



- High Repeatability
- High accuracy
- Short Lead times
- Fast Prototyping



[www.huco.com](http://www.huco.com) Tel: +44 (0)1992 501900  
Merchant Drive Hertford England

## High Precision Lead Screws

*An Altra Industrial Motion Company*

## Offering smooth, precise, cost effective positioning, lead screws are the ideal solution for your application.

Thomson Neff precision lead screws from Huco Dynatork are an excellent economical solution for your linear motion requirements. For more than 25 years, Thomson has designed and manufactured the highest quality lead screw assemblies in the industry. Our precision rolling process ensures accurate positioning to .075mm/300mm and our PTFE coating process produces assemblies that have less drag torque and last longer.

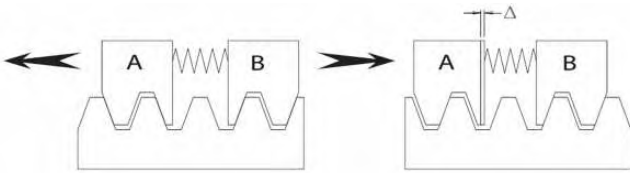
Huco Dynatork provides a large array of standard plastic nut assemblies in anti-backlash or standard Supernut® designs. All of our standard plastic nut assemblies use an internally lubricated Acetal providing excellent lubricity and wear resistance with or without additional lubrication. With the introduction of our new unique patented zero backlash designs, Huco Dynatork provides assemblies with high axial stiffness, zero backlash and the absolute minimum drag torque to reduce motor requirements. These designs produce products that cost less, perform better and last longer. Both designs automatically adjust for wear ensuring zero backlash for the life of the nut.

Huco Dynatork also provides engineering design services to aid in your design requirements producing a lead screw assembly to your specifications. Call Huco Dynatork today on **01992 501900** to discuss your application with one of our experienced application engineers

### Huco Dynatork Products

#### Deliver Performance

To ensure precise positioning, the elimination of backlash is of primary concern. Several types of anti-backlash mechanisms are common in the market which utilise compliant pre-



loads.

Because they are low in stiffness, a high preload is required to maintain position. This results in high drag torque, shorter life and poor performance. System costs increase as a larger motor is required.

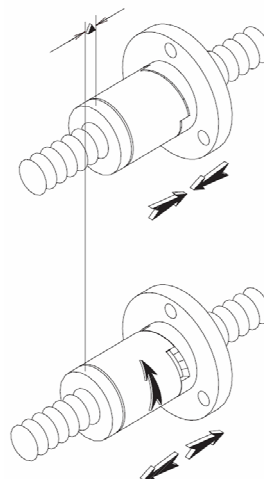
#### The Solution is available...

With the introduction of the Patented XC series nut with **ActiveCAM**, the highest axial stiffness with the absolute minimum drag torque is achieved. Utilising an extremely rigid stainless steel cam for biasing, axial stiffness is unsurpassed.

Axial play is removed without the need for high preload, resulting in the lowest drag torque possible.

#### Self-Compensating

As wear occurs over time, the unique **ActiveCAM** mechanism automatically compensates without compromising stiffness, positional accuracy or affecting drag torque at any time.



## Precision Lead Screws & Supernuts®

### Features/Advantages

#### Low Cost

Considerable savings when compared to ball screw assemblies.

#### Variety

Large range of leads and diameters to match your requirements.

#### Lubrication

Internally lubricated plastic nuts will operate without additional lubrication. However, TriGEL grease or dry film lubricant is recommended and will extend product life. See pages 13 and 14.

#### Vibration and Noise

No ball recirculation vibration and often less audible noise compared to ball screws.

### Design Considerations

#### Load

Supernuts provide a cost effective solution for moderate to light loads. For vertical applications, anti-backlash supernuts should be mounted with thread/flange on the bottom.

#### Cantilevered Loads

Cantilevered loads that might cause a moment on the nut will cause premature failure.

#### Critical Speed

Refer to critical speed chart on page 6.

#### Column Loading

Refer to column loading chart on page 7.

#### Self-Locking

Lead screws can be self locking at low leads. Generally, the lead of the screw should be more than 1/3 of the diameter to satisfactorily backdrive.

### Custom Capability

Option of custom components to fit into your design envelope.

