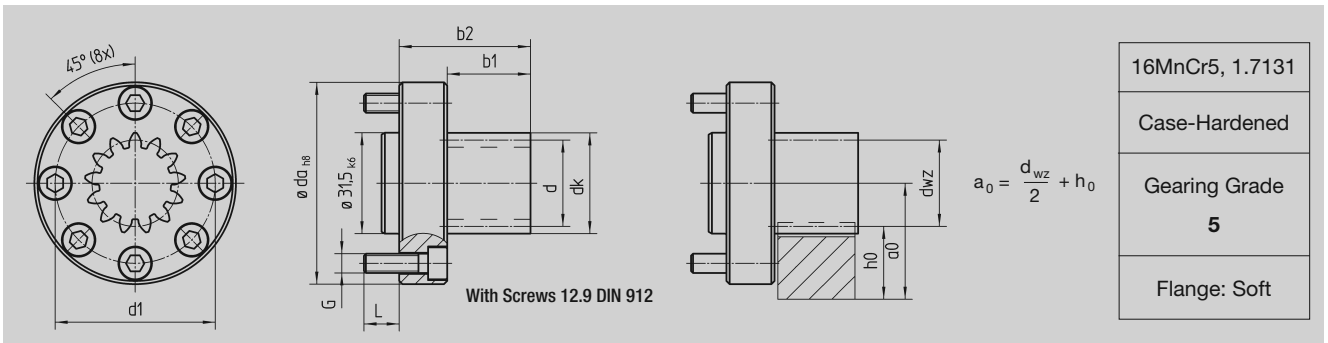




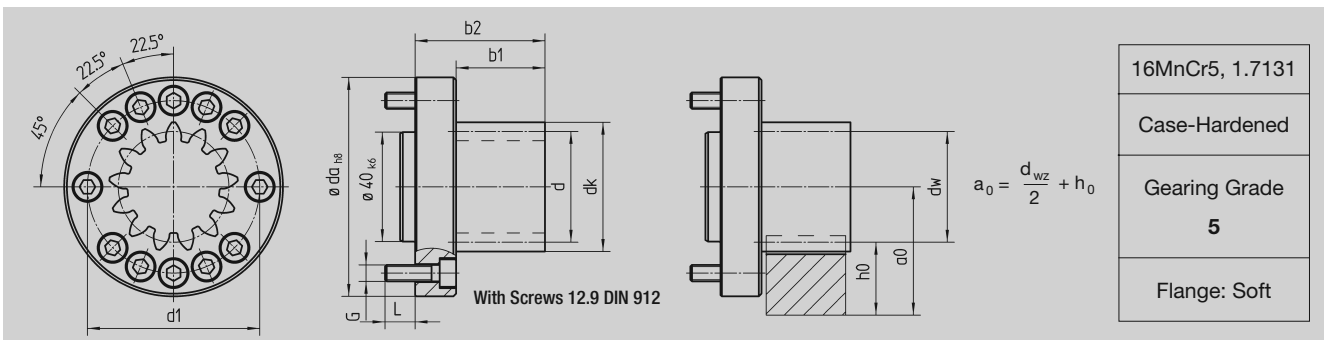
Bolt Circle-ø 50, straight tooth system



Order Code	No. of Teeth z	Profile Modification Factor x	Interface											
			d_{wz}	d_k	b_1	b_2	L	a_0	ISO	d_1	G	d_{ah8}	L	kg
Module 2														
78 21 813	13	0.366	27.47	31.5	26	41	81.68	35.73	9409-1-A-50	50	M6	63	11	0.5
78 21 817	17	-0.012	33.95	38.0	26	41	106.81	38.98	9409-1-A-50	50	M6	63	11	0.6

Further number of teeth on request, min. number of teeth 13, max. number of teeth 17

Bolt Circle-ø 63, straight tooth system



Order Code	No. of Teeth z	Profile Modification Factor x	Interface											
			d_{wz}	d_k	b_1	b_2	L	a_0	ISO	d_1	G	d_{ah8}	L	kg
Module 2														
78 22 813	13	0.366	27.47	31.5	26	41	81.68	35.73	9409-1-A-63	63	M6	80	11	0.8
78 22 817	17	-0.012	33.95	38.0	26	41	106.81	38.98	9409-1-A-63	63	M6	80	11	0.8
78 22 824	24	0.202	48.81	52.8	26	41	150.80	46.40	9409-1-A-63	63	M6	80	11	1.0

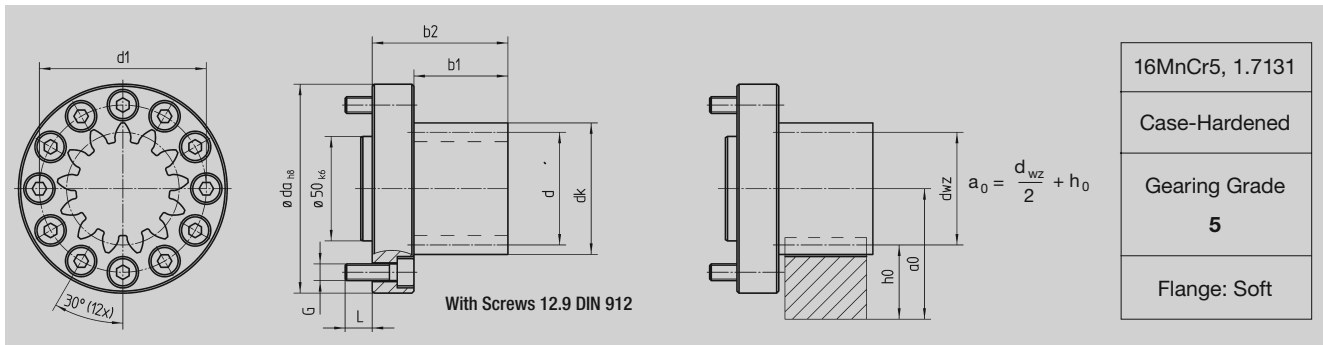
Further number of teeth on request, min. number of teeth 13, max. number of teeth 24

Module 3														
78 32 813	13	0.366	41.20	47.2	32.5	47.5	122.52	46.60	9409-1-A-63	63	M6	80	11	1.0

Further number of teeth on request, min. number of teeth 13, max. number of teeth 15



Bolt Circle- $\varnothing 80$, straight tooth system



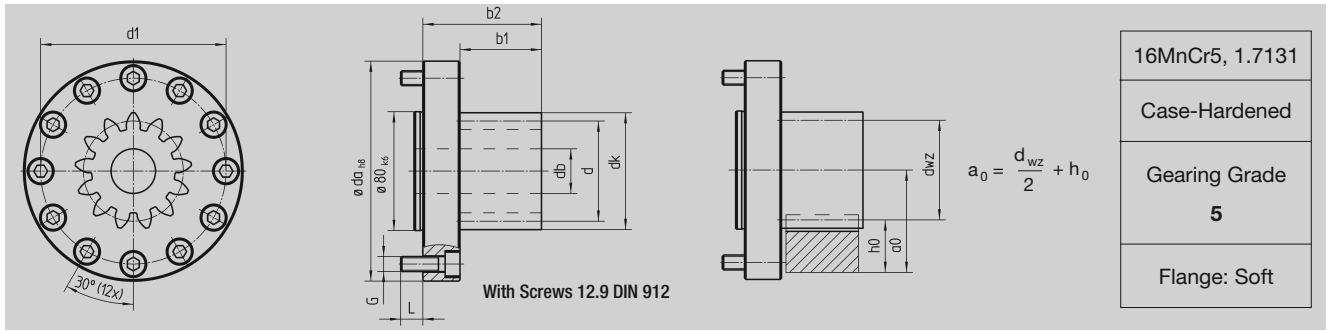
Order Code	No. of Teeth z	Profile Modification Factor x								Interface					kg
			d_{wz}	d_k	b_1	b_2	L	a_0	ISO	d_1	G	d_{ah8}	L		
Module 2															
78 23 813	13	0.366	27.47	31.5	26	46	81.68	35.73	9409-1-A-80	80	M8	100	13	1.4	
78 23 824 ⁽¹⁾	24	0.202	48.81	52.8	26	46	150.80	46.40	9409-1-A-80	80	M8	100	13	1.6	
Further number of teeth on request, min. number of teeth 13, max. number of teeth 31															
Module 3															
78 33 813	13	0.366	41.20	47.2	32.5	52.5	122.52	46.60	9409-1-A-80	80	M8	100	13	1.6	
78 33 820	20	0.080	60.48	66.5	32.5	52.5	188.50	56.24	9409-1-A-80	80	M8	100	13	2.0	
Further number of teeth on request, min. number of teeth 13, max. number of teeth 20															
Module 4															
78 43 813	13	0.366	54.93	62.9	45	65	163.36	62.47	9409-1-A-80	80	M8	100	13	2.1	
78 43 814	14	0.397	59.17	67.2	45	65	175.93	64.59	9409-1-A-80	80	M8	100	13	2.2	

⁽¹⁾ Also available as pinion for counter bearing.





