0,00118 | 6,1 | 8,9 |
| 7 | x | 10 | 4,5 | 3,7 | 80 | - | 3780 | 2,94 | 840 | 2 | 2 | 3 | 3 | 0,00136 | 7,1 | 9,9 |
| 8 | x | 11 | 4,5 | 3,7 | 90 | - | 4300 | 3,84 | 960 | 2 | 2 | 3 | 3 | 0,00151 | 8,1 | 10,9 |
| 9 | x | 12 | 4,5 | 3,7 | 105 | 7600 | 5700 | 5,7 | 1270 | 2 | 2 | 3 | 3 | 0,00166 | 9,1 | 11,9 |
| 10 | x | 13 | 4,5 | 3,7 | 116 | 6950 | 6300 | 7 | 1400 | 2 | 2 | 3 | 3 | 0,00182 | 10,1 | 12,9 |
| 12 | x | 15 | 4,5 | 3,7 | 139 | 6950 | 7500 | 10 | 1670 | 2 | 2 | 3 | 3 | 0,00214 | 12,1 | 14,9 |
| 13 | x | 16 | 4,5 | 3,7 | 151 | 6450 | 8150 | 11,8 | 1810 | 2 | 2 | 3 | 3 | 0,00226 | 13,1 | 15,9 |
| 14 | x | 18 | 6,3 | 5,3 | 233 | 11200 | 12600 | 19,6 | 2800 | 3 | 3 | 4 | 5 | 0,00487 | 14,1 | 17,9 |
| 15 | x | 19 | 6,3 | 5,3 | 250 | 10750 | 13500 | 22,5 | 3000 | 3 | 3 | 4 | 5 | 0,00526 | 15,1 | 18,9 |
| 16 | x | 20 | 6,3 | 5,3 | 266 | 10100 | 14400 | 25,5 | 3190 | 3 | 3 | 4 | 5 | 0,00545 | 16,1 | 19,9 |
| 17 | x | 21 | 6,3 | 5,3 | 283 | 9550 | 15300 | 28,9 | 3400 | 3 | 3 | 4 | 5 | 0,0058 | 17,1 | 20,9 |
| 18 | x | 22 | 6,3 | 5,3 | 300 | 9100 | 16200 | 32,4 | 3600 | 3 | 3 | 4 | 5 | 0,00612 | 18,1 | 21,9 |
| 19 | x | 24 | 6,3 | 5,3 | 316 | 12600 | 17100 | 36 | 3790 | 3 | 3 | 4 | 5 | 0,00782 | 19,2 | 23,8 |
| 20 | x | 25 | 6,3 | 5,3 | 333 | 12050 | 18000 | 40 | 4000 | 3 | 3 | 4 | 5 | 0,00817 | 20,2 | 24,8 |
| 22 | x | 26 | 6,3 | 5,3 | 366 | 9050 | 19800 | 48 | 4400 | 3 | 3 | 4 | 5 | 0,00724 | 22,2 | 25,8 |
| 24 | x | 28 | 6,3 | 5,3 | 400 | 8350 | 21600 | 58 | 4800 | 3 | 3 | 4 | 5 | 0,00792 | 24,2 | 27,8 |
| 25 | x | 30 | 6,3 | 5,3 | 416 | 9900 | 22500 | 62 | 5000 | 3 | 3 | 4 | 5 | 0,0101 | 25,2 | 29,8 |
| 28 | x | 32 | 6,3 | 5,3 | 466 | 7400 | 25200 | 78 | 5600 | 3 | 3 | 4 | 5 | 0,00918 | 28,2 | 31,8 |
| 30 | x | 35 | 6,3 | 5,3 | 499 | 8500 | 27000 | 90 | 6000 | 3 | 3 | 4 | 5 | 0,012 | 30,2 | 34,8 |
| 32 | x | 36 | 6,3 | 5,3 | 533 | 7850 | 28800 | 102 | 6400 | 3 | 3 | 4 | 5 | 0,01 | 32,2 | 35,8 |
| 35 | x | 40 | 7 | 6 | 659 | 10100 | 35600 | 138 | 7900 | 3 | 3 | 4 | 5 | 0,017 | 35,2 | 39,8 |
| 36 | x | 42 | 7 | 6 | 678 | 11600 | 36600 | 147 | 8200 | 3 | 3 | 4 | 5 | 0,02 | 36,2 | 41,8 |
| 38 | x | 44 | 7 | 6 | 716 | 11000 | 38700 | 163 | 8600 | 3 | 3 | 4 | 5 | 0,021 | 38,2 | 43,8 |
| 40 | x | 45 | 8 | 6,6 | 829 | 13800 | 45000 | 199 | 9950 | 3 | 4 | 5 | 6 | 0,023 | 40,2 | 44,8 |
| 42 | x | 48 | 8 | 6,6 | 870 | 15600 | 47000 | 219 | 10400 | 3 | 4 | 5 | 6 | 0,028 | 42,2 | 47,8 |

# 8006

| d | | D | L | l | $A_t$ | $F_o$ | $F_A$ | T | $F_{ax}$ | x 1 | x 2 | x 3 | x 4 | Weight | $d_1$ | $D_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | | mm | mm | mm | $mm^2$ | N | N | Nm | N | Locking elements mm | | | | kg | mm | mm |
| **45** | **x** | **52** | 10 | 8,6 | 1215 | 28200 | 66000 | 328 | 14600 | 3 | 4 | 5 | 6 | 0,042 | 45,2 | 51,8 |