#### Non-Corrosive\*

Stainless Steel and internally lubricated acetal.

#### Environment

Less susceptible to particulate contamination compared to ball screws.

#### Lightweight

Less mass to move.

#### Temperature

Ambient and friction generated heat are the primary causes of premature plastic nut failure. Observe the temperature limits below and discuss your design with our application engineers for continuous duty, high load and high speed applications.

Huco Dynatork recommends bronze nuts for very high temperature environments or can aid in your selection of high temperature plastic for a custom assembly.

#### Efficiency

Except at very high leads, efficiency increases as lead increases. Although the internally lubricated acetal provides excellent lubricity, Ball Screw Assemblies remain significantly more efficient than most Lead Screw designs. See page 12 for actual efficiencies.

#### Length Limitations

**Screw Diameter Max Length** 10 mm 1200 mm 12 - 16 mm 1800 mm >16 mm 3600 mm

#### Lead Accuracy

Standard Grade (SRA) 250 µm/300 mm

Precision Grade (SPR) 75 µm/300 mm

### Useful Formulas for Lead Screw Assemblies

#### TORQUE, ROTARY TO LINEAR

Driving the screw to translate the nut, or driving the nut to translate the screw.

$$\frac{\text{Torque} = \text{Load (N)} \times \text{Lead (mm)}}{(\text{N-mm}) 2\pi \times \text{efficiency}}$$

#### TORQUE, LINEAR TO ROTARY

Loading the nut to rotate the screw As a rule, assemblies that have an efficiency of 50% or more will backdrive.

See page 12 for efficiencies. Efficiencies listed in catalogue computed at 0,1 friction coefficient.

$$\frac{\% \text{ Efficiency} = \tan(\text{helix angle}) \times 100}{\tan(\text{helix angle} + \arctan f)}$$

