



	系列 Series	模數 Module	齒面熱處理 heat-treatment of teeth	精度等級 Tolerance of teeth	頁碼 Page
	48	5; 6; 8; 10; 12	高頻淬火 induction-hardened	4	ZA-1.1
	29	2; 3; 4	表面淬火 case-hardened	5	ZA-1.2
	29	2; 3; 4; 5; 6; 8; 10; 12	表面淬火 case-hardened	6 h 25	ZA-2-3
	29	2; 3; 4; 5	表面淬火 case-hardened	7 h 25	ZA-3.1
	39	2; 3; 4; 5	表面淬火 case-hardened	8 h 25	ZA-3.2
	38	2; 3; 4; 5	調質 quenched and tempered	8 e 27	ZA-4
	47	2; 3; 4; 5; 6; 8; 10	軟材 soft	9 e 27	ZA-5
	39	2; 3; 4; 5; 6; 8; 10; 12	高頻淬火 induction-hardened	10 e 27	ZA-6-7
	選型和負載參數表 Selection and load tables				ZH-2-6
	電控潤滑器、滑動毛刷和連接導管裝置 Electronically controlled lubricators, sliding-type lubricating brushes and hose-connection sets				ZI-2-6
	毛氈齒輪和安裝軸 Felt gear and mounting shaft				ZI-5
	裝配 Mounting				ZJ-2





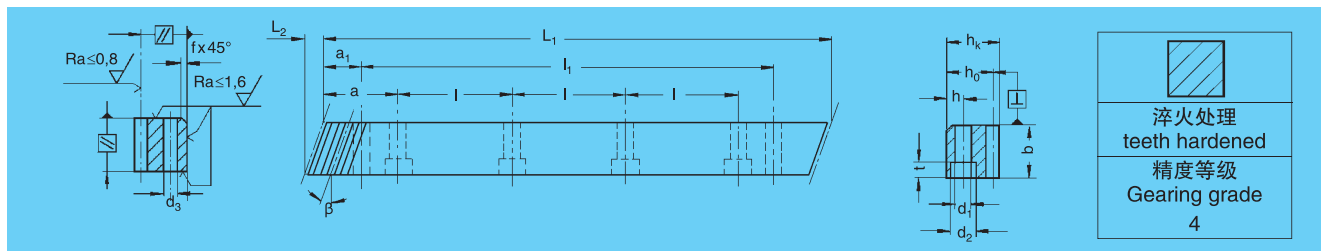
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可拼接齿条模数 2-4

Precision-racks for continuous linking module 5-12

斜齿类, 19° 31'42"右旋, 磨削齿, 20° 压力角

helical tooth system, 19° 31'42" right-hand, ground teeth, 20° pressure angle



订货号	模数	齿数								孔数								GT _f				
Order code	Module	L ₁	L ₂	N°	of teeth	b	$h_{k-0,018}^0$	$h_{0-0,018}^0$	f	a	l	N°	of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	/1000 ¹⁾	kg	
48 50 105	5	1000,00	17,38	60	49	39	34	3	62,5	125	8	12	13,5	20	13	37,5	925	11,7	0,012	12,15		
48 60 105	6	1000,00	20,93	50	59	49	43	3	62,5	125	8	16	17,5	26	17	37,5	925	15,7	0,012	20,60		
48 80 105	8	960,00	28,00	36	79	79	71	3	60,0	120	8	25	22,0	33	21	120,0	720	19,7	0,012	39,00		
48 10 105	10	1000,00	35,11	30	99	99	89	3	62,5	125	8	32	33,0	48	32	125,0	750	19,7	0,012	62,00		
48 12 105	12	1000,00	42,56	25	120	120	108	3	40,0	125	8	40	39,0	58	38	102,5	750	19,7	0,012	111,00		

材料C45, 材料編號no.1.0504, 特殊處理的光亮鋼, 拉伸強度大約650N/mm²。齒面高頻淬火硬度50 ~ 55HRC; 淬火後磨削各面。

Material C 45, mat. no. 1.0504, of specially treated bright steel with a tensile strength of approx. 650 N/mm². Teeth induction-hardened to 50 to 55 HRC; ground on all sides after hardening.

齒條已被標注20℃時測量的節距誤差。

Racks are signed with effective total pitch error, measured at 20 ° C.

綜合性能報告和精度測量報告可按需求提供。

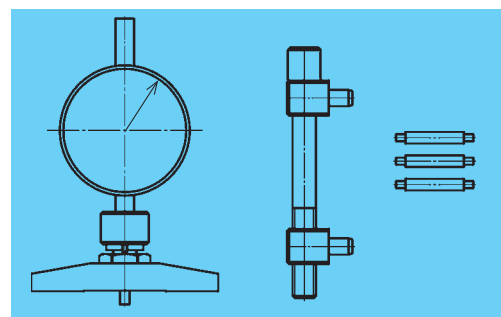
Comprehensive and accurate measurement reports are available on request.

1) GT_f/1000=整體節距誤差, 即齒條測量長度與理論長度 L₁₀₀₀ = (m / cos β) · π · Z₁₀₀₀ 相比的最大容許偏差 (每1000mm)。

1) GT_f /1000 = total pitch error, i.e. the max. permissible deviation (per 1000 mm) of the measured length of the rack compared to the theoretical length L₁₀₀₀, with L₁₀₀₀ = (m / cos β) · π · Z₁₀₀₀.

为了将齿条的拼接精度如同一根整体齿条, 我们建议使用以下安装工具

To adapt the precision of the mounted racks, to the precision of the single rack, we recommended the following Assembly kit



订货号	描述	模数	关联产品	
Order code	Description	Module	Relative item no.	kg
29.01.005	安裝工具 / Assembly kit	5	48.50.xxx	0,80
29.01.006	安裝工具 / Assembly kit	6	48.60.xxx	0,90
29.01.008	安裝工具 / Assembly kit	8	48.80.xxx	1,35
29.01.010	安裝工具 / Assembly kit	10	48.10.xxx	1,40
29.01.012	安裝工具 / Assembly kit	12	48.12.xxx	1,50

安裝工具, 包含:

- 1 x 調整裝置
- 3 x 磁性量棒
- 1 x 橋式測量表
- 1 x 手提箱

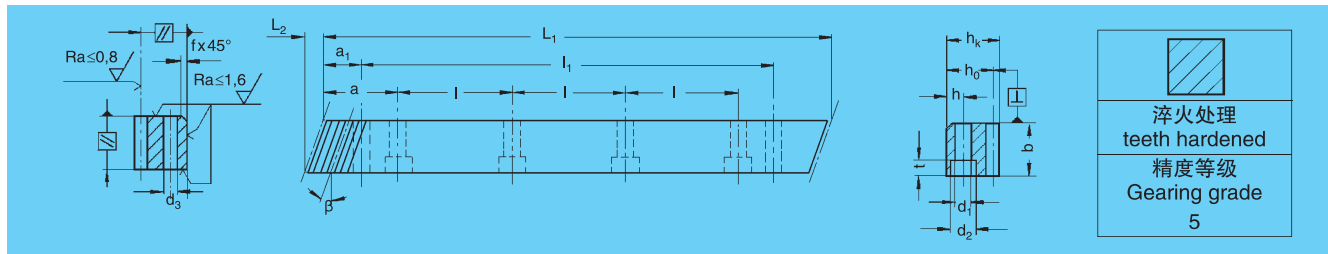
Assembly kit, comprising:

- 1 x Adjusting device
- 3 x Gauging roller with magnet
- 1 x Measuring bridge with dial gauge
- 1 Suitcase



斜齿类, 19° 31'42"右旋, 磨削齿, 20° 压力角

helical tooth system, 19° 31'42" right-hand, ground teeth, 20° pressure angle



订货号 Order code	模数 Module	齿数								孔数								GT _f		
		L ₁	L ₂	N°	of teeth	b	h _k	h ₀ ⁰ _{-0,020}	f	a	IN°	of holes	d ₁	d ₂	t	a ₁	I ₁	d ₃	/250 ¹⁾	
29 20 051	2	500,00	8,5	75	24	24	22	2	62,50	125	4	8	7	11	7	31,7	436,6	5,7	0,012	2,10
29 20 104	2	1000,00	8,5	150	24	24	22	2	62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,012	4,10
29 30 051	3	500,00	10,3	50	29	29	26	2	62,50	125	4	9	10	15	9	35,0	430,0	7,7	0,012	2,90
29 30 101	3	1000,00	10,3	100	29	29	26	2	62,50	125	8	9	10	15	9	35,0	930,0	7,7	0,012	5,90
29 40 051	4	506,67	13,8	38	39	39	35	3	62,50	125	4	12	10	15	9	33,3	433,0	7,7	0,015	5,90
29 40 101	4	1000,00	13,8	75	39	39	35	3	62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,015	10,70

材料16-MnCr5, 材料編號no.1.7131, 齒面高頻淬火, 硬度約 60HRC; 淬火後磨削各面。

Material 16-Mn Cr5, material no. 1.7131, case-hardened and teeth induction-hardened to approx. 60 HRC; ground on all sides after hardening.

齒條已被標注20°C時測量的節距誤差。

Racks are signed with effective total pitch error, measured at 20 ° C.

綜合性能報告和精度測量報告可按需求提供。

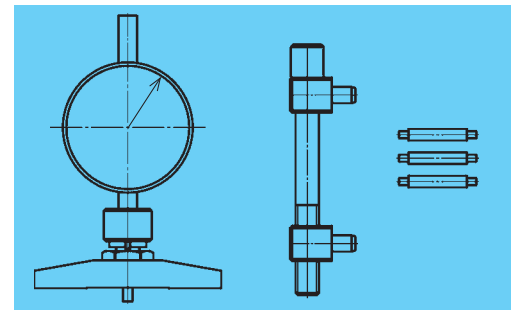
Comprehensive and accurate measurement reports are available on request.

1) $GT_f/250$ =整體節距誤差, 即齒條測量長度與理論長度 $L_{250} = (m / \cos \beta) \cdot \pi \cdot Z_{250}$ 相比的最大容許偏差 (每250mm)。

1) $GT_f/250$ = total pitch error, i.e. the max. permissible deviation (per 250 mm) of the measured length of the rack compared to the theoretical length L_{250} , with $L_{250} = (m / \cos \beta) \cdot \pi \cdot Z_{250}$.

为了将齿条的拼接精度如同一根整体齿条, 我们建议使用以下安装工具

To adapt the precision of the mounted racks, to the precision of the single rack, we recommended the following Assembly kit



安装工具, 包含:

- 1 x 調整裝置
- 3 x 磁性量棒
- 1 x 橋式測量表
- 1 x 手提箱

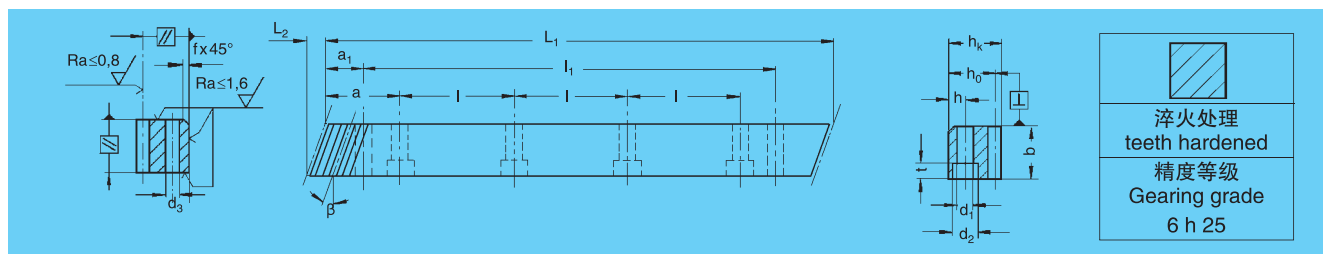
Assembly kit, comprising:

- 1 x Adjusting device
- 3 x Gauging roller with magnet
- 1 x Measuring bridge with dial gauge
- 1 Suitcase

订货号 Order code	描述 Description	模数 Module	关联产品 Relative item no.	
29.01.002	安装工具 / Assembly kit	2	29.20.xxx	0,40
29.01.003	安装工具 / Assembly kit	3	29.30.xxx	0,44
29.01.004	安装工具 / Assembly kit	4	29.40.xxx	0,55



斜齿类, 19° 31'42"右旋, 磨削齿, 20° 壓力角
helical tooth system, 19° 31'42" right-hand, ground teeth, 20° pressure angle



订货号	模数		齿数						孔数										GT _f		
Order code	Module	L ₁	L ₂	N°	of teeth	b	h _k	h ₀	f	a	IN°	of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	/300 ¹⁾		
29 20 050	2	500,00	8,5	75	24	24	22	2		62,50	125	4	8	7	11	7	31,7	436,6	5,7	0,022	2,10
29 21 050	2	500,00	8,5	75	24	24	22	2	無裝配孔 / without mounting holes											0,022	2,10
29 20 100	2	1000,00	8,5	150	24	24	22	2		62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,022	4,10
29 21 100	2	1000,00	8,5	150	24	24	22	2	無裝配孔 / without mounting holes											0,022	4,10
29 20 999	2	200,00	8,5	30	24	24	22		安裝塊 / companion part of assembly												0,85
29 30 050	3	500,00	10,3	50	29	29	26	2		62,50	125	4	9	10	15	9	35	430,0	7,7	0,024	2,90
29 31 050	3	500,00	10,3	50	29	29	26	2	無裝配孔 / without mounting holes											0,024	2,90
29 30 100	3	1000,00	10,3	100	29	29	26	2		62,50	125	8	9	10	15	9	35	930,0	7,7	0,024	5,90
29 31 100	3	1000,00	10,3	100	29	29	26	2	無裝配孔 / without mounting holes											0,024	5,90
29 30 999	3	200,00	10,3	20	29	29	26		安裝塊 / companion part of assembly												1,20
29 40 050*	4	506,67	13,8	38	39	39	35	3		62,50	125	4	12	10	15	9	33,3	433,0	7,7	0,024	5,40
29 41 050	4	506,67	13,8	38	39	39	35	3	無裝配孔 / without mounting holes											0,024	5,40
29 40 100	4	1000,00	13,8	75	39	39	35	3		62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,024	10,70
29 41 100	4	1000,00	13,8	75	39	39	35	3	無裝配孔 / without mounting holes											0,024	10,70
29 40 999	4	200,00	13,8	15	39	39	35		安裝塊 / companion part of assembly												2,70

材料16-MnCr5, 材料編號no.1.7131, 齒面高頻淬火, 硬度約60HRC; 淬火後磨削各面。因為僅有齒面高頻淬火, 所以不影響隨後的打孔和裝銷釘。

Material 16-Mn Cr5, material no. 1.7131, case-hardened and teeth induction-hardened to approx. 60 HRC; ground on all sides after hardening. Since only the teeth are induction-hardened, subsequent drilling and pinning is possible.

