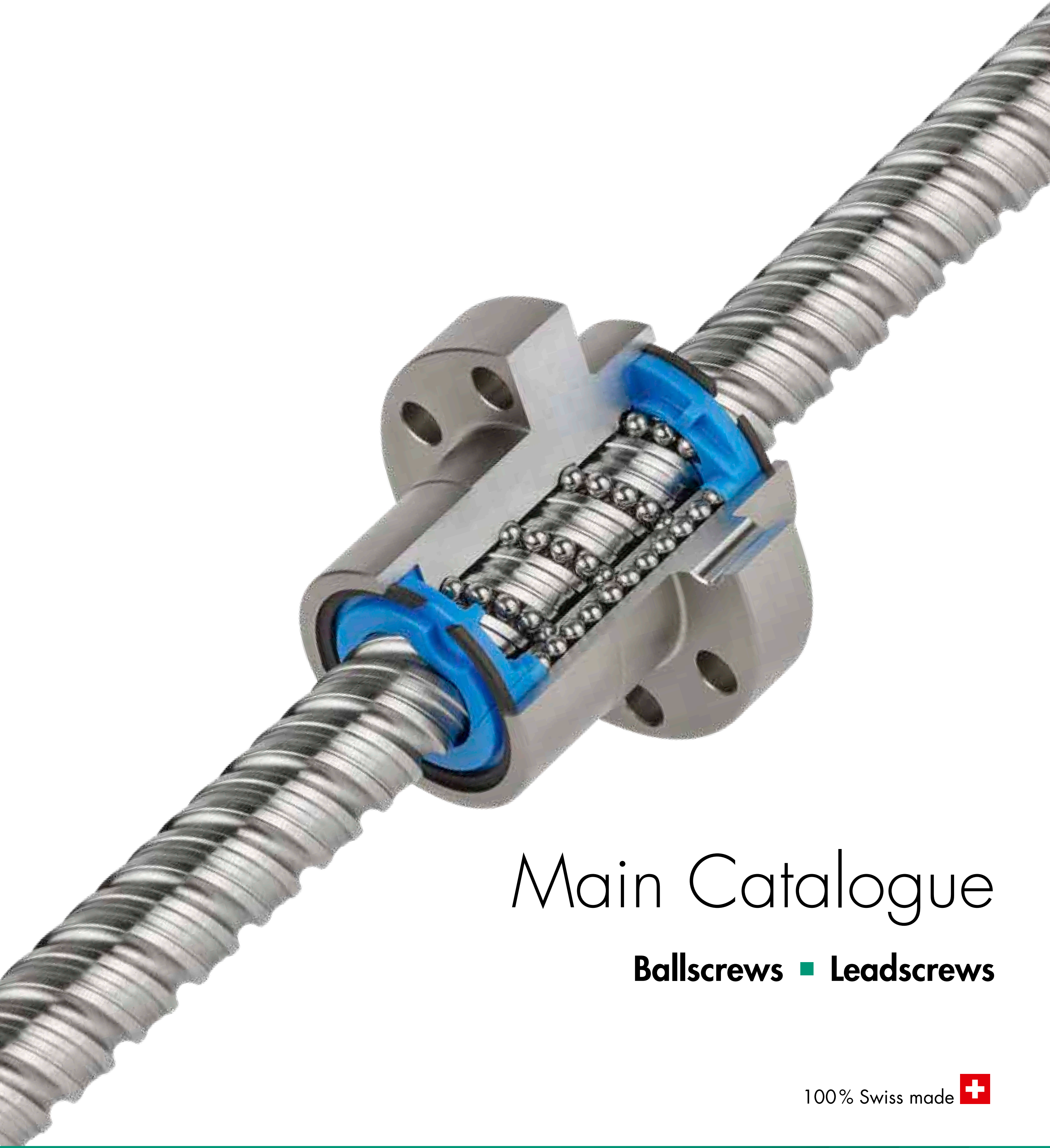
EichenbergerGewinde



Main Catalogue

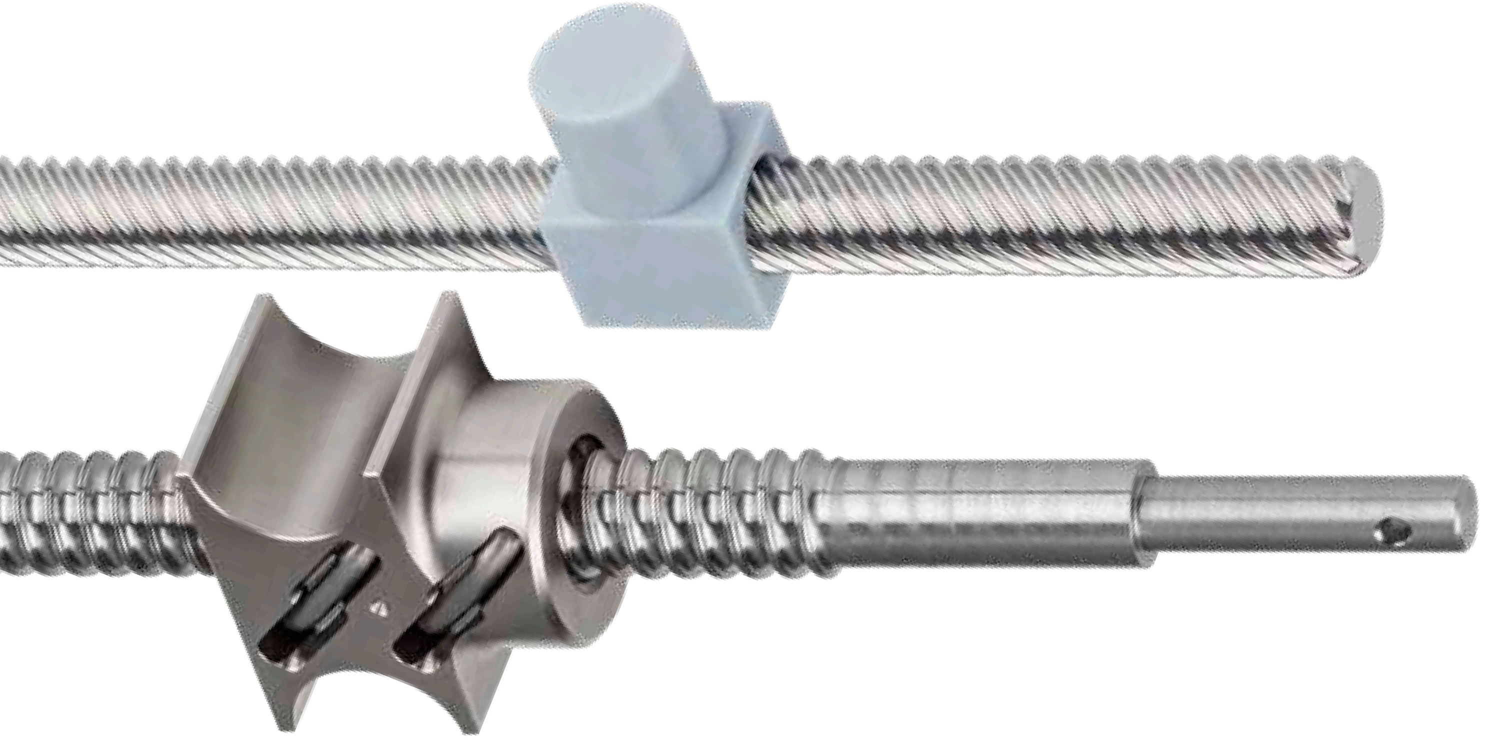
Ballscrews ■ Leadscrews

100 % Swiss made

A company of the Festo Group

on the move. worldwide

Your partner for thread drive solutions – 100% Swiss-made



Cold-rolled thread drives for every requirement

Eichenberger Gewinde AG has been supplying customers all over the world with "100% Swiss-made" thread drives for more than 30 years.

Eichenberger thread drives are high-performance nut and shaft units that have been tried and tested in their millions in all sorts of applications in linear and drive technology. Cost-effective and with maximum reliability and service life, they are manufactured using the high-quality and extremely economical cold-rolling process and offer precise conversion of rotational movement into linear movement and vice versa.

We are constantly expanding our comprehensive standard range of ballscrews and leadscrews, providing you with efficient and economical solutions "off the shelf".

For complex projects with more advanced requirements, we can support you with expert advice at short notice during the development of individual drive solutions:

- customer-specific adjustments of Eichenberger standard thread drives
- unique, tailor-made special thread drives

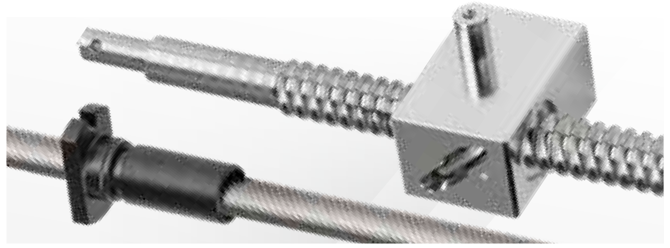
Your tailor-made thread drive

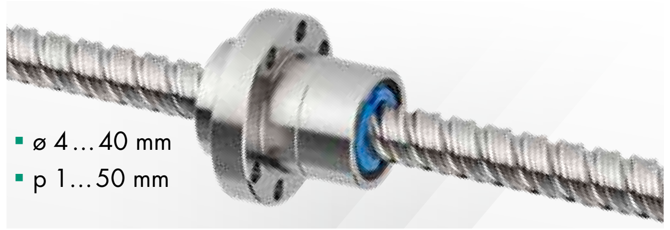
Special requirements often demand tailor-made solutions. If our standard thread drives cannot fulfil your specs, we will offer a wide range of individualized options:

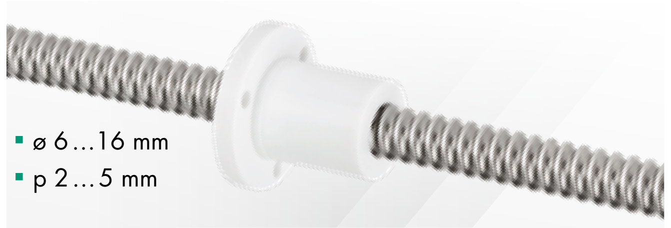
- application-specific nut shapes, including integrated additional features such as axles, mounting surfaces etc.
- individual thread profiles and customised ball sizes, e.g. for increased load ratings
- application-specific screw diameters and end machining
- special thread pitches
- customised number of ball circulations or number of carrying threads
- performance-optimised thread geometries
- special materials
- coating to improve sliding properties, to increase service life or as corrosion protection
- and much more.

Contact us with your revolutionary idea – we'll support you during development and provide YOUR tailor-made thread drive!

Content

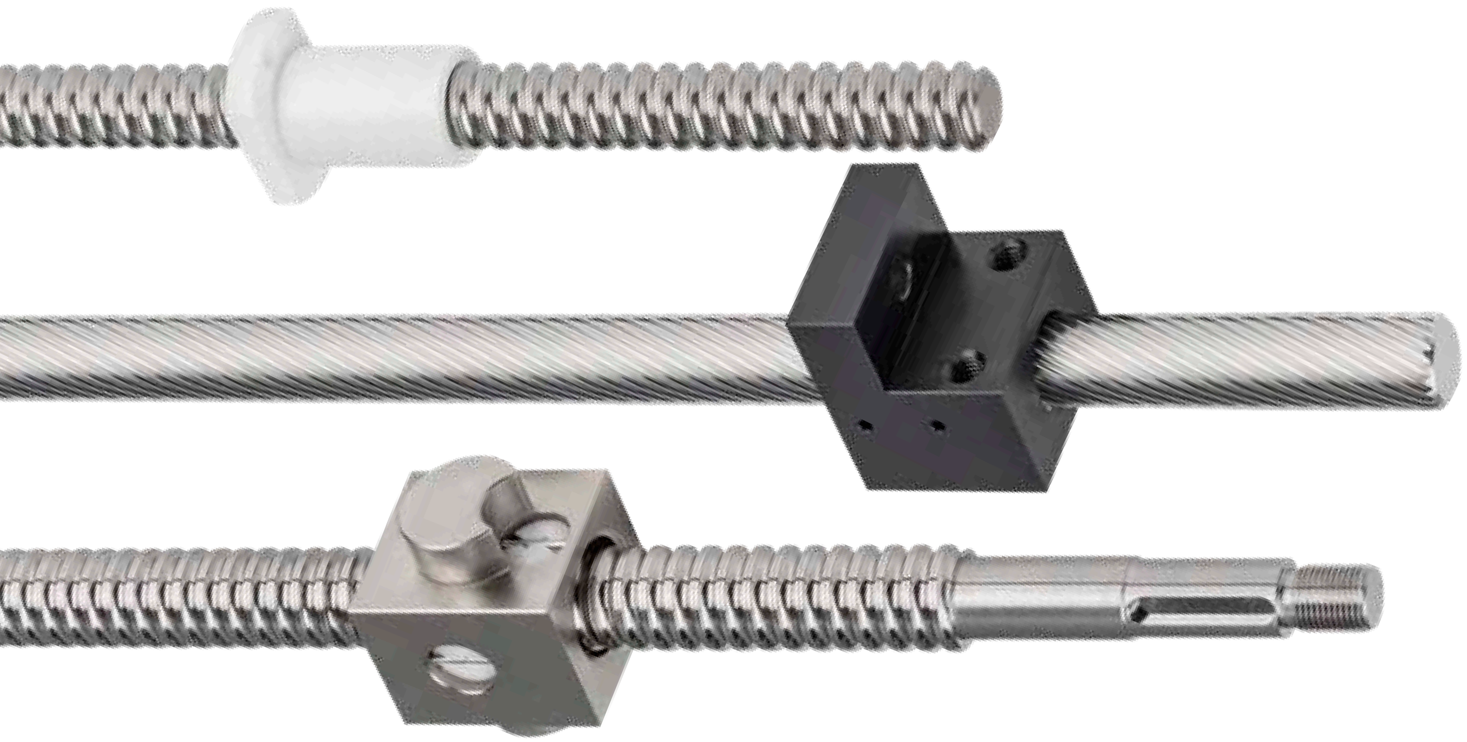






Individual tailor-made thread drives

100% Swiss made



Your revolutionary idea – our tailor-made solutions

Any nut shape

Innovative solutions often require special, application-specific nut shapes – sometimes the nut even has to be integrated directly into a component. Or specific measurement requirements or performance parameters have to be complied with where standard thread drives simply don't suffice.

Thanks to maximum adaptability during development as well as manufacture, Eichenberger is your perfect partner for tailor-made thread drives in any shape and design.

Any kind of end machining

Our speciality is any kind of application-specific end machining – for your application, too.

Contact us with your revolutionary idea – we'll support you during development and provide YOUR tailor-made thread drive!

Examples of customer-specific and application-specific solutions

Carry 6×1
- Medical technology
- Special nut with application-specific flange

Carry 9.3×2
- Electronics industry (building electric motors)
- Customer-specific screw diameter, special nut, ball recirculation made of high-temperature technopolymer

Carry 8×2.5 made of corrosion-resistant steel
- Off-shore industry (towed array sonar)
- Special nut for use with a "cradle"
- Corrosion-resistant

Carry 16×5
- Off-shore industry (oil drilling)
- "Safety nut"

Carry 8×3
- Medical technology
- Special nut with direct linear slide connection

Carry 25×5
- Development and Prototype
- Hollow screw with extremely large, continuous bore hole

Carry 12×4
- Automation
- Special nut; screw and nut with coating to reduce sliding friction

Carry 10×2
- Electrically operated manual device
- Load rating increased based on customer-specific adjustment of tube type ball returns

Carry 10×2
- Medical technology; large-scale production
- Nut polished on the outside, featuring adhesive grooves

Carry 16×7
- Motor racing
- Special pitch
- Special nut

Speedy 4/10
- Injected two-part technopolymer nut ready for preloading by the customer

Speedy 26/60
- Graphics industry
- Stop adjustment

Standard range overview

100% Swiss made

Cold-rolled precision

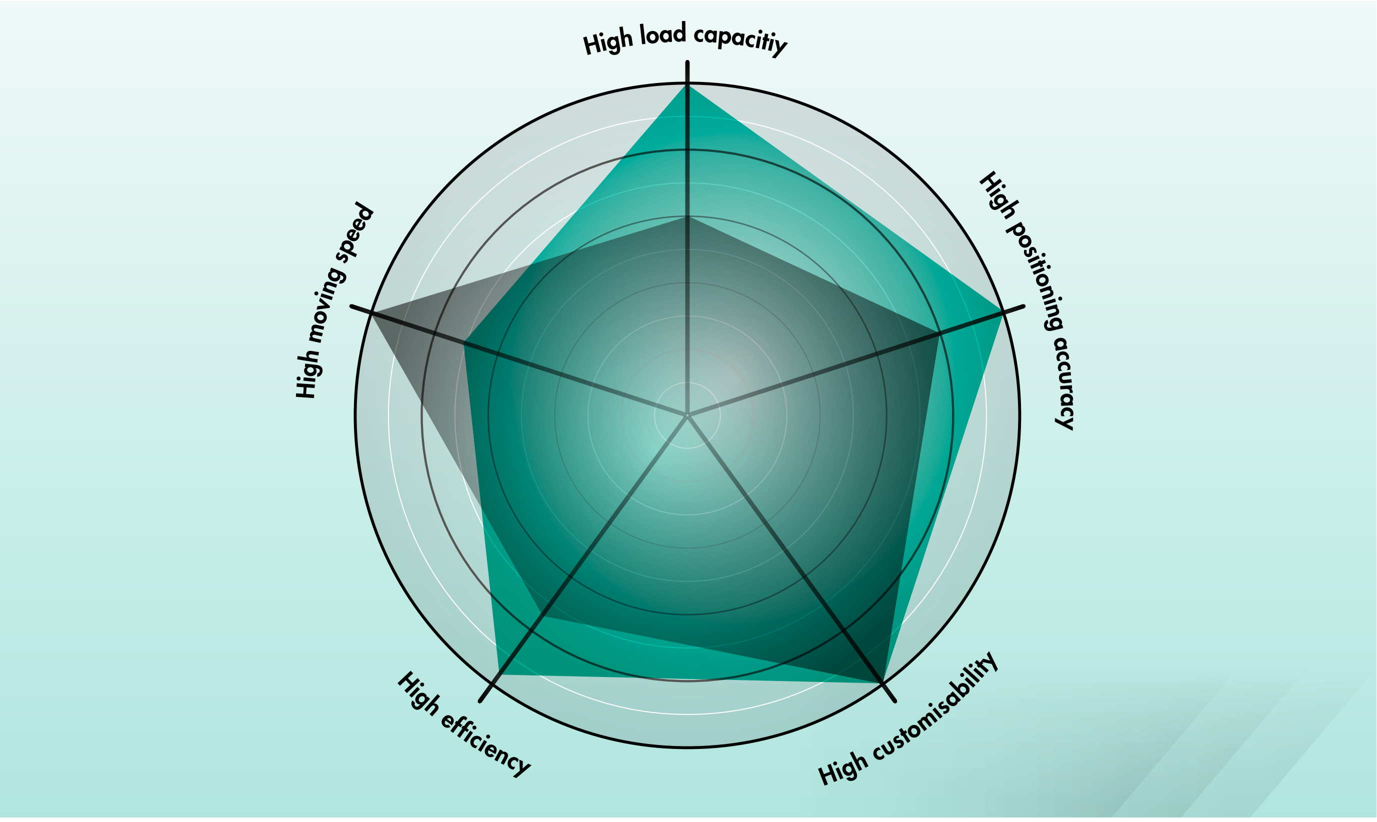
The manufacturing core competency of Eichenberger Gewinde AG is thread rolling. That is why the thread profiles of Eichenberger screws are exclusively made using this highly precise process.
Thread rolling describes the cold-forming process of the surface of round components. A thread is created by deforming a part between two rotating rolling tools with radial dynamic force application. The rolling tool profiles penetrate the surface of the part. So when the material is cold, it is pressed into the base of the thread rolling tool and rolled to the nominal dimensions.

Advantages of thread rolling:
- significant increase in strength based on cold-forming
- very good roughness values on the edges of the thread and in the base radius
- reduced notch-sensitivity
- grain orientation is not interrupted as in machined threads
- high dimensional accuracy
- efficient and quick production
- particularly cost-effective for large quantities

Even though all Eichenberger thread drives are made in accordance with the thread rolling process, the two construction series of the Eichenberger standard range,
- ballscrews (recirculating ballscrews in accordance with the principle of ball bearings) and
- leadscrews (thread drives with nut and screw thread edges that slide onto each other),

have very different performance characteristics, which are demonstrated in the overview.

Thread drive types and their characteristics



Ballscrews

Eichenberger ballscrews are characterised by:

- high load ratings, and are therefore suitable for high static and dynamic loads
- medium to high travelling speeds thanks to over-square pitches (p > d)
- excellent efficiency (η > 0.9), therefore:
  - low drive power required
  - low energy consumption
  - low self-heating
- low-friction operation
- no stick-slip effect
- high accuracy for positioning and repetition
- high reliability and long service life with minimum need for maintenance
- wipers possible

- **Carry** ballscrews pages 8 – 39

Leadscrews

Eichenberger leadscrews are characterised by:

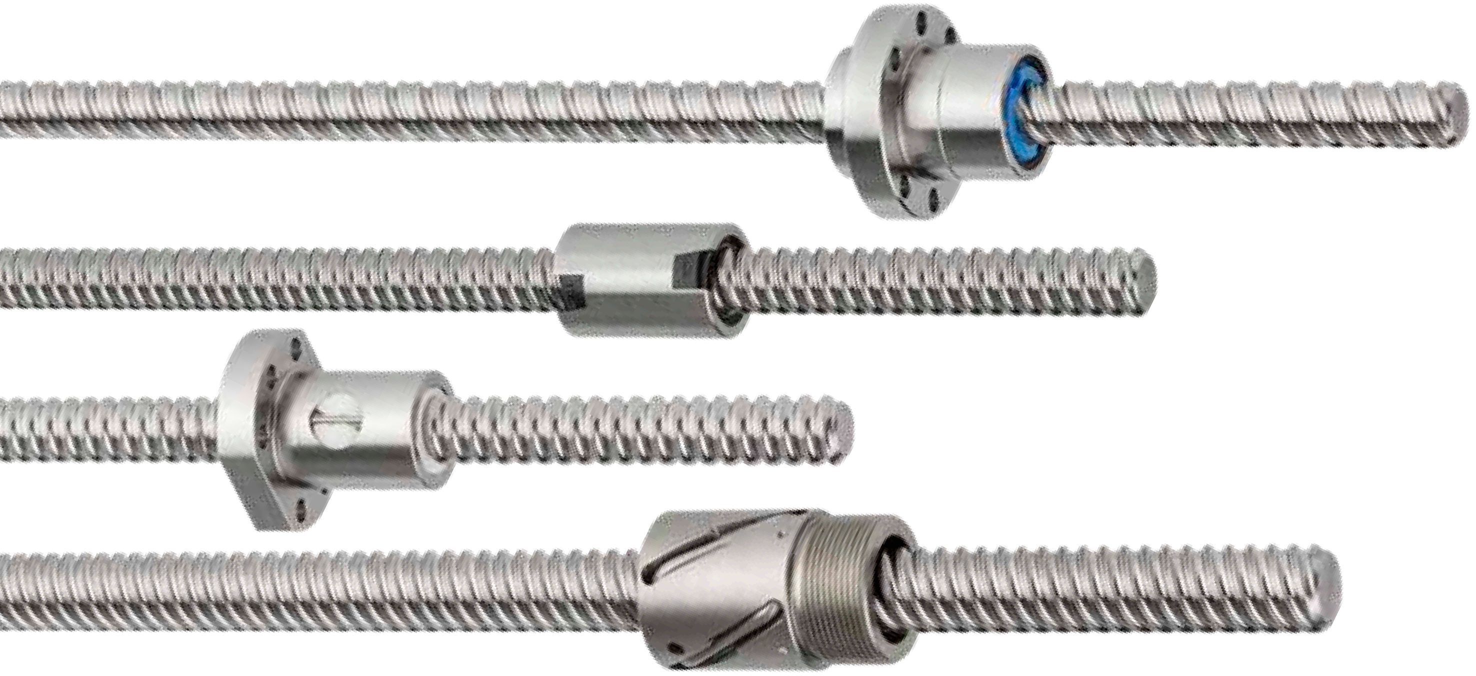
- small to medium load ratings, therefore suitable for low to medium loads
- very high travelling speeds, thanks to over-square pitches (p ≤ 6 × d)
- high efficiency (η ~0.5…0.8), thanks to the finest surface quality of the steel leadscrews and nuts made of high-performance technopolymer
- weight optimisation possible based on aluminium screws
- performance optimisation sometimes possible based on coating
- high reliability and long service life with marginal need for maintenance

Eichenberger's leadscrew range includes three types:

- **Speedy** high-helix leadscrews pages 40 – 57
- **Easy** light leadscrews pages 58 – 61
- **Rondo** round-thread leadscrews pages 62 – 65

Carry ballscrews (KGT)

100% Swiss made



Design features

Carry screws are made using the highly economical cold-rolling process, offering – at a significant price advantage – precision that has so far only been achieved with ground screws.
Carry screws are combined with individual steel nuts which are produced in a unique, highly efficient process.

