

These products are available from:



## MARYLAND METRICS

phones: (800) 638-1830 (410) 358-3130

faxes: (800) 872-9329 (410) 358-3142

E-mail: [sales@mdmetric.com](mailto:sales@mdmetric.com) URL: <http://mdmetric.com>

P.O.Box 261 Owings Mills, MD21117USA  
6119 Oakleaf Avenue Baltimore, MD21215USA

[click for Trapezoidal Rod/Screwjacks page index](#)

## Precision Trapezoidal Threaded Rods and Nuts

**MARYLAND METRICS** offers high-quality precision mechanical products.

Our suppliers are world leaders in the design and production of mechanical products, some of which are featured in this catalog.

### **Our Products Help Solve Problems**

Maryland Metrics is proud to offer the following solutions-oriented products to the North American marketplace:

#### **GT precision trapezoidal thread screw drives**

This product catalog is just one of many that we make available to existing and future customers.

### **Meeting Your Challenges**

Our precision products must meet the engineering challenges our customer's face. The factories applications and product engineers understand mechanical systems and can adapt our hardware for integration into your system. By drawing upon the latest manufacturing technology, our exceptional design experience, and extensive product knowledge, Maryland Metrics can offer the most effective product at the most cost-effective price. When possible, we can also provide custom-engineered products to better serve the unique requests of our customers.

#### **GT precision trapezoidal thread screw drives**

GT high-precision screw drives provide the performance you expect with the options you need. Our rolled screws are extremely resistant to notching, corrosion, and wear, and we offer trapezoidal thread rod and trapezoidal thread nuts in a variety of sizes and styles. In any condition, in any system, there is a Maryland Metrics trapezoidal thread screw drive that is right for you.

Available from: **MARYLAND METRICS**

Phones: (410)358-3130 (800)638-1830 Faxes: (410)358-3142 (800)872-9329

P.O.Box 261 Owings Mills, MD 21117 USA URL: <http://mdmetric.com> E-mail: [sales@mdmetric.com](mailto:sales@mdmetric.com)

# Table of Contents

## Lead screw drives TGT

Trapezoidal screws .....	3
Trapezoidal nuts .....	8

## Standard screw ends

## Principles of selection for trapezoidal screw drives

## Installation, maintenance and operation

## Order Codes

Trapezoidal screw drives .....	20
--------------------------------	----

Additional services .....	21
---------------------------	----

Additional products .....	21
---------------------------	----

, Inc. screw drive that is right for you.

---

# Maryland Metrics

## Driving your design

---

Rolled trapezoidal  
lead screw, with  
flanged nut

### **Excellent price/performance relationship**

High accuracy rolled Maryland Metrics screw drives—quality with decades of experience in conjunction with NEFF® AA, a company in Waldenbuch, Germany.

### **Precise operation and high accuracy for your machine**

Maryland Metrics screw drives are available in many sizes, pitches up to 50 mm and with a wide range of accessories.





## Lead screw drives TGT

Consisting of trapezoidal screw and trapezoidal nut

- Trapezoidal machined lead screw is nearly identical to Acme lead screw, offering excellent performance to cost
- Low-cost solution for use in clamping, positioning and feed movements
- Thread-rolling manufacturing process utilized
- Versatile, in combination with our wide offerings of nut configurations
- Screw and nut can be machined from a variety of materials as dictated by the application
- Screw end machining in accordance with customer requirements

# Trapezoidal lead screw threads

## Rolled trapezoidal lead screw

In the thread rolling process, the surface is strengthened and smoothed, and the natural grain-flow of the material is not interrupted. **Rolled trapezoidal screws are therefore particularly resistant to notching, corrosion and wear.**

Maryland Metrics trapezoidal screw drives are available in two variants:

- Rolled trapezoidal screws RTS
- Rolled precision trapezoidal screws RPTS

Our rolled trapezoidal screws are offered:

- With gunmetal nuts for low- and medium-speed drives
- With bronze nuts for motion drives
- With plastic nuts for high-speed drives

### Product Groupings

Characteristics	RTS	RPTS
Thread	Metric ISO trapezoidal thread to DIN 103.7e	Metric ISO trapezoidal thread to DIN 103.7e
Diameter	10 to 80 mm	10 to 80 mm
Lead	2 to 10 mm	2 to 24 mm
No. of starts	Single-start only	Up to 6 starts
Thread direction	Right hand thread Left hand thread are available upon request	Right hand thread Single-start and left hand thread versions are available up request
Length	Standard: 3000 mm Up to 6000 mm from Tr 20 mm Ø x 4 mm lead	Up to 3000 mm for screws up to Tr 18 mm Ø x 4 mm lead
Material	1.0401 (case-hardened steel C15)	1.0401 (case-hardened steel C15), stress-relief annealed, weldable
Pitch accuracy/ref. length	300 µm/300 mm	50 to 300 µm/300 mm
Straightness/ref. length	1.5 mm/300 mm	0.1 to 0.5 mm/300 mm
Left and right hand screws	-	For thread leads of 3/4/5/6 mm
End machining	To customer specification	To customer specification

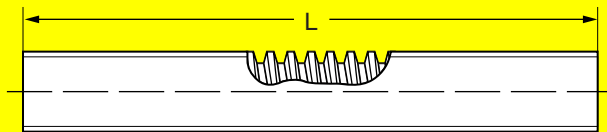
## Whirled Trapezoidal lead screws

Available upon request

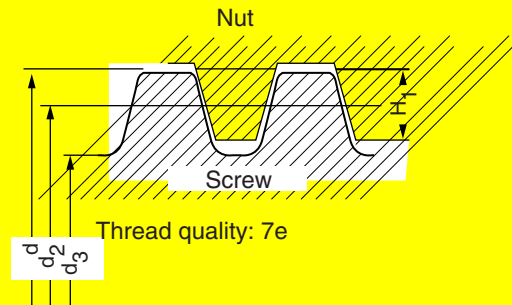
# Trapezoidal lead screws

## Rolled trapezoidal lead screws RTS

Manufactured length 3000mm



Material 1.0401 (C 15)