安裝齒條時使用的左旋齒安裝塊也可以供應 (見訂貨號...999)

Matching left-hand toothed companion parts as assembly aids are available (see order code999).

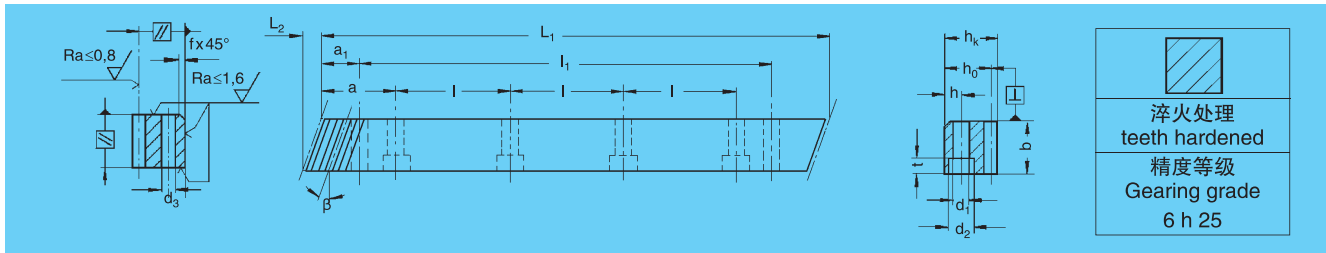
1) $GT_f / 300$ = 整體節距誤差, 即齒輪測量長度與理論長度 $L_{300} = (m / \cos \beta) \cdot \pi \cdot Z_{300}$ 相比的最大容許偏差 (每300mm)。

為確保齒條和齒輪傳動的連續潤滑, 建議選用Z1-2/3頁所介紹的電控潤滑器。

1) $GT_f / 300$ = total pitch error, i.e. the max. permissible deviation (per 300 mm) of the measured length of the rack compared to the theoretical length L_{300} , with $L_{300} = (m / \cos \beta) \cdot \pi \cdot Z_{300}$.
To ensure continuous lubrication of rack and pinion drives, we recommend to use electronic lubricators as described on page Z1-2/3!



斜齿类, 19° 31'42"右旋, 磨削齿, 20° 壓力角
helical tooth system, 19° 31'42" right-hand, ground teeth, 20° pressure angle



订货号 Order code	模数 Module	L ₁	L ₂	N° of teeth	b _k	h _o	f	a	孔数 IN° of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	GT _f /300 ¹⁾	kg	
29 20 105	2	1000,00	8,5	150	24	24	22	2	62,50 125 8 8 7 11 7	31,7	936,6	5,7	0,022	4,10				
29 21 105	2	1000,00	8,5	150	24	24	22	2	無裝配孔 / without mounting holes								0,022	4,10
29 20 155	2	1500,00	8,5	225	24	24	22	2	62,50 125 12 8 7 11 7	31,7	1436,6	5,7	0,022	6,15				
29 21 155	2	1500,00	8,5	225	24	24	22	2	無裝配孔 / without mounting holes								0,022	6,15
29 20 205	2	2000,00	8,5	300	24	24	22	2	62,50 125 16 8 7 11 7	31,7	1936,6	5,7	0,022	8,20				
29 21 205	2	2000,00	8,5	300	24	24	22	2	無裝配孔 / without mounting holes								0,022	8,20
29 20 999	2	200,00	8,5	30	24	24	22		安裝塊 / companion part of assembly									0,85
29 30 105	3	1000,00	10,3	100	29	29	26	2	62,50 125 8 9 10 15 9	35	930,0	7,7	0,024	5,90				
29 31 105	3	1000,00	10,3	100	29	29	26	2	無裝配孔 / without mounting holes								0,024	5,90
29 30 155	3	1500,00	10,3	150	29	29	26	2	62,50 125 12 9 10 15 9	35	1430,0	7,7	0,024	8,85				
29 31 155	3	1500,00	10,3	150	29	29	26	2	無裝配孔 / without mounting holes								0,024	8,85
29 30 205	3	2000,00	10,3	200	29	29	26	2	62,50 125 16 9 10 15 9	35	1930,0	7,7	0,024	11,80				
29 31 205	3	2000,00	10,3	200	29	29	26	2	無裝配孔 / without mounting holes								0,024	11,80
29 30 999	3	200,00	10,3	20	29	29	26		安裝塊 / companion part of assembly									1,20
29 40 105	4	1000,00	13,8	75	39	39	35	3	62,50 125 8 12 10 15 9	33,3	933,4	7,7	0,024	10,70				
29 41 105	4	1000,00	13,8	75	39	39	35	3	無裝配孔 / without mounting holes								0,024	10,70
29 40 205	4	2000,00	13,8	150	39	39	35	3	62,50 125 16 12 10 15 9	33,3	1933,4	7,7	0,024	21,40				
29 41 205	4	2000,00	13,8	150	39	39	35	3	無裝配孔 / without mounting holes								0,024	21,40
29 40 999	4	200,00	13,8	15	39	39	35		安裝塊 / companion part of assembly									2,70
29 50 055	5	500,00	17,4	30	49	49	34	3	62,50 125 4 12 14 20 13	37,5	425,0	11,7	0,025	6,50				
29 51 055	5	500,00	17,4	30	49	49	34	3	無裝配孔 / without mounting holes								0,025	6,50
29 50 105	5	1000,00	17,4	60	49	49	34	3	62,50 125 8 12 14 20 13	37,5	925,0	11,7	0,025	13,00				
29 51 105	5	1000,00	17,4	60	49	49	34	3	無裝配孔 / without mounting holes								0,025	13,00
29 50 155	5	1500,00	17,4	90	49	49	34	3	62,50 125 12 12 14 20 13	37,5	1425,00	11,7	0,025	19,50				
29 51 155	5	1500,00	17,4	90	49	49	34	3	無裝配孔 / without mounting holes								0,025	19,50
29 50 205	5	2000,00	17,4	120	49	49	34	3	62,50 125 16 12 14 20 13	37,5	1925,00	11,7	0,025	26,00				
29 51 205	5	2000,00	17,4	120	49	49	34	3	無裝配孔 / without mounting holes								0,025	26,00
29 50 999	5	200,00	17,4	12	49	49	34		安裝塊 / companion part of assembly									3,00
29 60 055	6	500,00	20,9	25	59	59	43	3	62,50 125 4 16 18 26 17	37,5	425,0	15,7	0,026	9,90				
29 61 055	6	500,00	20,9	25	59	59	43	3	無裝配孔 / without mounting holes								0,026	9,90
29 60 105	6	1000,00	20,9	50	59	59	43	3	62,50 125 8 16 18 26 17	37,5	925,0	15,7	0,026	18,10				
29 61 105	6	1000,00	20,9	50	59	59	43	3	無裝配孔 / without mounting holes								0,026	18,10
29 60 155	6	1500,00	20,9	75	59	59	43	3	62,50 125 12 16 18 26 17	37,5	1425,0	15,7	0,026	27,10				
29 61 155	6	1500,00	20,9	75	59	59	43	3	無裝配孔 / without mounting holes								0,026	27,10
29 60 205	6	2000,00	20,9	100	59	59	43	3	62,50 125 16 16 18 26 17	37,5	1925,0	15,7	0,026	36,20				
29 61 205	6	2000,00	20,9	100	59	59	43	3	無裝配孔 / without mounting holes								0,026	36,20
29 60 999	6	200,00	20,9	10	59	59	43		安裝塊 / companion part of assembly									4,40
29 80 055	8	480,00	28,0	18	79	79	71	3	60,00 120 4 25 22 33 21	120,0	240,0	19,7	0,027	21,00				
29 81 055	8	480,00	28,0	18	79	79	71	3	無裝配孔 / without mounting holes								0,027	21,00
29 80 105	8	960,00	28,0	36	79	79	71	3	60,00 120 8 25 22 33 21	120,0	720,0	19,7	0,027	42,50				
29 81 105	8	960,00	28,0	36	79	79	71	3	無裝配孔 / without mounting holes								0,027	42,50
29 80 205	8	1920,00	28,0	72	79	79	71	3	60,0 120 16 25 22 33 21	120	1680,0	19,7	0,027	85,00				
29 81 205	8	1920,00	28,0	72	79	79	71	3	無裝配孔 / without mounting holes								0,027	85,00
29 80 999	8	213,33	28,0	8	79	79	71		安裝塊 / companion part of assembly									9,50
29 10 105	10	1000,00	35,11	30	99	99	89	3	62,50 125 8 32 33 48 32	125,0	750,0	19,7	0,028	68,72				
29 11 105	10	1000,00	35,11	30	99	99	89	3	無裝配孔 / without mounting holes								0,028	68,72
29 10 999	10	233,33	28,02	7	79	79	69	3	安裝塊 / companion part of assembly									9,92
29 12 105	12	1000,00	42,56	25	120	120	108	3	40,00 125 8 40 39 58 38	125,0	750,0	19,7	0,029	111,00				
29 13 105	12	1000,00	42,56	25	120	120	108	3	無裝配孔 / without mounting holes								0,029	120,00
29 12 999	12	280,00	35,11	7	99	99	87		安裝塊 / companion part of assembly									19,20