Bolt Circle-ø 125, straight tooth system



Order Code	No. of Teeth	Profile Modification Factor	Interface							ISO	d ₁	G	d _{ah8}	L	d _b	kg
			z	x	d _{wz}	d _k	b ₁	b ₂	L							
Module 3																
78 34 813	13	0.366	41.20	47.2	32.5	57.5	122.52	46.60	9409-1-A-125	125	M10	148	15	-	3.8	
78 34 413	13	0.366	41.20	47.2	32.5	57.5	122.52	46.60	-	125	M12	148	17	-	3.8	
78 34 820	20	0.080	60.48	66.5	32.5	57.5	188.50	56.24	9409-1-A-125	125	M10	148	15	-	4.2	
78 34 420	20	0.080	60.48	66.5	32.5	57.5	188.50	56.24	-	125	M12	148	17	-	4.2	
78 34 427	27	0.294	82.76	88.8	32.5	57.5	254.47	67.38	-	125	M12	148	17	-	4.9	
78 34 433	33	0.477	101.86	107.9	32.5	57.5	311.02	76.93	-	125	M12	148	17	-	5.6	

Further number of teeth on request, min. number of teeth 13, max. number of teeth 34

Module 4																
78 44 813	13	0.366	54.93	62.9	45	70	163.36	62.47	9409-1-A-125	125	M10	148	15	-	4.4	
78 44 413	13	0.366	54.93	62.9	45	70	163.36	62.47	-	125	M12	148	17	-	4.4	
78 44 820	20	0.190	81.52	89.5	45	70	256.10	75.76	9409-1-A-125	125	M10	148	15	-	5.4	
78 44 420	20	0.190	81.52	89.5	45	70	256.10	75.76	-	125	M12	148	17	-	5.4	
78 44 821 ⁽¹⁾	21	0.110	84.88	92.9	45	70	263.89	77.44	9409-1-A-125	125	M10	148	15	-	5.5	
78 44 421	21	0.110	84.88	92.9	45	70	263.89	77.44	-	125	M12	148	17	-	5.5	
78 44 824	24	0.202	97.61	105.6	45	70	301.59	83.81	9409-1-A-125	125	M10	148	15	-	6.1	
78 44 424	24	0.202	97.61	105.6	45	70	301.59	83.81	-	125	M12	148	17	-	6.1	

Further number of teeth on request, min. number of teeth 13, max. number of teeth 24

Module 5																
78 54 813	13	0.366	68.66	78.7	55	80	204.20	68.33(2)	9409-1-A-125	125	M10	148	15	-	5.1	
78 54 413	13	0.366	68.66	78.7	55	80	204.20	68.33(2)	-	125	M12	148	17	-	5.1	
78 54 417	17	-0.012	84.88	94.9	55	80	267.04	79.44(2)	-	125	M12	148	17	-	6.0	
78 54 819	19	0.049	95.49	105.5	55	80	298.45	81.75(2)	9409-1-A-125	125	M10	148	15	-	6.6	
78 54 419	19	0.049	95.49	105.5	55	80	298.45	81.75(2)	-	125	M12	148	17	-	6.6	

Further number of teeth on request, min. number of teeth 13, max. number of teeth 19

Module 6																
78 64 813	13	0.366	82.40	94.4	65	90	245.04	84.20	9409-1-A-125	125	M10	148	15	25	5.8	
78 64 413	13	0.366	82.40	94.4	65	90	245.04	84.20	-	125	M12	148	17	25	5.9	
78 64 814	14	0.397	88.76	100.8	65	90	263.89	87.38	9409-1-A-125	125	M10	148	15	25	6.3	
78 64 816	16	-0.042	95.49	107.5	65	90	301.59	90.75	9409-1-A-125	125	M10	148	15	25	6.8	

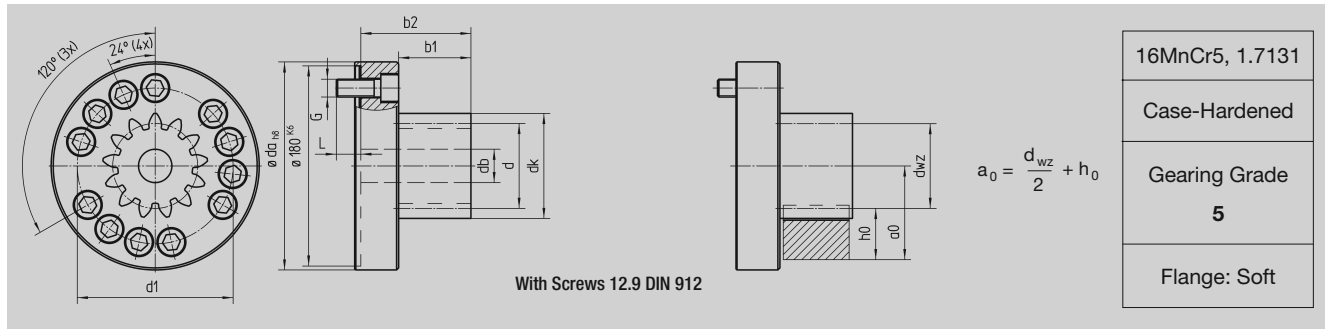
Further number of teeth on request, min. number of teeth 13, max. number of teeth 16

⁽¹⁾ Also available as pinion for counter bearing.

⁽²⁾ For 29 55 ... a'₀ = a₀ + 10.



Bolt Circle- ϕ 140, straight tooth system



Order Code	No. of Teeth	Profile Modification Factor								Interface					
			d_{wz}	d_k	b_1	b_2	L	a_0	ISO	d_1	G	d_{ah8}	L	d_b	kg
Module 4															
78 46 813	13	0.366	54.93	62.9	45	79	163.36	62.47	-	140	M16	187	22	-	8.1
78 46 820	20	0.190	81.52	89.5	45	79	256.10	75.76	-	140	M16	187	22	-	9.1
78 46 821	21	0.110	84.88	92.9	45	79	263.89	77.44	-	140	M16	187	22	-	9.2

Further number of teeth on request, min. number of teeth 13, max. number of teeth 26

Module 5															
78 56 815	15	0.227	77.27	87.3	55	89	235.62	72.64(2)	-	140	M16	187	22	-	9.2
78 56 820	20	0.080	100.80	110.8	55	89	314.16	84.40(2)	-	140	M16	187	22	-	10.6

Further number of teeth on request, min. number of teeth 13, max. number of teeth 21

Module 6															
78 66 813	13	0.366	82.40	94.4	65	99	245.04	84.20	-	140	M16	187	22	25	9.5
78 66 817 ⁽¹⁾	17	-0.012	101.86	113.9	65	99	320.44	93.93	-	140	M16	187	22	25	10.9

Further number of teeth on request, min. number of teeth 13, max. number of teeth 17

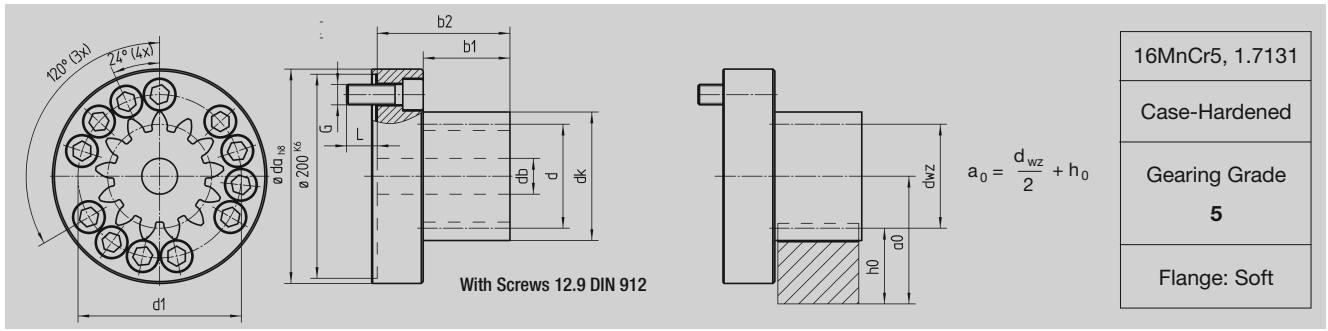
⁽¹⁾ Also available as pinion for counter bearing.