Type <sup>1)</sup>	d	d <sub>2min</sub>	d <sub>2max</sub>	d <sub>3</sub> <sup>5)</sup>	H <sub>1</sub>	Accuracy (μm/300mm)	Straightness (mm/300mm)	α <sup>2)</sup>	η <sup>3)</sup>	Weight (kg/m)	Planar moment of inertia (cm <sup>4</sup> )	Mass moment of inertia (kg m <sup>2</sup> /m)
RTS Tr 10x2	10	8.739	8.929	6.89	1	300	1.5	4° 2'	0.40	0.500	0.011	0.51 · 10 <sup>-5</sup>
RTS Tr 10x3	10	8.191	8.415	5.84	1.5	300	1.5	6° 24'	0.51	0.446	0.0057	0.40 · 10 <sup>-5</sup>
RTS Tr 12x3	12	10.191	10.415	7.84	1.5	300	1.5	5° 11'	0.46	0.746	0.019	1.03 · 10 <sup>-5</sup>
RTS Tr 14x3	14	12.191	12.415	9.84	1.5	300	1.5	4° 22'	0.42	1.04	0.046	2.04 · 10 <sup>-5</sup>
RTS Tr 14x4	14	11.640	11.905	8.80	2	300	1.5	6° 3'	0.50	0.888	0.029	1.60 · 10 <sup>-5</sup>
RTS Tr 16x4	16	13.640	13.905	10.80	2	300	1.5	5° 11'	0.46	1.21	0.067	2.96 · 10 <sup>-5</sup>
RTS Tr 18x4	18	15.640	15.905	12.80	2	300	1.5	4° 32'	0.43	1.58	0.132	5.05 · 10 <sup>-5</sup>
RTS Tr 20x4	20	17.640	17.905	14.80	2	300	1.5	4° 2'	0.40	2.00	0.236	8.10 · 10 <sup>-5</sup>
RTS Tr 22x5	22	19.114	19.394	15.50	2.5	300	1.5	4° 39'	0.43	2.23	0.283	1.00 · 10 <sup>-4</sup>
RTS Tr 24x5	24	21.094	21.394	17.50	2.5	300	1.5	4° 14'	0.41	2.72	0.460	1.50 · 10 <sup>-4</sup>
RTS Tr 26x5	26	23.094	23.394	19.50	2.5	300	1.5	3° 52'	0.39	3.26	0.710	2.0 · 10 <sup>-4</sup>
RTS Tr 28x5	28	25.094	25.394	21.50	2.5	300	1.5	3° 34'	0.37	3.85	1.05	3.0 · 10 <sup>-4</sup>
RTS Tr 30x6	30	26.547	26.882	21.90	3	300	1.5	4° 2'	0.40	4.50	1.13	4.0 · 10 <sup>-4</sup>
RTS Tr 32x6	32	28.547	28.882	23.90	3	300	1.5	3° 46'	0.38	5.18	1.60	5.0 · 10 <sup>-4</sup>
RTS Tr 36x6	36	32.547	32.882	27.90	3	300	1.5	3° 18'	0.35	6.71	2.97	9.0 · 10 <sup>-4</sup>
RTS Tr 40x7	40	36.020	36.375	30.50	3.5	300	1.5	3° 29'	0.37	8.00	4.25	1.3 · 10 <sup>-3</sup>
RTS Tr 44x7	44	40.020	40.275	34.50	3.5	300	1.5	3° 8'	0.34	9.87	6.95	2.0 · 10 <sup>-3</sup>
RTS Tr 48x8	48	43.468	43.868	37.80	4	300	1.5	3° 18'	0.35	12.0	10.0	2.9 · 10 <sup>-3</sup>
RTS Tr 50x8	50	45.468	45.868	39.30	4	300	1.5	3° 10'	0.34	13.1	11.7	3.4 · 10 <sup>-3</sup>
RTS Tr 60x9	60	54.935	55.360	48.15	4.5	300	1.5	2° 57'	0.33	18.0	26.4	6.9 · 10 <sup>-3</sup>
RTS Tr 70x10	70	64.425	64.850	57.00	5	300	1.5	2° 48'	0.32	26.0	51.8	1.4 · 10 <sup>-3</sup>
RTS Tr 80x10	80	74.425	74.850	67.00	5	300	1.5	2° 25'	0.29	34.7	98.9	2.4 · 10 <sup>-3</sup>

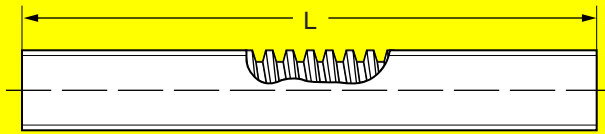
- 1) Definition of Tr 20x4: trapezoidal thread with outside diameter d = 20 mm, single-start, lead 4 mm.
- 2) Pitch angle at the flank diameter.
- 3) Theoretical efficiency for converting a rotary motion into a linear motion with a coefficient friction μ = 0.1.
- 4) The polar moment of inertia is double the moment of inertia.
- 5) d<sub>3</sub> may be slightly smaller than dictated by DIN 103 to allow for a larger fillet.

Order code: p. 35

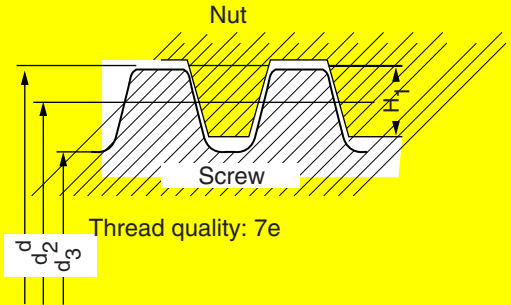
# Trapezoidal lead screws

## Rolled precision trapezoidal lead screws RPTS

Manufactured length 3000mm unless otherwise noted



Material 1.0401 (C 15)



