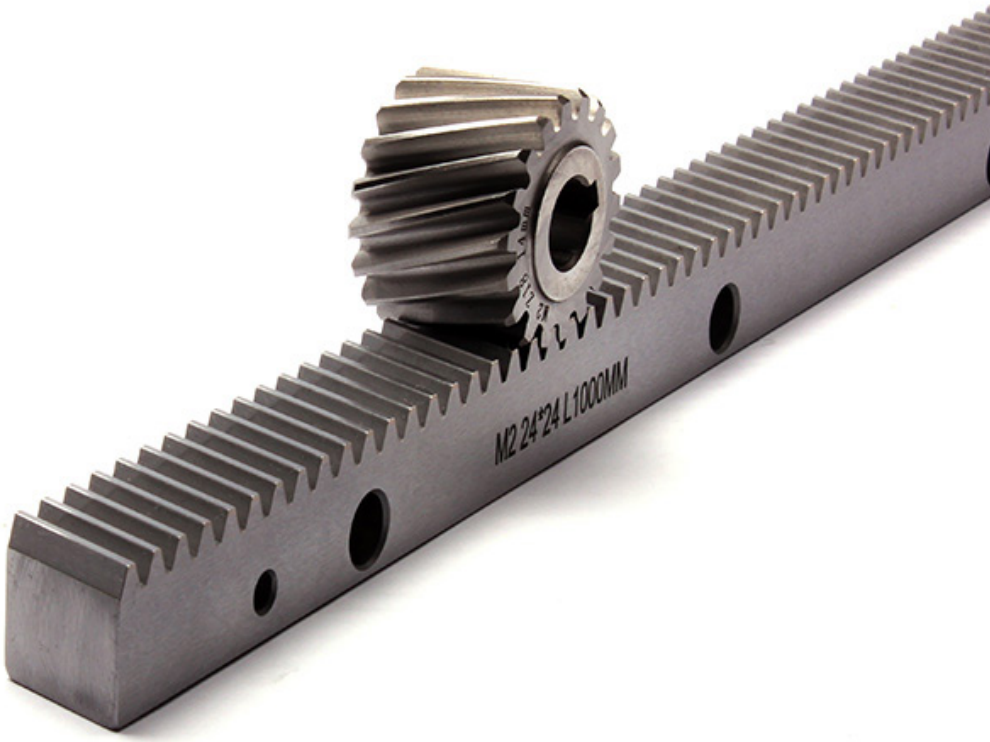
DATASHEET



Helical Racks & Pinions

- **Module 1.5**
- **Module 2.0**

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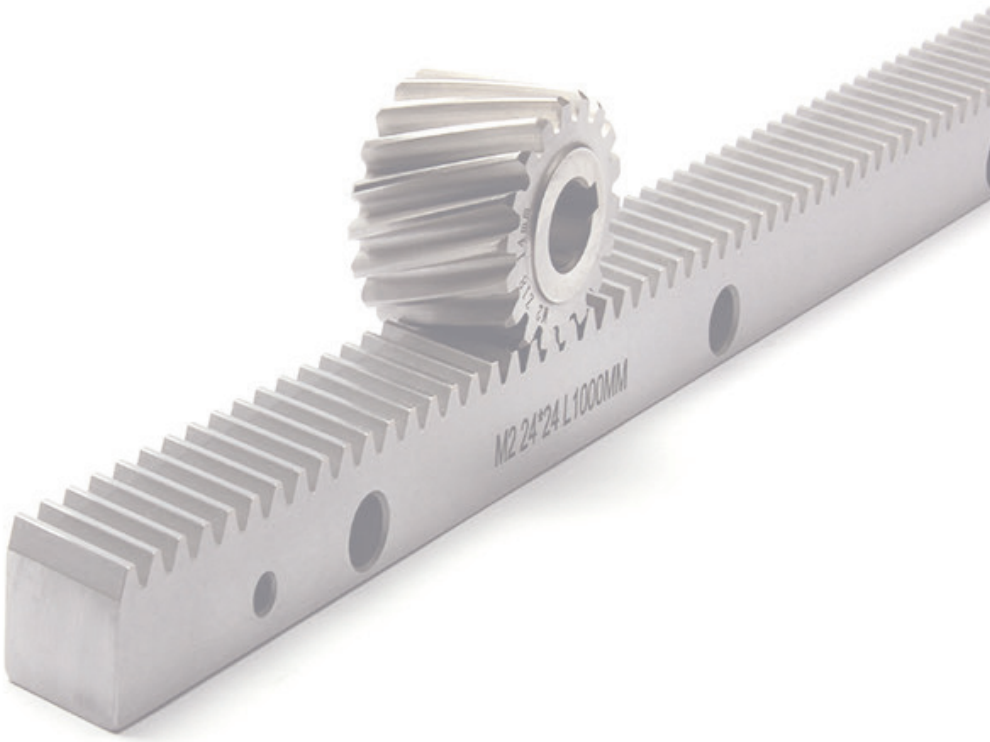
Other modules on request