Carry ballscrews offer all the advantages that are characteristic of ballscrews, such as:

- high efficiency ($\eta > 0.9$), i.e.
  - low drive power
  - low self-heating
- high load ratings
- low-friction, stick-slip-free operation
- minimum wear, i.e. with consistent positioning precision, very good repeat accuracy is achieved
- high reliability and long service life

Load ratings C_{dyn} and C_{stat}

The dynamic and static load ratings of Eichenberger ballscrews are determined on commonly used and recognised DIN calculation bases.
According to our experience, higher values are usually achieved during practical applications.

Materials

- standard: steel
  - 1.3505 (100Cr6)
  - 1.1213 (Cf53)
- on request:
  - corrosion-resistant steel 1.4034 (X46Cr13)
  - other materials
- on request:
  - coating for corrosion protection

⚠ The use of corrosion-resistant steel results in lower load ratings! Details on request.

Lead accuracy

- standard:
  - G9 $\triangleq \leq 0.1$ mm/300 mm (in accordance with DIN 69051)
- on request:
  - G7 $\triangleq \leq 0.052$ mm/300 mm
  - G5 $\triangleq \leq 0.023$ mm/300 mm

Carry ballscrews – design features

Nut types (shapes)

Nut with mounting thread
Type FG…
- cost-effective standard nut
- outer diameter turned
- with pin wrench hole

Cylindrical nut
Type ZY…
- outer diameter ground
- with keyway

Flange nut
Type FB… / FA…
- mounting section and flange ground (Type FB…)
- drilling pattern 1/2/3 following DIN 69051
- flange type C on request

If required, any application-specific nut shapes can be manufactured.
Contact us with your revolutionary idea – we'll provide YOUR tailor-made ballscrew!

Reduced backlash

Reduced backlash up to ≤0.01 mm is possible, if required (only for paired screw and nut units or those that have been mounted).

Efficiency

Efficiency η for Carry ballscrews is more than 0.9
› also see calculations and diagram, page 14

Ball return systems

End cap ball returns
Type …E / …F ▭
- also for over-square pitches ($p \geq d_0$)
- wipers firmly integrated into end caps
- made of high-performance technopolymer
- cost-effective

Tube ball return, fully integrated into nut body
Type …R ⧄
- for heavy loads
- can also be used in high temperatures
- space-saving in length

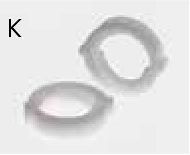
Single-thread ball return
Type …I ⊡
- space-saving in diameter
- made of high-performance technopolymer
- other materials (e.g. brass) on request

Operational temperatures

During normal use: –20 to +80 °C.
Different operational temperatures after consultation.

Wipers

Depending on the type, technopolymer wipers (K) or brush wipers (B) can be mounted. Felt rings (F) on request (for lifetime lubrication).



Production / Handling / Lubrication

Production lengths

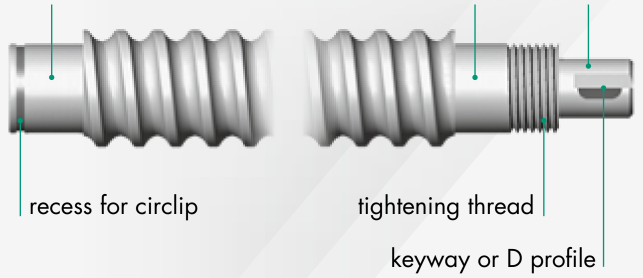
In general, Eichenberger screws are produced as threaded rods with a length of 3 m.

Any kind of end machining

Ballscrew ends are without any machining cut by grinding (standard).

Upon request, a so-called standard screw end journal with three turned bearing seats is available. Dimensions are as per customer specifications. Note also the links to the CAD data at www.gewinde.ch

3 turned bearing seats up to quality 6, surface up to R_a 0.8 µm



Screws may also be ordered with softened ends for subsequent finishing by the customer.

Our speciality is any application-specific end machining: Tell us your requirements, and we'll provide YOUR tailor-made screw!

In each instance, a detailed drawing would be necessary.

Radial loads and torque

Radial loads or torque brought to bear upon the nut result in overload of individual contact surfaces, thus seriously affecting the service life of the ballscrew assembly. Therefore it is important to properly mount the screw and to comply with all relevant form and positional tolerances.

Handling

Ballscrews are precision parts and must be protected from shock, dirt or moisture when transported or stored. Please do not unpack until ready for use.

Please check for cleanness when mounting the ballscrew. Dirt or foreign matter on the ball race – especially inside the nut – may cause increased wear and premature failure.

Lubrication

The usual specifications for lubricating ball bearings also apply to ballscrews. However, lubrication applied only once but intended to last a lifetime is not sufficient in most cases. Regular lubrication is required to extend the service life of the ballscrew.

⚠ When shipped, screws simply have a protective film. Before mounting or operating the ballscrew, units must be lubricated with the proper lubricant (through the lube hole for nuts with wipers; directly onto the screw for nuts without wipers).

Recommended all-purpose lubricant:
- Klüber Microlube GBU Y 131

When using another lubricant, please verify compatibility with anticorrosion agent; otherwise rinse ballscrew unit prior to lubrication.

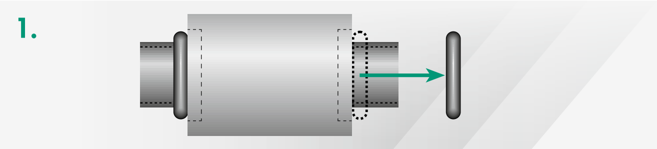
Do not use grease containing graphite or MoS!

Surface coatings

… possible on request:
- generally to reduce sliding friction
- if lubrication is not possible (e.g. in the food industry)
- as corrosion protection › also see Materials, page 8

Assembling of ballscrew units

1.

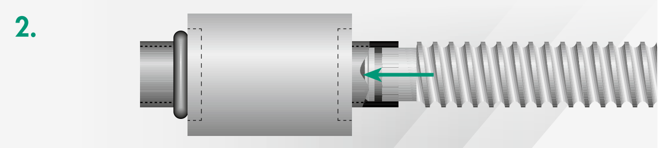


Remove transport lock (O-ring) on one side.

⚠ Please keep sleeve and nut in horizontal position. Otherwise, the nut may slide from the sleeve and balls may fall out of the ball race.

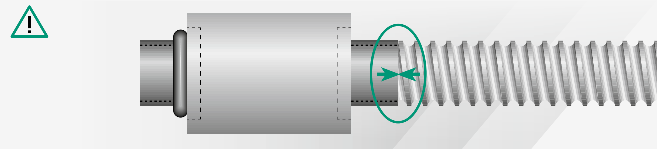
In the event such incident does occur, balls must be properly re-inserted to prevent damage to or blockage of the ballscrew. If in doubt, please contact Eichenberger Gewinde AG.

2.



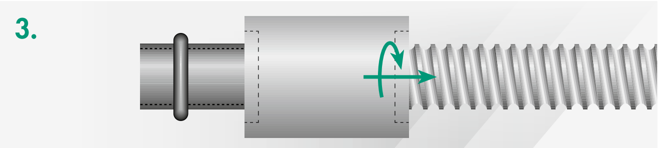
Insert screw end into mounting sleeve.

⚠



Operator must be able to advance sleeve up to the thread intake. Otherwise, balls may fall out of the ball race and damage or block the unit.

3.



Gently turn nut onto the screw.

Please consult lubrication recommendation opposite before mounting or operating ballscrews.

Design fundamentals

The following are the relevant calculations which underlie screw design and safe operation.

For detailed information on ballscrew design, please refer to DIN 69051.

«Suitability test» rotational speed characteristics

When selecting a ballscrew it is important to first ensure that the correct nut design for the ball return system required to support the maximum rotational speed demanded by the application is used (independent of the screw length).

The maximum rotational speed is based on the system's rotational speed characteristics and the outer screw diameter:

$$n_{max} = \frac{\text{rotational speed characteristic}}{d_1} \ [min^{-1}]$$

n_{max} = maximum rotational speed [min^{-1}]

d_1 = outer screw diameter [mm]

Rotational speed characteristic [–] for:

- single-thread ball return: 60000
  (Carry type **...I** ⊡)
- tube ball return: 80000
  (Carry type **...R** ▭)
- end cap ball return: 80000
  (Carry type **...E/...F** ▮)

Calculations at dynamic load

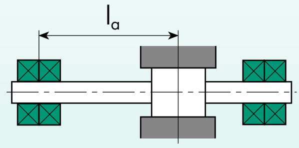
Critical rotational speed n_{per}

Permissible rotational speeds must differ substantially from the screw's own frequency.

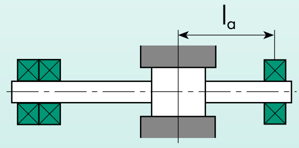
$$n_{per} = K_D \cdot 10^6 \cdot \frac{d_2}{l_a^2} \cdot S_n \ [min^{-1}]$$

n_{per} = permissible rotational speed [min^{-1}]
K_D = characteristic constant [–]
as a function of bearing configuration › see below
d_2 = core screw diameter [mm]
l_a = bearing distances [mm] › see below
(always include maximum allowable l_a in calculation!)
S_n = safety factor [–], usually S_n = 0.5 … 0.8

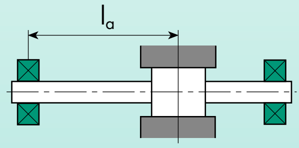
Config. 1: fixed – fixed
→ K_D = 276



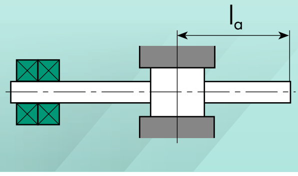
Config. 2: fixed – single
→ K_D = 190



Config. 3: simple – single
→ K_D = 122



Config. 4: fixed – free
→ K_D = 43



Nominal service life L_{10} or L_h

$$L_{10} = \left(\frac{C_{dyn}}{F_m}\right)^3 \cdot 10^6 \ [R]$$

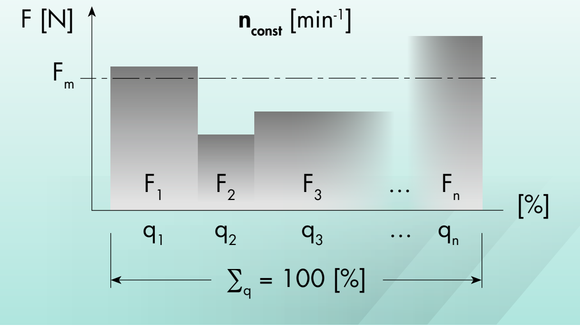
$$L_h = \frac{L_{10}}{n_m \cdot 60} \ [h]$$

L_{10} = service life in revolutions [R]
L_h = service life in hours [h]
C_{dyn} = dynamic load rate [N]
F_m = average axial load [N]
$F_{1…n}$ = load per cycle unit [N]
n_m = average rotational speed [min^{-1}]
$n_{1…n}$ = rotational speed per cycle unit [min^{-1}]
$q_{1…n}$ = cycles [%]
100 = $\sum_q$ (sum of cycles $q_{1…n}$) [%]

Average axial load F_m

at constant rotational speed n_{const} and dynamic load C_{dyn}

$$F_m = \sqrt[3]{\frac{F_1^3 \cdot n_1 \cdot \frac{q_1}{100} + F_2^3 \cdot n_2 \cdot \frac{q_2}{100} + \ldots + F_n^3 \cdot n_n \cdot \frac{q_n}{100}}{n_m}} \ [N]$$



$$\rightarrow L_{10} = \left(\frac{C_{dyn}}{F_m}\right)^3 \cdot 10^6 \ [R]$$

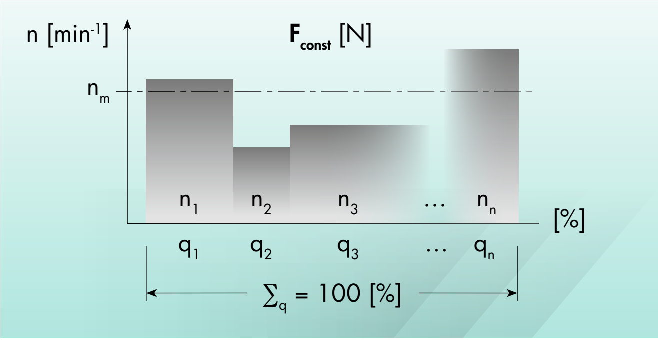
$$\rightarrow L_h = \frac{L_{10}}{n_{const} \cdot 60} \ [h]$$

Calculations at dynamic load (continued)

Average rotational speed n_m

at constant load F_{const} and variable rotational speeds $n_{1\ldots n}$

$$n_m = n_1 \frac{q_1}{100} + n_2 \frac{q_2}{100} + \ldots + n_n \frac{q_n}{100} \quad [\text{min}^{-1}]$$



$$\rightarrow L_{10} = \left(\frac{C_{dyn}}{F_{konst}}\right)^3 \cdot 10^6 \quad [R]$$

$$\rightarrow L_h = \frac{L_{10}}{n_m \cdot 60} \quad [h]$$

Average axial load F_m

at constant rotational speeds $n_{1\ldots n}$ and dynamic load C_{dyn}

$$F_m = \sqrt[3]{F_1^{\,3} \frac{q_1}{100} + F_2^{\,3} \frac{q_2}{100} + \ldots + F_n^{\,3} \frac{q_n}{100}} \quad [N]$$

$$n_m = n_1 \frac{q_1}{100} + n_2 \frac{q_2}{100} + \ldots + n_n \frac{q_n}{100} \quad [\text{min}^{-1}]$$

$$\rightarrow L_{10} = \left(\frac{C_{dyn}}{F_m}\right)^3 \cdot 10^6 \quad [R]$$

$$\rightarrow L_h = \frac{L_{10}}{n_m \cdot 60} \quad [h]$$

Efficiency η (theoretical)

depends upon the type of power transmission

- Case 1: torque → linear movement

$$\eta \approx \frac{\tan \alpha}{\tan (\alpha + \rho)} \quad [-]$$

- Case 2: axial force → torque

$$\eta' \approx \frac{\tan (\alpha - \rho)}{\tan \alpha} \quad [-]$$

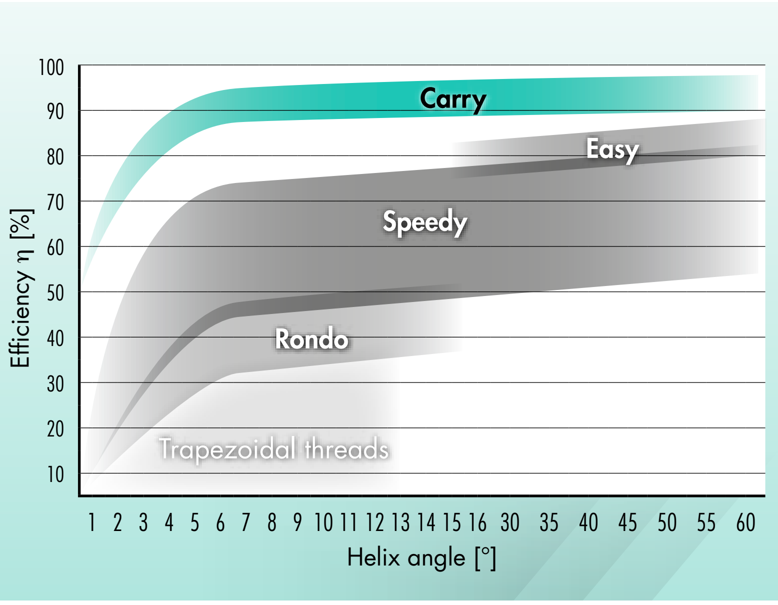
whereby

$$\tan \alpha \approx \frac{p}{d_0 \cdot \pi} \quad [-]$$

η = efficiency [%]
η' = corrected efficiency [%]
p = pitch [mm]
d_0 = nominal screw diameter [mm]
ρ = angle of friction [°] → ρ = 0.30 … 0.60°

Efficiency η_p (practical)

The efficiency η for Carry ballscrews is better than 0.9



Driving torque M

depends upon the type of power transmission

- Case 1: torque → linear movement

$$M_a = \frac{F_a \cdot p}{2000 \cdot \pi \cdot \eta} \quad [Nm]$$

- Case 2: axial force → torque

$$M_e = \frac{F_a \cdot p \cdot \eta'}{2000 \cdot \pi} \quad [Nm]$$

M_a = input torque [Nm], case 1
M_e = output torque [Nm], case 2
F_a = axial force [N]
p = pitch [mm]
η = efficiency [%]
η' = corrected efficiency [%]

Input performance P

$$P = \frac{M_a \cdot n}{9550} \quad [kW]$$

P = input performance [kW]
n = rotational speed [min⁻¹]

A safety margin of 20% is recommended when selecting drives.

Calculations at static load

Permissible maximum load F_{per}

$$F_{per} = \frac{C_{stat}}{f_s} \quad [N]$$

C_{stat} = static load rate [N]
f_s = operating coefficient
→ normal operation: 1 … **2** [–]
→ shock load: 2 … 3 [–]

Permissible buckling force F_B

$$F_B = \frac{K_B}{S_B} \cdot \frac{d_2^{\,4}}{l_a^{\,2}} \cdot 10^3 \quad [N]$$

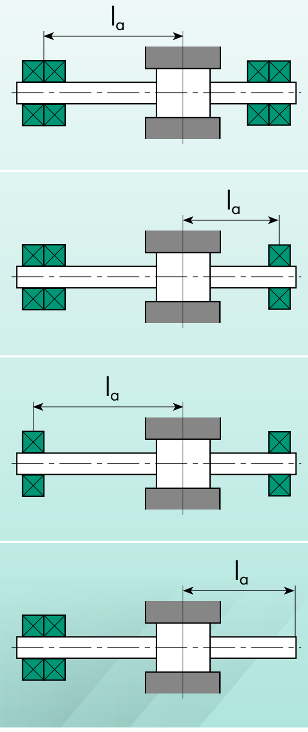
K_B = characteristic constant of load [–]
depends on design › see below
d_2 = core screw diameter [mm]
S_B = buckling safety factor [–] → usually S_B = 2 … 4
l_a = force-transferring screw length [mm]

Case 1:
→ K_B = 400

Case 2:
→ K_B = 200

Case 3:
→ K_B = 100

Case 4:
→ K_B = 25



Order system – Carry ballscrews

Example for complete Carry ballscrew — **KGT 16×5 FGR RH 1 S 350 G7 A E M**

Type of thread drive
KGT = **Carry** ballscrew

Nominal size (d_0 × p) [mm]

Nut type:

- **Shape** — for nut only

ZY = cylindrical nut type ZY…
FG = nut with mounting thread type FG…
FB = flange nut type FB…
FA = flange nut type FA…
MS = special design according to drawing

- **Ball return system** (assignment to nut shapes acc. dimensional charts) — for nut only

I = single-thread ball return type …I
R = tube ball return type …R
E = end cap ball return type …E
F = end cap ball return type …F

Right-hand / left-hand thread — for nut only
RH = right-hand thread (standard)
LH = left-hand thread (availability see dimensional charts)

Number of ball circulations (i) — for nut only
1 = 1 ball circulation
2 = 2 ball circulations
3 = 3 ball circulations
4 = 4 ball circulations

Wipers (SA) — for nut only
S = with wipers (technopolymer or brush)
N = without wipers

Ballscrew overall length [mm] — for screw only

Lead accuracy (class) — for screw only
G9 = ≤0.1 mm/300 mm (standard)
G7 = ≤0.052 mm/300 mm (on request)
G5 = ≤0.023 mm/300 mm (on request)

Backlash (T_{max}) — for screw only
A = standard backlash (see dimensional charts)
R = reduced backlash upon specification

Screw end machining — for screw only
O = no end machining (cut by grinding, hardened ends)
E = end machining according to drawing

Assembly
G = screw and nut separate
M = screw and nut assembled according to drawing/specified orientation

Example for screw only — **KGT 16×5 RH 350 G7 O G**

Example for nut only — **KGT 16×5 FGR RH 1 S A G**

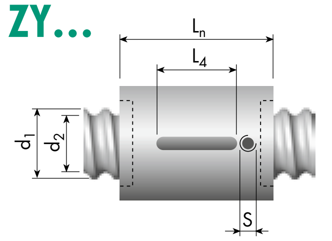
Dimension map – Carry standard range

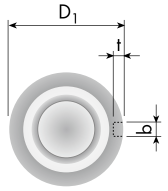
$d_0 \times p$ [mm]	4	5	6	8	10	12	12.7	14	15	16	20	25	32	40
Pitch p [mm]	Nominal diameter d_0 [mm]													
1	■		■	■										
1.5				■										
2		■	■	■	■	■		■		■	■			
2.5				■										
3		■		■	■	■								
4					■	■		■						
5				■		■				■	■	■	■	■
6			■											
8				■										
10					■	■				■	■	■	■	
12				■		■								
12.7							■							
15													■	
16										■				
20									■		■			■
25												■		
25.4							■							
30												■		
32													■	
40														■
50										■				
Register	ø4/5/6			ø8	ø10	ø12	ø12.7	ø14	ø15/16		ø20	ø25	ø32	ø40
Pages	18/19			20/21	22/23	24/25	26/27	28/29	30/31		32/33	34/35	36/37	38/39

