

## Overview Spur Gears with Straight Tooth System

		Module	Tooth width in mm	Page
	<b>Spur gears:</b> Acetal resin, die cast straight tooth system with hub	0,5	3	199
		0,7	6	200
	<b>Spur gears:</b> POM white, milled straight tooth system with hub	1,0	9	201
		1,25	10	202
		1,5	12	203
		2,0/3,0	15/19	204
		0,5	4	205
	<b>Spur gears:</b> POM black, milled straight tooth system with hub	0,7	5	206
		1,0	10	207
		1,25/1,5	10/15	208
		2,0/2,5/3,0	16/20/25	209
	<b>Spur gears:</b> Plastic with core made from steel and stainless steel, with hub	1,0	15	211
		1,5	17	211
		2	20	212
		2,5	25	212
		3,0	30	212
	<b>Spur gears:</b> Brass, straight tooth system with hub	1,5/2,0	17/20	213
		2,5/3,0/4,0	25/30/40	214
		0,3	2	215
		0,5	2	216
 	<b>Spur gears:</b> Steel, straight tooth system with and without hub (* only with hub)	0,7	4	217
		1,0	4	218
		0,5*	4	219
		0,7*	5	220
		1,0*	6,5	221
		1,0	10 / 15	222
		1,25	10	224
		1,5*	10	225
		1,5	15 / 17	226
		1,59 (pitch 5 mm)*	12	248
		2,0	16 / 20	228
		2,5	20 / 25	230
		3,0	25 / 30	232
		3,18 (pitch 10 mm)*	25	248
		4,0	30 / 40	234
5,0	40 / 50	236		
6,0	50 / 60	238		
8,0*	65	239		
	<b>Spur Gears:</b> straight tooth system, teeth hardened	1,0/1,5/2,0	15/15/20	240
		2,5/3,0	25/30	241
		4,0/5,0	40/50	241
	<b>Precision Spur Gears:</b> straight tooth system, hardened and ground	1,0/1,5	10/15	242
		2,0/3,0	20/25	243
	<b>Spur gears:</b> Stainless steel, straight tooth system with hub	1,0/1,5	10/15	244
		2,0/2,5	16/20	245
		3,0/4,0	25/30	246
		1,59 (pitch 5 mm)	12	248
		3,18 (pitch 10 m)	25	248

## Overview Spur Gear Elements with straight tooth system



**Spur gear shafts:** Steel,  
straight tooth system

Module	Length in mm	Page
1,0/1,5,/2,0	..... 200-250	..... 247



**Internal gears:** Brass,  
straight tooth system

**Internal gears:** Steel,  
straight tooth system

Module	Length in mm	Page
0,5/0,7,/1,0	..... 4/6/8	..... 249
1,0/1,5/2,0	..... 10/15/16	..... 249



**Ratchet wheels and braces:**  
Steel,  
straight tooth system

Module	Length in mm	Page
3,14	.....4/9	..... 250
4,71	.....6/9	..... 250

## Overview Spur Gears with Helical Teeth



**Spur gears:** Brass, helical teeth,  
right hand

Module	Length in mm	Page
0,3/0,5	..... 5/10	..... 251



**Spur gears:** Steel, helical teeth,  
right hand and left hand

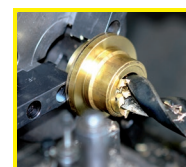
Module	Length in mm	Page
1,0	.....10	..... 251



**Spur gears:** Steel, helical teeth,  
left hand, hardened  
and ground

Module	Length in mm	Page
2,0/3,0	.....28	..... 252
4,0/5,0	.....40/50	..... 253

**Gear racks**  
**Page 255**



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## General Basics for Spur Gears

Spur gears enable a non-slip power transmission between two parallel-mounted shafts. The spur gears listed in the catalogue are involute gears with a pressure angle of 20°.

Please note that gears with a number of teeth < 17 are undercut for manufacturing reasons (one reason for this is the simple calculation of the centre distance). The centre distance tolerances depend on the tooth quality in line with DIN 3964. The modules for spur gears used in the catalogue were derived from DIN 780 Series 1.

The formulas below apply to straight and helical spur gears for the usual gear-cutting tools (see table) and for the addendum modification 0 for sprocket and wheel (the so-called reference centre distance tooth system).

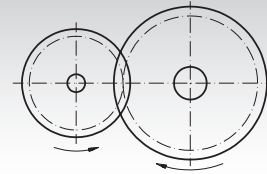
### Module-Series 1

Module 0.3 Module 0.5 Module 0.7 Module 1.0 Module 1.25 Module 1.5  
Module 2.0 Module 2.5 Module 3.0 Module 4.0 Module 5.0 Module 6.0  
Module 8.0

### Module-Series 2

Module 0.75 Module 3.5 Module 7.0

Rotational  
direction  
changes with  
every gear



Teeth straight		
to be calculated	given unit	formula
No. of Teeth = z	Pitch Ø and Module	$\frac{d}{m}$
	Addendum-Circle Ø	$\frac{d_a - 2m}{m}$
Module = m in mm	Pitch	$\frac{t_0}{\pi}$
	Tip Ø and No. of Teeth	$\frac{d_a}{z + 2}$
	Pitch Ø and No. of Teeth	$\frac{d}{z}$
Pitch Ø = d in mm	No. of Teeth and Module	$z \cdot m$
	No. of Teeth and Tip Ø	$\frac{z \cdot d_a}{z + 2}$
	Tip Ø and Module	$d_a - 2m$
Tip Ø = d <sub>a</sub> in mm	No. of Teeth and Module	$(z + 2) \cdot m$
	No. of Teeth and Pitch Ø	$d + \frac{2d}{z}$
	Pitch Ø and Module	$d + 2m$
Centre distance = a in mm	No. of Teeth and Module	$\left(\frac{z_1 + z_2}{2}\right) \cdot m$
	Pitch Ø and Pitch Ø	$\frac{d_1 + d_2}{2}$
Reduction Ratio = i	No. of Teeth and No. of Teeth	$\frac{z_2}{z_1}$
	Speed and Speed	$\frac{n_1}{n_2}$
Torque = Md in Nm	Power and Speed [kW] [min <sup>-1</sup> ]	$9550 \cdot \frac{P}{n}$
Peripheral Speed = V in m/sec.	Pitch Ø and Speed [mm] [min <sup>-1</sup> ]	$\frac{\pi \cdot d \cdot n}{60 \cdot 1000}$

**Material quality: Information about the material quality can be found at each individual group of gears.**

Teeth helical		
to be calculated	given unit	formula
No. of Teeth	Pitch Ø, Standard Module and Spiral Angle	$\frac{d \cdot \cos \beta}{m_n}$
	Tip Ø, Standard Module and Spiral Angle	$\frac{(d_a - 2 m_n) \cdot \cos \beta}{m_n}$
Normal Module	Standard Pitch	$\frac{t_{n0}}{\pi}$
	Pitch Ø, No. of Teeth and Spiral Angle	$\frac{d \cdot \cos \beta}{z}$
	Tip Ø, No. of Teeth and Spiral Angle	$\frac{d_a}{z} + 2 \cos \beta$
Real module	Reference Circle Pitch	$\frac{t_s}{\pi}$
	Standard Module and Spiral Angle	$\frac{m_n}{\cos \beta}$
	Pitch Ø and No. of Teeth	$\frac{d}{z}$
Pitch Ø	No. of Teeth, Standard Module and Spiral Angle	$\frac{z \cdot m_n}{\cos \beta}$
	No. of Teeth, Tip Ø and Spiral Angle	$\frac{z \cdot d_a}{z + 2 \cdot \cos \beta}$
	Tip Ø and Standard Module	$d_a - 2 m_n$
Tip Ø	No. of Teeth, Standard Module and Spiral Angle	$\left(\frac{z}{\cos \beta} + 2\right) m_n$
	Pitch Ø and Standard Module	$d + 2m_n$
Centre distance	Pitch Ø, No. of Teeth and Spiral Angle	$d + \frac{2d \cdot \cos \beta}{z}$
	No. of Teeth, Standard Module and Spiral Angle	$\left(\frac{z_1 + z_2}{2}\right) \frac{m_n}{\cos \beta}$
Spiral Angle	Pitch Ø and Pitch Ø	$\frac{d_1 + d_2}{2}$
	Standard Module u. Real Module	$\frac{m_n}{m_s} = \cos \beta$
	Standard Module, No. of Teeth and Pitch Ø	$\frac{z \cdot m_n}{d} = \cos \beta$

## Recommendations for the Lubrication of Spur Gear Units

Peripheral Speed	Lubrication	Lubricant
up to 1 m/s	Application of Lubricant	Adhesive Lubricant
up to 4 m/s	Splash Lubrication/Spray Lubrication	Grease or Adh. Lubricant
up to 15 m/s	Splash Lubrication	Oil
over 15 m/s	Pressure-Circulation or Spray Lubrication	Oil

## Note Regarding the Torque-Values Stated in the Catalogue

The torque values given for gears in the dimension tables (the value "perm. MT" stated in Nm or Ncm) only relate to the teeth, without considering the shaft diameter or key size.

The load bearing capacity calculations are based on the basic principles regarding the pitting resistance of the tooth flanks and the occurring tooth root stress. The calculations are based on the DIN 3990 (Method B). For the calculation, the following assumptions were made:

Calcul. Factor/Determining Factor	Abbreviation	Value	Note
Calculation Method	-	-	DIN 3990, method B
DIN Quality	-	8	-
Tooth-Number Ratio	U	1	If $U > 1$ , the flank safety for long and short addendum teeth increases while the tooth-root safety decreases For other tooth-number ratios please check both pinion and gear!
Manufacturing Tool: Addendum/Dedendum/ Tip Rounding	$h_{aPo}/h_{fPo}/rho_{aPo}$	1.25/1/0.25	Hob
Flank Safety	$S_H$	1.0	Endurance strength 10.000 h (for steel)
Tooth-Root Safety	$S_F$	1.5	Endurance strength 10.000 h (for steel)
Application Factor	$K_A$	1.25	Industrial gear mechanisms, uniform, light shocks.
Dynamics Factor	$K_V$	1.0	Usually without great influence
Load Distribution over Width	$K_{Hbeta}$	1	Idealised; requires precise, rigid and symmetric mounting
Lubricant/Surface Roughness Speed Factor	$Z_L * Z_V * Z_R$	1	<ul style="list-style-type: none"> <li>sufficient oil-lubrication</li> <li>relative surface roughness <math>R_{Z100} = 10</math></li> <li>peripheral speed 10 m/s</li> </ul>
Lifetime Factor	$Z_N$	1	Endurance strength 10.000 h (for steel)
Operating temperature for plastic gears	$T_{Betr}$	up to 60°C	The material parameters of plastic gears largely depend on the temperature

The load bearing capacity of a gear depends on various different factors. The stated torques are only reference values, serving to facilitate the selection process. If necessary, a specific calculation of strength and load bearing capacity must be carried out for each application.

Depending on the operating conditions the wear lifespan may be influenced by adequate grease/oil lubrication. Please also note that insufficient lubrication may lead to scuffing of the gear flanks.

### IMPORTANT

Please make sure you always check the permissible torque separately for the pinion and the gear side!  
Due to their higher elasticity plastic gears are calculated with a

$K_{Hbeta}$  of 1. Gears made from brass and zinc-die-cast are also calculated with a  $K_{Hbeta}$  of 1, as a good running-in characteristic is assumed for these materials.

### For the materials used, the following characteristic values were taken as basis:

Material	Perm. Pulsating Fatigue Strength under Bending Stress $s_{bw}$ in N/mm <sup>2</sup>	Perm. Flank Pressure $s_{Hlim}$ in N/mm <sup>2</sup>
POM	28 (VDI-2545)	40 (VDI-2545)
Acetal Resin	28 (VDI-2545)	40 (VDI-2545)
PA12G	40	48
ZnAl4Cu1	60	150
Ms58 (2.0401)	100	250
11SMnPb30 (alt: 9SMn28K)	150	350
C45 heat treated	200	590
42CrMo4 hardened	350	1360
16MnCr5 case hardened	400	1630
X10CrNiS18 9 (1.4305, stainless, austenitic)	200	400

**Real Size of the Module Teeth DIN 867**

**Module 0.3**



**Module 0.5**



**Module 0.7**



**Module 1.0**



**Module 1.25**



**Module 1.5**



**Module 2.0**



**Module 2.5**



**Module 4.0**



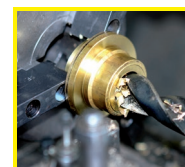
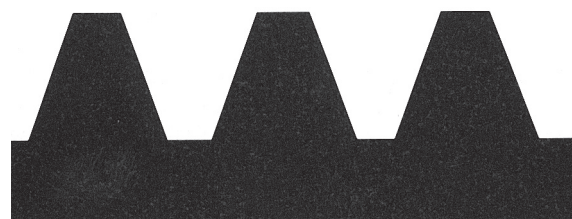
**Module 5.0**



**Module 6.0**



**Module 8.0**



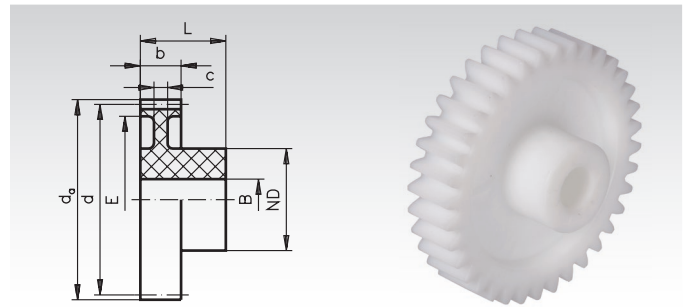
**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Acetal Resin with One-Sided Hub, Straight Tooth System

In die-cast version.  
Bores machined.  
Pressure angle 20°.

With high hardness and low friction coefficient these plastic gears can be used in various set-ups, even under water.

Material reference values page 821.



Ordering Details: e.g.: Product No. 281 012 00, Spur Gear, Acetal, Module 0.5, 12 Teeth

### Module 0.5 Tooth Width b = 3 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
281 012 00	12	3	7	6	4	-	7	-	2	0,8	0,15
281 013 00	13	3	7,5	6,5	4	-	7	-	2	0,9	0,17
281 014 00	14	3	8	7	5	-	7	-	2	1,0	0,22
281 015 00	15	3	8,5	7,5	6	-	10	-	3	1,1	0,35
281 016 00	16	3	9	8	6	-	10	-	3	1,2	0,36
281 017 00	17	3	9,5	8,5	6	-	10	-	3	1,3	0,39
281 018 00	18	3	10	9	8	-	10	-	4	1,5	0,56
281 019 00	19	3	10,5	9,5	8	-	10	-	4	1,7	0,57
281 020 00	20	3	11	10	8	-	10	-	4	1,9	0,62
281 021 00	21	3	11,5	10,5	8	-	10	-	4	2,1	0,66
281 022 00	22	3	12	11	10	-	10	-	4	2,4	0,95
281 023 00	23	3	12,5	11,5	10	-	10	-	4	2,6	0,98
281 024 00	24	3	13	12	10	-	10	-	4	2,9	1,04
281 025 00	25	3	13,5	12,5	10	-	10	-	4	3,2	1,06
281 026 00	26	3	14	13	10	-	10	-	4	3,5	1,09
281 027 00	27	3	14,5	13,5	10	-	10	-	4	3,8	1,14
281 028 00	28	3	15	14	10	-	10	-	4	4,2	1,16
281 030 00	30	3	16	15	12	-	10	-	4	4,9	1,59
281 032 00	32	3	17	16	12	-	10	-	4	5,7	1,68
281 035 00	35	3	18,5	17,5	12	-	10	-	4	7,0	1,86
281 036 00	36	3	19	18	12	-	10	-	4	7,5	1,89
281 038 00	38	3	20	19	12	-	10	-	4	8,5	2,00
281 040 00	40	3	21	20	12	14,5	10	2	4	9,5	1,95
281 042 00	42	3	22	21	12	16	10	2	4	10,6	2,12
281 045 00	45	3	23,5	22,5	12	18,5	10	2	4	12,5	2,20
281 048 00	48	3	25	24	15	19	10	2	6	14,5	3,01
281 050 00	50	3	26	25	15	20	10	2	6	16,0	2,96
281 052 00	52	3	27	26	15	21	10	2	6	17,5	3,12
281 054 00	54	3	28	27	15	22	10	2	6	19,0	3,24
281 055 00	55	3	28,5	27,5	15	23	10	2	6	19,8	3,20
281 056 00	56	3	29	28	15	23	10	2	6	20,4	3,40
281 060 00	60	3	31	30	15	24	10	2	6	21,2	3,63
281 064 00	64	3	33	32	15	25	10	2	6	23,5	4,05
281 065 00	65	3	33,5	32,5	15	27	10	2	6	23,9	4,00
281 070 00	70	3	36	35	15	29	10	2	6	25,8	4,35
281 072 00	72	3	37	36	15	30	10	2	6	26,5	4,55
281 075 00	75	3	38,5	37,5	15	33	10	2	6	27,7	4,66
281 080 00	80	3	41	40	15	36	10	2	6	29,5	5,27
281 090 00	90	3	46	45	15	39	10	2	6	33,2	5,64
281 096 00	96	3	49	48	15	42	10	2	6	35,5	7,05
281 100 00	100	3	51	50	15	44	10	2	6	37,0	7,35
281 120 00	120	3	61	60	15	54	10	2	6	44,0	10,20

\* Basis of calculations see page 197.

### Note Regarding the Machining

Inside these die-cast parts are some cavities caused by production. These parts should therefore not be drilled too deep. With larger bores or when grooving the cavities might become visible. This often does not affect the functionality.



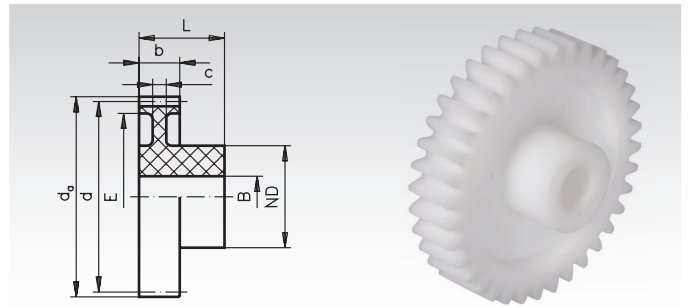
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Acetal Resin with One-Sided Hub, Straight Tooth System

In die-cast version.  
Bores machined.  
Pressure angle 20°.

With high hardness and low friction coefficient these plastic gears can be used in various set-ups, even under water.

Material reference values page 821.



Ordering Details:e.g.: Product No. 282 012 00, Spur Gear, Acetal, Module 0.7, 12 Teeth

### Module 0.7 Tooth Width b = 6 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
282 012 00	12	6	9,8	8,4	6	-	15	-	3	3,1	0,7
282 013 00	13	6	10,5	9,1	6	-	15	-	3	3,6	0,8
282 014 00	14	6	11,2	9,8	6	-	15	-	3	4,1	0,9
282 015 00	15	6	11,9	10,5	6	-	15	-	3	4,6	1,0
282 016 00	16	6	12,6	11,2	9	-	15	-	4	5,1	1,3
282 017 00	17	6	13,3	11,9	9	-	15	-	4	5,3	1,4
282 018 00	18	6	14	12,6	9	-	15	-	4	6,1	1,6
282 019 00	19	6	14,7	13,3	9	-	15	-	4	7,0	1,7
282 020 00	20	6	15,4	14,0	9	-	15	-	4	7,9	1,8
282 021 00	21	6	16,1	14,7	9	-	15	-	4	8,9	1,9
282 022 00	22	6	16,8	15,4	9	-	15	-	4	9,9	2,1
282 023 00	23	6	17,5	16,1	9	-	15	-	4	11,0	2,2
282 024 00	24	6	18,2	16,8	9	13,5	15	3	4	12,2	2,1
282 025 00	25	6	18,9	17,5	9	13,5	15	3	6	13,4	2,2
282 026 00	26	6	19,6	18,2	9	13,5	15	3	6	14,7	2,4
282 027 00	27	6	20,3	18,9	9	13,5	15	3	6	16,0	2,6
282 028 00	28	6	21	19,6	9	13,5	15	3	6	17,5	2,8
282 030 00	30	6	22,4	21	12	16	15	3	6	20,5	3,5
282 032 00	32	6	23,8	22,4	12	16	15	3	6	24,0	4,0
282 035 00	35	6	25,9	24,5	15	19	15	3	6	29,4	5,4
282 036 00	36	6	26,6	25,2	15	19	15	3	6	31,4	5,6
282 038 00	38	6	28	26,6	15	21,5	15	3	6	35,6	5,8
282 040 00	40	6	29,4	28	15	21,5	15	3	6	40,0	6,2
282 042 00	42	6	30,8	29,4	18	24,5	15	2	6	45,0	7,2
282 045 00	45	6	32,9	31,5	18	24,5	15	2	6	52,8	8,0
282 048 00	48	6	35	33,6	18	24,5	15	2	8	61,3	8,6
282 050 00	50	6	36,4	35	18	28	15	2	8	67,4	8,4
282 052 00	52	6	37,8	36,4	18	28	15	2	8	73,8	9,0
282 054 00	54	6	39,2	37,8	18	28	15	2	8	77,6	9,7
282 055 00	55	6	39,9	38,5	18	31	15	2	8	79,2	9,6
282 056 00	56	6	40,6	39,2	18	31	15	2	8	80,7	10,0
282 060 00	60	6	43,4	42	18	31	15	2	8	86,4	11,4
282 064 00	64	6	46,2	44,8	18	37,5	15	2	8	92,2	10,8
282 065 00	65	6	46,9	45,5	18	37,5	15	2	8	94,7	11,0
282 070 00	70	6	50,4	49	18	37,5	15	2	8	101,5	13,4
282 072 00	72	6	51,8	50,4	18	37,5	15	2	8	103,4	14,4
282 075 00	75	6	53,9	52,5	18	37,5	15	2	10	108,6	15,6
282 080 00	80	6	57,4	56	21	47	15	2	10	115,7	15,6
282 090 00	90	6	64,4	63	21	56,5	15	2	10	130,3	16,4
282 096 00	96	6	68,6	67,2	21	56,5	15	2	10	139,8	20,0
282 100 00	100	6	71,4	70	21	56,5	15	2	10	144,7	22,4
282 120 00	120	6	85,4	84	21	77	15	2	10	173,0	24,8

\* Basis of calculations see page 197.

### Note Regarding the Machining

Inside these die-cast parts are some cavities caused by production. These parts should therefore not be drilled too deep. With larger bores or when grooving the cavities might become visible. This often does not affect the functionality.



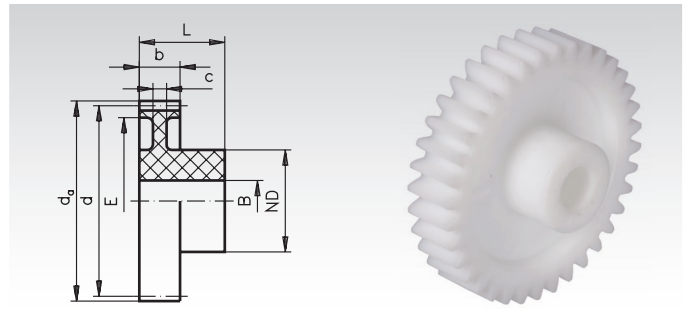
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Acetal Resin with One-Sided Hub, Straight Tooth System

In die-cast version.  
Bores machined.  
Pressure angle 20°.

With high hardness and low friction coefficient these plastic gears can be used in various set-ups, even under water.

Material reference values page 821.



Ordering Details: e.g.: Product No. 283 012 00, Spur Gear, Acetal, Module 1, 12 Teeth

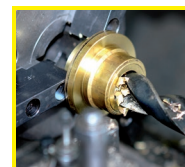
### Module 1.0 Tooth Width b = 9 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
283 012 00	12	9	14	12	9	-	17	-	4	10	1,8
283 013 00	13	9	15	13	9	-	17	-	4	12	1,9
283 014 00	14	9	16	14	9	-	17	-	4	13	2,2
283 015 00	15	9	17	15	9	-	17	-	4	15	2,5
283 016 00	16	9	18	16	9	-	17	-	4	17	2,8
283 017 00	17	9	19	17	9	-	17	-	4	17	3,0
283 018 00	18	9	20	18	9	13,5	17	6	4	20	3,2
283 019 00	19	9	21	19	9	13,5	17	6	4	23	3,5
283 020 00	20	9	22	20	9	13,5	17	6	4	26	3,9
283 021 00	21	9	23	21	12	16	17	6	5	29	4,7
283 022 00	22	9	24	22	12	16	17	6	5	33	5,1
283 023 00	23	9	25	23	12	16	17	6	5	36	5,6
283 024 00	24	9	26	24	15	19	18	6	6	40	6,6
283 025 00	25	9	27	25	15	19	18	6	6	44	7,2
283 026 00	26	9	28	26	15	19	18	6	6	49	7,7
283 027 00	27	9	29	27	15	19	18	6	6	53	8,1
283 028 00	28	9	30	28	15	22	18	6	6	58	8,4
283 030 00	30	9	32	30	15	22	18	6	6	68	9,4
283 032 00	32	9	34	32	18	24,5	18	4,6	6	79	11,3
283 035 00	35	9	37	35	18	24,5	18	4,6	8	98	12,7
283 036 00	36	9	38	36	18	28	18	4,6	8	104	12,6
283 038 00	38	9	40	38	18	28	18	4,6	8	119	14,0
283 040 00	40	9	42	40	18	28	18	4,6	8	134	15,6
283 042 00	42	9	44	42	18	28	18	4,6	8	150	14,0
283 045 00	45	9	47	45	18	37	18	4,6	8	176	17,0
283 048 00	48	9	50	48	18	37	18	4,6	8	205	19,8
283 050 00	50	9	52	50	18	37	18	4,6	8	221	21,6
283 052 00	52	9	54	52	21	47	18	4,6	8	229	21,4
283 054 00	54	9	56	54	21	47	18	4,6	8	238	23,5
283 055 00	55	9	57	55	21	47	18	4,6	8	243	24,7
283 056 00	56	9	58	56	21	47	18	4,6	8	247	25,9
283 058 00	58	9	60	58	21	47	18	4,6	8	257	26,8
283 060 00	60	9	62	60	21	47	18	4,6	8	266	30,5
283 064 00	64	9	66	64	21	57	18	4,6	10	285	29,8
283 065 00	65	9	67	65	21	57	18	4,6	10	289	31,0
283 070 00	70	9	72	70	21	57	18	4,6	10	312	37,7
283 072 00	72	9	74	72	21	67	18	4,6	10	321	33,8
283 075 00	75	9	77	75	21	67	18	4,6	10	335	39,1
283 080 00	80	9	82	80	21	67	18	4,6	10	358	46,5
283 085 00	85	9	87	85	21	77	18	4,6	10	380	48,7
283 090 00	90	9	92	90	21	77	18	4,6	10	403	57,5
283 100 00	100	9	102	100	24	87	18	4,6	12	447	95,1
283 110 00	110	9	112	110	24	97	18	4,6	12	491	82,5
283 120 00	120	9	122	120	24	107	18	4,6	12	535	95,2
283 130 00	130	9	132	130	24	115	18	4,6	12	573	109,3
283 140 00	140	9	142	140	24	125	18	4,6	12	616	127,1

\* Basis of calculations see page 197.

### Note Regarding the Machining

Inside these die-cast parts are some cavities caused by production. These parts should therefore not be drilled too deep. With larger bores or when grooving the cavities might become visible. This often does not affect the functionality.



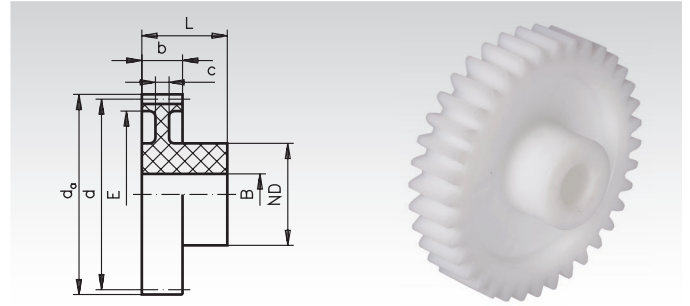
**Reworking within  
24h-service possible.  
Custom made parts  
on request.**



## Spur Gears Made from Acetal Resin with One-Sided Hub, Straight Tooth System

In die-cast version.  
Bores machined.  
Pressure angle 20°.

With high hardness and low friction coefficient these plastic gears can be used in various set-ups, even under water. Material reference values page 821.



Ordering Details: e.g.: Product No. 284 012 00, Spur Gear, Acetal, Module 1.25, 12 Teeth

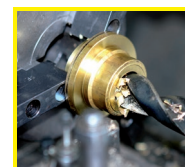
### Module 1.25 Tooth Width b = 10 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
284 012 00	12	10	17,5	15	9	-	19	-	5	19	2,5
284 013 00	13	10	18,75	16,25	9	-	19	-	5	21	3,0
284 014 00	14	10	20	17,5	9	-	19	-	5	24	3,4
284 015 00	15	10	21,25	18,75	9	13,5	19	7	5	27	3,8
284 016 00	16	10	22,5	20	9	13,5	19	7	5	31	4,3
284 017 00	17	10	23,75	21,25	9	13,5	19	7	5	32	4,7
284 018 00	18	10	25	22,5	12	16	19	7	5	36	6,0
284 019 00	19	10	26,25	23,75	12	16	19	7	5	42	6,5
284 020 00	20	10	27,5	25	12	16	19	7	5	47	7,0
284 021 00	21	10	28,75	26,25	15	19	19	7	6	53	8,4
284 022 00	22	10	30	27,5	15	19	19	7	6	59	9,1
284 023 00	23	10	31,25	28,75	15	19	19	7	6	66	9,9
284 024 00	24	10	32,5	30	15	21,5	19	7	6	73	10,3
284 025 00	25	10	33,75	31,25	15	21,5	19	7	6	81	11,2
284 026 00	26	10	35	32,5	18	24	19	5,5	6	89	12,5
284 027 00	27	10	36,25	33,75	18	24	19	5,5	6	97	13,3
284 028 00	28	10	37,5	35	18	24	19	5,5	8	106	13,8
284 030 00	30	10	40	37,5	18	28	19	5,5	8	124	15,0
284 032 00	32	10	42,5	40	18	28	19	5,5	8	145	17,1
284 035 00	35	10	46,25	43,75	18	28	19	5,5	8	179	20,5
284 036 00	36	10	47,5	45	18	37,5	19	5,5	8	191	18,8
284 038 00	38	10	50	47,5	18	37,5	19	5,5	8	217	21,2
284 040 00	40	10	52,5	50	18	37,5	19	5,5	8	245	24,0
284 042 00	42	10	55	52,5	18	37,5	19	5,5	8	275	26,7
284 045 00	45	10	58,75	56,25	21	47,5	19	5,5	8	324	29,4
284 048 00	48	10	62,5	60	21	47,5	19	5,5	8	366	24,0
284 050 00	50	10	65	62,5	21	47,5	19	5,5	8	383	37,1
284 052 00	52	10	67,5	65	21	57	19	5,5	10	399	35,2
284 054 00	54	10	70	67,5	21	57	19	5,5	10	416	38,7
284 055 00	55	10	71,25	68,75	21	57	19	5,5	10	424	40,3
284 056 00	56	10	72,5	70	21	57	19	5,5	10	432	42,4
284 060 00	60	10	77,5	75	21	67	19	5,5	10	465	45,2
284 064 00	64	10	82,5	80	21	67	19	5,5	10	497	52,0
284 065 00	65	10	83,75	81,25	21	67	19	5,5	10	505	55,4
284 070 00	70	10	90	87,5	21	77	19	5,5	10	546	60,5
284 075 00	75	10	96,25	93,75	21	77	19	5,5	10	585	72,5

\* Basis of calculations see page 197.

### Note Regarding the Machining

Inside these die-cast parts are some cavities caused by production. These parts should therefore not be drilled too deep. With larger bores or when grooving the cavities might become visible. This often does not affect the functionality.



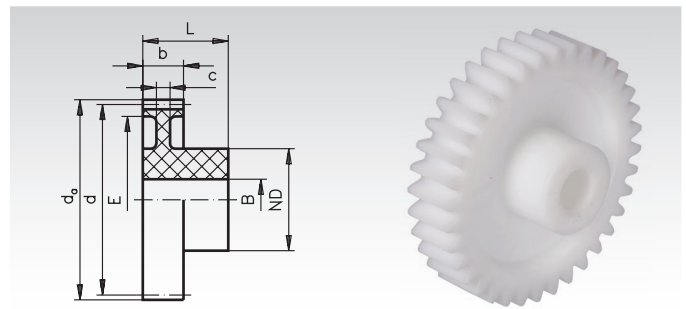
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Acetal Resin with One-Sided Hub, Straight Tooth System

In die-cast version.  
Bores machined.  
Pressure angle 20°.

With high hardness and low friction coefficient these plastic gears can be used in various set-ups, even under water.

Material reference values page 821.



Ordering Details: e.g.: Product No. 285 012 00, Spur Gear, Acetal, Module 1.5, 12 Teeth

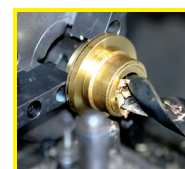
### Module 1.5 Tooth Width b = 12 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
285 012 00	12	12	21	18	14	-	23	-	6	33	5,6
285 013 00	13	12	22,5	19,5	14	-	23	-	6	38	6,3
285 014 00	14	12	24	21	14	-	23	-	6	44	7,1
285 015 00	15	12	25,5	22,5	14	-	23	-	6	49	7,8
285 016 00	16	12	27	24	14	-	23	-	6	55	8,7
285 017 00	17	12	28,5	25,5	14	-	23	-	6	57	9,7
285 018 00	18	12	30	27	17	-	23	-	8	65	10,9
285 019 00	19	12	31,5	28,5	17	-	23	-	8	75	11,9
285 020 00	20	12	33	30	17	-	23	-	8	85	12,9
285 021 00	21	12	34,5	31,5	17	23	23	5	8	96	13,0
285 022 00	22	12	36	33	17	23	23	5	8	107	14,3
285 023 00	23	12	37,5	34,5	17	23	23	5	8	119	15,5
285 024 00	24	12	39	36	19	27	23	5	8	132	16,8
285 025 00	25	12	40,5	37,5	19	27	23	5	8	146	18,3
285 026 00	26	12	42	39	19	27	23	5	8	160	19,9
285 027 00	27	12	43,5	40,5	19	27	23	5	8	175	21,6
285 028 00	28	12	45	42	19	27	23	5	8	191	23,3
285 030 00	30	12	48	45	24	35	23	5	10	225	26,1
285 032 00	32	12	51	48	24	35	23	5	10	262	29,9
285 035 00	35	12	55,5	52,5	24	43	23	5	10	324	31,2
285 036 00	36	12	57	54	24	43	23	5	10	347	33,0
285 038 00	38	12	60	57	24	43	23	5	10	394	37,7
285 040 00	40	12	63	60	24	50	23	5	10	445	37,4
285 042 00	42	12	66	63	24	50	23	5	10	500	42,3
285 045 00	45	12	70,5	67,5	24	50	23	5	10	589	49,4
285 048 00	48	12	75	72	24	50	23	5	10	635	57,2
285 050 00	50	12	78	75	27	65	23	5	12	664	53,1
285 052 00	52	12	81	78	27	65	23	5	12	693	58,9
285 054 00	54	12	84	81	27	65	23	5	12	721	64,8
285 055 00	55	12	85,5	82,5	27	65	23	5	12	735	67,9
285 060 00	60	12	93	90	27	65	23	5	12	806	83,9
285 070 00	70	12	108	105	30	90	23	5	14	946	97,7
285 080 00	80	12	123	120	30	106	23	5	14	1084	119,6
285 090 00	90	12	138	135	30	118	23	5	14	1212	149,8

\* Basis of calculations see page 197.

### Note Regarding the Machining

Inside these die-cast parts are some cavities caused by production. These parts should therefore not be drilled too deep. With larger bores or when grooving the cavities might become visible. This often does not affect the functionality.



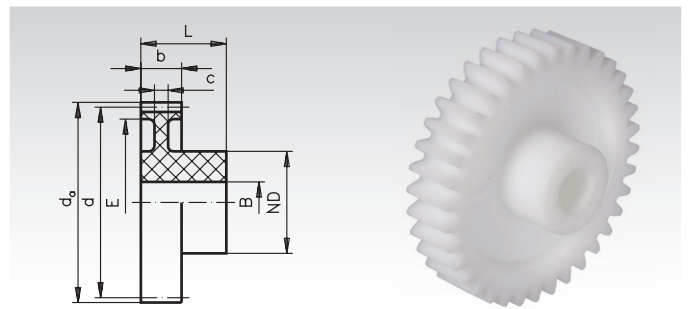
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Acetal Resin with One-Sided Hub, Straight Tooth System

In die-cast version.  
Bores machined.  
Pressure angle 20°.

With high hardness and low friction coefficient these plastic gears can be used in various set-ups, even under water.

Material reference values page 821.



Ordering Details: e.g.: Product No. 286 012 00, Spur Gear, Acetal, Module 2, 12 Teeth

### Module 2.0 Tooth Width b = 15 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
286 012 00	12	15	28	24	18,5	-	27	-	8	78	11,6
286 013 00	13	15	30	26	18,5	-	27	-	8	91	12,9
286 014 00	14	15	32	28	18,5	-	27	-	8	103	14,6
286 015 00	15	15	34	30	18,5	-	27	-	8	116	16,4
286 016 00	16	15	36	32	17,5	23	27	6	8	130	16,4
286 017 00	17	15	38	34	17,5	25	27	6	8	134	17,9
286 018 00	18	15	40	36	17,5	26	27	6	8	155	19,3
286 019 00	19	15	42	38	17,5	28	27	6	8	178	21,2
286 020 00	20	15	44	40	20	29	27	6	10	202	24,1
286 021 00	21	15	46	42	20	29	27	6	10	227	26,7
286 022 00	22	15	48	44	20	29	27	6	10	255	29,3
286 023 00	23	15	50	46	24	36	27	6	10	284	32,1
286 024 00	24	15	52	48	24	36	27	6	10	315	38,7
286 025 00	25	15	54	50	24	36	27	6	10	347	38,4
286 026 00	26	15	56	52	24	40	27	6	10	382	38,8
286 027 00	27	15	58	54	24	40	27	6	10	418	42,1
286 028 00	28	15	60	56	24	40	27	6	10	457	42,2
286 030 00	30	15	64	60	24	46	27	6	10	539	50,6
286 032 00	32	15	68	64	26	46	27	6	10	629	58,6
286 035 00	35	15	74	70	26	56	27	6	12	780	60,9
286 036 00	36	15	76	72	26	56	27	6	12	834	65,5
286 038 00	38	15	80	76	26	64	27	6	12	949	63,9
286 040 00	40	15	84	80	26	64	27	6	12	1074	77,0
286 042 00	42	15	88	84	26	64	27	6	12	1206	87,7
286 045 00	45	15	94	90	30	70	27	6	14	1323	100,6
286 048 00	48	15	100	96	30	76	27	6	14	1419	114,7
286 050 00	50	15	104	100	30	80	27	6	14	1483	116,7
286 055 00	55	15	114	110	30	90	27	6	14	1642	134,8
286 060 00	60	15	124	120	30	100	27	6	14	1800	153,8
286 070 00	70	15	144	140	30	110	27	6	14	2102	195,7

\* Basis of calculations see page 197.

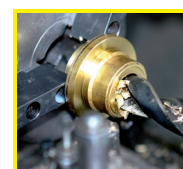
### Module 3.0 Tooth Width b = 19 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	ND mm	E mm	L mm	c mm	B mm	perm. MT* Ncm	Weight g
288 012 00	12	19	42	36	24	-	34	-	12	240	30,2
288 013 00	13	19	45	39	24	-	34	-	12	280	34,6
288 014 00	14	19	48	42	24	-	34	-	12	320	39,1
288 015 00	15	19	51	45	24	30	34	8	12	370	43,1
288 016 00	16	19	54	48	24	30	34	8	12	400	49,1
288 017 00	17	19	57	51	24	30	34	8	12	420	54,5
288 018 00	18	19	60	54	24	38	34	8	12	490	51,7
288 019 00	19	19	63	57	24	38	34	8	12	560	63,7
288 020 00	20	19	66	60	24	38	34	8	12	640	69,7
288 021 00	21	19	69	63	24	45	34	8	12	720	70,2
288 022 00	22	19	72	66	24	45	34	8	12	810	78,8
288 023 00	23	19	75	69	24	52	34	8	12	900	79,4
288 024 00	24	19	78	72	24	52	34	8	12	1000	86,9
288 025 00	25	19	81	75	28	58	34	8	14	1110	93,2
288 026 00	26	19	84	78	28	58	34	8	14	1220	102,2
288 027 00	27	19	87	81	28	58	34	8	14	1340	110,9
288 028 00	28	19	90	84	28	68	34	8	14	1460	108,6
288 030 00	30	19	96	90	28	68	34	8	14	1730	129,8
288 032 00	32	19	102	96	32	71	34	8	16	2020	149,9
288 033 00	33	19	105	99	32	71	34	8	16	2180	161,7
288 035 00	35	19	111	105	32	80	34	8	16	2510	169,8
288 038 00	38	19	120	114	32	89	34	8	16	3060	195,5
288 040 00	40	19	126	120	32	95	34	8	16	3330	208,5
288 045 00	45	19	141	135	32	110	34	8	16	3780	255,0

#### Note regarding the machining

Inside these die-cast parts are some cavities caused by production. These parts should therefore not be drilled too deep. With larger bores or when grooving the cavities might become visible. This often does not affect the functionality.

\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from POM, White, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d DIN 58405.

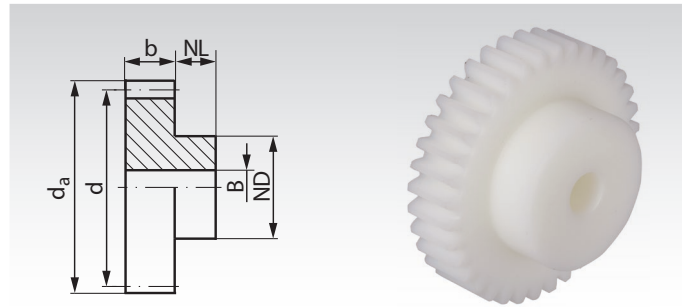
Pressure angle 20°.

Untoleranced dimensions in accordance with DIN ISO 2768 middle.

Temperature limit: continuous 100°C, only short time 140°C.

Water absorption (satiated) 0.5% Cws.