⁽²⁾ For 29 55 ... $a_0 = a_0 + 10$.





Bolt Circle-ø 160, straight tooth system



Order Code	No. of Teeth z	Profile Modification Factor x							Interface						
			d_{wz}	d_k	b_1	b_2	L	a_0	ISO	d_1	G	d_{ah8}	L	d_b	kg
Module 5															
78 57 813	13	0.366	68.66	78.7	55	100	204.20	68.33(2)	-	160	M20	210	30	-	13.8
78 57 820	20	0.080	100.80	110.8	55	100	314.16	84.40(2)	-	160	M20	210	30	-	15.6

Further number of teeth on request, min. number of teeth 13, max. number of teeth 23

Module 6															
78 67 813	13	0.366	82.39	94.4	65	110	245.04	84.20	-	160	M20	210	30	25	14.5
78 67 817	17	-0.012	101.86	113.9	65	110	320.44	93.93	-	160	M20	210	30	25	15.9
78 67 819	19	0.049	114.59	126.6	65	110	358.14	100.30	-	160	M20	210	30	25	17.0

Further number of teeth on request, min. number of teeth 13, max. number of teeth 19

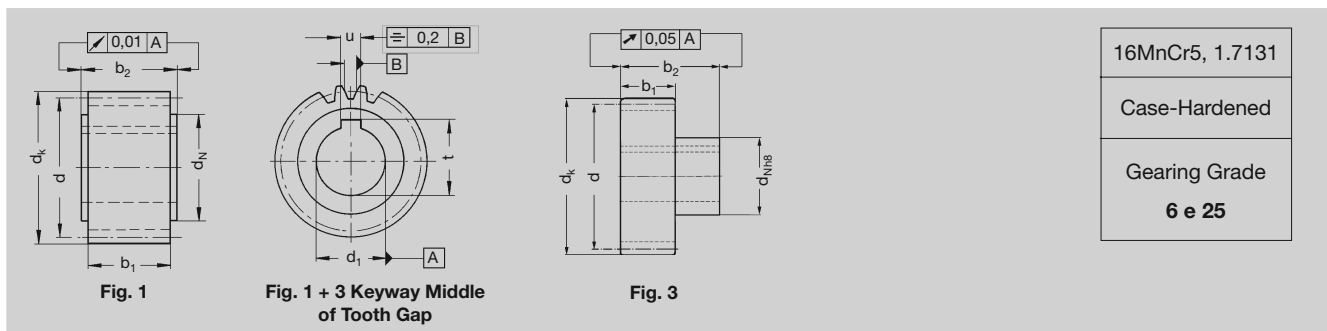
Module 8															
78 87 813	13	0.366	109.86	125.9	85	130	326.73	125.93	-	160	M20	210	30	30	17.8

(2) For 29 55 ... $a'_0 = a_0 + 10$.





Straight Tooth System, with Bore $\varnothing H6$ and Keyway acc. to DIN 6885



16MnCr5, 1.7131
Case-Hardened
Gearing Grade
6 e 25

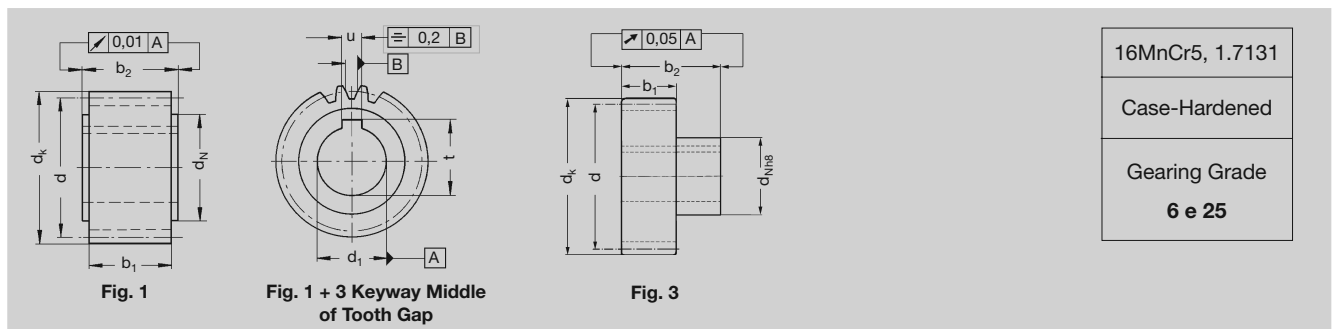
Order Code	Fig.	N° of Teeth z	d	d _k	d ₁ ^{H6}	d _N	b ₁	b ₂	u	t	kg	Shrink-Disk on Page GH-1
Module 2												
24 21 216	1	16	32	36	15	25	28	30.0	5	17.3	0.1	
24 21 218	1	18	36	40	15	28	28	30.0	5	17.3	0.2	
24 22 218	1	18	36	40	20	28	28	30.0	6	22.8	0.2	
24 21 220	1	20	40	44	15	25	28	30.0	5	17.3	0.2	
24 29 420	3	20	40	44	19*	30	28	56.0	6	21.8	0.2	80 83 030
24 29 220	1	20	40	44	19*	30	28	30.0	6	21.8	0.2	
24 22 220	1	20	40	44	20*	30	28	30.0	6	22.8	0.2	
24 20 120	3	20	40	44	22*	36	28	56.0	6	24.8	0.3	80 84 036
24 20 220	1	20	40	44	22*	30	28	30.0	6	24.8	0.2	
24 21 222	1	22	44	48	15	25	28	30.0	5	17.3	0.3	
24 29 222	1	22	44	48	19*	30	28	30.0	6	21.8	0.3	
24 29 422	3	22	44	48	19*	30	28	56.0	6	21.8	0.3	80 83 030
24 22 222	1	22	44	48	20	30	28	30.0	6	22.8	0.3	
24 20 222	1	22	44	48	22*	30	28	30.0	6	24.8	0.2	
24 20 122	3	22	44	48	22	36	28	56.0	6	27.8	0.2	80 84 036
24 23 222	1	22	44	48	25	36	28	30.0	8	28.3	0.2	
24 21 225	1	25	50	54	15	25	28	30.0	5	17.3	0.4	
24 26 225	3	25	50	54	16	30	28	54.0	5	18.3	0.3	80 83 030
24 29 225	1	25	50	54	19*	30	28	30.0	6	21.8	0.3	
24 29 425	3	25	50	54	19*	30	28	56.0	6	21.8	0.3	80 83 030
24 22 225	1	25	50	54	20	30	28	30.0	6	22.8	0.4	
24 20 225	1	25	50	54	22	30	28	30.0	6	24.8	0.3	
24 20 425	3	25	50	54	22*	36	28	56.0	6	24.8	0.4	80 84 036
24 23 225	1	25	50	54	25	36	28	30.0	8	28.3	0.3	
24 24 225	1	25	50	54	30	45	28	30.0	8	33.3	0.3	
24 21 228	1	28	56	60	15	25	28	30.0	5	17.3	0.5	
24 29 228	1	28	56	60	19*	30	28	30.0	6	21.8	0.5	
24 29 428	3	28	56	60	19*	30	28	56.0	6	21.8	0.5	80 83 030
24 22 228	1	28	56	60	20	30	28	30.0	6	22.8	0.5	
24 20 128	3	28	56	60	22*	36	28	56.0	6	24.8	0.3	80 84 036
24 20 228	1	28	56	60	22*	30	28	30.0	6	24.8	0.3	
24 23 228	1	28	56	60	25	36	28	30.0	8	28.3	0.4	
24 22 428	3	28	56	60	30	50	28	60.0	8	33.3	0.4	80 85 050
24 24 228	1	28	56	60	30	45	28	30.0	8	33.3	0.4	
24 25 228	1	28	56	60	35	48	28	30.0	10	38.3	0.3	
24 21 232	1	32	64	68	15	36	28	30.0	5	17.3	0.6	
24 26 232	3	32	64	68	16	30	28	54.0	5	18.3	0.6	80 83 030
24 22 232	1	32	64	68	20	30	28	30.0	6	22.8	0.6	
24 20 232	1	32	64	68	22*	30	28	30.0	6	24.8	0.4	
24 20 432	3	32	64	68	22	36	28	56.0	6	24.8	0.6	80 84 036
24 23 232	1	32	64	68	25	36	28	30.0	8	28.3	0.6	
24 22 432	3	32	64	68	30	50	28	60.0	8	33.3	0.6	80 85 050
24 24 232	1	32	64	68	30	45	28	30.0	8	33.3	0.6	
24 23 432	3	32	64	68	32	55	28	65.0	10	35.3	0.5	80 80 055
24 25 232	1	32	64	68	35	48	28	30.0	10	38.3	0.5	
24 22 236	1	36	72	76	20	30	28	30.0	6	22.8	0.8	
24 23 236	1	36	72	76	25	36	28	30.0	8	28.3	0.8	
24 24 236	1	36	72	76	30	45	28	30.0	8	33.3	0.7	
24 25 236	1	36	72	76	35	48	28	30.0	10	38.3	0.7	
24 25 436	3	36	72	76	40	62	28	65.0	12	43.3	0.5	80 86 062
24 27 236	1	36	72	76	45	58	28	30.0	14	48.8	0.6	