ø4/5/6

Cylindrical nut

ZY…

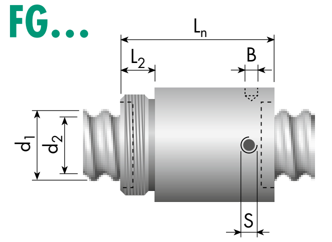


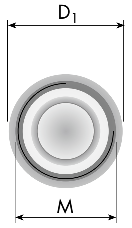


Nominal size	Ball return	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type			Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
4 × 1	…I ●●	€€€	RH / —	4.0	3.2	8 g6	—	—	—	—	—	10	—	—	—	—	—	—	3 × 1	0.80	—	ø2 +0.1/0	1.0	—	—	0.03	430	580	**4 × 1**
5 × 2	…I ●●	€€€	RH / —	5.0	4.0	10 g6	—	—	—	—	—	14	—	—	—	8	—	—	3 × 1	0.80	—	2	1.0	—	—	0.03	500	800	**5 × 2**
6 × 1	…I ●●	€€€	RH / —	6.0	5.0	12 g6	—	—	—	—	—	14	—	—	—	8	—	—	3 × 1	0.80	—	2	1.2	—	—	0.03	600	1 000	**6 × 1**

Nut with mounting thread

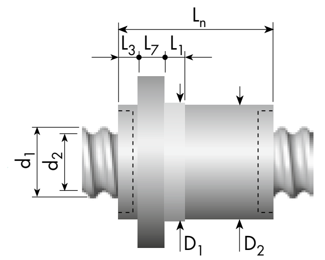
FG…



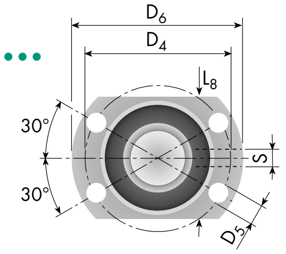


Nominal size	Ball return	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type			Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
5 × 2	…I ●●	€€	RH / —	5.0	4.0	10 0/–0.1	—	—	—	—	M8 × 0.75	18	—	6	—	—	—	—	3 × 1	0.80	2.5	—	—	—	—	0.03	500	800	**5 × 2**
5 × 3	…I ●●	€€	RH / —	5.0	4.2	10 0/–0.1	—	—	—	—	M8 × 0.75	19	—	6	—	—	—	—	2 × 1	0.80	2.5	—	—	—	—	0.03	340	490	**5 × 3**
5 × 3	…I ●●	€€	RH / —	5.0	4.2	10 0/–0.1	—	—	—	—	M8 × 0.75	23	—	6	—	—	—	—	3 × 1	0.80	2.5	—	—	—	—	0.03	480	770	**5 × 3**
6 × 2	…R ▬	€€	RH / LH	5.7	4.6	16 0/–0.1	—	—	—	—	M12 × 1	22	—	8	—	—	—	—	1 × 3.5	1.59	2.5	—	—	—	—	0.06	1 700	2 300	**6 × 2**
6 × 2	…F ▭	€	RH / —	5.7	4.6	19 0/–0.1	—	—	—	—	M16 × 1	19	—	8	—	—	—	—	1 × 3.7	1.59	2.5	—	—	ø 2	K	0.05	1 900	2 800	**6 × 2**
6 × 6	…F ▭	€	RH / —	5.9	4.6	19 0/–0.1	—	—	—	—	M16 × 1	19	—	8	—	—	—	—	2 × 1.6	1.50	2.5	—	—	ø 2	K	0.05	1 700	2 600	**6 × 6**

Flange nut

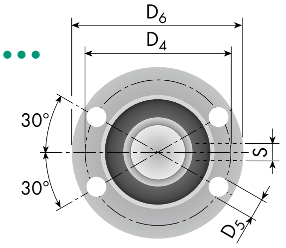


FB…



Nominal size	Ball return	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type			Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
4 × 1	…I ●●	€€€	RH / —	4.0	3.2	8 g6	7.9	12	2.7	17	—	14	2	—	—	—	3	11	3 × 1	0.80	—	—	—	—	—	0.03	430	580	**4 × 1**
6 × 1	…I ●●	€€€	RH / —	6.0	5.0	12 g6	11.8	18	3.4	24	—	18	4	—	—	—	4	16	3 × 1	0.80	—	—	—	ø 2	K	0.03	600	1 000	**6 × 1**

FA…



Nominal size	Ball return	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type			Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
6 × 2	…F ▭	€€	RH / —	5.7	4.6	18 –0.01/–0.05	17.5	26	3.4	34	—	19	4	—	4	—	4	—	1 × 3.7	1.59	—	—	—	ø 2	K	0.05	1 900	2 800	**6 × 2**
6 × 6	…F ▭	€€	RH / —	5.9	4.6	18 –0.01/–0.05	17.5	26	3.4	34	—	19	4	—	4	—	4	—	2 × 1.6	1.50	—	—	—	ø 2	K	0.05	1 700	2 600	**6 × 6**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

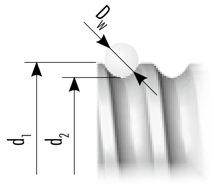
Single-thread ball return
Type …I ●●

Tube ball return
Type …R ▬

End cap ball return
Type …E / …F ▭

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

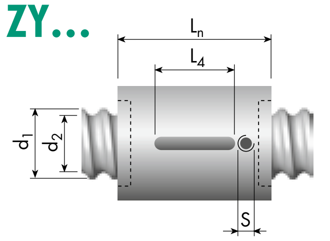
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

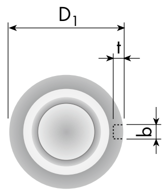
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 8

Cylindrical nut

ZY...

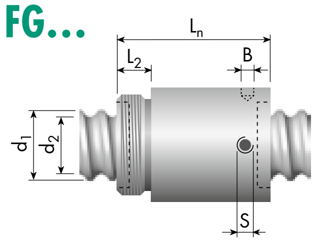


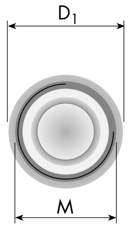


Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm] Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
8×1	...I [• •]	€€€	RH / —	8.0	7.0	14 g6	—	—	—	—	—	14	—	—	—	8	—	—	3×1	0.80	—	2	1.2	—	—	0.03	700	1 200	8×1
8×1.5	...I [• •]	€€€	RH / —	8.0	6.7	14 g6	—	—	—	—	—	14	—	—	—	8	—	—	3×1	1.20	—	2	1.2	—	—	0.04	800	1 300	8×1.5
8×2	...I [• •]	€€€	RH / —	8.0	6.5	16 g6	—	—	—	—	—	20	—	—	—	8	—	—	3×1	1.59	—	2	1.2	—	—	0.05	1 400	2 000	8×2
8×2	...R [⟋]	€€€	RH / —	8.0	6.5	18 g6	—	—	—	—	—	14	—	—	—	8	—	—	1×3.5	1.59	—	2	1.2	—	—	0.06	2 000	3 200	8×2
8×2.5	...I [• •]	€€€	RH / —	8.0	6.6	16 g6	—	—	—	—	—	22	—	—	—	10	—	—	3×1	1.59	—	3	2.0	—	—	0.05	1 400	2 100	8×2.5
8×2.5	...I [• •]	€€€	RH / —	8.0	6.6	16 g6	—	—	—	—	—	22	—	—	—	10	—	—	3×1	1.59	—	3	2.0	ø 2	K	0.05	1 400	2 100	8×2.5
8×2.5	...R [⟋]	€€€	RH / —	8.0	6.6	18 g6	—	—	—	—	—	16	—	—	—	10	—	—	1×3.5	1.59	—	3	2.0	—	—	0.06	2 000	3 200	8×2.5
8×3	...I [• •]	€€€	RH / —	8.0	6.7	14 g6	—	—	—	—	—	12	—	—	—	8	—	—	2×1	1.50	—	2	1.2	—	—	0.05	950	1 500	8×3
8×3 3)	...I [• •]	€€€	RH / —	8.0	6.7	14 g6	—	—	—	—	—	17	—	—	—	8	—	—	3×1	1.50	—	2	1.2	—	—	0.05	1 400	2 100	8×3 3)
8×5	...R [⟋]	€€€	RH / —	8.0	6.7	18 g6	—	—	—	—	—	19	—	—	—	10	—	—	2×2.5	1.50	—	3	2.0	—	—	0.06	1 960	3 470	8×5
8×12	...E [▌▐]	€€€	RH / —	8.0	6.7	18 g6	—	—	—	—	—	28	—	—	—	8	—	—	2×1.5	1.50	—	2	1.2	ø 2	K	0.05	1 400	2 300	8×12

Nut with mounting thread

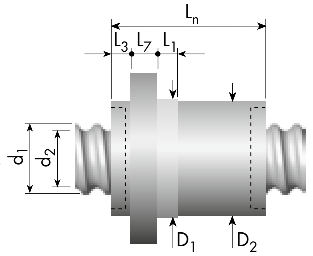
FG...



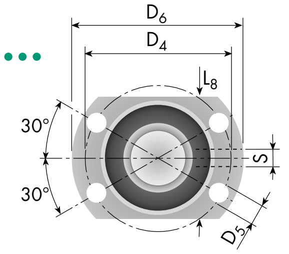


Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm] Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
8×1	...I [• •]	€€	RH / —	8.0	7.0	16 0/−0.1	—	—	—	—	M14×1	22	—	8	—	—	—	—	3×1	0.80	2.5	—	—	—	—	0.03	700	1 200	8×1
8×1.5	...I [• •]	€€	RH / —	8.0	6.7	16 0/−0.1	—	—	—	—	M14×1	22	—	8	—	—	—	—	3×1	1.20	2.5	—	—	—	—	0.04	800	1 300	8×1.5
8×2	...I [• •]	€€	RH / —	8.0	6.5	16 0/−0.1	—	—	—	—	M14×1	28	—	8	—	—	—	—	3×1	1.59	2.5	—	—	—	—	0.05	1 400	2 000	8×2
8×2	...R [⟋]	€€	RH / —	8.0	6.5	18 0/−0.1	—	—	—	—	M14×1	24	—	8	—	—	—	—	1×3.5	1.59	2.5	—	—	—	—	0.06	2 000	3 200	8×2
8×2	...R [⟋]	€€	RH / —	8.0	6.5	18 0/−0.1	—	—	—	—	M14×1	24	—	8	—	—	—	—	1×3.5	1.59	2.5	—	—	ø 2	K	0.06	2 000	3 200	8×2
8×2.5	...I [• •]	€€	RH / —	8.0	6.6	16 0/−0.1	—	—	—	—	M14×1	24	—	8	—	—	—	—	3×1	1.59	2.5	—	—	—	—	0.05	1 400	2 100	8×2.5
8×2.5	...R [⟋]	€€	RH / —	8.0	6.6	17.5 0/−0.1	—	—	—	—	M15×1	24	—	8	—	—	—	—	1×3.5	1.59	2.5	—	—	—	—	0.06	2 000	3 200	8×2.5
8×2.5	...R [⟋]	€€	RH / —	8.0	6.6	17.5 0/−0.1	—	—	—	—	M15×1	26	—	8	—	—	—	—	1×3.5	1.59	2.5	—	—	ø 2	K	0.06	2 000	3 200	8×2.5
8×3	...I [• •]	€€	RH / —	8.0	6.7	16 0/−0.1	—	—	—	—	M14×1	25	—	8	—	—	—	—	3×1	1.50	2.5	—	—	—	—	0.05	1 400	2 100	8×3
8×3	...F [▌▐]	€	RH / —	8.0	6.7	23 0/−0.1	—	—	—	—	M20×1	23	—	10	—	—	—	—	1×3.7	1.50	2.5	—	—	ø 2	K	0.05	1 900	3 300	8×3
8×5	...R [⟋]	€€	RH / —	8.0	6.7	18 0/−0.1	—	—	—	—	M14×1	25	—	8	—	—	—	—	2×1.5	1.50	2.5	—	—	—	—	0.06	1 960	3 470	8×5
8×8	...R [⟋]	€€	RH / —	8.0	6.6	18 0/−0.1	—	—	—	—	M14×1	25	—	8	—	—	—	—	2×1.5	1.50	2.5	—	—	—	—	0.06	1 500	2 500	8×8
8×8	...F [▌▐]	€	RH / —	8.0	6.6	23 0/−0.1	—	—	—	—	M20×1	23	—	10	—	—	—	—	2×1.7	1.50	2.5	—	—	ø 2	K	0.05	2 000	3 700	8×8

Flange nut

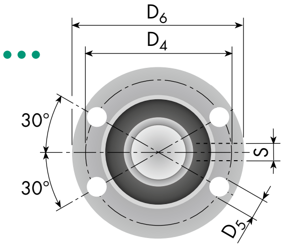


FB...



Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm] Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
8×1	...I [• •]	€€€	RH / —	8.0	7.0	14 g6	13.5	21	3.4	27	—	18	4	—	—	—	4	18	3×1	0.80	—	—	—	ø 2	K	0.03	700	1 200	8×1
8×2	...I [• •]	€€€	RH / —	8.0	6.5	16 g6	15.5	22	3.4	28	—	30	4	—	—	—	6	19	3×1	1.59	—	—	—	ø 4	K	0.05	1 400	2 000	8×2
8×2	...R [⟋]	€€€	RH / —	8.0	6.5	18 g6	17.5	22	3.4	28	—	25	4	—	—	—	6	19	1×3.5	1.59	—	—	—	ø 4	K	0.06	2 000	3 200	8×2
8×8 3)	...R [⟋]	€€€	RH / —	8.0	6.6	18 g6	17.5	22	3.4	28	—	30	4	—	—	—	6	19	2×1.5	1.50	—	—	—	—	—	0.06	1 500	2 500	8×8 3)
8×12	...E [▌▐]	€€	RH / —	8.0	6.7	18 g6	17.8	25	3.4	30	—	28	4	—	6	—	4	20	2×1.5	1.50	—	—	—	ø 2	K	0.05	1 400	2 300	8×12

FA...



Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm] Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
8×3	...F [▌▐]	€€	RH / —	8.0	6.7	20 −0.01/−0.05	19.5	28	3.4	36	—	23	4	—	5	—	4	—	1×3.7	1.50	—	—	—	ø 2	K	0.05	1 900	3 300	8×3
8×8	...F [▌▐]	€€	RH / —	8.0	6.6	20 −0.01/−0.05	19.5	28	3.4	36	—	23	4	—	5	—	4	—	2×1.7	1.50	—	—	—	ø 2	K	0.05	2 000	3 700	8×8

> CAD data > www.gewinde.ch

Ball return systems (details > page 9)

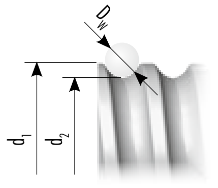
Single-thread ball return
Type ...I [• •]

Tube ball return
Type ...R [⟋]

End cap ball return
Type ...E / ...F [▌▐]

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details > page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

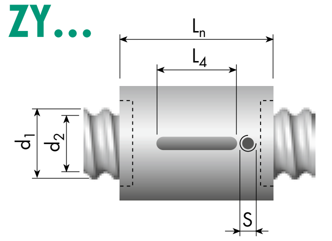
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

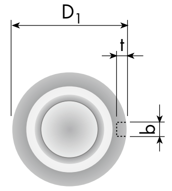
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation > page 12

ø 10

Cylindrical nut

ZY...

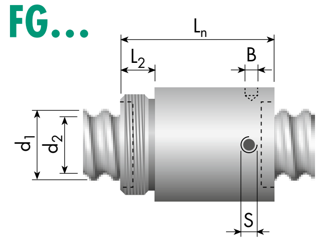


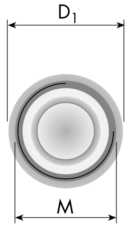


Nominal size	Ball return		Relative cost	Right-/ left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
d_0×p [mm]	Type				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	d_0×p [mm]
10×2	...I	●●	€€€	RH / LH	9.7	8.2	18 g6	—	—	—	—	—	14	—	—	—	10	—	—	2×1	1.59	—	3	1.2	—	—	0.06	1 250	2 100	10×2
10×2[3]	...I	●●	€€€	RH / LH	9.7	8.2	18 g6	—	—	—	—	—	20	—	—	—	10	—	—	3×1	1.59	—	3	1.2	—	—	0.06	1 750	3 200	10×2[3]
10×3	...R	⧸	€€€	RH / LH	9.9	7.8	22 g6	—	—	—	—	—	24	—	—	—	10	—	—	1×3.5	2.00	—	3	2.0	—	—	0.06	2 800	5 000	10×3
10×3	...R	⧸	€€€	RH / LH	9.9	7.8	22 g6	—	—	—	—	—	24	—	—	—	10	—	—	1×3.5	2.00	—	3	2.0	ø 3.5	K	0.06	2 800	5 000	10×3
10×4	...I	●●	€€€	RH / —	10.0	7.5	18 g6	—	—	—	—	—	35	—	—	—	10	—	—	4×1	2.50	—	3	1.2	—	—	0.07	4 100	6 700	10×4
10×4	...I	●●	€€€	RH / —	10.0	7.5	18 g6	—	—	—	—	—	35	—	—	—	10	—	—	4×1	2.50	—	3	1.2	ø 2	K	0.07	4 100	6 700	10×4
10×10	...R	⧸	€€€	RH / —	9.8	7.9	23 g6	—	—	—	—	—	26	—	—	—	10	—	—	2×1.5	2.00	—	3	2.0	—	—	0.06	2 500	4 500	10×10

Nut with mounting thread

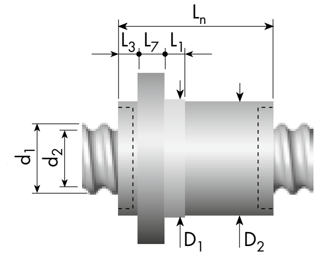
FG...





Nominal size	Ball return		Relative cost	Right-/ left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
d_0×p [mm]	Type				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	d_0×p [mm]
10×2	...I	●●	€€	RH / LH	9.7	8.2	18 0/−0.1	—	—	—	—	M16×1	22	—	8	—	—	—	—	2×1	1.59	2.5	—	—	—	—	0.06	1 250	2 100	10×2
10×2[3]	...I	●●	€€	RH / LH	9.7	8.2	18 0/−0.1	—	—	—	—	M16×1	28	—	8	—	—	—	—	3×1	1.59	2.5	—	—	—	—	0.06	1 750	3 200	10×2[3]
10×2	...R	⧸	€€	RH / LH	9.7	8.2	19.5 0/−0.1	—	—	—	—	M17×1	22	—	7	—	—	—	—	1×3.5	1.59	2.5	—	—	—	—	0.06	2 300	4 000	10×2
10×2	...R	⧸	€€	RH / —	9.7	8.2	19.5 0/−0.1	—	—	—	—	M17×1	22	—	7	—	—	—	—	1×3.5	1.59	2.5	—	—	ø 2	K	0.06	2 300	4 000	10×2
10×3	...I	●●	€€	RH / —	9.9	7.8	20 0/−0.1	—	—	—	—	M18×1	29	—	8	—	—	—	—	3×1	2.00	2.5	—	—	—	—	0.06	2 400	4 200	10×3
10×3	...I	●●	€€	RH / —	9.9	7.8	20 0/−0.1	—	—	—	—	M18×1	29	—	8	—	—	—	—	3×1	2.00	2.5	—	—	ø 2	K	0.06	2 400	4 200	10×3
10×3	...R	⧸	€€	RH / LH	9.9	7.8	21 0/−0.1	—	—	—	—	M18×1	29	—	9	—	—	—	—	1×3.5	2.00	3.0	—	—	—	—	0.06	2 800	5 000	10×3
10×3	...R	⧸	€€	RH / LH	9.9	7.8	21 0/−0.1	—	—	—	—	M18×1	29	—	9	—	—	—	—	1×3.5	2.00	3.0	—	—	ø 2	K	0.06	2 800	5 000	10×3
10×3	...F	▐▌	€	RH / —	9.9	7.8	27 0/−0.1	—	—	—	—	M24×1.5	27	—	10	—	—	—	—	1×3.7	2.00	3.0	—	—	ø 2	K	0.06	3 500	6 300	10×3
10×4	...I	●●	€€	RH / —	10.0	7.5	20 0/−0.1	—	—	—	—	M18×1	40	—	8	—	—	—	—	4×1	2.50	2.5	—	—	—	—	0.07	4 100	6 700	10×4
10×4	...I	●●	€€	RH / —	10.0	7.5	20 0/−0.1	—	—	—	—	M18×1	40	—	8	—	—	—	—	4×1	2.50	2.5	—	—	ø 2	K	0.07	4 100	6 700	10×4
10×10	...R	⧸	€€	RH / —	9.8	7.9	23 0/−0.1	—	—	—	—	M18×1	35	—	9	—	—	—	—	2×1.5	2.00	3.0	—	—	—	—	0.06	2 500	4 500	10×10
10×10	...R	⧸	€€	RH / —	9.8	7.9	23 0/−0.1	—	—	—	—	M18×1	35	—	9	—	—	—	—	2×1.5	2.00	3.0	—	—	ø 4	K	0.06	2 500	4 500	10×10
10×10	...F	▐▌	€	RH / —	9.9	7.9	27 0/−0.1	—	—	—	—	M24×1.5	27	—	10	—	—	—	—	2×1.7	2.00	3.0	—	—	ø 2	K	0.06	3 200	5 900	10×10

Flange nut



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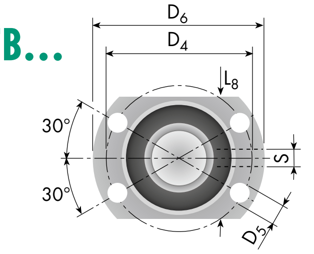
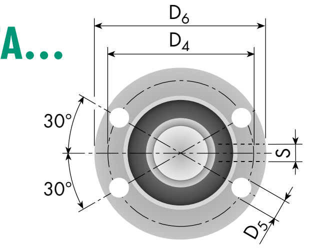


Nominal size	Ball return		Relative cost	Right-/ left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
d_0×p [mm]	Type				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	d_0×p [mm]
10×4	...I	●●	€€€	RH / —	10.0	7.5	18 g6	17.8	28	4.5	36	—	38	6	—	—	—	6	23	4×1	2.50	—	—	—	—	—	0.07	4 100	6 700	10×4
10×4	...I	●●	€€€	RH / —	10.0	7.5	18 g6	17.8	28	4.5	36	—	38	6	—	—	—	6	23	4×1	2.50	—	—	—	ø 2	K	0.07	4 100	6 700	10×4
10×10	...R	⧸	€€€	RH / —	9.8	7.9	23 g6	22.5	29	4.5	37	—	40	6	—	—	—	8	24	2×1.5	2.00	—	—	—	M5	K	0.06	2 500	4 500	10×10

FA...



