

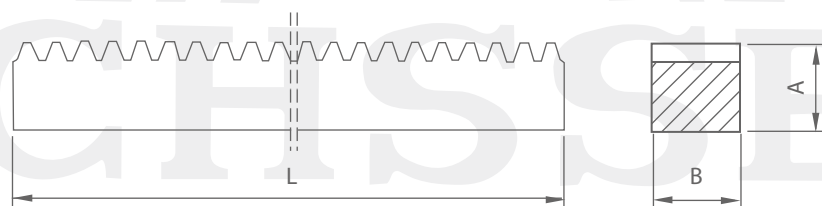
# Gears & Racks



### Special Note

The racks produced by CHSSB are of the following characters of high precision:

- In the whole length of 2000mm, unstraight degree is within 0.20mm, no matter the measurement is taken at any place of the rack.
- Unverticality of each vertical plane of the rack is less than 0.20mm.
- Smooth finish of each side is 0.8 and over.
- Error added up to circumferential pitch of any teeth is less than 0.20mm.



$a=20^\circ$

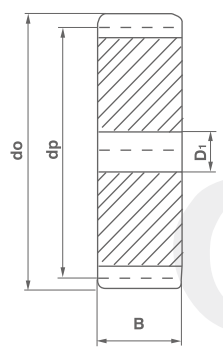
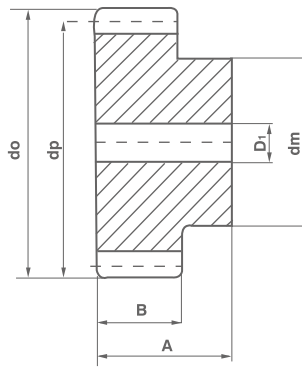
C45

Mod	L=250	L=500	L=1000	L=2000
	AXB	AXB	AXB	AXB
1	*15X15	15X15	15X15	15X15
1.5	*17X17	17X17	17X17	17X17
2	*20X20	20X20	20X20	20X20
2.5	*25X25	25X25	25X25	25X25
3	*30X30	30X30	30X30	30X30
4	-	-	*22X22	*22X22
4	-	-	25X25	25X25
4	-	*30X30	30X30	30X30
4	*40X40	40X40	40X40	40X40
5	*50X50	50X50	50X50	50X50
6	-	*60X60	60X60	60X60
8	-	-	*80X80	*80X80