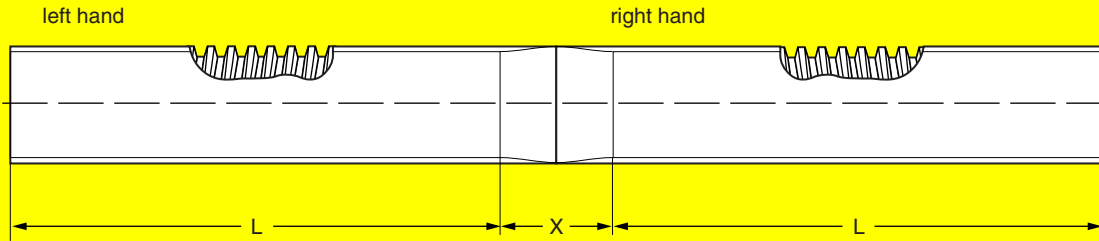
Type 1)	d	d <sub>2min</sub>	d <sub>2max</sub>	d <sub>3</sub> <sup>7)</sup>	H <sub>1</sub>	Accuracy (μm/300mm)	Straightness (mm/300mm)	α <sup>2)</sup>	η <sup>3)</sup>	Weight (kg/m)	Planar moment of inertia (cm <sup>4</sup> )	Mass moment of inertia (kg m <sup>2</sup> /m)
RPTS Tr 10x2	10	8.739	8.929	6.89	1	300	0.5	4° 2'	0.40	0.500	0.011	0.51 · 10 <sup>-5</sup>
RPTS Tr 10x3	10	8.191	8.415	5.84	1.5	300	0.5	6° 24'	0.51	0.446	0.0057	0.40 · 10 <sup>-5</sup>
RPTS Tr 12x3	12	10.191	10.415	7.84	1.5	300	0.5	5° 11'	0.46	0.746	0.019	1.03 · 10 <sup>-5</sup>
RPTS Tr 12x6 P3	12	10.165	10.415	7.84	1.5	300	0.5	10° 18'	0.62	0.746	0.019	1.03 · 10 <sup>-5</sup>
RPTS Tr 14x3	14	12.191	12.415	9.84	1.5	300	0.5	4° 22'	0.42	1.04	0.046	2.04 · 10 <sup>-5</sup>
RPTS Tr 14x4	14	11.640	11.905	8.80	2	300	0.5	6° 3'	0.50	0.888	0.029	1.60 · 10 <sup>-5</sup>
RPTS Tr 16x4	16	13.640	13.905	10.80	2	50	0.1	5° 11'	0.46	1.21	0.067	2.96 · 10 <sup>-5</sup>
RPTS Tr 16x8 P4	16	13.608	13.905	10.80	2	300	0.3	10° 18'	0.62	1.20	0.067	2.96 · 10 <sup>-5</sup>
RPTS Tr 18x4	18	15.640	15.905	12.80	2	50	0.1	4° 32'	0.43	1.58	0.132	5.05 · 10 <sup>-5</sup>
RPTS Tr 20x4 <sup>6)</sup>	20	17.640	17.905	14.80	2	50	0.1	4° 2'	0.40	2.00	0.236	8.10 · 10 <sup>-5</sup>
RPTS Tr 20x8 P4	20	17.608	17.905	14.80	2	200	0.2	8° 3'	0.57	2.00	0.236	8.10 · 10 <sup>-5</sup>
RPTS Tr 20x16 P4	20	17.608	17.905	14.80	2	200	0.2	15° 47'	0.71	2.00	0.236	8.10 · 10 <sup>-5</sup>
RPTS Tr 22x5	22	19.114	19.394	15.50	2.5	50	0.1	4° 39'	0.43	2.23	0.283	1.00 · 10 <sup>-4</sup>
RPTS Tr 22x24 P4 <sup>5)</sup>	22	19.140	19.505	16.50	2.5	200	0.2	21° 34'	0.75	2.23	0.364	1.00 · 10 <sup>-4</sup>
RPTS Tr 24x5	24	21.094	21.394	17.50	2.5	50	0.1	4° 14'	0.41	2.72	0.460	1.50 · 10 <sup>-4</sup>
RPTS Tr 24x10 P5	24	21.058	21.394	17.50	2.5	200	0.2	8° 25'	0.58	2.72	0.460	1.50 · 10 <sup>-4</sup>
RPTS Tr 26x5	26	23.094	23.394	19.50	2.5	50	0.1	3° 52'	0.39	3.26	0.710	2.0 · 10 <sup>-4</sup>
RPTS Tr 28x5	28	25.094	25.394	21.50	2.5	50	0.1	3° 34'	0.37	3.85	1.05	3.0 · 10 <sup>-4</sup>
RPTS Tr 30x6	30	26.547	26.882	21.90	3	50	0.1	4° 2'	0.40	4.50	1.13	4.0 · 10 <sup>-4</sup>
RPTS Tr 30x12 P6	30	26.507	26.882	21.90	3	200	0.2	8° 3'	0.57	4.50	1.13	4.0 · 10 <sup>-4</sup>
RPTS Tr 32x6	32	28.547	28.882	23.90	3	50	0.1	3° 46'	0.38	5.18	1.60	5.0 · 10 <sup>-4</sup>
RPTS Tr 36x6	36	32.547	32.882	27.90	3	50	0.1	3° 18'	0.35	6.71	2.97	9.0 · 10 <sup>-4</sup>
RPTS Tr 40x7	40	36.020	36.375	30.50	3.5	50	0.1	3° 29'	0.37	8.00	4.25	1.3 · 10 <sup>-3</sup>
RPTS Tr 40x14 P7	40	35.978	36.375	30.50	3.5	200	0.2	6° 57'	0.53	8.00	4.25	1.3 · 10 <sup>-3</sup>
RPTS Tr 44x7	44	40.020	40.275	34.50	3.5	50	0.1	3° 8'	0.34	9.87	6.95	2.0 · 10 <sup>-3</sup>
RPTS Tr 48x8	48	43.468	43.868	37.80	4	100	0.1	3° 18'	0.35	12.0	10.0	2.9 · 10 <sup>-3</sup>
RPTS Tr 50x8	50	45.468	45.868	39.30	4	100	0.1	3° 10'	0.34	13.1	11.7	3.4 · 10 <sup>-3</sup>
RPTS Tr 60x9	60	54.935	55.360	48.15	4.5	200	0.3	2° 57'	0.33	18.0	26.4	6.9 · 10 <sup>-3</sup>
RPTS Tr 70x10	70	64.425	64.850	57.00	5	200	0.3	2° 48'	0.32	26.0	51.8	1.4 · 10 <sup>-2</sup>
RPTS Tr 80x10	80	74.425	74.850	67.00	5	200	0.3	2° 25'	0.29	34.7	98.9	2.4 · 10 <sup>-2</sup>

- 1) Definition of Tr 20x4: trapezoidal thread with outside diameter d = 20 mm, single-start, lead 4 mm.  
Definition of Tr 20x8 P4: trapezoidal thread with outside diameter d = 20 mm, 2-start, lead 8 mm, pitch 4mm.
- 2) Pitch angle at the flank diameter.
- 3) Theoretical efficiency for converting a rotary motion into a linear motion with a coefficient of friction  $\mu = 0.1$ .
- 4) The polar moment of inertia is double the moment of inertia.
- 5) Special profile.
- 6) Up to 6000 mm production length, dimension L according to customer's requirements.
- 7) d<sub>3</sub> may be slightly smaller than dictated by DIN 103 to allow for a larger fillet.

Order code: p. 35

# Trapezoidal lead screws

## Trapezoidal lead screws with right and left hand thread



Diameter	as per RPTS-RH
Lead	3/4/5/6 mm
No. of starts	same as RPTS single-start
Length	max. 3000 mm (for Tp 20 x 4 pitch up to 6000 mm upon request)
Pitch accuracy / ref. length	50-300 μm/300
Straightness / ref. length	0.1 – 0.5 mm/300 mm
Material	1.0401 (C15)
X	100 mm

Nuts:

Nuts of diameter 18 mm and higher in chased thread version are available for all screws.

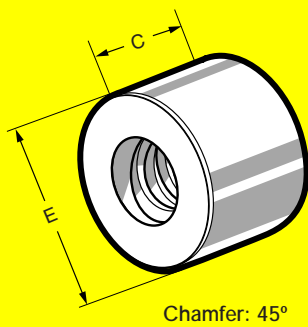
Order code: p. 35

# Trapezoidal thread nuts

Trapezoidal nuts are manufactured with special tools from a prebored blank conforming to DIN 103, tolerance class 7H.

## Short steel nut blanks KSM

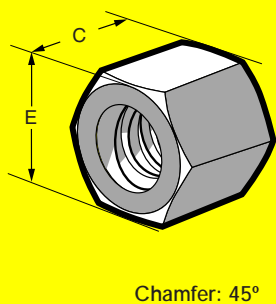
- Suitable for clamping operations, manual positioning and in combination with mounting bolts
- Not suitable for motion drives, because the steel/steel friction has a tendency to seize under certain conditions
- Further processing: the thread serves as reference for precise machining and assembly
- Material: free-cutting steel 1.0718 (9 SMn 28K)



Type	E (mm)	C (mm)	Weight (kg)	Type	E (mm)	C (mm)	Weight (kg)
KSM Tr 10 x 2	22	15	0.037	KSM Tr 28 x 5	60	42	0.76
KSM Tr 10 x 3	22	15	0.036	KSM Tr 30 x 6	60	45	0.79
KSM Tr 12 x 3	26	18	0.064	KSM Tr 32 x 6	60	48	0.81
KSM Tr 14 x 3	30	21	0.96	KSM Tr 36 x 6	75	54	1.5
KSM Tr 14 x 4	30	21	0.96	KSM Tr 40 x 7	80	60	1.9
KSM Tr 16 x 4	36	24	0.16	KSM Tr 44 x 7	80	66	2.7
KSM Tr 18 x 4	40	27	0.22	KSM Tr 48 x 8	90	72	2.9
KSM Tr 20 x 4	45	30	0.31	KSM Tr 50 x 8	90	75	2.7
KSM Tr 22 x 5	45	33	0.33	KSM Tr 60 x 9	100	90	3.7
KSM Tr 24 x 5	50	36	0.45	KSM Tr 70 x 10	110	105	4.9
KSM Tr 26 x 5	50	39	0.47	KSM Tr 80 x 10	120	120	6.4

