

Precision Spur Gears, Helical Tooth System, Case Hardened with Ground Teeth Flanks

Material: Steel 16MnCr5.

Tooth quality 7e25

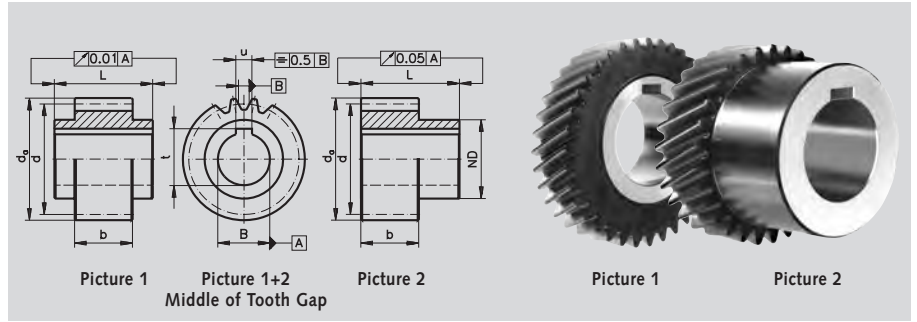
Helical tooth system, left hand 19° 31' 42".

Case hardened HRC 60+5.

Keyways in accordance with DIN 6885/1, tolerance P9.

Teeth, bores and faces ground. Matching helical-toothed gear racks page 236 - 238.

Ordering Details: e.g.: Product No. 254 015 35, Spur gear, Steel 16 MnCr5, Module 4.0, 15 Teeth, Ground



Module 4.0 Tooth Width b = 40 mm

Product No.	Number of teeth	b mm	Picture	d _a mm	d mm	B ^{H6} mm	ND mm	L mm	u mm	t mm	perm. MT* Nm	Weight kg
254 015 35	15	40	1	71.7	63.66	35	52	50	10	38.3	670	1.4
254 018 32	18	40	2	84.4	76.39	32	55	75	10	35.3	900	1.5
254 020 35	20	40	1	92.9	84.88	35	52	50	10	38.3	975	1.9
254 020 45	20	40	1	92.9	84.88	45	65	50	14	48.8	975	1.6
254 021 32	21	40	2	97.1	89.13	32	55	75	10	35.3	1050	2.0
254 021 35	21	40	2	97.1	89.13	35	55	75	10	38.3	1050	1.9
254 021 40	21	40	2	97.1	89.13	40	62	75	12	43.3	1050	1.9
254 021 45	21	40	2	97.1	89.13	45	68	75	14	48.8	1050	1.7
254 022 35	22	40	1	101.4	93.37	35	52	50	10	38.3	1100	2.3
254 022 45	22	40	1	101.4	93.37	45	65	50	14	48.8	1100	2.0
254 024 32	24	40	2	109.9	101.86	32	55	75	10	35.3	1150	2.6
254 024 35	24	40	2	109.9	101.86	35	55	75	10	38.3	1150	2.5
254 024 40	24	40	2	109.9	101.86	40	62	75	12	43.3	1150	2.5
254 024 45	24	40	2	109.9	101.86	45	68	75	14	48.8	1150	2.3
254 024 55	24	40	2	109.9	101.86	55	80	80	16	59.3	1150	2.4
254 025 35	25	40	1	114.1	106.10	35	52	50	10	38.3	1200	3.1
254 025 45	25	40	1	114.1	106.10	45	65	50	14	48.8	1200	2.8

Module 5.0 Tooth Width b = 50 mm

Product No.	Number of teeth	b mm	Picture	d _a mm	d mm	B ^{H6} mm	ND mm	L mm	u mm	t mm	perm. MT* Nm	Weight kg
255 018 45	18	50	2	105.5	95.49	45	68	85	14	48.8	1575	2.7
255 024 45	24	50	2	137.3	127.32	45	68	85	14	48.8	2085	4.9
255 024 55	24	50	2	137.3	127.32	55	80	90	16	59.3	2085	4.9
255 024 75	24	50	2	137.3	127.32	75	110	110	20	79.9	2085	5.6

*with reference to teeth, see calculation basis page 175.

When used with the gear racks page 236 - 238 the permissible peripheral force stated for the gear racks is decisive.