* H7 tolerance





Straight Tooth System, with Bore \varnothing H6 and Keyway acc. to DIN 6885



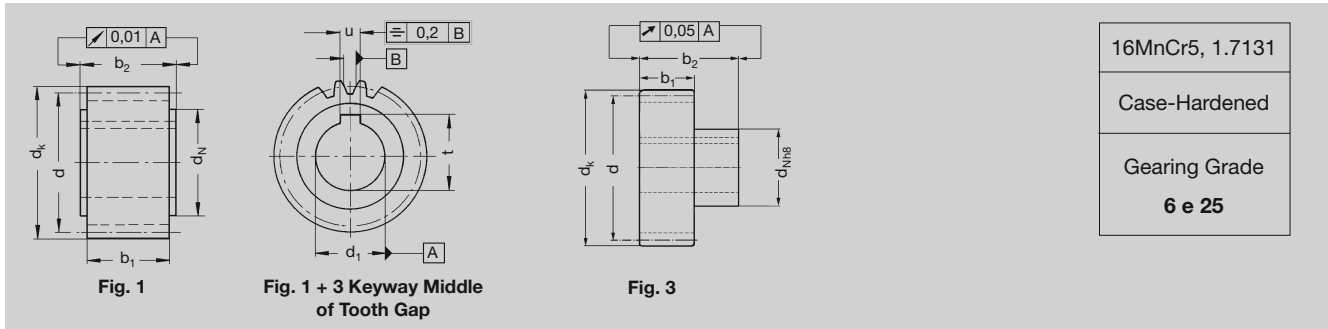
16MnCr5, 1.7131
Case-Hardened
Gearing Grade 6 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁ ^{H6}	d _N	b ₁	b ₂	u	t	kg	Shrink-Disk on Page GH-1
Modul / Module 2												
24 21 240	1	40	80	84	15	36	28	30.0	5	17.3	1.0	
24 22 240	1	40	80	84	20	30	28	30.0	6	22.8	1.0	
24 23 240	1	40	80	84	25	36	28	30.0	8	28.3	1.0	
24 24 240	1	40	80	84	30	45	28	30.0	8	33.3	1.0	
24 23 440	3	40	80	84	32	55	28	65.0	10	35.3	0.9	80 80 055
24 25 240	1	40	80	84	35	48	28	30.0	10	38.3	0.9	
24 25 440	3	40	80	84	40	62	28	65.0	12	43.3	0.7	80 86 062
24 26 440	3	40	80	84	45	68	28	65.0	14	48.8	1.3	80 80 068
24 27 240	1	40	80	84	45	58	28	30.0	14	48.8	0.8	
24 22 245	1	45	90	94	20	30	28	30.0	6	22.8	1.3	
24 23 245	1	45	90	94	25	36	28	30.0	8	28.3	1.2	
24 25 245	1	45	90	94	35	48	28	30.0	10	38.3	1.2	
24 27 245	1	45	90	94	45	58	28	30.0	14	48.8	1.1	
24 22 250	1	50	100	104	20	30	28	30.0	6	22.8	1.6	
24 23 250	1	50	100	104	25	36	28	30.0	8	28.3	1.5	
24 25 250	1	50	100	104	35	48	28	30.0	10	38.3	1.5	
24 27 250	1	50	100	104	45	58	28	30.0	14	48.8	1.4	
24 26 450	3	50	100	104	45	68	28	65.0	14	48.8	2.0	80 80 068
24 23 256	1	56	112	116	25	36	28	30.0	8	28.3	1.9	
24 25 256	1	56	112	116	35	48	28	30.0	10	38.3	1.8	
24 23 263	1	63	126	130	25	36	28	30.0	8	28.3	2.5	
24 25 271	1	71	142	146	35	48	28	30.0	10	38.3	3.15	
24 25 280	1	80	160	164	35	48	28	30.0	10	38.3	4.2	
24 27 290	1	90	180	184	45	58	28	30.0	14	48.8	5.7	