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Precision Helical Racks

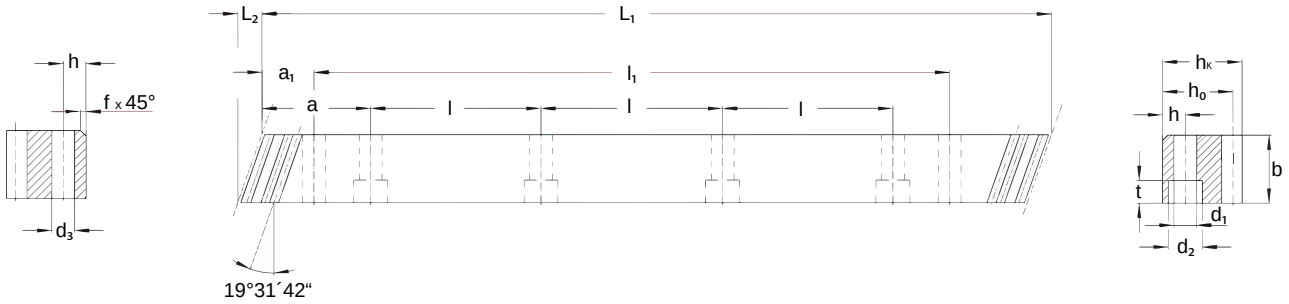
The teeth of these racks are set at an angle (19°31'42") to the rack length for higher load capacity and quiet operation. For right-hand racks left-hand pinions are required.

Technical Data:

- Teeth induction hardened and ground
- Ground on all sides after hardening

Material:	S45C
Angle:	19°31'42" right-hand
Pressure angle:	20°
Toothing quality:	DIN 6 h25
Quality class:	Q6
Max. feed force per pinion contact:	9kN **! (See note on the following page)**
Preciseness:	Total Pitch Error GT_f 1000mm ≤ 0,036mm

Module 1.5



Art.Nr. / *Item No.*	L_1	L_2	Anzahl Zähne / *No. of teeth*	Gesamtteilungs-fehler GT_f *Total Pitch Error GT_f*	Zahndicken-toleranz *Tooth Thickness Tolerance*	Max. Vorschubkraft pro Zahn *Max. Feed Force per Pinion Contact*
	mm	mm		(± µm)	µm	kN
HR-Q6-M1.5-19x19-0500-P125 *	500 **	6,7	100	NV	±20	9,0 ! **
HR-Q6-M1.5-19x19-1000-P125	1000	6,7	200	≤ 36	±20	9,0 !