Note

These gears are designed to be used in combination with the helical-toothed gear racks page 236 - 238. If this gear is used to drive a mating gear instead, this mating gear must have the same lead angle and the opposite tooth direction (right hand).

**Helical Tooth
Gear racks
Page 236-238**



Gear Racks Made from Steel, Helical Toothed, Tempered, Teeth Milled

Material: high-quality, specially treated bright steel with approx. 900 N/mm² tensile strength.

Tooth quality 8e27.

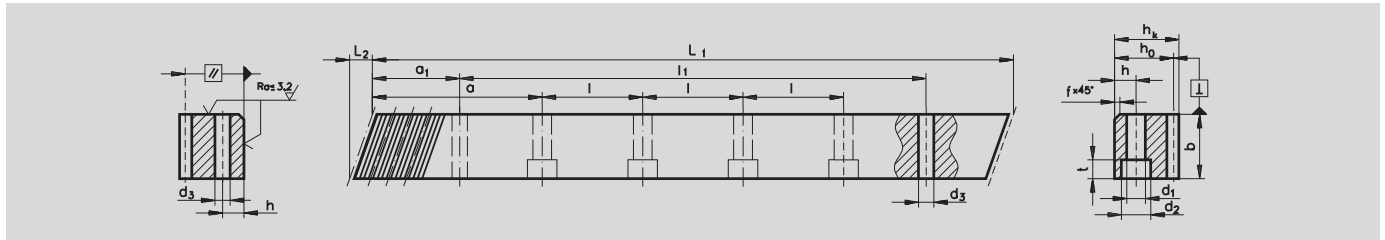
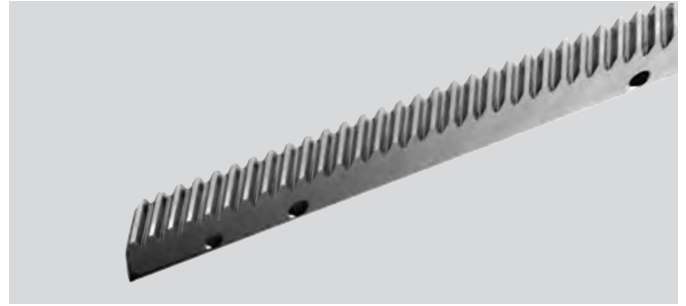
Helical tooth system, right hand 19° 31' 42".

For continuous linking.

Matching left hand-toothed counterparts, to simplify the mounting, are available at cost.

Matching helical-toothed spur gears page 225 and 226.

Ordering Details: e.g.: Product No. 251 603 11, Gear Rack, Helical Toothed, Tempered, Module 2.0, 500 mm



Module 2.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
251 603 11	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	2100	2.10
251 605 11	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	2100	4.30
without Bores																				
251 603 10	500.00	8.9	75	25	24	22	2											0.044	2100	2.10
251 605 10	1000.00	8.9	150	25	24	22	2											0.044	2100	4.30
Counterpart for mounting																				
251 600 00	200.00	8.8	30	25	24	22														0.85

Module 3.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
253 603 11	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	4500	3.00
253 605 11	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	4500	6.10
without Bores																				
253 603 10	500.00	10.6	50	30	29	26	2											0.046	4500	3.00
253 605 10	1000.00	10.6	100	30	29	26	2											0.046	4500	6.10
Counterpart for mounting																				
253 600 00	200.00	10.6	20	30	29	26														2.70

Module 4.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
254 603 11	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	8700	5.50
254 605 11	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	8700	10.90
without Bores																				
254 603 10	506.67	14.2	38	40	39	35	2											0.048	8700	5.50
254 605 10	1000.00	14.2	75	40	39	35	2											0.048	8700	10.90
Counterpart for mounting																				
254 600 00	200.00	14.2	15	40	39	35														2.70

Module 5.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
255 603 11	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	15000	6.50
255 605 11	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	15000	13.00
without Bores																				
255 603 10	500.00	17.4	30	50	39	34	3											0.050	15000	6.50
255 605 10	1000.00	17.4	60	50	39	34	3											0.050	15000	13.00
Counterpart for mounting																				
255 600 00	200.00	17.4	12	49	39	34														3.00

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.