Other material reference values page 821.

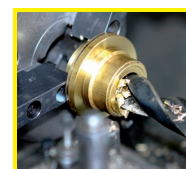


Ordering Details: e.g.: Product No. 291 010 00, Spur Gear, POM, Module 0.5, 10 Teeth

### Module 0.5 Tooth Width b = 4 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	B <sup>ISO10</sup> mm	perm. MT* Ncm	Weight g
291 010 00	10	4	6	5	4	3,5	2	0,7	0,12
291 012 00	12	4	7	6	4	4	2	1,0	0,18
291 013 00	13	4	7,5	6,5	4	5	2	1,2	0,25
291 014 00	14	4	8	7	4	5	2	1,3	0,28
291 015 00	15	4	8,5	7,5	4	6	3	1,5	0,28
291 016 00	16	4	9	8	4	6	3	1,6	0,34
291 017 00	17	4	9,5	8,5	4	6	3	1,7	0,36
291 018 00	18	4	10	9	4	6	3	1,9	0,42
291 019 00	19	4	10,5	9,5	4	8	3	2,2	0,57
291 020 00	20	4	11	10	4	8	3	2,5	0,63
291 021 00	21	4	11,5	10,5	4	8	3	2,8	0,66
291 022 00	22	4	12	11	4	8	3	3,2	0,71
291 023 00	23	4	12,5	11,5	4	8	3	3,5	0,80
291 024 00	24	4	13	12	4	8	3	3,9	0,80
291 025 00	25	4	13,5	12,5	4	10	3	4,3	0,90
291 026 00	26	4	14	13	4	10	3	4,7	1,10
291 027 00	27	4	14,5	13,5	4	10	3	5,1	1,10
291 028 00	28	4	15	14	4	10	3	5,6	1,20
291 030 00	30	4	16	15	4	10	3	6,5	1,40
291 032 00	32	4	17	16	4	12	4	7,6	1,60
291 035 00	35	4	18,5	17,5	4	12	4	9,3	1,70
291 036 00	36	4	19	18	4	12	4	10,0	1,80
291 038 00	38	4	20	19	4	12	4	11,3	2,10
291 040 00	40	4	21	20	4	12	4	12,7	2,20
291 042 00	42	4	22	21	4	12	4	14,2	2,40
291 045 00	45	4	23,5	22,5	4	12	4	16,7	2,70
291 048 00	48	4	25	24	4	12	4	19,3	3,00
291 050 00	50	4	26	25	4	15	4	21,0	3,00
291 052 00	52	4	27	26	4	15	4	23,0	3,80
291 054 00	54	4	28	27	4	15	4	25,0	4,00
291 055 00	55	4	28,5	27,5	4	15	4	26,5	4,20
291 056 00	56	4	29	28	4	15	4	27,0	4,30
291 060 00	60	4	31	30	5	15	4	29,0	5,00
291 064 00	64	4	33	32	5	18	5	31,0	6,00
291 065 00	65	4	33,5	32,5	5	18	5	32,0	6,30
291 070 00	70	4	36	35	5	18	5	34,0	6,80
291 072 00	72	4	37	36	5	18	5	35,5	7,10
291 075 00	75	4	38,5	37,5	5	18	5	37,0	7,70
291 080 00	80	4	41	40	5	18	5	39,5	8,40
291 085 00	85	4	43,5	42,5	5	25	5	41,9	11,50
291 090 00	90	4	46	45	5	25	5	44,0	12,20
291 096 00	96	4	49	48	5	25	5	47,0	13,00
291 100 00	100	4	51	50	5	25	5	49,0	14,30
291 114 00	114	4	58	57	5	25	5	55,0	17,60
291 120 00	120	4	61	60	5	25	5	58,0	18,60

\* Basis of calculations see page 197.



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from POM, White, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d DIN 58405.

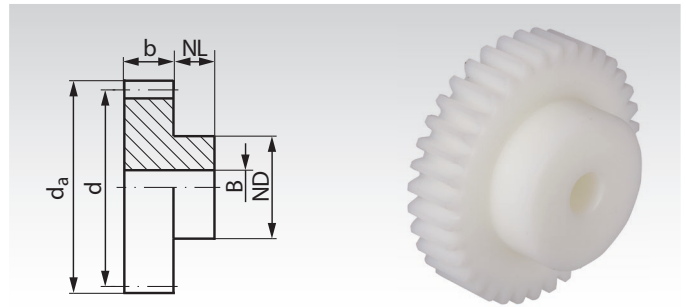
Pressure angle 20°.

Untoleranced dimensions in accordance with DIN ISO 2768 middle.

Temperature limit: continuous 100°C, only short time 140°C.

Water absorption (satiated) 0.5% Cws.

Other material reference values page 821.

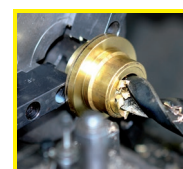


Ordering Details: e.g.: Product No. 292 010 00, Spur Gear, POM, Module 0.7, 10 Teeth

### Module 0.7 Tooth Width b = 5 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	B <sup>JS10</sup> mm	perm. MT* Ncm	Weight g
292 010 00	10	5	8,4	7	6	5	3	1,9	0,30
292 012 00	12	5	9,8	8,4	6	6	3	2,6	0,50
292 013 00	13	5	10,5	9,1	6	7	3	3,0	0,65
292 014 00	14	5	11,2	9,8	6	8	3	3,4	0,85
292 015 00	15	5	11,9	10,5	6	8	3	3,8	0,88
292 016 00	16	5	12,6	11,2	6	8	3	4,3	0,95
292 017 00	17	5	13,3	11,9	6	8	3	4,4	1,00
292 018 00	18	5	14	12,6	6	10	3	5,1	1,40
292 019 00	19	5	14,7	13,3	6	10	3	5,8	1,40
292 020 00	20	5	15,4	14	6	10	4	6,6	1,50
292 021 00	21	5	16,1	14,7	6	10	4	7,4	1,60
292 022 00	22	5	16,8	15,4	6	12	4	8,2	2,10
292 023 00	23	5	17,5	16,1	6	12	4	9,2	2,10
292 024 00	24	5	18,2	16,8	6	12	4	10,1	2,20
292 025 00	25	5	18,9	17,5	6	12	4	11,2	2,40
292 026 00	26	5	19,6	18,2	6	12	4	12,2	2,50
292 027 00	27	5	20,3	18,9	6	12	4	13,4	2,70
292 028 00	28	5	21	19,6	6	12	4	14,6	2,80
292 030 00	30	5	22,4	21	6	15	4	17,1	3,60
292 032 00	32	5	23,8	22,4	6	15	4	20,0	4,10
292 035 00	35	5	25,9	24,5	6	15	4	24,5	4,50
292 036 00	36	5	26,6	25,2	6	15	4	26,0	4,70
292 038 00	38	5	28	26,6	6	15	4	29,5	5,20
292 040 00	40	5	29,4	28	6	15	4	33,5	5,50
292 042 00	42	5	30,8	29,4	6	20	5	37,5	7,10
292 045 00	45	5	32,9	31,5	6	20	5	44,0	7,80
292 048 00	48	5	35	33,6	6	20	5	51,0	8,20
292 050 00	50	5	36,4	35	6	20	5	56,0	9,00
292 052 00	52	5	37,8	36,4	6	20	5	61,5	9,60
292 054 00	54	5	39,2	37,8	6	20	5	65,0	9,00
292 055 00	55	5	39,9	38,5	6	20	5	66,0	8,50
292 056 00	56	5	40,6	39,2	6	20	5	67,5	10,60
292 060 00	60	5	43,4	42	8	20	5	72,5	12,70
292 064 00	64	5	46,2	44,8	8	20	5	77,5	14,40
292 065 00	65	5	46,9	45,5	8	20	5	79,0	14,60
292 070 00	70	5	50,4	49	8	20	5	85,0	16,30
292 072 00	72	5	51,8	50,4	8	20	6	87,0	17,00
292 075 00	75	5	53,9	52,5	8	20	6	90,5	18,10
292 080 00	80	5	57,4	56	8	20	6	96,5	20,10
292 085 00	85	5	60,9	59,5	8	20	6	101,5	22,20
292 090 00	90	5	64,4	63	8	20	6	109,0	24,70
292 096 00	96	5	68,6	67,2	8	25	8	116,0	29,20
292 100 00	100	5	71,4	70	8	25	8	121,0	30,50
292 114 00	114	5	81,2	79,8	8	25	8	137,5	39,80
292 120 00	120	5	85,4	84	8	25	8	144,5	43,20

\* Basis of calculations see page 197.



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from POM, White, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d25 DIN 3967.

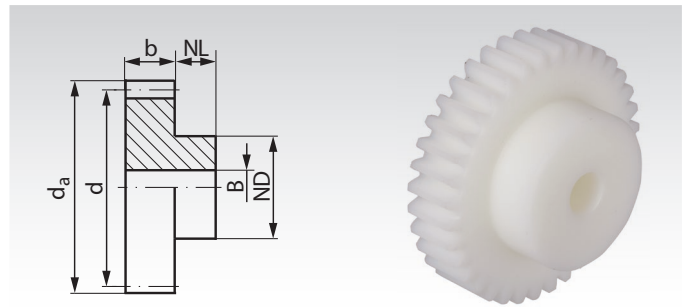
Pressure angle 20°.

Untoleranced dimensions in accordance with DIN ISO 2768 middle.

Temperature limit: continuous 100°C, only short time 140°C.

Water absorption (satiated) 0.5% Cws.

Other material reference values page 821.

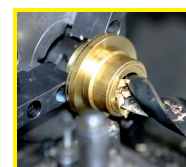


Ordering Details: e.g.: Product No. 293 010 00, Spur Gear, POM, Module 1, 10 Teeth

### Module 1.0 Tooth Width b = 10 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BS10 mm	perm. MT* Ncm	Weight g
293 010 00	10	10	12	10	6	8	5	8,3	1,0
293 011 00	11	10	13	11	6	8	5	9,8	1,2
293 012 00	12	10	14	12	6	10	5	11,4	1,7
293 013 00	13	10	15	13	6	10	5	13,1	2,0
293 014 00	14	10	16	14	6	10	5	14,9	2,3
293 015 00	15	10	17	15	6	12	5	16,8	2,8
293 016 00	16	10	18	16	6	12	5	18,7	3,2
293 017 00	17	10	19	17	6	12	5	19,3	3,5
293 018 00	18	10	20	18	6	12	5	22,2	4,0
293 019 00	19	10	21	19	6	15	5	25,5	4,9
293 020 00	20	10	22	20	8	15	5	29,0	5,8
293 021 00	21	10	23	21	8	15	5	32,5	6,2
293 022 00	22	10	24	22	8	15	5	36,0	6,5
293 023 00	23	10	25	23	8	15	5	40,0	7,1
293 024 00	24	10	26	24	8	15	5	44,5	7,6
293 025 00	25	10	27	25	8	15	5	49,0	8,2
293 026 00	26	10	28	26	8	15	5	54,0	8,7
293 027 00	27	10	29	27	8	15	5	59,0	9,3
293 028 00	28	10	30	28	8	15	5	64,0	9,9
293 030 00	30	10	32	30	8	15	5	75,5	11,2
293 032 00	32	10	34	32	8	18	6	88,0	13,2
293 035 00	35	10	37	35	8	18	6	109,0	15,4
293 036 00	36	10	38	36	8	18	6	116,0	16,1
293 038 00	38	10	40	38	8	18	6	132,0	17,9
293 040 00	40	10	42	40	8	18	6	148,0	19,6
293 042 00	42	10	44	42	8	18	6	166,0	21,5
293 045 00	45	10	47	45	8	18	6	196,0	24,0
293 048 00	48	10	50	48	8	20	6	228,0	27,8
293 050 00	50	10	52	50	8	20	6	245,0	30,0
293 052 00	52	10	54	52	8	20	6	254,0	32,4
293 054 00	54	10	56	54	8	20	6	264,0	34,6
293 055 00	55	10	57	55	8	20	6	269,0	35,6
293 056 00	56	10	58	56	8	20	6	274,0	36,9
293 060 00	60	10	62	60	8	25	6	295,0	44,1
293 064 00	64	10	66	64	10	25	6	316,0	51,1
293 065 00	65	10	67	65	10	25	6	321,0	52,7
293 070 00	70	10	72	70	10	25	6	347,0	59,6
293 072 00	72	10	74	72	10	30	6	357,0	65,5
293 075 00	75	10	77	75	10	30	6	372,0	71,1
293 080 00	80	10	82	80	10	50	10	397,0	94,7
293 085 00	85	10	87	85	10	50	10	422,0	104,1
293 090 00	90	10	92	90	10	50	10	447,0	113,1
293 096 00	96	10	98	96	10	50	10	468,0	126,1
293 100 00	100	10	102	100	10	50	10	496,0	135,0
293 120 00	120	10	122	120	10	50	10	594,0	182,6

\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from POM, White, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d25 DIN 3967.

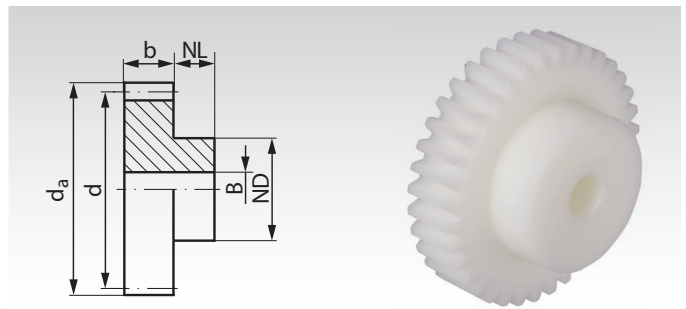
Pressure angle 20°.

Untoleranced dimensions in accordance with DIN ISO 2768 midle.

Temperature limit: continuous 100°C, only short time 140°C.

Water absorption (satiated) 0.5% Cws.

Other material reference values page 821.



Ordering Details: e.g.: Product No. 294 010 00, Spur Gear, Delrin, Module 1.25, 10 Teeth

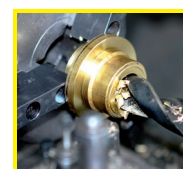
### Module 1.25 Tooth Width b = 10 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BS10 mm	perm. MT* Ncm	Weight g
294 010 00	10	10	15	12,5	8	10	5	14	2,1
294 012 00	12	10	17,5	15	10	10	5	19	3,0
294 014 00	14	10	20	17,5	10	12	5	25	4,3
294 015 00	15	10	21,25	18,75	10	15	8	28	4,7
294 018 00	18	10	25	22,5	10	15	8	41	6,4
294 020 00	20	10	27,5	25	10	15	8	52	7,8
294 024 00	24	10	32,5	30	10	20	8	73	12,7
294 025 00	25	10	33,75	31,25	10	20	8	81	13,3
294 030 00	30	10	40	37,5	10	20	8	125	18,4
294 032 00	32	10	42,5	40	10	20	8	145	20,4
294 035 00	35	10	46,25	43,75	10	20	8	179	23,8
294 036 00	36	10	47,5	45	10	20	8	192	24,9
294 038 00	38	10	50	47,5	10	20	8	218	27,7
294 040 00	40	10	52,5	50	10	20	8	246	30,2
294 050 00	50	10	65	62,5	10	20	8	383	45,6

### Module 1.5 Tooth Width b = 15 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BS10 mm	perm. MT* Ncm	Weight g
295 010 00	10	15	18	15	10	12	6	30	4,0
295 012 00	12	15	21	18	10	18	8	42	6,6
295 013 00	13	15	22,5	19,5	10	18	8	48	7,6
295 014 00	14	15	24	21	10	18	8	55	8,6
295 015 00	15	15	25,5	22,5	10	18	8	63	9,7
295 016 00	16	15	27	24	10	20	10	70	10,7
295 018 00	18	15	30	27	10	20	10	82	13,4
295 020 00	20	15	33	30	10	25	10	106	18,5
295 022 00	22	15	36	33	10	25	10	134	21,6
295 024 00	24	15	39	36	10	25	10	165	25,0
295 025 00	25	15	40,5	37,5	10	25	10	182	26,7
295 028 00	28	15	45	42	10	25	10	238	32,7
295 030 00	30	15	48	45	10	30	10	281	40,1
295 032 00	32	15	51	48	10	30	10	328	44,5
295 035 00	35	15	55,5	52,5	10	30	10	405	51,9
295 036 00	36	15	57	54	10	30	10	433	54,5
295 038 00	38	15	60	57	10	30	10	493	59,7
295 040 00	40	15	63	60	10	30	10	557	65,8
295 042 00	42	15	66	63	10	35	10	625	75,4
295 045 00	45	15	70,5	67,5	10	35	10	736	85,4
295 048 00	48	15	75	72	10	35	10	792	96,1
295 050 00	50	15	78	75	10	35	10	828	102
295 055 00	55	15	85,5	82,5	10	35	10	917	122
295 060 00	60	15	93	90	10	40	10	1005	147
295 065 00	65	15	100,5	97,5	10	40	10	1090	171
295 070 00	70	15	108	105	10	40	10	1180	195
295 072 00	72	15	111	108	10	40	10	1170	205
295 075 00	75	15	115,5	112,5	10	40	10	1320	220
295 080 00	80	15	123	120	10	50	10	1350	265
295 090 00	90	15	138	135	10	50	10	1510	322
295 100 00	100	15	153	150	10	50	10	1680	393
295 120 00	120	15	183	180	10	70	15	2000	588

\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears made from POM White, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d25 DIN 3967.

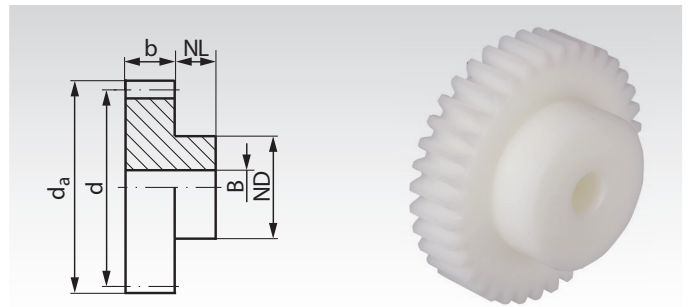
Pressure angle 20°.

Untoleranced dimensions in accordance with DIN ISO 2768 m.

Temperature limit: continuous 100°C, only short time 140°C.

Water absorption (satiated) 0.5% Cws.

Other material reference values page 821.

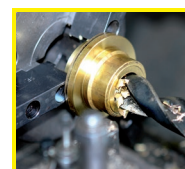


Ordering Details: e.g.: Product No. 296 010 00, Spur Gear, POM, Module 2.0, 10 Teeth

### Module 2.0 Tooth Width b = 16 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BS10 mm	perm. MT* Ncm	Weight g
296 010 00	10	16	24	20	15	15	8	60	8,0
296 012 00	12	16	28	24	15	20	8	83	13,9
296 014 00	14	16	32	28	15	20	8	108	18,0
296 015 00	15	16	34	30	15	20	12	124	17,0
296 016 00	16	16	36	32	15	25	12	138	23,2
296 018 00	18	16	40	36	15	30	12	165	32,0
296 020 00	20	16	44	40	15	30	12	215	37,3
296 024 00	24	16	52	48	15	30	12	340	50,0
296 025 00	25	16	54	50	15	30	12	370	53,6
296 028 00	28	16	60	56	15	30	12	485	64,4
296 030 00	30	16	64	60	15	30	12	575	72,7
296 032 00	32	16	68	64	15	40	12	670	92,6
296 035 00	35	16	74	70	15	45	12	780	114
296 036 00	36	16	76	72	15	45	12	915	118
296 040 00	40	16	84	80	15	50	12	1145	149
296 045 00	45	16	94	90	15	50	12	1410	177
296 050 00	50	16	104	100	15	60	12	1580	231
296 056 00	56	16	116	112	15	60	12	1770	272
296 060 00	60	16	124	120	15	60	12	1920	307
296 070 00	70	16	144	140	20	70	15	2260	439
296 072 00	72	16	148	144	20	70	15	2325	459
296 075 00	75	16	154	150	20	70	20	2420	482
296 080 00	80	16	164	160	20	70	20	2585	536
296 090 00	90	16	184	180	20	70	20	2890	654
296 100 00	100	16	204	200	20	80	20	3210	819
296 120 00	120	16	244	240	20	80	20	3840	1125

\* Basis of calculations see page 197.



Reworking within  
24h-service possible.  
Custom made parts  
on request.



## Spur Gears made from POM White, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d25 DIN 3967.

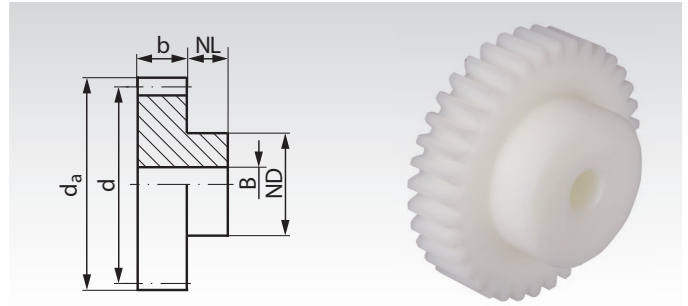
Pressure angle 20°.

Untoleranced dimensions in accordance with DIN ISO 2768m.

Temperature limit: continuous 100°C, only short time 140°C.

Water absorption (satiated) 0.5% Cws.

Other material reference values page 821.



Ordering Details: e.g.: Product No. 297 010 00, Spur Gear, POM, Module 2.5, 10 Teeth

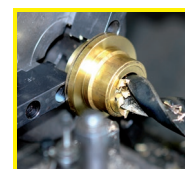
### Module 2.5 Tooth Width b = 20 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	B <sup>JS10</sup> mm	perm. MT* Ncm	Weight g
297 010 00	10	20	30	25	15	20	10	123	15,6
297 012 00	12	20	35	30	15	20	10	171	21,7
297 014 00	14	20	40	35	15	20	10	223	29,3
297 015 00	15	20	42,5	37,5	15	25	12	256	35,0
297 016 00	16	20	45	40	15	25	12	285	39,5
297 018 00	18	20	50	45	15	30	12	340	53,0
297 020 00	20	20	55	50	15	30	12	445	63,0
297 024 00	24	20	65	60	15	30	12	700	87,0
297 025 00	25	20	67,5	62,5	15	40	12	770	105
297 028 00	28	20	75	70	15	40	12	1010	127
297 030 00	30	20	80	75	15	40	12	1200	143
297 035 00	35	20	92,5	87,5	15	50	12	1730	202
297 036 00	36	20	95	90	15	50	15	1920	226
297 040 00	40	20	105	100	20	50	15	2390	264
297 045 00	45	20	117,5	112,5	20	50	15	2760	322
297 050 00	50	20	130	125	20	70	15	3100	443
297 056 00	56	20	145	140	20	70	20	3470	515
297 060 00	60	20	155	150	20	70	20	3740	585
297 072 00	72	20	185	180	20	80	20	4530	826
297 080 00	80	20	205	200	20	90	20	5030	1029
297 090 00	90	20	230	225	20	100	20	5670	1301
297 100 00	100	20	255	250	20	100	25	6290	1549
297 120 00	120	20	305	300	20	120	25	7530	2242

### Module 3.0 Tooth Width b = 25 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	B <sup>JS10</sup> mm	perm. MT* Ncm	Weight g
298 010 00	10	25	36	30	15	25	12	230	27
298 012 00	12	25	42	36	15	25	12	320	38
298 014 00	14	25	48	42	15	25	12	420	52
298 015 00	15	25	51	45	15	25	12	480	58
298 018 00	18	25	60	54	15	30	12	645	87
298 020 00	20	25	66	60	15	30	12	840	106
298 024 00	24	25	78	72	15	30	12	1320	149
298 025 00	25	25	81	75	15	45	15	1460	179
298 028 00	28	25	90	84	15	45	15	1920	217
298 030 00	30	25	96	90	15	45	15	2270	244
298 035 00	35	25	111	105	15	45	15	3500	325
298 036 00	36	25	114	108	15	45	15	3750	340
298 040 00	40	25	126	120	15	50	15	4370	424
298 045 00	45	25	141	135	15	50	20	4960	521
298 048 00	48	25	150	144	15	50	20	5320	603
298 050 00	50	25	156	150	20	70	20	5560	708
298 056 00	56	25	174	168	20	70	20	6220	854
298 060 00	60	25	186	180	20	70	20	6750	987

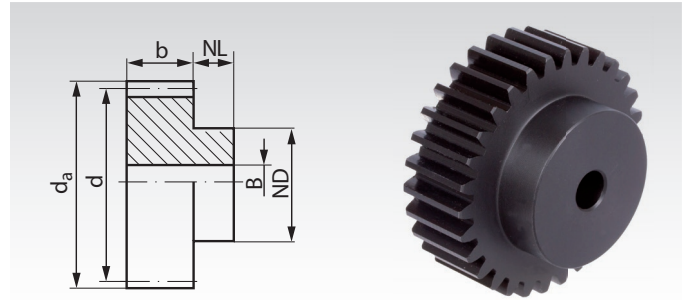
\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears made from POM black, wide version, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d25 DIN 3967.  
 Pressure angle 20°.  
 Untoleranced dimensions in accordance with DIN ISO 2768 m.  
 Temperature limit: continuous 100°C, only short time 140°C.  
 Water absorption (satiated) 0.5% Cws.  
 Other material reference values page 821.



Order. Details: e.g.: Product No. 293 110 10, Spur Gear, POM black, Module 1, 10 Teeth

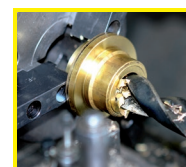
### Module 1.0 Tooth Width b = 15 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BS10 mm	perm. MT* Ncm	Weight g
293 110 10	10	15	12	10	10	8	4	13	1,6
293 110 12	12	15	14	12	10	9	4	17	2,2
293 110 15	15	15	17	15	10	12	6	25	4,3
293 110 18	18	15	20	18	10	15	6	33	6,8
293 110 20	20	15	22	20	10	16	6	44	8,3
293 110 24	24	15	26	24	10	20	8	67	11,5
293 110 25	25	15	27	25	10	20	8	74	12,3
293 110 28	28	15	30	28	10	20	8	96	14,9
293 110 30	30	15	32	30	10	20	8	113	16,8
293 110 32	32	15	34	32	10	25	8	132	21,3
293 110 36	36	15	38	36	10	25	8	174	25,7
293 110 40	40	15	42	40	10	25	8	222	30,7
293 110 45	45	15	47	45	10	30	8	294	40,6
293 110 50	50	15	52	50	10	30	8	368	48,4
293 110 56	56	15	58	56	10	40	8	411	66,4
293 110 60	60	15	62	60	10	40	8	443	73,9
293 110 72	72	15	74	72	10	50	10	536	109
293 110 75	75	15	77	75	10	50	10	558	116
293 110 80	80	15	82	80	10	60	10	596	141
293 110 90	90	15	92	90	10	60	10	671	169
293 111 00	100	15	102	100	10	60	10	744	200

### Module 1.5 Tooth Width b = 17 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BS10 mm	perm. MT* Ncm	Weight g
295 110 10	10	17	18	15	13	12	6	34	5,0
295 110 12	12	17	21	18	13	14	6	48	7,6
295 110 15	15	17	25,5	22,5	13	18	8	71	11,9
295 110 18	18	17	30	27	13	20	8	93	16,5
295 110 20	20	17	33	30	13	25	8	120	22,8
295 110 24	24	17	39	36	13	25	8	187	30,2
295 110 25	25	17	40,5	37,5	13	25	8	206	32,2
295 110 28	28	17	45	42	13	30	8	270	42,7
295 110 30	30	17	48	45	13	30	8	318	47,5
295 110 36	36	17	57	54	13	35	8	491	68,6
295 110 40	40	17	63	60	13	40	8	631	86,6
295 110 45	45	17	70,5	67,5	13	50	12	834	115
295 110 50	50	17	78	75	13	50	12	938	135
295 110 56	56	17	87	84	13	60	12	966	177
295 110 60	60	17	93	90	13	60	12	1140	196
295 110 72	72	17	111	108	13	80	12	1330	302
295 110 90	90	17	138	135	13	80	12	1710	423

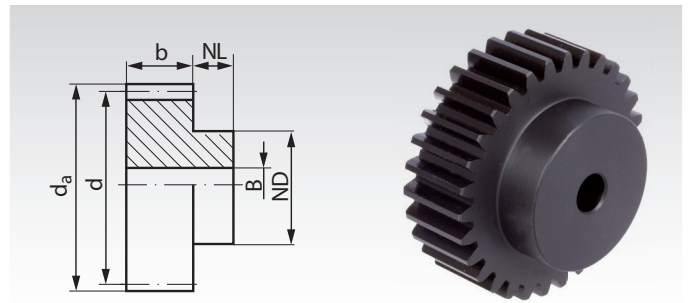
\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears made from POM black, wide version, with One-Sided Hub, Milled Teeth, Straight Tooth System

Tooth quality 10d25 DIN 3967.  
 Pressure angle 20°.  
 Untoleranced dimensions in accordance with DIN ISO 2768 m.  
 Temperature limit: continuous 100°C, only short time 140°C.  
 Water absorption (satiated) 0.5% Cws.  
 Other material reference values page 821.



Order. Details: e.g.: Product No. 296 110 10, Spur Gear, POM black, Module 2, 10 Teeth

### Module 2.0 Tooth Width b = 20 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	B <sup>JS10</sup> mm	perm. MT* Ncm	Weight g
296 110 10	10	20	24	20	15	15	8	75	9,9
296 110 12	12	20	28	24	15	18	8	104	15,4
296 110 15	15	20	34	30	15	24	8	155	25,9
296 110 18	18	20	40	36	15	25	8	206	35,3
296 110 20	20	20	44	40	15	30	8	269	46,4
296 110 24	24	20	52	48	15	35	12	425	64,6
296 110 25	25	20	54	50	15	35	12	463	68,9
296 110 30	30	20	64	60	15	40	12	719	98,9
296 110 36	36	20	76	72	15	50	12	1145	148
296 110 40	40	20	84	80	15	50	12	1430	175
296 110 45	45	20	94	90	15	60	12	1760	230
296 110 50	50	20	104	100	15	70	15	1980	289
296 110 60	60	20	124	120	15	70	15	2400	385
296 110 90	90	20	184	180	15	90	20	3610	821

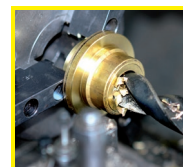
### Module 2.5 Tooth Width b = 25 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	B <sup>JS10</sup> mm	perm. MT* Ncm	Weight g
297 110 10	10	25	30	25	15	20	8	154	20,0
297 110 12	12	25	35	30	15	20	8	214	27,5
297 110 15	15	25	42,5	37,5	15	25	8	320	44,9
297 110 18	18	25	50	45	15	35	8	425	71,5
297 110 20	20	25	55	50	15	35	12	556	81,7
297 110 24	24	25	65	60	15	40	12	875	118
297 110 25	25	25	67,5	62,5	15	45	12	965	133
297 110 30	30	25	80	75	15	50	12	1500	187
297 110 36	36	25	95	90	15	60	12	2400	273
297 110 40	40	25	105	100	15	70	12	3000	346
297 110 45	45	25	117,5	112,5	15	70	15	3450	414
297 110 50	50	25	130	125	15	80	15	3880	519
297 110 60	60	25	155	150	15	90	15	4680	734

### Module 3.0 Tooth Width b = 30 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	B <sup>JS10</sup> mm	perm. MT* Ncm	Weight g
298 110 10	10	30	36	30	20	25	12	279	35,1
298 110 12	12	30	42	36	20	25	12	384	48,0
298 110 15	15	30	51	45	20	35	12	576	84,9
298 110 18	18	30	60	54	20	45	12	774	131
298 110 20	20	30	66	60	20	45	12	1010	154
298 110 24	24	30	78	72	20	50	12	1580	216
298 110 25	25	30	81	75	20	60	14	1750	251
298 110 30	30	30	96	90	20	60	14	2720	332
298 110 35	35	30	111	105	20	80	14	4190	489
298 110 36	36	30	114	108	20	80	14	4500	509
298 110 40	40	30	126	120	20	80	14	5240	599
298 110 45	45	30	141	135	20	90	20	5950	749
298 110 50	50	30	156	150	20	100	20	6670	930
298 110 60	60	30	186	180	20	100	20	8100	1253

\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made From Plastic with Steel Core, Milled, Straight Teeth

**Material:** Outer part: Plastic PA 12 G.  
Steel core: Choice of C45 or Stainless Steel 1.4305.

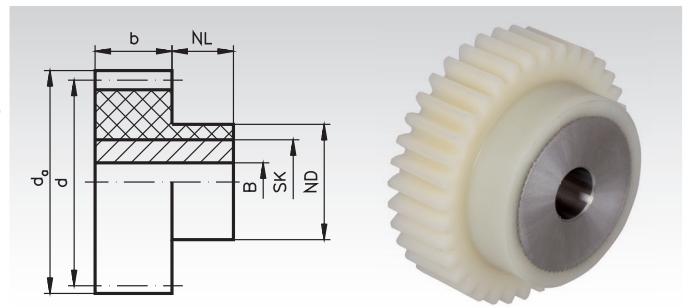


Temperature

Tooth quality 8e25 DIN 3967.  
range -60°C to +120° C, short periods 150° C.

- Special plastic with excellent material properties.
- Enables snugly fitting, high strength shaft-hub connection.
- Optimal force transmission due to cylindrical contact area.
- Light, silent and clean, with excellent dry running properties.

Ordering Details: e.g.: Product No. 218 550 25, spur gear, module 1.5, 25 teeth



### Module 1.5 Tooth width b = 17 mm

Product No. C45 core	Product No. Stainl. steel core	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	SK mm	B H7 mm	perm. MT* Nm	Weight g
218 550 25	218 950 25	25	17	40,5	37,5	13	33	25	10	2,1	112
218 550 30	218 950 30	30	17	48	45	13	35	25	10	3,2	122
218 550 32	218 950 32	32	17	51	48	13	35	25	10	3,7	125
218 550 36	218 950 36	36	17	57	54	13	45	35	10	4,9	238
218 550 40	218 950 40	40	17	63	60	13	50	40	10	6,3	312
218 550 45	218 950 45	45	17	70,5	67,5	13	50	40	10	8,3	325
218 550 48	218 950 48	48	17	75	72	13	55	45	10	9,0	407
218 550 50	218 950 50	50	17	78	75	13	55	45	10	9,4	413
218 550 56	218 950 56	56	17	87	84	13	65	55	15	10,6	582
218 550 60	218 950 60	60	17	93	90	13	70	60	15	11,4	695
218 550 64	218 950 64	64	17	99	96	13	70	60	15	12,2	710
218 550 70	218 950 70	70	17	108	105	13	70	60	15	13,4	735
218 550 72	218 950 72	72	17	111	108	13	80	70	15	13,8	967
218 550 80	218 950 80	80	17	123	120	13	85	75	20	15,3	1096
218 550 90	218 950 90	90	17	138	135	13	90	80	20	17,1	1281
218 551 00	218 951 00	100	17	153	150	13	110	90	20	19,0	1652
218 551 20	218 951 20	120	17	183	180	13	120	90	20	22,7	2114

### Module 2.0 Tooth width b = 20 mm

Product No. C45 core	Product No. Stainl. steel core	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	SK mm	B H7 mm	perm. MT* Nm	Weight g
231 550 18	231 950 18	18	20	40	36	15	31	25	10	2,1	127
231 550 20	231 950 20	20	20	44	40	15	35	25	10	2,7	135
231 550 25	231 950 25	25	20	54	50	15	45	35	10	4,6	271
231 550 28	231 950 28	28	20	60	56	15	45	35	15	6,1	254
231 550 30	231 950 30	30	20	64	60	15	50	40	15	7,2	338
231 550 32	231 950 32	32	20	68	64	15	50	40	15	8,4	345
231 550 35	231 950 35	35	20	74	70	15	55	45	15	10,4	444
231 550 36	231 950 36	36	20	76	72	15	55	45	15	11,1	448
231 550 40	231 950 40	40	20	84	80	15	65	55	20	14,3	631
231 550 45	231 950 45	45	20	94	90	15	70	60	20	17,6	774
231 550 48	231 950 48	48	20	100	96	15	70	60	20	19,0	792
231 550 50	231 950 50	50	20	104	100	15	75	65	20	19,8	930
231 550 56	231 950 56	56	20	116	112	15	80	70	20	23,8	1105
231 550 60	231 950 60	60	20	124	120	15	85	75	20	24,0	1280
231 550 64	231 950 64	64	20	132	128	15	90	80	20	25,7	1467
231 550 70	231 950 70	70	20	144	140	15	90	80	25	28,1	1469
231 550 72	231 950 72	72	20	148	144	15	90	80	25	28,8	1487
231 550 80	231 950 80	80	20	164	160	15	100	90	25	32,0	1905
231 550 90	231 950 90	90	20	184	180	15	110	90	25	36,1	2393
231 551 00	231 951 00	100	20	204	200	15	120	110	25	40,1	2933
231 551 20	231 951 20	120	20	244	240	15	130	120	25	47,8	3671

\* Basis of calculations see page 197.

#### On request:

Other versions and components made from PA 6 G / PA 12 G without core or with aluminium core.

#### Plastic PA 12 G

Produced using the vertical casting process.  
High-molecular, high crystalline and almost stress free.  
Very low moisture absorption, excellent dimensional stability.  
High viscosity even at very low temperatures.  
Very good mechanical and chemical resistance.

#### Steel core

Core with cylindrical body surface, knurled, permanently cast-in.  
As standard made from C45 and 1.4305.  
On request in aluminium.  
Bore tolerance H7, finished after casting.  
The steel core allows the transfer of high torque even for small shaft diameters and correspondingly small parallel key connections.

## Spur Gears Made From Plastic with Steel Core, Milled, Straight Teeth

**Material:** Outer part: Plastic PA 12 G.  
Steel core: Choice of C45 or  
Stainless Steel 1.4305.

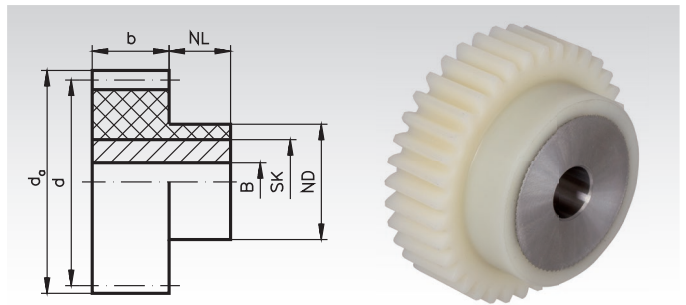


Temperature

Tooth quality 8e25 DIN 3967.  
range -60°C to +120° C, short periods 150° C.

- Special plastic with excellent material properties.
- Enables snugly fitting, high strength shaft-hub connection.
- Optimal force transmission due to cylindrical contact area.
- Light, silent and clean, with excellent dry running properties.

Ordering Details: e.g.: Product No. 232 550 15, spur gear, module 2,5, 15 teeth



### Module 2.5 Tooth width b = 25 mm

Product No. C45 core	Product No. Stainl. steel core	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	SK mm	B <sup>H7</sup> mm	perm. MT* Nm	Weight g
232 550 15	232 950 15	15	25	42,5	37,5	15	31	25	10	3,2	148
232 550 18	232 950 18	18	25	50	45	15	35	25	10	4,3	164
232 550 20	232 950 20	20	25	55	50	15	45	35	15	5,6	280
232 550 24	232 950 24	24	25	65	60	15	50	40	15	8,8	388
232 550 25	232 950 25	25	25	67,5	62,5	15	50	40	15	9,6	394
232 550 30	232 950 30	30	25	80	75	15	55	45	15	15,0	525
232 550 32	232 950 32	32	25	85	80	15	65	55	15	17,6	768
232 550 36	232 950 36	36	25	95	90	15	70	60	15	22,8	933
232 550 40	232 950 40	40	25	105	100	15	75	65	20	29,9	1070
232 550 45	232 950 45	45	25	117,5	112,5	15	80	70	20	34,5	1276
232 550 48	232 950 48	48	25	125	120	15	85	75	20	35,3	1475
232 550 50	232 950 50	50	25	130	125	15	85	75	20	38,8	1499
232 550 60	232 950 60	60	25	155	150	15	100	90	20	46,8	2197
232 550 70	232 950 70	70	25	180	175	15	100	90	20	54,8	2358
232 550 72	232 950 72	72	25	185	180	15	110	90	20	56,1	2824
232 550 80	232 950 80	80	25	205	200	15	120	110	20	62,2	3451

### Module 3.0 Tooth width b = 30 mm

Product No. C45 core	Product No. Stainl. steel core	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	SK mm	B <sup>H7</sup> mm	perm. MT* Nm	Weight g
233 550 15	233 950 15	15	30	51	45	20	35	25	10	5,8	204
233 550 18	233 950 18	18	30	60	54	20	45	35	10	7,7	398
233 550 20	233 950 20	20	30	66	60	20	45	35	15	10,1	376
233 550 24	233 950 24	24	30	78	72	20	55	45	15	15,8	643
233 550 25	233 950 25	25	30	81	75	20	55	45	15	17,5	654
233 550 30	233 950 30	30	30	96	90	20	70	60	15	27,2	1163
233 550 36	233 950 36	36	30	114	108	20	80	70	20	42,0	1565
233 550 40	233 950 40	40	30	126	120	20	85	75	20	52,4	1837
233 550 45	233 950 45	45	30	141	135	20	85	75	20	59,5	1927
233 550 48	233 950 48	48	30	150	144	20	90	80	20	63,8	2208
233 550 50	233 950 50	50	30	156	150	20	100	90	20	66,7	2734
233 550 60	233 950 60	60	30	186	180	20	100	90	20	81,0	2969

### Module 4.0 Tooth width b = 40 mm

Product No. C45 core	Product No. Stainl. steel core	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	SK mm	B <sup>H7</sup> mm	perm. MT* Nm	Weight g
234 550 12	234 950 12	12	40	56	48	20	35	25	10	8,1	256
234 550 15	234 950 15	15	40	68	60	20	50	40	20	12,1	519
234 550 16	234 950 16	16	40	72	64	20	50	40	20	13,5	535
234 550 20	234 950 20	20	40	88	80	20	65	55	20	20,9	1100
234 550 24	234 950 24	24	40	104	96	20	75	65	20	33,4	1588
234 550 25	234 950 25	25	40	108	100	20	75	65	20	38,4	1613
234 550 30	234 950 30	30	40	128	120	20	85	75	20	66,1	2227
234 550 36	234 950 36	36	40	152	144	20	100	90	30	98,7	3081
234 550 40	234 950 40	40	40	168	160	20	100	90	30	120,4	3234
234 550 45	234 950 45	45	40	188	180	20	110	90	30	135,6	4092
234 550 50	234 950 50	50	40	208	200	20	120	110	30	153,0	5042
234 550 60	234 950 60	60	40	248	240	20	130	120	30	185,8	6376

\* Basis of calculations see page 197.