Nominal size	Ball return		Relative cost	Right-/ left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size
d_0×p [mm]	Type				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	d_0×p [mm]
10×3	...F	▐▌	€€	RH / —	9.9	7.8	24 −0.01/−0.06	23.5	32	4.5	40	—	27	5	—	4	—	7	—	1×3.7	2.00	—	—	—	ø 3	K	0.06	3 500	6 300	10×3
10×10	...F	▐▌	€€	RH / —	9.8	7.9	24 −0.01/−0.06	23.5	32	4.5	40	—	27	5	—	4	—	7	—	2×1.7	2.00	—	—	—	ø 4	K	0.06	3 200	5 900	10×10

> CAD data > www.gewinde.ch

Ball return systems (details > page 9)

Single-thread ball return

Type **...I** ●●

Tube ball return

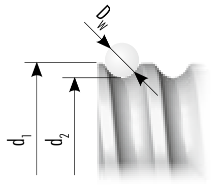
Type **...R** ⧸

End cap ball return

Type **...E** / **...F** ▐▌

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details > page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

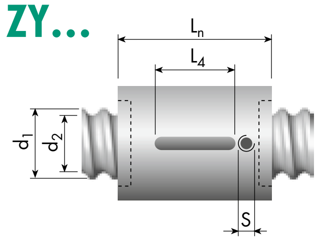
T_{max} = max. standard backlash [mm]
[3] = only on request
* position not defined
Special designs available on request

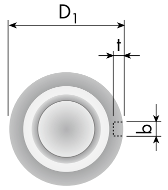
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics! Calculation > page 12

ø 12

Cylindrical nut

ZY...

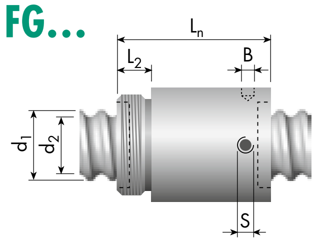


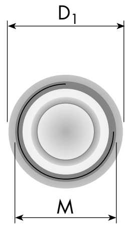


Nominal size	Ball return		Relative cost	Right-/left-hand thread	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type				d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
12×2	...I	● ●	€€€	RH / —	12.0	10.6	20 g6	—	—	—	—	—	15	—	—	—	10	—	—	2×1	1.59	—	3	1.2	—	—	0.06	1 380	2 500	**12×2**
12×2 3)	...I	● ●	€€€	RH / LH	12.0	10.6	20 g6	—	—	—	—	—	20	—	—	—	10	—	—	3×1	1.59	—	3	1.2	—	—	0.06	2 000	4 000	12×2 3)
12×4	...R	▬	€€€	RH / —	12.0	9.8	26 g6	—	—	—	—	—	24	—	—	—	10	—	—	1×3.5	2.50	—	3	1.8	—	—	0.07	5 500	11 000	**12×4**
12×4	...R	▬	€€€	RH / —	12.0	9.8	26 g6	—	—	—	—	—	32	—	—	—	10	—	—	1×3.5	2.50	—	3	1.8	ø 4	K	0.07	5 500	11 000	**12×4**

Nut with mounting thread

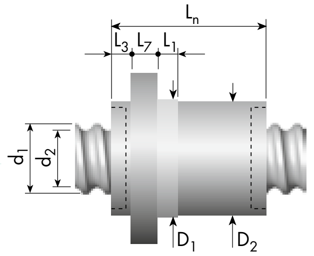
FG...





Nominal size	Ball return		Relative cost	Right-/left-hand thread	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type				d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
12×2	...I	● ●	€€	RH / —	12.0	10.6	20 0/–0.1	—	—	—	—	M18×1	23	—	8	—	—	—	—	2×1	1.59	2.5	—	—	—	—	0.06	1 380	2 500	**12×2**
12×2 3)	...I	● ●	€€	RH / LH	12.0	10.6	20 0/–0.1	—	—	—	—	M18×1	28	—	8	—	—	—	—	3×1	1.59	2.5	—	—	—	—	0.06	2 000	4 000	12×2 3)
12×4	...I	● ●	€€	RH / —	12.0	9.8	24 0/–0.1	—	—	—	—	M20×1	39	—	10	—	—	—	—	3×1	2.50	2.5	—	—	—	—	0.07	4 000	6 800	**12×4**
12×4	...I	● ●	€€	RH / —	12.0	9.8	24 0/–0.1	—	—	—	—	M20×1	39	—	10	—	—	—	—	3×1	2.50	2.5	—	—	ø 4	K	0.07	4 000	6 800	**12×4**
12×4	...R	▬	€€	RH / —	12.0	9.8	26 0/–0.1	—	—	—	—	M20×1	32	—	8	—	—	—	—	1×3.5	2.50	2.5	—	—	—	—	0.07	5 500	11 000	**12×4**
12×4	...R	▬	€€	RH / —	12.0	9.8	26 0/–0.1	—	—	—	—	M20×1	34	—	10	—	—	—	—	1×3.5	2.50	2.5	—	—	ø 4	K	0.07	5 500	11 000	**12×4**
12×5	...I	● ●	€€	RH / —	12.0	9.5	23 0/–0.1	—	—	—	—	M20×1	42	—	10	—	—	—	—	3×1	2.78	3.0	—	—	—	—	0.07	5 000	8 600	**12×5**
12×5	...I	● ●	€€	RH / —	12.0	9.5	23 0/–0.1	—	—	—	—	M20×1	42	—	10	—	—	—	—	3×1	2.78	3.0	—	—	ø 4	K	0.07	5 000	8 600	**12×5**
12×5	...R	▬	€€	RH / LH	12.0	9.5	26 0/–0.1	—	—	—	—	M20×1	37	—	8	—	—	—	—	1×3.5	2.78	3.0	—	—	—	—	0.07	6 600	12 000	**12×5**
12×5	...R	▬	€€	RH / —	12.0	9.5	26 0/–0.1	—	—	—	—	M20×1	37	—	8	—	—	—	—	1×3.5	2.78	3.0	—	—	ø 4	K	0.07	6 600	12 000	**12×5**
12×5	...F	▐ ▌	€	RH / —	12.0	9.5	32 0/–0.1	—	—	—	—	M28×1.5	30	—	12	—	—	—	—	1×3.7	2.78	3.5	—	—	ø 4	K	0.06	5 900	10 600	**12×5**
12×10	...R	▬	€€	RH / —	11.9	9.7	26 0/–0.1	—	—	—	—	M20×1	37	—	8	—	—	—	—	2×1.5	2.50	3.0	—	—	—	—	0.07	4 400	7 700	**12×10**
12×10	...F	▐ ▌	€	RH / —	11.9	9.7	32 0/–0.1	—	—	—	—	M28×1.5	38	—	12	—	—	—	—	2×2.4	2.50	3.5	—	—	ø 4	K	0.06	6 400	12 600	**12×10**
12×12	...F	▐ ▌	€	RH / —	12.0	9.7	32 0/–0.1	—	—	—	—	M28×1.5	30	—	12	—	—	—	—	2×1.6	2.50	3.5	—	—	ø 4	K	0.06	4 600	8 500	**12×12**

Flange nut



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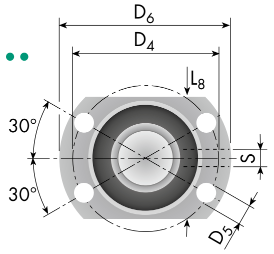
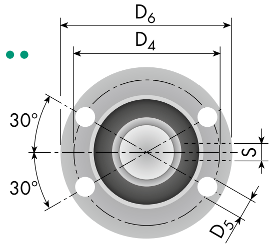


Nominal size	Ball return		Relative cost	Right-/left-hand thread	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type				d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
12×2	...R	▬	€€€	RH / —	12.0	10.6	22 g6	21.5	29	4.5	37	—	30	5	—	—	—	8	24	1×3.5	1.59	—	—	—	ø 4	K	0.06	2 500	5 100	**12×2**
12×3	...R	▬	€€€	RH / —	12.3	10.2	24 g6	23.5	32	4.5	40	—	36	5	—	—	—	8	26	2×2.5	2.00	—	—	—	—	—	0.06	5 000	11 000	**12×3**
12×4	...R	▬	€€€	RH / —	12.0	9.8	26 g6	25.5	32	4.5	39.5	—	36	5	—	—	—	8	28	1×3.5	2.50	—	—	—	M5	K	0.07	5 500	11 000	**12×4**
12×5	...I	● ●	€€€	RH / —	12.0	9.5	24 g6	23.5	32	4.5	40	—	40	6	—	—	—	8	26	3×1	2.78	—	—	—	ø 4	K	0.07	5 000	8 600	**12×5**
12×5	...R	▬	€€€	RH / —	12.0	9.5	26 g6	25.5	32	4.5	39.5	—	40	5	—	—	—	7	28	1×3.5	2.78	—	—	—	M5	K	0.07	6 600	12 000	**12×5**

FA...



Nominal size	Ball return		Relative cost	Right-/left-hand thread	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type				d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
12×5	...F	▐ ▌	€€	RH / —	12.0	9.5	26 –0.01/–0.06	25.5	34	4.5	42	—	30	6	—	6	—	8	—	1×3.7	2.78	—	—	—	ø 4	K	0.06	5 900	10 600	**12×5**
12×10	...F	▐ ▌	€€	RH / —	11.9	9.7	26 –0.01/–0.06	25.5	34	4.5	42	—	38	6	—	6	—	8	—	2×2.4	2.50	—	—	—	ø 4	K	0.06	6 400	12 600	**12×10**
12×12	...F	▐ ▌	€€	RH / —	12.0	9.7	26 –0.01/–0.06	25.5	34	4.5	42	—	30	6	—	6	—	8	—	2×1.6	2.50	—	—	—	ø 4	K	0.06	4 600	8 500	**12×12**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

Single-thread ball return

Type **...I** ● ●

Tube ball return

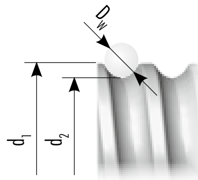
Type **...R** ▬

End cap ball return

Type **...E** / **...F** ▐ ▌

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

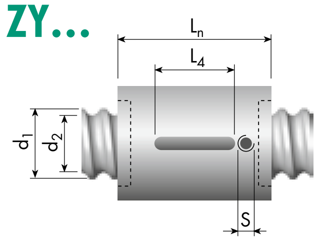
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

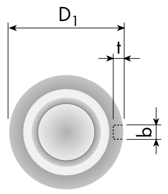
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 12.7 (½″)

Cylindrical nut

ZY…

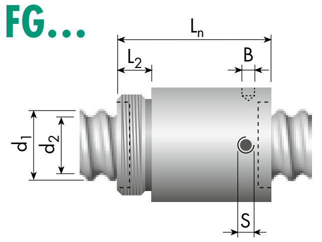


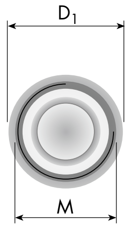


Nominal size $d_0 \times p$ [mm] (in)	Ball return Type		Relative cost	Right-/left-hand thread	Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
12.7 × 25.4 (½″ × 1″)	**…E**	▭	€€€	RH / —	12.5	10.6	26 g6	—	—	—	—	—	32	—	—	—	10	—	—	3 × 0.9	2.00	—	3	1.8	ø 4	K	0.05	2 300	4 500	**12.7 × 25.4**

Nut with mounting thread

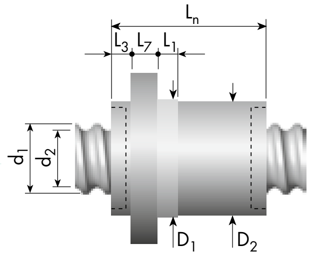
FG…



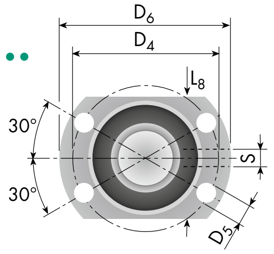


Nominal size $d_0 \times p$ [mm] (in)	Ball return Type		Relative cost	Right-/left-hand thread	Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
12.7 × 12.7 (½″ × ½″)	**…R**	⧄	€€	RH / —	13.1	10.3	29.5 0/–0.1	—	—	—	—	M25 × 1.5	50	—	12	—	—	—	—	2 × 1.5	3.50	3.0	—	—	—	—	0.07	8 000	15 500	**12.7 × 12.7**
12.7 × 12.7 (½″ × ½″)	**…R**	⧄	€€	RH / —	13.1	10.3	29.5 0/–0.1	—	—	—	—	M25 × 1.5	50	—	12	—	—	—	—	2 × 1.5	3.50	3.0	—	—	M5	B	0.07	8 000	15 500	**12.7 × 12.7**

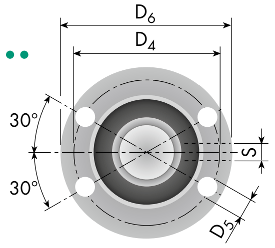
Flange nut



FB…



FA…



Nominal size $d_0 \times p$ [mm] (in)	Ball return Type		Relative cost	Right-/left-hand thread	Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
12.7 × 25.4 (½″ × 1″)	**…E**	▭	€€	RH / —	12.5	10.6	26 g6	25.5	33	4.5	42	—	32	5	—	7	—	8	28	3 × 0.9	2.00	—	—	—	ø 4	K	0.05	2 300	4 500	**12.7 × 25.4**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

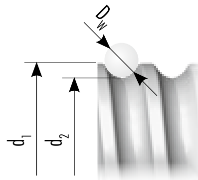
Single-thread ball return
Type **…I** ●

Tube ball return
Type **…R** ⧄

End cap ball return
Type **…E** / **…F** ▭

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

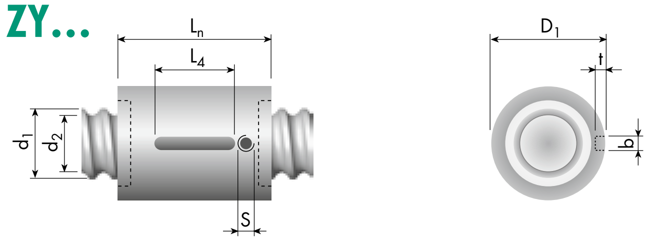
T_{max} = max. standard backlash [mm]
[3] = only on request
* position not defined
Special designs available on request

⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 14

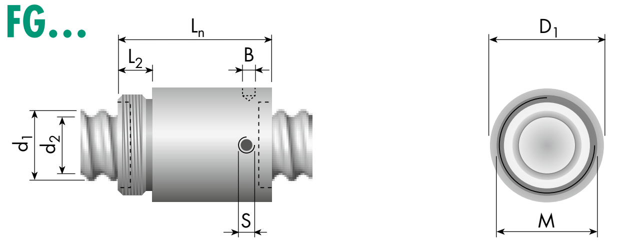
Cylindrical nut

ZY…

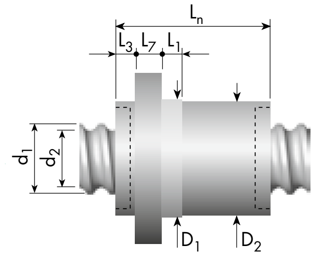


Nut with mounting thread

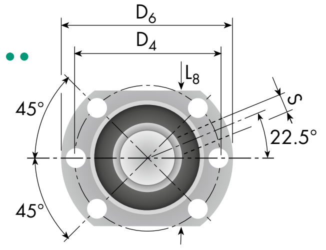
FG…



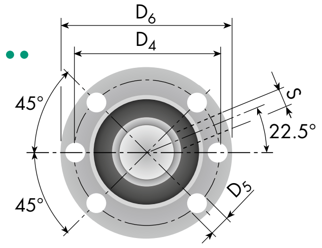
Flange nut



FB…



FA…



Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm] Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
14×4	…I ● ●	€€€	RH / —	14.0	11.5	25 g6	—	—	—	—	—	24	—	—	—	10	—	—	3×1	2.78	—	4	2.5	—	—	0.07	5 000	8 800	**14×4**
14×4	…I ● ●	€€€	RH / —	14.0	11.5	25 g6	—	—	—	—	—	32	—	—	—	10	—	—	3×1	2.78	—	4	2.5	ø 4	K	0.07	5 000	8 800	**14×4**
14×4	…R ╱	€€€	RH / LH	14.0	11.5	29 g6	—	—	—	—	—	24	—	—	—	16	—	—	1×3.5	2.78	—	4	2.5	—	—	0.07	8 100	16 000	**14×4**
14×4	…R ╱	€€€	RH / LH	14.0	11.5	29 g6	—	—	—	—	—	32	—	—	—	16	—	—	1×3.5	2.78	—	4	2.5	ø 4	K	0.07	8 100	16 000	**14×4**
14×2	…R ╱	€€	RH / —	14.0	12.5	26 0/–0.1	—	—	—	—	M22×1.5	32	—	10	—	—	—	—	2×2.5	1.59	3.0	—	—	—	—	0.06	4 500	10 000	**14×2**
14×2	…R ╱	€€	RH / —	14.0	12.5	26 0/–0.1	—	—	—	—	M22×1.5	32	—	10	—	—	—	—	2×2.5	1.59	3.0	—	—	ø 2	K	0.06	4 500	10 000	**14×2**
14×4	…I ● ●	€€	RH / —	14.0	11.5	25 0/–0.1	—	—	—	—	M22×1.5	34	—	10	—	—	—	—	3×1	2.78	2.5	—	—	—	—	0.07	5 000	8 800	**14×4**
14×4	…I ● ●	€€	RH / —	14.0	11.5	25 0/–0.1	—	—	—	—	M22×1.5	38	—	10	—	—	—	—	3×1	2.78	2.5	—	—	ø 4	K	0.07	5 000	8 800	**14×4**
14×4	…R ╱	€€	RH / LH	14.0	11.5	29 0/–0.1	—	—	—	—	M22×1.5	32	—	8	—	—	—	—	1×3.5	2.78	3.0	—	—	—	—	0.07	8 100	16 000	**14×4**
14×4	…R ╱	€€	RH / LH	14.0	11.5	29 0/–0.1	—	—	—	—	M22×1.5	38	—	10	—	—	—	—	1×3.5	2.78	3.0	—	—	ø 4	K	0.07	8 100	16 000	**14×4**
14×2	…R ╱	€€€	RH / —	14.0	12.5	26 g6	25.5	32	4.5	39.5	—	32	5	—	—	—	7	28	2×2.5	1.59	—	—	—	ø 4	K	0.06	4 500	10 000	**14×2**
14×4	…R ╱	€€€	RH / LH	14.0	11.5	29 g6	28.6	38	5.5	48	—	40	6	—	—	—	8	36	1×3.5	2.78	—	—	—	M5	K	0.07	8 100	16 000	**14×4**

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Ball return systems (details › page 9)

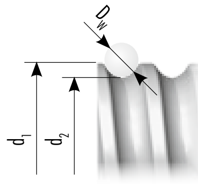
Single-thread ball return
Type **…I** ● ●

Tube ball return
Type **…R** ╱

End cap ball return
Type **…E** / **…F** ▭

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

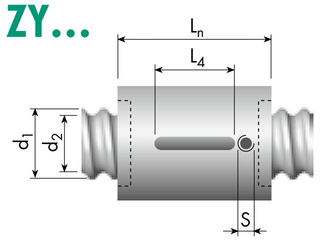
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

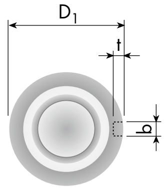
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 15/16

Cylindrical nut

ZY...

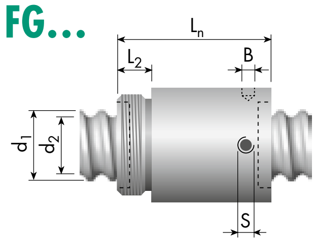


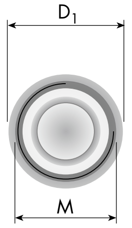


Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size $d_0 \times p$ [mm]
					Screw		Nut																							
					d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	
16×5	...I	●●	€€€	RH / LH	15.7	13.0	30 g6	—	—	—	—	—	43	—	—	—	16	—	—	3×1	3.50	—	4	2.5	M5	K	0.07	9 700	22 000	**16×5**
16×10	...R	／	€€€	RH / —	15.7	13.0	32 g6	—	—	—	—	—	45	—	—	—	16	—	—	2×2.5	3.50	—	4	2.5	—	—	0.07	17 000	25 000	**16×10**
16×10	...R	／	€€€	RH / —	15.7	13.0	32 g6	—	—	—	—	—	45	—	—	—	16	—	—	2×2.5	3.50	—	4	2.5	ø 4	K	0.07	17 000	25 000	**16×10**
16×10	...E	▮□▮	€€€	RH / —	16.0	13.4	28 g6	—	—	—	—	—	42	—	—	—	16	—	—	2×2.9	3.00	—	4	2.5	ø 4	K	0.07	12 500	26 000	**16×10**
16×16	...E	▮□▮	€€€	RH / —	15.5	13.2	28 g6	—	—	—	—	—	42	—	—	—	16	—	—	2×1.9	3.00	—	4	2.5	ø 3	K	0.07	7 800	15 500	**16×16**
16×50	...E	▮□▮	€€€	RH / —	16.0	13.2	28 g6	—	—	—	—	—	55	—	—	—	16	—	—	3×0.9	3.00	—	4	2.5	ø 4	K	0.06	4 800	11 000	**16×50**

Nut with mounting thread

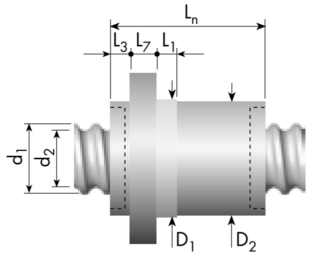
FG...