# Gears & Racks

Z	Mod.1				Mod.1,5				Mod.2				Mod.2,5			
	de	dp	dm	D1	de	dp	dm	D1	de	dp	dm	D1	de	dp	dm	D1
12	14	12	9	6	21.0	18.0	14	8	28	24	18	10	35.0	30.0	22	10
13	15	13	10	6	22.5	19.5	15	8	30	26	20	10	37.5	32.5	25	10
14	16	14	11	6	24.0	21.0	17	8	32	28	22	10	40.0	35.0	28	10
15	17	15	12	6	25.5	22.5	18	8	34	30	24	10	42.5	37.5	30	10
16	18	16	13	6	27.0	24.0	19	8	36	32	25	10	45.0	40.0	32	12
17	19	17	14	6	28.5	25.5	20	8	38	34	25	10	47.5	42.5	35	12
18	20	18	15	8	30.0	27.0	20	8	40	36	25	10	50.0	45.0	35	12
19	21	19	15	8	31.5	28.5	20	8	42	38	25	10	52.5	47.5	35	12
20	22	20	16	8	33.0	30.0	25	8	44	40	30	10	55.0	50.0	40	12
21	23	21	16	8	34.5	31.5	25	10	46	42	30	12	57.5	52.5	40	14
22	24	22	16	8	36.0	33.0	25	10	48	44	30	12	60.0	55.0	45	14
23	25	23	18	8	37.5	34.5	25	10	50	46	30	12	62.5	57.5	45	14
24	26	24	20	10	39.0	36.0	25	10	52	48	35	12	65.0	60.0	45	14
25	27	25	20	10	40.5	37.5	25	10	54	50	35	12	67.5	62.5	50	14
26	28	26	20	10	42.0	39.0	30	12	56	52	40	12	70.0	65.0	50	14
27	29	27	20	10	43.5	40.5	30	12	58	54	40	12	72.5	67.5	50	14
28	30	28	20	10	45.0	42.0	30	12	60	56	40	12	75.0	70.0	50	14
29	31	29	20	10	46.5	43.5	30	12	62	58	40	14	77.5	72.5	50	14
30	32	30	20	10	48.0	45.0	30	12	64	60	40	14	80.0	75.0	55	14
31	33	31	25	10	49.5	46.5	35	12	66	62	45	14	82.5	77.5	55	16
32	34	32	25	10	51.0	48.0	35	12	68	64	45	14	85.0	80.0	55	16
33	35	33	25	10	52.5	49.5	35	12	70	66	45	14	87.5	82.5	55	16
34	36	34	25	10	54.0	51.0	35	12	72	68	45	14	90.0	85.0	55	16
35	37	35	25	10	55.5	52.5	35	12	74	70	45	14	92.5	87.5	60	16
36	38	36	25	10	57.0	54.0	35	12	76	72	45	14	95.0	90.0	60	16
37	39	37	25	10	58.5	55.5	40	12	78	74	50	14	97.5	92.5	60	16
38	40	38	25	10	60.0	57.0	40	12	80	76	50	14	100.0	95.0	60	16
39	41	39	25	10	61.5	58.5	40	12	82	78	50	14	102.5	97.5	60	16
40	42	40	25	10	63.0	60.0	40	12	84	80	50	14	105.0	100.0	70	16
41	43	41	30	10	64.5	61.5	40	12	86	82	55	16	107.5	102.5	70	16
42	44	42	30	10	66.0	63.0	50	12	88	84	55	16	110.0	105.0	70	16
43	45	43	30	10	67.5	64.5	50	12	90	86	55	16	112.5	107.5	70	16
44	46	44	30	10	69.0	66.0	50	12	92	88	60	16	115.0	110.0	70	16
45	47	45	30	10	70.5	67.5	50	12	94	90	60	16	117.5	112.5	70	16
46	48	46	30	10	72.0	69.0	50	14	96	92	60	16	120.0	115.0	70	20
47	49	47	30	10	73.5	70.5	50	14	98	94	70	16	122.5	117.5	80	20
48	50	48	30	10	75.0	72.0	50	14	100	96	70	16	125.0	120.0	80	20
49	51	49	30	10	76.5	73.5	50	14	102	98	70	16	127.5	122.5	80	20
50	52	50	30	12	78.0	75.0	50	14	104	100	70	16	130.0	125.0	80	20
51	53	51	40	12	79.5	76.5	60	14	106	102	70	16	132.5	127.5	80	20
52	54	52	40	12	81.0	78.0	60	14	108	104	70	16	135.0	130.0	90	20
53	55	53	40	12	82.5	79.5	60	14	110	106	70	16	137.5	132.5	90	20
54	56	54	40	12	84.0	81.0	60	14	112	108	70	16	140.0	135.0	90	20
55	57	55	40	12	85.5	82.5	60	14	114	110	70	16	142.5	137.5	90	20
56	58	56	40	12	87.0	84.0	60	16	116	112	70	16	145.0	140.0	100	20
57	59	57	40	12	88.5	85.5	60	16	118	114	70	16	147.5	142.5	100	20
58	60	58	40	12	90.0	87.0	60	16	120	116	70	16	150.0	145.0	100	20
59	61	59	40	12	91.5	88.5	60	16	122	118	70	16	152.5	147.5	100	20
60	62	60	40	12	93.0	90.0	60	16	124	120	70	16	155.0	150.0	100	20
61	63	61	50	12	94.5	91.5	70	16	126	122	80	16				
62	64	62	50	12	96.0	93.0	70	16	128	124	80	16				
63	65	63	50	12	97.5	94.5	70	16	130	126	80	16				
64	66	64	50	12	99.0	96.0	70	16	132	128	80	16				
65	67	65	50	12	100.5	97.5	70	16	134	130	80	16	167.5	162.5		20
66	68	66	50	12	102.0	99.0	70	16	136	132	80	16				
67	69	67	50	12	103.5	100.5	70	16	138	134	80	16				
68	70	68	50	12	105.0	102.0	70	16	140	136	80	16				
69	71	69	50	12	106.5	103.5	70	16	142	138	80	16				
70	72	70	50	12	108.0	105.0	70	16	144	140	80	16	180.0	175.0		20
72	74	72		12	111.0	108.0		16	148	144		16	185.0	180.0		20
75	77	75		12	115.5	112.5		16	154	150		20	192.5	187.5		20
76	78	76		12	117.0	114.0		16	156	152		20	195.0	190.0		20
80	82	80		12	123.0	120.0		16	164	160		20	205.0	200.0		25
85	87	85		12	130.5	127.5		16	174	170		20	217.5	212.5		25
90	92	90		12	138.0	135.0		16	184	180		20	230.0	225.0		25