* Auf Anfrage / on request

** Ein Schraubverbindung begrenzt die Vorschubkraft. Durch eine Schraubenverbindung beträgt die Vorschubkraft max. 50 % des Wertes für Zahnstangen mit L1=1000mm
/ A screw joint limits the feed force. Due to the screw connection, the feed force is max. 50 % of the value for racks with L1 = 1000mm

! Bei diesen Werten handelt es sich um maximale Richtwerte. Sie können nur unter perfekten Bedingungen erreicht werden. In der Praxis können diese Daten aufgrund unterschiedlicher Betriebsbedingungen und Materialien (Chargen-abhängig) vertretbare Toleranzen aufweisen. Bei Ausnutzung der maximalen Belastbarkeit der Verzahnung oder mehreren in Kontakt stehenden Zähnen sind die Befestigungsschraubenbelastungen gesondert zu prüfen! Durch Schraubverbindungen miteinander verbundene Zahnstangen haben eine andere begrenzte Vorschubkraft. Bei einer Schraubenverbindung beträgt die Vorschubkraft max. 50 % des Richtwertes der verwendeten Zahnstangen-Längen. /
! This values are maximum reference values. They can only be achieved under perfect conditions. In practice, this data can have acceptable tolerances due to different operating conditions and materials (depending on the batch). When using the maximum feed force per pinion contact or when several pinions in contact, the fastening screw loads must be checked separately! Racks connected to each other by screw joints have a different limited feed force. Due to a screw connection, the feed force is max. 50% of the reference value for the rack lengths used.

b	h_k	h_0	f	a	l	Anzahl Löcher / *No. of holes*	h	d1	d2
mm	mm	mm	mm	mm	mm		mm	mm	mm
19	19	17,5	2	62,5	125	4	8	7	11
19	19	17,5	2	62,5	125	4	8	7	11

t	a_1	l_1	d_3	Gewicht / *Weight*	Anwendungen (Beispiele) *Applications (Examples)*
mm	mm	mm	mm	kg	
7	31,7	436,6	5,7	1,25	Werkzeugmaschinen, integrierbare Zahnstangen, Wasserstrahlschneidemaschine, Rohrbiege-systeme, Plasmaschneidemaschinen *Machine Tools, Integratable Racks, Water Cutting Machines, Tube Bending Systems, Plasma Cutting Machines*
7	31,7	936,6	5,7	2,5	

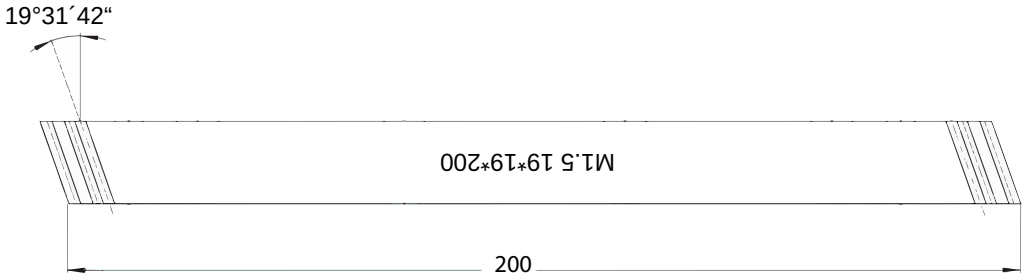
Assembly Jig

Our racks can be mounted one behind the other to create linear drives of any length. In order to achieve perfect transitions between the individual racks, this assembly jig should be used. The teeth of the assembly jig are mirrored to the racks. This ensures that the tooth pitch during the transition corresponds exactly to the tooth pitch of the rack.

N O T I C E :
A screw joint limits the feed force. For racks connected with screw joints, the feed force is a maximum of 50% of the guideline value of the rack lengths used.

Technical Data:

- Material: S45C
- Angle: 19°31'42" left-hand



Item No.: ML-HR-M1.5

Precision Helical Pinions

For right-hand racks left-hand pinions are required.