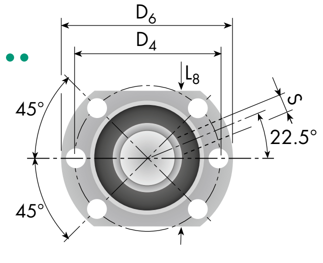


Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/left-hand thread	d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
15×20	...F	▮□▮	€	RH / —	14.9	12.0	36 0/–0.1	—	—	—	—	M33×1.5	46	—	19	—	—	—	—	2×1.7	3.00	4.0	—	—	ø 4	K	0.07	7 100	14 700	**15×20**
16×2	...I	●●	€€	— / LH	16.0	14.5	25 0/–0.1	—	—	—	—	M22×1.5	34	—	10	—	—	—	—	3×1	1.59	2.5	—	—	—	—	0.05	2 400	5 200	**16×2**
16×2	...R	／	€€	RH / —	16.0	14.5	30 0/–0.1	—	—	—	—	M26×1.5	28	—	12	—	—	—	—	1×2.5	1.59	3.5	—	—	—	—	0.06	2 500	5 500	**16×2**
16×2	...R	／	€€	RH / —	16.0	14.5	30 0/–0.1	—	—	—	—	M26×1.5	28	—	12	—	—	—	—	1×2.5	1.59	3.5	—	—	ø 2	K	0.06	2 500	5 500	**16×2**
16×5	...I	●●	€€	RH / —	15.7	13.0	30.2 0/–0.1	—	—	—	—	M26×1.5	45	—	12	—	—	—	—	3×1	3.50	3.5	—	—	—	—	0.07	9 700	22 000	**16×5**
16×5	...I	●●	€€	RH / LH[3)]	15.7	13.0	30.2 0/–0.1	—	—	—	—	M26×1.5	50	—	12	—	—	—	—	3×1	3.50	3.5	—	—	M5	K	0.07	9 700	22 000	**16×5**
16×5	...R	／	€€	RH / LH	15.7	13.0	32 0/–0.1	—	—	—	—	M26×1.5	42	—	12	—	—	—	—	1×3.5	3.50	4.0	—	—	—	—	0.07	12 000	25 000	**16×5**
16×5	...R	／	€€	RH / LH	15.7	13.0	32 0/–0.1	—	—	—	—	M26×1.5	47	—	12	—	—	—	—	1×3.5	3.50	4.0	—	—	M5	K	0.07	12 000	25 000	**16×5**
16×10	...R	／	€€	RH / —	15.7	13.0	32 0/–0.1	—	—	—	—	M26×1.5	47	—	12	—	—	—	—	1×2.5	3.50	4.0	—	—	—	—	0.07	8 500	12 500	**16×10**
16×10	...R	／	€€	RH / —	15.7	13.0	32 0/–0.1	—	—	—	—	M26×1.5	52	—	12	—	—	—	—	1×2.5	3.50	4.0	—	—	ø 4	K	0.07	8 500	12 500	**16×10**
16×10	...R	／	€€	RH / —	15.7	13.0	32 0/–0.1	—	—	—	—	M26×1.5	47	—	12	—	—	—	—	2×2.5	3.50	4.0	—	—	—	—	0.07	17 000	25 000	**16×10**
16×10	...R	／	€€	RH / —	15.7	13.0	32 0/–0.1	—	—	—	—	M26×1.5	52	—	12	—	—	—	—	2×2.5	3.50	4.0	—	—	ø 4	K	0.07	17 000	25 000	**16×10**
16×16	...R	／	€€	RH / —	15.9	13.2	32 0/–0.1	—	—	—	—	M26×1.5	47	—	12	—	—	—	—	3×1.5	3.00	4.0	—	—	—	—	0.07	9 150	18 750	**16×16**
16×16	...F	▮□▮	€	RH / —	15.5	13.2	36 0/–0.1	—	—	—	—	M33×1.5	41	—	19	—	—	—	—	2×1.6	3.00	4.0	—	—	ø 4	K	0.07	6 700	13 700	**16×16**

Flange nut

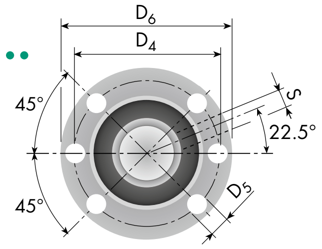


FB...



Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/left-hand thread	d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
16×2	...R	／	€€€	RH / —	16.0	14.5	30 g6	29.5	38	5.5	48	—	45	6	—	—	—	10	40	2×2.5	1.59	—	—	—	M6	K	0.06	4 500	11 000	**16×2**
16×2	...R	／	€€€	RH / —	16.0	14.5	30 g6	29.5	38	5.5	48	—	45	6	—	—	—	10	40	3×2.5	1.59	—	—	—	M6	K	0.06	6 000	15 000	**16×2**
16×5	...I	●●	€€€	RH / LH	15.7	13.0	28 g6	27.8	38	5.5	48	—	45	6	—	—	—	10	40	3×1	3.50	—	—	—	M6	K	0.07	9 700	22 000	**16×5**
16×10	...R	／	€€€	RH / —	15.7	13.0	32 g6	31.5	43	6.6	54	—	52	6	—	—	—	12	44	2×2.5	3.50	—	—	—	M6	K	0.07	17 000	25 000	**16×10**
16×10	...E	▮□▮	€€	RH / —	16.0	13.4	28 g6	27.8	38	5.5	48	—	42	10	—	10	—	10	40	2×2.9	3.00	—	—	—	ø 4	K	0.07	12 500	26 000	**16×10**
16×16	...E	▮□▮	€€	RH / —	15.5	13.2	28 g6	27.8	38	5.5	48	—	42	10	—	10	—	10	40	2×1.9	3.00	—	—	—	ø 4	K	0.07	7 800	15 500	**16×16**
16×50	...E	▮□▮	€€	RH / —	16.0	13.2	28 g6	27.8	38	5.5	48	—	55	10	—	10	—	10	40	3×0.9	3.00	—	—	—	ø 4	K	0.06	4 800	11 000	**16×50**

FA...



Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/left-hand thread	d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
15×20	...F	▮□▮	€€	RH / —	14.9	12.0	32 –0.01/–0.07	31.5	42	5.5	52	—	46	10	—	10	—	10	—	2×1.7	3.00	—	—	—	ø 4	K	0.07	7 100	14 700	**15×20**
16×16	...F	▮□▮	€€	RH / —	15.5	13.2	32 –0.01/–0.07	31.5	42	5.5	52	—	41	10	—	10	—	10	—	2×1.6	3.00	—	—	—	ø 4	K	0.07	6 700	13 700	**16×16**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

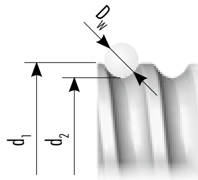
Single-thread ball return
Type **...I** ●●

Tube ball return
Type **...R** ／

End cap ball return
Type **...E** / **...F** ▮□▮

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

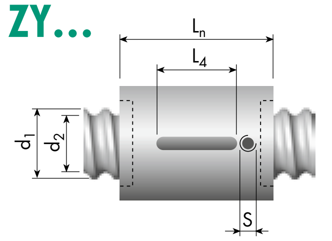
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

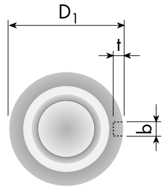
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 20

Cylindrical nut

ZY...

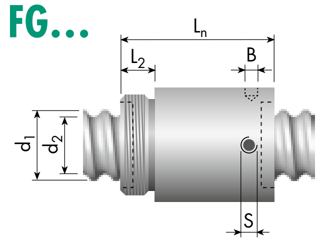


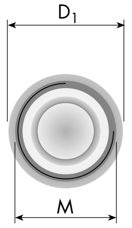


Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/ left-hand thread	Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
20 × 5	...I	⚁	€€€	RH / LH	19.2	16.5	33 g6	—	—	—	—	—	45	—	—	—	20	—	—	3 × 1	3.50	—	4	2.5	M5	K	0.07	10 800	25 000	20 × 5
20 × 20	...E	◫	€€€	RH / —	20.0	17.3	36 g6	—	—	—	—	—	50	—	—	—	20	—	—	4 × 1.9	3.00	—	4	2.5	ø 4	K	0.06	17 900	44 600	20 × 20

Nut with mounting thread

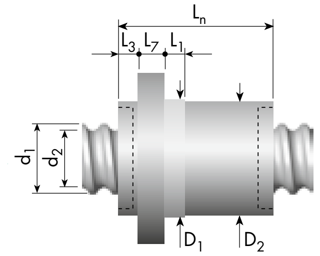
FG...



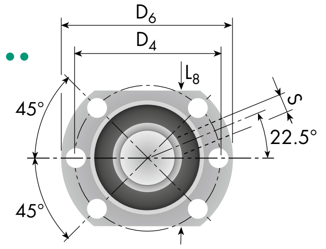


Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/ left-hand thread	Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
20 × 2	...R	⧄	€€	RH / LH	20.0	18.5	36 0/−0.1	—	—	—	—	M30 × 1.5	30	—	12	—	—	—	—	2 × 2.5	1.59	4.0	—	—	—	—	0.06	4 600	15 000	20 × 2
20 × 5	...I	⚁	€€	RH / LH	19.2	16.5	33 0/−0.1	—	—	—	—	M30 × 1.5	47	—	12	—	—	—	—	3 × 1	3.50	4.0	—	—	M5	K	0.07	10 800	25 000	20 × 5
20 × 5	...R	⧄	€€	RH / —	19.2	16.5	36 0/−0.1	—	—	—	—	M30 × 1.5	42	—	12	—	—	—	—	1 × 3.5	3.50	4.0	—	—	—	—	0.07	13 700	29 900	20 × 5
20 × 5	...R	⧄	€€	RH / —	19.2	16.5	36 0/−0.1	—	—	—	—	M30 × 1.5	47	—	12	—	—	—	—	1 × 3.5	3.50	4.0	—	—	ø 4	K	0.07	13 700	29 900	20 × 5
20 × 10	...R	⧄	€€	RH / —	19.5	16.5	38 0/−0.1	—	—	—	—	M35 × 1.5	58	—	19	—	—	—	—	2 × 2.5	3.50	4.0	—	—	—	—	0.07	21 000	51 000	20 × 10
20 × 10	...R	⧄	€€	RH / —	19.5	16.5	38 0/−0.1	—	—	—	—	M35 × 1.5	58	—	19	—	—	—	—	2 × 2.5	3.50	4.0	—	—	ø 4	B	0.07	21 000	51 000	20 × 10
20 × 20	...R	⧄	€€	RH / —	20.0	16.5	38 0/−0.1	—	—	—	—	M35 × 1.5	58	—	19	—	—	—	—	2 × 1.5	3.50	4.0	—	—	—	—	0.07	10 000	22 000	20 × 20
20 × 20	...R	⧄	€€	RH / —	20.0	16.5	38 0/−0.1	—	—	—	—	M35 × 1.5	64	—	19	—	—	—	—	2 × 1.5	3.50	4.0	—	—	ø 4	B	0.07	10 000	22 000	20 × 20
20 × 20	...R	⧄	€€	RH / —	20.0	17.3	38 0/−0.1	—	—	—	—	M35 × 1.5	58	—	19	—	—	—	—	4 × 1.5	3.00	4.0	—	—	—	—	0.07	14 600	35 000	20 × 20

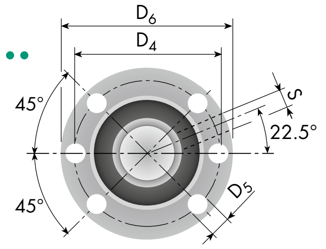
Flange nut



FB...



FA...



Nominal size $d_0 \times p$ [mm]	Ball return Type		Relative cost	Right-/ left-hand thread	Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	Load rates [N] C_{dyn}	C_{stat}	Nominal size $d_0 \times p$ [mm]
20 × 5	...I	⚁	€€€	RH / LH	19.2	16.5	36 g6	35.5	47	6.6	58	—	50	10	—	—	—	10	44	3 × 1	3.50	—	—	—	M6	K	0.07	10 800	25 000	20 × 5
20 × 10	...R	⧄	€€€	RH / —	19.5	16.5	38 g6	37.5	50	6.6	62	—	55	7	—	—	—	10	48	2 × 2.5	3.50	—	—	—	M6	B	0.07	21 000	51 000	20 × 10
20 × 10 [3]	...R	⧄	€€€	RH / —	19.5	16.5	38 g6	37.5	50	6.6	62	—	65	7	—	—	—	10	48	2 × 3.5	3.50	—	—	—	M6	B	0.07	26 000	65 000	20 × 10 [3]
20 × 20	...R	⧄	€€€	RH / —	20.0	16.5	36 g6	35.5	47	6.6	58	—	58	7	—	—	—	10	44	2 × 1.5	3.50	—	—	—	M6	B	0.07	10 000	22 000	20 × 20
20 × 20	...E	◫	€€	RH / —	20.0	17.3	36 g6	35.5	47	6.6	58	—	50	10	—	10	—	12	44	4 × 1.9	3.00	—	—	—	M6	K	0.06	17 900	44 600	20 × 20

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Ball return systems (details › page 9)

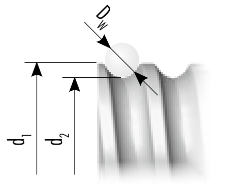
Single-thread ball return
Type **...I** ⚁

Tube ball return
Type **...R** ⧄

End cap ball return
Type **...E** / **...F** ◫

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

T_{max} = max. standard backlash [mm]
[3] = only on request
* position not defined
Special designs available on request

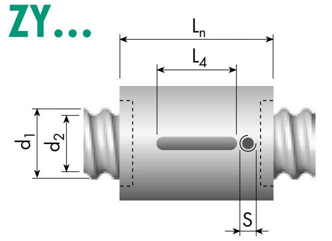
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

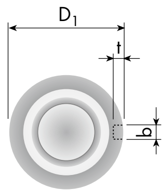
ø 20

ø 25

Cylindrical nut

ZY...

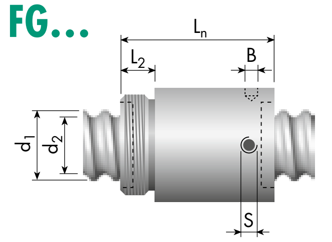


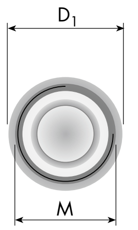


Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size $d_0 \times p$ [mm]
				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	
25×5	...I ● ●	€€€	RH / —	24.6	21.5	38 g6	—	—	—	—	—	50	—	—	—	20	—	—	3×1	3.50	—	4	2.5	M5	K	0.07	11 700	30 000	**25×5**
25×25	...E ▌▐	€€€	RH / —	24.5	21.2	40 g6	—	—	—	—	—	60	—	—	—	20	—	—	4×1.9	3.50	—	4	2.5	ø 4	K	0.06	23 300	68 000	**25×25**

Nut with mounting thread

FG...

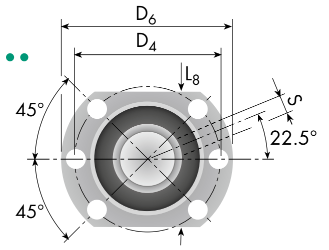


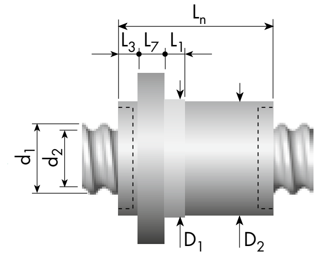


Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size $d_0 \times p$ [mm]
				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	
25×5	...I ● ●	€€	RH / —	24.6	21.5	40 0/–0.1	—	—	—	—	M38×1.5	57	—	12	—	—	—	—	3×1	3.50	4.0	—	—	M5	K	0.07	11 700	30 000	**25×5**
25×5	...R ╱	€€	RH / —	24.6	21.5	44 0/–0.1	—	—	—	—	M40×1.5	58	—	19	—	—	—	—	2×2.5	3.50	4.0	—	—	—	—	0.07	17 500	42 400	**25×5**
25×10	...R ╱	€€	RH / —	24.8	21.8	43 0/–0.1	—	—	—	—	M40×1.5	58	—	19	—	—	—	—	2×2.5	3.50	4.0	—	—	—	—	0.07	21 000	54 000	**25×10**
25×10	...R ╱	€€	RH / —	24.8	21.8	43 0/–0.1	—	—	—	—	M40×1.5	58	—	19	—	—	—	—	2×2.5	3.50	4.0	—	—	ø 4	B	0.07	21 000	54 000	**25×10**
25×10	...F ▌▐	€	RH / —	24.9	22.3	49 0/–0.1	—	—	—	—	M45×1.5	52	—	19	—	—	—	—	2×2.7	3.00	4.0	—	—	ø 4	K	0.07	14 100	39 800	**25×10**
25×25	...R ╱	€€	RH / —	24.5	21.2	44 0/–0.1	—	—	—	—	M40×1.5	72	—	20	—	—	—	—	2×1.5	3.50	4.0	—	—	ø 4	B	0.08	10 000	24 000	**25×25**
25×25	...R ╱	€€	RH / —	24.5	21.2	44 0/–0.1	—	—	—	—	M40×1.5	72	—	20	—	—	—	—	4×1.5	3.50	4.0	—	—	ø 4	B	0.08	20 000	48 000	**25×25**

Flange nut

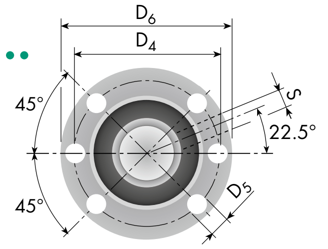
FB...





Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size $d_0 \times p$ [mm]
				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	
25×5	...I ● ●	€€€	RH / —	24.6	21.5	40 g6	39.5	51	6.6	62	—	50	10	—	—	—	10	48	3×1	3.50	—	—	—	M6	K	0.07	11 700	30 000	**25×5**
25×5	...I ● ●	€€€	RH / —	24.6	21.5	40 g6	39.5	51	6.6	62	—	55	10	—	—	—	10	48	4×1	3.50	—	—	—	M6	K	0.07	14 000	35 000	**25×5**
25×10	...R ╱	€€€	RH / —	24.8	21.8	43 g6	42.5	55	6.6	65	—	55	7	—	—	—	10	50	2×2.5	3.50	—	—	—	M6	B	0.07	21 000	54 000	**25×10**
25×25	...R ╱	€€€	RH / —	24.5	21.2	44 g6	43.5	56	6.6	70	—	67	10	—	—	—	12	52	2×1.5	3.50	—	—	—	M6	B	0.08	10 000	24 000	**25×25**
25×25	...R ╱	€€€	RH / —	24.5	21.2	44 g6	43.5	56	6.6	70	—	67	10	—	—	—	12	52	4×1.5	3.50	—	—	—	M6	B	0.08	20 000	48 000	**25×25**
25×25	...E ▌▐	€€	RH / —	24.5	21.2	40 g6	39.8	51	6.6	62	—	60	10	—	10	—	10	48	4×1.9	3.50	—	—	—	ø 4	K	0.06	23 300	68 000	**25×25**
25×30	...E ▌▐	€€	RH / —	24.8	21.5	40 g6	39.8	51	6.6	62	—	70	10	—	10	—	10	48	4×1.9	3.50	—	—	—	ø 4	K	0.06	23 000	67 800	**25×30**

FA...



Nominal size $d_0 \times p$ [mm]	Ball return Type	Relative cost	Right-/left-hand thread	Dimensions [mm]																							Load rates [N]		Nominal size $d_0 \times p$ [mm]
				Screw d_1	d_2	Nut D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	
25×10	...F ▌▐	€€	RH / —	24.9	22.3	42 –0.01/–0.08	41.5	53	6.6	64	—	52	10	—	10	—	10	—	2×2.7	3.00	—	—	—	ø 4	K	0.07	14 100	39 800	**25×10**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

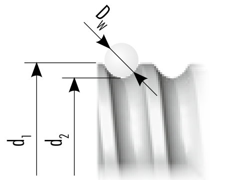
Single-thread ball return
Type **...I** ● ●

Tube ball return
Type **...R** ╱

End cap ball return
Type **...E** / **...F** ▌▐

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

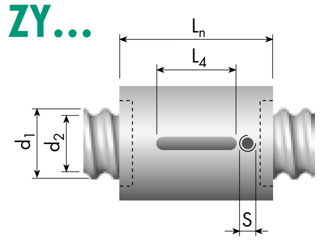
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

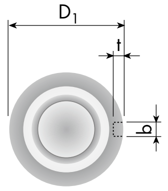
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 32

Cylindrical nut

ZY...

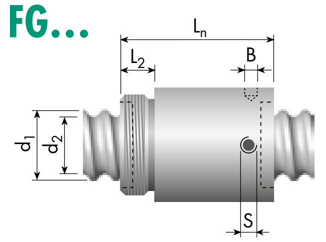


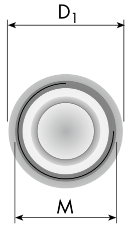


Nominal size	Ball return	Relative cost	Right-/ left-hand	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type		thread	d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
32 × 5	...I ● ●	€€€	RH / —	31.6	28.5	48 g6	—	—	—	—	—	48	—	—	—	20	—	—	4 × 1	3.50	—	5	3.0	M5	K	0.07	19 000	54 000	**32 × 5**

Nut with mounting thread

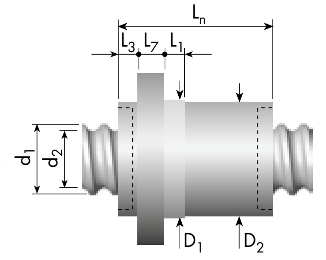
FG...



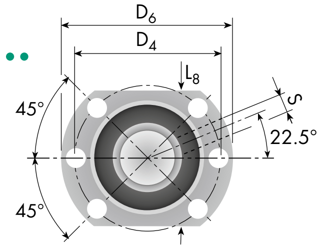


Nominal size	Ball return	Relative cost	Right-/ left-hand	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type		thread	d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
32 × 5	...I ● ●	€€	RH / —	31.6	28.5	52 0/−0.1	—	—	—	—	M48 × 1.5	55	—	15	—	—	—	—	4 × 1	3.50	4.0	—	—	M5	K	0.07	19 000	54 000	**32 × 5**
32 × 10	...R ▬	€€	RH / —	31.6	28.4	52 0/−0.1	—	—	—	—	M48 × 1.5	62	—	19	—	—	—	—	2 × 2.5	3.50	4.0	—	—	ø 4	B	0.07	20 000	55 000	**32 × 10**

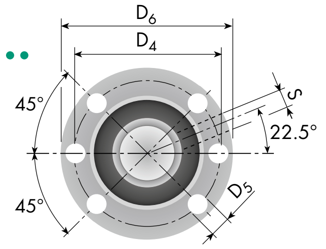
Flange nut



FB...



FA...



Nominal size	Ball return	Relative cost	Right-/ left-hand	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type		thread	d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
32 × 5	...I ● ●	€€€	RH / —	31.6	28.5	50 g6	49.5	65	9.0	80	—	57	10	—	—	—	12	62	4 × 1	3.50	—	—	—	M6	K	0.07	19 000	54 000	**32 × 5**
32 × 10	...R ▬	€€€	RH / —	31.6	28.4	52 g6	51.5	67	9.0	82	—	62	10	—	—	—	12	64	2 × 2.5	3.50	—	—	—	M6	B	0.07	20 000	55 000	**32 × 10**
32 × 15	...R ▬	€€€	RH / —	31.4	28.5	56 g6	55.5	71	9.0	86	—	74	12	—	—	—	14	65	2 × 2.5	3.50	—	—	—	M6	B	0.07	19 900	55 100	**32 × 15**
32 × 32	...R ▬	€€€	RH / —	31.5	28.5	56 g6	55.5	71	9.0	86	—	86	12	—	—	—	14	65	4 × 1.5	3.50	—	—	—	M6	B	0.07	25 700	76 200	**32 × 32**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

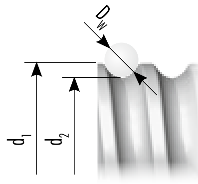
Single-thread ball return
Type **...I** ● ●

Tube ball return
Type **...R** ▬

End cap ball return
Type **...E / ...F** ▭

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

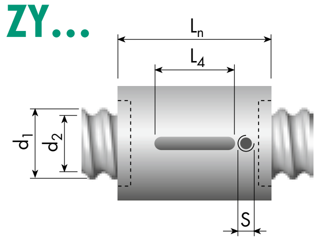
T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

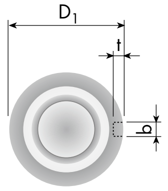
⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

ø 40

Cylindrical nut

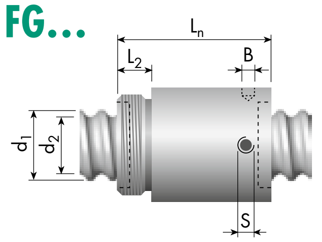
ZY...