## Spur Gears Made from Brass, Milled Teeth, Straight Tooth System

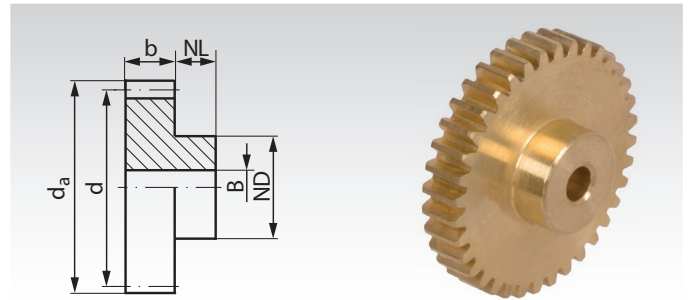
Material: Ms58 (2.0401).

Tooth quality 8d DIN 58405.

Pressure angle 20°.

Up to 30 teeth without hub.

From 40 teeth with one-sided hub.



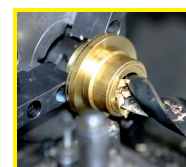
Ordering Details: e.g.: Product No. 260 010 00, Spur Gear Ms, Module 0.3, 10 Teeth

### Module 0.3

Product No.	Number of teeth	b** mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
260 010 00	10	5	3,6	3	-	-	1,0	0,14	0,1
260 012 00	12	5	4,2	3,6	-	-	1,5	0,18	0,2
260 014 00	14	5	4,8	4,2	-	-	2,0	0,23	0,4
260 015 00	15	5	5,1	4,5	-	-	2,0	0,25	0,5
260 016 00	16	5	5,4	4,8	-	-	2,0	0,27	0,6
260 018 00	18	5	6,0	5,4	-	-	2,0	0,36	0,8
260 020 00	20	5	6,6	6	-	-	2,0	0,40	1,0
260 022 00	22	5	7,2	6,6	-	-	2,0	0,49	1,3
260 024 00	24	5	7,8	7,2	-	-	2,0	0,60	1,4
260 025 00	25	5	8,1	7,5	-	-	2,0	0,65	1,6
260 030 00	30	5	9,6	9	-	-	2,0	1,00	2,3
260 040 00	40	2	12,6	12	3	10	3,0	1,85	3,5
260 050 00	50	2	15,6	15	5	10	3,0	3,00	5,7
260 060 00	60	2	18,6	18	5	10	3,0	4,50	6,9
260 080 00	80	2	24,6	24	5	15	3,0	8,50	14,7
260 100 00	100	2	30,6	30	5	15	3,0	14,00	18,5
260 120 00	120	2	36,6	36	5	15	3,0	21,00	23,7

\* Basis of calculations see page 197.

\*\* Up to a No. of Teeth of 30 the teeth run over the entire width of the gear.



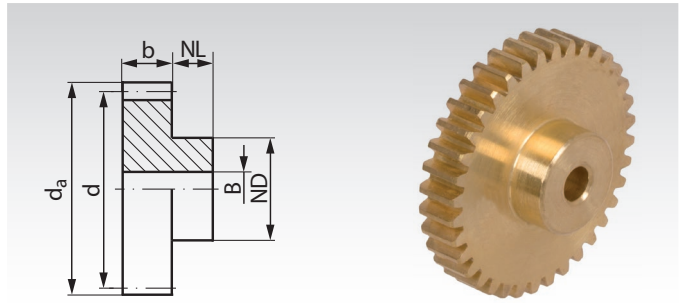
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Brass, with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: Ms58 (2.0401).

Tooth quality 8d DIN 58405.

Pressure angle 20°.

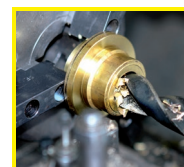


Ordering Details: e.g.: Product No. 261 010 00, Spur Gear, Ms58, Module 0.5, 10 Teeth

### Module 0.5 Tooth Width b = 2 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
261 010 00	10	2	6	5	4	4	2	0,42	0,5
261 012 00	12	2	7	6	4	4	2	0,55	0,7
261 013 00	13	2	7,5	6,5	4	5	2	0,62	1,0
261 014 00	14	2	8	7	4	5	2	0,69	1,1
261 015 00	15	2	8,5	7,5	4	6	2	0,75	1,4
261 016 00	16	2	9	8	4	6	2	0,80	1,5
261 017 00	17	2	9,5	8,5	4	7	2	0,83	2,0
261 018 00	18	2	10	9	4	7	2	0,94	2,2
261 019 00	19	2	10,5	9,5	4	8	2	1,07	2,8
261 020 00	20	2	11	10	4	8	2	1,20	2,8
261 021 00	21	2	11,5	10,5	4	8	2	1,34	2,7
261 022 00	22	2	12	11	4	8	2	1,49	3,1
261 023 00	23	2	12,5	11,5	4	10	2	1,65	4,1
261 024 00	24	2	13	12	4	10	2	1,80	4,3
261 025 00	25	2	13,5	12,5	4	10	2	2,00	4,6
261 026 00	26	2	14	13	4	10	3	2,20	4,4
261 027 00	27	2	14,5	13,5	4	10	3	2,40	4,5
261 028 00	28	2	15	14	4	10	3	2,60	4,8
261 030 00	30	2	16	15	4	10	3	3,00	5,2
261 032 00	32	2	17	16	4	10	3	3,50	5,6
261 035 00	35	2	18,5	17,5	4	12	3	4,20	7,3
261 036 00	36	2	19	18	4	12	3	4,50	7,7
261 038 00	38	2	20	19	4	12	3	5,10	8,0
261 040 00	40	2	21	20	4	12	3	5,70	8,6
261 042 00	42	2	22	21	4	12	3	6,30	8,9
261 045 00	45	2	23,5	22,5	4	12	3	7,40	9,9
261 048 00	48	2	25	24	4	12	3	8,50	10,7
261 050 00	50	2	26	25	4	12	3	9,30	11,4
261 052 00	52	2	27	26	4	12	3	10,20	12,1
261 054 00	54	2	28	27	4	12	3	11,10	13,0
261 055 00	55	2	28,5	27,5	4	12	3	11,50	13,2
261 056 00	56	2	29	28	4	12	3	12,00	13,7
261 060 00	60	2	31	30	4	12	3	14,00	15,4
261 064 00	64	2	33	32	4	15	3	16,00	18,7
261 065 00	65	2	33,5	32,5	4	15	3	16,70	19,0
261 070 00	70	2	36	35	4	15	3	19,70	21,3
261 072 00	72	2	37	36	4	15	3	21,00	22,4
261 075 00	75	2	38,5	37,5	4	15	3	23,00	23,7
261 080 00	80	2	41	40	4	15	3	26,50	26,2
261 085 00	85	2	43,5	42,5	4	15	3	30,50	29,1
261 090 00	90	2	46	45	4	15	3	34,50	32,3
261 096 00	96	2	49	48	4	15	3	40,00	36,1
261 100 00	100	2	51	50	4	15	3	44,00	39,4
261 114 00	114	2	58	57	4	15	3	62,00	47,5
261 120 00	120	2	61	60	4	25	3	72,00	62,8

\* Basis of calculations see page 197.



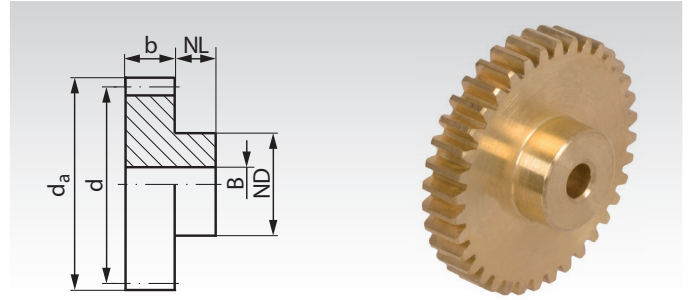
**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Brass, with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: Ms58 (2.0401).

Tooth quality 8d DIN 58405.

Pressure angle 20°.

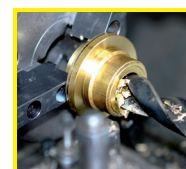


Ordering Details: e.g.: Product No. 262 010 00, Spur Gear, Ms58, Module 0.7, 10 Teeth

### Module 0.7 Tooth Width b = 4 mm

Product No.	Number of teeth	b mm	$d_a$ mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
262 010 00	10	4	8,4	7	6	5	3	1,7	1,6
262 012 00	12	4	9,8	8,4	6	8	3	2,3	3,3
262 013 00	13	4	10,5	9,1	6	8	3	2,6	4,0
262 014 00	14	4	11,2	9,8	6	8	3	2,8	4,4
262 015 00	15	4	11,9	10,5	6	8	3	3,1	4,8
262 016 00	16	4	12,6	11,2	6	9	3	3,3	5,8
262 017 00	17	4	13,3	11,9	6	10	3	3,5	7,0
262 018 00	18	4	14	12,6	6	10	4	3,9	6,9
262 019 00	19	4	14,7	13,3	6	10	4	4,4	7,4
262 020 00	20	4	15,4	14	6	10	4	5,0	7,9
262 021 00	21	4	16,1	14,7	6	12	4	5,6	10,2
262 022 00	22	4	16,8	15,4	6	12	4	6,2	10,7
262 023 00	23	4	17,5	16,1	6	12	4	6,9	11,2
262 024 00	24	4	18,2	16,8	6	12	4	7,6	12,0
262 025 00	25	4	18,9	17,5	6	12	4	8,3	12,6
262 026 00	26	4	19,6	18,2	6	12	4	9,1	13,2
262 027 00	27	4	20,3	18,9	6	12	4	9,9	13,9
262 028 00	28	4	21	19,6	6	12	4	10,8	14,7
262 030 00	30	4	22,4	21	6	12	4	12,6	16,1
262 032 00	32	4	23,8	22,4	6	12	4	14,5	17,7
262 035 00	35	4	25,9	24,5	6	12	4	17,7	20,0
262 036 00	36	4	26,6	25,2	6	12	4	18,9	21,5
262 038 00	38	4	28	26,6	6	12	4	21,3	22,9
262 040 00	40	4	29,4	28	6	12	5	24,0	24,3
262 042 00	42	4	30,8	29,4	6	12	5	26,5	26,6
262 045 00	45	4	32,9	31,5	6	12	5	31,0	29,8
262 048 00	48	4	35	33,6	6	15	5	36,0	36,5
262 050 00	50	4	36,4	35	6	15	5	39,0	39,1
262 052 00	52	4	37,8	36,4	6	15	5	43,0	41,1
262 054 00	54	4	39,2	37,8	6	15	5	47,0	44,4
262 055 00	55	4	39,9	38,5	6	15	5	49,0	45,8
262 056 00	56	4	40,6	39,2	6	15	5	51,0	47,4
262 060 00	60	4	43,4	42	8	15	5	59,0	56,0
262 064 00	64	4	46,2	44,8	8	15	5	69,0	62,2
262 065 00	65	4	46,9	45,5	8	15	5	71,0	63,7
262 070 00	70	4	50,4	49	8	18	5	84,0	77,8
262 072 00	72	4	51,8	50,4	8	18	5	90,0	80,8
262 075 00	75	4	53,9	52,5	8	18	5	98,0	87,6
262 080 00	80	4	57,4	56	8	18	5	114,0	97,7
262 085 00	85	4	60,9	59,5	8	20	6	130,0	109,7
262 090 00	90	4	64,4	63	8	20	6	154,0	119,9
262 096 00	96	4	68,6	67,2	8	25	6	186,0	149,6
262 100 00	100	4	71,4	70	8	25	6	210,0	157,2
262 114 00	114	4	81,2	79,8	8	25	6	310,0	192,0
262 120 00	120	4	85,4	84	8	25	6	350,0	216,7

\* Basis of calculations see page 197.



Reworking within  
24h-service possible.  
Custom made parts  
on request.

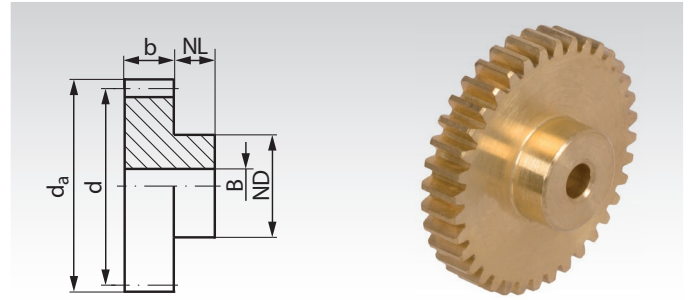


## Spur Gears Made from Brass, with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: Ms58 (2.0401).

Tooth quality 8d25 DIN 3967.

Pressure angle 20°.

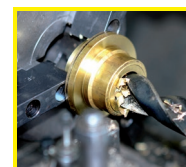


Ordering Details: e.g.: Product No. 263 010 00, Spur Gear, Ms58, Module 1, 10 Teeth

### Module 1.0 Tooth Width b = 6.5 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
263 010 00	10	6,5	12	10	6	8	4	6,1	5,1
263 012 00	12	6,5	14	12	6	10	4	8,0	8,4
263 013 00	13	6,5	15	13	6	10	5	9,1	8,7
263 014 00	14	6,5	16	14	6	10	5	10,0	9,9
263 015 00	15	6,5	17	15	6	12	5	11,1	12,9
263 016 00	16	6,5	18	16	6	12	5	11,8	14,2
263 017 00	17	6,5	19	17	6	12	5	12,2	15,7
263 018 00	18	6,5	20	18	6	12	5	13,8	17,1
263 019 00	19	6,5	21	19	6	15	5	15,8	21,8
263 020 00	20	6,5	22	20	6	15	5	17,8	23,3
263 021 00	21	6,5	23	21	6	15	5	20,0	27,0
263 022 00	22	6,5	24	22	6	15	5	22,2	27,1
263 023 00	23	6,5	25	23	6	15	5	24,5	28,8
263 024 00	24	6,5	26	24	6	15	5	27,0	31,2
263 025 00	25	6,5	27	25	6	15	5	30,0	33,1
263 026 00	26	6,5	28	26	6	15	5	32,5	35,1
263 027 00	27	6,5	29	27	6	15	5	35,5	37,5
263 028 00	28	6,5	30	28	6	15	5	38,5	39,9
263 030 00	30	6,5	32	30	6	15	5	45,0	44,7
263 032 00	32	6,5	34	32	6	15	5	52,0	50,6
263 035 00	35	6,5	37	35	6	15	5	64,0	58,9
263 036 00	36	6,5	38	36	6	15	5	68,0	61,3
263 038 00	38	6,5	40	38	6	18	5	77,0	72,0
263 040 00	40	6,5	42	40	6	18	6	86,0	77,5
263 042 00	42	6,5	44	42	6	18	6	96,0	84,7
263 045 00	45	6,5	47	45	8	18	6	112,5	99,4
263 048 00	48	6,5	50	48	8	18	6	130,0	110,4
263 050 00	50	6,5	52	50	8	18	6	143,0	119,8
263 052 00	52	6,5	54	52	8	18	6	156,0	127,8
263 054 00	54	6,5	56	54	8	18	6	170,0	138,3
263 055 00	55	6,5	57	55	8	18	6	177,0	141,8
263 056 00	56	6,5	58	56	8	18	6	185,0	146,9
263 060 00	60	6,5	62	60	8	18	6	216,0	166,6
263 064 00	64	6,5	66	64	8	18	6	250,0	187,2
263 065 00	65	6,5	67	65	8	18	6	259,0	195,0
263 070 00	70	6,5	72	70	8	20	6	317,0	229,2
263 072 00	72	6,5	74	72	10	20	6	345,0	241,9
263 075 00	75	6,5	77	75	10	40	8	389,0	335,9
263 080 00	80	6,5	82	80	10	40	8	469,0	367,5
263 085 00	85	6,5	87	85	12	40	8	560,0	423,6
263 090 00	90	6,5	92	90	12	40	8	685,0	466,8
263 096 00	96	6,5	98	96	12	40	8	800,0	505,6
263 100 00	100	6,5	102	100	12	50	10	880,0	609,9
263 120 00	120	6,5	122	120	12	50	10	1190,0	806,5

\* Basis of calculations see page 197.



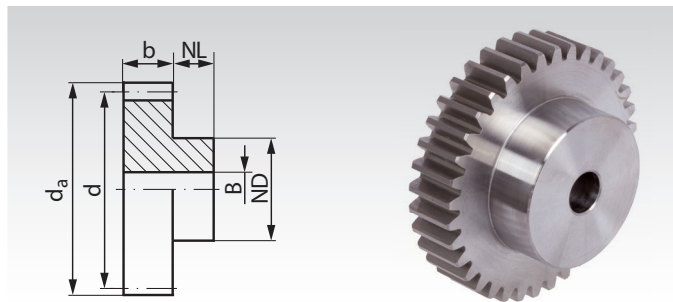
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: 11SMnPb30.

Tooth quality 8d DIN 58405.

Pressure angle 20°.

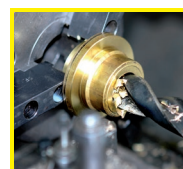


Ordering Details: e.g.: Product No. 211 010 00, Spur Gear, 11SMnPb30, Module 0.5, 10 Teeth

### Module 0.5 Tooth Width b = 4 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	B <sup>H7</sup> mm	perm. MT* Ncm	Weight g
211 010 00	10	4	6	5	4	4	2	0,8	0,8
211 012 00	12	4	7	6	4	4	2	1,0	1
211 013 00	13	4	7,5	6,5	4	5	2	1,1	1
211 014 00	14	4	8	7	4	5	2	1,2	2
211 015 00	15	4	8,5	7,5	4	6	3	1,4	2
211 016 00	16	4	9	8	4	6	3	1,5	2
211 017 00	17	4	9,5	8,5	4	6	3	1,6	2
211 018 00	18	4	10	9	4	6	3	1,7	2
211 019 00	19	4	10,5	9,5	4	8	3	1,9	3
211 020 00	20	4	11	10	4	8	3	2,2	3
211 021 00	21	4	11,5	10,5	4	8	3	2,4	4
211 022 00	22	4	12	11	4	8	3	2,7	4
211 023 00	23	4	12,5	11,5	4	8	3	3,0	4
211 024 00	24	4	13	12	4	8	3	3,3	4
211 025 00	25	4	13,5	12,5	4	10	4	3,6	5
211 026 00	26	4	14	13	4	10	4	4,0	5
211 027 00	27	4	14,5	13,5	4	10	4	4,3	5
211 028 00	28	4	15	14	4	10	4	4,7	6
211 030 00	30	4	16	15	4	10	4	5,5	7
211 032 00	32	4	17	16	4	12	4	6,3	9
211 035 00	35	4	18,5	17,5	4	12	4	7,7	10
211 036 00	36	4	19	18	4	12	4	8,2	10
211 038 00	38	4	20	19	4	12	4	9,2	11
211 040 00	40	4	21	20	4	12	4	10,3	12
211 042 00	42	4	22	21	4	15	5	11,5	14
211 045 00	45	4	23,5	22,5	4	15	5	13,4	16
211 048 00	48	4	25	24	4	15	5	15,5	18
211 050 00	50	4	26	25	4	15	5	17,0	19
211 052 00	52	4	27	26	4	15	5	18,5	20
211 054 00	54	4	28	27	4	15	5	20,2	22
211 055 00	55	4	28,5	27,5	4	15	5	21,0	23
211 056 00	56	4	29	28	4	15	5	21,9	23
211 060 00	60	4	31	30	4	20	5	25,5	30
211 064 00	64	4	33	32	4	20	5	29,4	33
211 065 00	65	4	33,5	32,5	4	20	5	30,5	33
211 070 00	70	4	36	35	4	20	5	36,0	39
211 072 00	72	4	37	36	4	20	5	38,3	40
211 075 00	75	4	38,5	37,5	4	20	5	42,0	42
211 080 00	80	4	41	40	4	20	5	48,5	47
211 085 00	85	4	43,5	42,5	4	25	6	55,6	57
211 090 00	90	4	46	45	4	25	6	63,2	62
211 096 00	96	4	49	48	4	25	6	73,2	69
211 100 00	100	4	51	50	4	25	6	80,2	74
211 114 00	114	4	58	57	4	25	6	108,0	94
211 120 00	120	4	61	60	4	25	6	121,0	100

\* Basis of calculations see page 197.



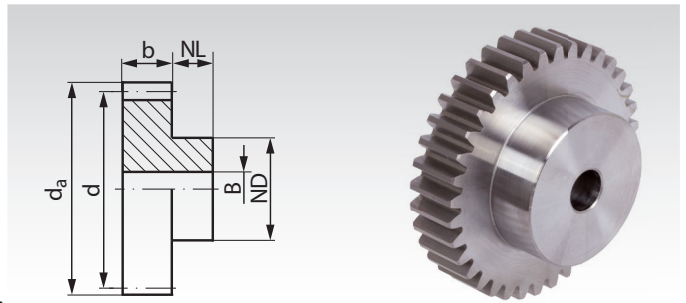
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: 11SMnPb30.

Tooth quality 8d DIN 58405.

Pressure angle 20°.

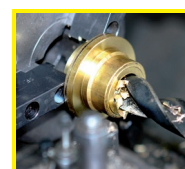


Ordering Details: e.g.: Product No. 212 010 00, Spur Gear, 11 SMnPb30, Module 0.7, 10 Teeth

### Module 0.7 Tooth Width b = 5 mm

Product No.	Number of teeth	b mm	$d_a$ mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
212 010 00	10	5	8,4	7	6	5	3	2,0	2
212 012 00	12	5	9,8	8,4	6	8	3	2,6	3
212 013 00	13	5	10,5	9,1	6	8	3	2,9	4
212 014 00	14	5	11,2	9,8	6	8	3	3,3	5
212 015 00	15	5	11,9	10,5	6	8	3	3,6	5
212 016 00	16	5	12,6	11,2	6	10	4	3,8	6
212 017 00	17	5	13,3	11,9	6	10	4	4,0	6
212 018 00	18	5	14	12,6	6	10	4	4,5	7
212 019 00	19	5	14,7	13,3	6	10	4	5,1	8
212 020 00	20	5	15,4	14	6	10	4	5,7	8
212 021 00	21	5	16,1	14,7	6	12	4	6,4	10
212 022 00	22	5	16,8	15,4	6	12	4	7,1	11
212 023 00	23	5	17,5	16,1	6	12	4	7,9	12
212 024 00	24	5	18,2	16,8	6	12	4	8,7	13
212 025 00	25	5	18,9	17,5	6	15	4	9,5	16
212 026 00	26	5	19,6	18,2	6	15	5	10,4	16
212 027 00	27	5	20,3	18,9	6	15	5	11,3	17
212 028 00	28	5	21	19,6	6	15	5	12,2	18
212 030 00	30	5	22,4	21	6	15	5	14,3	20
212 032 00	32	5	23,8	22,4	6	15	5	16,5	21
212 035 00	35	5	25,9	24,5	6	15	5	20,2	24
212 036 00	36	5	26,6	25,2	6	15	5	21,5	26
212 038 00	38	5	28	26,6	6	18	5	24,3	31
212 040 00	40	5	29,4	28	6	18	5	27,2	33
212 042 00	42	5	30,8	29,4	6	18	6	30,4	35
212 045 00	45	5	32,9	31,5	6	18	6	35,5	39
212 048 00	48	5	35	33,6	6	18	6	41,0	43
212 050 00	50	5	36,4	35	6	18	6	45,0	46
212 052 00	52	5	37,8	36,4	6	18	6	49,0	49
212 054 00	54	5	39,2	37,8	6	18	6	53,4	53
212 055 00	55	5	39,9	38,5	6	18	6	55,6	53
212 056 00	56	5	40,6	39,2	6	18	6	57,9	56
212 060 00	60	5	43,4	42	6	18	6	67,9	63
212 064 00	64	5	46,2	44,8	6	18	6	78,2	70
212 065 00	65	5	46,9	45,5	6	18	6	81,0	72
212 070 00	70	5	50,4	49	6	18	6	95,8	83
212 072 00	72	5	51,8	50,4	6	20	6	102,0	89
212 075 00	75	5	53,9	52,5	6	20	6	112,0	97
212 080 00	80	5	57,4	56	6	20	6	129,5	108
212 085 00	85	5	60,9	59,5	6	20	6	149,0	121
212 090 00	90	5	64,4	63	6	20	6	169,5	133
212 096 00	96	5	68,6	67,2	6	25	8	196,0	157
212 100 00	100	5	71,4	70	6	25	8	215,5	168
212 114 00	114	5	81,2	79,8	6	25	8	291,0	217
212 120 00	120	5	85,4	84	6	25	8	327,0	239

\* Basis of calculations see page 197.



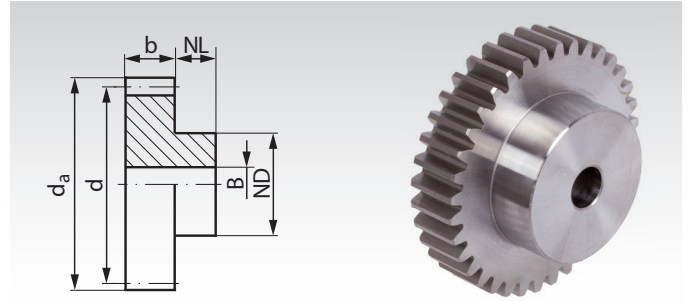
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, with One-Sided Hub, Slim Design, Milled Teeth, Straight Tooth System

Material: 11SMnPb30 up to 80 mm Ø, above C45.

Tooth quality 8d25 DIN 3967.

Pressure angle 20°.



Ordering Details: e.g.: Product No. 213 010 00, Spur Gear, 11SMnPb30, Module 1.0, 10 Teeth

### Module 1.0 Tooth Width b = 6.5 mm

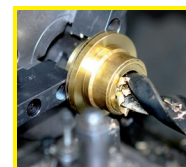
Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
213 010 00	10	6,5	12	10	6	8	4	5,5	5
213 012 00	12	6,5	14	12	6	10	4	7,3	8
213 014 00	14	6,5	16	14	6	10	5	9,2	9
213 015 00	15	6,5	17	15	6	10	5	10,1	11
213 016 00	16	6,5	18	16	6	12	5	10,8	13
213 017 00	17	6,5	19	17	6	12	5	11,2	14
213 018 00	18	6,5	20	18	6	15	5	12,7	19
213 020 00	20	6,5	22	20	6	15	5	16,3	22
213 022 00	22	6,5	24	22	6	15	5	20,3	25
213 024 00	24	6,5	26	24	6	15	5	24,7	28
213 025 00	25	6,5	27	25	6	15	5	27,1	30
213 028 00	28	6,5	30	28	6	15	5	35,1	37
213 030 00	30	6,5	32	30	6	15	5	41,0	41
213 032 00	32	6,5	34	32	6	15	5	47,5	46
213 035 00	35	6,5	37	35	6	15	5	58,1	54
213 036 00**	36	6,5	38	36	6	15	5	61,9	57
213 040 00	40	6,5	42	40	6	18	6	78,6	71
213 042 00	42	6,5	44	42	6	18	6	87,7	78
213 045 00	45	6,5	47	45	6	18	6	102,5	88
213 048 00	48	6,5	50	48	8	18	6	118,7	103
213 050 00	50	6,5	52	50	8	18	6	130,2	111
213 054 00	54	6,5	56	54	8	18	6	155,0	127
213 060 00	60	6,5	62	60	8	18	6	197,0	155
213 064 00	64	6,5	66	64	8	18	6	228,0	174
213 065 00	65	6,5	67	65	8	18	8	236,0	175
213 070 00	70	6,5	72	70	8	25	8	280,0	219
213 072 00	72	6,5	74	72	10	25	8	298,5	236
213 075 00	75	6,5	77	75	10	40	8	328,0	313
213 080 00	80	6,5	82	80	10	40	10	994,0	342
213 090 00	90	6,5	92	90	12	40	10	1190,0	426
213 100 00	100	6,5	102	100	12	40	10	1400,0	501
213 120 00	120	6,5	122	120	12	40	10	1930,0	674

Material C 45

Spur gears made from Steel Module 1 with and without hub Wide version page 222-223.

\* Basis of calculations see page 197.

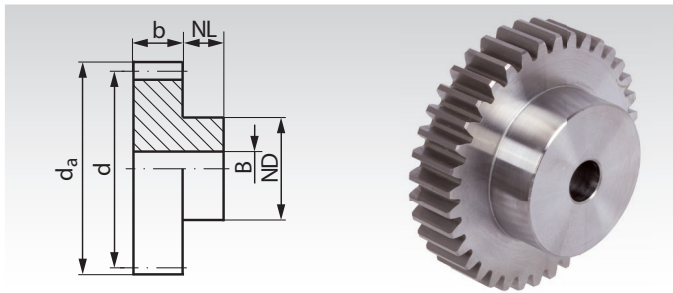
\*\* Next production will be made from steel C45.



Reworking within 24h-service possible. Custom made parts on request.

## Spur Gears Made from Steel, Module 1.0, Tooth Width b = 10 mm, Milled Teeth, Straight Teethed

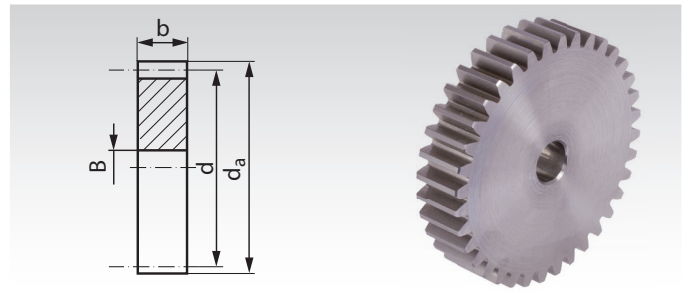
Material: up to 76 teeth: 11SMnPb30, from 78 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



Ordering Details: e.g.: Product No. 214 010 00, Spur Gear, 11SMnPb30, Module 1, 10 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. Ncm	MT*Weight g
214 010 00	10	10	12	10	6	8	4	8	7
214 011 00	11	10	13	11	6	8	4	10	8
214 012 00	12	10	14	12	6	10	4	11	10
214 013 00	13	10	15	13	6	10	5	13	11
214 014 00	14	10	16	14	6	10	5	14	14
214 015 00	15	10	17	15	6	12	5	15	16
214 016 00	16	10	18	16	6	12	5	16	18
214 017 00	17	10	19	17	6	12	6	17	19
214 018 00	18	10	20	18	6	15	6	19	24
214 019 00	19	10	21	19	6	15	6	22	26
214 020 00	20	10	22	20	6	15	6	25	28
214 021 00	21	10	23	21	6	15	6	28	31
214 022 00	22	10	24	22	6	15	6	31	33
214 023 00	23	10	25	23	6	15	6	35	36
214 024 00	24	10	26	24	6	15	6	38	39
214 025 00	25	10	27	25	6	20	8	42	46
214 026 00	26	10	28	26	6	20	8	46	49
214 027 00	27	10	29	27	6	20	8	50	52
214 028 00	28	10	30	28	6	20	8	54	55
214 029 00	29	10	31	29	6	20	8	59	59
214 030 00	30	10	32	30	8	25	8	63	77
214 031 00	31	10	33	31	8	25	8	68	80
214 032 00	32	10	34	32	8	25	8	73	85
214 033 00	33	10	35	33	8	25	8	79	89
214 034 00	34	10	36	34	8	25	8	84	92
214 035 00	35	10	37	35	8	25	8	90	96
214 036 00	36	10	38	36	8	25	8	96	102
214 037 00	37	10	39	37	8	25	8	102	106
214 038 00	38	10	40	38	8	25	8	108	110
214 039 00**	39	10	41	39	8	25	8	114	115
214 040 00	40	10	42	40	8	25	8	121	120
214 041 00**	41	10	43	41	8	25	8	128	125
214 042 00	42	10	44	42	8	25	8	135	131
214 043 00	43	10	45	43	8	25	8	143	134
214 044 00**	44	10	46	44	8	25	8	150	140
214 045 00	45	10	47	45	10	30	10	158	165
214 046 00**	46	10	48	46	10	30	10	166	171
214 047 00**	47	10	49	47	10	30	10	174	178
214 048 00	48	10	50	48	10	30	10	183	182
214 049 00**	49	10	51	49	10	30	10	192	188
214 050 00	50	10	52	50	10	30	10	200	193
214 052 00**	52	10	54	52	10	40	10	219	249
214 053 00**	53	10	55	53	10	40	10	228	254
214 054 00	54	10	56	54	10	40	10	238	262
214 055 00**	55	10	57	55	10	40	10	249	269
214 056 00	56	10	58	56	10	40	10	259	275
214 057 00**	57	10	59	57	12	40	10	270	300
214 058 00**	58	10	60	58	12	40	10	281	307
214 060 00	60	10	62	60	12	40	10	303	320
214 062 00	62	10	64	62	12	40	10	327	337
214 064 00	64	10	66	64	12	40	10	351	352
214 065 00**	65	10	67	65	12	40	10	364	360
214 068 00**	68	10	70	68	12	40	10	403	386
214 070 00	70	10	72	70	12	40	10	431	401
214 072 00**	72	10	74	72	12	50	10	459	484
214 074 00	74	10	76	74	12	50	10	489	502
214 075 00**	75	10	77	75	12	50	10	504	510
214 076 00**	76	10	78	76	12	50	10	520	521
214 078 00**	78	10	80	78	12	50	10	1400	541
214 080 00	80	10	82	80	12	50	10	1450	560
214 082 00	82	10	84	82	12	50	10	1500	583
214 083 00	83	10	85	83	12	50	10	1530	594
214 085 00	85	10	87	85	12	50	10	1590	611
214 087 00	87	10	89	87	12	50	10	1650	633
214 090 00	90	10	92	90	12	50	12	1750	659
214 095 00	95	10	97	95	12	60	12	1900	795
214 100 00	100	10	102	100	12	60	12	2070	856
214 110 00	110	10	112	110	12	60	12	2650	983
214 114 00	114	10	116	114	12	60	12	2730	1036
214 120 00	120	10	122	120	12	60	12	2860	1125

Material: up to 76 teeth: 11SMnPb30, from 78 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



Ordering Details: e.g.: Product No. 224 018 00, Spur Gear, 11SMnPb30, Module 1, 18 Teeth

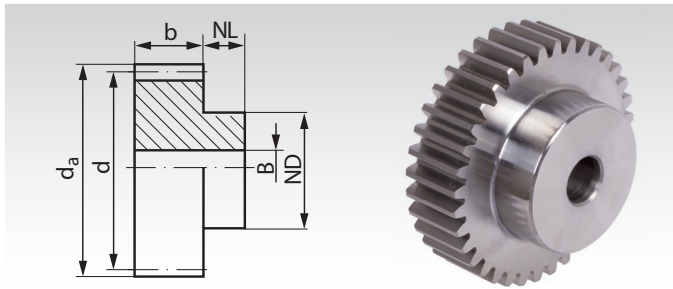
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. Ncm	MT*Weight g
224 018 00	18	10	20	18	6	19	17
224 020 00	20	10	22	20	6	25	21
224 021 00	21	10	23	21	6	28	26
224 022 00	22	10	24	22	6	31	26
224 023 00	23	10	25	23	6	35	29
224 024 00	24	10	26	24	6	38	32
224 025 00	25	10	27	25	6	42	35
224 026 00	26	10	28	26	6	46	38
224 027 00**	27	10	29	27	6	50	41
224 028 00	28	10	30	28	6	54	44
224 030 00	30	10	32	30	8	63	50
224 032 00	32	10	34	32	8	73	54
224 033 00	33	10	35	33	8	79	61
224 034 00	34	10	36	34	8	84	65
224 035 00	35	10	37	35	8	90	69
224 036 00	36	10	38	36	8	96	74
224 037 00**	37	10	39	37	8	102	79
224 038 00	38	10	40	38	8	108	82
224 039 00**	39	10	41	39	8	114	87
224 040 00	40	10	42	40	8	121	92
224 041 00**	41	10	43	41	8	128	97
224 042 00	42	10	44	42	8	135	101
224 043 00**	43	10	45	43	8	143	108
224 044 00	44	10	46	44	8	150	113
224 045 00	45	10	47	45	10	158	116
224 046 00**	46	10	48	46	10	166	121
224 047 00**	47	10	49	47	10	174	128
224 048 00**	48	10	50	48	10	183	133
224 049 00	49	10	51	49	10	192	139
224 050 00	50	10	52	50	10	200	145
224 051 00**	51	10	53	51	10	208	152
224 052 00	52	10	54	52	10	219	157
224 053 00**	53	10	55	53	10	229	163
224 054 00	54	10	56	54	10	239	170
224 055 00	55	10	57	55	10	249	176
224 056 00	56	10	58	56	10	259	183
224 059 00**	59	10	61	59	10	292	204
224 060 00	60	10	62	60	10	303	212
224 061 00**	61	10	63	61	10	315	218
224 063 00**	63	10	65	63	10	339	234
224 064 00	64	10	66	64	10	351	242
224 065 00**	65	10	67	65	10	364	249
224 066 00**	66	10	68	66	10	378	260
224 067 00**	67	10	69	67	10	385	265
224 068 00**	68	10	70	68	10	403	274
224 069 00**	69	10	71	69	10	417	283
224 070 00	70	10	72	70	10	431	290
224 071 00**	71	10	73	71	10	445	301
224 072 00	72	10	74	72	10	459	309
224 073 00**	73	10	75	73	10	474	317
224 075 00**	75	10	77	75	10	504	334
224 076 00	76	10	78	76	10	520	343
224 077 00**	77	10	79	77	10	536	351
224 078 00	78	10	80	78	10	1400	366
224 079 00	79	10	81	79	10	1425	373
224 080 00	80	10	82	80	10	1450	384
224 082 00	82	10	84	82	10	1500	401
224 084 00	84	10	86	84	10	1560	423
224 085 00	85	10	87	85	12	1590	427
224 090 00	90	10	92	90	12	1750	486
224 092 00	92	10	94	92	12	1810	508
224 096 00	96	10	98	96	12	1940	550
224 100 00	100	10	102	100	12	2070	601
224 105 00	105	10	107	105	12	2550	662
224 110 00	110	10	112	110	12	2650	728
224 114 00	114	10	116	114	12	2730	783
224 120 00	120	10	122	120	12	2860	870
224 124 00	124	10	126	124	12	2910	934

\* Basis of calculations see page 197.

\*\* Next production will be made from steel C45.

## Spur Gears Made from Steel, Module 1.0, Tooth Width b = 15 mm, Milled Teeth, Straight Tooth System

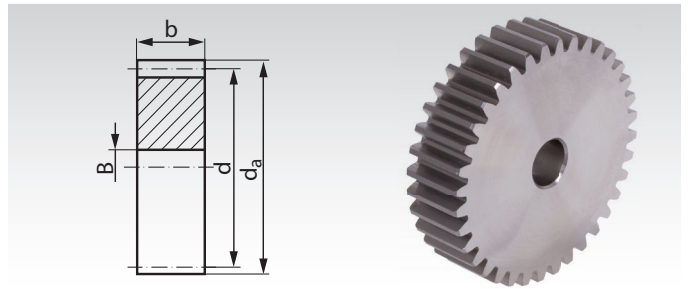
Material: C45. Gear-tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 214 110 11, Spur Gear, C45, Module 1.0, 11 Teeth

Product No. with Hub	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. Ncm	MT* g	Weight g
214 110 11	11	15	13	11	10	8	5	30	12	
214 110 12	12	15	14	12	10	9	6	35	13	
214 110 13	13	15	15	13	10	10	6	40	16	
214 110 14	14	15	16	14	10	11	6	45	20	
214 110 15	15	15	17	15	10	12	6	49	24	
214 110 16	16	15	18	16	10	13	6	53	28	
214 110 17	17	15	19	17	10	14	6	55	33	
214 110 18	18	15	20	18	10	15	8	62	33	
214 110 19	19	15	21	19	10	15	8	72	37	
214 110 20	20	15	22	20	10	16	8	81	42	
214 110 21	21	15	23	21	10	16	8	91	46	
214 110 22	22	15	24	22	10	16	8	101	50	
214 110 23	23	15	25	23	10	18	8	112	58	
214 110 24	24	15	26	24	10	20	10	125	61	
214 110 25	25	15	27	25	10	20	10	136	66	
214 110 26	26	15	28	26	10	20	10	150	70	
214 110 27	27	15	29	27	10	20	10	164	75	
214 110 28	28	15	30	28	10	20	10	177	80	
214 110 29	29	15	31	29	10	20	10	195	85	
214 110 30	30	15	32	30	10	20	10	209	90	
214 110 31	31	15	33	31	10	25	10	224	110	
214 110 32	32	15	34	32	10	25	10	243	120	
214 110 33	33	15	35	33	10	25	10	262	120	
214 110 34	34	15	36	34	10	25	10	279	130	
214 110 35	35	15	37	35	10	25	10	299	135	
214 110 36	36	15	38	36	10	25	10	318	140	
214 110 37	37	15	39	37	10	25	10	329	145	
214 110 38	38	15	40	38	10	25	10	364	155	
214 110 39	39	15	41	39	10	25	10	385	160	
214 110 40	40	15	42	40	10	25	10	409	170	
214 110 41	41	15	43	41	10	30	10	436	190	
214 110 42	42	15	44	42	10	30	10	459	200	
214 110 43	43	15	45	43	10	30	10	486	210	
214 110 44	44	15	46	44	10	30	10	511	215	
214 110 45	45	15	47	45	10	30	10	538	225	
214 110 46	46	15	48	46	10	30	10	566	230	
214 110 47	47	15	49	47	10	30	10	602	240	
214 110 48	48	15	50	48	10	30	10	642	250	
214 110 49	49	15	51	49	10	30	10	682	260	
214 110 50	50	15	52	50	10	30	12	725	260	
214 110 51	51	15	53	51	10	40	12	769	310	
214 110 52	52	15	54	52	10	40	12	818	320	
214 110 53	53	15	55	53	10	40	12	843	330	
214 110 54	54	15	56	54	10	40	12	893	340	
214 110 55	55	15	57	55	10	40	12	934	350	
214 110 56	56	15	58	56	10	40	12	972	360	
214 110 57	57	15	59	57	10	40	12	1013	370	
214 110 58	58	15	60	58	10	40	12	1054	380	
214 110 59	59	15	61	59	10	40	12	1101	390	
214 110 60	60	15	62	60	10	40	12	1146	400	
214 110 61	61	15	63	61	10	50	12	1196	470	
214 110 62	62	15	64	62	10	50	12	1265	480	
214 110 63	63	15	65	63	10	50	12	1330	490	
214 110 64	64	15	66	64	10	50	12	1395	500	
214 110 65	65	15	67	65	10	50	12	1459	515	
214 110 66	66	15	68	66	10	50	12	1503	525	
214 110 67	67	15	69	67	10	50	12	1548	540	
214 110 68	68	15	70	68	10	50	12	1592	550	
214 110 69	69	15	71	69	10	50	12	1630	560	
214 110 70	70	15	72	70	10	50	12	1665	575	

Material: C45. Gear-tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

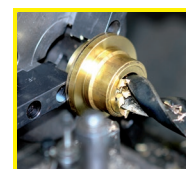


Ordering Details: e.g.: Product No. 224 110 18, Spur Gear, C45, Module 1.0, 18 Teeth

Product No. without Hub	Number of teeth	b mm	d <sub>a</sub> mm	d mm	BH7 mm	perm. Ncm	MT* g	Weight g
224 110 18	18	15	20	18	8	62	24	
224 110 20	20	15	22	20	8	81	30	
224 110 24	24	15	26	24	10	125	43	
224 110 25	25	15	27	25	10	136	48	
224 110 30	30	15	32	30	10	209	72	
224 110 35	35	15	37	35	10	299	102	
224 110 36	36	15	38	36	10	318	108	
224 110 40	40	15	42	40	10	409	136	
224 110 45	45	15	47	45	10	538	174	
224 110 48	48	15	50	48	10	642	200	
224 110 50	50	15	52	50	12	725	214	
224 110 52	52	15	54	52	12	818	232	
224 110 60	60	15	62	60	12	1146	313	
224 110 72	72	15	74	72	12	1729	460	
224 110 75	75	15	77	75	12	1838	510	
224 110 76	76	15	78	76	12	1872	520	
224 110 80	80	15	82	80	12	2030	580	
224 110 85	85	15	87	85	12	2230	650	
224 110 90	90	15	92	90	12	2450	730	
224 110 95	95	15	97	95	12	2660	820	
224 111 00	100	15	102	100	12	2890	910	
224 111 10	110	15	112	110	12	3710	1084	
224 111 14	114	15	116	114	12	3820	1165	
224 111 20	120	15	122	120	12	4000	1320	
224 111 27	127	15	129	127	12	4200	1470	

\* Basis of calculations see page 197.