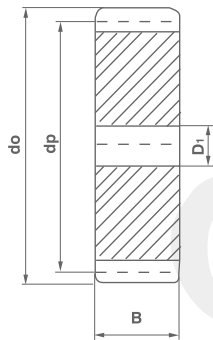
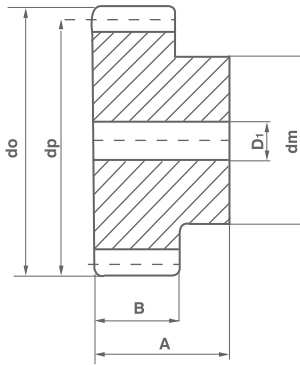
Standard Spur Gear  
Pressure Angle 20°



- Tooth Width «B»  
 Modulo 1 =15mm.  
 Modulo 1.5 =17mm.  
 Modulo 2 =20mm.  
 Modulo 2.5 =25mm.  
 Modulo 3 =30mm.  
 Modulo 4 =40mm.  
 Modulo 5 =50mm.  
 Modulo 6 =60mm.  
 Total Thickness «A»  
 Modulo 1 =25mm.  
 Modulo 1.5 =30mm.  
 Modulo 2 =35mm.  
 Modulo 2.5 =45mm.  
 Modulo 3 =50mm.  
 Modulo 4 =60mm.  
 Modulo 5 =75mm.  
 Modulo 6 =80mm.

# Gears & Racks

Standard Spur Gear  
Pressure Angle 20°



**Tooth Width «B»**

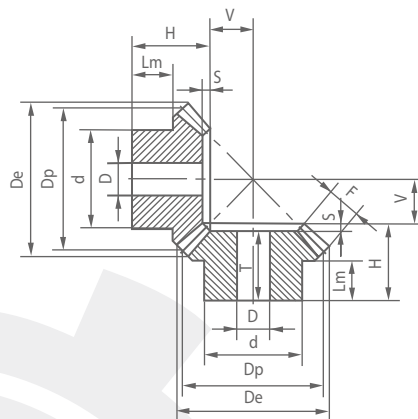
- Modulo 1 =15mm.
  - Modulo 1.5 =17mm.
  - Modulo 2 =20mm.
  - Modulo 2.5 =25mm.
  - Modulo 3 =30mm.
  - Modulo 4 =40mm.
  - Modulo 5 =50mm.
  - Modulo 6 =60mm.
- Total Thickness «A»**
- Modulo 1 =25mm.
  - Modulo 1.5 =30mm.
  - Modulo 2 =35mm.
  - Modulo 2.5 =45mm.
  - Modulo 3 =50mm.
  - Modulo 4 =60mm.
  - Modulo 5 =75mm.
  - Modulo 6 =80mm.