Technical Data:

- Ground teeth
- Material: 20CrMnTi
- Carburized
- 19°31'42" left-hand
- Hole ØH6
- Keyway acc. to DIN6885
- Toothing quality DIN 6 e25

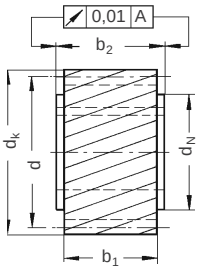


Bild 1
Fig. 1

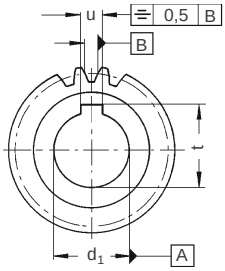


Bild 1 + 3 Nut Mitte Zahnlücke
Fig. 1 + 3 Keyway Middle of Tooth Gap

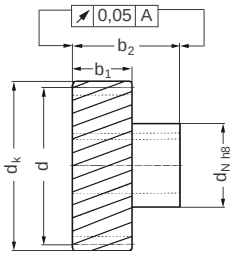


Bild 3
Fig. 3

Art.Nr. / *Item No.*	**Bild /** *Fig*	**Anzahl Zähne /** *No. of teeth*	**d**	**d*PI**	**d_k**	**d_1^{H6}**	**d_N**	**b_1**	**b_2**	**u**	**t**	**Gewicht** */ Weight*
			mm	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**	**kg**
HP-Q6-M1.5-T20-B14	1	20	31,83	100	34,83	14	25	20	22	5	16,3	0,13
HP-Q6-M1.5-T20-B16	1	20	31,83	100	34,83	16	25	20	22	5	18,3	0,13
HP-Q6-M1.5-T21-HUB-B14	3	20	31,83	100	34,83	14	25	20	46	5	16,3	0,15
HP-Q6-M1.5-T21-HUB-B16	3	20	31,83	100	34,83	16	25	20	46	5	18,3	0,15

Andere Bohrungsdurchmesser und Zähneanzahl ebenfalls auf Anfrage / Other bore diameters and number of teeth also on request

Precision Helical Racks

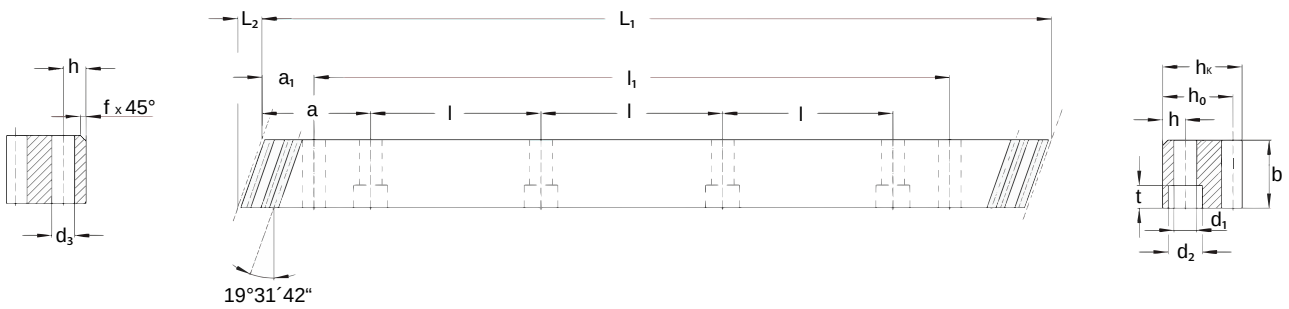
The teeth of these racks are set at an angle (19°31'42") to the rack length for higher load capacity and quiet operation. For right-hand racks left-hand pinions are required.

Technical Data:

- Teeth induction hardened and ground
- Ground on all sides after hardening

Material:	S45C
Angle:	19°31'42" right-hand
Pressure angle:	20°
Toothing quality:	DIN 6 h25
Quality class:	Q6
Max. feed force per pinion contact:	19,5kN **! (See note on the following page)**
Preciseness:	Total Pitch Error GT_f 1000mm ≤ 0,036mm

Module 2.0



Art.Nr. / *Item No.*	L_1	L_2	Anzahl Zähne / *No. of teeth*	Gesamt-teilungs-fehler GT_f *Total Pitch Error GT_f*	Zahndickentoleranz *Tooth Thickness Tolerance*	Max. Vorschubkraft pro Zahn *Max. Feed Force per Pinion Contact*
	mm	mm		(± µm)	µm	kN
HR-Q6-M2-24x24-1000-P125	1000	8,5	150	≤ 36	±20	19,5 !
HR-Q6-M2-24x24-2000-P125	2000	8,5	300	≤ 58	±20	15,5 !