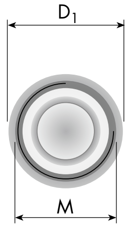




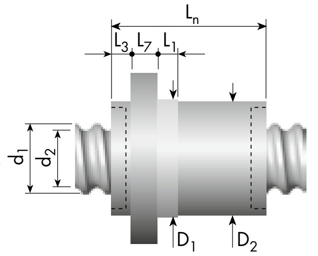
Nut with mounting thread

FG...

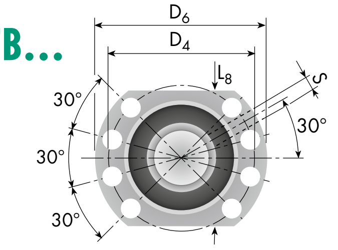




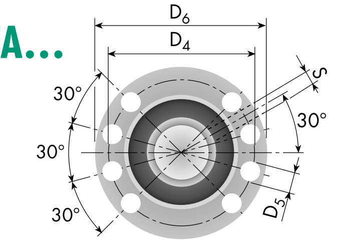
Flange nut



FB...



FA...



Nominal size	Ball return	Relative cost	Right-/left-hand thread	Dimensions [mm] Screw		Nut																					Load rates [N]		Nominal size
$d_0 \times p$ [mm]	Type			d_1	d_2	D_1	D_2	D_4 TK	D_5 H13	D_6 h13	M	L_n	L_1	L_2	L_3	L_4	L_7	L_8 h13	i	D_W	B +0.5/0	b P9	t	S	SA	T_{max}	C_{dyn}	C_{stat}	$d_0 \times p$ [mm]
40×5	...R ⧄	€€€	RH / —	39.8	36.9	65 g6	64.5	78	9.0	93	—	75	12	—	—	—	14	70	2×3.5	3.50	—	—	—	M8×1	B	0.07	29 400	97 000	**40×5**
40×20	...R ⧄	€€€	RH / —	40.3	36.9	65 g6	64.7	78	9.0	93	—	88	12	—	—	—	14	70	2×2.5	4.00	—	—	—	M8×1	B	0.07	25 500	77 400	**40×20**
40×40	...R ⧄	€€€	RH / —	39.8	36.4	66 g6	65.5	80	9.0	95	—	98	12	—	—	—	14	75	4×1.5	4.00	—	—	—	M8×1	B	0.07	29 900	94 500	**40×40**
40×40	...F ▭	€€	RH / —	39.8	36.4	$62_{-0.01/-0.09}$	61.5	78	9.0	93	—	90	12	—	12	—	12	—	4×1.7	4.00	—	—	—	ø 4	K	0.07	30 600	108 100	**40×40**

› CAD data › www.gewinde.ch

Ball return systems (details › page 9)

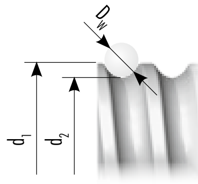

Single-thread ball return
Type ...I • •


Tube ball return
Type ...R ⧄


End cap ball return
Type ...E / ...F ▭

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]



i = number of ball circulations [–]
D_W = ball diameter [mm]
B = pin wrench hole * [mm]
S = lubrication hole * [mm]

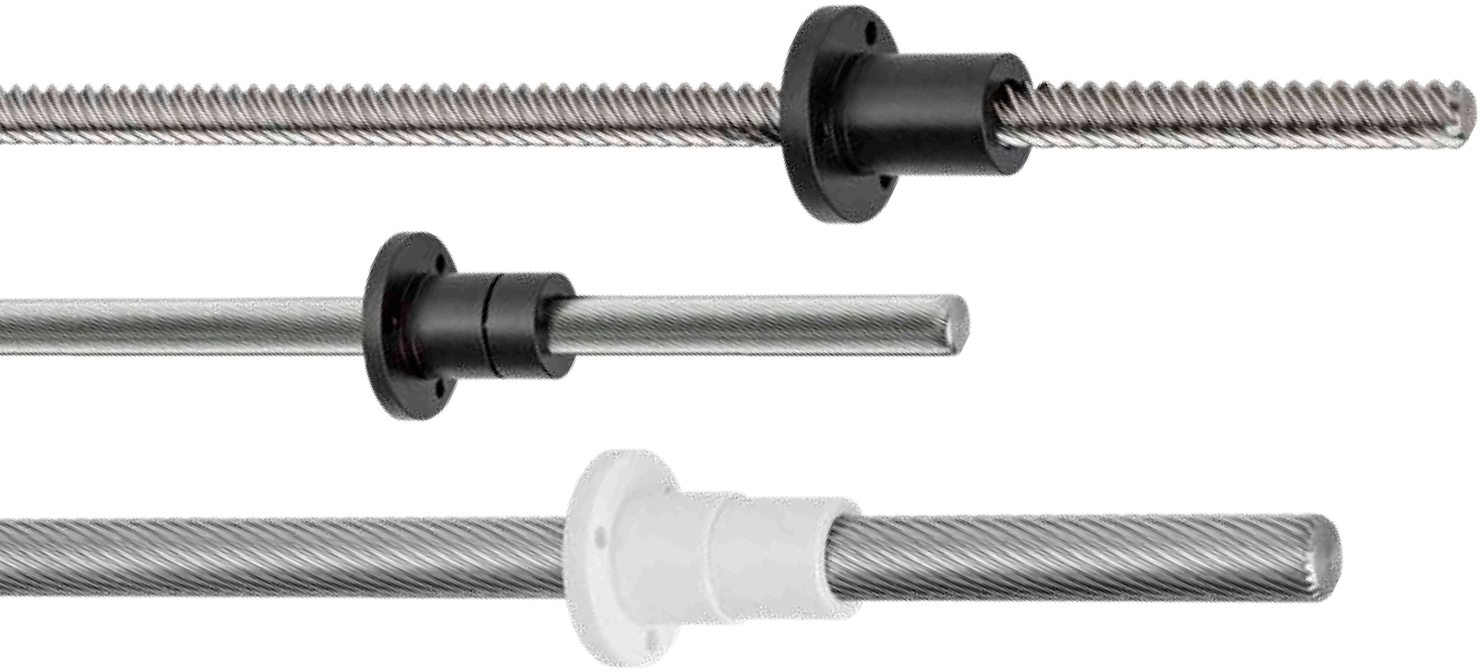
SA = wipers (details › page 9)
K = technopolymer wipers
B = brush wipers
F = felt rings (on request)

T_{max} = max. standard backlash [mm]
3) = only on request
* position not defined
Special designs available on request

⚠ When selecting a ballscrew, always observe the maximum rotational speed dependent on the system-specific rotational speed characteristics!
Calculation › page 12

Speedy high-helix leadscrews (SGS)

100 % Swiss made



Design features

Eichenberger high-helix leadscrews are called Speedy for good reason: never before have such high moving speeds been obtained at such low rotational speeds. The Eichenberger Speedy has made this possible by using a helix pitch unheard of before.

High-helix leadscrews are made of corrosion-protected steel and are formed by the cold-rolling process. They are coupled with high wear-resistant technopolymer flange nuts in non-preloaded or preloaded designs.

For higher loads or special applications, alternative technopolymer materials or bronze may be used to make the nuts.

Materials

Screw
- standard: corrosion-protected steel
  - 1.4021 (X20Cr13)
- on request: other materials such as
  - corrosion and acid resistant steel 1.4404 (X2CrNiMo17-12-2)
  - aluminium
- on request:
  - coating to reduce sliding friction

Nut
- non-preloaded:
  - POM-C black
  - bronze 2.1052 (CuSn12)
- preloaded:
  - axial-preloaded (if $p_0 < d_0$): POM-C black
  - torsion-preloaded (if $p_0 \geq d_0$): EX100 white
  - bronze on request
- on request: other materials such as
  - iglidur® J *

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* iglidur® is a registered trademark of igus® GmbH

Speedy high-helix leadscrews – design features

Nut types (shapes)

For all Speedy high-helix leadscrews one standard flange nut design has been defined (flange nut type A following DIN 69051), which is deliverable in the following types:

Flange nut, non-preloaded
- **Type SFM**: POM-C black
- **Type SBM**: bronze

Flange nut axial-preloaded (if $p_0 < d_0$)
- **Type SFV**: POM-C black
- on request:
  - nut body made of bronze

Flange nut torsion-preloaded (if $p_0 \geq d_0$)
- **Type SFT**: EX100 white
- on request:
  - nut body made of bronze

If required, any application-specific nut shapes can be manufactured, for large series also from injection molding.
Contact us with your revolutionary idea – we'll provide YOUR tailor-made high-helix leadscrew!

Operational temperatures

POM-C / EX100	–40 to +60 °C
iglidur® J	–50 to +90 °C
bronze	–40 to +200 °C

Lead accuracy
- standard:
  - G9 ≙ ≤0.1 mm/300 mm (in accordance with DIN 69051)
- on request:
  - other lead accuracies

Efficiency

The efficiency η depends on the helix angle and reaches values from ~0.5 to 0.75

› also see diagram, page 44

Production / Handling / Lubrication

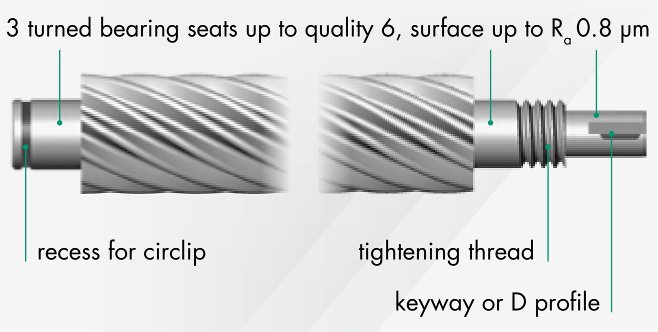
Production lengths

In general, Eichenberger screws are produced as bars with a length of 3 m. Depending on the diameter and the material availability, lengths up to 6 m are also possible on request.

Any kind of end machining

By default leadscrews are cut to the desired length without special machining.

Upon request, a so-called standard screw end journal with three turned bearing seats is available. Dimensions are as per customer specifications. Note also the links to the CAD data at www.gewinde.ch



Our speciality is any application-specific end machining: Tell us your requirements, and we'll provide YOUR tailor-made screw!

In each instance, a detailed drawing would be necessary.

Handling

Speedy, Easy and Rondo leadscrews are precision parts and must be protected from shock, dirt or moisture when transported or stored. Please do not unpack until ready for use.

Please check for cleanness when mounting a leadscrew. Dirt or foreign matter on the thread may cause increased wear and premature failure.

Please consult lubrication recommendation before mounting or operating leadscrews.

Radial loads and torque

Radial loads or torque brought to bear upon the nut result in overload of individual contact surfaces, thus seriously affecting the service life of the leadscrew assembly. Therefore it is important to properly mount the screw and to comply with all relevant form and positional tolerances.

Lubrication

⚠ In some cases, a single lubrication with grease or oil is sufficient. However, any lubrication cycle depends on the application environment.

Bronze nuts have to be lubricated regularly.

Recommended all-purpose lubricant:
- Klüber Microlube GBU Y 131

Surface coatings

… possible on request:
- generally to reduce sliding friction
- if lubrication is not possible (e.g. in the food industry)

› also see Materials, page 40

Application examples for Eichenberger leadscrews

Eichenberger Speedy, Easy and Rondo leadscrews are suitable for numerous applications: On the one hand, for shorter lifts, they are a great substitute for belt drive systems because of their lower engineering effort. On the other hand, they are also an excellent substitute for hydraulic and pneumatic lift cylinders because they can be freely accelerated and positioned, and work independently of secondary energy sources. Thanks to high efficiency and excellent value for money, they are an ideal alternative to trapezoidal screws or ballscrews in particular areas of use.

Typical areas of application:
- Drives for doors, gates and windows
- Air-conditioning technology (valve/slide drives)
- Construction industry (e.g. automatic shading systems)
- Handling systems
- Graphics equipment and devices
- Medical technology
- Textile machines
- Food and packaging industry
- Electric cylinders (actuators)
- Electronics industry

Rondo: Pressing of freshly ground coffee in a modern gastro coffee machine

Speedy: Automatic shading systems for modern glass façades

Easy: Door drives in train carriages

Design fundamentals

The following are the relevant calculations which underlie screw design and safe operation of a Speedy, Easy or Rondo leadscrew.

Calculations at dynamic load:

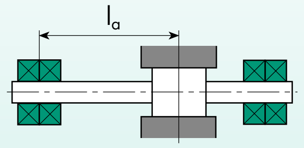
Critical rotational speed n_{per}

Permissible rotational speeds must differ substantially from the screw's own frequency.

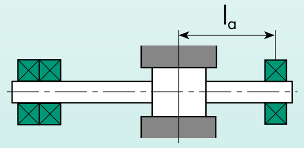
$$n_{per} = K_D \cdot 10^6 \cdot \frac{d_2}{l_a^{\,2}} \cdot S_n \ \ [\mathrm{min}^{-1}]$$

n_{per} = permissible rotational speed [min^{-1}]
K_D = characteristic constant [–]
as a function of bearing configuration › see aside
d_2 = core screw diameter [mm]
l_a = bearing distances [mm] › see aside
(always include maximum allowable l_a in calculation!)
S_n = safety factor [–], usually S_n = 0.5 … 0.8

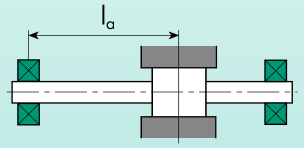
Config. 1: fixed – fixed
→ K_D = 276



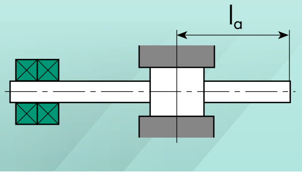
Config. 2: fixed – single
→ K_D = 190



Config. 3: single – single
→ K_D = 122



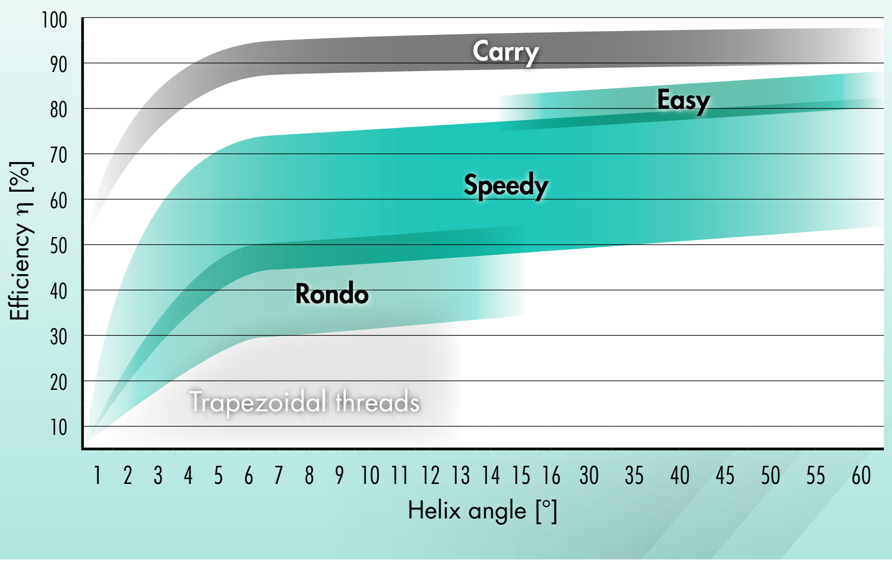
Config. 4: fixed – free
→ K_D = 43



Efficiency η_p (practical)

The efficiency η depends on the helix angle and reaches the following values:

- **Speedy** ~0.5 … 0.75
- **Easy** >0.8
- **Rondo** ~0.3 … 0.5



Driving torque M

depends upon the type of power transmission

- Case 1: torque → linear movement

$$M_a = \frac{F_a \cdot p}{2000 \cdot \pi \cdot \eta} \ \ [\mathrm{Nm}]$$

- Case 2: axial force → torque

$$M_e = \frac{F_a \cdot p \cdot \eta'}{2000 \cdot \pi} \ \ [\mathrm{Nm}]$$

M_a = input torque [Nm], case 1
M_e = output torque [Nm], case 2
F_a = axial force [N]
p = pitch [mm]
η = efficiency [%]
η' = corrected efficiency [%]

Input performance P

$$P = \frac{M_a \cdot n}{9550} \ \ [\mathrm{kW}]$$

P = input performance [kW]
n = rotational speed [min^{-1}]

A safety margin of 20% is recommended when selecting drives.

Basic calculations

Maximum authorized load depending on speed

$$F_{per.} = C_0 \cdot f_L \ \ [\mathrm{N}]$$

C_0 = static load rate [N]
f_L = load factor [–] for POM-C nuts

Circumferential speed v_C [m/min]	Load factor f_L [–]
5	0.95
10	0.75
20	0.45
30	0.37
40	0.12
50	0.08

Example

- Parameters:
  Speedy 10/50 with non-preloaded POM-C nut, d_0 = 10 mm, p = 50 mm and C_0 = 1250 N;
  required moving speed v_S = 200 mm/sec.

- We need to find: $F_{per.}$

Therefore we calculate n [min^{-1}],

$$n = \frac{v_S\,[\mathrm{mm/sec.}] \cdot 60}{p\,[\mathrm{mm}]} = \frac{200 \cdot 60}{50} = 240\ \mathrm{min}^{-1}$$

the circumferential speed v_C [m/min]

$$v_C = \frac{d_0\,[\mathrm{mm}] \cdot \pi \cdot n\,[\mathrm{min}^{-1}]}{1000} = \frac{10 \cdot \pi \cdot 240}{1000} = 7.53\ \mathrm{m/min}$$

and find the load factor f_L in above table:

f_L at v_C of 7.53 m/min ≈ 0.85 [–]

- It follows:

$F_{per.} = C_{stat} \cdot f_L = 1250 \cdot 0.85 = 1062.5$ N

So the maximum load for a Speedy 10/50 at v_S = 200 mm/sec. (→ n = 240 min^{-1}) is 1060 N.

Order system – Speedy high-helix leadscrews

Example for complete Speedy high-helix leadscrew — **SGS 18/100 SFM RH 350 G9 E M**

Type of thread drive
SGS = **Speedy** high-helix leadscrews

Nominal size (d_0 / p_0) [mm]

Nut type — for nut only
SFM = standard flange nut, non-preloaded (POM-C black) [1]
SBM = standard flange nut, non-preloaded, made of bronze
SFV = standard flange nut, axial-preloaded ($p_0 < d_0$; POM-C black) [1,2]
SFT = standard flange nut, torsion-preloaded ($p_0 \geq d_0$; EX100 white) [1,2]
MSX = special design according to drawing

Right-hand / left-hand thread
RH = right-hand thread (standard)
LH = left-hand thread (availability see dimensional charts)

Leadscrew overall length [mm] — for screw only
standard quality: 1.4021 (X20Cr13) [1]

Lead accuracy (class) — for screw only
G9 = ≤0.1 mm/300 mm (standard)
GX = lead accuracy upon specification

Screw end machining — for screw only
O = no end machining (cut by grinding)
E = end machining according to drawing

Assembly
G = screw and nut separate (standard)
M = screw and nut assembled according to drawing/specified orientation

[1] other materials on request
[2] bronze on request

Example for screw only — **SGS 18/100 RH 350 G9 O G**

Example for nut only — **SGS 18/100 SFM RH G**

Dimension map – Speedy standard range

Nominal pitch p_0 [mm]

d_0 / p_0	Nominal diameter d_0 [mm]																																			
[mm]	4	4.96	5	6	6.35	7.5	7.94	8	9	9.7	10	11	11.2	12	12.5	12.8	13	14	14.3	15	16	17.6	18	19	20	21	22	23	24	25.7	26	27	28	30	32	34	36
4								■																													
5			■																																		
6.35					■																																
7.5						■																															
8																		■																			
10	■							■			■																										
12								■			■														■												
12.5															■																						
12.7					■		■																														
15								■			■			■																							
16																							■								■						
16.25		■																																			
18																		■																			
20			■						■								■			■							■								■		
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65																																	■				
70																	■																	■			
75																																			■		
76.2																														■							
80																				■																■	
90																					■																
96.5																																			■		
100																							■														
120																											■										
200																																					■
Register	ø 4 … 9.7										ø 10 … 13							ø 14 … 17.6					ø 18 … 25.7								ø 26 … 36						
Pages	48/49										50/51							52/53					54/55								56/57						

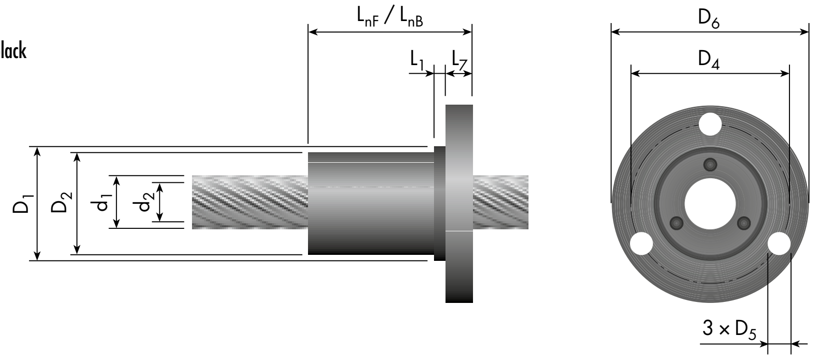
ø4 … 9.7

Standard flange nut non-preloaded / preloaded

Non-preloaded:

SFM POM-C black

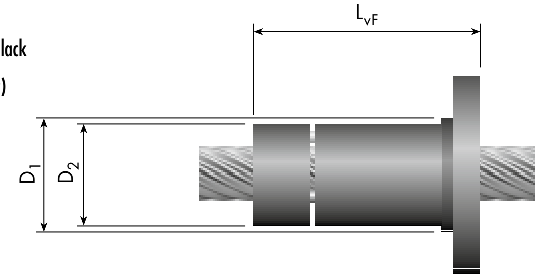
SBM bronze



Axial-preloaded, if $p_0 < d_0$:

SFV POM-C black

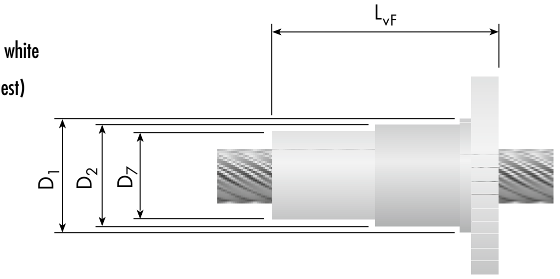
(bronze on request)



Torsion-preloaded, if $p_0 \geq d_0$:

SFT EX100 white

(bronze on request)