Straight Tooth System, with Bore ØH6 and Keyway acc. to DIN 6885



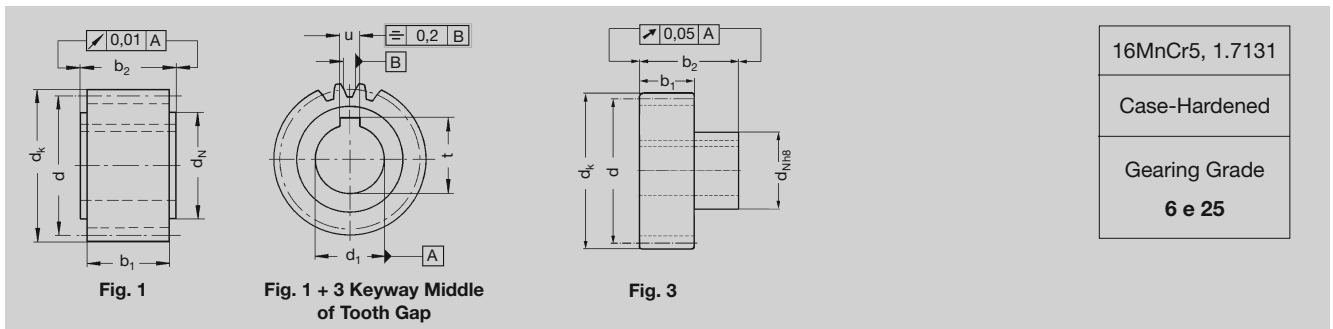
Order Code	Fig.	N° of Teeth z	d	dk	d ₁ ^{H6}	d _N	b ₁	b ₂	u	t	kg	Shrink-Disk on Page GH-1
Module 3												
24 33 218	1	18	54	60	25	36	28	30.0	8	28.3	0.4	
24 33 220	1	20	60	66	25	36	28	30.0	8	28.3	0.5	
24 34 220	1	20	60	66	30	45	28	30.0	8	33.3	0.5	
24 35 220	1	20	60	66	35	48	28	30.0	10	38.3	0.4	
24 30 422	3	22	66	72	22	36	28	56.0	6	24.8	0.8	80 84 036
24 31 422	3	22	66	72	25	44	28	60.0	8	28.3	0.9	80 80 044
24 33 222	1	22	66	72	25	36	28	30.0	8	28.3	0.6	
24 32 422	3	22	66	72	30	50	28	60.0	8	33.3	0.9	80 85 050
24 34 222	1	22	66	72	30	45	28	30.0	8	33.3	0.6	
24 33 422	3	22	66	72	32	55	28	65.0	10	35.3	1.0	80 80 055
24 34 422	3	22	66	72	35	55	28	65.0	10	38.3	0.9	80 80 055
24 35 222	1	22	66	72	35	48	28	30.0	10	38.3	0.6	
24 35 422	3	22	66	72	40*	62	28	65	12	43.3	1.0	80 86 062
24 33 225	1	25	75	81	25	36	28	30.0	8	28.3	0.9	
24 34 225	1	25	75	81	30	45	28	30.0	8	33.3	0.8	
24 33 425	3	25	75	81	32*	55	28	65	10	35.3	1.2	80 80 055
24 35 225	1	25	75	81	35	48	28	30.0	10	38.3	0.8	
24 35 425	3	25	75	81	40	62	28	65.0	12	43.3	1.2	80 86 062
24 37 225	1	25	75	81	45	58	28	30.0	14	48.8	0.6	
24 30 428	3	28	84	90	22	36	28	56.0	6	24.8	1.3	80 84 036
24 31 428	3	28	84	90	25	44	28	60.0	8	28.3	1.4	80 80 044
24 33 228	1	28	84	90	25	36	28	30.0	8	28.3	1.1	
24 32 428	3	28	84	90	30	50	28	60.0	8	33.3	1.4	80 85 050
24 34 228	1	28	84	90	30	45	28	30.0	8	33.3	1.1	
24 33 428	3	28	84	90	32	55	28	65.0	10	35.3	1.5	80 80 055
24 34 428	3	28	84	90	35	55	28	65.0	10	38.3	1.4	80 80 055
24 35 228	1	28	84	90	35	48	28	30.0	10	38.3	1.0	
24 35 428	3	28	84	90	40*	62	28	65	12	43.3	1.4	80 86 062
24 36 428	3	28	84	90	45	68	28	65.0	14	48.8	1.5	80 80 068
24 37 228	1	28	84	90	45	58	28	30.0	14	48.8	0.9	
24 33 232	1	32	96	102	25	36	28	30.0	8	28.3	1.5	
24 34 232	1	32	96	102	30	45	28	30.0	8	33.3	1.4	
24 33 432	3	32	96	102	32*	55	28	65	10	35.3	1.8	80 80 055
24 35 232	1	32	96	102	35	48	28	30.0	10	38.3	1.4	
24 35 432	3	32	96	102	40	62	28	65.0	12	43.3	1.8	80 86 062
24 37 232	1	32	96	102	45	58	28	30.0	14	48.8	1.3	
24 39 232	1	32	96	102	60	80	28	30.0	18	64.4	1.1	
24 33 236	1	36	108	114	25	36	28	30.0	8	28.3	1.9	
24 35 236	1	36	108	114	35	48	28	30.0	10	38.3	1.8	
24 36 436	3	36	108	114	45	68	28	65.0	14	48.8	2.2	80 80 068
24 37 236	1	36	108	114	45	58	28	30.0	14	48.8	1.7	
24 39 236	1	36	108	114	60	80	28	30.0	18	64.4	1.4	
24 33 240	1	40	120	126	25	36	28	30	8	28.3	2.3	
24 35 240	1	40	120	126	35	48	28	30.0	10	38.3	2.3	
24 37 240	1	40	120	126	45	58	28	30.0	14	48.8	2.1	
24 39 240	1	40	120	126	60	80	28	30.0	18	64.4	1.9	
24 33 245	1	45	135	141	25	36	28	30.0	8	28.3	3.0	
24 35 245	1	45	135	141	35	48	28	30.0	10	38.3	2.7	
24 37 245	1	45	135	141	45	58	28	30.0	14	48.8	2.4	

* H7 tolerance





Straight Tooth System, with Bore \varnothing H6 and Keyway acc. to DIN 6885



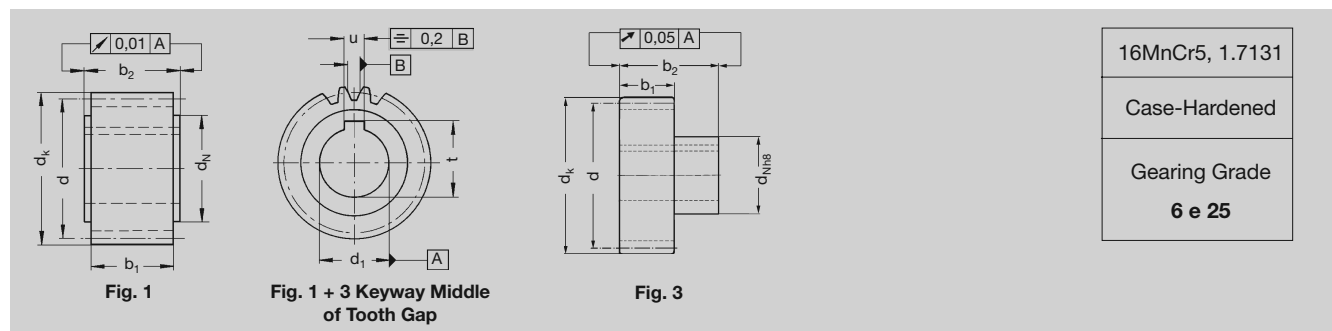
16MnCr5, 1.7131
Case-Hardened
Gearing Grade 6 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁ ^{H6}	d _N	b ₁	b ₂	u	t	kg	Shrink-Disk on Page GH-1
Module 3												
24 39 245	1	45	135	141	60	80	28	30.0	18	64.4	2.4	
24 35 250	1	50	150	156	35	48	28	30.0	10	38.3	3.6	
24 37 250	1	50	150	156	45	58	28	30	14	48.8	3.5	
24 37 256	1	56	168	174	45	58	28	30.0	14	48.8	4.4	
24 37 263	1	63	189	195	45	58	28	30.0	14	48.8	5.4	
24 39 263	1	63	189	195	60	80	28	30.0	18	64.4	5.4	