f = coefficient of friction

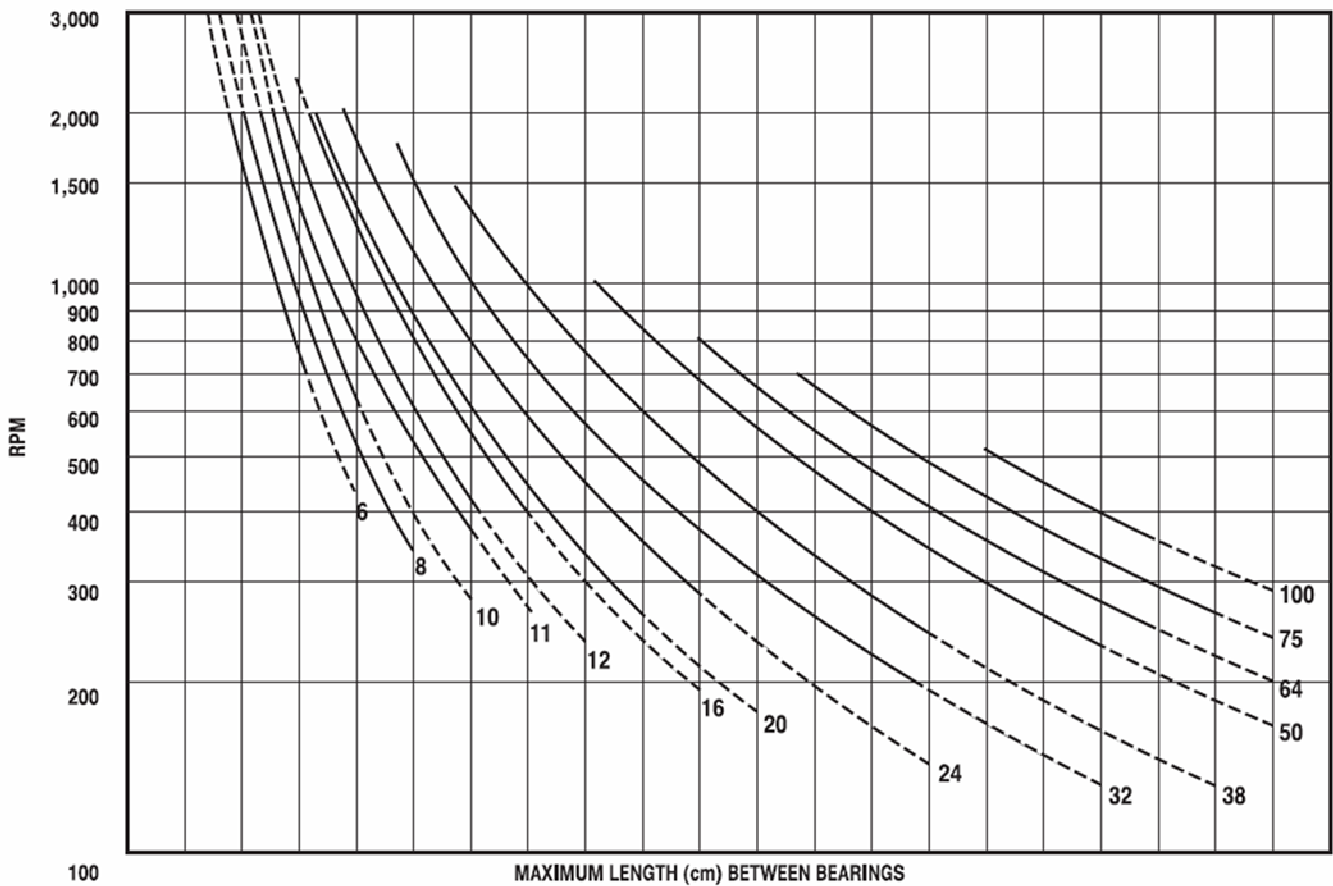
#### EFFICIENCY

$$\frac{\text{Torque} = \text{Load} \times \text{Lead} \times \text{Efficiency}}{2\pi}$$

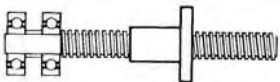
## Critical Speed Limits Chart

Every screw shaft has a rotational speed limit. That is the point at which the rotational speed sets up excessive vibration. This critical point is modified by the type of end bearing support used. To use this chart, determine the required RPM and the maximum length between bearing supports. Next, select one of the four types of end support shown below. The critical speed limit can be found by locating the point at which the RPM (horizontal lines) intersects with the unsupported screw length (vertical lines) as modified by the type of supports select below. We recommend operating at no more than 80% of the critical speed limit.

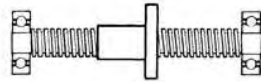
**Warning:** Curves for the screw diameters shown are based on the smallest root (minor) diameter of the standard screws within the nominal size range and truncated at the maximum ball nut rotational speed. **DO NOT EXCEED** this RPM regardless of screw length.



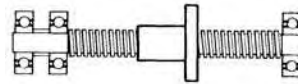
(A) Fixed Free	15	30	46	61	76	91	107	122	137	152	168	183	198	213	229	244	259	274	305	320
(B) Simple Simple	25	51	76	102	127	152	178	203	229	254	279	305	330	356	381	406	432	457	483	508
(C) Fixed Simple	30	61	91	122	155	185	216	246	277	307	338	391	401	432	462	493	523	554	584	615
(D) Fixed Fixed	38	76	114	152	191	229	267	302	340	378	417	455	493	531	569	607	645	683	721	757