Nominal size		Right-hand/ left-hand	Dimensions [mm]															Load rates	Nominal size	
			Screw				Nut											for POM-C/EX100		
d_0 / p_0 [mm]	(in)	thread	d_1	d_2	p	g	D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	D_7	L_{nF}	L_{nB}	L_{vF}	L_1	L_7	C_{stat} [N]	d_0 / p_0 [mm]	(in)
4 / 10		RH / —	4.0	3.0	10	8	12	11.5	18	3.2	28	—	20	15	—	3	4	150	**4 / 10**	
4.96 / 16.25		RH / —	5.0	4.0	16.25	13	12	11.5	18	3.2	28	—	20	15	—	3	4	220	**4.96 / 16.25**	
5 / 5		RH / —	5.4	3.6	5	4	21	20.5	29	4.2	38	18.5	25	18	38	3	5	300	**5 / 5**	
5 / 20		RH / LH	6.0	5.0	20	16	21	20.5	29	4.2	38	18.5	25	18	38	3	5	300	**5 / 20**	
6 / 25		RH / —	7.4	6.3	25	20	21	20.5	29	4.2	38	18.5	25	18	38	3	5	400	**6 / 25**	
6.35 / 6.35	(¼″/ ¼″)	RH / —	6.4	4.4	6.35	4	21	20.5	29	4.2	38	18.5	25	18	38	3	5	850	**6.35 / 6.35**	(¼″/ ¼″)
6.35 / 12.7	(¼″/ ½″)	RH / —	6.3	4.6	12.70	6	21	20.5	29	4.2	38	18.5	25	18	38	3	5	800	**6.35 / 12.7**	(¼″/ ½″)
6.35 / 25.4	(¼″/ 1″)	RH / —	6.35	4.2	25.40	8	21	20.5	29	4.2	38	18.5	25	18	38	3	5	800	**6.35 / 25.4**	(¼″/ 1″)
6.35 / 25.4	(¼″/ 1″)	RH / —	6.1	4.4	25.40	10	21	20.5	29	4.2	38	18.5	25	18	38	3	5	700	**6.35 / 25.4**	(¼″/ 1″)
7.5 / 7.5		RH / —	7.7	5.9	7.5	6	21	20.5	29	4.2	38	18.5	25	18	38	3	5	450	**7.5 / 7.5**	
7.94 / 12.7	(5⁄16″/ ½″)	RH / —	7.9	5.8	12.70	6	21	20.5	29	4.2	38	18.5	25	18	38	3	5	1 100	**7.94 / 12.7**	(5⁄16″/ ½″)
8 / 4		RH / —	7.9	5.5	4	2	24	23.5	32	4.2	42	—	25	18	38	3	5	950	**8 / 4**	
8 / 10		RH / LH	8.2	5.5	10	4	24	23.5	32	4.2	42	21.5	25	18	38	3	5	800	**8 / 10**	
8 / 12		RH / —	8.0	5.9	12	5	24	23.5	32	4.2	42	21.5	25	18	38	3	5	800	**8 / 12**	
8 / 15		RH / —	8.0	5.9	15	6	24	23.5	32	4.2	42	21.5	25	18	38	3	5	850	**8 / 15**	
8 / 30		RH / LH	8.6	7.5	30	24	21	20.5	29	4.2	38	18.5	25	18	38	3	5	500	**8 / 30**	
8 / 38		RH / —	8.0	5.7	38	8	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 000	**8 / 38**	
9 / 20		RH / —	8.9	5.8	20	5	24	23.5	32	4.2	42	21.5	25	18	38	3	5	850	**9 / 20**	
9.7 / 25.4	(⅜″/ 1″)	RH / LH	9.7	6.4	25.40	5	24	23.5	32	4.2	42	21.5	25	—	38	3	5	1 200	**9.7 / 25.4**	(⅜″/ 1″)

› CAD data › www.gewinde.ch

Nut types (details › page 41)

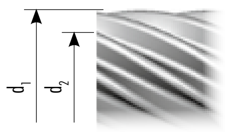
Flange nut,
non-preloaded
Type **SFM** / **SBM**

Flange nut,
axial-preloaded
Type **SFV**

Flange nut.
torsion-preloaded
Type **SFT**

Legend

d_0 = Nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]



p_0 = nominal pitch [mm]
p = effective pitch [mm]
g = number of threads [–]

L_{nF} = length of nut body, non-preloaded, POM-C (type SFM)
L_{nB} = length of nut body, non-preloaded, bronze (type SBM)
L_{vF} = length of nut body, preloaded, POM-C/EX100 (types SFV and SFT)

C_{stat} = static load rates for non-preloaded **and** preloaded nuts made of POM-C / EX100 [N];
for higher load rates → bronze nuts → $C_{stat\ bronze} = \mathbf{1.3} \times C_{stat\ POM\text{-}C/EX100}$
[3] = only on request

Special designs available on request

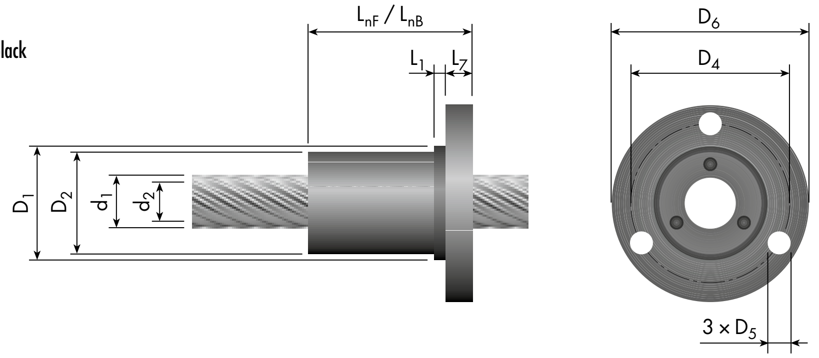
ø10 … 13

Standard flange nut non-preloaded / preloaded

Non-preloaded:

SFM POM-C black

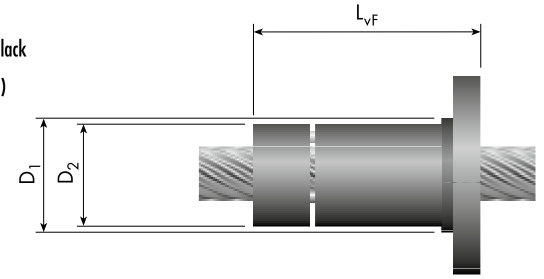
SBM bronze



Axial-preloaded, if $p_0 < d_0$:

SFV POM-C black

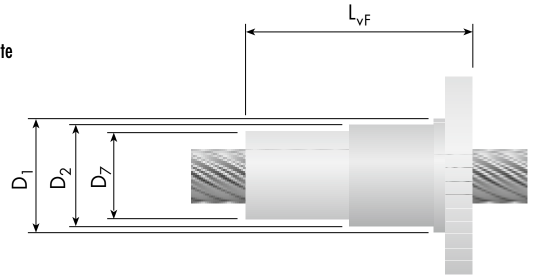
(bronze on request)



Torsion-preloaded, if $p_0 \geq d_0$:

SFT EX100 white

(bronze on request)



Nominal size d_0 / p_0 [mm] (in)	Right-hand/ left-hand thread	Dimensions [mm] Screw d_1	d_2	p	g	Nut D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	D_7	L_{nF}	L_{nB}	L_{vF}	L_1	L_7	Load rates for POM-C/EX100 C_{stat} [N]	Nominal size d_0 / p_0 [mm] (in)
10 / 10	RH / —	10.0	8.2	10	8	24	23.5	32	4.2	42	21.5	25	18	38	3	5	600	**10 / 10**
10 / 12	RH / LH	10.0	7.1	12	4	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 200	**10 / 12**
10 / 15	RH / —	10.0	7.4	15	5	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 200	**10 / 15**
10 / 35	RH / LH	10.1	8.9	35	28	24	23.5	32	4.2	42	21.5	25	18	38	3	5	600	**10 / 35**
10 / 50	RH / LH	10.0	7.4	50	10	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 250	**10 / 50**
11 / 40	RH / —	11.5	10.2	40	32	24	23.5	32	4.2	42	21.5	25	18	38	3	5	700	**11 / 40**
11 / 60	RH / —	11.7	9.1	60	12	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 500	**11 / 60**
11.2 / 30.5 (7⁄16″ / 1 13⁄64″)	RH / —	11.2	8.0	30.48	6	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 400	**11.2 / 30.5** (7⁄16″ / 1 13⁄64″)
12 / 15	RH / LH	12.2	9.2	15	5	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 400	**12 / 15**
12 / 25	RH / LH	11.9	8.0	25	5	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 500	**12 / 25**
12 / 45	RH / LH	12.8	11.4	45	36	24	23.5	32	4.2	42	21.5	25	18	38	3	5	800	**12 / 45**
12.5 / 12.5 [3]	RH / —	12.3	10.4	12.5	10	24	23.5	32	4.2	42	21.5	25	18	38	3	5	750	12.5 / 12.5 [3]
12.8 / 35.6 (½″ / 1⅖″)	RH / —	12.8	9.6	35.56	7	24	23.5	32	4.2	42	21.5	25	18	38	3	5	1 600	**12.8 / 35.6** (½″ / 1⅖″)
13 / 20	RH / —	13.3	8.8	20	4	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 300	**13 / 20**
13 / 70	RH / LH	13.5	10.9	70	14	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 750	**13 / 70**

› CAD data › www.gewinde.ch

Nut types (details › page 41)

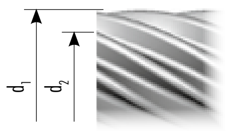
Flange nut,
non-preloaded
Type **SFM** / **SBM**

Flange nut,
axial-preloaded
Type **SFV**

Flange nut.
torsion-preloaded
Type **SFT**

Legend

d_0 = Nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]



p_0 = nominal pitch [mm]
p = effective pitch [mm]
g = number of threads [–]

L_{nF} = length of nut body, non-preloaded, POM-C (type SFM)
L_{nB} = length of nut body, non-preloaded, bronze (type SBM)
L_{vF} = length of nut body, preloaded, POM-C/EX100 (types SFV and SFT)

C_{stat} = static load rates for non-preloaded **and** preloaded nuts made of POM-C / EX100 [N]; for higher load rates → bronze nuts → $C_{stat\ bronze} = \mathbf{1.3} \times C_{stat\ POM\text{-}C/EX100}$

[3] = only on request

Special designs available on request

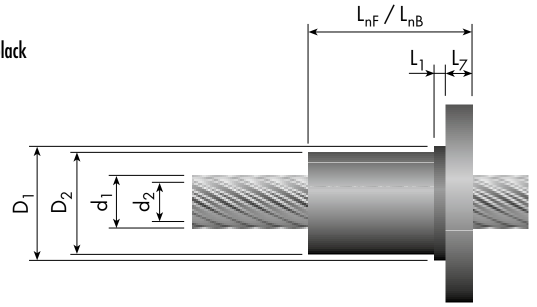
ø14 … 17.6

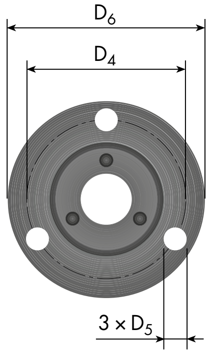
Standard flange nut non-preloaded / preloaded

Non-preloaded:

SFM POM-C black

SBM bronze

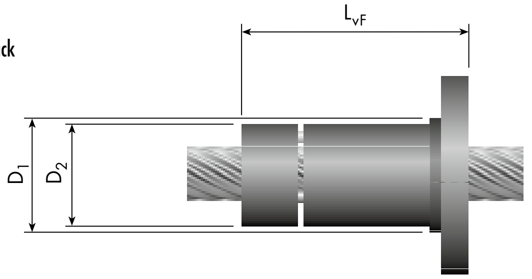




Axial-preloaded, if $p_0 < d_0$:

SFV POM-C black

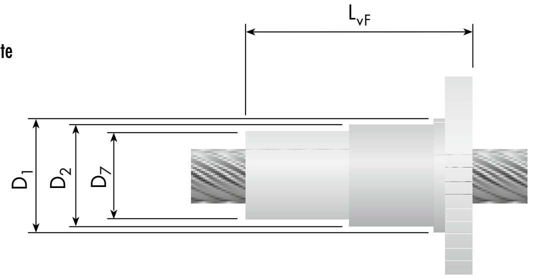
(bronze on request)



Torsion-preloaded, if $p_0 \geq d_0$:

SFT EX100 white

(bronze on request)



Nominal size	**Right-hand/ left-hand thread**	**Dimensions** [mm] Screw				Nut											**Load rates** for POM-C/EX100	**Nominal size**
d_0 / p_0 [mm] (in)		d_1	d_2	p	g	D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	D_7	L_{nF}	L_{nB}	L_{vF}	L_1	L_7	C_{stat} [N]	d_0 / p_0 [mm] (in)
14 / 8	RH / —	14.0	9.8	8	2	26	25.5	36	5.1	46	—	42	30	58	3	7	900	**14 / 8**
14 / 18	RH / LH	14.3	11.4	18	6	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 600	**14 / 18**
14 / 30	RH / LH	13.9	10.1	30	6	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 750	**14 / 30**
14 / 40	RH / —	14.0	10.9	40	5	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 800	**14 / 40**
14.3 / 40.6 (9⁄16″ / 13⁄5″)	RH / LH	14.4	11.2	40.64	8	26	25.5	36	5.1	46	23.5	42	30	58	3	7	1 800	**14.3 / 40.6** (9⁄16″ / 13⁄5″)
15 / 20	RH / LH	15.2	12.5	20	8	30	29.5	39	5.1	49	27	42	30	58	3	7	1 600	**15 / 20**
15 / 80	RH / LH	15.2	12.6	80	16	30	29.5	39	5.1	49	27	42	30	58	3	7	2 000	**15 / 80**
16 / 21	RH / LH	16.5	13.6	21	7	30	29.5	39	5.1	49	27	42	30	58	3	7	1 800	**16 / 21**
16 / 25	RH / —	16.0	11.5	25	5	30	29.5	39	5.1	49	27	42	30	58	3	7	1 550	**16 / 25**
16 / 35	RH / —	15.9	12.1	35	7	30	29.5	39	5.1	49	27	42	30	58	3	7	2 000	**16 / 35**
16 / 45.7 [3] (5⁄8″ / 14⁄5″)	RH / —	16.0	12.8	45.72	9	30	29.5	39	5.1	49	27	42	30	58	3	7	2 000	16 / 45.7 [3] (5⁄8″ / 14⁄5″)
16 / 90	RH / LH	17.0	14.3	90	18	30	29.5	39	5.1	49	27	42	30	58	3	7	2 250	**16 / 90**
17.6 / 50.8 (7⁄10″ / 2″)	RH / —	17.6	14.4	50.80	10	30	29.5	39	5.1	49	27	42	30	58	3	7	2 200	**17.6 / 50.8** (7⁄10″ / 2″)

› CAD data › www.gewinde.ch

Nut types (details › page 41)

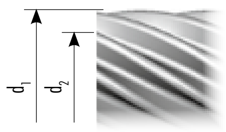
Flange nut,
non-preloaded
Type **SFM** / **SBM**

Flange nut,
axial-preloaded
Type **SFV**

Flange nut.
torsion-preloaded
Type **SFT**

Legend

d_0 = Nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]



p_0 = nominal pitch [mm]
p = effective pitch [mm]
g = number of threads [–]

L_{nF} = length of nut body, non-preloaded, POM-C (type SFM)
L_{nB} = length of nut body, non-preloaded, bronze (type SBM)
L_{vF} = length of nut body, preloaded, POM-C/EX100 (types SFV and SFT)

C_{stat} = static load rates for non-preloaded **and** preloaded nuts made of POM-C / EX100 [N];
for higher load rates → bronze nuts → $C_{stat\ bronze} = \mathbf{1.3} \times C_{stat\ POM\text{-}C/EX100}$
[3] = only on request

Special designs available on request

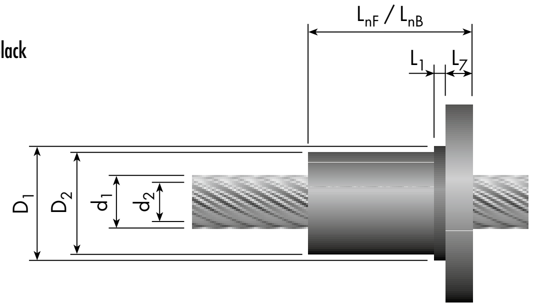
ø 18 … 25.7

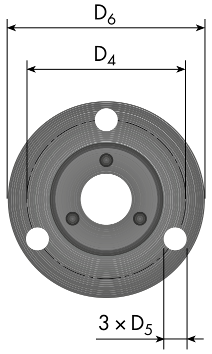
Standard flange nut non-preloaded / preloaded

Non-preloaded:

SFM POM-C black

SBM bronze

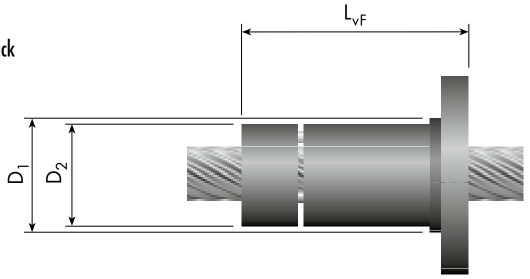




Axial-preloaded, if $p_0 < d_0$:

SFV POM-C black

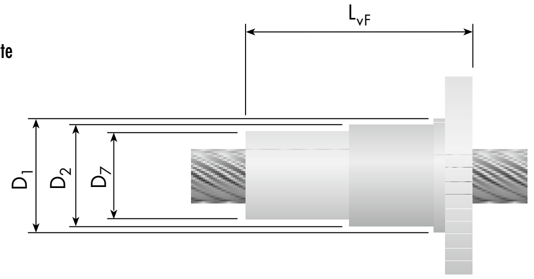
(bronze on request)



Torsion-preloaded, if $p_0 \geq d_0$:

SFT EX100 white

(bronze on request)



Nominal size	**Right-hand/ left-hand thread**	**Dimensions** [mm]															**Load rates** for POM-C/EX100	**Nominal size**
		Screw				Nut												
d_0 / p_0 [mm] (in)		d_1	d_2	p	g	D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	D_7	L_{nF}	L_{nB}	L_{vF}	L_1	L_7	C_{stat} [N]	d_0 / p_0 [mm] (in)
18 / 16	RH / —	18.0	14.3	16	4	30	29.5	39	5.1	49	—	42	30	58	3	7	1 100	**18 / 16**
18 / 24	RH / LH	18.7	15.7	24	8	30	29.5	39	5.1	49	27	42	30	58	3	7	2 000	**18 / 24**
18 / 40	RH / LH	17.9	14.1	40	8	30	29.5	39	5.1	49	27	42	30	58	3	7	2 250	**18 / 40**
18 / 100	RH / LH	18.8	16.2	100	20	30	29.5	39	5.1	49	27	42	30	58	3	7	2 500	**18 / 100**
19 / 30	RH / —	18.8	14.2	30	6	30	29.5	39	5.1	49	27	42	30	58	3	7	1 800	**19 / 30**
20 / 12	RH / —	20.0	15.8	12	3	36	35.5	47	6.2	59	—	46	32	64	5	8	1 200	**20 / 12**
20 / 45	RH / —	20.0	16.1	45	9	36	35.5	47	6.2	59	33	46	32	64	5	8	2 500	**20 / 45**
21 / 27	RH / —	20.8	17.9	27	9	36	35.5	47	6.2	59	33	46	32	64	5	8	2 200	**21 / 27**
21 / 35 [3]	RH / —	21.5	17.0	35	7	36	35.5	47	6.2	59	33	46	32	64	5	8	2 050	21 / 35 [3]
22 / 20	RH / —	22.0	18.3	20	5	36	35.5	47	6.2	59	—	46	32	64	5	8	1 400	**22 / 20**
22 / 50	RH / —	22.0	18.1	50	10	36	35.5	47	6.2	59	33	46	32	64	5	8	2 750	**22 / 50**
22 / 120	RH / —	22.5	19.8	120	24	36	35.5	47	6.2	59	33	46	32	64	5	8	3 000	**22 / 120**
23 / 30	RH / LH	23.0	20.0	30	10	36	35.5	47	6.2	59	33	46	32	64	5	8	2 400	**23 / 30**
24 / 40 [3]	RH / —	24.3	19.8	40	8	36	35.5	47	6.2	59	33	46	32	64	5	8	2 300	24 / 40 [3]
24 / 55	RH / —	24.0	20.1	55	11	36	35.5	47	6.2	59	33	46	32	64	5	8	3 000	**24 / 55**
25.7 / 76.2 (1″/3″)	RH / LH	25.7	24.0	76.20	15	42	41.5	53	6.2	64	39	50	35	71	5	8	2 800	**25.7 / 76.2** (1″/3″)

› CAD data › www.gewinde.ch

Nut types (details › page 41)

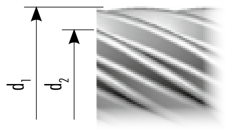
Flange nut,
non-preloaded
Type **SFM** / **SBM**

Flange nut,
axial-preloaded
Type **SFV**

Flange nut.
torsion-preloaded
Type **SFT**

Legend

d_0 = Nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]



p_0 = nominal pitch [mm]
p = effective pitch [mm]
g = number of threads [–]

L_{nF} = length of nut body, non-preloaded, POM-C (type SFM)
L_{nB} = length of nut body, non-preloaded, bronze (type SBM)
L_{vF} = length of nut body, preloaded, POM-C/EX100 (types SFV and SFT)

C_{stat} = static load rates for non-preloaded **and** preloaded nuts made of POM-C / EX100 [N];
for higher load rates ⟶ bronze nuts ⟶ $C_{stat\ bronze} = \mathbf{1.3} \times C_{stat\ POM\text{-}C/EX100}$
[3] = only on request

Special designs available on request

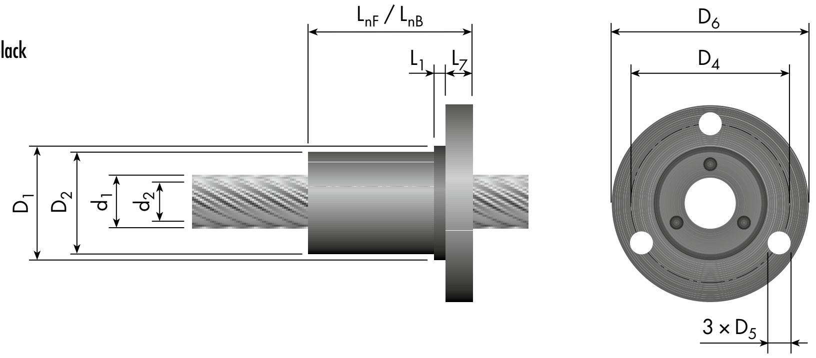
ø 26 … 36

Standard flange nut non-preloaded / preloaded

Non-preloaded:

SFM POM-C black

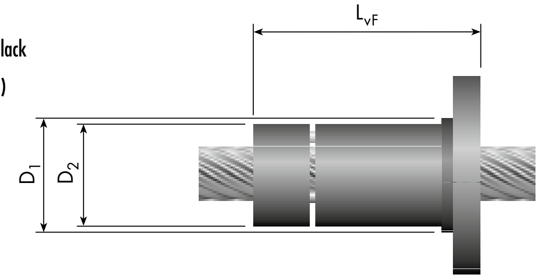
SBM bronze



Axial-preloaded, if $p_0 < d_0$:

SFV POM-C black

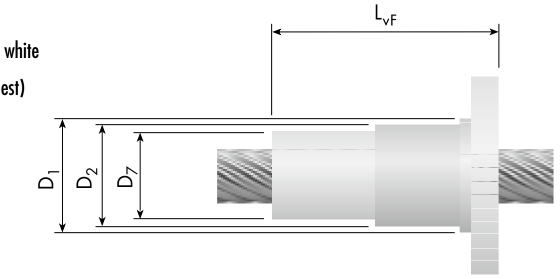
(bronze on request)