材料C45, 材料編號no.1.0504, 見ZA-6頁。

Material C 45, mat. no. 1.0504 see page ZA-6.

安裝齒條時使用的左旋齒無裝配孔也可以供應 (見訂貨號...999)

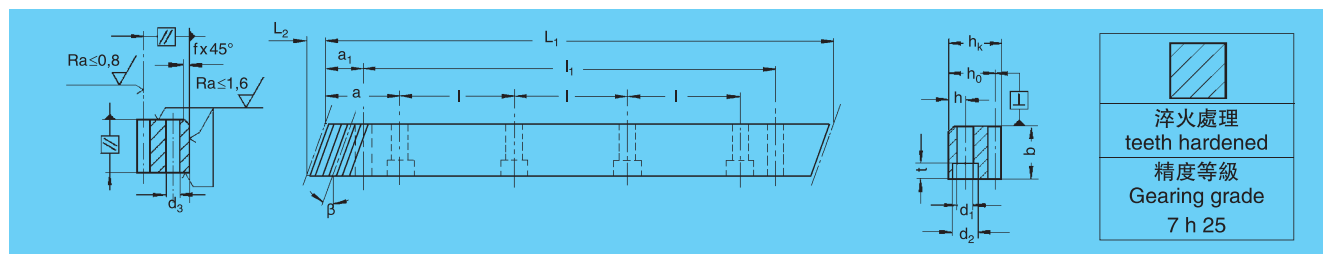
Matching left-hand toothed companion parts as assembly aids are available (see order code999).

1) GT_f/300 = 見 頁碼 ZA - 2

1) GT_f/300 = see page ZA - 2



斜齒類, 19° 31' 42" 右旋, 磨削齒, 20° 壓力角
helical tooth system, 19° 31' 42" right-hand, ground teeth, 20° pressure angle



訂貨號	模數	齒數								孔數								GT _f			
Order code	Module	L ₁	L ₂	N°	of teeth	b	h _k	h ₀	f	a	IN°	of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃		/1000 ¹⁾	
29 20 107	2	1000,00	8,5	150	24	24	24	22	1	62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,060	4,10
29 20 999	2	200,00	8,5	30	24	24	24	22		安裝塊 / companion part of assembly											0,85
29 30 107	3	1000,00	10,3	100	29	29	29	26	1	62,50	125	8	9	10	15	9	35	930,0	7,7	0,060	5,90
29 30 999	3	200,00	10,3	20	29	29	29	26		安裝塊 / companion part of assembly											1,20
29 40 107	4	1000,00	13,8	75	39	39	39	35	1	62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,060	10,70
29 40 999	4	200,00	13,8	15	39	39	39	35		安裝塊 / companion part of assembly											2,70
29 50 107	5	1000,00	17,4	60	49	49	49	34	1	62,50	125	8	12	14	20	13	37,5	925,0	11,7	0,060	13,00
29 50 999	5	200,00	17,4	12	49	49	49	34		安裝塊 / companion part of assembly											3,00

材料C45, 材料編號N0.1.0504/1.1191, 特殊處理的光亮鋼, 拉伸強度大約650N/mm², 齒面高頻淬火硬度55 ~ 60HRC; 齒條基準面和安裝面銑削加工, 由于僅是齒面高頻淬火, 所以不影響其後的打孔和裝銷釘。

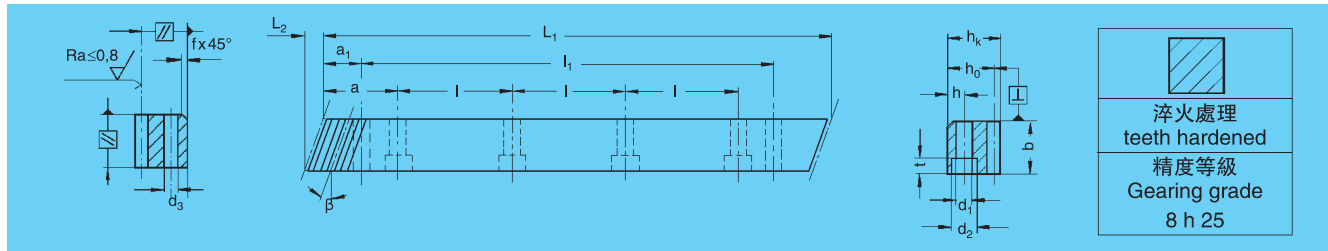
Material C 45, Mat.No. 1.0504/1.1191, of specially treated bright steel with a tensile strength of approx. 650 N/mm². Teeth ground and induction-hardened to 55 to 60 HRC. Ground on all sides after hardening. Since only the teeth are induction hardened, subsequent drilling and pinning is possible.