Z	Mod.3				Mod.4				Mod.5				Mod.6			
	de	dp	dm	D1	de	dp	dm	D1	de	dp	dm	D1	de	dp	dm	D1
12	42	36	27	12	56	48	35	14	70	60	45	20	84	72	54	20
13	45	39	30	12	60	52	40	14	75	65	50	20	90	78	60	20
14	48	42	33	12	64	56	45	14	80	70	55	20				
15	51	45	35	12	68	60	45	14	85	75	60	20	102	90	70	20
16	54	48	38	14	72	64	50	16	90	80	65	20	108	96	75	20
17	57	51	42	14	76	68	50	16	95	85	70	20				
18	60	54	45	14	80	72	50	16	100	90	70	20	120	108	80	20
19	63	57	45	14	84	76	60	16	105	95	70	20				
20	66	60	45	14	88	80	60	16	110	100	80	20	132	120	90	20
21	69	63	45	16	92	84	70	16	115	105	80	20				
22	72	66	50	16	96	88	70	16	120	110	80	20				
23	75	69	50	16	100	92	75	20	125	115	90	20				
24	78	72	50	16	104	96	75	20	130	120	90	20	156	144	110	25
25	81	75	60	16	108	100	75	20	135	125	90	20	162	150	110	25
26	84	78	60	16	112	104	75	20	140	130	100	20				
27	87	81	60	16	116	108	75	20	145	135	100	20				
28	90	84	60	16	120	112	75	20	150	140	100	25	180	168	-	25
29	93	87	60	16	124	116	75	20	155	145	110	25				
30	96	90	60	16	128	120	75	20	160	150	110	25	192	180	-	25
31	99	93	60	16	132	124	80	20								
32	102	96	70	16	136	128	80	20	170	160	-	25	204	192	-	25
33	105	99	70	16	140	132	80	20								
34	108	102	70	16	144	136	80	20								
35	111	105	70	16	148	140	80	20	185	175	-	25	222	210	-	25
36	114	108	70	20	152	144	80	25								
37	117	111	70	20												
38	120	114	80	20	160	152	-	25	200	190		25	240	220	-	25
39	123	117	80	20												
40	126	120	80	20	168	160	-	25	210	200		25	252	240	-	25
41	129	138	90	20												
42	132	126	80	20												
43	135	129	80	20												
44	138	132	90	20												
45	141	135	90	20	188	180	-	25	235	225	-	25				
46	144	138	90	20												
47	147	141	100	20												
48	150	144	100	20	200	192	-	25	250	240	-	25				
50	156	150	-	20	208	200	-	25	260	250	-	30				
52	162	156	-	20	216	208	-	25	270	260	-	30				
55	171	165	-	20	228	220	-	25	285	275	-	30				
57	177	171	-	20	236	228	-	25	295	285	-	30				
60	186	180	-	20	248	240	-	25	310	300	-	30				
65	201	195	-	20	268	260	-	25	335	325	-	30				
70	216	210	-	25	288	280	-	25	360	350	-	30				
72	222	216	-	25												
75	231	225	-	25	308	300	-	25	385	375	-	30				
76	234	228	-	25	312	304	-	30	390	380	-	30				
80	246	240	-	25	328	320	-	30	410	400	-	30				
85	261	255	-	25	348	340	-	30	435	425	-	30				
90	276	270	-	25	368	360	-	30	460	450	-	30				
95	291	285	-	25	388	380	-	30	485	475	-	30				
100	306	300	-	25	408	400	-	30	510	500	-	30				
110	336	330	-	25	448	440	-	30	560	550	-	30				
114	348	342	-	30	464	456	-	30	580	570	-	30				
120	366	360	-	30												
127	387	381	-	30												

# Bevel Gear

## Pairs With Usual Axes

Pressure angle 20°



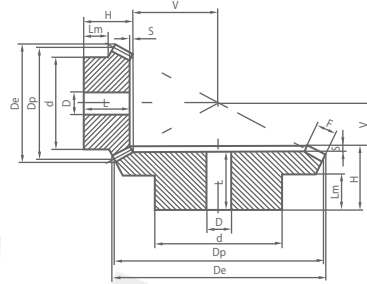
### Type - A

1:1

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
15	16	26.1	24.0	18.9	6	20.3	8	7.10		12	
	20	32.1	30.0	20	10	22	10	7.40	18	8.5	2
	25	39.6	37.5	23	10	28	10	11.09	21	12	2
	30	47.1	45.0	25	12	30	12	13.35	22.5	12	2.5
2	16	34.8	32.0	23.5	8	25.3	10	9.50		14	
	20	42.8	40.0	25	12	32	10	10.78	22	12	3
	25	52.8	50.0	28	14	40	12	14.28	25	12.3	3
	30	62.8	60.0	30	16	50	12	17.78	27	12.8	3
2.5	16	43.5	40.0	28.1	10	30.3	12	11.90		15	
	20	53.5	50.0	30.5	12	40	12	15.43	27	16	3.5
	25	66.0	62.5	33.5	15	50	15	19.48	30	16	3.5
	30	78.5	75.0	35.5	18	55	15	23.63	32	16	3.5
3	16	52.2	48.0	31.7	12	40.3	15	14.30		18	
	20	64.2	60.0	35	18	45	15	16.00	31	13.6	4
	25	79.2	75.0	38	20	55	15	22.00	34	16	4
	30	94.2	90.0	40	22	60	20	28.00	36	17	4
3.5	16	60.9	56.0	36.4	14	45.3	15	16.60		20	
	20	74.9	70.0	40.5	22	55	15	18.13	36	17	4.5
	25	92.4	87.5	43.5	26	65	20	23.97	39	18	4.5
	30	109.9	105.0	48	30	70	20	30.02	43.5	19	4.5
4	16	69.6	64.0	44.3	15	50.3	15	19.70		25	
	20	85.6	80.0	43	25	60	18	20.74	38	18	5
	25	105.6	100.0	45	28	70	20	28.50	40	18	5
	30	125.6	120.0	48	32	80	25	35.67	43	16	5
4.5	16	78.3	72.0	46.3	18	55.3	18	21.70		25	
	20	96.3	90.0	48	28	65	20	23.41	42	18	6
	25	118.8	112.5	50	32	75	20	31.76	44	18	6
	30	141.3	135.0	53	35	90	25	40.82	47	17	6
5	16	87.0	80.0	48.9	18	60.36	20	25.10		25	
	20	107.1	100.0	50.5	30	70	20	26.86	44	18.5	6.5
	25	132.1	125.0	53.5	34	90	20	36.36	47	18	6.5
	30	157.1	150.0	56.5	38	110	30	45.97	50	18	6.5