## Hexagonal steel nuts--SKM

- For clamping operations, manual positioning and mounting
- Not suitable for motion drives because the steel/steel friction has a tendency to seize under certain conditions
- Further processing: the thread serves as reference for precise machining and assembly
- Material: free-cutting steel 1.0718 (9 SMnPb 28)



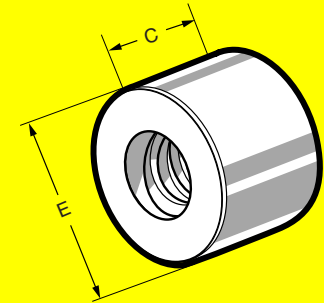
Type	E (mm)	C (mm)	Weight (kg)	Type	E (mm)	C (mm)	Weight (kg)
SKM Tr 10 x 2	17	15	0.022	SKM Tr 28 x 5	41	42	0.30
SKM Tr 10 x 3	17	15	0.022	SKM Tr 30 x 6	46	45	0.43
SKM Tr 12 x 3	19	18	0.028	SKM Tr 32 x 6	46	48	0.42
SKM Tr 14 x 3	22	21	0.044	SKM Tr 36 x 6	55	54	0.73
SKM Tr 14 x 4	22	21	0.044	SKM Tr 40 x 7	65	60	1.3
SKM Tr 16 x 4	27	24	0.084	SKM Tr 44 x 7	65	66	1.2
SKM Tr 18 x 4	27	27	0.086	SKM Tr 48 x 8	75	72	1.8
SKM Tr 20 x 4	30	30	0.17	SKM Tr 50 x 8	75	75	1.8
SKM Tr 22 x 5	30	33	0.17	SKM Tr 60 x 9	90	90	2.8
SKM Tr 24 x 5	36	36	0.20	SKM Tr 70 x 10	90	105	3.1
SKM Tr 26 x 5	36	39	0.20				

Order code: p. 35

# Trapezoidal thread nuts

## Long gunmetal nuts, cylindrical LRM

- For slow and medium-speed motion drives with duty cycles less than 20%
- Can be used in combination with corrosion-proof screws to produce “sea water resistant” drives
- Further processing: the thread serves as reference for precise machining and assembly
- Material: 2.1090 (G-CuSn 7 Zn (Rg7)) (Characteristics: page 11)



Type	E (mm)	C (mm)	Weight (kg)	Bearing Surface (mm <sup>2</sup> )	Type	E(mm)	C (mm)	Weight(kg)	Bearing Surface (mm <sup>2</sup> )
LRM Tr 10x2	22	20	0.056	200	LRM Tr 26x5	50	48	0.58	1240
LRM Tr 10x3	22	20	0.056	190	LRM Tr 28x5	60	60	1.2	1680
LRM Tr 12x3	26	24	0.092	280	LRM Tr 30x6	60	60	1.2	1780
LRM Tr 12x6 P3	26	24	0.092	280	LRM Tr 30x12 P6	60	60	1.2	1780
LRM Tr 14x3	30	28	0.14	380	LRM Tr 32x6	60	60	1.2	1910
LRM Tr 14x4	30	28	0.14	370	LRM Tr 36x6	75	72	2.2	2610
LRM Tr 16x4	36	32	0.25	490	LRM Tr 40x7	80	80	2.8	3210
LRM Tr 16x8 P4	36	32	0.25	490	LRM Tr 40x14 P7	80	80	2.8	3210
LRM Tr 18x4	40	36	0.34	630	LRM Tr 44x7	80	80	2.6	3560
LRM Tr 20x4	45	40	0.48	790	LRM Tr 48x8	90	100	4.3	4840
LRM Tr 20x8 P4	45	40	0.45	790	LRM Tr 50x8	90	100	4.2	5060
LRM Tr 22x5	45	40	0.46	850	LRM Tr 60x9	100	120	5.7	7320
LRM Tr 22x24 P4S <sup>1)</sup>	45	40	0.46	880	LRM Tr 70x10	110	140	7.6	10000
LRM Tr 24x5	50	48	0.69	1130	LRM Tr 80x10	120	160	9.7	13200
LRM Tr 24x10 PS	50	48	0.65	1130					

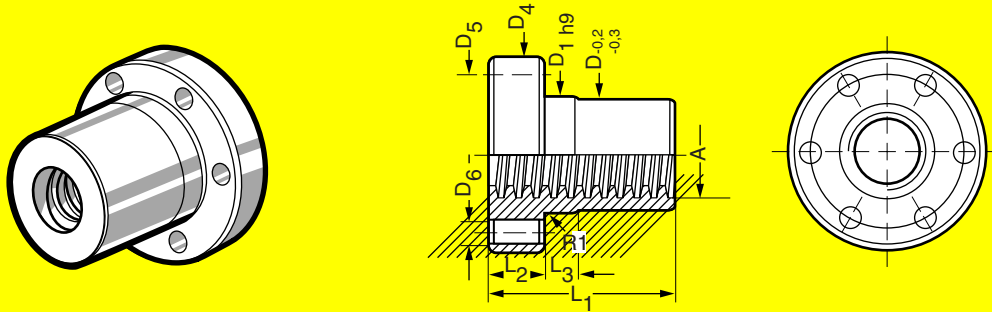
<sup>1)</sup> Special profile; nominal diameter 21.5

Order code: p. 35

# Trapezoidal thread nuts

## Complete bronze nuts--EFM

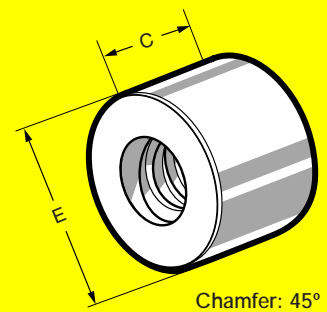
- For motion drives in continuous operation requiring good wear characteristics
- Suitable for use as a safety nut
- Can be used in combination with corrosion-proof screws to produce "sea water resistant" drive systems
- EFM nuts can be mounted with the KON and KAR adaptors (page 22-23)
- Material: 2.1090 (G-CuSn (Rg7)) (Characteristics: page 11)



Type	D <sub>1</sub>	D <sub>4</sub>	D <sub>5</sub>	6xD <sub>6</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Weight(kg)	Bearing Surface (mm <sup>2</sup> )
EFM Tr 16x4	28	48	38	6	44	12	8	0.25	670
EFM Tr 18x4	28	48	38	6	44	12	8	0.25	770
EFM Tr 20x4	32	55	45	7	44	12	8	0.30	870
EFM Tr 24x5	32	55	45	7	44	12	8	0.30	1040
EFM Tr 30x6	38	62	50	7	46	14	8	0.40	1370
EFM Tr 36x6	45	70	58	7	59	16	10	0.60	2140
EFM Tr 40x7	63	95	78	9	73	16	10	1.7	2930
EFM Tr 50x8	72	110	90	11	97	18	10	2.6	4900
EFM Tr 60x9	85	125	105	11	99	20	10	3.7	6040