1) $GT_f / 1000$ = 整體節距誤差, 即齒輪測量長度與理論長度 $L_{1000} = (m / \cos \beta) \cdot \pi \cdot Z_{1000}$ 相比的最大容許偏差 (每1000mm)。為確保齒條和齒輪傳動的連續潤滑, 建議選用ZI-2/3頁所介紹的電控潤滑器。

1) $GT_f / 1000$ = total pitch error, i.e. the max. permissible deviation (per 1000 mm) of the measured length of the rack compared to the theoretical length L_{1000} , with $L_{1000} = (m / \cos \beta) \cdot \pi \cdot Z_{1000}$. To ensure continuous lubrication of rack and pinion drives, we recommend to use electronic lubricators as described on page ZI-2/3!



斜齒類，19° 31' 42"右旋，磨削齒，20° 壓力角
helical tooth system, 19° 31' 42" right-hand, ground teeth, 20° pressure angle



訂貨號	模數	齒數							孔數										GT _f	
Order code	Module	L ₁	L ₂	N° of teeth	b	h _k	h _o	f	a	IN° of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	/1000 ¹⁾	kg		
39 20 108	2	1000,00	8,5	150	25	24	22	1	62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,060	4,10
29 20 999	2	200,00	8,5	30	24	24	22		安裝塊 / companion part of assembly											0,85
39 30 108	3	1000,00	10,3	100	30	29	26	1	62,50	125	8	9	10	15	9	35,0	930,0	7,7	0,060	5,90
29 30 999	3	200,00	10,3	20	29	29	26		安裝塊 / companion part of assembly											1,20
39 40 108	4	1000,00	13,8	75	40	39	35	1	62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,060	10,70
29 40 999	4	200,00	13,8	15	39	39	35		安裝塊 / companion part of assembly											2,70
39 50 108	5	1000,00	17,4	60	50	39	34	1	62,50	125	8	12	14	20	13	37,5	925,0	11,7	0,060	13,00
29 50 999	5	200,00	17,4	12	49	39	34		安裝塊 / companion part of assembly											3,00

材料C45，材料編號NO.1.0504/1.1191，特殊處理的光亮鋼，拉伸強度大約650N/mm²，齒面高頻淬火硬度55 ~ 60HRC；齒條基準面和安裝面銑削加工，由于僅是齒面高頻淬火，所以不影響其後的打孔和裝銷釘。

Material C 45, Mat.No. 1.0504/1.1191, of specially treated bright steel with a tensile strength of approx. 650 N/mm². Teeth ground and induction-hardened to 55 to 60 HRC. Since only the teeth are induction hardened, subsequent drilling and pinning is possible.

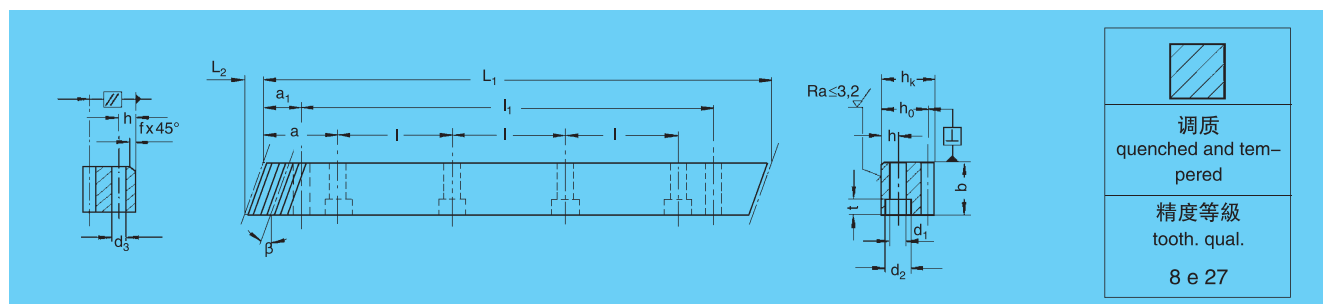
1) GT_f /1000 = 整體節距誤差，即齒輪測量長度與理論長度 L₁₀₀₀ = (m / cos β) · π · Z₁₀₀₀ 相比的最大容許偏差（每1000mm）。為確保齒條和齒輪傳動的連續潤滑，建議選用ZI-2/3頁所介紹的電控潤滑器。

1) GT_f /1000 = total pitch error, i.e. the max. permissible deviation (per 1000 mm) of the measured length of the rack compared to the theoretical length L₁₀₀₀, with L₁₀₀₀ = (m / cos β) · π · Z₁₀₀₀. To ensure continuous lubrication of rack and pinion drives, we recommend to use electronic lubricators as described on page ZI-2/3!





斜齿类, 19° 31'42"右旋, 铣削齿, 20° 壓力角
helical tooth system, 19° 31'42" right-hand, milled teeth, 20° pressure angle



订货号	模数		齿数						孔数								GT _f			
Order code	Module	L ₁	L ₂	N° of teeth	b	h _k	h _o	f	a	l N° of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	/300 ¹⁾			
38 21 050	2	500,00	8,9	75	25	24	22	2	62,50	125	4	8	7	11	7	31,7	436,6	5,7	0,044	2,10
38 20 050	2	500,00	8,9	75	25	24	22	2	無裝配孔 / without mounting holes										0,044	2,10
38 21 100	2	1000,00	8,9	150	25	24	22	2	62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,044	4,30
38 20 100	2	1000,00	8,9	150	25	24	22	2	無裝配孔 / without mounting holes										0,044	4,30
38 21 200	2	2000,00	8,9	300	25	24	22	2	62,50	125	16	8	7	11	7	31,7	1936,6	5,7	0,044	8,60
38 20 200	2	2000,00	8,9	300	25	24	22	2	無裝配孔 / without mounting holes										0,044	8,60
29 20 999	2	200,00	8,8	30	25	24	22		安裝塊 / companion part of assembly											0,85
38 31 050	3	500,00	10,6	50	30	29	26	2	62,50	125	4	9	10	15	9	35,0	430,0	7,7	0,046	3,00
38 30 050	3	500,00	10,6	50	30	29	26	2	無裝配孔 / without mounting holes										0,046	3,00
38 31 100	3	1000,00	10,6	100	30	29	26	2	62,50	125	8	9	10	15	9	35,0	930,0	7,7	0,046	6,10
38 30 100	3	1000,00	10,6	100	30	29	26	2	無裝配孔 / without mounting holes										0,046	6,10
38 31 200	3	2000,00	10,6	200	30	29	26	2	62,50	125	16	9	10	15	9	35,0	1930,0	7,7	0,046	12,20
38 30 200	3	2000,00	10,6	200	30	29	26	2	無裝配孔 / without mounting holes										0,046	12,20
29 30 999	3	200,00	10,6	20	30	29	26		安裝塊 / companion part of assembly											2,70
38 41 050*	4	506,67	14,2	38	40	39	35	2	62,50	125	4	12	10	15	9	33,3	433,0	7,7	0,048	5,50
38 40 050	4	506,67	14,2	38	40	39	35	2	無裝配孔 / without mounting holes										0,048	5,50
38 41 100	4	1000,00	14,2	75	40	39	35	2	62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,048	10,90
38 40 100	4	1000,00	14,2	75	40	39	35	2	無裝配孔 / without mounting holes										0,048	10,90
38 41 200	4	2000,00	14,2	150	40	39	35	2	62,50	125	16	12	10	15	9	33,3	1933,4	7,7	0,048	21,80
38 40 200	4	2000,00	14,2	150	40	39	35	2	無裝配孔 / without mounting holes										0,048	21,80
29 40 999	4	200,00	14,2	15	40	39	35		安裝塊 / companion part of assembly											2,70
38 51 050	5	500,00	17,4	30	50	39	34	3	62,50	125	4	12	14	20	13	37,5	425,0	11,7	0,050	6,50
38 50 050	5	500,00	17,4	30	50	39	34	3	無裝配孔 / without mounting holes										0,050	6,50
38 51 100	5	1000,00	17,4	60	50	39	34	3	62,50	125	8	12	14	20	13	37,5	925,0	11,7	0,050	13,00
38 50 100	5	1000,00	17,4	60	50	39	34	3	無裝配孔 / without mounting holes										0,050	13,00
38 51 200	5	2000,00	17,4	120	50	39	34	3	62,50	125	16	12	14	20	13	37,5	1925,0	11,7	0,050	26,00
38 50 200	5	2000,00	17,4	120	50	39	34	3	無裝配孔 / without mounting holes										0,050	26,00
29 50 999	5	200,00	17,4	12	49	39	34		安裝塊 / companion part of assembly											3,00