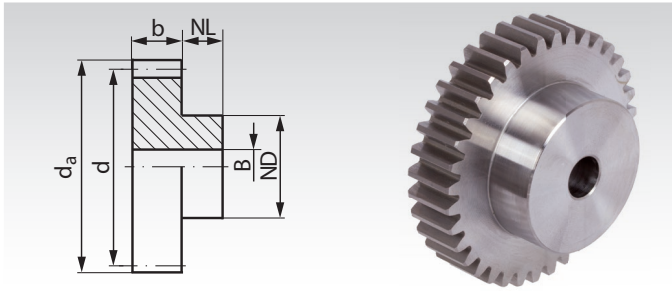
Gears with  
hardened teeth  
Page 240



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 1.25, Tooth Width b = 10 mm, Milled Teeth, Straight Tooth System

Material: up to 60 teeth: 11SMnPb30, from 64 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



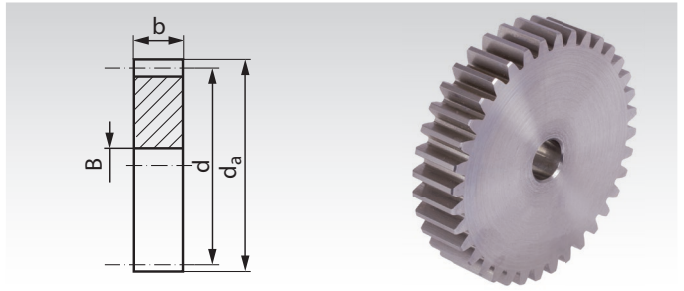
Ordering Details: e.g.: Product No. 216 012 00, Spur Gear, 11SMnPb30, Module 1.25, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 perm. mm	MT* Ncm	Weight g
216 012 00	12	10	17,5	15	10	12	5	19	19
216 013 00	13	10	18,75	16,25	10	12	5	21	21
216 014 00	14	10	20	17,5	10	12	5	23	24
216 015 00	15	10	21,25	18,75	10	15	6	26	30
216 016 00	16	10	22,5	20	10	15	6	27	33
216 017 00	17	10	23,75	21,25	10	15	6	28	36
216 018 00	18	10	25	22,5	10	15	6	32	40
216 019 00	19	10	26,25	23,75	10	15	6	37	43
216 020 00	20	10	27,5	25	10	15	6	41	46
216 021 00	21	10	28,75	26,25	10	15	6	46	50
216 022 00	22	10	30	27,5	10	20	8	51	61
216 023 00	23	10	31,25	28,75	10	20	8	57	66
216 024 00	24	10	32,5	30	10	20	8	63	70
216 025 00**	25	10	33,75	31,25	10	20	8	69	75
216 026 00	26	10	35	32,5	10	20	8	75	80
216 027 00	27	10	36,25	33,75	10	20	8	82	88
216 028 00	28	10	37,5	35	10	20	8	89	90
216 030 00	30	10	40	37,5	10	25	10	104	111
216 032 00	32	10	42,5	40	10	25	10	121	121
216 035 00**	35	10	46,25	43,75	10	25	10	148	140
216 036 00**	36	10	47,5	45	10	25	10	158	147
216 037 00**	37	10	48,75	46,25	10	25	10	168	154
216 038 00	38	10	50	47,5	10	30	10	178	179
216 040 00	40	10	52,5	50	12	30	10	200	204
216 042 00**	42	10	55	52,5	12	30	10	224	218
216 045 00	45	10	58,75	56,25	12	30	10	261	244
216 048 00	48	10	62,5	60	12	30	10	303	268
216 050 00	50	10	65	62,5	12	30	10	332	291
216 052 00**	52	10	67,5	65	12	30	10	363	307
216 054 00	54	10	70	67,5	12	40	10	396	380
216 055 00	55	10	71,25	68,75	12	40	10	413	392
216 056 00	56	10	72,5	70	12	40	10	430	402
216 057 00	57	10	73,75	71,25	12	40	10	448	407
216 060 00	60	10	77,5	75	12	40	10	504	444
216 064 00	64	10	82,5	80	12	40	10	1700	491
216 065 00	65	10	83,75	81,25	12	40	10	1760	507
216 070 00	70	10	90	87,5	12	40	12	2090	566
216 072 00	72	10	92,5	90	12	40	12	2220	594
216 075 00	75	10	96,25	93,75	12	40	12	2360	634
216 076 00	76	10	97,5	95	12	50	12	2410	712
216 080 00	80	10	102,5	100	12	50	12	2600	772
216 085 00	85	10	108,75	106,25	12	50	12	2850	868
216 090 00	90	10	115	112,5	12	50	12	3110	938
216 100 00	100	10	127,5	125	12	50	12	3960	1119
216 120 00	120	10	152,5	150	12	50	12	4390	1537

\* Basis of calculations see page 197.

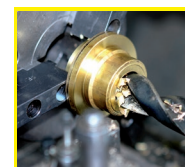
\*\* Next production will be made from steel C45.

Material: up to 60 teeth: 11SMnPb30, from 64 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



Ordering Details: e.g.: Product No. 226 016 00, Spur Gear, 11SMnPb30, Module 1.25, 16 Teeth

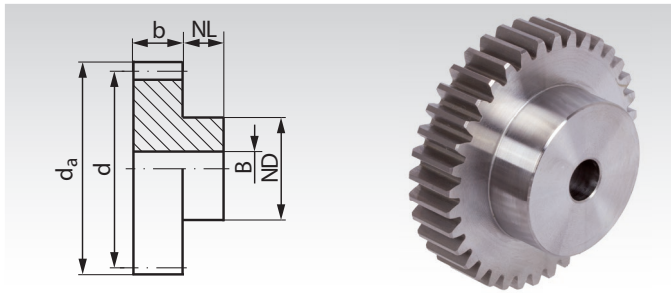
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 perm. mm	MT* Ncm	Weight g
226 016 00	16	10	22,5	20	6	27	21
226 017 00**	17	10	23,75	21,25	6	28	25
226 019 00**	19	10	26,25	23,75	6	32	32
226 020 00	20	10	27,5	25	6	41	35
226 021 00**	21	10	28,75	26,25	6	46	40
226 022 00**	22	10	30	27,5	6	51	43
226 023 00**	23	10	31,25	28,75	6	57	48
226 024 00**	24	10	32,5	30	8	63	50
226 025 00	25	10	33,75	31,25	8	69	55
226 026 00**	26	10	35	32,5	8	75	59
226 027 00**	27	10	36,25	33,75	8	82	64
226 028 00**	28	10	37,5	35	8	89	70
226 030 00	30	10	40	37,5	10	104	81
226 032 00**	32	10	42,5	40	10	121	90
226 034 00**	34	10	45	42,5	10	138	103
226 035 00**	35	10	46,25	43,75	10	148	109
226 036 00**	36	10	47,5	45	10	158	117
226 038 00**	38	10	50	47,5	10	178	129
226 040 00	40	10	52,5	50	10	200	144
226 042 00**	42	10	55	52,5	10	224	159
226 045 00**	45	10	58,75	56,25	10	261	184
226 048 00**	48	10	62,5	60	10	303	209
226 050 00	50	10	65	62,5	10	332	229
226 052 00**	52	10	67,5	65	10	363	250
226 054 00**	54	10	70	67,5	10	396	267
226 055 00**	55	10	71,25	68,75	10	413	278
226 056 00	56	10	72,5	70	10	430	291
226 060 00**	60	10	77,5	75	10	504	334
226 064 00	64	10	82,5	80	10	1700	384
226 070 00	70	10	90	87,5	12	2090	460
226 072 00	72	10	92,5	90	12	2220	488
226 075 00	75	10	96,25	93,75	12	2360	525
226 080 00	80	10	102,5	100	12	2600	601
226 090 00	90	10	115	112,5	12	3110	758
226 095 00	95	10	121,25	118,75	12	3810	842
226 100 00	100	10	127,5	125	15	3960	940
226 114 00	114	10	145	142,5	15	4300	1220
226 120 00	120	10	152,5	150	20	4390	1335



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Steel, Module 1.5, Tooth Width $b = 10$ mm, with Hub, Milled Teeth, Straight Tooth System

Material: 11SMnPb30 up to 80 mm diameter, above C45. Tooth quality 8d25 DIN 3967. Pressure angle 20°.



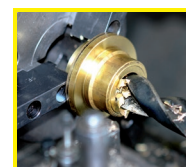
Ordering Details: e.g.: Product No. 217 012 00, Spur Gear, 11SMnPb30, Module 1.5, 12 Teeth

Product No.	Number of teeth	b mm	$d_a$ mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
217 012 00	12	10	21	18	10	15	8	27,5	24
217 015 00	15	10	25,5	22,5	10	18	10	38,0	37
217 018 00	18	10	30	27	10	22	10	47,5	61
217 020 00	20	10	33	30	10	25	10	61,5	79
217 024 00	24	10	39	36	10	25	10	94,0	101
217 025 00	25	10	40,5	37,5	10	25	10	103,0	110
217 028 00	28	10	45	42	10	25	10	134,0	131
217 030 00	30	10	48	45	10	25	10	156,5	148
217 032 00	32	10	51	48	10	25	10	181,5	164
217 035 00	35	10	55,5	52,5	10	25	10	222,5	204
217 040 00	40	10	63	60	10	25	10	302,0	242
217 042 00	42	10	66	63	10	25	10	338,0	267
217 045 00	45	10	70,5	67,5	10	25	10	395,5	301
217 048 00	48	10	75	72	10	25	10	459,0	339
217 050 00	50	10	78	75	10	30	10	503,5	382
217 055 00	55	10	85,5	82,5	10	30	10	1820,0	460
217 060 00	60	10	93	90	10	30	10	2230,0	535
217 065 00	65	10	100,5	97,5	15	45	12	2830,0	742
217 070 00	70	10	108	105	15	45	12	3430,0	839
217 080 00	80	10	123	120	15	45	12	4150,0	1041

Material C45

Spur gears made from Steel Module 1.5 with and without hub Wide Version page 226.

\* Basis of calculations see page 197.

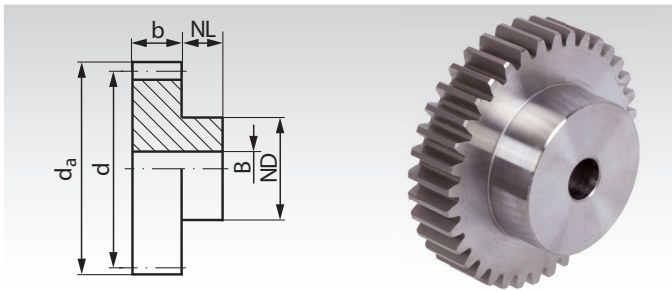


Reworking within 24h-service possible. Custom made parts on request.



## Spur Gears Made from Steel, Module 1.5, Tooth Width b = 15 mm, Milled Teeth, Straight Tooth System

Material: up to 51 teeth: 11SMnPb30, from 52 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



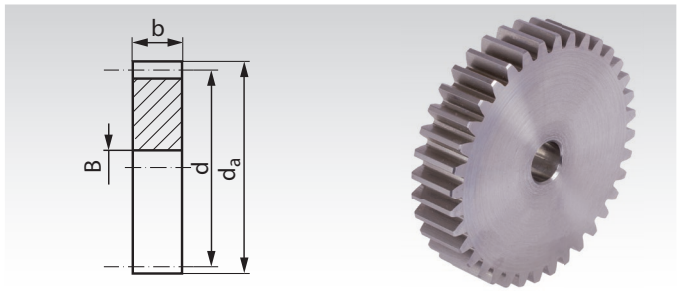
Ordering Details: e.g.: Product No. 218 011 00, Spur Gear, 11SMnPb30, Module 1.5, 11 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 perm. mm	MT* Ncm	Weight g
218 011 00**	11	15	19,5	16,5	10	12	6	35	28
218 012 00	12	15	21	18,0	10	15	8	41	32
218 013 00	13	15	22,5	19,5	10	15	8	47	37
218 014 00	14	15	24	21,0	10	15	8	52	42
218 015 00	15	15	25,5	22,5	10	18	10	57	49
218 016 00	16	15	27	24,0	10	20	10	62	60
218 017 00	17	15	28,5	25,5	10	20	10	67	66
218 018 00	18	15	30	27,0	10	22	10	72	79
218 019 00	19	15	31,5	28,5	10	25	10	82	95
218 020 00	20	15	33	30,0	10	25	10	92	103
218 021 00	21	15	34,5	31,5	15	25	10	103	128
218 022 00	22	15	36	33,0	15	25	10	115	136
218 023 00	23	15	37,5	34,5	15	25	10	128	145
218 024 00	24	15	39	36,0	15	25	10	141	154
218 025 00	25	15	40,5	37,5	15	25	10	155	166
218 026 00	26	15	42	39,0	15	25	10	169	175
218 027 00**	27	15	43,5	40,5	15	25	10	185	185
218 028 00	28	15	45	42,0	15	25	10	201	198
218 030 00	30	15	48	45,0	15	30	10	235	246
218 031 00	31	15	49,5	46,5	15	30	10	251	263
218 032 00	32	15	51	48,0	15	30	10	272	273
218 034 00	34	15	54	51,0	15	30	10	313	298
218 035 00	35	15	55,5	52,5	15	30	10	334	317
218 036 00	36	15	57	54,0	15	40	10	356	392
218 038 00	38	15	60	57,0	15	40	10	403	422
218 040 00	40	15	63	60,0	15	40	10	453	454
218 042 00	42	15	66	63,0	15	40	10	507	488
218 044 00	44	15	69	66,0	15	40	10	564	523
218 045 00	45	15	70,5	67,5	15	40	10	593	541
218 046 00**	46	15	72	69,0	15	40	10	624	560
218 048 00	48	15	75	72,0	15	40	10	688	599
218 050 00	50	15	78	75,0	15	50	10	755	721
218 052 00	52	15	81	78,0	15	50	10	2400	765
218 054 00	54	15	84	81,0	15	50	10	2620	810
218 055 00	55	15	85,5	82,5	15	50	10	2740	831
218 056 00	56	15	87	84,0	15	50	10	2850	855
218 057 00	57	15	88,5	85,5	15	50	10	2970	880
218 058 00	58	15	90	87,0	15	50	10	3090	905
218 060 00	60	15	93	90,0	15	60	12	3360	1041
218 062 00	62	15	96	93,0	15	60	12	3710	1096
218 063 00	63	15	97,5	94,5	15	60	12	3900	1122
218 064 00	64	15	99	96,0	15	60	12	4090	1148
218 065 00	65	15	100,5	97,5	15	60	12	4280	1172
218 068 00	68	15	105	102,0	15	60	12	4670	1254
218 070 00	70	15	108	105,0	20	60	12	4870	1423
218 072 00	72	15	111	108	20	70	12	5070	1683
218 075 00	75	15	115,5	112,5	20	70	12	5390	1726
218 076 00	76	15	117	114	20	70	15	5490	1746
218 078 00	78	15	120	117	20	70	15	5710	1782
218 080 00	80	15	123	120	20	70	15	5920	1878
218 082 00	82	15	126	123	20	70	15	6100	1941
218 085 00	85	15	130,5	127,5	20	70	15	7330	2038
218 090 00	90	15	138	135	20	70	15	7710	2221
218 095 00	95	15	145,5	142,5	20	70	15	8080	2398
218 100 00	100	15	153	150	20	70	15	8380	2620
218 114 00	114	15	174	171	20	70	20	8750	3166
218 120 00	120	15	183	180	20	70	20	9160	3468

\* Basis of calculations see page 197.

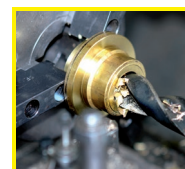
\*\* Next production will be made from steel C45.

Material: up to 51 teeth: 11SMnPb30, from 52 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



Ordering Details: e.g.: Product No. 228 018 00, Spur Gear, 11SMnPb30, Module 1.5, 18 Teeth

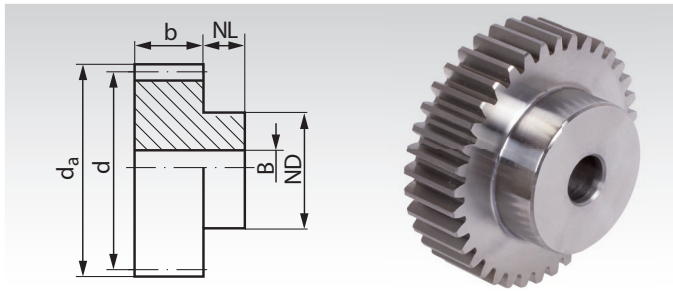
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 perm. mm	MT* Ncm	Weight g
228 018 00	18	15	30	27	8	72	60
228 020 00	20	15	33	30	8	92	75
228 021 00	21	15	34,5	31,5	8	103	83
228 023 00	23	15	37,5	34,5	8	128	101
228 024 00	24	15	39	36	8	141	110
228 025 00	25	15	40,5	37,5	8	155	120
228 026 00	26	15	42	39	8	169	131
228 027 00	27	15	43,5	40,5	8	185	141
228 028 00	28	15	45	42	10	201	149
228 029 00	29	15	46,5	43,5	10	218	161
228 030 00	30	15	48	45	10	235	174
228 032 00	32	15	51	48	10	272	199
228 033 00	33	15	52,5	49,5	10	292	212
228 035 00	35	15	55,5	52,5	10	334	240
228 036 00	36	15	57	54	10	356	255
228 037 00	37	15	58,5	55,5	10	379	267
228 038 00	38	15	60	57	10	403	284
228 039 00	39	15	61,5	58,5	10	428	300
228 040 00	40	15	63	60	10	453	316
228 041 00	41	15	64,5	61,5	10	480	336
228 043 00	43	15	67,5	64,5	10	535	367
228 045 00	45	15	70,5	67,5	10	593	403
228 047 00	47	15	73,5	70,5	10	656	441
228 048 00	48	15	75	72	10	688	460
228 050 00	50	15	78	75	10	755	500
228 051 00	51	15	79,5	76,5	10	790	525
228 052 00	52	15	81	78	10	2400	545
228 053 00	53	15	82,5	79,5	10	2510	574
228 054 00	54	15	84	81	12	2620	585
228 055 00	55	15	85,5	82,5	12	2740	607
228 056 00	56	15	87	84	12	2850	629
228 060 00	60	15	93	90	12	3360	726
228 064 00	64	15	99	96	12	4090	832
228 065 00	65	15	100,5	97,5	12	4280	850
228 067 00	67	15	103,5	100,5	12	4570	909
228 070 00	70	15	108	105	12	4870	990
228 071 00	71	15	109,5	106,5	12	4970	1022
228 072 00	72	15	111	108	12	5070	1051
228 075 00	75	15	115,5	112,5	12	5390	1146
228 076 00	76	15	117	114	15	5490	1166
228 080 00	80	15	123	120	15	5920	1298
228 085 00	85	15	130,5	127,5	15	7330	1455
228 088 00	88	15	135	132	15	7560	1576
228 090 00	90	15	138	135	15	7710	1659
228 095 00	95	15	145,5	142,5	15	8080	1825
228 096 00	96	15	147	144	15	8150	1878
228 100 00	100	15	153	150	15	8380	2048
228 110 00	110	15	168	165	20	8620	2465
228 114 00	114	15	174	171	20	8750	2647
228 120 00	120	15	183	180	20	9160	2939



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Steel, Module 1.5, Tooth Width b = 17 mm, Milled Teeth, Straight Tooth System

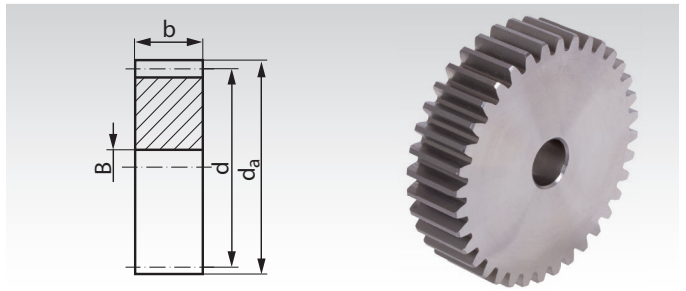
Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 218 110 11, Spur Gear, C45, Module 1.5, 11 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. Ncm	MT* g	Weight g
218 110 11	11	17	19,5	16,5	13	12	6	99	33	
218 110 12	12	17	21	18	13	14	8	114	40	
218 110 13	13	17	22,5	19,5	13	15	8	130	50	
218 110 14	14	17	24	21	13	17	8	146	60	
218 110 15	15	17	25,5	22,5	13	18	8	158	70	
218 110 16	16	17	27	24	13	19	8	171	80	
218 110 17	17	17	28,5	25,5	13	20	8	179	90	
218 110 18	18	17	30	27	13	20	8	199	100	
218 110 19	19	17	31,5	28,5	13	20	8	231	100	
218 110 20	20	17	33	30	13	25	8	260	130	
218 110 21	21	17	34,5	31,5	13	25	10	292	130	
218 110 22	22	17	36	33	13	25	10	325	140	
218 110 23	23	17	37,5	34,5	13	25	10	361	160	
218 110 24	24	17	39	36	13	25	10	402	170	
218 110 25	25	17	40,5	37,5	13	25	10	438	180	
218 110 26	26	17	42	39	13	30	12	483	200	
218 110 27	27	17	43,5	40,5	13	30	12	528	220	
218 110 28	28	17	45	42	13	30	12	572	230	
218 110 29	29	17	46,5	43,5	13	30	12	629	240	
218 110 30	30	17	48	45	13	30	12	674	260	
218 110 31	31	17	49,5	46,5	13	35	12	723	300	
218 110 32	32	17	51	48	13	35	12	784	310	
218 110 33	33	17	52,5	49,5	13	35	12	844	330	
218 110 34	34	17	54	51	13	35	12	901	340	
218 110 35	35	17	55,5	52,5	13	35	12	966	360	
218 110 36	36	17	57	54	13	35	12	1027	370	
218 110 37	37	17	58,5	55,5	13	40	12	1060	420	
218 110 38	38	17	60	57	13	40	12	1173	440	
218 110 39	39	17	61,5	58,5	13	40	12	1242	460	
218 110 40	40	17	63	60	13	40	12	1320	480	
218 110 41	41	17	64,5	61,5	13	40	12	1405	500	
218 110 42	42	17	66	63	13	50	12	1482	590	
218 110 43	43	17	67,5	64,5	13	50	12	1567	610	
218 110 44	44	17	69	66	13	50	12	1648	630	
218 110 45	45	17	70,5	67,5	13	50	12	1734	650	
218 110 46	46	17	72	69	13	50	14	1827	660	
218 110 47	47	17	73,5	70,5	13	50	14	1941	700	
218 110 48	48	17	75	72	13	50	14	2071	700	
218 110 49	49	17	76,5	73,5	13	50	14	2200	730	
218 110 50	50	17	78	75	13	50	14	2339	760	
218 110 51	51	17	79,5	76,5	13	60	14	2480	860	
218 110 52	52	17	81	78	13	60	14	2640	890	
218 110 53	53	17	82,5	79,5	13	60	14	2720	910	
218 110 54	54	17	84	81	13	60	14	2882	940	
218 110 55	55	17	85,5	82,5	13	60	14	3014	960	
218 110 56	56	17	87	84	13	60	16	3135	980	
218 110 59	59	17	91,5	88,5	13	60	16	3551	1060	
218 110 60	60	17	93	90	13	60	16	3696	1090	
218 110 64	64	17	99	96	13	70	16	4499	1310	
218 110 65	65	17	100,5	97,5	13	70	16	4708	1340	
218 110 66	66	17	102	99	13	70	16	4848	1370	
218 110 68	68	17	105	102	13	70	16	5137	1430	
218 110 69	69	17	106,5	103,5	13	70	16	5257	1460	
218 110 70	70	17	108	105	13	70	16	5370	1500	
218 110 72	72	17	111	108	13	80	16	5577	1660	
218 110 75	75	17	115,5	112,5	13	80	16	5929	1760	
218 110 80	80	17	123	120	13	80	16	6512	1940	
218 110 90	90	17	138	135	13	80	16	8481	2330	
218 111 00	100	17	153	150	13	80	16	9218	2770	
218 111 20	120	17	183	180	13	80	16	10076	3790	

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

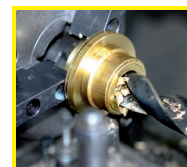


Ordering Details: e.g.: Product No. 228 110 18, Spur Gear, C45, Module 1.5, 18 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. Ncm	MT* g	Weight g
228 110 18	18	17	30	27	8	199	68	
228 110 20	20	17	33	30	8	260	86	
228 110 24	24	17	39	36	10	402	123	
228 110 25	25	17	40,5	37,5	10	438	135	
228 110 30	30	17	48	45	12	674	195	
228 110 35	35	17	55,5	52,5	12	966	270	
228 110 36	36	17	57	54	12	1027	285	
228 110 40	40	17	63	60	12	1320	355	
228 110 45	45	17	70,5	67,5	12	1734	455	
228 110 48	48	17	75	72	14	2071	510	
228 110 50	50	17	78	75	14	2339	560	
228 110 60	60	17	93	90	16	3696	810	
228 110 72	72	17	111	108	16	5577	1190	
228 110 75	75	17	115,5	112,5	16	5929	1300	
228 110 76	76	17	117	114	16	6039	1330	
228 110 80	80	17	123	120	16	6512	1480	
228 110 85	85	17	130,5	127,5	16	8063	1670	
228 110 90	90	17	138	135	16	8481	1880	
228 110 95	95	17	145,5	142,5	16	8888	2090	
228 111 00	100	17	153	150	16	9218	2320	
228 111 10	110	17	168	165	16	9416	2820	
228 111 14	114	17	174	171	16	9620	3030	
228 111 20	120	17	183	180	16	10076	3360	
228 111 27	127	17	193,5	190,5	16	10705	3770	

\* Basis of calculations see page 197.

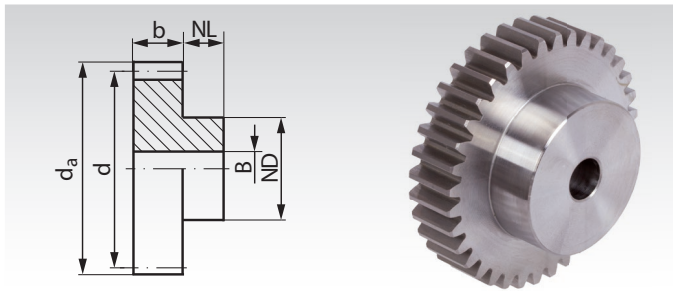
Gears with  
hardened teeth  
Page 240



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 2.0, Tooth Width b = 16 mm, Milled Teeth, Straight Tooth System

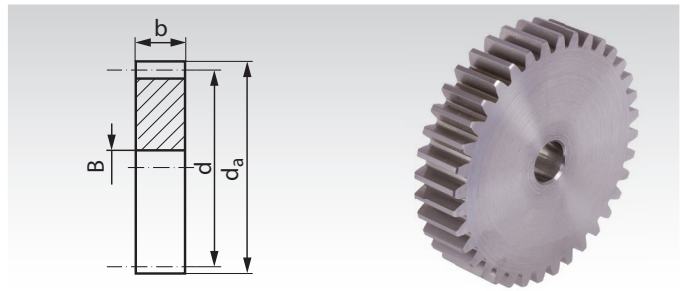
Material: up to 37 teeth: 11SMnPb30, from 38 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



Ordering Details: e.g.: Product No. 231 010 00, Spur Gear, 11SMnPb30, Module 2, 10 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 perm. mm	MT* Nm	Weight g
231 010 00	10	16	24	20	15	15	8	0,6	45
231 012 00	12	16	28	24	15	20	10	0,8	70
231 013 00	13	16	30	26	15	20	10	0,9	81
231 014 00	14	16	32	28	15	25	10	1,1	110
231 015 00	15	16	34	30	15	25	12	1,2	114
231 016 00	16	16	36	32	15	25	12	1,3	126
231 017 00	17	16	38	34	15	25	12	1,4	139
231 018 00	18	16	40	36	15	30	12	1,5	179
231 019 00	19	16	42	38	15	30	12	1,7	192
231 020 00	20	16	44	40	15	30	12	1,9	207
231 021 00	21	16	46	42	15	30	12	2,1	224
231 022 00	22	16	48	44	15	30	12	2,3	240
231 023 00	23	16	50	46	15	30	12	2,6	257
231 024 00	24	16	52	48	15	30	12	2,9	275
231 025 00	25	16	54	50	15	30	12	3,2	295
231 026 00	26	16	56	52	15	35	12	3,5	344
231 027 00	27	16	58	54	15	35	12	3,8	364
231 028 00	28	16	60	56	15	35	12	4,1	386
231 029 00	29	16	62	58	15	35	12	4,5	409
231 030 00	30	16	64	60	15	40	12	4,8	466
231 031 00	31	16	66	62	15	40	12	5,2	489
231 032 00	32	16	68	64	15	40	12	5,6	514
231 034 00	34	16	72	68	15	40	12	6,4	566
231 035 00	35	16	74	70	15	45	12	6,9	632
231 036 00	36	16	76	72	15	45	12	7,3	659
231 037 00	37	16	78	74	15	45	12	7,8	689
231 038 00	38	16	80	76	15	45	12	24,1	720
231 040 00	40	16	84	80	15	50	12	27,1	825
231 042 00	42	16	88	84	15	50	12	30,4	891
231 044 00	44	16	92	88	15	50	12	33,8	955
231 045 00	45	16	94	90	15	50	12	35,6	991
231 046 00	46	16	96	92	15	50	12	37,5	1025
231 047 00	47	16	98	94	15	50	12	39,8	1066
231 048 00	48	16	100	96	15	50	12	42,5	1098
231 050 00	50	16	104	100	15	50	12	48,0	1174
231 052 00	52	16	108	104	15	60	12	54,0	1357
231 053 00	53	16	110	106	15	60	12	57,1	1396
231 054 00	54	16	112	108	15	60	12	60,3	1442
231 055 00	55	16	114	110	15	60	12	63,6	1485
231 056 00	56	16	116	112	15	60	12	67,1	1527
231 057 00	57	16	118	114	15	70	12	70,6	1688
231 058 00	58	16	120	116	15	70	12	74,2	1737
231 059 00	59	16	122	118	15	70	12	77,6	1784
231 060 00	60	16	124	120	15	70	12	81,1	1827
231 062 00	62	16	128	124	15	70	12	88,8	1929
231 063 00	63	16	130	126	15	70	12	92,6	1969
231 064 00	64	16	132	128	15	70	12	95,1	2028
231 065 00	65	16	134	130	20	70	15	97,2	2194
231 067 00	67	16	138	134	20	70	15	101,6	2306
231 068 00	68	16	140	136	20	70	15	103,8	2360
231 070 00	70	16	144	140	20	70	15	108,2	2463
231 072 00	72	16	148	144	20	80	15	112,7	2769
231 074 00	74	16	152	148	20	80	15	136,5	2883
231 075 00	75	16	154	150	20	80	15	138,1	2945
231 076 00	76	16	156	152	20	80	15	139,7	2982
231 078 00	78	16	160	156	20	80	15	142,8	3129
231 080 00	80	16	164	160	20	80	20	146,0	3196
231 085 00	85	16	174	170	20	80	20	149,0	3513
231 090 00	90	16	184	180	20	80	20	150,0	3875
231 095 00	95	16	194	190	20	100	20	151,0	4652
231 100 00	100	16	204	200	20	100	20	154,3	5056
231 110 00	110	16	224	220	20	100	20	167,8	5856
231 114 00	114	16	232	228	20	100	20	173,0	6179
231 120 00	120	16	244	240	20	100	20	181,0	6822

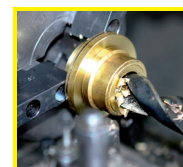
Material: up to 37 teeth: 11SMnPb30, from 38 teeth: C45.  
Tooth quality 8d25 DIN 3967. Pressure angle 20°.



Ordering Details: e.g.: Product No. 241 018 00, Spur Gear, 11SMnPb30, Module 2, 18 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 perm. mm	MT* Nm	Weight g
241 018 00	18	16	40	36	12	1,5	108
241 020 00	20	16	44	40	12	1,9	138
241 021 00	21	16	46	42	12	2,1	154
241 022 00	22	16	48	44	12	2,3	170
241 023 00	23	16	50	46	12	2,6	187
241 024 00	24	16	52	48	12	2,9	206
241 025 00	25	16	54	50	12	3,2	225
241 026 00	26	16	56	52	12	3,5	244
241 027 00	27	16	58	54	12	3,8	265
241 028 00	28	16	60	56	12	4,1	286
241 030 00	30	16	64	60	12	4,8	330
241 032 00	32	16	68	64	12	5,6	380
241 035 00	35	16	74	70	12	6,9	457
241 036 00	36	16	76	72	12	7,3	486
241 037 00	37	16	78	74	12	7,8	514
241 038 00	38	16	80	76	12	24,1	545
241 039 00	39	16	82	78	12	25,6	578
241 040 00	40	16	84	80	12	27,1	605
241 041 00	41	16	86	82	12	28,7	639
241 042 00	42	16	88	84	12	30,4	668
241 043 00	43	16	90	86	12	32,1	703
241 045 00	45	16	94	90	12	35,6	773
241 047 00	47	16	98	94	12	39,8	843
241 048 00	48	16	100	96	12	42,5	879
241 049 00	49	16	102	98	12	45,2	921
241 050 00	50	16	104	100	12	48,0	954
241 051 00	51	16	106	102	12	50,9	995
241 052 00	52	16	108	104	12	54,0	1038
241 053 00	53	16	110	106	12	57,1	1092
241 054 00	54	16	112	108	12	60,3	1124
241 055 00	55	16	114	110	12	63,6	1153
241 056 00	56	16	116	112	12	67,1	1208
241 057 00	57	16	118	114	12	70,6	1249
241 060 00	60	16	124	120	12	81,1	1385
241 061 00	61	16	126	122	12	85,1	1443
241 063 00	63	16	130	126	12	92,6	1530
241 064 00	64	16	132	128	15	95,1	1576
241 065 00	65	16	134	130	15	97,2	1625
241 067 00	67	16	138	134	15	101,6	1733
241 070 00	70	16	144	140	15	108,2	1886
241 072 00	72	16	148	144	15	112,7	1988
241 075 00	75	16	154	150	15	138,1	2178
241 076 00	76	16	156	152	15	139,7	2229
241 078 00	78	16	160	156	15	142,8	2358
241 080 00	80	16	164	160	20	146,0	2458
241 085 00	85	16	174	170	20	149,0	2782
241 090 00	90	16	184	180	20	150,0	3134
241 095 00	95	16	194	190	20	151,0	3493
241 096 00	96	16	196	192	20	152,0	3556
241 100 00	100	16	204	200	20	154,3	3870
241 114 00	114	16	232	228	20	173,0	5052
241 120 00	120	16	244	240	20	181,0	5585

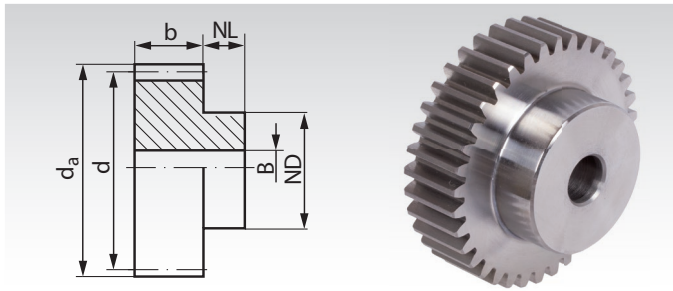
\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Steel, Module 2.0, Tooth Width b = 20 mm, Milled Teeth, Straight Tooth System

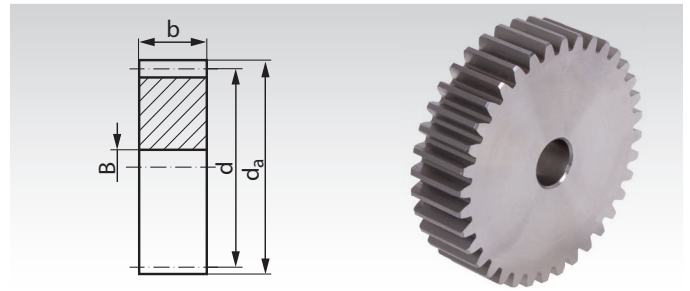
Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 231 110 12, Spur Gear, C45, Module 2.0, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
231 110 12	12	20	28	24	15	18	10	2,8	80
231 110 13	13	20	30	26	15	20	10	3,2	100
231 110 14	14	20	32	28	15	22	10	3,6	120
231 110 15	15	20	34	30	15	24	10	3,9	140
231 110 16	16	20	36	32	15	25	10	4,2	160
231 110 17	17	20	38	34	15	25	10	4,4	180
231 110 18	18	20	40	36	15	25	10	4,9	190
231 110 19	19	20	42	38	15	25	10	5,7	210
231 110 20	20	20	44	40	15	30	10	6,4	260
231 110 21	21	20	46	42	15	30	12	7,2	270
231 110 22	22	20	48	44	15	30	12	8,0	290
231 110 23	23	20	50	46	15	30	12	8,9	310
231 110 24	24	20	52	48	15	35	12	9,9	360
231 110 25	25	20	54	50	15	35	12	10,8	390
231 110 26	26	20	56	52	15	40	12	11,9	450
231 110 27	27	20	58	54	15	40	12	13,0	470
231 110 28	28	20	60	56	15	40	12	14,1	500
231 110 29	29	20	62	58	15	40	14	15,5	520
231 110 30	30	20	64	60	15	40	14	16,6	550
231 110 31	31	20	66	62	15	45	14	17,8	610
231 110 32	32	20	68	64	15	45	14	19,3	650
231 110 33	33	20	70	66	15	45	14	20,8	680
231 110 34	34	20	72	68	15	45	14	22,2	710
231 110 35	35	20	74	70	15	45	14	23,8	740
231 110 36	36	20	76	72	15	45	14	25,3	780
231 110 37	37	20	78	74	15	50	14	26,1	860
231 110 38	38	20	80	76	15	50	14	28,9	900
231 110 39	39	20	82	78	15	50	14	30,6	930
231 110 40	40	20	84	80	15	50	14	32,5	970
231 110 41	41	20	86	82	15	55	16	34,6	1050
231 110 42	42	20	88	84	15	55	16	36,5	1090
231 110 43	43	20	90	86	15	55	16	38,6	1130
231 110 44	44	20	92	88	15	60	16	40,6	1230
231 110 45	45	20	94	90	15	60	16	42,7	1270
231 110 46	46	20	96	92	15	60	16	45	1310
231 110 47	47	20	98	94	15	70	16	47,8	1480
231 110 48	48	20	100	96	15	70	16	51	1530
231 110 49	49	20	102	98	15	70	16	54,2	1570
231 110 50	50	20	104	100	15	70	16	57,6	1620
231 110 51	51	20	106	102	15	70	16	61,1	1670
231 110 52	52	20	108	104	15	70	16	64,8	1720
231 110 53	53	20	110	106	15	70	16	68,5	1780
231 110 54	54	20	112	108	15	70	16	72,4	1830
231 110 55	55	20	114	110	15	70	16	76,3	1880
231 110 56	56	20	116	112	15	70	16	80,5	1940
231 110 57	57	20	118	114	15	70	16	84,7	1990
231 110 58	58	20	120	116	15	70	16	89	2050
231 110 60	60	20	124	120	15	70	16	97,3	2160
231 110 62	62	20	128	124	15	80	16	107	2420
231 110 63	63	20	130	126	15	80	16	111	2480
231 110 64	64	20	132	128	15	80	16	114	2550
231 110 65	65	20	134	130	15	80	16	117	2610
231 110 66	66	20	136	132	15	80	16	120	2670
231 110 67	67	20	138	134	15	80	16	122	2740
231 110 69	69	20	142	138	15	80	16	127	2870
231 110 70	70	20	144	140	15	80	16	130	2940
231 110 75	75	20	154	150	15	80	20	166	3250
231 110 80	80	20	164	160	15	80	20	175	3600
231 110 90	90	20	184	180	15	90	20	180	4570
231 111 00	100	20	204	200	15	100	20	185	5670
231 111 20	120	20	244	240	15	100	20	217	7790

Material: C45. Tooth quality 8d25 DIN 3967. Pressure angle 20°.