## Long plastic nut blanks, cylindrical, LKM

- For use in motion drives requiring low-noise and high speed
- Good emergency running characteristics
- Material: NeKu 1 (NEFF® works standard) (Characteristics: page 11)
- Lubrication: synthetic oil-based gear grease  
REINER NOTROPEEN LGX-00



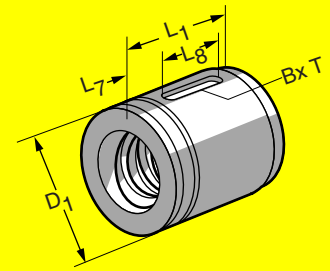
Type	E (mm)	C (mm)	Weight (kg)	Bearing Surface (mm <sup>2</sup> )	Type	E(mm)	C (mm)	Weight(kg)	Bearing Surface (mm <sup>2</sup> )
LKM Tr 12x3	26	24	0.012	280	LKM Tr 30x6	60	60	0.15	1780
LKM Tr 12x6 P3	26	24	0.012	280	LKM Tr 30x12 P6	60	60	0.15	1780
LKM Tr 16x4	36	32	0.032	490	LKM Tr 36x6	75	72	0.3	2610
LKM Tr 16x8 P4	36	32	0.032	490	LKM Tr 40x7	80	80	0.37	3210
LKM Tr 20x4	45	40	0.06	790	LKM Tr 50x8	90	100	0.55	5060
LKM Tr 20x8 P4	45	40	0.06	790					
LKM Tr 24x5	50	48	0.088	1130					

Order code: p. 35

# Trapezoidal thread nuts

## Complete plastic nuts EKM

- For use in motion drives requiring low-noise, high speeds and duty cycles, and medium loads
- Good emergency running characteristics
- Material: NeKu 1 (NEFF® Works Standard) (Characteristics: see below)



Type	D1	L1	L7	L8	BxT	Weight(kg)	Bearing Surface (mm <sup>2</sup> )
EKM Tr 12x4	20	24	5	14	3x1.8	0.01	140
EKM Tr 16x4	28	34	7	20	5x2.9	0.02	520
EKM Tr 20x4	32	34	7	20	5x2.9	0.03	670
EKM Tr 20x8 P4	32	34	7	20	5x2.9	0.03	670
EKM Tr 20x16 P4	32	34	7	20	5x2.9	0.03	670
EKM Tr 24x5	38	34	7	20	5x2.9	0.04	800
EKM Tr 32x6	53	60	14	32	6x3.5	0.14	1910
EKM Tr 40x7	63	60	14	32	6x3.5	0.18	2400
EKM Tr 50x8	72	82	16	50	6x3.5	0.29	4140

### Material Characteristics:

#### Material 2.1090

0.2% yield strength $R_p$ 0.2:	120 N/mm <sup>2</sup>
Tensile strength $R_m$ (δB):	240 N/mm <sup>2</sup>
Min. strain at break:	15%
Brinell hardness HB 10/1000:	65
Density:	8.8 kg/dm <sup>3</sup>
Modulus of elasticity:	90000 N/mm <sup>2</sup>
pv factor:	300 N/mm <sup>2</sup> x m/min

#### Material NeKu 1

Tensile strength:	80 N/mm <sup>2</sup>
Modulus of elasticity:	2800-3000 N/mm <sup>2</sup>
Impact strength:	40 kJm <sup>2</sup>
Notch impact strength:	4 kJm <sup>2</sup>
Thermal expansion:	8.5 x 10 <sup>-5</sup> /°C
Water absorption:	0.25%
Water saturation:	0.6%
Density:	1.38 kg/dm <sup>3</sup>
Friction against steel:	0.05-0.08
Ball hardness H 358/30:	150 N/mm <sup>2</sup>
Strain with a yield stress of 80 N/mm <sup>2</sup> :	4-5%
pv factor:	100 N/mm <sup>2</sup> x m/min
Max. pressure per unit area:	10 N/mm <sup>2</sup>
Max. rubbing speed:	120 m/min

# Installation, maintenance and operation

## Installation and maintenance of trapezoidal thread drives

**Installation:** Trapezoidal thread drives must be aligned carefully during installation – if suitable measuring equipment is not available, the thread drive should be turned through its entire length by hand before the drive unit is attached. Variations in the amount of force required and/or marks on the external diameter of the spindle indicate alignment errors between the spindle axis and guide. In this case, the relevant mounting bolts should first be loosened and the thread drive should be turned through by hand. If the amount of force required is not constant throughout, the appropriate components should be aligned, otherwise the alignment error should be localized by loosening further mounting bolts.

**Cover:** By virtue of their design, trapezoidal thread drives are less sensitive to dirt than ball screw drives, particularly at low speeds (manual operation).

**Motor driven units,** especially with plastic nuts, nonetheless require protection against dirt in the same way as noted for ball thread drives.

**Oil lubrication:** Used only in special cases for trapezoidal thread drives.

**Grease lubrication:** Grease is the usual lubrication method for trapezoidal thread drives. Lubrication intervals are governed by operating conditions; it is advisable to clean the spindle before greasing. We do not recommend Molykote grease with graphite additives.

**Operating temperature:** This depends on the type of nut used, the lubrication conditions and the user's requirements. Please consult us in the case of temperatures above 100°C (plastic nuts 70°C).

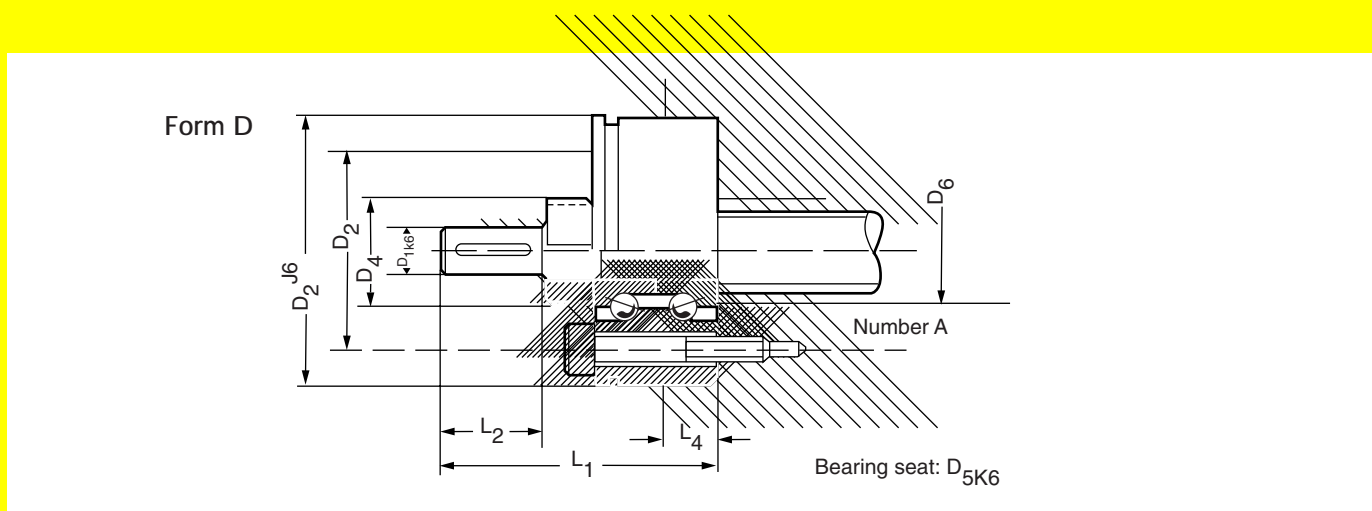
**Wear:** This can be checked manually: if the axial backlash with a single-start screw drive is more than  $\frac{1}{4}$  of the pitch, the nut should be replaced immediately.