特殊處理的光亮鋼，拉伸强度大約900N/mm²，齒條基準面和安裝面銑削加工，左旋斜齒的配件也可供應（見訂貨號.....999）。

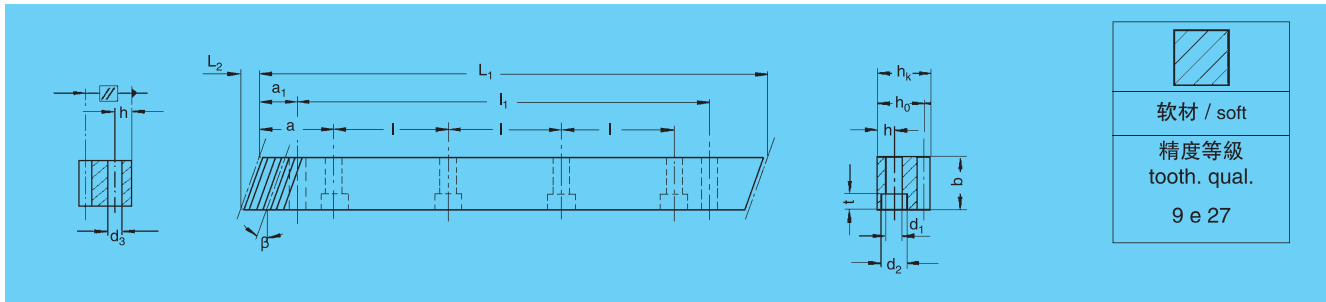
Of specially treated bright steel with a tensile strength of approx. 900 N/mm². Back face of racks machined. Matching left-hand toothed companion parts as assembly aids are available (see order code ... 999).

1) $GT_f / 300$ = 整體節距誤差，即齒輪測量長度與理論長度 $L_{300} = (m / \cos \beta) \cdot \pi \cdot Z_{300}$ 相比的最大容許偏差（每300mm）。為確保齒條和齒輪傳動的連續潤滑，建議選用ZI-2/3頁所介紹的電控潤滑器。

1) $GT_f / 300$ = total pitch error, i.e. the max. permissible deviation (per 300 mm) of the measured length of the rack compared to the theoretical length L_{300} , with $L_{300} = (m / \cos \beta) \cdot \pi \cdot Z_{300}$. To ensure continuous lubrication of rack and pinion drives, we recommend to use electronic lubricators as described on page ZI-2/3!



斜齿类, 19° 31'42"右旋, 铣削齿, 20° 壓力角
helical tooth system, 19° 31'42" right-hand, milled teeth, 20° pressure angle



订货号 Order code	模数 Module	L ₁	L ₂	N° of teeth	b	h _k	h _o	f	a	孔数 IN° of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	GT ₁ /300 ¹⁾	kg		
47 20 050	2	500,00	9,2	75	26	24	22		62,50	125	4	8	7	11	7	31,7	436,6	5,7	0,061	2,20
47 21 050	2	500,00	9,2	75	26	24	22		無裝配孔 / without mounting holes										0,061	2,20
47 20 100	2	1000,00	9,2	150	26	24	22		62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,061	4,40
47 21 100	2	1000,00	9,2	150	26	24	22		無裝配孔 / without mounting holes										0,061	4,40
47 20 200	2	2000,00	9,2	300	26	24	22		62,50	125	16	8	7	11	7	31,7	1936,6	5,7	0,061	8,80
47 21 200	2	2000,00	9,2	300	26	24	22		無裝配孔 / without mounting holes										0,061	8,80
29 20 999	2	200,00	8,5	30	24	24	22		安裝塊 / companion part of assembly											0,85
47 30 050	3	500,00	11,0	50	31	29	26		62,50	125	4	9	10	15	9	35,0	430,0	7,7	0,065	3,10
47 31 050	3	500,00	11,0	50	31	29	26		無裝配孔 / without mounting holes										0,065	3,10
47 30 100	3	1000,00	11,0	100	31	29	26		62,50	125	8	9	10	15	9	35,0	930,0	7,7	0,065	6,20
47 31 100	3	1000,00	11,0	100	31	29	26		無裝配孔 / without mounting holes										0,065	6,20
47 30 200	3	2000,00	11,0	200	31	29	26		62,50	125	16	9	10	15	9	35,0	1930,0	7,7	0,065	12,50
47 31 200	3	2000,00	11,0	200	31	29	26		無裝配孔 / without mounting holes										0,065	12,50
29 30 999	3	200,00	10,3	20	29	29	26		安裝塊 / companion part of assembly											1,20
47 40 050*	4	506,67	14,5	38	41	39	35		62,50	125	4	12	10	15	9	33,3	433,0	7,7	0,068	5,60
47 41 050	4	506,67	14,5	38	41	39	35		無裝配孔 / without mounting holes										0,068	5,60
47 40 100	4	1000,00	14,5	75	41	39	35		62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,068	11,10
47 41 100	4	1000,00	14,5	75	41	39	35		無裝配孔 / without mounting holes										0,068	11,10
47 40 200	4	2000,00	14,5	150	41	39	35		62,50	125	16	12	10	15	9	33,3	1933,4	7,7	0,068	22,20
47 41 200	4	2000,00	14,5	150	41	39	35		無裝配孔 / without mounting holes										0,068	22,20
29 40 999	4	200,00	13,8	15	39	39	35		安裝塊 / companion part of assembly											2,70
47 50 100	5	1000,00	17,7	60	50	39	34		62,50	125	8	12	14	20	13	37,5	925,0	11,7	0,070	13,26
47 51 100	5	1000,00	17,7	60	50	39	34		無裝配孔 / without mounting holes										0,070	13,26
47 50 200	5	2000,00	17,7	120	50	39	34		62,50	125	16	12	14	20	13	37,5	1925,0	11,7	0,070	26,52
47 51 200	5	2000,00	17,7	120	50	39	34		無裝配孔 / without mounting holes										0,070	26,52
29 50 999	5	200,00	17,4	12	49	39	34		安裝塊 / companion part of assembly											3,00
47 60 100	6	1000,00	21,3	50	60	49	43		62,50	125	8	16	18	26	17	37,5	925,0	15,7	0,072	20,12
47 61 100	6	1000,00	21,3	50	60	49	43		無裝配孔 / without mounting holes										0,072	20,12
47 60 200	6	2000,00	21,3	100	60	49	43		62,50	125	16	16	18	26	17	37,5	1925,0	15,7	0,072	40,24
47 61 200	6	2000,00	21,3	100	60	49	43		無裝配孔 / without mounting holes										0,072	40,24
29 60 999	6	200,00	20,9	10	59	49	43		安裝塊 / companion part of assembly											4,40
47 80 100	8	960,00	28,7	36	81	79	71		60,0	120	8	25	22	33	21	120,0	720,0	19,7	0,075	44,85
47 81 100	8	960,00	28,7	36	81	79	71		無裝配孔 / without mounting holes										0,075	44,85
47 80 200	8	1920,00	28,7	72	81	79	71		60,0	120	16	25	22	33	21	120,0	1680,0	19,7	0,075	89,71
47 81 200	8	1920,00	28,7	72	81	79	71		無裝配孔 / without mounting holes										0,075	89,71
29 80 999	8	213,33	28,0	8	79	79	71		安裝塊 / companion part of assembly											9,50
47 10 100	10	1000,00	35,5	30	100	99	89		62,50	125	8	32	33	48	32	750	19,7	0,077	69,80	
47 11 100	10	1000,00	35,5	30	100	99	89		無裝配孔 / without mounting holes										0,077	69,80
29 10 999	10	233,33	28,0	7	79	79	69		安裝塊 / companion part of assembly											10,00