Torsion-preloaded, if $p_0 \geq d_0$:

SFT EX100 white

(bronze on request)



Nominal size d_0 / p_0 [mm] (in)	Right-hand/ left-hand thread	Dimensions [mm] Screw d_1	d_2	p	g	Nut D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	D_7	L_{nF}	L_{nB}	L_{vF}	L_1	L_7	Load rates for POM-C/EX100 C_{stat} [N]	Nominal size d_0 / p_0 [mm] (in)
26 / 16 [3]	RH / —	26.0	21.8	16	4	42	41.5	53	6.2	64	—	50	35	71	5	8	1 400	26 / 16 [3]
26 / 24	RH / —	26.0	22.3	24	6	42	41.5	53	6.2	64	—	50	35	71	5	8	2 000	**26 / 24**
26 / 60	RH / —	26.0	22.2	60	12	42	41.5	53	6.2	64	39	50	35	71	5	8	3 250	**26 / 60**
27 / 45 [3]	RH / —	27.0	22.5	45	9	42	41.5	53	6.2	64	39	50	35	71	5	8	2 550	27 / 45 [3]
28 / 65 [3]	RH / —	28.0	24.2	65	13	42	41.5	53	6.2	64	39	50	35	71	5	8	3 500	28 / 65 [3]
30 / 28	RH / —	30.0	26.5	28	7	42	41.5	53	6.2	64	—	50	35	71	5	8	2 000	**30 / 28**
30 / 50	RH / —	29.8	25.3	50	10	42	41.5	53	6.2	64	39	50	35	71	5	8	2 800	**30 / 50**
30 / 70	RH / —	30.0	26.2	70	14	42	41.5	53	6.2	64	39	50	35	71	5	8	3 750	**30 / 70**
32 / 20 [3]	RH / —	32.0	27.8	20	5	50	49.5	65	9.0	80	—	70	50	—	10	12	2 000	32 / 20 [3]
32 / 75 [3]	RH / —	32.0	28.2	75	15	50	49.5	65	9.0	80	—	70	50	—	10	12	4 000	32 / 75 [3]
32 / 96.5 (1¼″/ 3¾″)	RH / LH	32.2	29.0	96.52	19	50	49.5	65	9.0	80	—	70	50	—	10	12	4 600	**32 / 96.5** (1¼″/ 3¾″)
34 / 32 [3]	RH / —	34.0	30.5	32	8	50	49.5	65	9.0	80	—	70	50	—	10	12	2 300	34 / 32 [3]
34 / 80	RH / —	34.0	30.2	80	16	50	49.5	65	9.0	80	—	70	50	—	10	12	4 250	**34 / 80**
36 / 200	RH / —	36.0	33.4	200	40	50	49.5	65	9.0	80	—	70	50	—	10	12	4 500	**36 / 200**

› CAD data › www.gewinde.ch

Nut types (details › page 41)

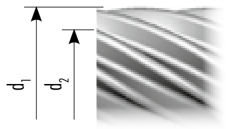
Flange nut,
non-preloaded
Type **SFM** / **SBM**

Flange nut,
axial-preloaded
Type **SFV**

Flange nut.
torsion-preloaded
Type **SFT**

Legend

d_0 = Nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]



p_0 = nominal pitch [mm]
p = effective pitch [mm]
g = number of threads [–]

L_{nF} = length of nut body, non-preloaded, POM-C (type SFM)
L_{nB} = length of nut body, non-preloaded, bronze (type SBM)
L_{vF} = length of nut body, preloaded, POM-C/EX100 (types SFV and SFT)

C_{stat} = static load rates for non-preloaded **and** preloaded nuts made of POM-C / EX100 [N];
for higher load rates → bronze nuts → $C_{stat\ bronze} = \mathbf{1.3} \times C_{stat\ POM\text{-}C/EX100}$
[3] = only on request

Special designs available on request

Easy light leadscrews (EGS)

100 % Swiss made

Design features

Eichenberger Easy light leadscrews set new benchmarks for net weight and smooth running properties. Thanks to the rolled aluminium screw and the associated nut made of high-performance technopolymer, the screw unit is a real lightweight. The screw's robust sliding coating (hard-anodised) makes the screw unit very smooth. With correct lubrication, efficiency of more than 0.8 can be achieved – an excellent figure for a leadscrew!

Thanks to the special thread geometry, the screw unit is also relatively impervious to dirt and tilting torque.

Materials

Screw
- standard:
  - aluminium, hard-anodised
- on request:
  - other materials and coatings

Nut
- standard:
  - EX100 white
- on request:
  - other materials

Nut type (shape)

Easy standard flange nut

Type EFM
- flange nut type A following DIN 69051
- not preloaded
- wear-resistant technopolymer EX100 white

If required, any application-specific nut shapes can be manufactured, for large series also from injection molding.
Contact us with your revolutionary idea – we'll provide YOUR tailor-made light leadscrew!

Operational temperatures

- EX100 –40 to +60 °C

Lead accuracy

- standard:
  - G9 ≙ ≤0.1 mm/300 mm (in accordance with DIN 69051)
- on request:
  - other lead accuracies

Order system – Easy light leadscrews

Example for complete Easy light leadscrews — **EGS 20×80 EFM RH 650 G9 E M**

Type of thread drive
EGS = **Easy** light leadscrew

Nominal size (d_0×p) [mm]

Nut type — for nut only
EFM = Easy standard flange nut (EX100 white) [1]
MSX = special design according to drawing

Right-hand / left-hand thread
RH = right-hand thread (standard)
LH = left-hand thread (availability see dimensional chart)

Leadscrew overall length [mm] — for screw only
standard material quality: aluminium, hard-anodised [1]

Lead accuracy (class) — for screw only
G9 = ≤0.1 mm/300 mm (standard)
GX = lead accuracy upon specification

Screw end machining — for screw only
O = no end machining (cut by grinding)
E = end machining according to drawing

Assembly
G = screw and nut separate (standard)
M = screw and nut assembled according to drawing/specified orientation

[1] other materials on request

Example for screw only — **EGS 20×80 RH 650 G9 O G**

Example for nut only — **EGS 20×80 EFM RH G**

Efficiency

The efficiency η depends on the helix angle and reaches impressive values over 0.8
› also see diagram, page 44

Production / Handling / Lubrication

› see Speedy, page 42

Application examples for Eichenberger leadscrews

› see Speedy, page 43

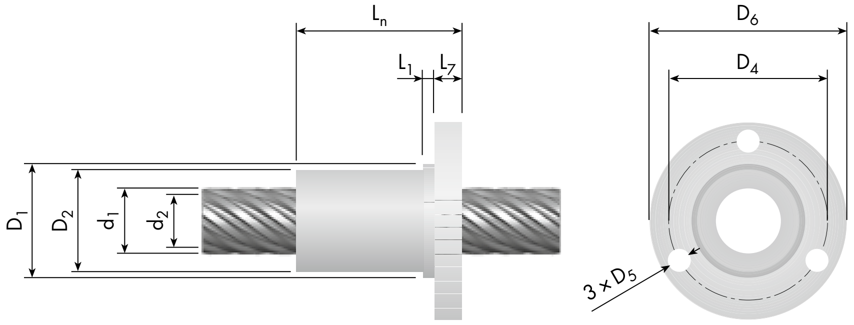
Design fundamentals for leadscrews

› see Speedy, pages 44–45

ø 20

Standard flange nut

EFM



Nominal size d₀ × p [mm]	**Right-hand/ left-hand thread**	**Dimensions** [mm]											**Load rates**	**Nominal size**
		Screw			Nut									
		d_1	d_2	g	D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	L_n	L_1	L_7	C_{stat} [N]	$d_0 \times p$ [mm]
20 × 80	RH / LH	20.0	15.2	8	36	35.5	47	6.2	59	46	5	8	4000	**20 × 80**

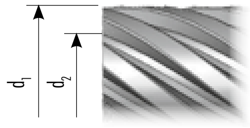
› CAD data › www.gewinde.ch

Nut type (details › page 58)

Flange nut, not preloaded
Type **EFM**

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]



p = pitch [mm]
g = number of threads [–]
Special designs available on request

Design fundamentals for leadscrews
› see Speedy, pages 44 – 45

Application examples

Thanks to their low weight, excellent smooth running properties and robust thread profile, Eichenberger Easy light leadscrews are suitable for numerous applications including:

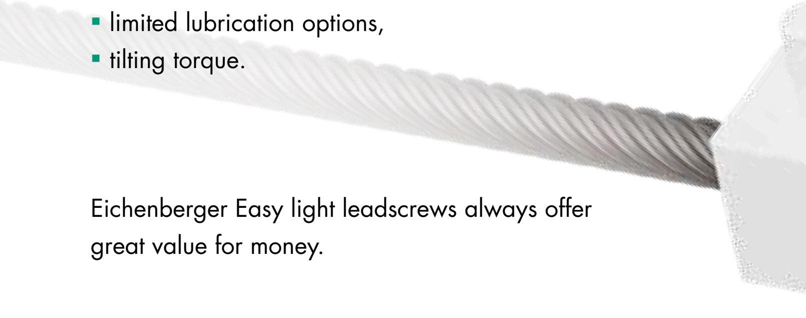
- Drives for doors, gates and windows
- Handling technology
- Graphics equipment and devices
- Construction industry
- Air-conditioning technology (valve/slide drives)
- Textile machines
- Food and packaging industry
- Electric cylinders (actuators)

etc.

Easy light leadscrews are preferred for increased demand from

- major temperature fluctuation based on climate,
- impact on environmental conditions such as pollution,
- limited lubrication options,
- tilting torque.

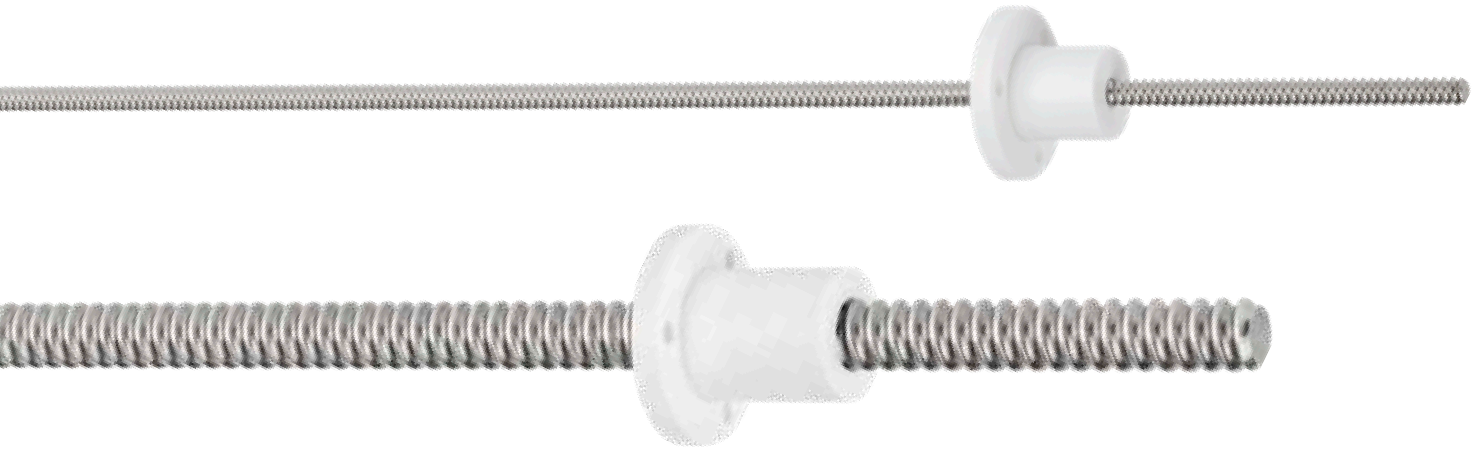
Eichenberger Easy light leadscrews always offer great value for money.



Easy door drives in train carriages of high speed trains withstand the harshest weather conditions and maximum physical forces

Rondo round-thread leadscrews (RGS)

100 % Swiss made ✚



Design features

Eichenberger Rondo round-thread leadscrews are a true alternative to conventional trapezoidal screws. They deliver outstanding efficiency and quiet running due to their round-thread profile. Made of corrosion-protected steel or alternatively aluminium, the screws are combined with high-performance technopolymer flange nuts (outer dimensions equal those of Speedy standard flange nuts)

Materials

Screw

- standard: corrosion-protected steel
  - 1.4021 (X20Cr13)
- on request:
  - steel 1.0401 (C15)
  - aluminium
- on request:
  - coating to reduce sliding friction

Nut

- standard:
  - EX100 white
- on request:
  - iglidur® J *
  - other materials

Nut type (shape)

Rondo standard flange nut

Type RFM

- flange nut type A following DIN 69051
- not preloaded
- wear-resistant technopolymer EX100 white

If required, any application-specific nut shapes can be manufactured, for large series also from injection molding.
Contact us with your revolutionary idea – we'll provide YOUR tailor-made round-thread leadscrew!

Operational temperatures

- EX100 –40 to +60 °C
- iglidur® J * –50 to +90 °C

Lead accuracy

- standard:
  - G9 ≙ ≤0.1 mm/300 mm (in accordance with DIN 69051)
- on request:
  - other lead accuracies

* iglidur® is a registered trademark of igus® GmbH

Order system – Rondo round-thread leadscrews

Example for complete Rondo round-thread leadscrew — **RGS 10×3 RFM RH 350 G9 E M**

Type of thread drive
RGS = **Rondo** round-thread leadscrew

Nominal size ($d_0 \times p$) [mm]

Nut type — for nut only
RFM = Rondo standard flange nut (EX100 white) 1)
MSX = special design according to drawing

Right-hand / left-hand thread
RH = right-hand thread (standard)
LH = left-hand thread (availability see dimensional chart)

Leadscrew overall length [mm] — for screw only
standard quality: 1.4021 (X20Cr13) 1)

Lead accuracy (class) — for screw only
G9 = ≤0.1 mm/300 mm (standard)
GX = lead accuracy upon specification

Screw end machining — for screw only
O = no end machining (cut by grinding)
E = end machining according to drawing

Assembly
G = screw and nut separate (standard)
M = screw and nut assembled according to drawing/specified orientation

1) other materials on request

Example for screw only — **RGS 10×3 RH 350 G9 O G**

Example for nut only — **RGS 10×3 RFM RH G**

Efficiency

The efficiency η depends on the helix angle and reaches values from ~0.3 up to 0.5
› also see diagram, page 44

Production / Handling / Lubrication

› see Speedy, page 42

Application examples for Eichenberger leadscrews

› see Speedy, page 43

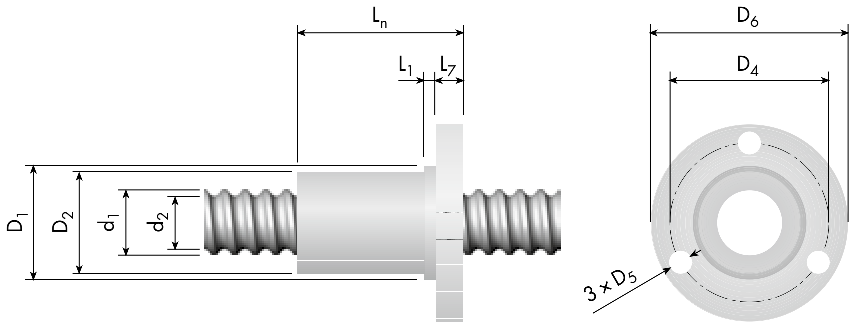
Design fundamentals for leadscrews

› see Speedy, pages 44–45

ø6…16

Standard flange nut

RFM



Nominal size	Right-hand/ left-hand thread	Dimensions [mm]										Load rates	Nominal size
		Screw		Nut									
$d_0 \times p$ [mm]		d_1	d_2	D_1 h8	D_2 ±0.05	D_4 TK	D_5	D_6	L_n	L_1	L_7	C_{stat} [N]	$d_0 \times p$ [mm]
6 × 2	RH / LH [3]	5.9	4.5	21	20.5	29	4.2	38	25	3	5	600	**6 × 2**
8 × 2	RH / LH	7.9	6.5	21	20.5	29	4.2	38	25	3	5	800	**8 × 2**
10 × 3	RH / LH	9.9	7.8	24	23.5	32	4.2	42	25	3	5	1 200	**10 × 3**
12 × 3	RH / LH [3]	12.0	9.9	26	25.5	36	5.1	46	42	3	7	2 000	**12 × 3**
12 × 4	RH / LH [3]	12.0	9.8	26	25.5	36	5.1	46	42	3	7	2 500	**12 × 4**
12 × 5	RH / —	12.3	9.4	26	25.5	36	5.1	46	42	3	7	2 200	**12 × 5**
14 × 3	RH / LH [3]	14.0	12.0	26	25.5	36	5.1	46	42	3	7	2 400	**14 × 3**
14 × 4	RH / LH	14.0	11.5	26	25.5	36	5.1	46	42	3	7	3 200	**14 × 4**
16 × 4	RH / —	16.0	13.5	30	29.5	39	5.1	49	42	3	7	3 900	**16 × 4**
16 × 5	RH / LH	15.7	13.0	30	29.5	39	5.1	49	42	3	7	5 000	**16 × 5**

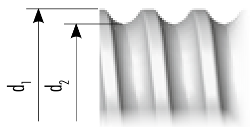
› CAD data › www.gewinde.ch

Nut type (details › page 62)

Flange nut, not preloaded
Type **RFM**

Legend

d_0 = nominal screw diameter [mm]
d_1 = outer screw diameter [mm]
d_2 = core diameter [mm]
p = pitch [mm]

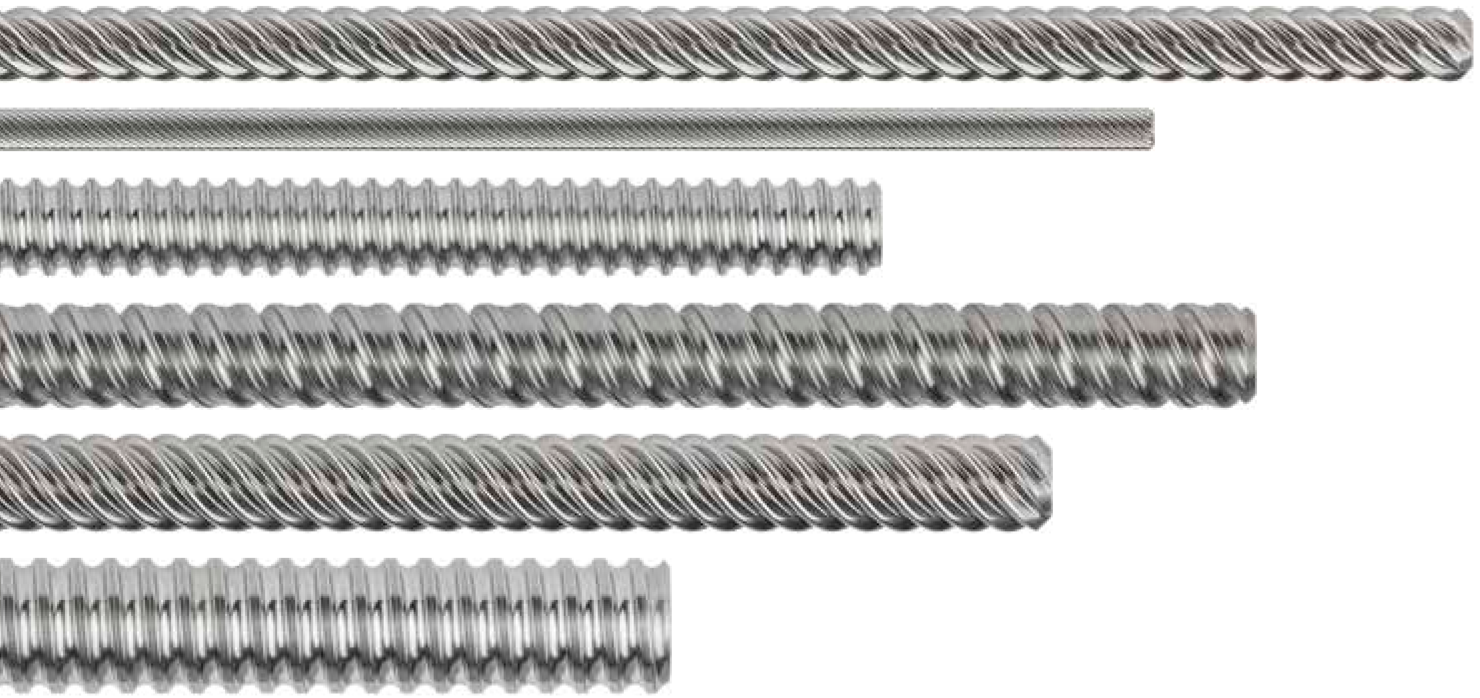


[3] = only on request

Special designs available on request

Design fundamentals for leadscrews
› see Speedy, pages 44–45

Advantageous thread production for everyone



The core competency of Eichenberger Gewinde AG is thread rolling. Production companies can also benefit from this if they want to have any type of threads efficiently manufactured.

State-of-the-art production methods, extensive product expertise and access to more than 1000 machine tools, enable us to meet each and every demand for rolled threads – however exotic they may be:

- pitches up to 6 × diameter
- spindle length up to 6 m
- spindle diameter from 2 to 160 mm
- all standard profiles (M, Tr, UNC, UNF, UNEF, Whitworth)
- high-helix thread profiles
- ballscrew thread profiles
- special profiles
- multiple start threads including right-hand/left-hand threads
- worm gears (quality and price advantages)
- serrations and knurlings
- conical threads
- threads on prefabricated and/or irregular parts, e.g. also on forged parts

Suitable materials for thread rolling:

- high-alloy, corrosion and acid-resistant steel
- special aluminium alloys
- riveting-quality brass
- copper alloys

Threads can be rolled on hollow bodies and tubes only if wall thickness is sufficient; this wall thickness depends upon the type and depth of intended profile as well as material used. We are happy to provide advice.

We look forward to your challenge!

About us

The name Eichenberger Gewinde AG has stood for work in the area of thread production of the highest quality since 1953. With our innovative drive technology products as well as our comprehensive services as a supplier (thread production using cold-forming), we are supporting our customers with unique products and extensive know-how as a thread specialist and partner.

Development, production and IMS

"Quality first": As a certified company, we leave nothing to chance, from development and manufacture to delivery. Our integrated management system complies with **ISO 9001** (Quality Management) and **ISO 14001** (Environmental Management). This guarantees a quality benchmark that makes us the preferred partner of many well-known companies all over the world.

A company of the Festo Group

Eichenberger Gewinde AG – together with its affiliate for the automotive industry, Eichenberger Motion AG – has been a company of the globally active Festo Group since 2016.

History

1953	Founding of precision turning workshop Hans Eichenberger
1986	Change of name to Eichenberger Gewinde AG
1988	Start of in-house ballscrew development
1995	Introduction of automated manufacture
1998	Take-over of Eichenberger Gewinde AG by the management
2004	Founding of Eichenberger Motion AG (large-scale production for the automotive industry)
2006	Production site expansion; doubling the production space
2016	Integration into Festo Group
2018	With 150 employees, we are supplying about 900 customers in 45 countries all over the world – with an export share of 80%

EichenbergerGewinde

Map and directions
› www.gewinde.ch

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