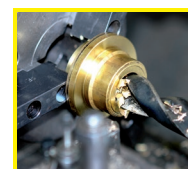


Ordering Details: e.g.: Product No. 241 110 18, Spur Gear, C45 Module 2.0, 18 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT* Nm	Weight g
241 110 18	18	20	40	36	10	4,9	145
241 110 20	20	20	44	40	10	6,4	180
241 110 24	24	20	52	48	12	9,9	260
241 110 25	25	20	54	50	12	10,8	285
241 110 30	30	20	64	60	14	16,6	410
241 110 35	35	20	74	70	14	23,8	570
241 110 36	36	20	76	72	14	25,3	600
241 110 40	40	20	84	80	14	32,5	750
241 110 45	45	20	94	90	16	42,7	950
241 110 48	48	20	100	96	16	51	1080
241 110 50	50	20	104	100	16	57,6	1180
241 110 72	72	20	148	144	16	135	2500
241 110 75	75	20	154	150	20	166	2710
241 110 76	76	20	156	152	20	168	2790
241 110 80	80	20	164	160	20	175	3090
241 110 85	85	20	174	170	20	179	3500
241 110 90	90	20	184	180	20	180	3930
241 110 95	95	20	194	190	20	181	4390
241 111 00	100	20	204	200	20	185	4870
241 111 10	110	20	224	220	20	201	5900
241 111 14	114	20	232	228	20	208	6340
241 111 20	120	20	244	240	20	217	7030
241 111 27	127	20	258	254	20	235	7890

\* Basis of calculations see page 197.

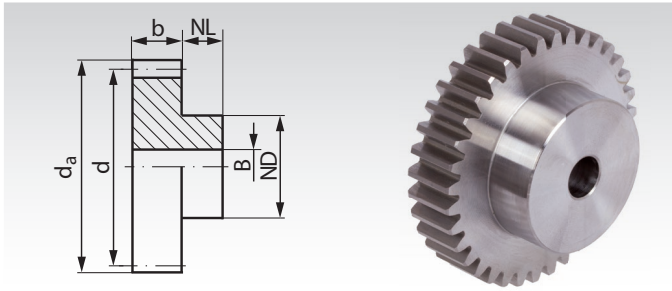
Gears with  
hardened teeth  
Page 240



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 2.5, Tooth Width b = 20 mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

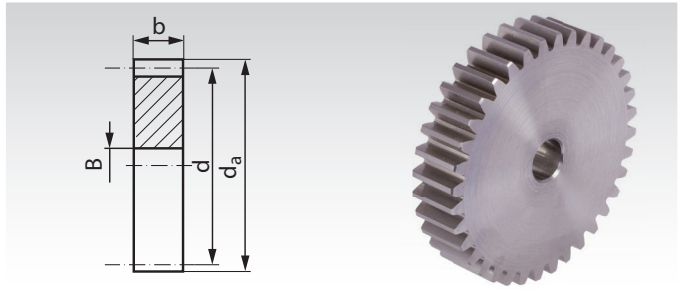


Ordering Details: e.g.: Product No. 232 012 00, Spur Gear, Steel C45, Module 2.5, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
232 012 00	12	20	35	30	15	20	12	4,9	0,11
232 013 00	13	20	37,5	32,5	15	20	12	5,6	0,12
232 014 00	14	20	40	35	15	20	12	6,3	0,14
232 015 00	15	20	42,5	37,5	15	25	12	6,9	0,19
232 016 00	16	20	45	40	15	25	12	7,4	0,21
232 017 00	17	20	47,5	42,5	15	25	12	7,7	0,23
232 018 00	18	20	50	45	15	30	12	8,7	0,29
232 019 00	19	20	52,5	47,5	15	30	12	9,9	0,31
232 020 00	20	20	55	50	15	30	12	11,2	0,34
232 021 00	21	20	57,5	52,5	15	30	12	12,6	0,38
232 022 00	22	20	60	55	15	30	12	14,1	0,41
232 023 00	23	20	62,5	57,5	15	40	12	15,6	0,51
232 024 00	24	20	65	60	15	40	12	17,3	0,54
232 025 00	25	20	67,5	62,5	15	40	12	19,0	0,58
232 026 00	26	20	70	65	15	40	12	20,8	0,62
232 027 00	27	20	72,5	67,5	15	40	12	22,7	0,66
232 028 00	28	20	75	70	15	40	12	24,7	0,70
232 030 00	30	20	80	75	15	40	12	29,1	0,79
232 032 00	32	20	85	80	15	50	15	33,8	0,95
232 034 00	34	20	90	85	15	50	15	38,9	1,04
232 035 00	35	20	92,5	87,5	15	50	15	41,6	1,10
232 036 00	36	20	95	90	15	60	15	44,4	1,25
232 038 00	38	20	100	95	15	60	15	50,7	1,38
232 040 00	40	20	105	100	20	60	15	59,3	1,60
232 042 00	42	20	110	105	20	60	15	68,5	1,72
232 045 00	45	20	117,5	112,5	20	60	15	83,9	1,92
232 046 00	46	20	120	115	20	60	15	89,4	1,98
232 048 00	48	20	125	120	20	60	15	100,3	2,14
232 050 00	50	20	130	125	20	70	15	112,2	2,43
232 052 00	52	20	135	130	20	70	15	124,3	2,60
232 054 00	54	20	140	135	20	70	20	137,2	2,73
232 055 00	55	20	142,5	137,5	20	70	20	143,9	2,78
232 056 00	56	20	145	140	20	70	20	150,9	2,89
232 060 00	60	20	155	150	20	70	20	180,9	3,24
232 062 00	62	20	160	155	20	70	20	197,3	3,43
232 065 00	65	20	167,5	162,5	20	80	20	238,3	3,90
232 070 00	70	20	180	175	20	80	20	269,6	4,44
232 072 00	72	20	185	180	20	80	20	276,3	4,62
232 075 00	75	20	192,5	187,5	20	90	20	282,0	5,19
232 080 00	80	20	205	200	20	90	20	285,0	5,79
232 082 00	82	20	210	205	20	90	20	286,0	6,05
232 085 00	85	20	217,5	212,5	20	100	20	288,0	6,69
232 090 00	90	20	230	225	20	100	20	290,0	7,31
232 092 00	92	20	235	230	20	100	20	292,0	7,60
232 095 00	95	20	242,5	237,5	20	100	25	301,0	7,97
232 100 00	100*	20	255	250	20	100	25	315,0	8,74
232 110 00	110*	20	280	275	20	120	25	340,0	10,86
232 120 00	120*	20	305	300	20	120	25	365,0	12,64
232 127 00	127*	20	322,5	317,5	20	120	25	380,0	13,96

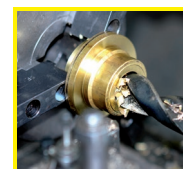
\* Basis of calculations see page 197.

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 242 018 00, Spur Gear, Steel C45, Module 2.5, 18 Teeth

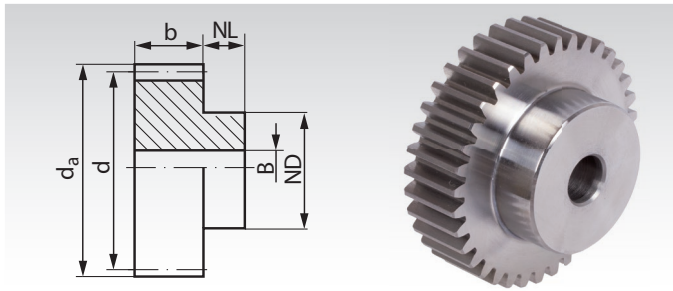
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT* Nm	Weight kg
242 018 00	18	20	50	45	12	8,7	0,23
242 020 00	20	20	55	50	12	11,2	0,29
242 022 00	22	20	60	55	12	14,1	0,34
242 023 00	23	20	62,5	57,5	12	15,6	0,37
242 024 00	24	20	65	60	12	17,3	0,41
242 025 00	25	20	67,5	62,5	12	19,0	0,45
242 026 00	26	20	70	65	12	20,8	0,49
242 029 00	29	20	77,5	72,5	12	26,0	0,61
242 030 00	30	20	80	75	12	29,1	0,66
242 031 00	31	20	82,5	77,5	12	31,4	0,70
242 033 00	33	20	87,5	82,5	15	36,3	0,79
242 034 00	34	20	90	85	15	38,9	0,84
242 035 00	35	20	92,5	87,5	15	41,6	0,89
242 037 00	37	20	97,5	92,5	15	47,3	1,00
242 038 00	38	20	100	95	15	50,7	1,06
242 039 00	39	20	102,5	97,5	15	54,9	1,12
242 040 00	40	20	105	100	15	59,3	1,18
242 041 00	41	20	107,5	102,5	15	65,8	1,24
242 043 00	43	20	112,5	107,5	15	73,5	1,38
242 044 00	44	20	115	110	15	78,6	1,43
242 045 00	45	20	117,5	112,5	15	83,9	1,50
242 047 00	47	20	122,5	117,5	15	95,0	1,64
242 048 00	48	20	125	120	15	100,3	1,71
242 049 00	49	20	127,5	122,5	15	106,5	1,79
242 050 00	50	20	130	125	15	112,1	1,86
242 051 00	51	20	132,5	127,5	15	118,2	1,94
242 053 00	53	20	137,5	132,5	15	130,6	2,10
242 054 00	54	20	140	135	20	137,2	2,17
242 056 00	56	20	145	140	20	150,9	2,33
242 057 00	57	20	147,5	142,5	20	158,1	2,43
242 060 00	60	20	155	150	20	180,9	2,69
242 070 00	70	20	180	175	20	269,6	3,68
242 076 00	76	20	195	190	20	283,8	4,35
242 080 00	80	20	205	200	20	285,0	4,83
242 090 00	90	20	230	225	20	290,0	6,13
242 100 00	100	20	255	250	20	315,0	7,62
242 114 00	114	20	290	285	25	349,0	9,80
242 120 00	120	20	305	300	25	365,0	10,94



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Steel, Module 2.5, Tooth Width b = 25 mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

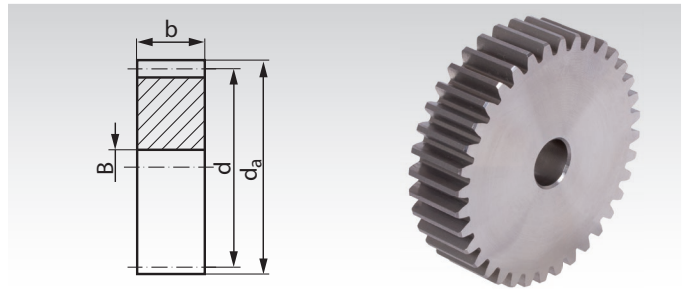


Ordering Details: e.g.: Product No. 232 110 12, Spur Gear, C45, Module 2.5, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
232 110 12	12	25	35	30	20	22	10	5,9	0,17
232 110 13	13	25	37,5	32,5	20	25	10	6,7	0,21
232 110 14	14	25	40	35	20	28	10	7,6	0,25
232 110 15	15	25	42,5	37,5	20	30	10	8,3	0,30
232 110 16	16	25	45	40	20	32	12	8,9	0,33
232 110 17	17	25	47,5	42,5	20	35	12	9,2	0,38
232 110 18	18	25	50	45	20	35	12	10,4	0,42
232 110 19	19	25	52,5	47,5	20	35	12	11,9	0,45
232 110 20	20	25	55	50	20	40	12	13,4	0,54
232 110 21	21	25	57,5	52,5	20	40	14	15,1	0,56
232 110 22	22	25	60	55	20	45	14	16,9	0,66
232 110 23	23	25	62,5	57,5	20	45	14	18,7	0,70
232 110 24	24	25	65	60	20	45	14	20,8	0,74
232 110 25	25	25	67,5	62,5	20	50	14	22,8	0,85
232 110 26	26	25	70	65	20	50	14	25	0,90
232 110 27	27	25	72,5	67,5	20	50	14	27,3	0,95
232 110 28	28	25	75	70	20	50	14	29,6	1,00
232 110 29	29	25	77,5	72,5	20	50	14	32,7	1,06
232 110 30	30	25	80	75	20	55	14	34,9	1,18
232 110 31	31	25	82,5	77,5	20	55	16	37,5	1,22
232 110 32	32	25	85	80	20	55	16	40,6	1,28
232 110 33	33	25	87,5	82,5	20	55	16	43,8	1,34
232 110 34	34	25	90	85	20	55	16	46,7	1,41
232 110 35	35	25	92,5	87,5	20	60	16	50,2	1,54
232 110 36	36	25	95	90	20	60	16	53,3	1,61
232 110 37	37	25	97,5	92,5	20	60	16	54,9	1,68
232 110 38	38	25	100	95	20	60	16	60,8	1,75
232 110 39	39	25	102,5	97,5	20	60	16	65,3	1,83
232 110 40	40	25	105	100	20	70	16	71,2	2,06
232 110 41	41	25	107,5	102,5	20	70	16	77,4	2,14
232 110 42	42	25	110	105	20	70	16	82,2	2,22
232 110 43	43	25	112,5	107,5	20	70	16	92,4	2,30
232 110 44	44	25	115	110	20	70	16	96,6	2,38
232 110 45	45	25	117,5	112,5	20	70	16	100	2,47
232 110 46	46	25	120	115	20	70	20	107	2,52
232 110 47	47	25	122,5	117,5	20	80	20	114	2,80
232 110 48	48	25	125	120	20	80	20	120	2,88
232 110 49	49	25	127,5	122,5	20	80	20	128	2,98
232 110 50	50	25	130	125	20	80	20	135	3,07
232 110 51	51	25	132,5	127,5	20	80	20	143	3,17
232 110 52	52	25	135	130	20	90	20	149	3,48
232 110 53	53	25	137,5	132,5	20	90	20	156	3,58
232 110 54	54	25	140	135	20	90	20	165	3,68
232 110 55	55	25	142,5	137,5	20	90	20	173	3,78
232 110 56	56	25	145	140	20	100	20	181	4,13
232 110 57	57	25	147,5	142,5	20	100	20	190	4,23
232 110 58	58	25	150	145	20	100	20	199	4,34
232 110 59	59	25	152,5	147,5	20	100	20	208	4,46
232 110 60	60	25	155	150	20	100	20	217	4,57
232 110 70	70	25	180	175	20	100	20	324	5,74
232 110 90	90	25	230	225	20	120	25	348	9,24
232 111 20	120	25	305	300	20	120	25	438	15,19

\* Basis of calculations see page 197.

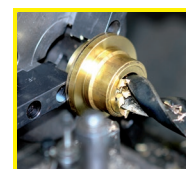
Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 242 110 18, Spur Gear, C45, Module 2.5, 18 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT* Nm	Weight kg
242 110 18	18	25	50	45	12	10,4	0,28
242 110 20	20	25	55	50	12	13,4	0,36
242 110 22	22	25	60	55	14	16,9	0,43
242 110 24	24	25	65	60	14	20,8	0,51
242 110 25	25	25	67,5	62,5	14	22,8	0,56
242 110 30	30	25	80	75	14	34,9	0,82
242 110 40	40	25	105	100	16	71,2	1,47
242 110 48	48	25	125	120	20	120	2,12
242 110 50	50	25	130	125	20	135	2,30
242 110 60	60	25	155	150	20	217	3,34
242 110 65	65	25	167,5	162,5	20	286	3,99
242 110 70	70	25	180	175	20	324	4,64
242 110 72	72	25	185	180	20	332	4,91
242 110 75	75	25	192,5	187,5	20	338	5,33
242 110 76	76	25	195	190	20	340	5,48
242 110 80	80	25	205	200	25	342	6,04
242 110 85	85	25	217,5	212,5	25	346	6,84
242 110 90	90	25	230	225	25	348	7,68
242 110 95	95	25	242,5	237,5	25	361	8,57
242 111 00	100	25	255	250	25	378	9,51
242 111 10	110	25	280	275	25	408	11,53
242 111 14	114	25	290	285	25	419	12,39
242 111 20	120	25	305	300	25	438	13,74
242 111 27	127	25	322,5	317,5	25	453	15,40

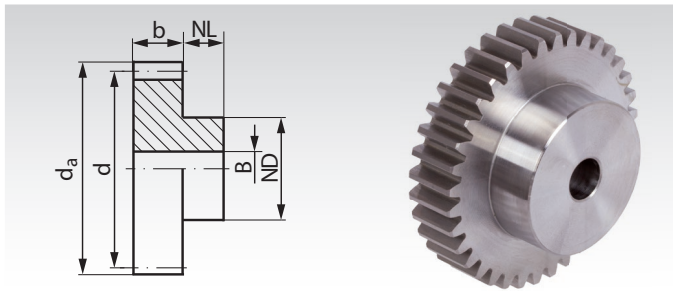
Gears with  
hardened teeth  
Page 241



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 3.0, Tooth Width $b = 25$ mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .

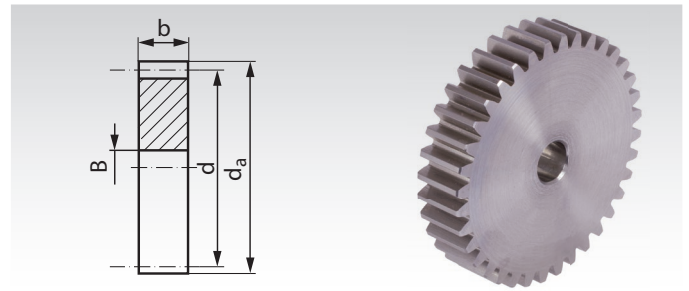


Ordering Details: e.g.: Product No. 233 012 00, Spur Gear, Steel C45, Module 3, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT** Nm	Weight kg
233 012 00	12	25	42	36	15	25	12	9,3	0,21
233 013 00	13	25	45	39	15	25	12	10,5	0,24
233 014 00	14	25	48	42	15	25	12	11,8	0,28
233 015 00	15	25	51	45	15	35	12	13,0	0,37
233 016 00	16	25	54	48	15	35	12	14,0	0,41
233 017 00	17	25	57	51	15	35	12	14,8	0,46
233 018 00	18	25	60	54	15	45	12	16,5	0,58
233 019 00	19	25	63	57	15	45	12	18,8	0,63
233 020 00	20	25	66	60	15	45	15	21,3	0,67
233 021 00	21	25	69	63	15	45	15	23,9	0,72
233 022 00	22	25	72	66	15	45	15	26,7	0,78
233 023 00	23	25	75	69	15	50	15	29,6	0,89
233 024 00	24	25	78	72	15	50	15	32,7	0,95
233 025 00	25	25	81	75	15	50	15	36,0	1,01
233 026 00	26	25	84	78	15	50	15	39,5	1,08
233 027 00	27	25	87	81	15	50	15	43,2	1,16
233 028 00	28	25	90	84	15	50	20	47,0	1,19
233 030 00	30	25	96	90	15	50	20	55,2	1,35
233 032 00	32	25	102	96	15	60	20	64,9	1,62
233 035 00	35	25	111	105	15	60	20	85,0	1,90
233 036 00	36	25	114	108	15	60	20	92,4	2,00
233 038 00	38	25	120	114	20	60	20	108,2	2,30
233 040 00	40	25	126	120	20	70	20	124,7	2,67
233 042 00	42	25	132	126	20	70	20	142,3	2,89
233 045 00	45	25	141	135	20	70	20	170,2	3,26
233 048 00	48	25	150	144	20	80	20	201,5	3,84
233 050 00	50	25	156	150	20	80	20	224,3	4,10
233 052 00	52	25	162	156	20	80	20	248,6	4,39
233 054 00	54	25	168	162	20	80	20	274,6	4,66
233 055 00	55	25	171	165	20	80	20	288,2	4,82
233 056 00	56	25	174	168	20	90	20	302,2	5,18
233 057 00	57	25	177	171	20	90	20	316,7	5,33
233 058 00	58	25	180	174	20	90	20	331,5	5,49
233 060 00	60	25	186	180	20	90	20	380,3	5,83
233 065 00	65	25	201	195	20	90	20	461,9	6,67
233 067 00	67	25	207	201	20	90	20	476,4	7,04
233 070 00	70	25	216	210	20	90	20	480,0	7,64
233 072 00	72	25	222	216	20	100	20	482,0	8,22
233 075 00	75	25	231	225	20	100	20	484,0	8,87
233 076 00	76	25	234	228	20	100	30	486,0	8,94
233 080 00	80	25	246	240	20	100	30	490,0	9,77
233 090 00	90*	25	276	270	20	100	30	530,4	12,12
233 100 00	100*	25	306	300	20	100	30	580,0	14,72
233 114 00	114*	25	348	342	20	100	30	644,0	18,79
233 120 00	120*	25	366	360	20	100	30	673,0	21,00

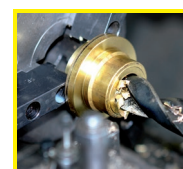
\* Basis of calculations see page 197.

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .



Ordering Details: e.g.: Product No. 243 018 00, Spur Gear, Steel C45, Module 3, 18 Teeth

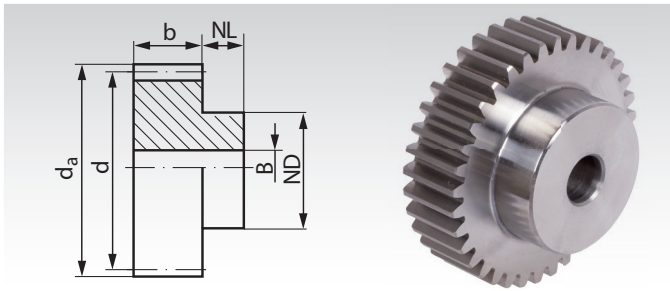
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT** Nm	Weight kg
243 018 00	18	25	60	54	12	16,5	0,42
243 020 00	20	25	66	60	15	21,3	0,50
243 021 00	21	25	69	63	15	23,9	0,55
243 024 00	24	25	78	72	15	32,7	0,74
243 025 00	25	25	81	75	15	36,0	0,81
243 028 00	28	25	90	84	15	47,0	1,02
243 030 00	30	25	96	90	20	55,2	1,15
243 035 00	35	25	111	105	20	85,0	1,61
243 037 00	37	25	117	111	20	100,2	1,80
243 038 00	38	25	120	114	20	108,0	1,91
243 040 00	40	25	126	120	20	125,0	2,11
243 042 00	42	25	132	126	20	142,0	2,34
243 045 00	45	25	141	135	20	170,0	2,70
243 046 00	46	25	144	138	20	180,0	2,81
243 047 00	47	25	147	141	20	191,0	2,95
243 048 00	48	25	150	144	20	202,0	3,09
243 050 00	50	25	156	150	20	224,0	3,34
243 052 00	52	25	162	156	20	249,0	3,64
243 053 00	53	25	165	159	20	261,0	3,78
243 056 00	56	25	174	168	20	302,0	4,23
243 058 00	58	25	180	174	20	332,0	4,54
243 060 00	60	25	186	180	20	380,0	4,87
243 065 00	65	25	201	195	20	462,0	5,72
243 067 00	67	25	207	201	20	476,0	6,09
243 070 00	70	25	216	210	20	480,0	6,67
243 072 00	72	25	222	216	30	482,0	6,99
243 076 00	76	25	234	228	30	486,0	7,80
243 080 00	80	25	246	240	30	490,0	8,63
243 090 00	90	25	276	270	30	530,0	11,00
243 096 00	96	25	294	288	30	559,0	12,53
243 100 00	100	25	306	300	30	580,0	13,61
243 114 00	114	25	348	342	30	644,0	17,72



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Steel, Module 3.0, Tooth Width $b = 30$ mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .

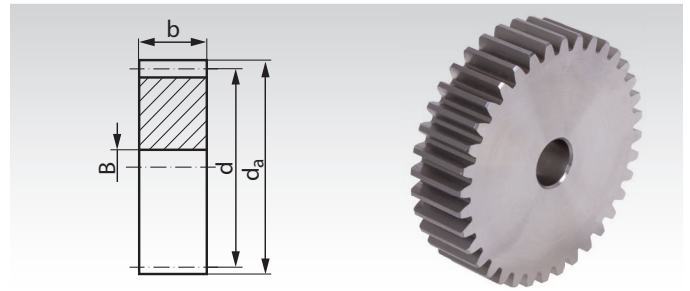


Ordering Details: e.g.: Product No. 233 110 12, Spur Gear, C45, Module 3.0, 12 Teeth

Product No. with Hub	Number of teeth	b mm	$d_a$ mm	d mm	NL mm	ND mm	BH7 mm	perm. Nm	MT* Weight kg
233 110 12	12	30	42	36	20	27	12	10,7	0,28
233 110 13	13	30	45	39	20	30	12	12,1	0,34
233 110 14	14	30	48	42	20	33	12	13,6	0,41
233 110 15	15	30	51	45	20	35	12	15	0,47
233 110 16	16	30	54	48	20	38	14	16,1	0,54
233 110 17	17	30	57	51	20	42	14	17	0,63
233 110 18	18	30	60	54	20	45	14	19	0,72
233 110 19	19	30	63	57	20	45	14	21,6	0,78
233 110 20	20	30	66	60	20	45	14	24,5	0,84
233 110 21	21	30	69	63	20	45	16	27,5	0,89
233 110 22	22	30	72	66	20	50	16	30,7	1,02
233 110 23	23	30	75	69	20	50	16	34	1,10
233 110 24	24	30	78	72	20	50	16	37,6	1,18
233 110 25	25	30	81	75	20	60	16	41,4	1,39
233 110 26	26	30	84	78	20	60	16	45,4	1,48
233 110 27	27	30	87	81	20	60	16	49,7	1,56
233 110 28	28	30	90	84	20	60	16	54,1	1,66
233 110 29	29	30	93	87	20	60	16	59,2	1,75
233 110 30	30	30	96	90	20	60	16	63,5	1,85
233 110 31	31	30	99	93	20	60	16	69,2	1,95
233 110 32	32	30	102	96	20	70	16	74,6	2,21
233 110 33	33	30	105	99	20	70	16	82,8	2,32
233 110 34	34	30	108	102	20	70	16	88,6	2,43
233 110 35	35	30	111	105	20	70	16	97,8	2,55
233 110 36	36	30	114	108	20	70	20	106	2,62
233 110 37	37	30	117	111	20	70	20	115	2,74
233 110 38	38	30	120	114	20	80	20	124	3,05
233 110 39	39	30	123	117	20	80	20	135	3,18
233 110 40	40	30	126	120	20	80	20	143	3,31
233 110 41	41	30	129	123	20	80	20	155	3,44
233 110 42	42	30	132	126	20	80	20	164	3,58
233 110 43	43	30	135	129	20	80	20	175	3,72
233 110 44	44	30	138	132	20	90	20	186	4,07
233 110 45	45	30	141	135	20	90	20	196	4,22
233 110 46	46	30	144	138	20	90	20	207	4,37
233 110 47	47	30	147	141	20	100	20	220	4,76
233 110 48	48	30	150	144	20	100	20	232	4,92
233 110 50	50	30	156	150	20	100	20	258	5,18
233 110 60	60	30	186	180	20	100	20	437	6,97
233 110 65	65	30	201	195	20	100	20	531	7,99
233 110 70	70	30	216	210	20	100	25	552	9,03
233 110 75	75	30	231	225	20	120	25	557	10,75
233 110 90	90	30	276	270	20	120	25	610	14,79
233 111 20	120	30	366	360	20	120	30	774	24,98

\* Basis of calculations see page 197.

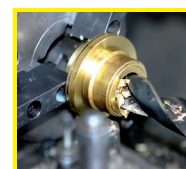
Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .



Ordering Details: e.g.: Product No. 243 110 18, Spur Gear, C45, Module 3.0, 18 Teeth

Product No. without Hub	Number of teeth	b mm	$d_a$ mm	d mm	BH7 mm	perm. Nm	MT* Weight kg
243 110 18	18	30	60	54	14	19	0,49
243 110 20	20	30	66	60	14	24,5	0,62
243 110 24	24	30	78	72	16	37,6	0,89
243 110 25	25	30	81	75	16	41,4	0,97
243 110 30	30	30	96	90	16	63,5	1,42
243 110 40	40	30	126	120	20	143	2,54
243 110 48	48	30	150	144	20	232	3,69
243 110 50	50	30	156	150	20	258	4,06
243 110 52	52	30	162	156	20	286	4,40
243 110 55	55	30	171	165	20	331	4,93
243 110 57	57	30	177	171	20	364	5,30
243 110 60	60	30	186	180	20	437	5,89
243 110 65	65	30	201	195	20	531	6,92
243 110 70	70	30	216	210	25	552	8,00
243 110 72	72	30	222	216	25	554	8,47
243 110 75	75	30	231	225	25	557	9,21
243 110 76	76	30	234	228	25	559	9,46
243 110 80	80	30	246	240	25	564	10,49
243 110 85	85	30	261	255	25	580	11,86
243 110 90	90	30	276	270	25	610	13,32
243 110 95	95	30	291	285	25	640	14,86
243 111 00	100	30	306	300	25	667	16,48
243 111 10	110	30	336	330	25	705	19,97
243 111 14	114	30	348	342	30	740	21,40
243 111 20	120	30	366	360	30	774	23,74
243 111 27	127	30	387	381	30	800	26,61

Gears with  
hardened teeth  
Page 241

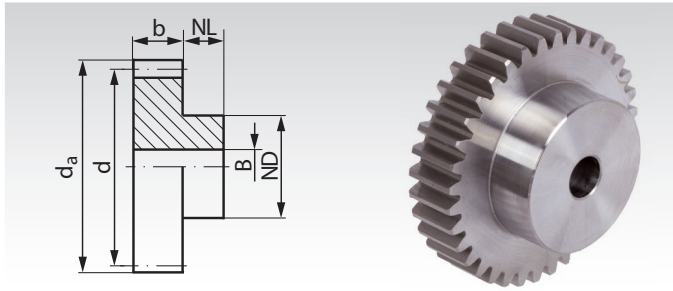


Reworking within  
24h-service possible.  
Custom made parts  
on request.



## Spur Gears Made from Steel, Module 4.0, Tooth Width b = 30 mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

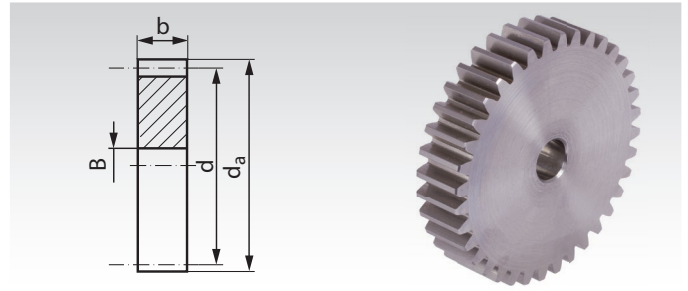


Ordering Details: e.g.: Product No. 234 012 00, Spur Gear, Steel C45, Module 4, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT** Nm	Weight kg
234 012 00	12	30	56	48	20	35	15	21	0,48
234 013 00	13	30	60	52	20	35	15	24	0,55
234 014 00	14	30	64	56	20	40	15	27	0,68
234 015 00	15	30	68	60	20	40	15	30	0,76
234 016 00	16	30	72	64	20	40	20	32	0,80
234 017 00	17	30	76	68	20	40	20	34	0,90
234 018 00	18	30	80	72	20	50	20	38	1,11
234 019 00	19	30	84	76	20	50	20	43	1,21
234 020 00	20	30	88	80	20	50	20	49	1,33
234 021 00	21	30	92	84	20	50	20	55	1,45
234 022 00	22	30	96	88	20	50	20	62	1,58
234 023 00	23	30	100	92	20	50	20	69	1,70
234 024 00	24	30	104	96	20	60	20	76	1,98
234 025 00	25	30	108	100	20	60	20	87	2,12
234 026 00	26	30	112	104	20	60	20	97	2,28
234 027 00	27	30	116	108	20	60	20	109	2,43
234 028 00	28	30	120	112	20	60	20	122	2,58
234 030 00	30	30	128	120	20	70	20	148	3,08
234 032 00	32	30	136	128	20	70	20	176	3,44
234 035 00	35	30	148	140	20	70	25	222	3,97
234 036 00	36	30	152	144	20	70	25	239	4,18
234 038 00	38	30	160	152	20	70	25	275	4,61
234 040 00	40	30	168	160	20	80	25	315	5,27
234 042 00	42	30	176	168	20	80	25	358	5,77
234 044 00	44	30	184	176	20	80	25	404	6,24
234 045 00	45	30	188	180	20	80	25	429	6,52
234 046 00	46	30	192	184	20	80	25	456	6,79
234 048 00	48	30	200	192	20	100	25	510	7,78
234 050 00	50	30	208	200	20	100	25	568	8,36
234 052 00	52	30	216	208	20	100	25	636	8,96
234 054 00	54	30	224	216	20	100	25	698	9,50
234 055 00	55	30	228	220	20	100	25	730	10,00
234 056 00	56	30	232	224	20	100	25	763	10,50
234 058 00	58	30	240	232	20	100	25	832	11,00
234 060 00	60	30	248	240	20	100	25	905	11,50
234 065 00	65*	30	268	260	20	100	30	976	13,50
234 067 00	67*	30	276	268	20	100	30	980	14,00
234 070 00	70*	30	288	280	20	100	30	985	15,30
234 072 00	72*	30	296	288	20	100	30	993	16,00
234 075 00	75*	30	308	300	20	100	30	1030	17,50
234 076 00	76*	30	312	304	20	120	30	1042	18,38
234 080 00	80*	30	328	320	20	120	30	1083	20,00
234 090 00	90*	30	368	360	20	120	30	1200	25,20
234 096 00	96*	30	392	384	20	120	30	1270	28,50
234 100 00	100*	30	408	400	20	120	30	1320	31,00

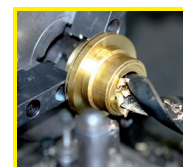
\* Basis of calculations see page 197.

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 244 020 00, Spur Gear, Steel C45, Module 4, 20 Teeth

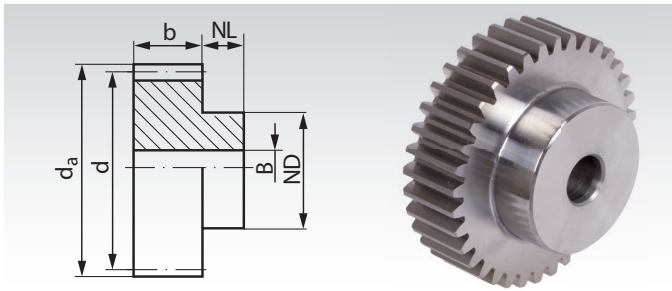
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT** Nm	Weight kg
244 020 00	20	30	88	80	20	49	1,07
244 024 00	24	30	104	96	20	76	1,59
244 025 00	25	30	108	100	20	87	1,73
244 030 00	30	30	128	120	25	148	2,49
244 035 00	35	30	148	140	25	222	3,44
244 036 00	36	30	152	144	25	239	3,55
244 037 00	37	30	156	148	25	256	3,86
244 038 00	38	30	160	152	25	275	4,04
244 040 00	40	30	168	160	25	315	4,55
244 042 00	42	30	176	168	25	358	5,02
244 045 00	45	30	188	180	25	429	5,78
244 046 00	46	30	192	184	25	456	6,08
244 047 00	47	30	196	188	25	483	6,34
244 048 00	48	30	200	192	25	510	6,62
244 050 00	50	30	208	200	25	568	7,18
244 052 00	52	30	216	208	25	636	7,78
244 056 00	56	30	232	224	25	763	9,06
244 060 00	60	30	248	240	25	905	10,42
244 065 00	65	30	268	260	30	976	12,19
244 067 00	67	30	276	268	30	980	12,99
244 070 00	70	30	288	280	30	985	14,14
244 076 00	76	30	312	304	30	1042	17,00
244 080 00	80	30	328	320	30	1083	18,50
244 090 00	90	30	368	360	30	1200	23,50
244 096 00	96	30	392	384	30	1270	26,89



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Steel, Module 4.0, Tooth Width b = 40 mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

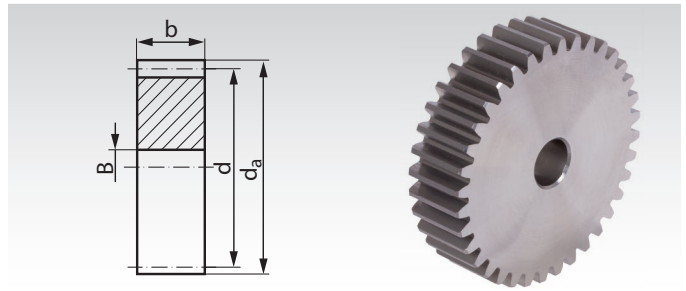


Ordering Details: e.g.: Product No. 234 110 12, Spur Gear, C45, Module 4.0, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. Nm	MT*Weight kg
234 110 12	12	40	56	48	20	35	14	26	0,63
234 110 13	13	40	60	52	20	40	14	30	0,78
234 110 14	14	40	64	56	20	45	14	34	0,93
234 110 15	15	40	68	60	20	45	14	38	1,05
234 110 16	16	40	72	64	20	50	16	40	1,20
234 110 17	17	40	76	68	20	50	16	43	1,33
234 110 18	18	40	80	72	20	50	16	48	1,47
234 110 19	19	40	84	76	20	60	16	54	1,75
234 110 20	20	40	88	80	20	60	16	61	1,90
234 110 21	21	40	92	84	20	70	16	69	2,22
234 110 22	22	40	96	88	20	70	16	78	2,39
234 110 23	23	40	100	92	20	75	20	86	2,60
234 110 24	24	40	104	96	20	75	20	95	2,79
234 110 25	25	40	108	100	20	75	20	109	2,98
234 110 26	26	40	112	104	20	75	20	121	3,18
234 110 27	27	40	116	108	20	75	20	136	3,39
234 110 28	28	40	120	112	20	75	20	153	3,60
234 110 29	29	40	124	116	20	75	20	171	3,83
234 110 30	30	40	128	120	20	75	20	185	4,06
234 110 31	31	40	132	124	20	80	20	205	4,39
234 110 32	32	40	136	128	20	80	20	220	4,64
234 110 33	33	40	140	132	20	80	20	248	4,90
234 110 34	34	40	144	136	20	80	20	264	5,16
234 110 35	35	40	148	140	20	80	20	278	5,43
234 110 36	36	40	152	144	20	80	25	299	5,63
234 110 38	38	40	160	152	20	80	25	344	6,14
234 110 40	40	40	168	160	20	80	25	394	6,74
234 110 50	50	40	208	200	20	100	25	710	10,66
234 110 60	60	40	248	240	20	100	25	1131	14,92
234 110 90	90	40	368	360	20	120	30	1500	32,76

\* Basis of calculations see page 197.

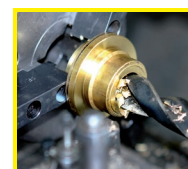
Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 244 110 20, Spur Gear, C45, Module 4.0, 20 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. Nm	MT* Weight kg
244 110 20	20	40	88	80	16	61	1,49
244 110 24	24	40	104	96	20	95	2,13
244 110 25	25	40	108	100	20	109	2,32
244 110 30	30	40	128	120	20	185	3,38
244 110 35	35	40	148	140	20	278	4,64
244 110 36	36	40	152	144	25	299	4,86
244 110 38	38	40	160	152	25	344	5,20
244 110 40	40	40	168	160	25	394	6,11
244 110 45	45	40	188	180	25	536	7,78
244 110 48	48	40	200	192	25	638	8,87
244 110 50	50	40	208	200	25	710	9,65
244 110 52	52	40	216	208	25	795	10,45
244 110 55	55	40	228	220	25	913	11,71
244 110 57	57	40	236	228	25	1020	12,59
244 110 60	60	40	248	240	25	1131	13,97
244 110 65	65	40	268	260	25	1220	16,43
244 110 70	70	40	288	280	25	1231	19,09
244 110 75	75	40	308	300	25	1288	21,94
244 110 76	76	40	312	304	30	1303	22,47
244 110 80	80	40	328	320	30	1354	24,93
244 110 85	85	40	348	340	30	1430	28,18
244 110 90	90	40	368	360	30	1500	31,62
244 110 95	95	40	388	380	30	1580	35,26
244 111 00	100	40	408	400	30	1650	39,11
244 111 10	110	40	448	440	30	1744	47,38
244 111 14	114	40	464	456	30	1830	50,91

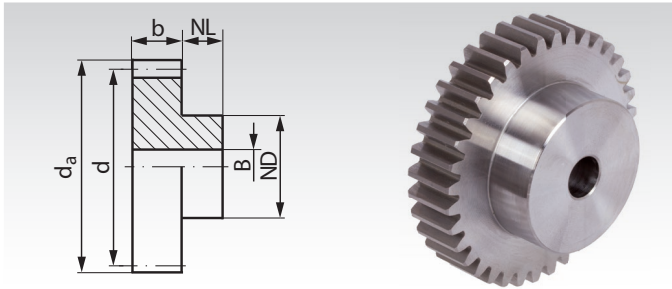
Gears with  
hardened teeth  
Page 241



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 5.0, Tooth Width $b = 40$ mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .



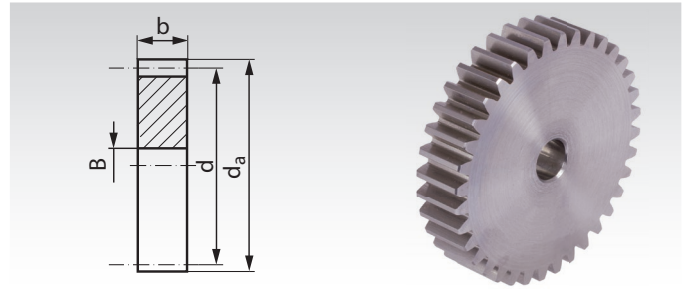
Ordering Details: e.g.: Product No. 235 012 00, Spur Gear, Steel C45, Module 5, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. Nm	MT**	Weight kg
235 012 00	12	40	70	60	25	40	15	49	0,99	
235 013 00	13	40	75	65	25	40	15	54	1,14	
235 014 00	14	40	80	70	25	50	15	60	1,45	
235 015 00	15	40	85	75	25	60	15	66	1,79	
235 016 00	16	40	90	80	25	60	15	72	1,98	
235 017 00	17	40	95	85	25	60	20	74	2,11	
235 018 00	18	40	100	90	25	60	20	84	2,33	
235 019 00	19	40	105	95	25	60	20	97	2,55	
235 020 00	20	40	110	100	25	60	20	113	2,78	
235 021 00	21	40	115	105	25	60	20	132	3,03	
235 022 00	22	40	120	110	25	60	20	152	3,30	
235 023 00	23	40	125	115	25	60	20	173	3,57	
235 024 00	24	40	130	120	25	80	20	195	4,29	
235 025 00	25	40	135	125	25	80	20	219	4,59	
235 026 00	26	40	140	130	25	80	25	242	4,80	
235 027 00	27	40	145	135	25	80	25	267	5,13	
235 028 00	28	40	150	140	25	80	25	293	5,47	
235 030 00	30	40	160	150	25	80	25	351	6,18	
235 032 00	32	40	170	160	30	80	25	416	7,14	
235 035 00	35	40	185	175	30	80	25	526	8,36	
235 036 00	36	40	190	180	30	100	25	566	9,45	
235 038 00	38	40	200	190	30	100	25	656	10,33	
235 040 00	40	40	210	200	30	100	25	750	11,30	
235 045 00	45	40	235	225	30	100	25	1010	13,87	
235 048 00	48**	40	250	240	30	100	30	1186	15,44	
235 050 00	50**	40	260	250	30	120	30	1312	17,50	
235 052 00	52**	40	270	260	30	120	30	1446	18,75	
235 055 00	55**	40	285	275	30	150	30	1662	22,00	
235 056 00	56**	40	290	280	30	150	30	1739	23,00	
235 060 00	60**	40	310	300	30	160	30	1850	26,50	

\* Basis of calculations see page 197.