Straight Tooth System, with Bore ØH6 and Keyway acc. to DIN 6885



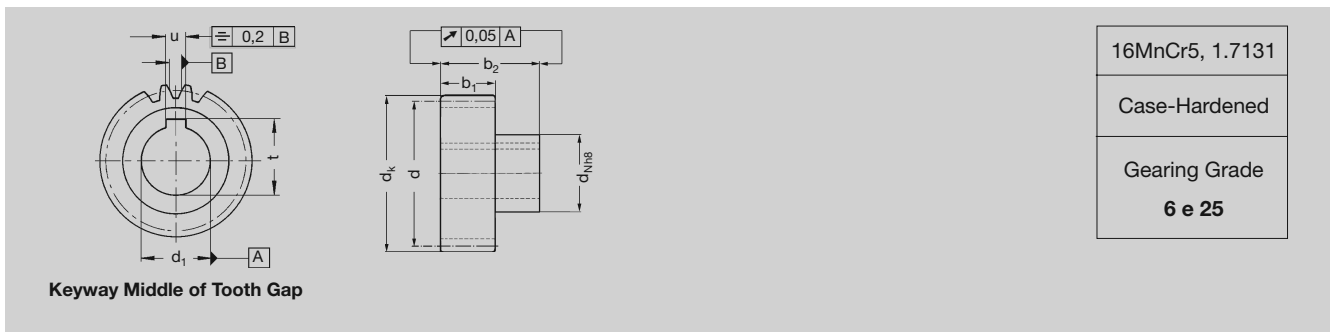
16MnCr5, 1.7131
Case-Hardened
Gearing Grade 6 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁ ^{H6}	d _N	b ₁	b ₂	u	t	kg	Shrink-Disk on Page GH-1
Module 4												
24 43 420	3	20	80	88	32	55	40	75.0	10	35.3	1.7	80 80 055
24 45 220	1	20	80	88	35	52	40	50.0	10	38.3	1.3	
24 44 420	3	20	80	88	35	55	40	75.0	10	38.3	1.7	80 80 055
24 45 420	3	20	80	88	40	62	40	75.0	12	43.3	1.7	80 86 062
24 47 220	1	20	80	88	45	65	40	50.0	14	48.8	1.2	
24 45 222	1	22	88	96	35	52	40	50.0	10	38.3	1.7	
24 47 222	1	22	88	96	45	65	40	50.0	14	48.8	1.5	
24 46 422	3	22	88	96	45	68	40	75.0	14	48.8	2.0	80 80 068
24 43 425	3	25	100	108	32	55	40	75.0	10	35.3	2.6	80 80 055
24 45 225	1	25	100	108	35	52	40	50.0	10	38.3	2.2	
24 44 425	3	25	100	108	35	55	40	75.0	10	38.3	2.5	80 80 055
24 45 425	3	25	100	108	40	62	40	75.0	12	43.3	2.5	80 86 062
24 47 225	1	25	100	108	45	65	40	50.0	14	48.8	2.0	
24 47 425	3	25	100	108	55	80	40	80.0	16	59.3	2.5	80 87 080
24 45 228	1	28	112	120	35	52	40	50.0	10	38.3	2.9	
24 47 228	1	28	112	120	45	65	40	50.0	14	48.8	2.7	
24 46 428	3	28	112	120	45	68	40	75.0	14	48.8	3.1	80 80 068
24 45 232	1	32	128	136	35	52	40	50.0	10	38.3	3.8	
24 47 232	1	32	128	136	45	65	40	50.0	14	48.8	3.7	
24 47 432	3	32	128	136	55	80	40	80.0	16	59.3	4.1	80 87 080
24 48 432	3	32	128	136	75	110	40	100.0	20	79.9	5.0	80 80 110
24 47 240	1	40	160	168	45	65	40	50.0	14	48.8	5.9	
24 49 240	1	40	160	168	60	80	40	50.0	18	64.4	5.6	
24 48 440	3	40	160	168	75	110	40	100.0	20	79.9	7.3	80 80 110





Straight Tooth System, with Bore $\varnothing H6$ and Keyway acc. to DIN 6885



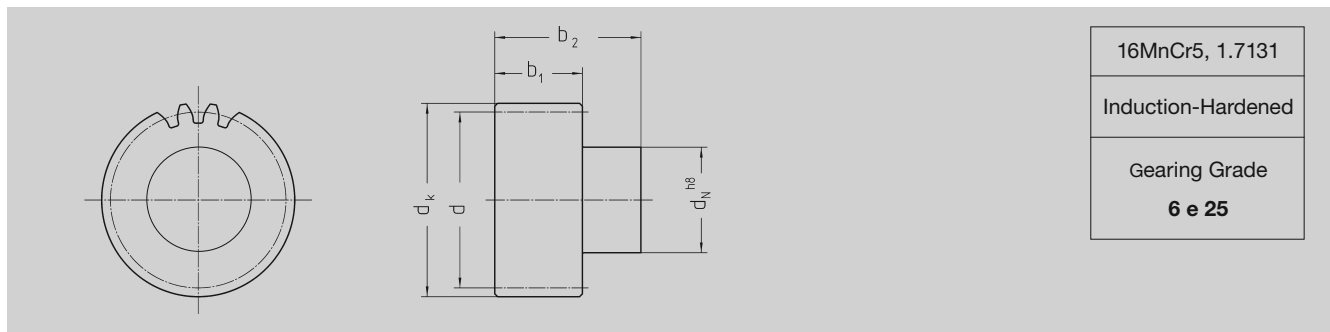
Order Code	Fig.	N° of Teeth z	d	d _k	d ₁ ^{H6}	d _N	b ₁	b ₂	u	t	kg	Shrink-Disk on Page GH-1
Module 5												
24 56 421		21	105	115	45	68	50	85.0	14	48.8	3.7	80 80 068
24 57 421		21	105	115	55	80	50	90.0	16	59.3	3.7	80 87 080
24 56 425		25	125	135	45	68	50	85.0	14	48.8	5.2	80 80 068
24 57 425		25	125	135	55	80	50	90.0	16	59.3	5.1	80 87 080
24 58 425		25	125	135	75	110	50	110.0	20	80.4	4.7	80 80 110
Module 6												
24 67 421		21	126	138	55	80	60	100.0	16	59.3	5.6	80 87 080
24 68 421		21	126	138	75	110	60	120.0	20	79.9	4.7	80 80 110
24 67 425		25	150	162	55	80	60	100.0	16	59.3	8.0	80 87 080
24 68 425		25	150	162	75	110	60	120.0	20	79.9	7.1	80 80 110
Module 8												
24 88 420*		20	160	176	75	110	80	140	20	79.9	12.0	80 80 110
24 89 420*		20	160	176	85	125	80	145	22	90.4	12.1	80 80 125
Module 10												
24 09 620*		20	200	220	85	125	100	165	22	90.4	23	80 80 125

* Gearing quality 5 f 23





Straight Tooth System, 20° Pressure Angle, without Bore



Order Code	Module	N° of Teeth	d	d _k	d _N	b ₁	b ₂	kg	Shrink-Disk on Page GH-1
24 98 218	2	18	36	40	30	28	56	0.3	80 83 030
24 98 220	2	20	40	44	30	28	56	0.4	80 83 030
24 98 222	2	22	44	48	36	28	56	0.5	80 84 036
24 98 225	2	25	50	54	44	28	60	0.7	80 80 044
24 98 228	2	28	56	60	50	28	60	0.9	80 85 050
24 98 230	2	30	60	64	50	28	60	1.0	80 85 050
24 98 232	2	32	64	68	55	28	65	1.3	80 80 055
24 98 236	2	36	72	76	62	28	65	1.6	80 86 062
24 98 240	2	40	80	84	68	28	65	2.0	80 80 068
24 98 318	3	18	54	60	44	28	60	0.8	80 80 044
24 98 320	3	20	60	66	50	28	60	1.0	80 85 050
24 98 322	3	22	66	72	55	28	65	1.3	80 80 055
24 98 325	3	25	75	81	62	28	65	1.7	80 86 062
24 98 328	3	28	84	90	68	28	65	2.1	80 80 068
24 98 330	3	30	90	96	68	28	65	2.2	80 80 068
24 98 332	3	32	96	102	68	28	65	2.4	80 80 068
24 98 336	3	36	108	114	68	28	65	2.8	80 80 068
24 98 340	3	40	120	126	68	28	65	3.3	80 80 068
24 98 418	4	18	72	80	55	40	77	1.7	80 80 055
24 98 420	4	20	80	88	62	40	77	2.2	80 86 062
24 98 422	4	22	88	96	68	40	77	2.7	80 80 068
24 98 425	4	25	100	108	80	40	80	3.7	80 87 080
24 98 428	4	28	112	120	80	40	80	4.4	80 87 080
24 98 430	4	30	120	128	80	40	80	4.6	80 87 080
24 98 432	4	32	128	136	110	40	100	7.9	80 80 110
24 98 436	4	36	144	152	110	40	100	8.9	80 80 110
24 98 440	4	40	160	168	110	40	100	9.9	80 80 110
24 98 521	5	21	105	115	80	50	90	4.9	80 87 080
24 98 522	5	22	110	120	80	50	90	5.0	80 87 080
24 98 525	5	25	125	135	110	50	110	9.0	80 80 110
24 98 528	5	28	140	150	110	50	110	10.2	80 80 110
24 98 530	5	30	150	160	110	50	110	10.9	80 80 110
24 98 621	6	21	126	138	110	60	120	5.9	80 80 110
24 98 625	6	25	150	162	110	60	120	8.9	80 80 110

The pinion could be fixed at d_k or d_n to be reworked (see page ZF-10).

Maximum bore diameter of the pinion on request.