# Bevel Gear Pairs With Usual Axes

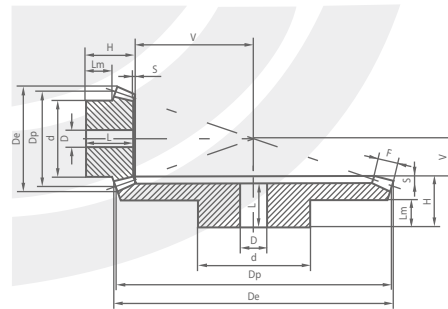
Pressure angle 20°



## Type - A

1:2

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	16	26.7	24	19.5	8	21	10	16.33	18	11.3	1.5
	32	49.3	48	20	8	32	12	7.45	17	10	3
2	16	35.6	32	23	10	26	10	22.41	21	12.2	2
	32	65.8	64	25	10	40	12	10.21	21	10	4
2.5	16	44.4	40	27.5	12	34	12	28.38	25	14.4	2.5
	32	82.2	80	26	12	50	15	14.10	20	10	5
3	16	53.4	48	28	15	40	15	33.64	25	11.6	3
	32	98.7	96	30	15	60	15	15.31	24	10	6
3.5	16	62.3	56	33.5	18	48	15	38.83	30	14.4	3.5
	32	115.1	112	31	18	70	20	17.77	24	10	7
4	16	71.1	64	36	20	50	20	44.81	32	13.4	4
	32	131.6	128	32	20	80	20	20.42	24	10	8
4.5	16	80.1	72	39.5	22	60	20	51	35	15.4	4.5
	32	148.0	144	36	22	90	25	23.21	27	10	9
5	16	88.9	80	50	25	60	20	56.06	45	21.1	5
	32	164.5	160	38	25	100	25	25.52	28	10	10



## Type - A

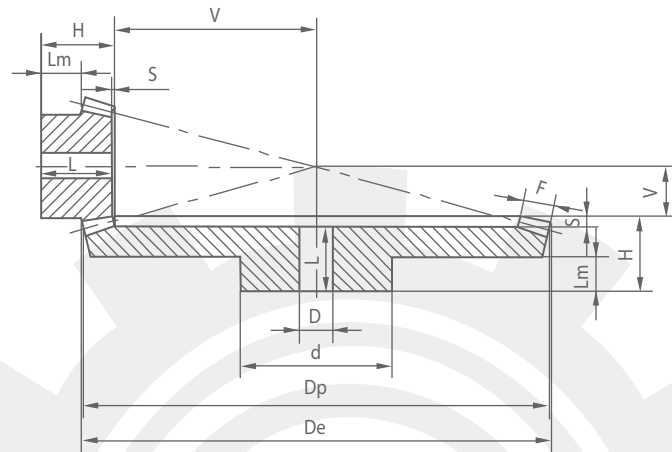
1:3

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	16	26.9	24	22	12	20	10	24.44	21	9.8	1
	48	72.9	72	20	12	50	15	7.27	17	10	3
2	16	35.8	32	28.5	15	26	12	33.26	27	12.7	1.5
	48	97.3	96	23	15	60	15	9.90	19	10	4
2.5	16	44.7	40	32	18	32	12	42.41	30	13	2
	48	121.6	120	26.6	18	70	20	13.23	21	10	5
3	16	53.7	48	32	18	40	15	54.25	30	12.1	2
	48	145.9	144	29	18	80	20	16.20	23	10	6
3.5	16	62.6	56	38	22	48	15	62.29	35.5	15	2.5
	48	170.2	168	31	22	90	20	18.48	24	10	7
4	16	71.6	64	41.5	25	55	20	71.23	38.5	15.2	3
	48	194.5	192	33	25	100	22	21.20	25	10	8
4.5	16	80.6	72	53	28	60	20	80.27	50	23.4	3
	48	218.6	216	49	28	100	25	23.93	40	18	9
5	16	89.5	80	60	35	60	20	85.61	57	22.5	3
	48	243.1	240	50	35	150	28	25.45	40	20	10