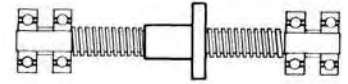
A Fixed—Free



B Simple—Simple



C Fixed—Simple



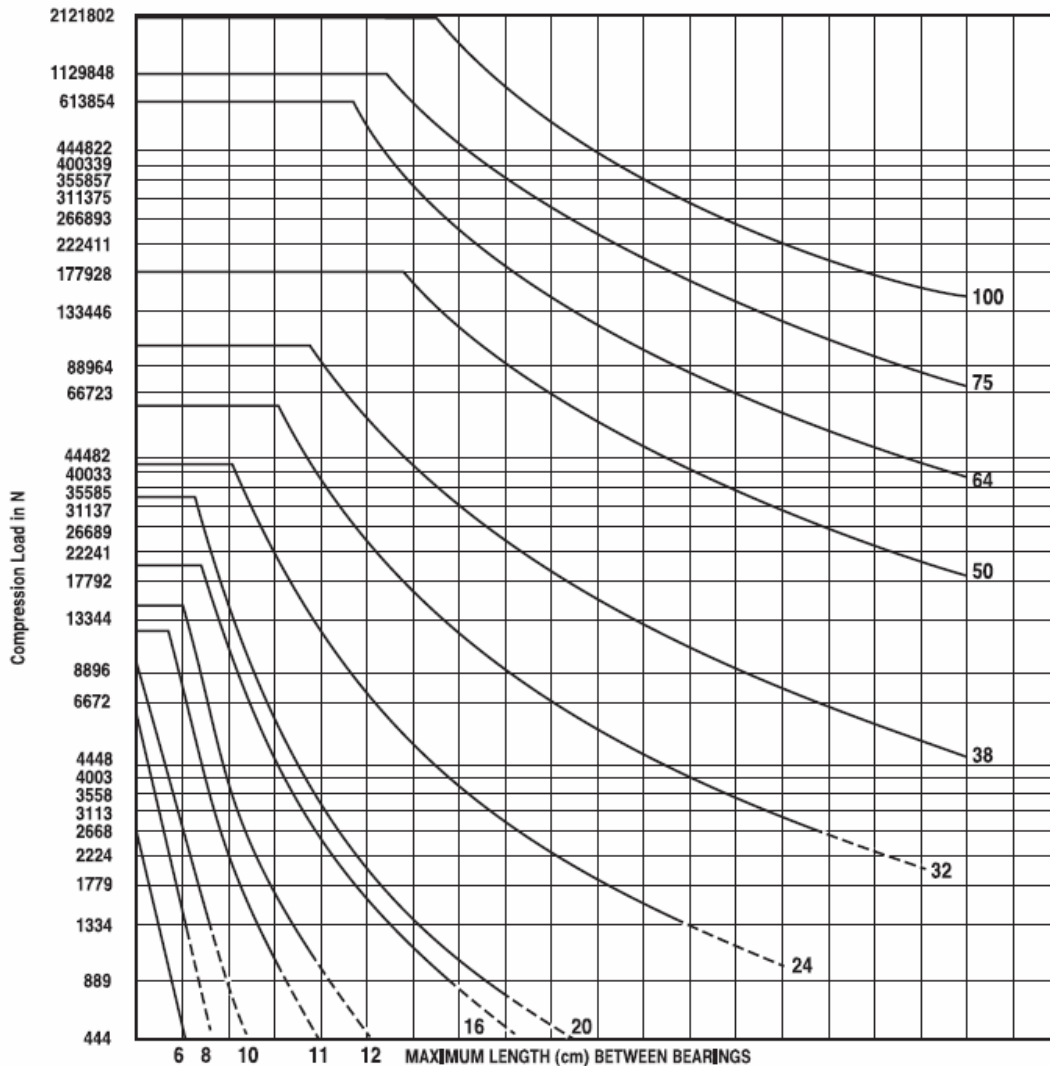
D Fixed—Fixed



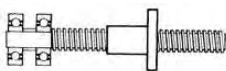
## Column Loading Capacities Chart

Use the chart below to determine the Maximum Compression Load for Screw Shaft. Usually, screws operated in tension can handle loads up to the rated capacity of the nut, providing the screw length is within standard lengths. End supports have an effect on the load capacity of screws. The four standard variations are shown below with corresponding rating adjustments. Find the point of intersecting lines of load (horizontal) and length (vertical) to determine the minimum safe diameter of screw. If loads fall into dotted lines, consult factory.

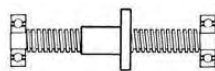
**Warning: DO NOT EXCEED nut capacity. Curves for the screw diameters shown are based on the smallest root (minor) diameter of the standard**



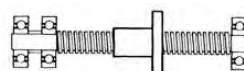
(A) Fixed Free	13	25	38	51	64	76	89	102	114	127	140	152	165	178	191	203	216	229	241
(B) Simple Simple	25	51	76	102	127	152	178	203	229	254	279	305	330	356	381	406	432	457	483
(C) Fixed Simple	36	71	107	145	180	216	251	287	323	358	396	432	467	503	538	574	610	648	686
(D) Fixed Fixed	51	102	152	203	254	305	356	406	457	508	559	610	660	711	762	813	864	914	965