材料C45, 材料編號NO.1.0504, 特殊處理的光亮鋼, 拉伸強度大約650N/mm²。

Material C 45, mat. no. 1.0504, of specially treated bright steel with a tensile strength of approx. 650 N/mm².

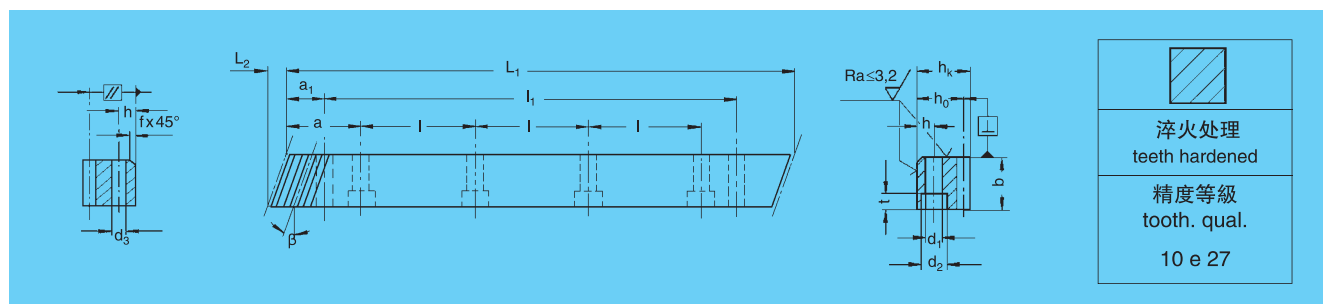
1) $GT_f / 300$ = 整體節距誤差, 即齒輪測量長度與理論長度 $L_{300} = (m / \cos \beta) \cdot \pi \cdot Z_{300}$ 相比的最大容許偏差 (每300mm)。
為確保齒條和齒輪傳動的連續潤滑, 建議選用ZI-2/3頁所介紹的電控潤滑器。

1) $GT_f / 300$ = total pitch error, i.e. the max. permissible deviation (per 300 mm) of the measured length of the rack compared to the theoretical length L_{300} , with $L_{300} = (m / \cos \beta) \cdot \pi \cdot Z_{300}$.
To ensure continuous lubrication of rack and pinion drives, we recommend to use electronic lubricators as described on page ZI-2/3!



斜齿类, 19° 31'42"右旋, 铣削齿, 20° 壓力角

helical tooth system, 19° 31' 42" right-hand, milled teeth, 20° pressure angle



订货号	模数		齿数						孔数										GT _f	
Order code	Module	L ₁	L ₂	N° of teeth	b	h _k	h _o	f	a	I N° of holes	d ₁	d ₂	t	a ₁	l ₁	d ₃	/300 ¹⁾			
39 20 050	2	500,00	8,5	75	24,5	24	22	2	62,50	125	4	8	7	11	7	31,7	436,6	5,7	0,086	2,10
39 21 050	2	500,00	8,5	75	24,5	24	22	2	無裝配孔 / without mounting holes										0,086	2,10
39 20 100	2	1000,00	8,5	150	24,5	24	22	2	62,50	125	8	8	7	11	7	31,7	936,6	5,7	0,086	4,20
39 21 100	2	1000,00	8,5	150	24,5	24	22	2	無裝配孔 / without mounting holes										0,086	4,20
39 20 200	2	2000,00	8,5	300	24,5	24	22	2	62,50	125	16	8	7	11	7	31,7	1936,6	5,7	0,086	8,40
39 21 200	2	2000,00	8,5	300	24,5	24	22	2	無裝配孔 / without mounting holes										0,086	8,40
29 20 999	2	200,00	8,5	30	24,0	24	22		安裝塊 / companion part of assembly											0,85
39 30 050	3	500,00	10,3	50	29,5	29	26	2	62,50	125	4	9	10	15	9	35,0	430,0	7,7	0,091	3,00
39 31 050	3	500,00	10,3	50	29,5	29	26	2	無裝配孔 / without mounting holes										0,091	3,00
39 30 100	3	1000,00	10,3	100	29,5	29	26	2	62,50	125	8	9	10	15	9	35,0	930,0	7,7	0,091	6,00
39 31 100	3	1000,00	10,3	100	29,5	29	26	2	無裝配孔 / without mounting holes										0,091	6,00
39 30 200	3	2000,00	10,3	200	29,5	29	26	2	62,50	125	16	9	10	15	9	35,0	1930,0	7,7	0,091	12,00
39 31 200	3	2000,00	10,3	200	29,5	29	26	2	無裝配孔 / without mounting holes										0,091	12,00
29 30 999	3	200,00	10,3	20	29,0	29	26		安裝塊 / companion part of assembly											1,80
39 40 050*	4	506,67	13,8	38	39,5	39	35	2	62,50	125	4	12	10	15	9	33,3	433,0	7,7	0,095	5,30
39 41 050	4	506,67	13,8	38	39,5	39	35	2	無裝配孔 / without mounting holes										0,095	5,30
39 40 100	4	1000,00	13,8	75	39,5	39	35	2	62,50	125	8	12	10	15	9	33,3	933,4	7,7	0,095	10,50
39 41 100	4	1000,00	13,8	75	39,5	39	35	2	無裝配孔 / without mounting holes										0,095	10,50
39 40 200	4	2000,00	13,8	150	39,5	39	35	2	62,50	125	16	12	10	15	9	33,3	1933,4	7,7	0,095	21,00
39 41 200	4	2000,00	13,8	150	39,5	39	35	2	無裝配孔 / without mounting holes										0,095	21,00
29 40 999	4	200,00	13,8	15	39,0	39	35		安裝塊 / companion part of assembly											2,70
39 50 050	5	500,00	17,4	30	49,5	39	34	2	62,50	125	4	12	14	20	13	37,5	425,0	11,7	0,098	6,50
39 51 050	5	500,00	17,4	30	49,5	39	34	2	無裝配孔 / without mounting holes										0,098	6,50
39 50 100	5	1000,00	17,4	60	49,5	39	34	2	62,50	125	8	12	14	20	13	37,5	925,0	11,7	0,098	13,00
39 51 100	5	1000,00	17,4	60	49,5	39	34	2	無裝配孔 / without mounting holes										0,098	13,00
39 50 200	5	2000,00	17,4	120	49,5	39	34	2	62,50	125	16	12	14	20	13	37,5	1925,0	11,7	0,098	26,00
39 51 200	5	2000,00	17,4	120	49,5	39	34	2	無裝配孔 / without mounting holes										0,098	26,00
29 50 999	5	200,00	17,4	12	49,0	39	34		安裝塊 / companion part of assembly											3,00
39 60 050	6	500,00	20,9	25	59,5	49	43	2	62,50	125	4	16	18	26	17	37,5	425,0	15,7	0,100	9,90
39 61 050	6	500,00	20,9	25	59,5	49	43	2	無裝配孔 / without mounting holes										0,100	9,90
39 60 100	6	1000,00	20,9	50	59,5	49	43	2	62,50	125	8	16	18	26	17	37,5	925,0	15,7	0,100	19,80
39 61 100	6	1000,00	20,9	50	59,5	49	43	2	無裝配孔 / without mounting holes										0,100	19,80
39 60 200	6	2000,00	20,9	100	59,5	49	43	2	62,50	125	16	16	18	26	17	37,5	1925,0	15,7	0,100	39,60
39 61 200	6	2000,00	20,9	100	59,5	49	43	2	無裝配孔 / without mounting holes										0,100	39,60
29 60 999	6	200,00	20,9	10	59,0	49	43		安裝塊 / companion part of assembly											4,40