# Bevel Gear

## Pairs With Usual Axes

Pressure angle 20°



### Type - A

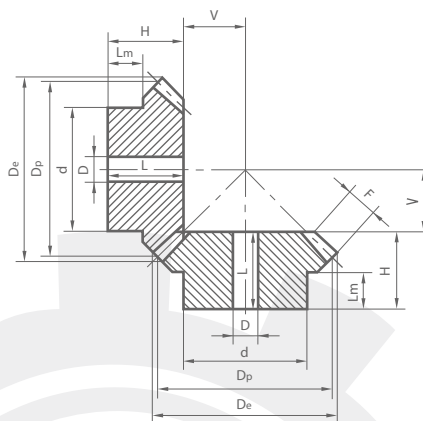
**1:4**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	16	26.9	24	25	12	18	10	36.02	24	12.2	1
	64	96.7	96	22.5	12	70	15	8.53	19	10	3
2	16	35.9	32	24	15	25	12	49.07	23	8.2	1
	64	129.0	128	25	15	80	20	11.79	20	10	4
2.5	16	44.9	40	30.5	18	30	15	61.99	29	11.2	1.5
	64	161.2	160	29	18	90	20	13.77	24	10	5
3	16	53.8	48	34	22	40	15	74.05	32	11	2
	64	193.5	192	30	22	100	20	16.41	24	10	6
3.5	16	62.8	56	45	25	48	15	87.13	43	19.1	2
	64	225.7	224	50	25	100	25	19.32	43	22	7
4	16	71.7	64	50	30	50	20	98.21	48	18.5	2
	64	257.9	256	50	30	120	28	21.72	42	20	8
4.5	16	80.7	72	53	32	55	20	112.08	50.5	19	2.5
	64	290.1	288	53	32	130	30	24.83	44	23	9
5	16	89.7	80	58	35	60	20	125.06	55.5	20.6	2.5
	64	322.4	320	58	35	150	30	27.65	48	25	2.5

