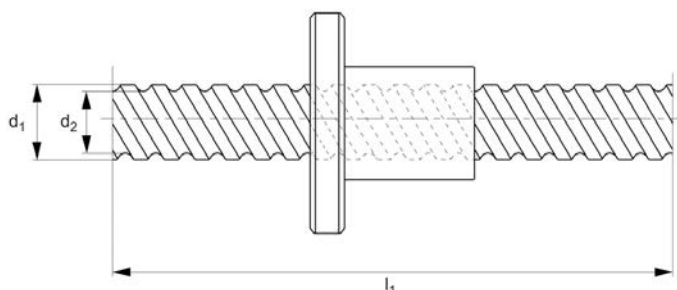




High Helix Lead Screws - Stainless

lead screw only (to suit L1350 nuts)

Lead Screws & Nuts



L1349

LEAD SCREWS & NUTS

Material

Stainless steel screw (SUS 304).

Technical Notes

High precision.

The 'lead' refers to the distance the nut will travel for one complete revolution of the thread.

Order corresponding lead screw- see part

L1350.

| Order No. | Lead | d ₁ | l ₁ | d ₂ core |
|-----------------|------|----------------|----------------|---------------------|
| L1349.04-01-0.2 | 1 | 4 | 200 | 3.3 |
| L1349.04-02-0.2 | 2 | 4 | 200 | 3.3 |
| L1349.06-01-0.3 | 1 | 6 | 300 | 5.3 |
| L1349.06-02-0.3 | 2 | 6 | 300 | 5.3 |
| L1349.06-09-0.3 | 9 | 6 | 300 | 5.4 |
| L1349.06-18-0.3 | 18 | 6 | 300 | 5.6 |
| L1349.08-01-0.3 | 1 | 8 | 300 | 7.3 |
| L1349.08-02-0.3 | 2 | 8 | 300 | 6.6 |
| L1349.08-12-0.4 | 12 | 8 | 400 | 6.7 |
| L1349.08-24-0.4 | 24 | 8 | 400 | 7.5 |
| L1349.10-02-0.3 | 2 | 10 | 300 | 8.6 |
| L1349.10-06-1.0 | 6 | 10 | 1000 | 8.0 |
| L1349.10-10-1.0 | 10 | 10 | 1000 | 8.0 |
| L1349.10-15-0.5 | 15 | 10 | 450 | 8.4 |
| L1349.10-30-0.5 | 30 | 10 | 450 | 8.9 |
| L1349.12-02-0.3 | 2 | 12 | 300 | 10.6 |
| L1349.12-04-1.0 | 4 | 12 | 1000 | 10.0 |
| L1349.12-08-1.0 | 8 | 12 | 1000 | 9.8 |
| L1349.12-12-1.0 | 12 | 12 | 1000 | 10.3 |
| L1349.12-18-0.5 | 18 | 12 | 500 | 10.6 |
| L1349.12-36-0.5 | 36 | 12 | 500 | 10.9 |
| L1349.15-05-2.0 | 5 | 15 | 2000 | 12.2 |
| L1349.15-10-2.0 | 10 | 15 | 2000 | 12.3 |
| L1349.15-20-2.0 | 20 | 15 | 2000 | 12.6 |
| L1349.20-10-2.0 | 10 | 20 | 2000 | 17.5 |
| L1349.20-20-2.0 | 20 | 20 | 2000 | 17.6 |



Precision lead screws

The high lead thread form maximises linear motion and minimises shaft rotation. The close tolerance, free running nuts are individually matched to their lead screws and are ideal for miniature applications requiring rotary to linear, or linear to rotary actuation.

Anti-backlash nuts

For applications requiring precision positioning there is now a newly patented Anti-backlash nut. This device, consisting of only three components, utilises the constant force of a compression spring to push two halves apart. This action eliminates any play (backlash) which exists between the internal thread of the nut and the external screw thread.

To ensure accuracy and repeatability the nut can be fine tuned through the use of many available spring constants, to meet any preload design requirements.

| | |
|---------------------------------|--|
| Lead screw specification | High precision lead screw |
| Lead error | ±0,2mm/300mm |
| Repeatability | 0,01mm |
| Straightness | 0,03mm/100mm |
| Backlash | 0,08mm (zero when using anti-backlash nut) |
| Temperature range | -30°C to +90°C |

Design considerations

Critical speed

The critical speed of a lead screw is the maximum speed (rpm) before the screw will become dynamically unstable. This results when the forced frequency of the rotating screw corresponds to its natural frequency. Its value is dependent on the length of the screw, the diameter of the thread, and the support configuration. The critical speed value is governed by the following equation.

$$\text{Critical screw speed (RPM)} = K \times C \times 10^6 \times (d/L^2)$$

Where;

K = End support factor

0,36 one end fixed, other free

1,00 simple supports both ends

1,47 one end fixed, one simple

2,23 both ends fixed

C = Material factor

4,5 for Stainless Steel screws

1,6 for Aluminium screws

d = Root diameter of the screws

L = Length between bearing supports

Load

In order to properly incorporate a lead screw into a design, load requirements must be taken into account. These numbers are based on the shear of the nuts and does not take shaft buckling into account. Wherever possible, nuts should be positioned so as to be put in tension, pulling the load. This eliminates the need for buckling considerations.