Straight Tooth System, prebored

Fig. 1

Fig. 2

Soft

C45,
1.0503

Gearing Grade

8 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 10 012	1	12	12.0	14.0	6	9	–	–	0.01
21 10 013	1	13	13.0	15.0	6	9	–	–	0.01
21 10 014	1	14	14.0	16.0	6	11	–	–	0.02
21 10 015	1	15	15.0	17.0	6	12	–	–	0.02
21 10 016	1	16	16.0	18.0	6	12	–	–	0.03
21 10 017	1	17	17.0	19.0	6	14	–	–	0.03
21 10 018	1	18	18.0	20.0	6	15	–	–	0.04
21 10 019	1	19	19.0	21.0	6	15	–	–	0.04
21 10 020	1	20	20.0	22.0	6	16	–	–	0.05
21 10 021	1	21	21.0	23.0	6	16	–	–	0.05
21 10 022	1	22	22.0	24.0	6	18	–	–	0.06
21 10 023	1	23	23.0	25.0	6	18	–	–	0.06
21 10 024	1	24	24.0	26.0	9	20	–	–	0.07
21 10 025	1	25	25.0	27.0	9	20	–	–	0.07
21 10 030	1	30	30.0	32.0	9	20	–	–	0.10
21 10 035	1	35	35.0	37.0	9	25	–	–	0.14
21 10 038	1	38	38.0	40.0	9	25	–	–	0.17
21 10 040	1	40	40.0	42.0	9	25	–	–	0.18
21 10 045	1	45	45.0	47.0	9	30	–	–	0.25
21 10 048	1	48	48.0	50.0	9	30	–	–	0.26
21 10 050	1	50	50.0	52.0	9	30	–	–	0.28
21 10 057	1	57	57.0	59.0	9	40	–	–	0.37
21 10 060	1	60	60.0	62.0	9	40	–	–	0.40
23 10 076	2	76	76.0	78.0	10	–	–	–	0.55
23 10 080	2	80	80.0	82.0	10	–	–	–	0.60
23 10 095	2	95	95.0	97.0	10	–	–	–	0.85
23 10 100	2	100	100.0	102.0	10	–	–	–	0.95
23 10 114	2	114	114.0	116.0	10	–	–	–	1.20

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.





Straight Tooth System, prebored

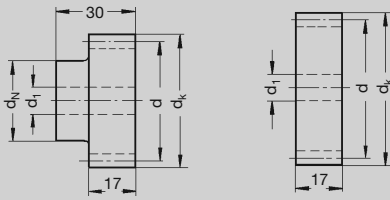


Fig. 1

Fig. 2

Soft
C45, 1.0503
Gearing Grade
8 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 15 012	1	12	18.0	21.0	6	14	–	–	0.03
21 15 013	1	13	19.5	22.5	6	14	–	–	0.03
21 15 014	1	14	21.0	24.0	6	16	–	–	0.04
21 15 015	1	15	22.5	25.5	6	18	–	–	0.05
21 15 016	1	16	24.0	27.0	6	18	–	–	0.07
21 15 017	1	17	25.5	28.5	9	20	–	–	0.08
21 15 018	1	18	27.0	30.0	9	20	–	–	0.09
21 15 019	1	19	28.5	31.5	9	20	–	–	0.10
21 15 020	1	20	30.0	33.0	9	25	–	–	0.13
21 15 021	1	21	31.5	34.5	9	25	–	–	0.14
21 15 022	1	22	33.0	36.0	9	25	–	–	0.15
21 15 023	1	23	34.5	37.5	9	25	–	–	0.16
21 15 024	1	24	36.0	39.0	9	25	–	–	0.17
21 15 025	1	25	37.5	40.5	9	25	–	–	0.18
21 15 030	1	30	45.0	48.0	9	30	–	–	0.23
21 15 035	1	35	52.5	55.5	9	40	–	–	0.40
21 15 038	1	38	57.0	60.0	9	40	–	–	0.40
21 15 040	1	40	60.0	63.0	9	40	–	–	0.46
21 15 045	1	45	67.5	70.5	12	50	–	–	0.61
21 15 048	1	48	72.0	75.0	12	50	–	–	0.70
21 15 050	1	50	75.0	78.0	12	50	–	–	0.75
21 15 057	1	57	85.5	88.5	12	60	–	–	1.00
21 15 060	1	60	90.0	93.0	12	60	–	–	1.16
23 15 076	2	76	114.0	117.0	16	–	–	–	1.40
23 15 080	2	80	120.0	123.0	16	–	–	–	1.50
23 15 595	2	95	142.5	145.5	20	–	–	–	2.10

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.





Straight Tooth System, prebored

Fig. 1

Fig. 2

Soft

C45,
1.0503

Gearing Grade

8 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 20 012	1	12	24.0	28.0	9	18.0	-	-	0.07
21 20 013	1	13	26.0	30.0	9	19.0	-	-	0.12
21 20 014	1	14	28.0	32.0	9	19.0	-	-	0.14
21 20 015	1	15	30.0	34.0	9	24.5	-	-	0.15
21 20 016	1	16	32.0	36.0	9	25.0	-	-	0.17
21 20 017	1	17	34.0	38.0	9	25.0	-	-	0.18
21 20 018	1	18	36.0	40.0	9	25.0	-	-	0.19
21 20 019	1	19	38.0	42.0	9	25.0	-	-	0.20
21 20 020	1	20	40.0	44.0	9	30.0	-	-	0.22
21 20 021	1	21	42.0	46.0	9	30.0	-	-	0.26
21 20 022	1	22	44.0	48.0	9	30.0	-	-	0.27
21 20 023	1	23	46.0	50.0	9	30.0	-	-	0.28
21 20 024	1	24	48.0	52.0	12	35.0	-	-	0.36
21 20 025	1	25	50.0	54.0	12	35.0	-	-	0.39
21 20 028	1	28	56.0	60.0	12	40.0	-	-	0.45
21 20 030	1	30	60.0	64.0	12	40.0	-	-	0.50
21 20 032	1	32	64.0	68.0	12	40.0	-	-	0.60
21 20 035	1	35	70.0	74.0	12	50.0	-	-	0.67
21 20 036	1	36	72.0	76.0	12	50.0	-	-	0.85
21 20 038	1	38	76.0	80.0	12	50.0	-	-	0.90
21 20 040	1	40	80.0	84.0	12	50.0	-	-	0.95
21 20 045	1	45	90.0	94.0	12	60.0	-	-	1.25
21 20 048	1	48	96.0	100.0	15	70.0	-	-	1.50
21 20 050	1	50	100.0	104.0	15	70.0	-	-	1.60
21 20 056	1	56	112.0	116.0	15	70.0	-	-	1.90
21 20 057	1	57	114.0	118.0	15	70.0	-	-	2.00
21 20 060	1	60	120.0	124.0	15	70.0	-	-	2.40
23 20 576	2	76	152.0	156.0	20	-	-	-	2.80
23 20 580	2	80	160.0	164.0	20	-	-	-	3.10
23 20 595	2	95	190.0	194.0	20	-	-	-	4.40

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.



Straight Tooth System, prebored

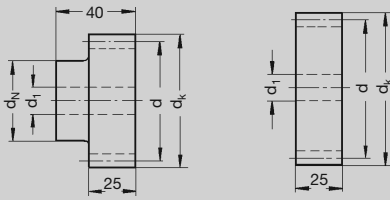


Fig. 1

Fig. 2

Soft
C45, 1.0503
Gearing Grade
8 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 25 012	1	12	30.0	35.0	9	20.0	–	–	0.16
21 25 013	1	13	32.5	37.5	9	20.0	–	–	0.18
21 25 014	1	14	35.0	40.0	9	25.0	–	–	0.22
21 25 015	1	15	37.5	42.5	9	25.0	–	–	0.25
21 25 016	1	16	40.0	45.0	9	30.0	–	–	0.31
21 25 017	1	17	42.5	47.5	9	30.0	–	–	0.35
21 25 018	1	18	45.0	50.0	9	35.0	–	–	0.41
21 25 019	1	19	47.5	52.5	12	35.0	–	–	0.43
21 25 020	1	20	50.0	55.0	12	35.0	–	–	0.47
21 25 021	1	21	52.5	57.5	12	35.0	–	–	0.50
21 25 022	1	22	55.0	60.0	12	40.0	–	–	0.53
21 25 023	1	23	57.5	62.5	12	40.0	–	–	0.62
21 25 024	1	24	60.0	65.0	12	40.0	–	–	0.66
21 25 025	1	25	62.5	67.5	12	45.0	–	–	0.75
21 25 030	1	30	75.0	80.0	12	50.0	–	–	0.97
21 25 035	1	35	87.5	92.5	12	60.0	–	–	1.49
21 25 038	1	38	95.0	100.0	12	60.0	–	–	1.72
21 25 040	1	40	100.0	105.0	12	70.0	–	–	1.84
21 25 045	1	45	112.5	117.5	15	70.0	–	–	2.36
21 25 048	1	48	120.0	125.0	15	80.0	–	–	2.75
21 25 050	1	50	125.0	130.0	15	80.0	–	–	2.94
21 25 057	1	57	142.5	147.5	15	90.0	–	–	3.67
21 25 060	1	60	150.0	155.0	15	90.0	–	–	4.00
23 25 580	2	80	200.0	205.0	25	–	–	–	6.10

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.