# Bevel Gear

## Pairs With Usual Axes

Pressure angle 20°



### Type - B

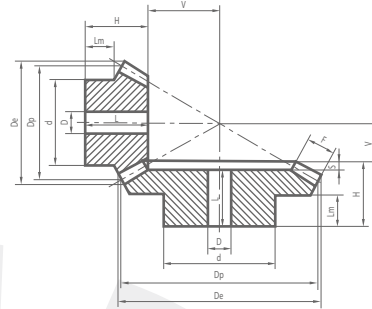
1:1

M	Z	De	Dp	H	F	d	D	V	Lm
1.5	16	26.1	24.0	18.9	6	20.3	8	7.10	12
	19	30.6	28.5	21.3	7	20.3	8	8.70	12
	22	35.1	33.0	22.5	7.5	25.3	8	10.50	12
	26	41.1	39.0	23.2	8.5	28.3	8	12.80	12
2	30	47.1	45.0	27.2	10	30.3	12	14.80	12
	16	34.8	32.0	23.5	8	25.3	8	9.50	14
	19	40.8	38.0	24.2	9	25.3	8	11.80	12
	22	46.8	44.0	27.9	10	30.3	12	14.10	14
2.5	26	54.8	52.0	31.4	12	35.3	12	16.60	14
	30	62.8	60.0	34.1	13	40.3	14	19.90	17
	16	43.5	40.0	28.1	10	30.3	12	11.90	15
	19	51.0	47.5	27.1	11	35.3	12	14.90	13
3	22	58.5	55.0	30.1	12	45.3	16	17.90	16
	26	68.5	65.0	33.2	15	45.3	16	20.80	16
	30	78.5	75.0	39	16	50.3	16	25.00	20
	16	52.5	48.0	31.7	12	40.3	12	14.30	18
3.5	19	61.2	57.0	36	13	40.3	14	18.00	17
	22	70.2	66.0	36.9	15	50.3	16	21.10	17
	26	82.2	78.0	38.4	17	50.3	16	25.60	18
	30	94.2	90.0	43.8	19	60.3	20	30.20	22
4	16	60.9	56.0	36.4	14	45.3	16	16.60	20
	19	71.5	66.54	37.8	15	50.3	18	21.00	19
	22	81.9	77.0	39.1	17	55.3	20	24.90	18
	26	96.0	91.0	43.35	20	62.3	20	29.70	20
4.5	30	110.0	105.0	47.1	23	70.3	20	34.90	22
	16	69.7	64.0	44.3	15	50.3	16	19.70	25
	19	81.7	76.0	44.4	18	55.3	20	23.60	22
	22	93.7	88.0	45.9	20	60.3	20	28.10	22
5	26	109.7	104.0	48	25	70.3	20	34.00	22
	30	125.7	120.0	54.2	26	80.3	25	39.80	25
	16	78.4	72.0	46.3	17.5	55.3	20	21.70	25
	19	91.8	85.5	49	20	62.3	20	26.57	25
5	22	105.3	99.0	50.1	22	70.3	20	31.90	25
	26	123.0	117.0	54.7	25	75.3	20	38.60	26
	30	141.4	135.0	60	29	80.3	25	45.00	28
	16	87.1	80.0	48.9	18	60.3	20	25.10	25
5	19	102.1	95.0	52.2	22	60.3	20	29.80	25
	22	117.1	110.0	58.2	24	80.3	25	35.80	30
	26	137.1	130.0	62.7	29	80.3	25	42.30	30
	30	157.1	150.0	68.9	32	80.3	30	50.10	35



# Bevel Gear Pairs With Usual Axes

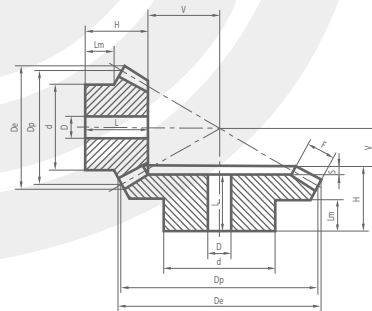
Pressure angle 20°



## Type - B

**1:1.5**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	16	27.1	24	20.3	8	20.3	8	10.7		11.8	
	24	37.2	36	24.9	8	28.3	8	7.1	22.7	16	2.2
2	16	36.2	32	25.2	10	25.3	8	14.8		13.8	
	24	49.7	48	27.2	10	32.3	8	9.8	24.7	16	2.5
2.5	16	45.2	40	30.8	13	32.3	12	18.2		16.4	
	24	62.1	60	34	13	45.3	16	12.0	30.8	20	3.2
3	16	54.3	48	32.4	14.5	40.3	12	22.6		16.4	
	24	74.5	72	36.2	14.5	55.3	16	14.8	32	20	4.2
3.5	16	63.3	56	40.4	18	45.3	16	25.6		20.4	
	24	86.9	84	44.2	18	55.3	20	16.8	40	25	4.2
4	16	72.4	64	46.8	18	50.3	16	31.2		25.4	
	24	99.3	96	45.5	18	60.3	20	20.5	40	25	5.5
4.5	16	81.4	72	47.6	20	60.3	20	35.4		25.1	
	24	111.7	108	57.8	20	80.3	25	23.2	51.3	35	6.5
5	16	90.5	80	54.1	24	60.3	25	37.9		25.4	
	24	124.1	120	61.1	24	80.3	30	24.9	54.5	35	6.6