# Standard screw ends

## for TGT trapezoidal screw drives

Different bearings are used to support screw drives, depending on the application. The type of bearing influences the stiffness of the entire screw drive, as well as the critical speed and buckling resistance of the screw.

To suit these different types of bearings, Maryland Metrics supplies screws with different end designs.



KGT	TGT	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub> min.	L <sub>4</sub> max.	Mounting bolts		Keyway	Bearing ZKLF- ...2RS	Shaft nut Type RS	F <sub>ax</sub> max (kN)
													A	M				
1605	Tr 18/20/22x...	9	55	42	22	12	25	55	20	25	5	15	3	M6	3x3x16	1255	M12x1	12
2005/20	Tr 24/26x...	11	60	46	25	15	30	58	23	25	5	15	3	M6	4x4x16	1560	M15x1	14
2505/10	Tr 28/30/32x...	14	68	53	32	20	35	70	30	28	5	17	4	M6	5x5x22	2068	M20x1	16
3205/40	Tr 36x...	19	75	58	38	25	40	82	40	28	5	17	4	M6	6x6x28	2575	M25x1.5	20
4005/10	Tr 40/44/48/50	24	80	63	45	30	45	92	50	28	5	17	6	M6	8x7x36	3080	M30x1.5	22

Notes: Bearings not included.

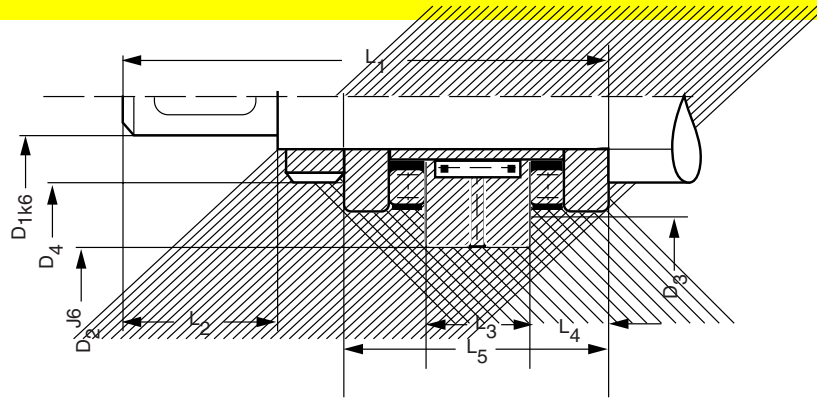
Please contact Maryland Metrics for information on tolerance conversions.

Order code: p. 35/36

# Standard screw ends

## for TGT trapezoidal screw drives

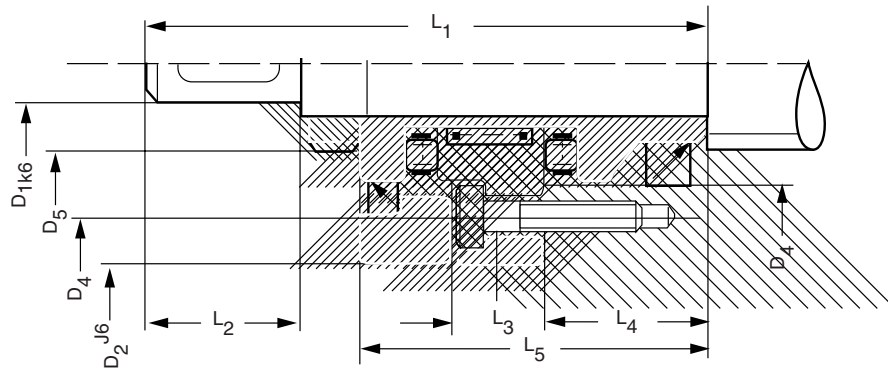
Form F



Bearing seat:  $D_{7K6}$

KGT	TGT	$D_1$	$D_2$	$D_3$ min.	$D_4$	$D_7$	$L_1$	$L_2$	$L_3$	$L_4$	$L_5$	Keyway	Bearing ZARF- ...LTN	Shaft nut Type RS/AS	$F_{ax}$ max (kN)
2505	Tr 22/24/26x...	11	45	35.5	25	15	73	23	16	12	40	4x4x16	1545	M15x1 RS	20
3205	Tr 28/30/32x...	14	52	42.5	32	20	88	30	16	15	46	5x5x22	2052	M20x1 RS	30
3240	Tr 28/30/32x...	14	52	42.5	32	20	88	30	16	15	46	5x5x22	2052	M20x1 RS	30
3210	Tr 28/30/32x...	14	62	52.5	32	20	107	30	20	20	60	5x5x22	2062	M20x1 AS	60
4005	Tr 36/40/44x...	19	57	47.5	38	25	105	40	20	15	50	6x6x28	2557	M25x1.5 RS	32
4010	Tr 36/40/44x...	19	72	62.5	38	25	120	40	20	20	60	6x6x28	2572	M25x1.5 AS	75
5010	Tr 48/50x...	28	85	73.5	52	35	145	60	20	23	66	8x7x40	3585	M35x1.5 AS	100
6310	Tr 60/70x...	36	90	78.5	58	40	175	80	25	25	75	10x8x63	4090	M40x1.5 AS	110
8010	Tr (70)/80x...	48	115	100.5	75	55	215	110	25	28.5	82	14x9x90	55115	M55x2 AS	150

Form H



Bearing seat:  $D_{7K6}$

KGT	TGT	$D_1$	$D_2$	$D_3$	$D_4$	$D_5$	$D_7$	$L_1$	$L_2$	$L_3$	$L_4$	$L_5$	Mounting bolts		Keyway	Bearing ZARF- ...LTN	Shaft nut Type RS/AS	$F_{ax}$ max (kN)
													A	M				
2505	Tr 22/24/26x...	11	60	46	35	25	15	85	23	14	25	53	6	M 6	4x4x16	1560	M15x1 RS	30
3205	Tr 28/30/32x...	14	68	53	42	32	20	102	30	14	29	60	8	M 6	5x5x22	2068	M20x1 RS	30
3240	Tr 28/30/32x...	14	68	53	42	32	20	102	30	14	29	60	8	M 6	5x5x22	2068	M20x1 RS	30
3210	Tr 28/30/32x...	14	80	63	52	32	20	122	30	18	35	75	12	M 6	5x5x22	2080	M20x1 AS	60
4005	Tr 36/40/44x...	19	75	58	47	38	25	120	40	18	30	65	8	M 6	6x6x28	2575	M25x1.5 RS	32
4010	Tr 36/40/44x...	19	90	73	62	38	25	135	40	18	35	75	12	M 6	6x6x28	2590	M25x1.5 AS	75
5010	Tr 48/50x...	28	110	88	73	52	35	160	60	18	39	82	12	M 8	8x7x40	35110	M35x1.5 AS	100
6310	Tr 60/70x...	36	115	94	80	58	40	195	80	22.5	43	93	12	M 8	10x8x63	40115	M40x1.5 AS	110
8010	Tr (70)/80x...	48	145	118	100	75	55	235	110	22.5	49.5	103	12	M10	14x9x90	55145	M55x2 AS	150

Notes: Bearings not included.