Straight Tooth System, prebored

Fig. 1

Fig. 2

Soft

C45,
1.0503

Gearing Grade

8 e 25

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 30 012	1	12	36	42	14	25	–	–	0.25
21 30 013	1	13	39	45	14	25	–	–	0.30
21 30 014	1	14	42	48	14	25	–	–	0.34
21 30 015	1	15	45	51	14	35	–	–	0.41
21 30 016	1	16	48	54	14	35	–	–	0.51
21 30 017	1	17	51	57	14	42	–	–	0.67
21 30 018	1	18	54	60	14	45	–	–	0.70
21 30 019	1	19	57	63	14	45	–	–	0.75
21 30 020	1	20	60	66	14	45	–	–	0.82
21 30 021	1	21	63	69	14	45	–	–	0.89
21 30 022	1	22	66	72	14	50	–	–	1.05
21 30 023	1	23	69	75	14	50	–	–	1.10
21 30 024	1	24	72	78	14	50	–	–	1.20
21 30 025	1	25	75	81	14	60	–	–	1.35
21 30 027	1	27	81	87	14	60	–	–	1.60
21 30 028	1	28	84	90	14	60	–	–	1.70
21 30 030	1	30	90	96	14	60	–	–	1.80
21 30 032	1	32	96	102	14	60	–	–	2.00
21 30 035	1	35	105	111	14	80	–	–	2.70
21 30 036	1	36	108	114	14	80	–	–	2.80
21 30 038	1	38	114	120	14	80	–	–	3.00
21 30 040	1	40	120	126	14	80	–	–	3.30
23 30 545	2	45	135	141	20	–	–	–	3.30
23 30 548	2	48	144	150	20	–	–	–	3.80
23 30 550	2	50	150	156	25	–	–	–	4.10
23 30 552	2	52	156	162	25	–	–	–	4.50
23 30 556	2	56	168	174	25	–	–	–	5.20
23 30 560	2	60	180	186	25	–	–	–	6.00
23 30 576	2	76	228	234	25	–	–	–	9.60
23 30 595	2	95	285	291	25	–	–	–	15.00

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.





Straight Tooth System, prebored

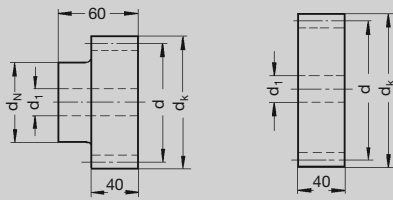


Fig. 1

Fig. 2

Soft
C45, 1.0503
Gearing Grade
8 e 25

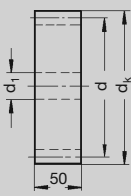
Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 40 012	1	12	48	56	16	35	–	–	0.58
21 40 013	1	13	52	60	16	35	–	–	0.72
21 40 014	1	14	56	64	16	45	–	–	0.90
21 40 015	1	15	60	68	16	45	–	–	1.00
21 40 016	1	16	64	72	16	45	–	–	1.10
21 40 017	1	17	68	76	16	50	–	–	1.30
21 40 018	1	18	72	80	16	50	–	–	1.40
21 40 019	1	19	76	84	16	60	–	–	1.70
21 40 020	1	20	80	88	16	60	–	–	1.80
21 40 021	1	21	84	92	16	70	–	–	2.20
21 40 022	1	22	88	96	16	70	–	–	2.50
21 40 023	1	23	92	100	16	75	–	–	2.60
21 40 024	1	24	96	104	16	75	–	–	2.75
21 40 025	1	25	100	108	16	75	–	–	2.90
21 40 030	1	30	120	128	16	75	–	–	4.00
23 40 538	2	38	152	160	25	–	–	–	5.70
23 40 540	2	40	160	168	25	–	–	–	6.30
23 40 545	2	45	180	188	25	–	–	–	8.00
23 40 550	2	50	200	208	25	–	–	–	9.80
23 40 556	2	56	224	232	25	–	–	–	12.30
23 40 560	2	60	240	248	25	–	–	–	14.20
23 40 580	2	80	320	328	25	–	–	–	25.20
23 40 595	2	95	380	388	25	–	–	–	35.60

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.





Straight Tooth System, prebored

Soft

C45,
1.0503

Gearing Grade

8 e 25

Fig. 1

Fig. 2

Order Code	Fig.	N° of Teeth z	d	d _k	d ₁	d _N	d ₃	s	kg
21 50 012	1	12	60	70	20	45	–	–	1.20
21 50 013	1	13	65	75	20	45	–	–	1.38
21 50 014	1	14	70	80	20	55	–	–	1.78
21 50 015	1	15	75	85	20	60	–	–	2.00
21 50 016	1	16	80	90	20	60	–	–	2.10
21 50 017	1	17	85	95	20	70	–	–	2.20
21 50 018	1	18	90	100	20	70	–	–	2.58
21 50 019	1	19	95	105	20	70	–	–	2.80
21 50 020	1	20	100	110	20	70	–	–	3.10
21 50 021	1	21	105	115	20	70	–	–	3.80
21 50 022	1	22	110	120	20	80	–	–	4.30
21 50 023	1	23	115	125	20	80	–	–	4.70
21 50 024	1	24	120	130	20	80	–	–	5.00
21 50 025	1	25	125	135	20	80	–	–	5.40
21 50 030	1	30	150	160	20	90	–	–	7.70
23 50 536	2	36	180	190	30	–	–	–	9.90
23 50 540	2	40	200	210	30	–	–	–	12.30
23 50 550	2	50	250	260	30	–	–	–	19.20
23 50 595	2	95	475	485	30	–	–	–	69.50

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.





Module 6, Straight Tooth System, prebored

Fig. 1

Fig. 2

Soft

C45,
1.0503

Gearing Grade

8 e 25

Order Code	Fig.	N° of Teeth z	d	dk	d ₁	d _N	d ₃	s	kg
21 60 015	1	15	90	102	20	60	–	–	3.20
21 60 019	1	19	114	126	20	80	–	–	5.40
21 60 020	1	20	120	132	20	90	–	–	6.00
21 60 021	1	21	126	138	20	90	–	–	6.70
21 60 022	1	22	132	144	20	100	–	–	7.40
21 60 025	1	25	150	162	20	110	–	–	9.60
23 60 530	2	30	180	192	30	–	–	–	11.90
23 60 536	2	36	216	228	30	–	–	–	17.20

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.

Module 8, 10 and 12, Straight Tooth System, prebored

Fig. 1

Fig. 2

Fig. 3

Soft

C45,
1.0503

Gearing Grade

8 e 25

Order Code	Fig.	N° of Teeth z	d	dk	d ₁	d _N	d ₃	s	kg
Module 8									
21 80 015	1	15	120	136	40	90	–	–	7.70
21 80 018	1	18	144	160	40	100	–	–	9.90
21 80 020	1	20	160	176	40	120	–	–	14.80
21 80 024	1	24	192	208	40	150	–	–	22.00
21 80 025	1	25	200	216	40	150	–	–	23.80
21 80 030	1	30	240	256	40	190	–	–	32.00
Module 10*									
21 11 020	2	20	200	220	40	150	–	–	35.00
Module 12*									
21 12 020	3	20	240	264	40	170	–	–	51.33

* with threads for handling

Further finishing (turning bores, keywaying, threading, etc.) is possible within short time.