材料C45, 材料編號NO.1.0504, 特殊處理的光亮鋼, 拉伸強度大約650N/mm², 齒面高頻淬火硬度50 ~ 55HRC; 齒條基準面和安裝面銑削加工, 由于僅是齒面高頻淬火, 所以不影響其後的打孔和裝銷釘。

Material C 45, Mat.No. 1.0504, of specially treated bright steel with a tensile strength of approx. 650 N/mm². Teeth induction-hardened to 50 to 55 HRC. Backs and contact faces of racks machined. Since only the teeth are induction hardened, subsequent drilling and pinning is possible.

1) GT_f /300 = 整體節距誤差, 即齒輪測量長度與理論長度 L₃₀₀ = (m / cos β) · π · Z₃₀₀ 相比的最大容許偏差 (每300mm)。
為確保齒條和齒輪傳動的連續潤滑, 建議選用ZI-2/3頁所介紹的電控潤滑器。

1) GT_f /300 = total pitch error, i.e. the max. permissible deviation (per 300 mm) of the measured length of the rack compared to the theoretical length L₃₀₀, with L₃₀₀ = (m / cos β) · π · Z₃₀₀.
To ensure continuous lubrication of rack and pinion drives, we recommend to use electronic lubricators as described on page ZI-2/3!

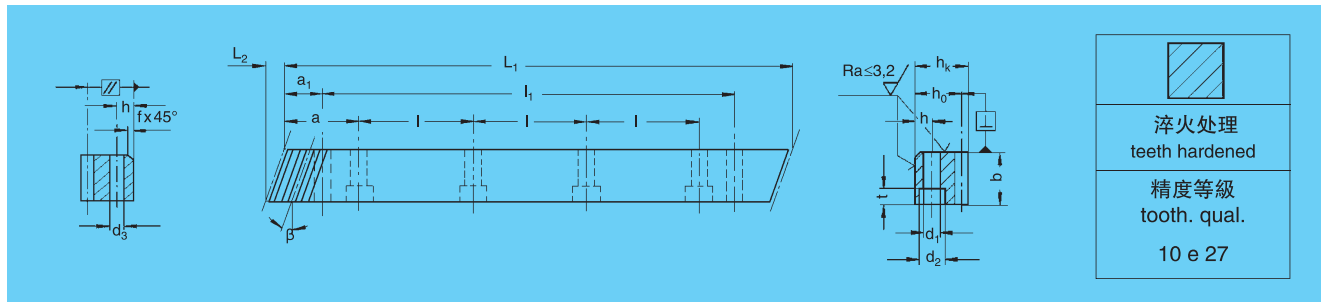


ATLANTA

可拼接齿条模数8-12 Racks for continous linking module 8-12

斜齿类, 19° 31'42"右旋, 铣削齿, 20° 壓力角

helical tooth system, 19° 31' 42" right-hand, milled teeth, 20° pressure angle



订货号	模数	齿数							孔数										GT _f	
Order code	Module	L ₁	L ₂	N° of teeth	b	h _k	h _o	f	a	I N° of holesh	d ₁	d ₂	t	a ₁	l ₁	d ₃	/300 ¹⁾	kg		
39 80 050	8	480,00	28,0	18	79	79	71	3	60,00	120	4	25	22	33	21	120,0	240,0	19,7	0,104 21,00	
39 81 050	8	480,00	28,0	18	79	79	71	3	無裝配孔 / without mounting holes										0,104 21,00	
39 80 100	8	960,00	28,0	36	79	79	71	3	60,00	120	8	25	22	33	21	120,0	720,0	19,7	0,104 42,50	
39 81 100	8	960,00	28,0	36	79	79	71	3	無裝配孔 / without mounting holes										0,104 42,50	
39 80 200	8	1920,00	28,0	72	79	79	71	3	60,00	120	16	25	22	33	21	120,0	1680,0	19,7	0,104 85,00	
39 81 200	8	1920,00	28,0	72	79	79	71	3	無裝配孔 / without mounting holes										0,104 85,00	
29 80 999	8	213,33	28,0	8	79	79	71		安裝塊 / companion part of assembly										9,50	
39 10 100	10	1000,00	35,11	30	99	99	89	2	62,50	125	8	32	33	48	32	125,0	750,0	19,7	0,108 68,72	
39 11 100	10	1000,00	35,11	30	99	99	89	2	無裝配孔 / without mounting holes										0,108 68,72	
29 10 999	10	233,33	28,02	7	79	79	69		安裝塊 / companion part of assembly										0,108 9,92	
39 12 100	12	1000,00	42,56	25	120	120	108	3	40	125	8	40	39	58	38	102,5	750,0	19,7	0,111 120,00	
39 13 100	12	1000,00	42,56	25	120	120	108	3	無裝配孔 / without mounting holes										0,111 120,00	
29 12 999	12	260,00	35,11	7	99	99	87		安裝塊 / companion part of assembly										19,20	

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Material C 45, Mat.No. 1.0504, of specially treated bright steel with a tensile strength of approx. 650 N/mm². Teeth induction-hardened to 50 to 55 HRC. Backs and contact faces of racks machined. Since only the teeth are induction hardened, subsequent drilling and pinning is possible.

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