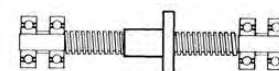
(A) Fixed-Free



(B) Simple-Simple



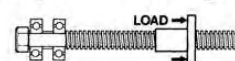
(C) Fixed-Simple



(D) Fixed-Fixed



Compression (Column) Load



Tension (Pulling) Load

## Lead Screw Product Summary

Series	Precision Lead Screw
Lead Accuracy	Standard Precision 250 µm / 300 mm High Precision 75 µm / 300 mm
Standard diameters	3.175 mm to 24 mm
Standard leads	1 mm to 45mm
Backlash	Zero - with anti-backlash nuts .02 to .25 mm with plain nuts
Dynamic Load	up to 1550 N
Max Static Load	up to 6675 N
Catalogue Pages	7 to 9

## Available leads

Metric	Lead (mm)													
	2	3	4	5	6	8	10	12	15	16	20	25	35	45
Dia (mm)	10	•	•	•	•	•	•	•			•		•	
12		•	•	•	•		•		•			•		•
16			•	•		•				•		•	•	
20			•			•		•		•	•			•
24				•										

Inch	Lead (in)													
	0.050	0.063	0.083	0.100	0.125	0.167	0.200	0.250	0.375	0.500	0.800	1.000	1.200	2.000
Dia (in)	1/8	•			•									
1/4	•				•			•		•				
3/8	•	•	•	•	•	•	•	•	•	•		•	•	
7/16					•			•		•				
1/2	•	•		•		•	•	•		•	•	•		
5/8				•	•		•	•		•				
3/4				•	•	•	•			•		•		•
1				•	•		•	•		•		•		

**Note:** Other non-standard leads are available—please ask your Huco Dynatork representative

Precision rolled lead screws offer a burnished finish for maximum efficiency and lowest wear. All screws are stainless steel to provide corrosion resistance and a bright finish. SPT and SRT screws conform to DIN 103 while SPR and SRA screws have optimised thread forms for maximum performance.



Shaft Diameter (mm)	Lead (mm)	Part Number			Root Diameter (mm)	Efficiency @.1 Friction Coefficient (%)
		Precision Accuracy Prefix	Standard Accuracy Prefix	Size		
10	2*	SPT	SRT	10 x 2M	7,4	42
	3^	SPT	SRT	10 x 3M	6,4	53
	5	SPR	SRA	2-10 x 2,5M	7,1	64
	6	SPR	SRA	4-10 x 1,5M	8,2	66
	10	SPR	SRA	5-10 x 2M	7,5	76
	20	-	SRA	6-10 x 3,3M	8,4	81
	35	-	SRA	10-10 x 3,5M	7,4	81
12	3*	SPT	SRT	12 x 3M	8,0	48
	4	SPR	SRA	2-12 x 2M	9,2	54
	5^	SPT	SRT	2-12 x 2,5M	8,9	59
	6	SPR	SRA	3-12 x 2M	9,1	63
	10^	SPT	SRT	4-12 x 2,5M	8,9	73
	15	SPR	SRA	6-12 x 2,5M	8,7	78
	25	-	SRA	10-12 x 2,5M	9,2	82
	45	-	SRA	15-12 x 3M	9,6	81
16	4*	SPT	SRT	16 x 4M	11,3	48
	5	SPR	SRA	2-16 x 2,5M	12,2	52
	8	SPR	SRA	4-16 x 2M	13,0	63
	16	SPR	SRA	7-16 x 2,3M	12,6	75
	25	-	SRA	5-16 x 5M	11,5	80
	35	-	SRA	7-16 x 5M	12,2	82
	45	-	SRA	9-16 x 5M	12,2	82
20	4*	SPT	SRT	20 x 4M	15,3	42
	8	SPR	SRA	2-20 x 4M	14,8	59
	12	SPR	SRA	3-20 x 4M	15,0	67
	16	SPR	SRA	4-20 x 4M	15,0	72
	20	-	SRA	5-20 x 4M	15,0	76
	45	-	SRA	9-20 x 5M	15,8	82
24	5*	SPT	SRT	24 x 5M	18,5	42

\* Conforms to DIN 103 parts 1 & 2. Tolerance grade 7e.

^ Conforms to DIN 103 part 1, not defined in parts 2 & 3

See page 5 for maximum available screw lengths