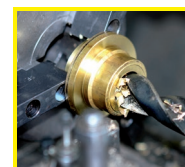
\*\* The hubs on these gears are welded on.

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .



Ordering Details: e.g.: Product No. 245 020 00, Spur Gear, Steel C45, Module 5, 20 Teeth

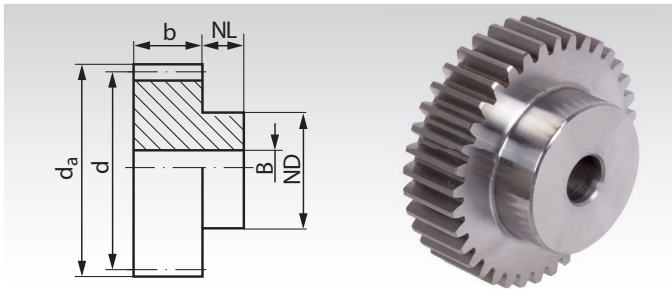
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. Nm	MT**	Weight kg
245 020 00	20	40	110	100	20	113	113	2,29
245 025 00	25	40	135	125	25	219	219	3,61
245 030 00	30	40	160	150	25	351	351	5,29
245 035 00	35	40	185	175	25	526	526	7,27
245 036 00	36	40	190	180	25	566	566	7,71
245 038 00	38	40	200	190	25	656	656	8,63
245 040 00	40	40	210	200	25	750	750	9,57
245 045 00	45	40	235	225	25	1010	1010	12,15
245 048 00	48	40	250	240	30	1186	1186	13,02
245 050 00	50	40	260	250	30	1312	1312	13,59
245 052 00	52	40	270	260	30	1446	1446	16,28
245 060 00	60	40	310	300	30	1850	1850	22,00
245 065 00	65	40	335	325	30	1953	1953	25,50
245 070 00	70	40	360	350	30	2086	2086	30,00



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 5.0, Tooth Width $b = 50$ mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .

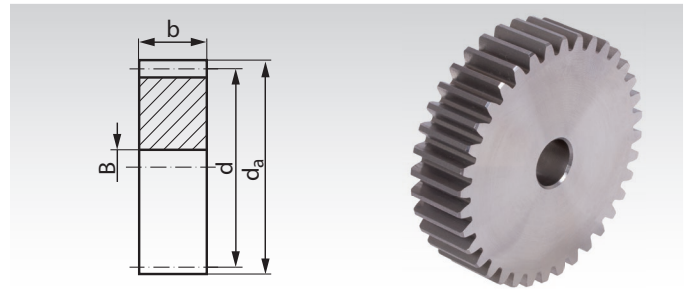


Ordering Details: e.g.: Product No. 235 110 12, Spur Gear, C45, Module 5.0, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
235 110 12	12	50	70	60	25	45	20	58	1,21
235 110 13	13	50	75	65	25	50	20	64	1,47
235 110 14	14	50	80	70	25	55	20	71	1,76
235 110 15	15	50	85	75	25	60	20	79	2,07
235 110 16	16	50	90	80	25	65	20	86	2,40
235 110 17	17	50	95	85	25	70	20	88	2,75
235 110 18	18	50	100	90	25	70	20	100	3,02
235 110 19	19	50	105	95	25	70	20	115	3,30
235 110 20	20	50	110	100	25	80	20	134	3,83
235 110 21	21	50	115	105	25	80	20	157	4,15
235 110 22	22	50	120	110	25	80	20	181	4,48
235 110 23	23	50	125	115	25	90	20	206	5,08
235 110 24	24	50	130	120	25	90	20	232	5,44
235 110 25	25	50	135	125	25	90	20	261	5,82
235 110 26	26	50	140	130	25	100	20	288	6,50
235 110 27	27	50	145	135	25	100	20	318	6,91
235 110 28	28	50	150	140	25	100	25	349	7,22
235 110 29	29	50	155	145	25	110	25	385	7,98
235 110 30	30	50	160	150	25	110	25	418	8,44
235 110 32	32	50	170	160	25	110	25	495	9,30
235 110 50	50	50	260	250	25	120	30	1561	20,67
235 110 60	60	50	310	300	25	160	30	2202	30,69

\* Basis of calculations see page 197.

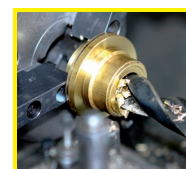
Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle  $20^\circ$ .



Ordering Details: e.g.: Product No. 245 110 20, Spur Gear, C45, Module 5.0, 20 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT* Nm	Weight kg
245 110 20	20	50	110	100	20	134	2,90
245 110 24	24	50	130	120	20	232	4,23
245 110 25	25	50	135	125	20	261	4,60
245 110 30	30	50	160	150	25	418	6,61
245 110 32	32	50	170	160	25	495	7,62
245 110 35	35	50	185	175	25	626	9,16
245 110 38	38	50	200	190	25	781	10,84
245 110 40	40	50	210	200	25	893	12,04
245 110 45	45	50	235	225	25	1202	15,30
245 110 48	48	50	250	240	25	1411	17,44
245 110 50	50	50	260	250	30	1561	18,86
245 110 52	52	50	270	260	30	1721	20,43
245 110 55	55	50	285	275	30	1978	22,89
245 110 57	57	50	295	285	30	2030	24,62
245 110 60	60	50	310	300	30	2202	27,31
245 110 65	65	50	335	325	30	2324	32,12
245 110 70	70	50	360	350	30	2482	37,31
245 110 75	75	50	385	375	30	2576	42,88
245 110 76	76	50	390	380	30	2606	44,04
245 110 80	80	50	410	400	30	2708	48,84
245 110 85	85	50	435	425	30	2860	55,19
245 110 90	90	50	460	450	30	3000	61,92
245 110 95	95	50	485	475	30	3160	69,03
245 111 00	100	50	510	500	30	3300	76,53
245 111 10	110	50	560	550	30	3450	92,69
245 111 14	114	50	580	570	30	3600	99,59

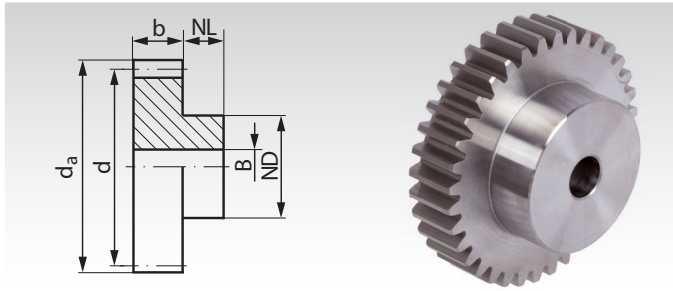
Gears with  
hardened teeth  
Page 241



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 6.0, Tooth Width b = 50 mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



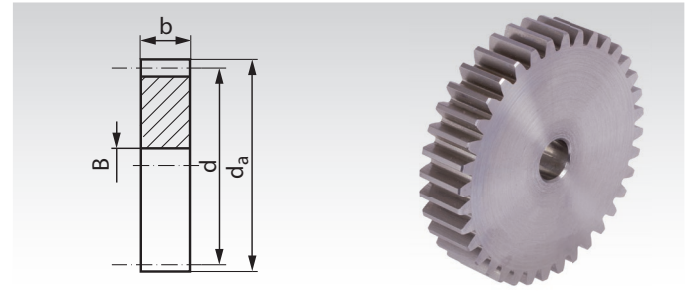
Ordering Details: e.g.: Product No. 236 012 00, Spur Gear, Steel C45, Module 6, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. Nm	MT**	Weight kg
236 012 00	12	50	84	72	25	50	20	96	1,72	
236 013 00	13	50	90	78	25	50	20	112	1,99	
236 014 00	14	50	96	84	25	60	20	128	2,45	
236 015 00	15	50	102	90	25	60	20	140	2,79	
236 016 00	16	50	108	96	25	60	20	145	3,12	
236 017 00	17	50	114	102	25	60	20	150	3,47	
236 018 00	18	50	120	108	25	70	20	175	4,05	
236 019 00	19	50	126	114	25	70	20	207	4,46	
236 020 00	20	50	132	120	25	70	20	241	4,88	
236 021 00	21	50	138	126	25	70	25	276	5,24	
236 022 00	22	50	144	132	25	80	25	312	5,94	
236 023 00	23	50	150	138	25	80	25	350	6,43	
236 024 00	24	50	156	144	25	80	25	391	6,93	
236 025 00	25	50	162	150	25	80	25	436	7,49	
236 026 00	26	50	168	156	25	80	25	483	8,05	
236 027 00	27	50	174	162	25	80	25	533	8,62	
236 028 00	28	50	180	168	25	90	25	587	9,78	
236 030 00	30	50	192	180	30	100	25	703	11,33	
236 032 00	32	50	204	192	30	100	25	836	12,74	
236 035 00	35	50	222	210	30	100	25	1045	14,95	
236 036 00	36	50	228	216	30	100	25	1120	15,70	
236 038 00	38	50	240	228	30	120	25	1280	18,00	
236 040 00	40**	50	252	240	30	120	30	1460	19,69	
236 045 00	45**	50	282	270	30	120	30	1955	24,50	
236 048 00	48**	50	300	288	30	120	30	2300	27,66	
236 050 00	50**	50	312	300	30	140	30	2550	30,61	
236 052 00	52**	50	324	312	30	140	30	2800	34,91	
236 055 00	55**	50	342	330	30	150	40	3060	35,84	
236 060 00	60**	50	372	360	30	150	40	3350	43,00	

\* Basis of calculations see page 197.

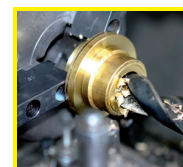
\*\* The hubs on these gears are welded on.

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 246 020 00, Spur Gear, Steel C45, Module 6, 20 Teeth

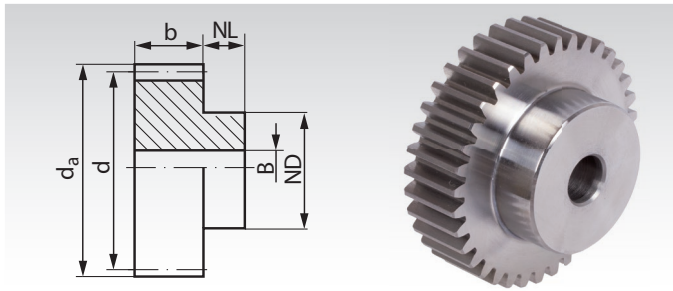
Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. Nm	MT**	Weight kg
246 020 00	20	50	132	120	20	241		4,23
246 024 00	24	50	156	144	25	391		6,08
246 025 00	25	50	162	150	25	436		6,50
246 030 00	30	50	192	180	25	703		9,50
246 035 00	35	50	222	210	25	1045		13,14
246 036 00	36	50	228	216	25	1120		14,00
246 040 00	40	50	252	240	30	1460		17,50
246 045 00	45	50	282	270	30	1955		22,00
246 048 00	48	50	300	288	30	2300		25,00
246 050 00	50	50	312	300	30	2550		27,00
246 052 00	52	50	324	312	30	2800		29,50
246 056 00	56	50	348	336	40	3120		34,00
246 060 00	60	50	372	360	40	3350		39,00



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Made from Steel, Module 6.0, Tooth Width b = 60 mm, Milled Teeth, Straight Tooth System

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

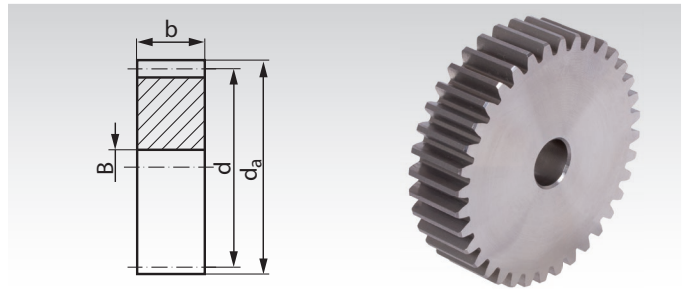


Ordering Details: e.g.: Product No. 236 110 12, Spur Gear, C45, Module 6.0, 12 Teeth

Product No. with Hub	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
236 110 12	12	60	84	72	20	54	20	110	1,82
236 110 13	13	60	90	78	20	60	20	129	2,20
236 110 14	14	60	96	84	20	65	20	147	2,88
236 110 15	15	60	102	90	20	70	20	161	3,01
236 110 16	16	60	108	95	20	75	20	167	3,46
236 110 17	17	60	114	102	20	75	20	172	4,26
236 110 18	18	60	120	108	20	80	20	201	4,33
236 110 20	20	60	132	120	20	90	20	277	5,43
236 110 21	21	60	138	126	20	90	25	317	6,44
236 110 22	22	60	144	132	20	100	25	358	7,23
236 110 24	24	60	156	144	20	110	25	450	7,88
236 110 25	25	60	162	150	20	110	25	500	8,42
236 110 30	30	60	192	180	20	120	25	808	13,20
236 110 36	36	60	228	216	20	130	25	1284	18,68
236 110 50	50	60	312	300	20	140	30	2924	34,59
236 110 60	60	60	372	360	20	150	40	3842	48,97

\* Basis of calculations see page 197.

Material: C45. Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.

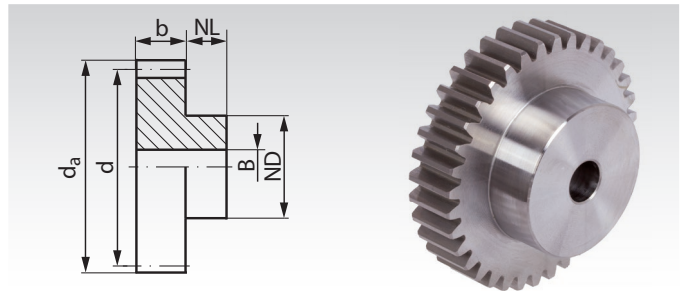


Ordering Details: e.g.: Product No. 246 110 20, Spur Gear, C45, Module 6.0, 20 Teeth

Product No. without Hub	Number of teeth	b mm	da mm	d mm	BH7 mm	perm. MT* Nm	Weight kg
246 110 20	20	60	132	120	20	277	5,08
246 110 24	24	60	156	144	25	450	7,29
246 110 25	25	60	162	150	25	500	7,93
246 110 28	28	60	180	168	25	675	10,00
246 110 30	30	60	192	180	25	808	11,52
246 110 32	32	60	204	192	25	960	13,14
246 110 35	35	60	222	210	25	1200	15,77
246 110 36	36	60	228	216	25	1284	16,69
246 110 38	38	60	240	228	25	1470	18,63
246 110 40	40	60	252	240	25	1680	20,66
246 110 50	50	60	312	300	30	2924	32,31
246 110 60	60	60	372	360	40	3842	46,42

## Spur Gears Made from Steel, Module 8, with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: C45.  
Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.



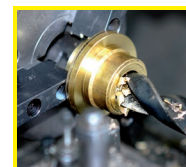
Ordering Details: e.g.: Product No. 238 012 00, Spur Gear, C45, Module 8, 12 Teeth

### Module 8.0 Tooth Width b = 65 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
238 012 00	12	65	112	96	30	70	25	240	4,20
238 015 00	15	65	136	120	30	80	25	370	6,50
238 018 00	18	65	160	144	30	80	25	495	9,00
238 020 00	20	65	176	160	30	100	30	655	11,50
238 024 00	24	65	208	192	30	120	30	1045	16,90
238 025 00	25	65	216	200	30	120	30	1160	18,10
238 030 00	30	65	256	240	30	150	30	1834	26,60
238 036 00	36	65	304	288	30	160	40	2900	36,90
238 040 00**	40	65	336	320	30	180	40	3790	46,00

\* Basis of calculations see page 197.

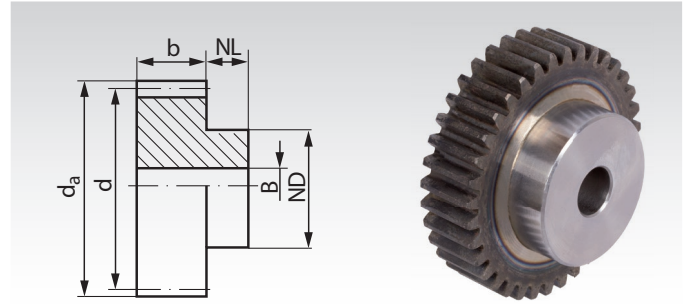
\*\* The hubs on these gears are welded on.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears with One-Sided Hub, Milled Teeth, Straight Tooth System, Teeth Induction Hardened

**Material:** C45. Teeth milled in quality 8d25 DIN 3967.  
After milling, the tooth area is induction hardened, 54 + 4 HRC.  
The hardening sets the tooth quality to 10-11.  
Pressure angle 20°.



Ordering Details: e.g.: Product No. 214 881 12, Spur Gear, Hardened, Module 1, 12 Teeth

### Module 1 Tooth Width b = 15 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
214 881 12	12	15	14	12	10	9	6	1,2	13
214 881 14	14	15	16	14	10	11	6	1,5	20
214 881 15	15	15	17	15	10	12	6	1,6	24
214 881 16	16	15	18	16	10	13	6	1,7	28
214 881 18	18	15	20	18	10	15	8	2,0	33
214 881 20	20	15	22	20	10	16	8	2,7	42
214 881 24	24	15	26	24	10	20	10	4,1	61
214 881 25	25	15	27	25	10	20	10	4,5	66
214 881 26	26	15	28	26	10	20	10	5,0	70
214 881 28	28	15	30	28	10	20	10	5,8	80
214 881 30	30	15	32	30	10	20	10	6,9	90
214 881 36	36	15	38	36	10	25	10	10,5	140
214 881 40	40	15	42	40	10	25	10	13,5	170
214 881 50	50	15	52	50	10	30	12	23,9	260
214 881 60	60	15	62	60	10	40	12	37,8	400

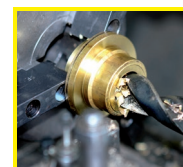
### Module 1.5 Tooth Width b = 17 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
218 881 12	12	17	21	18	13	14	8	3,8	40
218 881 15	15	17	25,5	22,5	13	18	8	5,2	70
218 881 18	18	17	30	27	13	20	8	6,6	100
218 881 20	20	17	33	30	13	25	8	8,6	130
218 881 24	24	17	39	36	13	25	10	13,3	170
218 881 25	25	17	40,5	37,5	13	25	10	14,5	180
218 881 30	30	17	48	45	13	30	12	22,2	260
218 881 36	36	17	57	54	13	35	12	34	370
218 881 40	40	17	63	60	13	40	12	44	480
218 881 50	50	17	78	75	13	50	14	77	760
218 881 60	60	17	93	90	13	60	16	122	1090

### Module 2 Tooth Width b = 20 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
231 881 12	12	20	28	24	15	18	10	9,0	80
231 881 15	15	20	34	30	15	24	10	12,9	140
231 881 18	18	20	40	36	15	25	10	16,2	190
231 881 20	20	20	44	40	15	30	10	21,1	260
231 881 24	24	20	52	48	15	35	12	32,7	360
231 881 25	25	20	54	50	15	35	12	35,6	390
231 881 30	30	20	64	60	15	40	14	55	550
231 881 36	36	20	76	72	15	45	14	84	780
231 881 40	40	20	84	80	15	50	14	107	970
231 881 50	50	20	104	100	15	70	16	190	1620
231 881 60	60	20	124	120	15	70	16	321	2160

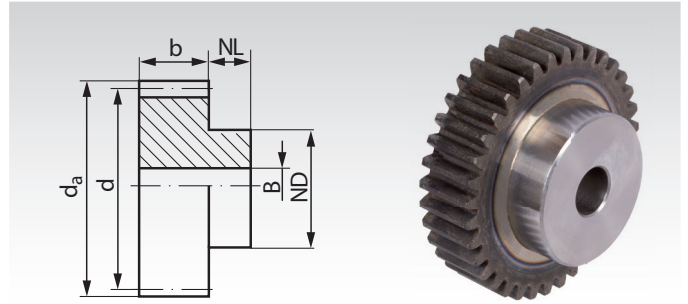
\* Basis of calculations see page 197.



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears with One-Sided Hub, Milled Teeth, Straight Tooth System, Teeth Induction Hardened

**Material:** C45. Teeth milled in quality 8d25 DIN 3967.  
 After milling, the tooth area is induction hardened, 54 + 4 HRC.  
 The hardening sets the tooth quality to 10-11.  
 Pressure angle 20°.



Ordering Details: e.g.: Product No. 232 881 12, Spur Gear, Hardened, Module 2.5, 12 Teeth

### Module 2.5 Tooth Width b = 25 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
232 881 12	12	25	35	30	20	22	10	19,5	0,17
232 881 15	15	25	42,5	37,5	20	30	10	27,4	0,30
232 881 18	18	25	50	45	20	35	12	34,3	0,42
232 881 20	20	25	55	50	20	40	12	44,2	0,54
232 881 24	24	25	65	60	20	45	14	69	0,74
232 881 25	25	25	67,5	62,5	20	50	14	75	0,85
232 881 30	30	25	80	75	20	55	14	115	1,18
232 881 36	36	25	95	90	20	60	16	176	1,61
232 881 40	40	25	105	100	20	70	16	235	2,06
232 881 50	50	25	130	125	20	80	20	446	3,07
232 881 60	60	25	155	150	20	100	20	716	4,57

### Module 3 Tooth Width b = 30 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
233 881 12	12	30	42	36	20	27	12	35	0,28
233 881 15	15	30	51	45	20	35	12	49	0,47
233 881 18	18	30	60	54	20	45	14	63	0,72
233 881 20	20	30	66	60	20	45	14	81	0,84
233 881 24	24	30	78	72	20	50	16	124	1,18
233 881 25	25	30	81	75	20	60	16	137	1,39
233 881 30	30	30	96	90	20	60	16	210	1,85
233 881 36	36	30	114	108	20	70	20	350	2,62
233 881 40	40	30	126	120	20	80	20	472	3,31
233 881 50	50	30	156	150	20	100	20	851	5,18
233 881 60	60	30	186	180	20	100	20	1442	6,97

### Module 4 Tooth Width b = 40 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
234 881 12	12	40	56	48	20	35	14	86	0,63
234 881 15	15	40	68	60	20	45	14	125	1,05
234 881 18	18	40	80	72	20	50	16	158	1,47
234 881 20	20	40	88	80	20	60	16	201	1,90
234 881 24	24	40	104	96	20	75	20	314	2,79
234 881 25	25	40	108	100	20	75	20	360	2,98
234 881 30	30	40	128	120	20	75	20	611	4,06
234 881 36	36	40	152	144	20	80	25	987	5,63
234 881 40	40	40	168	160	20	80	25	1300	6,74
234 881 50	50	40	208	200	20	100	25	2343	10,66
234 881 60	60	40	248	240	20	100	25	3732	14,92

### Module 5 Tooth Width b = 50 mm

Product No.	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight kg
235 881 12	12	50	70	60	25	45	20	191	1,21
235 881 15	15	50	85	75	25	60	20	261	2,07
235 881 18	18	50	100	90	25	70	20	330	3,02
235 881 20	20	50	110	100	25	80	20	442	3,83
235 881 24	24	50	130	120	25	90	20	766	5,44
235 881 25	25	50	135	125	25	90	20	861	5,82
235 881 30	30	50	160	150	25	110	25	1380	8,44



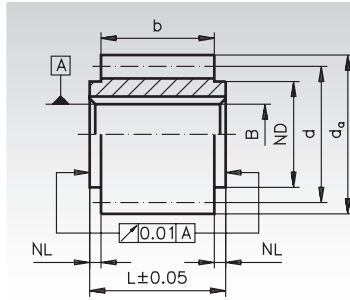
**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

\* Basis of calculations see page 197.



## Precision Spur Gears Made From Steel 16MnCr5, Hardened with Ground Tooth Flanks

Tooth quality 7e25.  
 Pressure angle 20°.  
 Case hardened HRC 58± 2.  
 Feather keyways in accordance with DIN 6885/1, Tol. P9.  
 Teeth, bores and faces ground.



Ordering Details: e.g.: Product No. 224 818 00,  
 spur gear, steel 16MnCr5 module 1.0, 18 teeth, ground

### Module 1.0 tooth width b = 10 mm, various bore sizes

Product No.	Number of teeth	b mm	d <sub>a</sub> <sup>-0,1</sup> mm	d mm	NL mm	ND mm	L±0,05 mm	BH6 mm	perm. MT* Nm	Weight g
224 818 00	18	10	20	18	1,5/1,5	15	13	8	5,7	19
224 820 00	20	10	22	20	1,5/1,5	15	13	8	7,5	23
224 824 00	24	10	26	24	1,5/1,5	18	13	10	12,2	33
224 824 12	24	10	26	24	1,5/1,5	18	13	12	12,2	30
224 825 00	25	10	27	25	1,5/1,5	20	13	10	13,5	41
224 825 12	25	10	27	25	1,5/1,5	20	13	12	13,5	38
224 830 00	30	10	32	30	1,5/1,5	25	13	10	16,1	58
224 830 12	30	10	32	30	1,5/1,5	25	13	12	16,1	54
224 836 00	36	10	38	36	1,5/1,5	25	13	10	19,3	82
224 836 15	36	10	38	36	1,5/1,5	25	13	15	19,3	72
224 840 00	40	10	42	40	1,5/1,5	30	13	12	21,4	102
224 840 15	40	10	42	40	1,5/1,5	30	13	15	21,4	95
224 848 00	48	10	50	48	1,5/1,5	40	13	12	25,7	158
224 848 15	48	10	50	48	1,5/1,5	40	13	15	25,7	151
224 850 00	50	10	52	50	1,5/1,5	40	13	12	26,8	170
224 850 20	50	10	52	50	1,5/1,5	40	13	20	26,8	149
224 860 00	60	10	62	60	1,5/1,5	50	13	12	32,6	253
224 860 20	60	10	62	60	1,5/1,5	50	13	20	32,6	232

\* Basis of calculations see page 197.

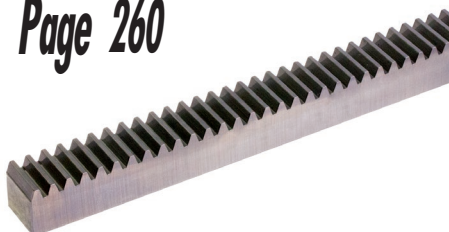
### Module 1.5 tooth width b = 15 mm, various bore sizes

Product No.	Number of teeth	b mm	d <sub>a</sub> <sup>-0,1</sup> mm	d mm	NL mm	ND mm	L±0,05 mm	BH6 mm	perm. MT* Nm	Weight g
228 812 00	12	15	21	18	1,5/1,5	14	18	8	12,5	25
228 815 00	15	15	25,5	22,5	1,5/1,5	18	18	10	18,1	40
228 815 12	15	15	25,5	22,5	1,5/1,5	18	18	12	18,1	36
228 818 00	18	15	30	27	1,5/1,5	22	18	10	23,0	63
228 818 12	18	15	30	27	1,5/1,5	22	18	12	23,0	58
228 820 00	20	15	33	30	1,5/1,5	25	18	10	30,3	82
228 820 15	20	15	33	30	1,5/1,5	25	18	15	30,3	63
228 824 00	24	15	39	36	1,5/1,5	25	18	10	45,5	115
228 824 15	24	15	39	36	1,5/1,5	25	18	15	45,5	104
228 825 00	25	15	40,5	37,5	1,5/1,5	28	18	12	50,3	126
228 825 15	25	15	40,5	37,5	1,5/1,5	28	18	15	50,3	117
228 830 00	30	15	48	45	1,5/1,5	30	18	12	60,2	185
228 830 15	30	15	48	45	1,5/1,5	30	18	15	60,2	176
228 836 00	36	15	57	54	1,5/1,5	40	18	12	72,0	277
228 836 20	36	15	57	54	1,5/1,5	40	18	20	72,0	251
228 840 00	40	15	63	60	1,5/1,5	40	18	12	80,0	345
228 840 20	40	15	63	60	1,5/1,5	40	18	20	80,0	313
228 848 00	48	15	75	72	1,5/1,5	40	18	15	96,8	474
228 848 20	48	15	75	72	1,5/1,5	40	18	20	96,8	458
228 850 00	50	15	78	75	1,5/1,5	50	18	15	101,0	545
228 850 25	50	15	78	75	1,5/1,5	50	18	25	101,0	490
228 860 00	60	15	93	90	1,5/1,5	60	18	15	122,0	777
228 860 25	60	15	93	90	1,5/1,5	60	18	25	122,0	736

\* Basis of calculations see page 197.

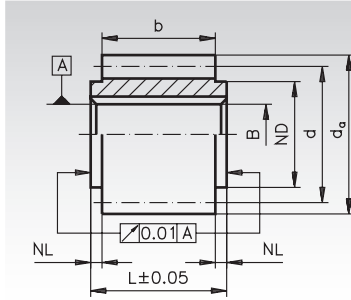
## Precision Gear Racks

### Page 260



## Precision Spur Gears Made From Steel 16MnCr5, Hardened with Ground Tooth Flanks

Tooth quality 7e25.  
 Pressure angle 20°.  
 Case hardened HRC 58±2.  
 Feather keyways in accordance with DIN 6885/1, Tol. P9.  
 Teeth, bores and faces ground.



Ordering Details: e.g.: Product No. 241 812 00,  
 spur gear, steel 16MnCr5 module 2, 12 teeth, ground

### Module 2.0 tooth width b = 20 mm, various bore sizes

Product No.	Number of teeth	b mm	d <sub>a</sub> <sup>-0,1</sup> mm	d mm	NL mm	ND mm	L±0,05 mm	B <sup>H6</sup> mm	perm. MT* Nm	Weight g
241 812 00	12	20	28	24	1,5/1,5	18	23	10	30,5	61
241 815 00	15	20	34	30	1,5/1,5	25	23	12	44,4	100
241 815 15	15	20	34	30	1,5/1,5	25	23	15	44,4	88
241 818 00	18	20	40	36	1,5/1,5	28	23	12	56,4	150
241 818 15	18	20	40	36	1,5/1,5	28	23	15	56,4	139
241 820 00	20	20	44	40	1,5/1,5	30	23	12	74,2	190
241 820 15	20	20	44	40	1,5/1,5	30	23	15	74,2	179
241 824 00	24	20	52	48	1,5/1,5	30	23	12	113,3	271
241 824 15	24	20	52	48	1,5/1,5	30	23	15	113,3	265
241 824 20	24	20	52	48	1,5/1,5	30	23	20	113,3	240
241 825 00	25	20	54	50	1,5/1,5	35	23	15	125,2	294
241 825 20	25	20	54	50	1,5/1,5	35	23	20	125,2	269
241 830 00	30	20	64	60	1,5/1,5	40	23	15	151,0	430
241 830 20	30	20	64	60	1,5/1,5	40	23	20	151,0	411
241 830 25	30	20	64	60	1,5/1,5	40	23	25	151,0	379
241 836 00	36	20	76	72	1,5/1,5	45	23	15	188,3	629
241 836 20	36	20	76	72	1,5/1,5	45	23	20	188,3	612
241 836 25	36	20	76	72	1,5/1,5	45	23	25	188,3	580
241 840 00	40	20	84	80	1,5/1,5	50	23	15	213,3	793
241 840 20	40	20	84	80	1,5/1,5	50	23	20	213,3	769
241 840 25	40	20	84	80	1,5/1,5	50	23	25	213,3	737
241 848 00	48	20	100	96	1,5/1,5	50	23	15	261,2	1137
241 848 20	48	20	100	96	1,5/1,5	50	23	20	261,2	1122
241 848 25	48	20	100	96	1,5/1,5	50	23	25	261,2	1080
241 850 00	50	20	104	100	1,5/1,5	60	23	20	273,7	1225
241 850 25	50	20	104	100	1,5/1,5	60	23	25	273,7	1196
241 850 30	50	20	104	100	1,5/1,5	60	23	30	273,7	1157
241 860 00	60	20	124	120	1,5/1,5	70	23	20	337,0	1788
241 860 30	60	20	124	120	1,5/1,5	70	23	30	337,0	1717
241 860 35	60	20	124	120	1,5/1,5	70	23	35	337,0	1671

\* Basis of calculations see page 197.

### Module 3.0 tooth width b = 25 mm, various bore sizes

Product No.	Number of teeth	b mm	d <sub>a</sub> <sup>-0,1</sup> mm	d mm	NL mm	ND mm	L±0,05 mm	B <sup>H6</sup> mm	perm. MT* Nm	Weight g
243 812 00	12	25	42	36	1,5/1,5	25	28	12	90	183
243 812 15	12	25	42	36	1,5/1,5	25	28	15	90	169
243 815 00	15	25	51	45	1,5/1,5	35	28	12	130	305
243 815 20	15	25	51	45	1,5/1,5	35	28	20	130	261
243 818 00	18	25	60	54	1,5/1,5	40	28	15	167	434
243 818 20	18	25	60	54	1,5/1,5	40	28	20	167	402
243 820 00	20	25	66	60	1,5/1,5	45	28	15	220	550
243 820 25	20	25	66	60	1,5/1,5	45	28	25	220	477
243 824 00	24	25	78	72	1,5/1,5	50	28	15	336	780
243 824 25	24	25	78	72	1,5/1,5	50	28	25	336	727
243 824 35	24	25	78	72	1,5/1,5	50	28	35	336	624
243 825 00	25	25	81	75	1,5/1,5	50	28	25	371	792
243 825 35	25	25	81	75	1,5/1,5	50	28	35	371	688
243 830 00	30	25	96	90	1,5/1,5	50	28	20	463	1220
243 830 25	30	25	96	90	1,5/1,5	50	28	25	463	1171
243 830 35	30	25	96	90	1,5/1,5	50	28	35	463	1068
243 836 00	36	25	114	108	1,5/1,5	60	28	20	575	1762
243 836 30	36	25	114	108	1,5/1,5	60	28	30	575	1688
243 836 35	36	25	114	108	1,5/1,5	60	28	35	575	1632
243 840 00	40	25	126	120	1,5/1,5	70	28	20	650	2250
243 840 35	40	25	126	120	1,5/1,5	70	28	35	650	2073
243 840 40	40	25	126	120	1,5/1,5	70	28	40	650	2008
243 848 00	48	25	150	144	1,5/1,5	80	28	20	795	3208
243 848 35	48	25	150	144	1,5/1,5	80	28	35	795	3066
243 848 45	48	25	150	144	1,5/1,5	80	28	45	795	2928
243 850 00	50	25	156	150	1,5/1,5	80	28	20	830	3500
243 850 35	50	25	156	150	1,5/1,5	80	28	35	830	3355
243 850 45	50	25	156	150	1,5/1,5	80	28	45	830	3197
243 860 00	60	25	186	180	1,5/1,5	90	28	25	1060	4972
243 860 35	60	25	186	180	1,5/1,5	90	28	35	1060	4875
243 860 45	60	25	186	180	1,5/1,5	90	28	45	1060	4737

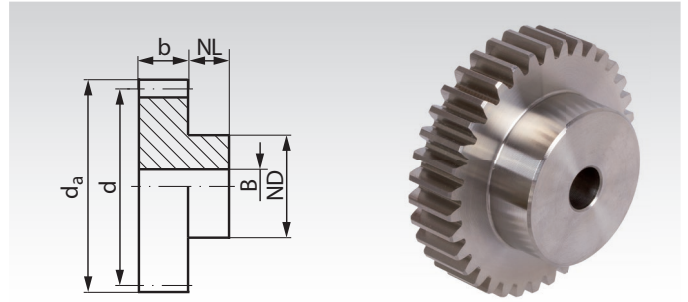
\* Basis of calculations see page 197.

## Spur Gears Made from Stainless Steel with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: Stainless steel 1.4305.

Tooth quality 8d25 DIN 3967.

Pressure angle 20°.



Ordering Details: e.g.: Product No. 214 990 10, Spur Gear, Stainless Steel, Module 1, 10 Teeth

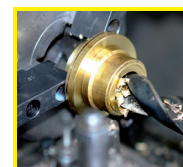
### Module 1 Tooth Width b = 10 mm

Product No.	Number of teeth	b mm	$d_a$ mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
214 990 10	10	10	12	10	6	8	4	11	7
214 990 11	11	10	13	11	6	8	4	14	8
214 990 12	12	10	14	12	6	10	4	15	10
214 990 13	13	10	15	13	6	10	5	18	11
214 990 14	14	10	16	14	6	10	5	19	14
214 990 15	15	10	17	15	6	12	5	21	16
214 990 16	16	10	18	16	6	12	5	22	18
214 990 17	17	10	19	17	6	12	6	23	19
214 990 18	18	10	20	18	6	15	6	26	24
214 990 19	19	10	21	19	6	15	6	30	26
214 990 20	20	10	22	20	6	15	6	33	28
214 990 22	22	10	24	22	6	15	6	42	33
214 990 24	24	10	26	24	6	15	6	51	39
214 990 25	25	10	27	25	6	20	8	56	46
214 990 26	26	10	28	26	6	20	8	61	49
214 990 28	28	10	30	28	6	20	8	72	55
214 990 30	30	10	32	30	8	25	8	84	77
214 990 36	36	10	38	36	8	25	8	127	102
214 990 40	40	10	42	40	8	25	8	162	120
214 990 45	45	10	47	45	10	30	10	211	165
214 990 48	48	10	50	48	10	30	10	244	182
214 990 50	50	10	52	50	10	30	10	268	193
214 990 54	54	10	56	54	10	40	10	319	262
214 990 60	60	10	62	60	12	40	10	405	320
214 990 64	64	10	66	64	12	40	10	469	352
214 990 65	65	10	67	65	12	40	10	486	360
214 990 70	70	10	72	70	12	40	10	576	401
214 990 72	72	10	74	72	12	50	10	614	484
214 990 75	75	10	77	75	12	50	10	674	510
214 990 80	80	10	82	80	12	50	10	782	560
214 991 00	100	10	102	100	12	60	12	1310	856
214 991 20	120	10	122	120	12	60	12	2150	1125

### Module 1.5 Tooth Width b = 15 mm

Product No.	Number of teeth	b mm	$d_a$ mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
218 990 11	11	15	19,5	16,5	10	12	6	47	28
218 990 12	12	15	21	18	10	15	8	55	32
218 990 14	14	15	24	21	10	15	8	69	42
218 990 15	15	15	25,5	22,5	10	18	10	76	49
218 990 16	16	15	27	24	10	20	10	83	60
218 990 17	17	15	28,5	25,5	10	20	10	89	66
218 990 18	18	15	30	27	10	22	10	96	79
218 990 20	20	15	33	30	10	25	10	123	103
218 990 22	22	15	36	33	15	25	10	153	136
218 990 24	24	15	39	36	15	25	10	188	154
218 990 25	25	15	40,5	37,5	15	25	10	207	166
218 990 28	28	15	45	42	15	25	10	269	198
218 990 30	30	15	48	45	15	30	10	314	246
218 990 35	35	15	55,5	52,5	15	30	10	447	317
218 990 40	40	15	63	60	15	40	10	606	454
218 990 45	45	15	70,5	67,5	15	40	10	793	541
218 990 48	48	15	75	72	15	40	10	920	599
218 990 50	50	15	78	75	15	50	10	1010	721
218 990 55	55	15	85,5	82,5	15	50	10	1260	831
218 990 60	60	15	93	90	15	60	12	1540	1041
218 990 65	65	15	100,5	97,5	15	60	12	1850	1172
218 990 70	70	15	108	105	20	60	12	2190	1423
218 990 80	80	15	123	120	20	70	15	2990	1878

\* Basis of calculations see page 197.



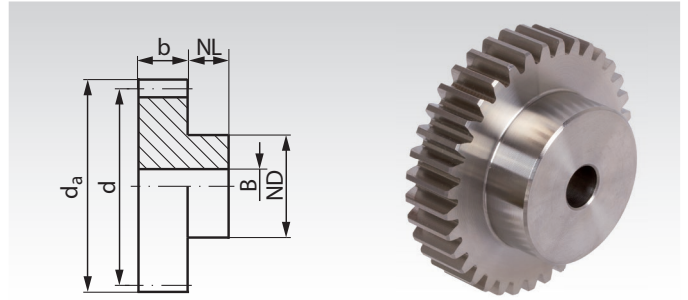
**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Stainless Steel with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: Stainless steel 1.4305.

Tooth quality 8d25 DIN 3967.

Pressure angle 20°.