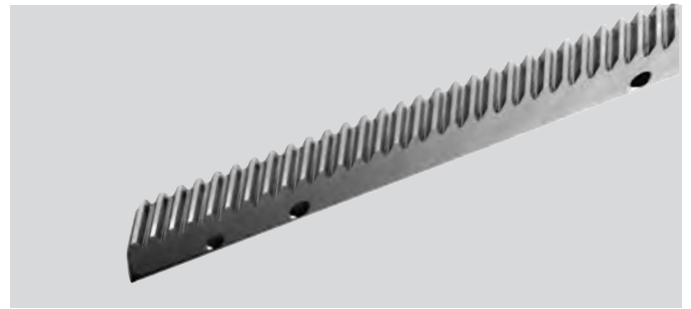
*Tangential force at tooth, calculated for z ≥ 20. With a smaller number of teeth, the tangential force has to be reduced by 10%.

Precision Gear Racks Made from Steel, Helical Tooth System, Teeth Hardened and Ground

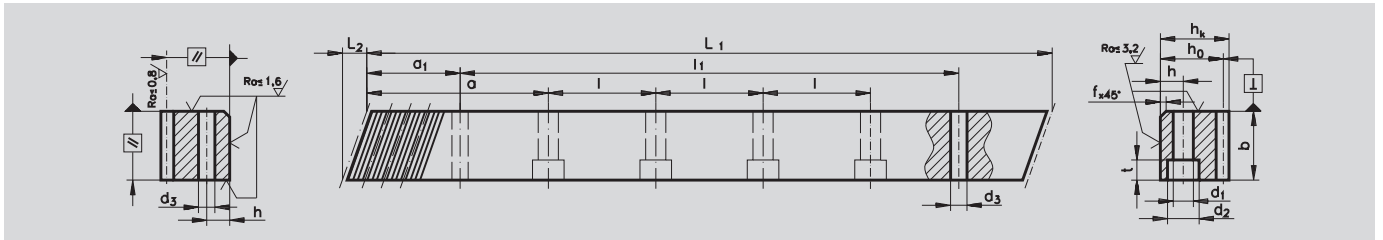
Tooth quality 6h25.
Helical tooth system, right hand 19° 31' 42".
For continuous linking.

Matching left hand-toothed counterparts, to simplify the mounting, are available at cost.

Matching helical-toothed spur gears page 225 and 226.



Ordering Details: e.g.: Product No. 251 603 01, Gear Rack, Helical Tooth System, hardened, Teeth Ground, Module 2.0, 500 mm



Gear racks Made from Steel 16MnCr5, helical tooth system, teeth hardened and ground

Material: 16MnCr5, Material-No. 1.7131, teeth induction hardened to about 60 HRC after hardening ground all around.

As only the teeth are hardened subsequent drilling and pinning is easily possible.

Module 2.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
251 603 01	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	8500	2.10
251 605 01	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	8500	4.10
without Bores																				
251 603 00	500.00	8.5	75	24	24	22	2										0.022	8500	2.10	
251 605 00	1000.00	8.5	150	24	24	22	2										0.022	8500	4.10	
Counterpart for mounting																				
251 600 00	200.00	8.5	30	24	24	22														0.85

Module 3.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
253 603 01	500.00	10.3	50	29	29	26	2	62.50	125	4	9	10	15	9	35	430.0	7.7	0.024	15000	2.90
253 605 01	1000.00	10.3	100	29	29	26	2	62.50	125	8	9	10	15	9	35	930.0	7.7	0.024	15000	5.90
without Bores																				
253 603 00	500.00	10.3	50	29	29	26	2										0.024	15000	2.90	
253 605 00	1000.00	10.3	100	29	29	26	2										0.024	15000	5.90	
Counterpart for mounting																				
253 600 00	200.00	10.3	20	29	29	26														1.20