| **48** | **x** | **55** | 10 | 8,6 | 1296 | 24600 | 70000 | 373 | 15600 | 3 | 4 | 5 | 6 | 0,045 | 48,2 | 54,8 |
| **50** | **x** | **57** | 10 | 8,6 | 1350 | 23500 | 73000 | 405 | 16200 | 3 | 4 | 5 | 6 | 0,047 | 50,2 | 56,8 |
| **55** | **x** | **62** | 10 | 8,6 | 1485 | 21800 | 80000 | 490 | 17800 | 3 | 4 | 5 | 6 | 0,05 | 55,2 | 61,8 |
| **56** | **x** | **64** | 12 | 10,4 | 1829 | 29400 | 99000 | 615 | 22000 | 3 | 4 | 5 | 7 | 0,067 | 56,2 | 63,8 |
| **60** | **x** | **68** | 12 | 10,4 | 1959 | 27400 | 106000 | 705 | 23500 | 3 | 4 | 5 | 7 | 0,072 | 60,2 | 67,8 |
| **63** | **x** | **71** | 12 | 10,4 | 2057 | 26300 | 111000 | 780 | 24800 | 3 | 4 | 5 | 7 | 0,077 | 63,2 | 70,8 |
| **65** | **x** | **73** | 12 | 10,4 | 2123 | 25400 | 115000 | 830 | 25600 | 3 | 4 | 5 | 7 | 0,079 | 65,2 | 72,8 |
| **70** | **x** | **79** | 14 | 12,2 | 2682 | 31000 | 145000 | 1120 | 32000 | 3 | 5 | 6 | 7 | 0,111 | 70,3 | 78,7 |
| **71** | **x** | **80** | 14 | 12,2 | 2720 | 31000 | 147000 | 1160 | 32600 | 3 | 5 | 6 | 7 | 0,113 | 71,3 | 79,7 |
| **75** | **x** | **84** | 14 | 12,2 | 2873 | 34600 | 155000 | 1290 | 34400 | 3 | 5 | 6 | 7 | 0,12 | 75,3 | 83,7 |
| **80** | **x** | **91** | 17 | 15 | 3768 | 48000 | 203000 | 1810 | 45000 | 4 | 5 | 6 | 8 | 0,188 | 80,3 | 90,7 |
| **85** | **x** | **96** | 17 | 15 | 4004 | 45600 | 216000 | 2040 | 48000 | 4 | 5 | 6 | 8 | 0,2 | 85,3 | 95,7 |
| **90** | **x** | **101** | 17 | 15 | 4239 | 43400 | 229000 | 2290 | 51000 | 4 | 5 | 6 | 8 | 0,216 | 90,3 | 100,7 |
| **95** | **x** | **106** | 17 | 15 | 4475 | 41200 | 242000 | 2550 | 54000 | 4 | 5 | 6 | 8 | 0,224 | 95,3 | 105,7 |
| **100** | **x** | **114** | 21 | 18,7 | 5872 | 60700 | 317000 | 3520 | 70000 | 4 | 6 | 7 | 9 | 0,38 | 100,3 | 113,7 |
| **110** | **x** | **124** | 21 | 18,7 | 6459 | 66000 | 349000 | 4250 | 77000 | 4 | 6 | 7 | 9 | 0,41 | 110,3 | 123,7 |
| **120** | **x** | **134** | 21 | 18,7 | 7046 | 60200 | 380000 | 5050 | 84000 | 4 | 6 | 7 | 9 | 0,452 | 120,3 | 133,7 |
| **130** | **x** | **148** | 28 | 25,3 | 10328 | 96200 | 558000 | 8050 | 124000 | 5 | 7 | 9 | 11 | 0,847 | 130,3 | 147,6 |
| **140** | **x** | **158** | 28 | 25,3 | 11122 | 89000 | 600000 | 9350 | 134000 | 5 | 7 | 9 | 11 | 0,91 | 140,3 | 157,6 |
| **150** | **x** | **168** | 28 | 25,3 | 11916 | 84500 | 643000 | 10700 | 143000 | 5 | 7 | 9 | 11 | 0,967 | 150,4 | 167,6 |
| **160** | **x** | **178** | 28 | 25,3 | 12711 | 78500 | 686000 | 12200 | 152500 | 5 | 7 | 9 | 11 | 1,023 | 160,4 | 177,6 |
| **170** | **x** | **191** | 33 | 30 | 16014 | 117500 | 865000 | 16300 | 192000 | 6 | 8 | 10 | 12 | 1,5 | 170,4 | 190,5 |
| **180** | **x** | **201** | 33 | 30 | 16956 | 111200 | 916000 | 18300 | 204000 | 6 | 8 | 10 | 12 | 1,58 | 180,5 | 200,5 |