Listed below are some helpful formulae to assist in proper lead screw selection.

$$\text{Critical load (N)} = K \times C \times 10^6 \times (d^4/D^2)$$

Where;

K = End support factor

0,25 one end fixed, other free
(figure 1)

1,00 simple supports both ends
(figure 2)

2,00 one end fixed, one simple
(figure 3)

4,00 both ends fixed (figure 4)

C = Material factor

13,4 for Stainless Steel screws

4,8 for Aluminium screws

d = Root diameter of the screws

D = Length between bearing supports

$$\text{Torque to move a load (T)} = F \times L/2 \times \pi \times E$$

Where;

F = Load

L = Lead

E = Efficiency (see product pages)

End fixing configurations

Figure 1



Double bearing,
one end only

Figure 3



Double bearing one end,
single bearing other end

Figure 2



Single bearing both ends

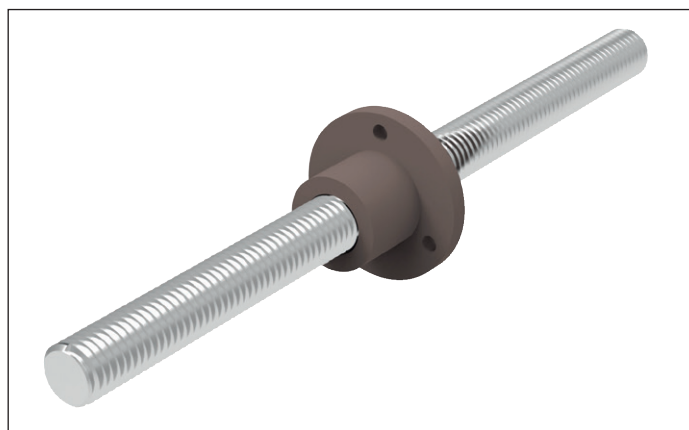
Figure 4



Double bearing both ends



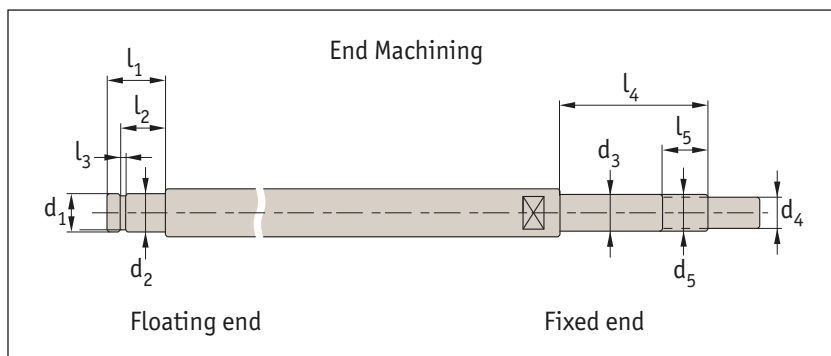
- Select the relevant size lead screw diameter and load required.



- These are precision, high helix lead screws from stainless steel (304 grade)
- We can cut length to suit and/or machine the ends to your requirements
- They have an accumulative lead error of $\pm 0.20/300\text{mm}$ (C10 grade)
- The actual clearance depends on the nut selected L1350 standard flanged nut or L1351 anti-backlash nut
- Nuts are very smooth running with little friction. They are made from plastic resin (PPS).
- The anti-backlash nuts are longer than the standard length nuts as they incorporate a spring pushing the two halves of the unit apart.

| Lead screw Ø | Lead (distance travelled per revolution) | | | | | | | | | | | | | | |
|--------------|--|---|---|---|---|---|---|----|----|----|----|----|----|----|----|
| | 1 | 2 | 4 | 5 | 6 | 8 | 9 | 10 | 12 | 15 | 18 | 20 | 24 | 30 | 36 |
| 4 | ● | ● | | | | | | | | | | | | | |
| 6 | ● | ● | | | | | ● | | | | ● | | | | |
| 8 | ● | ● | | | | | | | ● | | | | ● | | |
| 10 | | ● | | | ● | | | ● | | ● | | | | ● | |
| 12 | | ● | ● | | | ● | | | ● | | ● | | | | ● |
| 15 | | | | ● | | | | ● | | | | ● | | | |
| 20 | | | | | | | | ● | | | | ● | | | |

End machining to suit miniature bearing support units



| Screw Ø | Type | Floating | Fixed | d ₁ | d ₂ | l ₁ | l ₂ | l ₃ | d ₃ | d ₄ | l ₄ | l ₅ | d ₅ x p |
|---------|---------|-----------|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|
| 4 | Pillow | L1355.030 | L1353.030 | 2 | 1,59 | 5 | 4 | 0,5 | +0,05 | 3 | 17,5 | 6,5 | M3x0,5 |
| 4 | Flanged | L1356.030 | L1354.030 | | | | | | | | | | |
| 6 | Pillow | L1355.040 | L1353.040 | 3 | 2,73 | 5,5 | 4,5 | 0 | 0,5 | 4 | 18,5 | 7 | M4x0,5 |
| 6 | Flanged | L1356.040 | L1354.040 | | | | | | | | | | |
| 6 | Pillow | L1355.050 | L1353.050 | 4 | 3,73 | 6,5 | 5,5 | 0,5 | +0,05 | 5 | 19,5 | 7 | M5x0,5 |
| 6 | Flanged | L1356.050 | L1354.050 | | | | | | | | | | |
| 8 | Pillow | L1355.060 | L1353.060 | 6 | 5,7 | 8 | 6,8 | +0,1 | 0,8 | 6 | 23 | 7 | M6x0,75 |
| 8 | Flanged | L1356.060 | L1354.060 | | | | | | | | | | |
| 10 | Pillow | L1355.080 | L1353.080 | 6 | 5,7 | 8 | 6,8 | 0 | 0,8 | 8 | 27 | 8,5 | M8x1,0 |
| 10 | Flanged | L1356.080 | L1354.080 | | | | | | | | | | |