! Bei diesen Werten handelt es sich um maximale Richtwerte. Sie können nur unter perfekten Bedingungen erreicht werden. In der Praxis können diese Daten aufgrund unterschiedlicher Betriebsbedingungen und Materialien (Chargen-abhängig) vertretbare Toleranzen aufweisen. Bei Ausnutzung der maximalen Belastbarkeit der Verzahnung oder mehreren in Kontakt stehenden Zähnen sind die Befestigungsschraubenbelastungen gesondert zu prüfen! Durch Schraubverbindungen miteinander verbundene Zahnstangen haben eine andere begrenzte Vorschubkraft. Bei einer Schraubenverbindung beträgt die Vorschubkraft max. 50 % des Richtwertes der verwendeten Zahnstangen-Längen. /
! This values are maximum reference values. They can only be achieved under perfect conditions. In practice, this data can have acceptable tolerances due to different operating conditions and materials (depending on the batch). When using the maximum feed force per pinion contact or when several pinions in contact, the fastening screw loads must be checked separately! Racks connected to each other by screw joints have a different limited feed force. Due to a screw connection, the feed force is max. 50% of the reference value for the rack lengths used.

b	h_k	h_0	$f^{+0.5}$	a	l	Anzahl Löcher / *No. of holes*	h	d1	d2
mm	mm	mm	mm	mm	mm		mm	mm	mm
24	24	22	2	62,5	125	8	8	7	11
24	24	22	2	62,5	125	16	8	7	11

t	a_1	l_1	d_3	Gewicht / *Weight*	Anwendungen (Beispiele) *Applications (Examples)*
mm	mm	mm	mm	kg	
7	31,7	936,6	5,7	4,4	Werkzeugmaschinen, integrierbare Zahnstangen, Wasserstrahlschneidemaschine, Rohrbiegesysteme, Plasmaschneidemaschinen *Machine Tools, Integratable Racks, Water Cutting Machines, Tube Bending Systems, Plasma Cutting Machines*
7	31,7	1936,6	5,7	8,8	Holz, Kunststoff, Verbundwerkstoffe, Aluminium verarbeitende Maschinen / *Wood, Plastic, Composite, Aluminum Working Machines*