| **190** | **x** | **211** | 33 | 30 | 17898 | 105000 | 966000 | 20400 | 214000 | 6 | 8 | 10 | 12 | 1,68 | 190,5 | 210,5 |
| **200** | **x** | **224** | 38 | 34,8 | 21854 | 134000 | 1180000 | 26200 | 262000 | 6 | 8 | 11 | 13 | 2,32 | 200,6 | 223,4 |
| **210** | **x** | **234** | 38 | 34,8 | 22947 | 127000 | 1239000 | 28900 | 275000 | 6 | 8 | 11 | 13 | 2,45 | 210,6 | 233,4 |
| **220** | **x** | **244** | 38 | 34,8 | 24040 | 122000 | 1298000 | 31700 | 288000 | 6 | 8 | 11 | 13 | 2,49 | 220,6 | 243,4 |
| **230** | **x** | **257** | 43 | 39,5 | 28527 | 165000 | 1540000 | 39400 | 342000 | 6 | 9 | 12 | 14 | 3,38 | 230,6 | 256,4 |
| **240** | **x** | **267** | 43 | 39,5 | 29767 | 157500 | 1610000 | 43000 | 358000 | 6 | 9 | 12 | 14 | 3,52 | 240,6 | 266,4 |
| **250** | **x** | **280** | 48 | 44 | 34700 | 190000 | 1870000 | 52000 | 415000 | 7 | 10 | 13 | 16 | 4,68 | 250,8 | 279,2 |
| **260** | **x** | **290** | 48 | 44 | 36100 | 182000 | 1950000 | 56500 | 435000 | 7 | 10 | 13 | 16 | 4,82 | 260,8 | 289,2 |
| **270** | **x** | **300** | 48 | 44 | 37500 | 177000 | 2030000 | 61000 | 450000 | 7 | 10 | 13 | 16 | 4,94 | 270,8 | 299,2 |
| **280** | **x** | **313** | 53 | 49 | 43100 | 206000 | 2330000 | 72500 | 520000 | 7 | 10 | 14 | 17 | 6,27 | 280,8 | 312,2 |
| **290** | **x** | **323** | 53 | 49 | 44600 | 222000 | 2410000 | 77500 | 535000 | 7 | 11 | 14 | 17 | 6,5 | 290,8 | 332,2 |
| **300** | **x** | **333** | 53 | 49 | 46200 | 214000 | 2490000 | 83000 | 555000 | 7 | 11 | 14 | 17 | 6,74 | 300,8 | 322,2 |
| **320** | **x** | **360** | 65 | 59 | 59300 | 292000 | 3200000 | 114000 | 710000 | 10 | 15 | 20 | 25 | 10,9 | 321 | 359 |
| **340** | **x** | **380** | 65 | 59 | 63000 | 272000 | 3400000 | 128500 | 755000 | 10 | 15 | 20 | 25 | 11,5 | 341 | 379 |
| **360** | **x** | **400** | 65 | 59 | 66700 | 258000 | 3600000 | 144000 | 800000 | 10 | 15 | 20 | 25 | 12,2 | 361 | 399 |
| **380** | **x** | **420** | 65 | 59 | 70400 | 269000 | 3800000 | 160500 | 845000 | 10 | 15 | 20 | 25 | 12,8 | 381 | 419 |
| **400** | **x** | **440** | 65 | 59 | 74200 | 256000 | 4000000 | 178000 | 890000 | 10 | 15 | 20 | 25 | 13,5 | 401 | 439 |
| **420** | **x** | **460** | 65 | 59 | 77800 | 244000 | 4200000 | 196000 | 935000 | 10 | 15 | 20 | 25 | 14,1 | 421 | 459 |
| **440** | **x** | **480** | 65 | 59 | 81500 | 234000 | 4400000 | 215000 | 980000 | 10 | 15 | 20 | 25 | 14,7 | 441 | 479 |
| **460** | **x** | **500** | 65 | 59 | 85300 | 224000 | 4600000 | 235000 | 1020000 | 10 | 15 | 20 | 25 | 15,4 | 461 | 499 |
| **480** | **x** | **520** | 65 | 59 | 89000 | 239000 | 4800000 | 256000 | 1070000 | 10 | 15 | 20 | 25 | 16 | 481 | 519 |
| **500** | **x** | **540** | 65 | 59 | 92700 | 229000 | 5000000 | 278000 | 1110000 | 10 | 15 | 20 | 25 | 16,6 | 501 | 539 |