Ordering Details: e.g.: Product No. 231 990 10, Spur Gear, Stainless Steel, Module 2, 10 Teeth

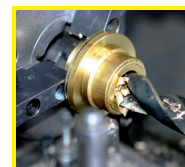
### Module 2 Tooth Width b = 16 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
231 990 10	10	16	24	20	15	15	8	0,8	45
231 990 11	11	16	26	22	15	18	10	0,9	55
231 990 12	12	16	28	24	15	20	10	1,1	70
231 990 14	14	16	32	28	15	25	10	1,4	110
231 990 15	15	16	34	30	15	25	12	1,5	114
231 990 16	16	16	36	32	15	25	12	1,6	126
231 990 18	18	16	40	36	15	30	12	1,9	179
231 990 20	20	16	44	40	15	30	12	2,5	207
231 990 22	22	16	48	44	15	30	12	3,0	240
231 990 24	24	16	52	48	15	30	12	3,8	275
231 990 25	25	16	54	50	15	30	12	4,2	295
231 990 28	28	16	60	56	15	35	12	5,5	389
231 990 30	30	16	64	60	15	40	12	6,4	466
231 990 35	35	16	74	70	15	45	12	9,2	632
231 990 40	40	16	84	80	15	50	12	12,5	825
231 990 45	45	16	94	90	15	50	12	16,4	911
231 990 48	48	16	100	96	15	50	12	19,0	1098
231 990 50	50	16	104	100	15	50	12	20,9	1174
231 990 55	55	16	114	110	15	60	12	26,0	1485
231 990 60	60	16	124	120	15	70	12	31,9	1827
231 990 80	80	16	164	160	20	80	20	57,4	3196

### Module 2.5 Tooth Width b = 20 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
232 990 12	12	20	35	30	15	20	12	2,3	110
232 990 14	14	20	40	35	15	20	12	2,9	140
232 990 15	15	20	42,5	37,5	15	25	12	3,2	190
232 990 16	16	20	45	40	15	25	12	3,4	210
232 990 18	18	20	50	45	15	30	12	4,0	290
232 990 20	20	20	55	50	15	30	12	5,2	340
232 990 24	24	20	65	60	15	40	12	7,9	540
232 990 25	25	20	67,5	62,5	15	40	12	8,7	580
232 990 28	28	20	75	70	15	40	12	11,4	700
232 990 30	30	20	80	75	15	40	12	13,4	790
232 990 32	32	20	85	80	15	50	15	15,5	950
232 990 35	35	20	92,5	87,5	15	50	15	19,1	1100
232 990 40	40	20	105	100	20	60	15	26,0	1600
232 990 45	45	20	117,5	112,5	20	60	15	34,3	1920
232 990 48	48	20	125	120	20	60	15	39,8	2140
232 990 50	50	20	130	125	20	70	15	43,8	2430
232 990 55	55	20	142,5	137,5	20	70	20	55,2	2780
232 990 60	60	20	155	150	20	70	20	72,0	3240

\* Basis of calculations see page 197.



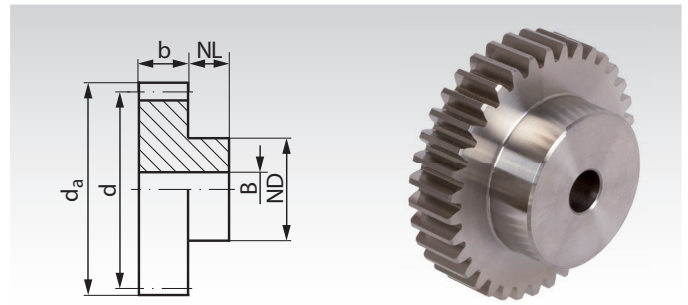
**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gears Made from Stainless Steel with One-Sided Hub, Milled Teeth, Straight Tooth System

Material: Stainless steel 1.4305.

Tooth quality 8d25 DIN 3967.

Pressure angle 20°.



Ordering Details: e.g.: Product No. 233 990 12, Spur Gear, Stainless Steel, Module 3, 12 Teeth

### Module 3 Tooth Width b = 25 mm

Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
233 990 12	12	25	42	36	15	25	12	4,3	210
233 990 14	14	25	48	42	15	25	12	5,4	280
233 990 15	15	25	51	45	15	35	12	6,0	378
233 990 16	16	25	54	48	15	35	12	6,5	410
233 990 18	18	25	60	54	15	45	12	7,6	586
233 990 20	20	25	66	60	15	45	15	9,8	670
233 990 22	22	25	72	66	15	45	15	12,2	780
233 990 24	24	25	78	72	15	50	15	15,0	957
233 990 25	25	25	81	75	15	50	15	16,6	1019
233 990 26	26	25	84	78	15	50	15	18,2	1080
233 990 28	28	25	90	84	15	50	20	21,6	1190
233 990 30	30	25	96	90	15	50	20	25,4	1355
233 990 35	35	25	111	105	15	60	20	33,9	1904
233 990 36	36	25	114	108	15	60	20	36,8	2000
233 990 40	40	25	126	120	20	70	20	49,7	2670
233 990 45	45	25	141	135	20	70	20	65,5	3263
233 990 48	48	25	150	144	20	80	20	77,6	3841
233 990 50	50	25	156	150	20	80	20	88,0	4101
233 990 60	60	25	186	180	20	90	20	149,2	5830

### Module 4 Tooth Width b = 30 mm

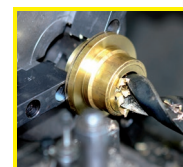
Product No.	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Nm	Weight g
234 990 12	12	30	56	48	20	35	15	9,8	480
234 990 14	14	30	64	56	20	40	15	12,4	680
234 990 15	15	30	68	60	20	40	15	13,8	760
234 990 16	16	30	72	64	20	40	20	14,7	800
234 990 18	18	30	80	72	20	50	20	17,5	1110
234 990 20	20	30	88	80	20	50	20	22,6	1330
234 990 24	24	30	104	96	20	60	20	35,0	1980
234 990 25	25	30	108	100	20	60	20	40,0	2120
234 990 28	28	30	120	112	20	60	20	49,0	2580
234 990 30	30	30	128	120	20	70	20	60,0	3080
234 990 35	35	30	148	140	20	70	25	85,0	3970
234 990 40	40	30	168	160	20	80	25	125,0	5270
234 990 45	45	30	188	180	20	80	25	176,0	6520
234 990 48	48	30	200	192	20	100	25	214,0	7780
234 990 50	50	30	208	200	20	100	25	240,0	8360
234 990 60	60	30	248	240	20	100	25	382,0	11500

\* Basis of calculations see page 197.

*Gears Stainless Module 1.59 and 3.18 Page 248*

*Gear Racks stainless Page 261*

*Round Gear Racks stainless Page 263*

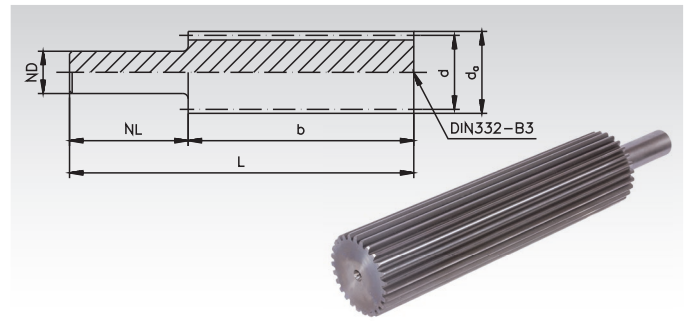


**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Spur Gear Shafts Made From Steel with One-Sided Hub, Milled, Straight Teeth

Material: 11SMnPb30 to 80 mm Ø, above this C45.

Pressure angle 20°.



Ordering Details: e.g.: Product No. 214 511 00, spur gear, module 1, 11 teeth

### Module 1.0

Product No.	Number of teeth	d mm	d <sub>a</sub> mm	ND mm	NL mm	b mm	L mm	Weight kg
214 511 00	11	11	13	12	50	150	200	0,14
214 513 00	13	13	15	12	50	150	200	0,18
214 514 00	14	14	16	12	50	150	200	0,21
214 516 00	16	16	18	12	50	150	200	0,27
214 517 00	17	17	19	16	50	150	200	0,33
214 519 00	19	19	21	16	50	180	230	0,46
214 521 00	21	21	23	16	50	180	230	0,55
214 523 00	23	23	25	16	50	180	230	0,64
214 527 00	27	27	29	16	50	180	230	0,86
214 531 00	31	31	33	16	50	180	230	1,12
214 535 00	35	35	37	16	50	180	230	1,40
214 537 00	37	37	39	16	50	180	230	1,56
214 545 00	45	45	47	16	50	180	230	2,28
214 552 00	52	52	54	16	50	180	230	3,02
214 557 00	57	57	59	16	50	180	230	3,61

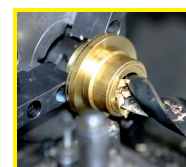
### Module 1.5

Product No.	Number of teeth	d mm	d <sub>a</sub> mm	ND mm	NL mm	b mm	L mm	Weight kg
218 513 00	13	19,5	22,5	16	50	150	200	0,41
218 514 00	14	21	24	16	50	150	200	0,46
218 516 00	16	24	27	16	50	150	200	0,58
218 517 00	17	25,5	28,5	16	50	180	230	0,77
218 519 00	19	28,5	31,5	16	50	180	230	0,94
218 521 00	21	31,5	34,5	16	50	180	230	1,14
218 527 00	27	40,5	43,5	16	50	180	230	1,84
218 532 00	32	48	51	16	50	180	230	2,57

### Module 2.0

Product No.	Number of teeth	d mm	d <sub>a</sub> mm	ND mm	NL mm	b mm	L mm	Weight kg
241 513 00	13	26	30	16	50	200	250	0,87
241 514 00	14	28	32	16	50	200	250	0,99
241 516 00	16	32	36	16	50	200	250	1,28
241 517 00	17	34	38	16	50	200	250	1,44
241 519 00	19	38	42	16	50	200	250	1,79
241 521 00	21	42	46	16	50	200	250	2,17
241 523 00	23	46	50	16	50	200	250	2,61
241 527 00	27	54	58	16	30	220	250	3,89
241 529 00	29	58	62	16	30	220	250	4,49
241 542 00*	42	84	88	16	30	220	250	9,48

\* Material C45.



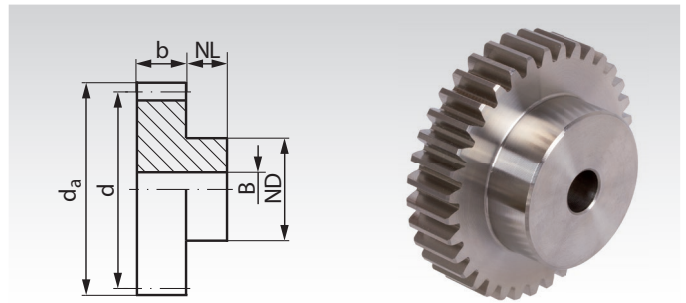
Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Spur Gears Metric Pitch, Straight Teeth, Made from Steel and Stainless Steel

Material: Steel C45.  
Stainless steel 1.4305



Tooth quality 8d25 DIN 3967.  
Pressure angle 20°.  
Standard design with one-sided hub.  
Other models and number of teeth on request.



Ordering Details: e.g.: Product No. 205 012 00, spur gear, steel C45, pitch 5 mm, 12 teeth

### Pitch 5mm (Module 1.59) Tooth width b = 12 mm

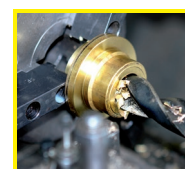
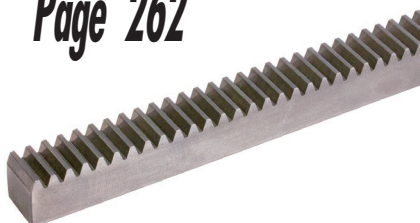
Product No. Steel	Product No. Stainless Steel	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT*		Weight kg
									Steel Nm	Stainless Steel Nm	
205 012 00	205 990 12	12	12	22,3	19,1	13	14	6	0,8	0,4	0,03
205 015 00	205 990 15	15	12	27,0	23,9	13	18	6	1,1	0,5	0,06
205 018 00	205 990 18	18	12	31,8	28,6	13	20	8	1,4	0,7	0,07
205 020 00	205 990 20	20	12	35,0	31,8	13	20	8	1,9	0,9	0,10
205 024 00	205 990 24	24	12	41,4	38,2	13	25	8	2,9	1,3	0,14
205 025 00	205 990 25	25	12	43,0	39,8	13	25	8	3,1	1,4	0,14
205 030 00	205 990 30	30	12	50,9	47,7	13	30	10	4,8	2,2	0,20
205 036 00	205 990 36	36	12	60,5	57,3	13	40	10	7,3	3,4	0,32
205 040 00	205 990 40	40	12	66,8	63,6	13	40	10	9,4	4,3	0,36
205 045 00	205 990 45	45	12	74,8	71,6	13	45	10	12,4	5,7	0,45
205 050 00	205 990 50	50	12	82,7	79,6	13	50	12	16,7	7,7	0,56
205 060 00	205 990 60	60	12	98,6	95,5	13	60	12	26,4	12,1	0,82

### Pitch 10mm (Module 3.18) Tooth width b = 25 mm

Product No. Steel	Product No. Stainless Steel	Number of teeth	b mm	d <sub>a</sub> mm	d mm	NL mm	ND mm	BH7 mm	perm. MT*		Weight kg
									Steel Nm	Stainless Steel Nm	
210 012 00	210 990 12	12	25	44,6	38,2	15	25	10	9,8	4,5	0,22
210 015 00	210 990 15	15	25	54,1	47,7	15	30	12	13,7	6,3	0,38
210 018 00	210 990 18	18	25	63,7	57,3	15	40	15	17,3	8,0	0,50
210 020 00	210 990 20	20	25	70,0	63,7	15	40	15	22,4	10,3	0,60
210 024 00	210 990 24	24	25	82,8	76,4	15	50	15	34,3	15,8	0,86
210 025 00	210 990 25	25	25	85,9	79,6	15	50	15	37,8	17,4	0,96
210 030 00	210 990 30	30	25	101,9	95,5	15	60	20	58	27	1,45
210 036 00	210 990 36	36	25	121,0	114,6	15	70	20	97	45	2,15
210 040 00	210 990 40	40	25	133,7	127,3	15	80	20	131	60	2,68
210 045 00	210 990 45	45	25	149,6	143,2	20	80	20	179	82	3,44
210 050 00	210 990 50	50	25	165,5	159,2	20	80	20	236	108	4,10
210 060 00	210 990 60	60	25	197,3	191,0	20	90	25	399	184	5,79

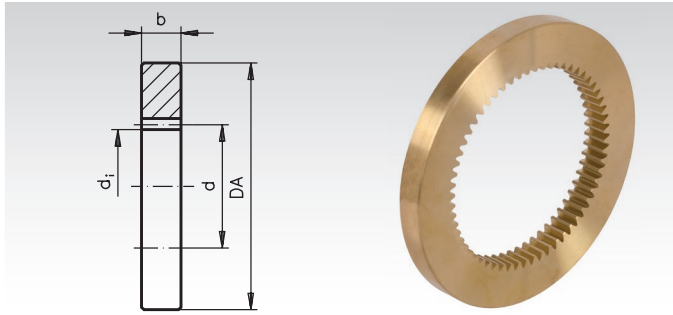
\* Basis of calculations see page 197.

**Matching  
Gear Racks  
Page 262**



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

### Straight-Toothed Internal Gears Made from Brass



Tooth quality: 8, Teeth generated.

Pressure angle 20°.

Outside-diameter tolerance in accordance with DIN ISO 2768 middle.

Ordering Details: e.g.: Product No. 261 440 00, Internal Gear, Brass, Module 0.5, 40 Teeth

#### Module 0.5 / b = 4 mm, Brass Ms58 (2.0401)

Product No.	Number of teeth	b mm	d mm	d <sub>i</sub> mm	DA mm	Weight g
261 440 00	40	4	20	19	36	23
261 445 00	45	4	22,5	21,5	40	28
261 448 00	48	4	24	23	40	27
261 450 00	50	4	25	24	45	37
261 460 00	60	4	30	29	50	42
261 470 00	70	4	35	34	55	45
261 490 00	90	4	45	44	70	74
261 410 00	100	4	50	49	70	63

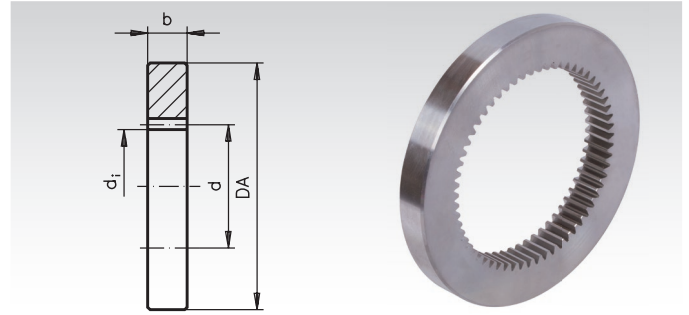
#### Module 0.7 / b = 6 mm, Brass Ms58 (2.0401)

Product No.	Number of teeth	b mm	d mm	d <sub>i</sub> mm	DA mm	Weight g
262 440 00	40	6	28	26,6	48	59
262 445 00	45	6	31,5	30,1	50	58
262 448 00	48	6	33,6	32,2	55	75
262 450 00	50	6	35	33,6	55	74
262 460 00	60	6	42	40,6	65	96
262 470 00	70	6	49	47,6	70	97
262 480 00	80	6	56	54,6	80	126
262 490 00	90	6	63	61,6	85	128
262 410 00	100	6	70	68,6	95	171

#### Module 1.0 / b = 8 mm, Brass Ms58 (2.0401)

Product No.	Number of teeth	b mm	d mm	d <sub>i</sub> mm	DA mm	Weight g
263 430 00	30	8	30	28	55	108
263 436 00	36	8	36	34	60	116
263 440 00	40	8	40	38	65	137
263 445 00	45	8	45	43	70	151
263 448 00	48	8	48	46	75	172
263 450 00	50	8	50	48	75	159
263 455 00	55	8	55	53	80	174
263 460 00	60	8	60	58	85	182
263 465 00	65	8	65	63	90	204
263 470 00	70	8	70	68	95	218
263 480 00	80	8	80	78	105	246
263 490 00	90	8	90	88	115	265
263 410 00	100	8	100	98	125	293
263 412 00	120	8	120	118	145	332

### Straight-Toothed Internal Gears Made from Steel



Tooth quality: 8, Teeth generated.

Pressure angle 20°.

Outside-diameter tolerance in accordance with DIN ISO 2768 middle.

Ordering Details: e.g.: Product No. 224 425 00, Internal Gear, Steel, Module 1, Width 10, 25 Teeth

#### Module 1.0 / b = 10 mm, Steel C45

Product No.	Number of teeth	b mm	d mm	d <sub>i</sub> mm	DA mm	Weight g
224 425 00	25	10	25	23	50	113
224 430 00	30	10	30	28	55	128
224 436 00	36	10	36	34	60	141
224 440 00	40	10	40	38	65	156
224 445 00	45	10	45	43	70	180
224 448 00	48	10	48	46	75	198
224 450 00	50	10	50	48	75	185
224 460 00	60	10	60	58	85	213
224 470 00	70	10	70	68	95	249
224 472 00	72	10	72	70	100	294
224 480 00	80	10	80	78	105	275
224 490 00	90	10	90	88	115	306
224 410 00	100	10	100	98	125	342
224 412 00	120	10	120	118	150	488

#### Module 1.5 / b = 15 mm, Steel C45

Product No.	Number of teeth	b mm	d mm	d <sub>i</sub> mm	DA mm	Weight g
228 425 00	25	15	37,5	34,5	70	320
228 430 00	30	15	45	42	75	328
228 436 00	36	15	54	51	85	392
228 440 00	40	15	60	57	90	413
228 445 00	45	15	67,5	64,5	100	497
228 448 00	48	15	72	69	100	465
228 450 00	50	15	75	72	105	489
228 460 00	60	15	90	87	120	558
228 470 00	70	15	105	102	135	653
228 472 00	72	15	108	105	140	716
228 480 00	80	15	120	117	150	738
228 490 00	90	15	135	132	170	975
228 410 00	100	15	150	147	190	1241
228 412 00	120	15	180	177	220	1441

#### Module 2.0 / b = 16 mm, Steel C45

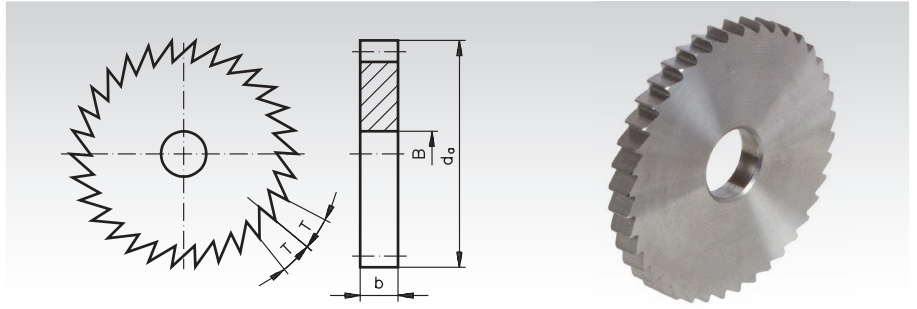
Product No.	Number of teeth	b mm	d mm	d <sub>i</sub> mm	DA mm	Weight g
241 430 00	30	16	60	56	95	530
241 436 00	36	16	72	68	107	599
241 440 00	40	16	80	76	115	662
241 445 00	45	16	90	86	125	729
241 448 00	48	16	96	92	131	761
241 450 00	50	16	100	96	135	783
241 455 00	55	16	110	106	145	865
241 460 00	60	16	120	116	155	930
241 465 00	65	16	130	126	165	999
241 470 00	70	16	140	136	175	1070
241 472 00	72	16	144	140	185	1313
241 480 00	80	16	160	156	195	1202
241 490 00	90	16	180	176	220	1538
241 410 00	100	16	200	196	240	1711
241 412 00	120	16	240	236	280	2014



## Ratchet Wheels Made from Steel

**Material:** C45Pb up to 80 mm diameter, above C45. Unhardened.

Without Hub. Tip angle 60°.



**Ordering Details:**

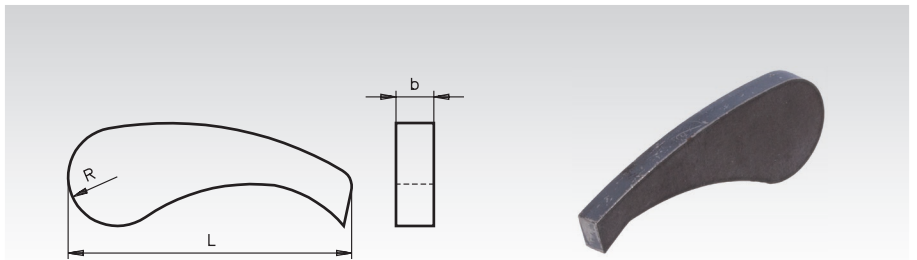
e.g.: Product No. 223 720 00, Ratchet Wheel, pitch 3.14, 20 Teeth

Product No.	Number of teeth	Tooth Width b mm	Pitch mm	Tip Ø d <sub>a</sub> mm	B mm	Weight g
223 720 00	20	4	3,14	20	6	7
223 730 00	30	9	3,14	30	6	45
223 740 00	40	4	3,14	40	10	33
223 760 00	60	4	3,14	60	15	78
223 780 00	80	4	3,14	80	15	145
227 720 00	20	6	4,71	30	8	55
227 740 00	40	6	4,71	60	12	116
227 760 00	60	6	4,71	90	15	274
227 780 00	80	6	4,71	120	20	494
227 710 00	100	6	4,71	150	20	781
227 712 00	120	9	4,71	180	20	1723

## Ratchet Braces Made from Steel

**Material:** Steel St37, unhardened, without bore.

Tip angle 60°.



**Ordering Details:**

e.g.: Product No. 223 701 00, Ratchet Brace, Steel

Product No.	Length L approx. in mm	Radius R approx. in mm	Width b approx. in mm	Weight g
223 701 00	49,5	9	4	20
227 701 00	49,5	9	6	28
227 702 00	75	13	9	127



**Reworking within 24h-service possible. Custom made parts on request.**

## Spur Gears Made from Brass and Steel with One-Sided Hub, Helical Tooth System

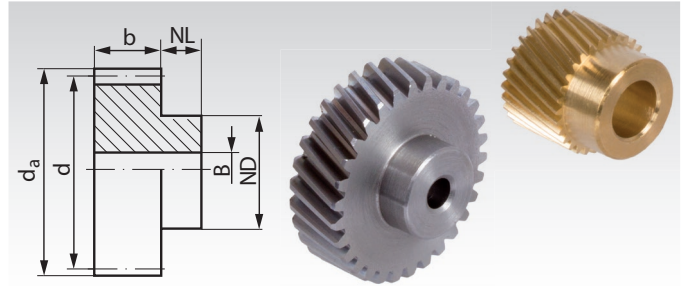
Material: Module 0,3/0,5: Brass Ms58 (2.0401).  
 Module 1,0: Steel 11SMnPb30.

20° helical tooth system. Pressure angle 20°. Milled teeth.

These gears are designed to be used in combination with the helical-toothed gear racks page 257. 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 (left hand).

Ordering Details: e.g.:

Product No. 269 012 00, Spur Gear, Helical Tooth System, Module 0.3, 12 Teeth Right Hand



Photos: right hand

### Module 0.3 from Ms58 (2.0401) Tooth Width b = 5 mm

Product No. Right Hand	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
269 012 00	12	5	4,4	3,83	4	3	2,0	0,7	0,5
269 015 00	15	5	5,4	4,79	4	4	2,5	1,0	0,7
269 018 00	18	5	6,4	5,75	4	5	3	1,6	1,2
269 020 00	20	5	7,0	6,39	4	6	3,5	2,0	1,4
269 024 00	24	5	8,3	7,66	4	7	4,5	3,0	1,9
269 030 00	30	5	10,2	9,58	5	9	5	5,0	4,0

### Module 0.5 from Ms58 (2.0401) Tooth Width b = 10 mm

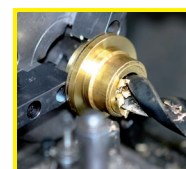
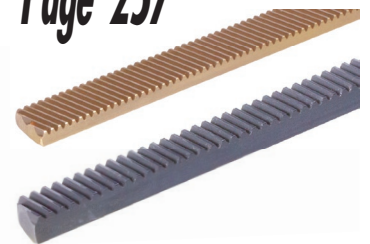
Product No. Right Hand	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
269 218 00	18	10	10,6	9,58	6	8	4	9,6	6,7
269 222 00	22	10	12,7	11,71	6	10	6	15,0	9,6
269 225 00	25	10	14,3	13,30	6	12	6	20,5	17,6
269 230 00	30	10	17,0	15,96	6	14	8	31,0	24,3
269 234 00	34	10	19,1	18,09	6	16	8	42,0	27,0
269 240 00	40	10	22,3	21,28	8	18	8	60,0	38,0

### Module 1.0 from Steel 11SMnPb30 Tooth Width b = 10 mm

Product No. Right Hand	Product No. Left Hand	Number of teeth	b mm	da mm	d mm	NL mm	ND mm	BH7 mm	perm. MT* Ncm	Weight g
214 210 00	214 310 00	10	10	12,6	10,64	6	8	4	11	7,3
214 215 00	214 315 00	15	10	18,0	15,96	6	12	5	26	17,9
214 218 00	214 318 00	18	10	21,2	19,16	6	12	5	39	24,4
214 220 00	214 320 00	20	10	23,3	21,28	6	15	5	50	32,5
214 224 00	214 324 00	24	10	27,5	25,54	6	15	5	78	44,4
214 225 00	214 325 00	25	10	28,6	26,60	6	15	5	85	47,8
214 230 00	214 330 00	30	10	33,9	31,93	6	15	5	131	66,9
214 236 00	214 336 00	36	10	40,3	38,31	6	18	6	201	96,9
214 240 00	214 340 00	40	10	44,6	42,57	6	18	6	258	118,3
214 250 00	214 350 00	50	10	55,2	53,21	8	18	6	436	184,4

\*Basis of calculations see page 197.

**Helical Tooth  
Gear racks  
Page 257**



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

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

Material: Steel 16MnCr5.

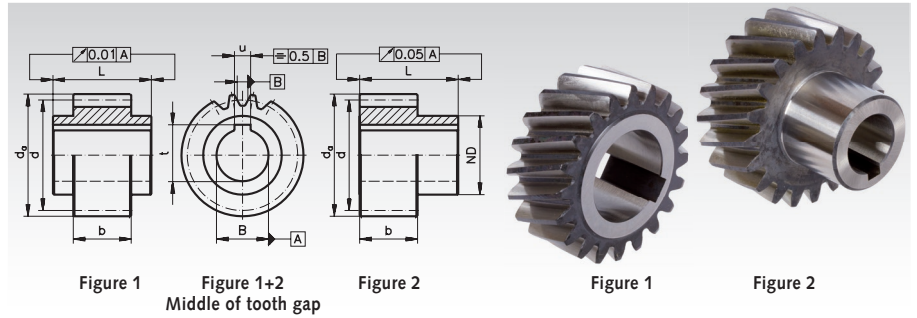
Tooth quality 7e25.

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

Case hardened, approx. 60 HRC.

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

Teeth, bores and faces ground. Matching helical-toothed gear racks page 264.



Ordering Details: e.g.: Product No. 251 020 20, Spur gear, Steel 16 MnCr5, Module 2.0, 20 Teeth, ground

### Module 2.0 (Pitch 6.667mm), Tooth Width b = 28 mm

Product No.	Number of teeth	b mm	Figure	d <sub>a</sub> mm	d mm	d x π mm	BH6 mm	ND mm	L mm	u mm	t mm	perm. MT* Nm	Weight kg
251 020 20	20	28	1	46,4	42,44	133,33	20	30	30	6	22,8	115	0,3
251 020 22	20	28	1	46,4	42,44	133,33	22	30	30	6	24,8	115	0,3
251 021 16	21	28	1	48,6	44,56	140,00	16	25	30	5	18,3	130	0,3
251 021 22	21	28	2	48,6	44,56	140,00	22	36	56	6	24,8	130	0,2
251 025 20	25	28	1	57,1	53,05	166,67	20	30	30	6	22,8	195	0,4
251 025 25	25	28	1	57,1	53,05	166,67	25	36	30	8	28,3	195	0,4
251 028 35	28	28	1	63,4	59,42	186,67	35	48	30	10	38,3	220	0,4
251 030 16	30	28	1	67,7	63,66	200,00	16	25	30	5	18,3	235	0,7
251 030 20	30	28	1	67,7	63,66	200,00	20	30	30	6	22,8	235	0,6
251 030 22	30	28	2	67,7	63,66	200,00	22	36	56	6	24,8	235	0,6
251 030 25	30	28	1	67,7	63,66	200,00	25	36	30	8	28,3	235	0,8
251 030 30	30	28	2	67,7	63,66	200,00	30	50	60	8	33,3	235	0,8
251 030 32	30	28	2	67,7	63,66	200,00	32	55	65	10	35,3	235	0,8
251 032 20	32	28	1	71,9	67,91	213,33	20	30	30	6	22,8	275	0,8
251 032 25	32	28	1	71,9	67,91	213,33	25	36	30	8	28,3	275	0,7
251 032 35	32	28	1	71,9	67,91	213,33	35	48	30	10	38,3	275	0,6
251 036 35	36	28	1	80,4	76,39	240,00	35	48	30	10	38,3	290	0,8
251 039 32	39	28	2	86,8	82,76	260,00	32	55	65	10	35,3	310	1,3
251 040 35	40	28	1	88,9	84,88	266,67	35	48	30	10	38,3	330	1,1

### Module 3.0 (Pitch 10.00mm), Tooth Width b = 28 mm

Product No.	Number of teeth	b mm	Figure	d <sub>a</sub> mm	d mm	d x π mm	BH6 mm	ND mm	L mm	u mm	t mm	perm. MT* Nm	Weight kg
253 020 22	20	28	2	69,7	63,66	200,00	22	36	56	6	24,8	275	0,6
253 020 25	20	28	2	69,7	63,66	200,00	25	44	60	8	28,3	275	0,7
253 020 30	20	28	1	69,7	63,66	200,00	30	45	30	8	33,3	275	0,8
253 020 32	20	28	2	69,7	63,66	200,00	32	55	65	10	35,3	275	0,8
253 020 35	20	28	1	69,7	63,66	200,00	35	48	30	10	38,3	275	0,7
253 022 25	22	28	1	76,0	70,03	220,00	25	36	30	8	28,3	345	0,8
253 022 30	22	28	1	76,0	70,03	220,00	30	45	30	8	33,3	345	0,7
253 022 35	22	28	1	76,0	70,03	220,00	35	48	30	10	38,3	345	0,7
253 025 22	25	28	2	85,6	79,58	250,00	22	36	56	6	24,8	440	1,0
253 025 25	25	28	1	85,6	79,58	250,00	25	36	30	8	28,3	440	1,0
253 025 30	25	28	1	85,6	79,58	250,00	30	45	30	8	33,3	440	1,0
253 025 32	25	28	2	85,6	79,58	250,00	32	55	65	10	35,3	440	1,2
253 025 35	25	28	1	85,6	79,58	250,00	35	48	30	10	38,3	440	0,9
253 025 40	25	28	1	85,6	79,58	250,00	40	70	50	12	43,3	440	1,1

#### Note

These gears are designed to be used in combination with the helical-toothed gear racks page 264. 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 264**



**Spur Gears Metric Pitch, Straight Teeth Page 248**

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

Material: Steel 16MnCr5.

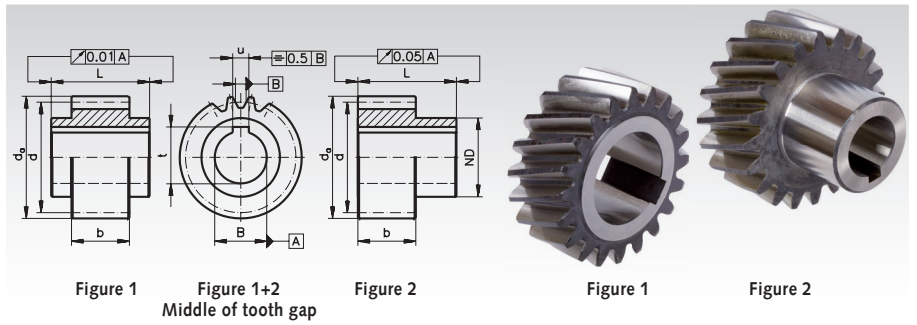
Tooth quality 7e25.

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

Case hardened, approx. 60 HRC.

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

Teeth, bores and faces ground. Matching helical-toothed gear racks page 264.



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

### Module 4.0 (Pitch 13.333mm), Tooth Width b = 40 mm

Product No.	Number of teeth	b mm	Figure	d <sub>a</sub> mm	d mm	d x π mm	BH6 mm	ND mm	L mm	u mm	t mm	perm. MT* Nm	Weight kg
254 015 35	15	40	1	71,7	63,66	200,00	35	52	50	10	38,3	670	1,4
254 018 32	18	40	2	84,4	76,39	240,00	32	55	75	10	35,3	900	1,5
254 020 35	20	40	1	92,9	84,88	266,67	35	52	50	10	38,3	975	1,9
254 020 45	20	40	1	92,9	84,88	266,67	45	65	50	14	48,8	975	1,6
254 021 32	21	40	2	97,1	89,13	280,00	32	55	75	10	35,3	1050	2,0
254 021 35	21	40	2	97,1	89,13	280,00	35	55	75	10	38,3	1050	1,9
254 021 40	21	40	2	97,1	89,13	280,00	40	62	75	12	43,3	1050	1,9
254 021 45	21	40	2	97,1	89,13	280,00	45	68	75	14	48,8	1050	1,7
254 022 35	22	40	1	101,4	93,37	293,33	35	52	50	10	38,3	1100	2,3
254 022 45	22	40	1	101,4	93,37	293,33	45	65	50	14	48,8	1100	2,0
254 024 32	24	40	2	109,9	101,86	320,00	32	55	75	10	35,3	1150	2,6
254 024 35	24	40	2	109,9	101,86	320,00	35	55	75	10	38,3	1150	2,5
254 024 40	24	40	2	109,9	101,86	320,00	40	62	75	12	43,3	1150	2,5
254 024 45	24	40	2	109,9	101,86	320,00	45	68	75	14	48,8	1150	2,3
254 024 55	24	40	2	109,9	101,86	320,00	55	80	80	16	59,3	1150	2,4
254 025 35	25	40	1	114,1	106,10	333,33	35	52	50	10	38,3	1200	3,1
254 025 45	25	40	1	114,1	106,10	333,33	45	65	50	14	48,8	1200	2,8

### Module 5.0 (Pitch 16.666mm), Tooth Width b = 50 mm

Product No.	Number of teeth	b mm	Figure	d <sub>a</sub> mm	d mm	d x π mm	BH6 mm	ND mm	L mm	u mm	t mm	perm. MT* Nm	Weight kg
255 018 45	18	50	2	105,5	95,49	300,00	45	68	85	14	48,8	1575	2,7
255 024 45	24	50	2	137,3	127,32	400,00	45	68	85	14	48,8	2085	4,9
255 024 55	24	50	2	137,3	127,32	400,00	55	80	90	16	59,3	2085	4,9
255 024 75	24	50	2	137,3	127,32	400,00	75	110	110	20	79,9	2085	5,6

#### Note

These gears are designed to be used in combination with the helical-toothed gear racks page 264. 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 264*



# Rolling bearings at MÄDLER®:



Ball bearings, open



Ball bearings, 2Z



Ball bearings, 2RS



The premium brand  
- for the sophisticated  
application



The reliable brand  
- the inexpensive  
option



Angular contact  
ball bearings



Self aligning  
ball bearings



Cylindrical roller  
bearings



Spherical roller  
bearings



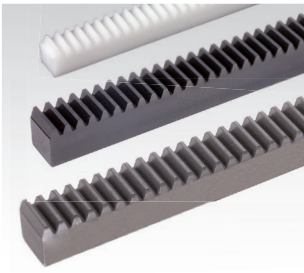
Tapered roller  
bearings

**The rolling bearings are to find:**

- **in this catalog page 416**
- **on the internet at [www.maedler.de](http://www.maedler.de)**

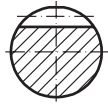
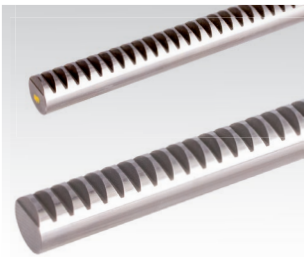
## Overview Gear Racks

### Square gear racks with straight teeth



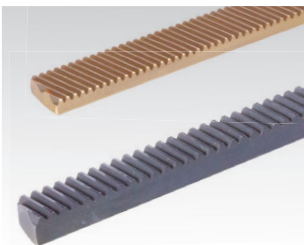
Material/Version	Module	Page
Acetal resin, die cast	0,5-3,0	256
POM, milled	0,5-3,0	256
Brass, milled	0,3-1,0	257
Steel, milled quality 8	0,5-8,0	258
Steel, milled quality 9	1,0-6,0	259
Steel, teeth hardened	2,0-5,0	259
Steel, hardened and ground	1,0-3,0	260
Stainless steel, milled	1,0-4,0	261
Steel and stainless steel, metric pitch	1,59/3,18 (5mm/10mm)	262

### Round gear racks with straight teeth



Material/Version	Module	Page
Steel, milled	1,0-6,0	263
High strength steel, milled	1,0-6,0	263
Stainless steel, milled	1,0-4,0	263
Steel and stainless steel, metric pitch	1,59/3,18 (5mm/10mm)	262

### Helical tooth gear racks, square, left hand



Material/Version	Module	Page
Brass, milled	0,3-0,5	257
Steel, milled	1,0	257

### Helical tooth gear racks, square, right hand



Material/Version	Module	Page
Steel, milled, tempered	2,0-5,0	264
Steel, hardened and ground	2,0-5,0	265

**Spur gears**  
**Page 194**

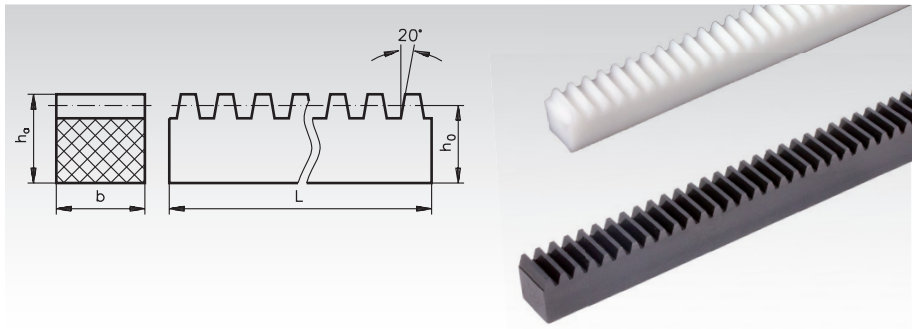


**Reworking within  
24h-service possible.  
Custom made parts  
on request.**

## Gear Racks Made from Plastic, Straight Tooth System

Because of the material used, plastic gear racks are not straightened.

Material reference values page 821.



Ordering Details: e.g.: Product No. 291 601 00, Gear Rack, Delrin, Module 0.5, 4x6x250 mm

## Gear Racks Made from Acetal Resin, White, Die-Cast Version

Pressure angle 20°, Nominal length 250 mm\*

	Product No.	b mm	$h_a$ mm	$h_0$ mm	Nominal Length L* mm	Weight g
<b>Module 0.5</b>	281 601 00	4	4,5	4	250	6
	281 602 00	4	6	5,5	250	8
<b>Module 0.7</b>	282 601 00	6	6,7	6	250	13
<b>Module 1.0</b>	283 601 00	9	9	8	250	25
<b>Module 1.25</b>	284 601 00	10	11	9,75	250	34
<b>Module 1.5</b>	285 601 00	12	12	10,5	250	43
<b>Module 2.0</b>	286 601 00	15,4	11	9	250	44
<b>Module 3.0</b>	288 601 00	19,4	15	12	250	76

## Gear Racks Made from POM, White, Milled Teeth, Slim Version

Material: POM, white (nature)

Pressure angle 20°.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

Dimensions  $h_a$  and  $h_0$  up to Module 2: -0.2 mm from Module 2.5: -0.3 mm.

From Module 2, except for nominal length 500 mm, cut for continuous linking.

\*\* Material PET.

	Product No.	b mm	$h_a$ mm	$h_0$ mm	Nominal Length L* mm	Weight g
<b>Module 0.5**</b>	291 601 00**	4	6	5,5	250	8
<b>Module 0.7</b>	292 601 00	5	7	6,3	250	11
	293 601 00	10	10	9,0	250	32
<b>Module 1.0</b>	293 603 00	10	10	9,0	500	63
	294 601 00	10	10	8,75	250	31
<b>Module 1.25</b>	294 603 00	10	10	8,75	500	61
	295 601 00	15	15	13,5	250	72
<b>Module 1.5</b>	295 603 00	15	15	13,5	500	140
	295 605 00	15	15	13,5	1000	285
	296 603 00	16	16	14,0	500	157
<b>Module 2.0</b>	296 605 00	16	16	14,0	1000	312
	296 607 00	16	16	14,0	1500	466
	297 603 00	20	20	17,5	500	243
<b>Module 2.5</b>	297 605 00	20	20	17,5	1000	489
	297 607 00	20	20	17,5	1500	735
	298 603 00	25	25	22,0	500	385
<b>Module 3.0</b>	298 605 00	25	25	22,0	1000	772
	298 607 00	25	25	22,0	1500	1146

## Gear Racks Made from POM, White or Black, Milled Teeth

Material: POM, on choice white (nature) or black.