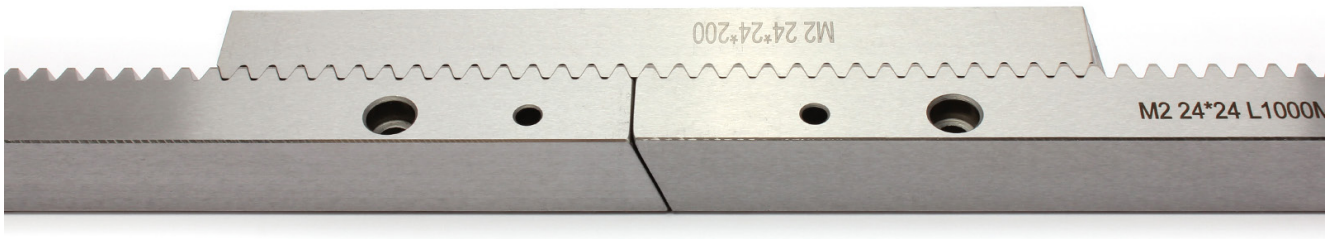
Assembly Jig

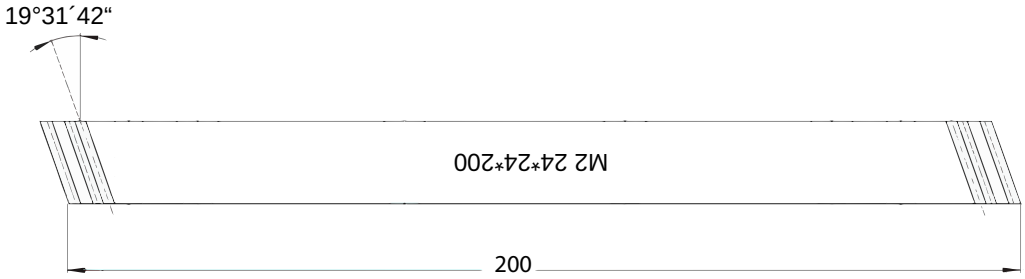
Our racks can be mounted one behind the other to create linear drives of any length. In order to achieve perfect transitions between the individual racks, this assembly jig should be used. The teeth of the assembly jig are mirrored to the racks. This ensures that the tooth pitch during the transition corresponds exactly to the tooth pitch of the rack.

N O T I C E :
A screw joint limits the feed force. For racks connected with screw joints, the feed force is a maximum of 50% of the guideline value of the rack lengths used.

Technical Data:

- Material: S45C
- Angle: 19°31'42" left-hand





Item No.: ML-HR-M2

Precision Helical Pinions

For right-hand racks left-hand pinions are required.

Technical Data:

- Ground teeth
- Material: 20CrMnTi
- Carburized
- 19°31'42" left-hand
- Hole ØH6
- Keyway acc. to DIN6885
- Toothing quality DIN 6 e25

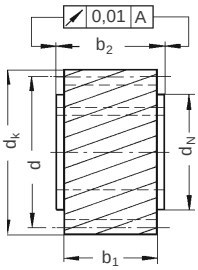


Bild 1
Fig. 1

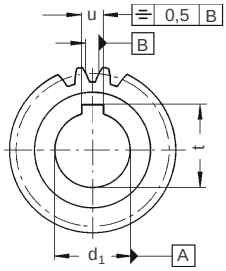


Bild 1 + 3 Nut Mitte Zahnlücke
Fig. 1 + 3 Keyway Middle of Tooth Gap

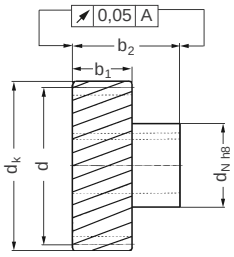


Bild 3
Fig. 3

Art.Nr. / *Item No.*	**Bild /** *Fig*	**Anzahl Zähne /** *No. of teeth*	**d**	**d*PI**	**d_k**	**d_1^{H6}**	**d_N**	**b_1**	**b_2**	**u**	**t**	**Gewicht** ***/ Weight***
			mm	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**	**mm**	**kg**
HP-Q6-M2-T18-B14	1	18	38,197	120	42,2	14	25	28	30	6	16,3	0,2
HP-Q6-M2-T18-B16 *	1	18	38,197	120	42,2	16	25	28	30	6	18,3	0,2
HP-Q6-M2-T20-B14	1	20	42,22	133,33	46,4	14	30	28	30	6	16,3	0,3
HP-Q6-M2-T20-B16 *	1	20	42,22	133,33	46,4	16	30	28	30	6	18,3	0,3
HP-Q6-M2-T20-B19 *	1	20	42,22	133,33	46,4	19	30	28	30	6	21,8	0,3
HP-Q6-M2-T20-HUB-B14	3	20	42,22	133,33	46,4	14	30	28	56	6	16,3	0,3
HP-Q6-M2-T20-HUB-B16 *	3	20	42,22	133,33	46,4	16	30	28	56	6	18,3	0,3
HP-Q6-M2-T20-HUB-B19 *	3	20	42,22	133,33	46,4	19	30	28	56	6	21,8	0,3

* Auf Anfrage / on request

Andere Bohrungsdurchmesser und Zähneanzahl ebenfalls auf Anfrage / Other bore diameters and number of teeth also on request