Module 4.0

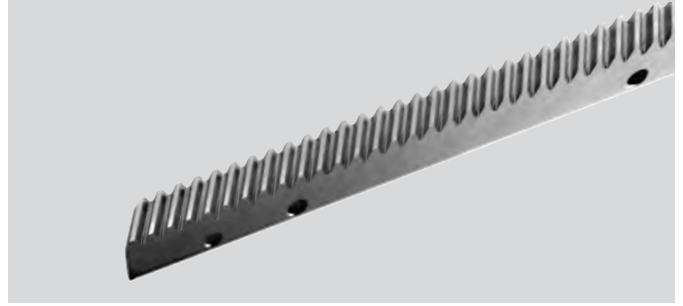
Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
254 603 01	506.67	13.8	38	39	39	35	3	62.50	125	4	12	10	15	9	33.3	433.0	7.7	0.024	25000	5.40
254 605 01	1000.00	13.8	75	39	39	35	3	62.50	125	8	12	10	15	9	33.3	933.4	7.7	0.024	25000	10.70
without Bores																				
254 603 00	506.67	13.8	38	39	39	35	3										0.024	25000	5.40	
254 605 00	1000.00	13.8	75	39	39	35	3										0.024	25000	10.70	
Counterpart for mounting																				
254 600 00	200.00	13.8	15	39	39	35														2.70

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.

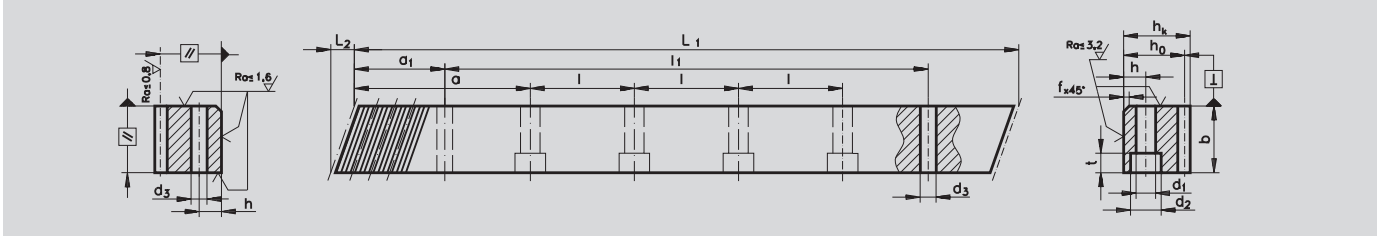
*Tangential force at tooth, calculated for z ≥ 20. With a smaller number of teeth, the tangential force has to be reduced by 10%.

Precision Gear Racks Made from Steel, Helical Toothed, Teeth Hardened and Ground

Tooth quality 6h25.
Helical tooth system, right hand 19° 31' 42".
For continuous linking.
Matching left hand-toothed counterparts, to simplify the mounting, are available at cost.
Matching helical-toothed spur gears page 225 and 226.



Ordering Details: e.g.: Product No. 255 603 01, Gear Rack, Helical Toothed, Hardened, Teeth Ground, Module 5.0, 500 mm



Gear Racks Made from Steel C45K, Helical Toothed, Teeth Hardened and Ground

Material: C45K, Material-No. 1.0503, made from specially treated bright steel with approx. 650 N/mm² tensile strength. Teeth induction hardened to 50 to 55 HRC, after hardening ground all around. As only the teeth are hardened subsequent drilling and pinning is easily possible.

Module 5.0

Product No. with Bores	L ₁ mm	L ₂ mm	Number of teeth	b mm	h _k mm	h ₀ mm	f mm	a mm	l mm	No. of h bores	d ₁ mm	d ₂ mm	t mm	a ₁ mm	l ₁ mm	d ₃ mm	GT _f /300 ¹⁾ mm	Fu* N	Weight kg	
255 603 01	500.00	17.4	30	49	39	34	3	62.50	125	4	12	14	20	13	37.5	425.0	11.7	0.025	32000	6.50
255 605 01	1000.00	17.4	60	49	39	34	3	62.50	125	8	12	14	20	13	37.5	925.0	11.7	0.025	32000	13.00
without Bores																				
255 603 00	500.00	17.4	30	49	39	34	3											0.025	32000	6.50
255 605 00	1000.00	17.4	60	49	39	34	3											0.025	32000	13.00
Counterpart for mounting																				
255 600 00	200.00	17.4	12	49	39	34												0.025	32000	3.00

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.

*Tangential force at tooth, calculated for z ≥ 20. With a smaller number of teeth, the tangential force has to be reduced by 10%.

Helical Tooth Spur Gears Page 225-226