Please contact Maryland Metrics for information on tolerance conversions.

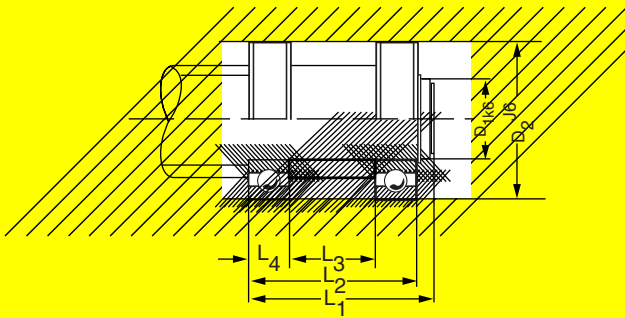
Order code: p. 35/36



# Standard screw ends

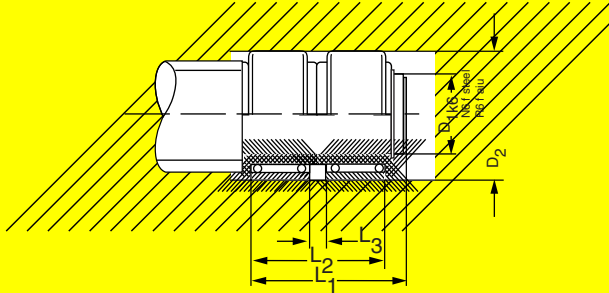
## for TGT trapezoidal screw drives

Form S



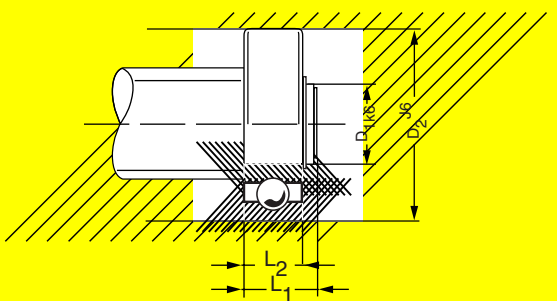
KGT	TGT	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Bearing ...RSkey	Spacer bushing Ø x Ø x L <sub>4</sub>	Shaft ring DIN 471
1605	Tr 18/20x...	12	28	45	40	8	6001	18x12.1x24	12x1
2005/20	Tr 22/24/26x...	15	32	51	46	9	6002	21x15.1x28	15x1
2505	Tr 28/30/32x...	20	42	58	53	12	6004	27x20.1x29	20x1.2
3205/10 3240	Tr 36x...	25	52	58	53	15	6205	32x25.1x23	25x1.2
4005	Tr 40/44x...	30	62	68	60	16	6206	40x30.1x28	30x1.5
4010	Tr 48/50x...	30	62	68	60	16	6206	40x30.1x28	30x1.5
5010	Tr 60x...	40	80	88	80	18	6208	50x40.1x44	40x1.75
6310	Tr 70/80x...	55	100	110	102	21	6211	65x55.1x60	55x2
8010		70	125	130	122	24	6214	80x70.1x74	70x2.5

Form T



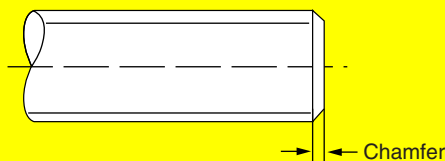
KGT	TGT	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	Internal rings	Needle sleeve HK..RS	Shaft ring DIN 471
1605	Tr 18/20x...	12	22	45	40	8	2 IR 12x16x20	1614	12x1
2005/20	Tr 22/24/26x...	15	26	51	46	6	2 IR 15x20x23	2018	15x1.2
2505	Tr 28/30/32x...	20	32	58	53	13	2 LR 20x25x26.5	2518	20x1.2
3205/10 3240	Tr 36x...	25	37	58	53	13	2 LR 25x30x26.5	3018	25x1.2
4005	Tr 40/44x...	30	42	68	60	20	2 LR 30x35x30	3518	30x1.5
4010	Tr 48/50x...	30	42	68	60	20	2 LR 30x35x30	3518	30x1.5
5010	Tr 60x...	40	52	88	80	40	4 LR 40x45x20	4518	40x1.5

Form W



KGT	TGT	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	Bearing ...2RS	Shaft ring DIN 471
-	Tr 14/16x...	10	26	12	8	6000	10x1
1605	Tr 18/20x...	12	28	12	8	6001	12x1
2005/20	Tr 22/24/26x...	15	32	13	9	6002	15x1
2505	Tr 28/30/32x...	20	42	16	12	6004	20x1.2
3205/10 3240	Tr 36x...	25	52	20	15	6205	25x1.2
4005	Tr 40/44x...	30	62	21	16	6206	30x1.5
4010	Tr 48/50x...	30	62	21	16	6206	30x1.5
5010	Tr 60x...	40	80	25	18	6208	40x1.75
6310	Tr 70/80x...	55	100	28.5	21	6211	55x2
8010	-	70	125	32	24	6214	70x2.5

Form Z



Chamfer 2 x 45°: KGS with lead 5, 20, 40 mm and TGS up to Tr 36 x 6  
 Chamfer 3 x 45°: TGS from Tr 40 x 7 onwards  
 Chamfer 4 x 45°: KGS with lead 10 mm

Form G: Screw end annealed to customer's specification.

Form K: Produced specially to customer's drawing.

Notes: Bearings not included.

Please contact Maryland Metrics for information on tolerance conversions.

## Selecting trapezoidal lead screw drives

Please contact Maryland Metrics at (410)358-3130 (800)638-1830 or [techinfo@mdmetric.com](mailto:techinfo@mdmetric.com) for application engineering assistance in the proper selection of hardware for your application.

In addition, we are continuously developing and improving applications notes and software for use by our customers. We are happy to provide our customers with tools and assistance in solving your needs for successful implementation of high performance mechanical linear drive systems.

web: <http://mdmetric.com> e-mail: [techinfo@mdmetric.com](mailto:techinfo@mdmetric.com)

# Installation, maintenance and operation

## Installation and maintenance of trapezoidal thread drives

**Installation:** Trapezoidal thread drives must be aligned carefully during installation – if suitable measuring equipment is not available, the thread drive should be turned through its entire length by hand before the drive unit is attached. Variations in the amount of force required and/or marks on the external diameter of the spindle indicate alignment errors between the spindle axis and guide. In this case, the relevant mounting bolts should first be loosened and the thread drive should be turned through by hand. If the amount of force required is not constant throughout, the appropriate components should be aligned, otherwise the alignment error should be localized by loosening further mounting bolts.