Pressure angle 20°.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

Dimensions  $h_a$  and  $h_0$  up to Module 2: -0.2 mm from Module 2.5 to 3: -0.3 mm.

Module 2, nominal length 1000 mm, and from module 3, the racks are cut for continuous linking.

	Product No. White	Product No. Black	b mm	$h_a$ mm	$h_0$ mm	Nominal Length L* mm	Weight g
<b>Module 1.0</b>	293 116 01	293 117 01	15	15	14,0	250	75
	293 116 03	293 117 03	15	15	14,0	500	149
	293 116 05	293 117 05	15	15	14,0	1000	300
<b>Module 1.5</b>	295 116 01	295 117 01	17	17	15,5	250	92
	295 116 03	295 117 03	17	17	15,5	500	186
	295 116 05	295 117 05	17	17	15,5	1000	400
<b>Module 2.0</b>	296 116 01	296 117 01	20	20	18,0	250	127
	296 116 03	296 117 03	20	20	18,0	500	254
	296 116 05	296 117 05	20	20	18,0	1000	500
<b>Module 2.5</b>	297 116 01	297 117 01	25	25	22,5	250	198
	297 116 03	297 117 03	25	25	22,5	500	397
	297 116 05	297 117 05	25	25	22,5	1000	800
<b>Module 3.0</b>	298 116 01	298 117 01	30	30	27,0	250	400
	298 116 03	298 117 03	30	30	27,0	500	800
	298 116 05	298 117 05	30	30	27,0	1000	1600

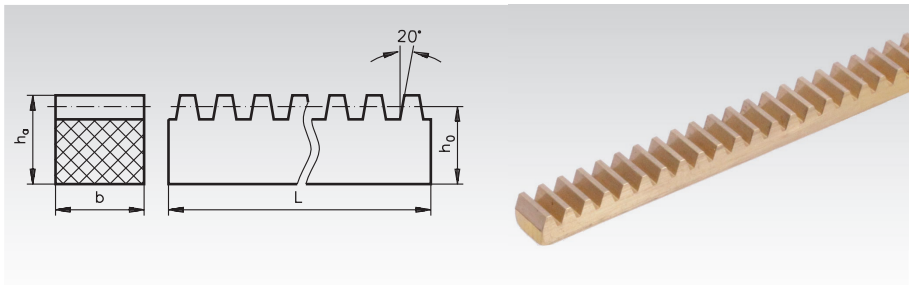
\* The real length is roughly one multiple of the pitch.

## Gear Racks Made from Brass (Ms58), Straight Tooth System, Precisely Straightened

Pressure angle 20°.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances

Dimension  $h_a$  and  $h_0 = -0.2$  mm



The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances. Dimension  $h_a$  and  $h_0$  up to Module 2 -0.2 mm.

Ordering Details: e.g.: Product No. 260 601 00, Straight-Toothed Gear Rack, Module 0.3, 250 mm

Teeth cut with reference profile (RP) II in accordance with DIN 867/DIN 3972.

	Product No.	b mm	$h_a$ mm	$h_0$ mm	Nominal Length L* mm	Weight g
<b>Module 0.3</b>	260 601 00	2	4	3,7	250	14
<b>Module 0.5</b>	261 601 00	2	4	3,5	250	14
<b>Module 0.7</b>	262 601 00	4	6	5,3	250	42
<b>Module 1.0</b>	263 600 00	7	5	4,0	250	56
	263 601 00	10	8	7,0	230**	131
	263 603 00	10	10	9,0	250	184
	263 605 00	10	10	9,0	500	371

\* The real length is roughly one multiple of the pitch.

\*\* Special length.

## Gear Racks Made from Brass (Ms58) and Steel (C45KG), Helical Toothed, Precisely Straightened

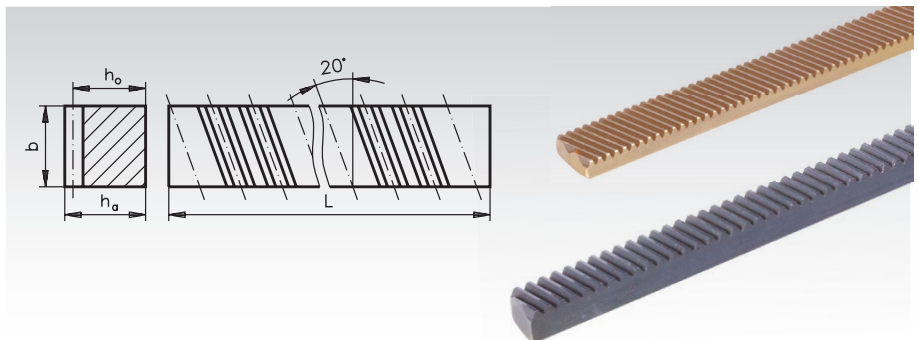
20° helical tooth system, left-toothed.  
Pressure angle 20°.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

Dimensions  $h$  and  $h_0 = -0.2$  mm.

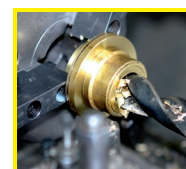
The standardised left-toothed gear racks always need to be matched with a right-toothed pinion.

Ordering Details: e.g.: Product No. 269 601 00, Helical Toothed Gear Rack, Module 0.3, 250 mm



	Product No.	Material	b mm	$h_a$ mm	$h_0$ mm	L mm	Weight g
<b>Module 0.3</b>	269 601 00	Ms58	5	3	2,7	250	29
<b>Module 0.5</b>	269 605 00	Ms58	10	4	3,5	250	70
	269 606 00	Ms58	10	4	3,5	500	139
<b>Module 1.0</b>	224 655 00	C45KG	10	10	9,0	500	344
	224 658 00	C45KG	10	10	9,0	1000	685

Matching helical-toothed spur gears see page 251.



Reworking within  
24h-service possible.  
Custom made parts  
on request.



## Gear Racks Made from Specially Treated Bright Steel C45KG, Milled Teeth, Straight Tooth System

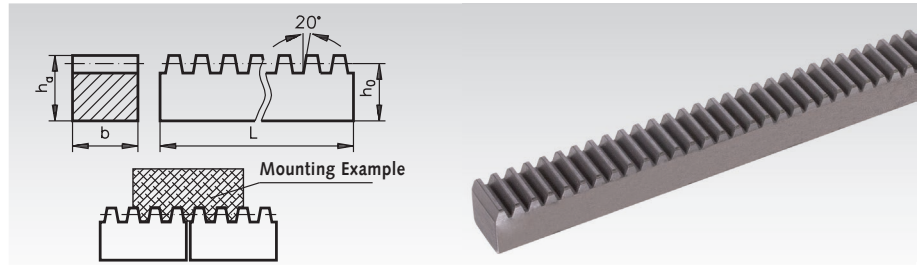
Tooth quality 8d25  
modelled on DIN 3962, 3967, 3968.  
Pressure angle 20°. Precisely Straightened.  
Cross-section tolerance  $h_{11} = -1/10$  to  $2/10$  depending on size.

All gear racks from **Module 2**, except for **nominal length 500 mm**, are cut off for **continuous linking**.

The teeth of the gear racks are not cut to join edge-to-edge, which leads to minor gaps when mounting. These gaps do, however, not cause any problems for the gears rolling across.

**Total pitch error page 261.**

Ordering Details: e.g.: Product No. 224 603 00, Gear Rack, C45KG, Module 1.0, 250 mm.



The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances. Dimensions  $h_a$  and  $h_0$  up to Module 2 -0.2 mm, Module 2.5-4 -0.3 mm, Module 5-8 -0.4 mm

Teeth cut with reference profile (RP) II in accordance with DIN 867/DIN 3972.  
Rounded edge at square bar of 15 up to 60 mm.  
Chamfered edge at square bar of 80 mm

	Product No.	Tooth Width b mm	Overall Height $h_a$ mm	$h_0$ mm	Nominal Length L mm	Effective Length mm	Weight kg
* Key Steel.							
** St37K.							
<b>Module 0.5*</b>	221 601 00	4	6	5,5	250	-	0,04
<b>Module 0.7**</b>	222 601 00	5	7	6,3	250	-	0,06
<b>Module 1.0**</b>	223 601 00	7	5	4,0	250	-	0,05
<b>Module 1.0</b>	224 603 00	10	10	9,0	250	-	0,17
	224 605 00	10	10	9,0	500	-	0,34
	224 608 00	10	10	9,0	1000	-	0,68
	224 610 00	15	15	14,0	500	-	0,81
	224 612 00	15	15	14,0	1000	-	1,61
<b>Module 1.25</b>	226 601 00	10	10	8,75	250	-	0,16
	226 603 00	10	10	8,75	500	-	0,33
	226 605 00	10	10	8,75	1000	-	0,66
<b>Module 1.5</b>	227 601 00	10	10	8,5	500	-	0,32
	227 605 00	10	10	8,5	1000	-	0,63
	228 601 00	15	10	8,5	1000	-	0,95
	228 603 00	15	15	13,5	500	-	0,77
	228 605 00	15	15	13,5	1000	-	1,54
	228 607 00	15	15	13,5	1500	-	2,33
<b>Module 2.0</b>	241 601 00	16	20	18,0	1000	1005,0 - 1	2,22
	241 603 00	20	20	18,0	500	-	1,38
	241 605 00	20	20	18,0	1000	1005,0 - 1	2,77
	241 607 00	20	20	18,0	1500	1501,0 - 1	4,12
	241 609 00	20	20	18,0	2000	2004,0 - 1,5	5,50
<b>Module 2.5</b>	242 601 00	20	25	22,5	1000	1005,0 - 1	3,47
	242 603 00	25	25	22,5	500	-	2,17
	242 605 00	25	25	22,5	1000	1005,0 - 1	4,31
	242 607 00	25	25	22,5	1500	1507,5 - 1	6,46
	242 609 00	25	25	22,5	2000	2002,5 - 1,5	8,61
<b>Module 3.0</b>	243 601 00	25	30	27,0	1000	1008,0 - 1,5	5,24
	243 603 00	30	30	27,0	500	-	3,17
	243 605 00	30	30	27,0	1000	1008,0 - 1,5	6,27
	243 607 00	30	30	27,0	1500	1507,5 - 1,5	9,33
	243 609 00	30	30	27,0	2000	2007,0 - 1,5	12,43
<b>Module 4.0</b>	244 601 00	30	40	36,0	1000	1005,0 - 1,5	8,43
	244 603 00	40	40	36,0	500	-	5,55
	244 605 00	40	40	36,0	1000	1005,0 - 1,5	11,14
	244 607 00	40	40	36,0	1500	1507,5 - 1	16,50
	244 609 00	40	40	36,0	2000	2010,0 - 1,5	22,50
<b>Module 5.0</b>	245 601 00	40	50	45,0	1000	1005,0 - 1,5	14,00
	245 603 00	50	50	45,0	500	-	8,50
	245 605 00	50	50	45,0	1000	1005,0 - 1,5	17,50
	245 607 00	50	50	45,0	1500	1507,5 - 1,5	26,00
	245 609 00	50	50	45,0	2000	2010,0 - 1,5	35,00
<b>Module 6.0</b>	246 601 00	60	60	54,0	500	-	12,50
	246 603 00	60	60	54,0	1000	998,5 - 1,5	25,00
	246 605 00	60	60	54,0	1500	1507,5 - 1,5	37,50
	246 607 00	60	60	54,0	2000	1997,5 - 1,5	50,00
<b>Module 8.0</b>	248 601 00	80	80	72,0	1000	1005,0 - 1,5	44,00
	248 603 00	80	80	72,0	1500	1507,0 - 1,5	66,00

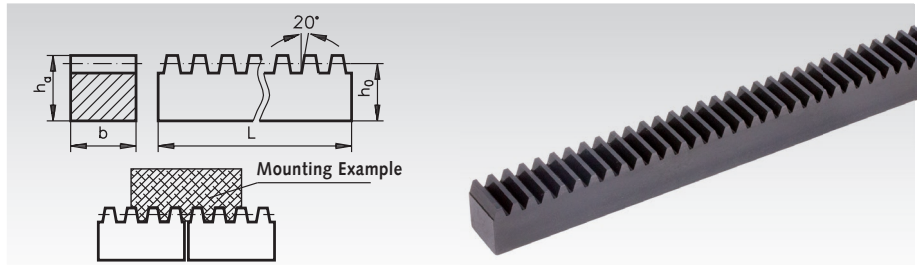
## Gear Racks Made from Steel C43, Milled Teeth, Straight Tooth System

Material: Steel C43, burnished.

Tooth quality 9.

Pressure angle 20°.

From Module 2.5 cut for continuous linking.



Ordering Details: e.g.: Product No. 224 116 08, Gear Rack, C43 , Module 1.0, 1000 mm

	Product No.	b mm	$h_a$ mm	$h_0$ mm	Nominal Length L mm	Weight kg
<b>Module 1.0</b>	224 116 08	10	10	9,0	1000	0,68
	224 116 09	10	10	9,0	2000	1,36
	224 116 12	15	15	14,0	1000	1,61
	224 116 19	15	15	14,0	2000	3,32
<b>Module 1.5</b>	228 116 05	15	15	13,5	1000	1,54
	228 116 09	15	15	13,5	2000	3,09
	228 116 12	17	17	15,5	1000	2,05
	228 116 19	17	17	15,5	2000	4,10
<b>Module 2.0</b>	241 116 05	20	20	18,0	1000	2,77
	241 116 09	20	20	18,0	2000	5,54
<b>Module 2.5</b>	242 116 05	25	25	22,5	1000	4,35
	242 116 09	25	25	22,5	2000	8,70
<b>Module 3.0</b>	243 116 05	30	30	27,0	1000	6,27
	243 116 09	30	30	27,0	2000	12,54
<b>Module 4.0</b>	244 116 05	40	40	36,0	1000	11,10
	244 116 09	40	40	36,0	2000	22,20
<b>Module 5.0</b>	245 116 05	50	50	45,0	1000	17,50
	245 116 09	50	50	45,0	2000	35,00
<b>Module 6.0</b>	246 116 05	60	60	54,0	1000	24,60
	246 116 09	60	60	54,0	2000	49,20

## Gear Racks Made from Bright Steel C45KG, Teeth Milled and Induction Hardened

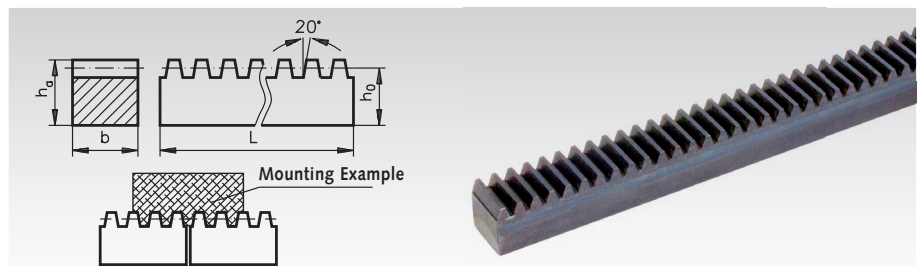
Milled, quality 8.

Tooth area induction hardened, 54 + 4 HRC.

The hardening sets the tooth quality to 10-11.

Pressure angle 20°.

The gear racks are **cut for continuous linking**. The teeth of the gear racks are not cut to join edge-to-edge, which leads to minor gaps when mounting. These gaps do, however, not cause any problems for the gears rolling across.



The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances. Dimensions  $h_a$  and  $h_0$  up to Module 2 -0.2 mm, Module 3-4 -0.3 mm, Module 5 -0.4 mm

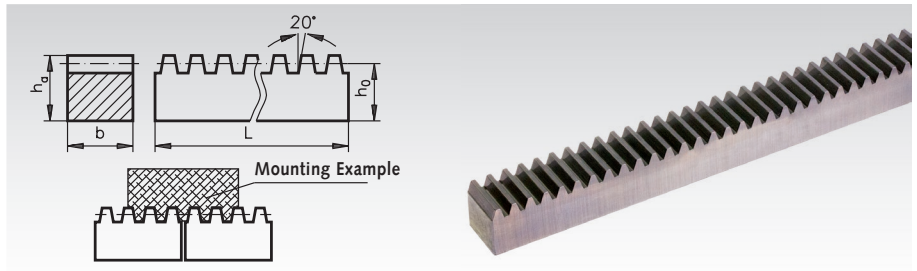
Ordering Details: e.g.: Product No. 241 886 05, Gear Rack, Module 2.0, 1000mm, hardened

Teeth cut with reference profile (RP) II in accordance with DIN 867/DIN 3972. Rounded edge.

	Product No.	Tooth Width b mm	Overall Height $h_a$ mm	$h_0$ mm	Nominal Length L mm	Effective Length mm	Weight kg
<b>Module 2.0</b>	241 886 05	20	20	18,0	1000	1005,0 – 1	2,77
	241 886 09	20	20	18,0	2000	2004,0 – 1,5	5,50
<b>Module 2.5</b>	242 886 05	25	25	22,5	1000	1005,0 – 1,	4,31
	242 886 09	25	25	22,5	2000	2002,5 – 1,5	8,61
<b>Module 3.0</b>	243 886 05	30	30	27,0	1000	1008,0 – 1,5	6,27
	243 886 09	30	30	27,0	2000	2007,0 – 1,5	12,43
<b>Module 4.0</b>	244 886 05	40	40	36,0	1000	1005,0 – 1,5	11,14
	244 886 09	40	40	36,0	2000	2010,0 – 1,5	22,50
<b>Module 5.0</b>	245 886 05	50	50	45,0	1000	1005,0 – 1,5	17,50
	245 886 09	50	50	45,0	2000	2010,0 – 1,5	35,00

## Precision Gear Racks Made from Steel 16MnCr5, Tooth Area Induction Hardened, Teeth Ground

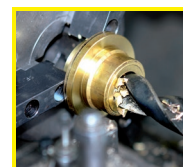
Tooth quality 7h25.  
 Pressure angle 20°.  
 Tooth area induction hardened,  
 HRC 58±2.  
 Ground all around including teeth.  
 From Module 1.5 cut for continuous linking.  
 Angle accuracy 0.02 mm,  
 Parallelism on 500 mm = 0.03 mm,  
 on 1000 mm = 0.05 mm,  
 Tolerance to  $h_0$  line  
 on 500 mm = 0.03 mm,  
 on 1000 mm = 0.05 mm.  
 The width is machined with a tolerance of  
 0.05.



Ordering Details: e.g.: Product No. 224 683 00, Gear Rack, Steel 16MnCr5, Module 1.0, 500 mm long,  
 Teeth Ground

	Product No.	Tooth Width b mm	Overall Height $h_a^{-0.1}$ mm	Height to Line $h_0$ mm	Nom. Length L mm	Eff. Length mm	Weight kg
<b>Module 1.0</b>	224 683 00	15	15	14	500	500,0 <sup>+1</sup>	0,81
<b>Module 1.5</b>	228 683 00	15	15	13,5	500	499,1 <sup>±0,3</sup>	0,78
<b>Module 2.0</b>	241 683 00	20	20	18	500	502,1 <sup>±0,3</sup>	1,40
	241 685 00	20	20	18	1000	998,5 <sup>±0,3</sup>	2,53
<b>Module 3.0</b>	243 683 00	25	25	22	500	498,9 <sup>±0,3</sup>	2,12
	243 685 00	25	25	22	1000	998,4 <sup>±0,3</sup>	4,22

**Matching Precision**  
**Spur Gears**  
**Page 242**



**Reworking within  
 24h-service possible.  
 Custom made parts  
 on request.**

## Gear Racks Made from Stainless Steel (Stainless), Milled Teeth, Straight Tooth System

Material: Stainless steel 1.4305



Tooth quality

8d25 modelled on DIN 3967.

Pressure angle 20°. Precisely Straightened.

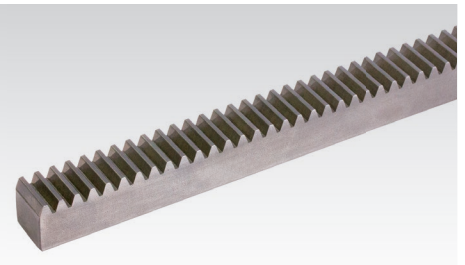
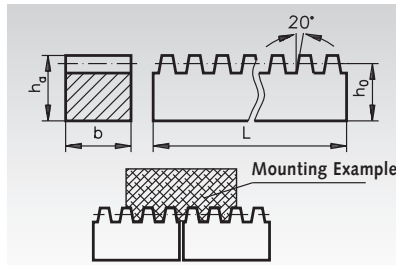
From Module 2, except for nominal length 500 mm, cut for continuous linking.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

Dimensions  $h_a$  and  $h_o$ :

up to Module 2 -0.2 mm

Module 2.5 - 4 -0.3 mm



Ordering Details: e.g.: Product No. 224 996 05, Gear Rack, Module 1, 10 x 10x 500, Stainless

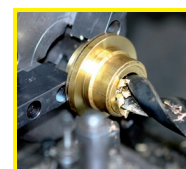
	Product No.	Tooth Width b mm	Overall Height $h_a$ mm	$h_o$ mm	Nominal Length L mm	Effective Length mm	Weight kg
<b>Module 1.0</b>	224 996 05	10	10	9,0	500	-	0,34
	224 996 08	10	10	9,0	1000	-	0,68
<b>Module 1.5</b>	228 996 03	15	15	13,5	500	-	0,77
	228 996 05	15	15	13,5	1000	-	1,55
	228 996 07	15	15	13,5	1500	-	2,33
<b>Module 2.0</b>	241 996 03	20	20	18,0	500	-	1,38
	241 996 05	20	20	18,0	1000	1005,0 - 1	2,77
	241 996 07	20	20	18,0	1500	1501,0 - 1	4,12
	241 996 09	20	20	18,0	2000	2004,0 - 1,5	5,50
<b>Module 2.5</b>	242 996 03	25	25	22,5	500	-	2,17
	242 996 05	25	25	22,5	1000	1005,1 - 1	4,31
	242 996 07	25	25	22,5	1500	1507,5 - 1	6,46
	242 996 09	25	25	22,5	2000	2002,5 - 1,5	8,61
<b>Module 3.0</b>	243 996 03	30	30	27,0	500	-	3,17
	243 996 05	30	30	27,0	1000	1008,0 - 1,5	6,27
	243 996 07	30	30	27,0	1500	1507,5 - 1,5	9,33
	243 996 09	30	30	27,0	2000	2007,0 - 1,5	12,43
<b>Module 4.0</b>	244 996 03	40	40	36,0	500	-	5,55
	244 996 05	40	40	36,0	1000	1005,0 - 1,5	11,14
	244 996 07	40	40	36,0	1500	1507,5 - 1	16,50
	244 996 09	40	40	36,0	2000	2010,0 - 1,5	22,50

### Total pitch error for steel racks in tooth quality 8

Total Pitch Error  $F_p$  along the lines of DIN 3962 quality 8 tolerance for teeth on spur gears, analogously applied on gear racks.

Value in  $\mu = 1/1000$  mm

Module	Permissible Pitch Error for Length in mm				
	250	500	1000	1500	2000
1.00 - 2.00	50	56	63	63	71
over 2.00 up to 3.55	50	63	71	71	80
over 3.55 up to 6.00	56	71	80	80	90
over 6.00 up to 10.00	63	71	80	80	90



Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Gear racks with metric pitch, straight teeth, square

**Material:** Steel C45KG.  
Stainless steel 1.4305.

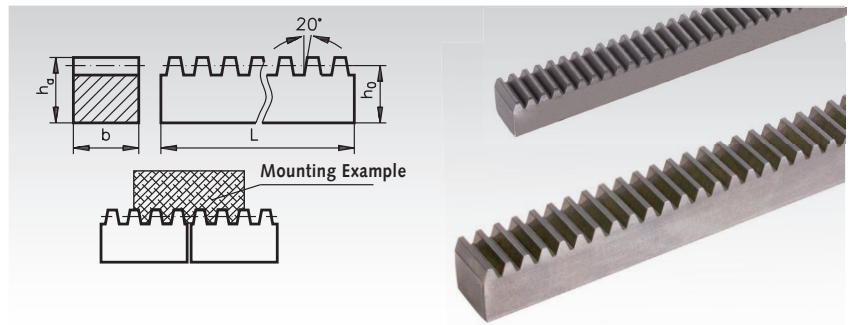


Tooth quality 8d25 modelled on DIN 3967.  
Pressure angle 20°.

Pitch 10 mm, can be assembled together except for 500 mm nominal length.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

Dim.  $h_a$  and  $h_0$ : Pitch 5 mm: -0.2 mm  
Pitch 10 mm: -0.3 mm



Ordering Details: e.g.: Product No. 205 601 00, gear rack pitch 5mm, 250 mm long

	Product No. Steel	Product No. Stainless Steel	Tooth Width		Overall Height		Nominal Length	Weight kg
			b mm	$h_a$ mm	$h_0$ mm	L mm		
<b>Pitch 5mm (Module 1.59)</b>	205 601 00	205 996 01	15	15	13,4	250	0,39	
	205 603 00	205 996 03	15	15	13,4	500	0,78	
	205 605 00	205 996 05	15	15	13,4	1000	1,55	
<b>Pitch 10mm (Module 3.18)</b>	205 609 00	205 996 09	15	15	13,4	2000	3,10	
	210 601 00	210 996 01	30	30	26,8	250	1,59	
	210 603 00	210 996 03	30	30	26,8	500	3,17	
	210 605 00	210 996 05	30	30	26,8	1000	6,27	
	210 609 00	210 996 09	30	30	26,8	2000	12,43	

## Round Gear racks with metric pitch, straight teeth

**Material:** Steel St50K (length 2000mm:C45K), diameter tolerance **h6, ground**.

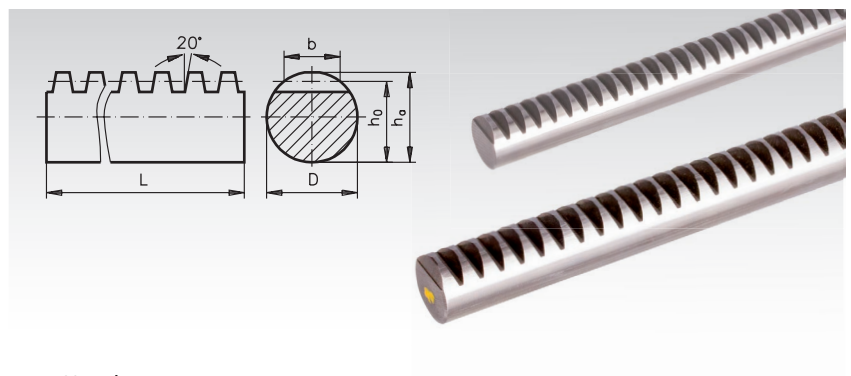
Stainless steel 1.4305.  
Diameter tolerance **h9**.



Tooth quality 8d25 modelled on DIN 3967.  
Pressure angle 20°.

The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

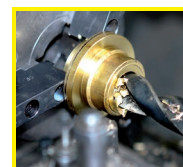
Dim.  $h_a$  and  $h_0$ : Pitch 5 mm: -0.2 mm  
Pitch 10 mm: -0.3 mm



Ordering Details: e.g.: Product No. 205 631 00, round gear rack, pitch 5mm, 500mm long

	Product No. Steel	Product No. Stainless Steel	Nom. length L mm	D mm	$h_0$ mm	$h_a$ mm	b mm	Weight
								kg
<b>Pitch 5mm (Module 1.59)</b>	205 631 00	205 996 31	500	15	13,4	15,0	9,4	0,64
	205 632 00	205 996 32	1000	15	13,4	15,0	9,4	1,28
	205 634 00	205 996 34	2000	15	13,4	15,0	9,4	2,56
<b>Pitch 10mm (Module 3.18)</b>	210 631 00	210 996 31	500	30	26,8	30,0	18,8	2,59
	210 632 00	210 996 32	1000	30	26,8	30,0	18,8	5,14
	210 634 00	210 996 34	2000	30	26,8	30,0	8,8	10,28

Matching  
Spur Gears  
Page 248

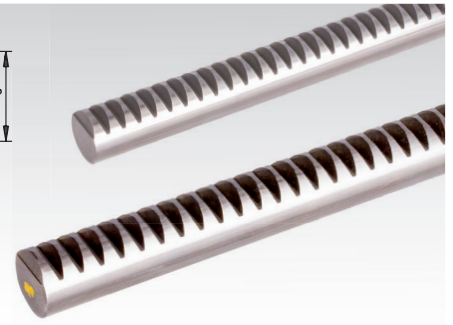
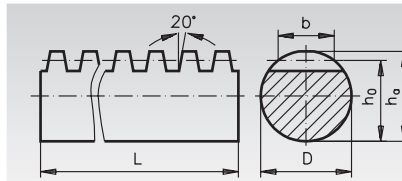


Reworking within  
24h-service possible.  
Custom made parts  
on request.

## Round Gear Racks Made From Steel

Tooth quality 8d25 modelled on DIN 3967.  
Pressure angle 20°.  
The teeth on the gear racks are manufactured using an overhead milling cutter. This leads to negative tolerances.

Dim.  $h_a$  and  $h_0$ : to module 2 -0.2 mm  
module 2.5 - 4 -0.3 mm  
module 5 - 6 -0.4 mm



Ordering Details: e.g.: Product No. 224 631 00,  
Round gear rack St., module 1, D 10 x 500 mm

## Round Gear Racks Made From Steel, Milled Teeth, Straight Tooth System, Precisely Straightened

### On choice: High Strength Steel!

		Product No. Standard	Product No. High Strength	Nom. length L mm	$h_0$ mm	$h_a$ mm	b mm	Weight kg
Material standard: St50K	<b>Module 1.0</b> D = 10 mm	224 631 00	224 666 31	500	9,0	10,0	6,0	0,28
		224 632 00	224 666 32	1000	9,0	10,0	6,0	0,56
Material High Strength:	<b>Module 1.0</b> D = 15 mm	225 631 00	-	500	14,0	15,0	7,5	0,66
		225 632 00	-	1000	14,0	15,0	7,5	1,35
Special steel with strength 1,000N/mm <sup>2</sup>	<b>Module 1.5</b> D = 17 mm	228 631 00	228 666 31	500	13,5	15,0	9,0	0,64
		228 632 00	228 666 32	1000	13,5	15,0	9,0	1,28
Diameter tolerance $h_6$ ground. (Tooth flanks not ground). Other dimensions, also from drawing, can be supplied at short notice.	<b>Module 1.5</b> D = 15 mm	229 631 00	-	500	15,5	17,0	9,6	0,84
		229 632 00	-	1000	15,5	17,0	9,6	1,70
<b>Module 2.0</b> D = 20 mm		241 631 00	241 666 31	500	18,0	20,0	12,0	1,14
		241 632 00	241 666 32	1000	18,0	20,0	12,0	2,28
		241 634 00*	241 666 34	2000	18,0	20,0	12,0	4,52
<b>Module 2.5</b> D = 25 mm		242 631 00	242 666 31	500	22,5	25,0	15,0	1,78
		242 632 00	242 666 32	1000	22,5	25,0	15,0	3,56
		242 634 00*	242 666 34	2000	22,5	25,0	15,0	7,20
<b>Module 3.0</b> D = 30 mm		243 631 00	243 666 31	500	27,0	30,0	18,0	2,59
		243 632 00	243 666 32	1000	27,0	30,0	18,0	5,14
		243 634 00*	243 666 34	2000	27,0	30,0	18,0	10,28
<b>Module 4.0</b> D = 40 mm		244 631 00	244 666 31	500	36,0	40,0	24,0	4,56
		244 632 00	244 666 32	1000	36,0	40,0	24,0	9,12
		244 634 00*	244 666 34	2000	36,0	40,0	24,0	18,24
<b>Module 5.0</b> D = 50 mm		245 631 00	245 666 31	500	45,0	50,0	30,0	7,10
		245 632 00	245 666 32	1000	45,0	50,0	30,0	14,20
		245 634 00*	245 666 34	2000	45,0	50,0	30,0	28,40
<b>Module 6.0</b> D = 60 mm		246 631 00	246 666 31	500	54,0	60,0	36,0	10,28
		246 632 00	246 666 32	1000	54,0	60,0	36,0	20,56
		246 634 00*	246 666 34	2000	54,0	60,0	36,0	41,12

\* Material: C45K.

Racks length 250 mm from C45 (up to module 5) at [www.maedler.de](http://www.maedler.de)

## Round Gear Racks Made From Stainless Steel, Milled Teeth, Straight Tooth System, Precisely Straightened

Material:  
Stainless steel  
1.4305.  
Diameter tolerance  
 $h_9$  drawn.



	Product No.	Nom. length L mm	$h_0$ mm	$h_a$ mm	b mm	Weight kg
<b>Module 1.0</b> D = 10 mm	224 996 31	500	9,0	10,0	6,0	0,28
	224 996 32	1000	9,0	10,0	6,0	0,56
<b>Module 1.5</b> D = 15 mm	228 996 31	500	13,5	15,0	9,0	0,64
	228 996 32	1000	13,5	15,0	9,0	1,28
<b>Module 2.0</b> D = 20 mm	241 996 31	500	18,0	20,0	12,0	1,14
	241 996 32	1000	18,0	20,0	12,0	2,28
	241 996 34	2000	18,0	20,0	12,0	4,56
<b>Module 2.5</b> D = 25 mm	242 996 31	500	22,5	25,0	15,0	1,78
	242 996 32	1000	22,5	25,0	15,0	3,56
	242 996 34	2000	22,5	25,0	15,0	7,12
<b>Module 3.0</b> D = 30 mm	243 996 31	500	27,0	30,0	18,0	2,59
	243 996 32	1000	27,0	30,0	18,0	5,14
	243 996 34	2000	27,5	30,0	18,0	10,28
<b>Module 4.0</b> D = 40 mm	244 996 31	500	36,0	40,0	24,0	4,56
	244 996 32	1000	36,0	40,0	24,0	9,12
	244 996 34	2000	36,0	40,0	24,0	18,24

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

**Material:** high-quality, specially treated bright steel with approx. 900 N/mm<sup>2</sup> tensile strength.

Tooth quality 8e27.

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

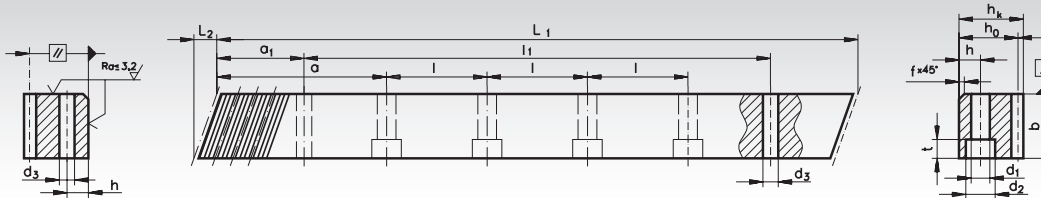
For continuous linking.

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

Matching helical-toothed spur gears page 252.



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 <sub>1</sub> mm	L <sub>2</sub> mm	Number of teeth	b mm	h <sub>k</sub> mm	h <sub>0</sub> mm	f mm	a mm	l mm	No. of h bores	d <sub>1</sub> mm	d <sub>2</sub> mm	t mm	a <sub>1</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	GT <sub>f</sub> /300 <sup>1)</sup> 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
<b>without Bores</b>																				
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	
<b>Counterpart for mounting</b>																				
251 600 00	200,00	8,8	30	25	24	22														0,85

### Module 3.0

Product No. with Bores	L <sub>1</sub> mm	L <sub>2</sub> mm	Number of teeth	b mm	h <sub>k</sub> mm	h <sub>0</sub> mm	f mm	a mm	l mm	No. of h bores	d <sub>1</sub> mm	d <sub>2</sub> mm	t mm	a <sub>1</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	GT <sub>f</sub> /300 <sup>1)</sup> 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
<b>without Bores</b>																				
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	
<b>Counterpart for mounting</b>																				
253 600 00	200,00	10,6	20	30	29	26														2,70

### Module 4.0

Product No. with Bores	L <sub>1</sub> mm	L <sub>2</sub> mm	Number of teeth	b mm	h <sub>k</sub> mm	h <sub>0</sub> mm	f mm	a mm	l mm	No. of h bores	d <sub>1</sub> mm	d <sub>2</sub> mm	t mm	a <sub>1</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	GT <sub>f</sub> /300 <sup>1)</sup> 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
<b>without Bores</b>																				
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	
<b>Counterpart for mounting</b>																				
254 600 00	200,00	14,2	15	40	39	35														2,70

### Module 5.0

Product No. with Bores	L <sub>1</sub> mm	L <sub>2</sub> mm	Number of teeth	b mm	h <sub>k</sub> mm	h <sub>0</sub> mm	f mm	a mm	l mm	No. of h bores	d <sub>1</sub> mm	d <sub>2</sub> mm	t mm	a <sub>1</sub> mm	l <sub>1</sub> mm	d <sub>3</sub> mm	GT <sub>f</sub> /300 <sup>1)</sup> 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
<b>without Bores</b>																				
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	
<b>Counterpart for mounting</b>																				
255 600 00	200,00	17,4	12	49	39	34														3,00

<sup>1)</sup> GT<sub>f</sub> /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<sub>300</sub>, with L<sub>300</sub> = (m / cos β) • π • z<sub>300</sub>.

\* Tangential force at tooth, calculated for z  $\geq$  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

**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.

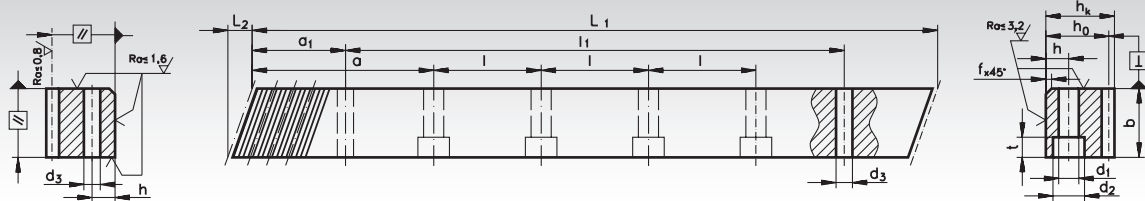
As only the teeth are hardened subsequent drilling and pinning is easily possible. Tooth quality 8e27.

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

For continuous linking.

Matching helical-toothed spur gears page 252.

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



### Module 2.0

Product No. with Bores	L <sub>1</sub>	L <sub>2</sub>	Number of teeth	b	h <sub>k</sub>	h <sub>0</sub>	f	a	l	No. of h bores		d <sub>1</sub>	d <sub>2</sub>	t	a <sub>1</sub>	l <sub>1</sub>	d <sub>3</sub>	GT <sub>f</sub> /300 <sup>1)</sup>	Fu* N	Weight kg
	mm	mm								mm	mm									
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
<b>without Bores</b>																				
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
<b>Counterpart for mounting</b>																				
251 600 00	200,00	8,5	30	24	24	22														0,85

### Module 3.0

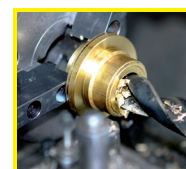
Product No. with Bores	L <sub>1</sub>	L <sub>2</sub>	Number of teeth	b	h <sub>k</sub>	h <sub>0</sub>	f	a	l	No. of h bores		d <sub>1</sub>	d <sub>2</sub>	t	a <sub>1</sub>	l <sub>1</sub>	d <sub>3</sub>	GT <sub>f</sub> /300 <sup>1)</sup>	Fu* N	Weight kg
	mm	mm								mm	mm									
253 603 01	500,00	10,3	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
<b>without Bores</b>																				
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
<b>Counterpart for mounting</b>																				
253 600 00	200,00	10,3	20	29	29	26														1,20

### Module 4.0

Product No. with Bores	L <sub>1</sub>	L <sub>2</sub>	Number of teeth	b	h <sub>k</sub>	h <sub>0</sub>	f	a	l	No. of h bores		d <sub>1</sub>	d <sub>2</sub>	t	a <sub>1</sub>	l <sub>1</sub>	d <sub>3</sub>	GT <sub>f</sub> /300 <sup>1)</sup>	Fu* N	Weight kg
	mm	mm								mm	mm									
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
<b>without Bores</b>																				
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
<b>Counterpart for mounting</b>																				
254 600 00	200,00	13,8	15	39	39	35														2,70

<sup>1)</sup> GT<sub>f</sub> /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<sub>300</sub>, with L<sub>300</sub> = (m / cos β) • π • z<sub>300</sub>.

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



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**



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

**Material:** C45K, Material-No. 1.0503, made from specially treated bright steel with approx. 650 N/mm<sup>2</sup> 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. Tooth quality 6h25.

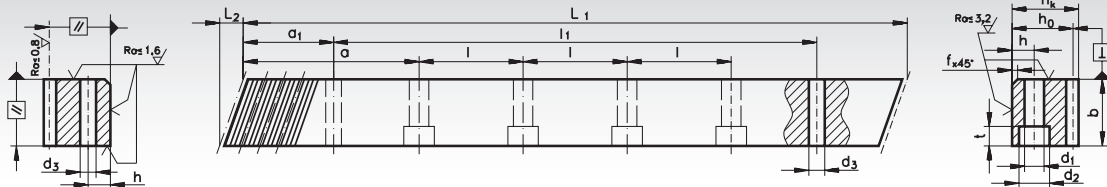
Helical tooth system, right hand 19° 31' 42".

For continuous linking.

Matching helical-toothed spur gears page 252.



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



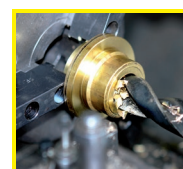
### Module 5.0

Product No. with Bores	L <sub>1</sub>	L <sub>2</sub>	Number of teeth	b	h <sub>k</sub>	h <sub>0</sub>	f	a	l	No. of h bores	d <sub>1</sub>	d <sub>2</sub>	t	a <sub>1</sub>	l <sub>1</sub>	d <sub>3</sub>	GT <sub>f</sub> /300 <sup>1)</sup>	Fu*	Weight	
	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	N	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
<b>without Bores</b>																				
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	
<b>Counterpart for mounting</b>																				
255 600 00	200,00	17,4	12	49	39	34											0,025	32000	3,00	

<sup>1)</sup> GT<sub>f</sub> / 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<sub>300</sub>, with  $L_{300} = (m / \cos \beta) \cdot \pi \cdot z_{300}$ .

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

**Helical Tooth  
Spur Gears  
Page 252**



**Reworking within  
24h-service possible.  
Custom made parts  
on request.**