**Cover:** By virtue of their design, trapezoidal thread drives are less sensitive to dirt than ball screw drives, particularly at low speeds (manual operation).

**Motor driven units,** especially with plastic nuts, nonetheless require protection against dirt in the same way as noted for ball thread drives.

**Oil lubrication:** Used only in special cases for trapezoidal thread drives.

**Grease lubrication:** Grease is the usual lubrication method for trapezoidal thread drives. Lubrication intervals are governed by operating conditions; it is advisable to clean the spindle before greasing. We do not recommend Molykote grease with graphite additives.

**Operating temperature:** This depends on the type of nut used, the lubrication conditions and the user's requirements. Please consult us in the case of temperatures above 100°C (plastic nuts 70°C).

**Wear:** This can be checked manually: if the axial backlash with a single-start screw drive is more than  $\frac{1}{4}$  of the pitch, the nut should be replaced immediately.

# Order Code

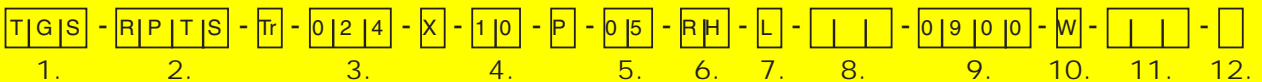
## Trapezoidal screw drives

Structure of order code: Trapezoidal screw drives



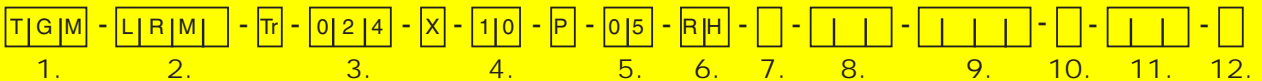
- |   |  |   |
|---|--|---|
| 1. Product<br>TGS = Trapezoidal screw<br>TGM = Trapezoidal nut                | 4. Thread lead (mm)<br>X = cut only  | 9. Overall length TGS (mm)  |
| 2. Type<br>Screw: RTS, RPTS<br>Nut: LKM, EKM, KSM,<br>SKM, LRM, EFM           | 6. Thread direction<br>RH = right hand screw<br>LH = left hand screw   | 10. Screw end 2<br>Standard ends form D, F, H,<br>J, L, S, T, W, Z, see p. 15-17<br>K = in accordance with<br>customers drawing<br>X = cut only |
| 3. Nominal thread diameter (mm)   | 7. Screw end 1<br>Standard ends form D, F, H,<br>J, L, S, T, W, Z, see p. 15-17<br>K = in accordance with<br>customers drawing | 11. Code for end length 2<br>For »K« end length (mm)  |
| 5. Thread pitch (mm)<br>Multi-start threads only; the<br>distance between two | 8. Code for end length 1<br>For »K« end length (mm)  | 12. Special version or with<br>accessories<br>0 = No<br>1 = Yes   |

Example: Trapezoidal screw with screw ends



- |                                       |  |  |
|---------------------------------------|--|--|
| 1. Product<br>TGS =Trapezoidal screw  | 5. Thread pitch (mm)<br>5                    | 10. Screw end 2<br>Standard ends form W              |
| 2. Type<br>RPTS                       | 6. Thread direction<br>RH = right hand screw | 12. Special version or with<br>accessories<br>0 = No |
| 3. Nominal thread diameter (mm)<br>24 | 7. Screw end 1<br>Standard ends form L       |  |
| 4. Thread lead (mm)<br>10             | 9. Overall length TGS (mm)<br>900            |  |

Example: Trapezoidal nut



- |                                       |  |
|---------------------------------------|--|
| 1. Product<br>TGM = Trapezoidal nut   | 4. Thread lead (mm)<br>10                    |
| 2. Type<br>Nut: LRM                   | 5. Thread pitch (mm)<br>5                    |
| 3. Nominal thread diameter (mm)<br>24 | 6. Thread direction<br>RH = right hand screw |

## Maryland Metrics--Additional Services

### Consultation on site where practical

Technical advice and service are available from Maryland Metrics suppliers highly trained staff.

### CAD and software support

Our supplier is actively developing software for release to our customers that includes CAD files and sizing programs. Please contact us to obtain the latest versions.

### Motor adapter flange service

Reduce your internal expenses with the motor adapter flange service. Standard or individual customer-made motor adapter flanges are available for all Maryland Metrics linear drive units and screw jack assemblies.

### Determination of drive technology

Maryland Metrics can provide assistance in the proper selection of motors and drives for you to complete your system.

### Remote-analysis via monitor-data transmission

Send us an e-mail with a digital photo of your damaged Maryland Metrics part and we will assist with a prompt and accurate analysis of failure.

## Maryland Metrics--Additional Product Offerings

### MULI™, JUMBO™ cubic housed screw jacks

The MULI™ and JUMBO™ worm gear screw jacks are ideal units for moving loads from 5 to 500 kN. Different motion variations, screws produced in-house, and matching accessories make the range easy to adapt to virtually every application.

### Single-face screw jacks

These screw jack units are designed to operate in a range of applications, in nearly any environment. Our precision-engineered screw jacks are available in either upright or inverted configurations, with plain or keyed screws. All units can be fitted with an anti-backlash feature.

### GT, KOKON™ precision screw drives

GT, KOKON™ screw drives are available in a wide variety of precision lead and ball screw and nut assemblies. Our rolled screws are extremely resistant to notching, corrosion, and wear. The special MICRON™ Line of ball screws and nut assemblies provides high accuracy to 23µm/300mm. Also, screw ends can be machined to customer specifications. Our completely sealed KOKON™ series is designed to work in the dirtiest of environments.

### WIESEL™ mechanical linear drive units

For accurate positioning or highly dynamic movement, the patented features of Maryland Metrics WIESEL™ units provide superior performance. All WIESEL™ units can be combined with complete servo-drive packages. Preassembled, preconfigured, and ready to plug in.

### SPIRACON® planetary roller screws

Spiracon® roller screws convert rotary motion to linear movement with low noise, high efficiency, and high positional accuracy, all in a system designed for a high dynamic load capacity, long lifespan, and low maintenance.

### ROLARAM™ electro-mechanical actuator

Rolaram™ actuators are an attractive alternative to hydraulic cylinders, matching their load capacity and exceeding the load capacity of conventional electro mechanical actuators. Easy installation and synchronization of multiple units, low power consumption and noise, and a simplified control system are added benefits.

### NEETER DRIVE™ and GRAESSNER™ standard spiral bevel gearboxes and accessories

For transmitting power through an angle of 90°, our compact right-angle gearboxes provide power transmission without slippage. Can be driven with electric, hydraulic, reciprocating, or pneumatic motors. Perfect for systems requiring high precision, accuracy, efficiency, speed, and load carrying capacity.

### Custom designed electro-mechanical actuators

Our custom designed electro-mechanical actuators have a long list of available options. Choose from low-voltage DC or high-voltage AC input, low capacity to 1000kg, and linear speeds up to 50m/minute.

*Spiracon® is a registered trademark of Illinois Tool Works, Inc. (ITW) which is licensed for use to Precision Technology USA, Inc., along with certain patented technology of ITW.*