## Type - B

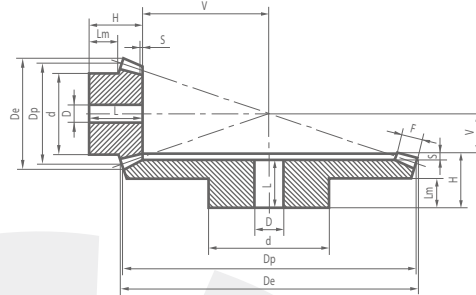
**1:2**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	15	26.1	22.5	21.1	9	19.3	8	13.9		11.9	
	30	45.9	45.0	25.2	9	32.3	8	6.8	23	16	2.2
2	15	34.8	30.0	26	11.5	25.3	8	19.0		14.1	
	30	61.2	60.0	29.8	11.5	40.3	14	9.2	26.8	18	3
2.5	15	43.5	37.5	31.8	15	32.3	12	23.2		16.2	
	30	76.5	75.0	33.7	15	45.3	16	11.3	30	20	3.7
3	15	52.2	45.0	37.3	17	40.3	12	28.7		19.9	
	30	91.8	90.0	42.1	17	55.3	16	13.9	38	25	4.1
3.5	15	60.9	52.5	46.1	20.5	45.3	16	32.9		24.7	
	30	107.1	105.0	45	20.5	60.3	20	16.0	40	25	5
4	15	69.6	60.0	48.6	22.5	50.3	20	38.4		24.6	
	30	122.3	120.0	57.3	22.5	80.3	25	18.7	51.9	35	5.4
4.5	15	78.3	67.5	51.4	26	60.3	20	42.6		24.7	
	30	137.6	135.0	60.3	26	80.3	30	20.7	54.3	35	6
5	15	87.0	75.0	57.6	30	60.3	25	46.4		25.3	
	30	152.9	150.0	62.5	30	80.3	30	22.5	56	35	6.5



# Bevel Gear Pairs With Usual Axes

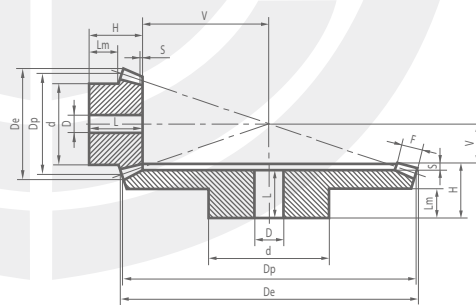
Pressure angle 20°



## Type - B

**1:2.5**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	16	27.9	24	24.2	11.5	20.3	8	18.8		12.3	
	40	60.7	60	27.8	11.5	40.3	14	7.2	25.5	18	2.3
2	16	37.2	32	29.6	15	25.3	8	25.4		13.7	
	40	80.9	80	32.4	15	45.3	16	9.6	29	20	3.4
2.5	16	46.4	40	38.4	19	32.3	12	31.6		18.5	
	40	101.1	100	39.8	19	55.3	16	12.2	35.9	25	3.9
3	16	55.7	48	41.9	21.5	40.3	16	39.1		19.6	
	40	121.4	120	47.9	21.5	60.3	20	15.1	44	30	3.9
3.5	16	65.0	56	49.1	22.6	45.3	20	47.9		25	
	40	141.6	140	54.6	22.6	80.3	25	18.4	50	35	4.6
4	16	74.3	64	52.5	26	55.3	20	54.5		25.3	
	40	161.8	160	57	26	80.3	30	21.0	50.5	35	6.5
4.5	16	83.6	72	56.3	30	60.3	25	60.7		24.6	
	40	182.1	180	59.7	30	80.3	30	23.3	53	35	6.7
5	16	92.9	80	65.4	32	60.3	25	68.6		30.1	
	40	202.3	200	65.7	32	90.3	30	26.3	58.3	40	7.4



## Type - B

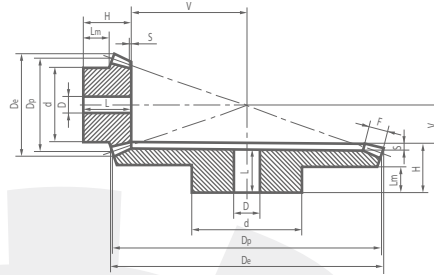
**1:3**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	15	26.5	22.5	22.6	10.5	19.3	8	23.4		11.7	
	45	68.1	67.5	29.6	10.5	45.3	14	7.4	27.2	20	2.4
2	15	35.4	30	28.9	14	25.3	8	31.1		14.2	
	45	90.8	90	32.1	14	45.3	16	9.9	28.4	20	3.7
2.5	15	44.1	37.5	34.6	18	32.3	12	38.4		15.9	
	45	113.4	112.5	39.7	18	60.3	20	12.3	35.3	25	4.4
3	15	53.0	45	41.3	21	40.3	16	46.7		19.7	
	45	136.1	135	47.2	21	60.3	25	14.8	42	30	5.2
3.5	15	61.9	52.5	49.6	23.5	45.3	20	55.4		25	
	45	158.8	157.5	54.4	23.5	80.3	25	17.6	48.6	35	5.8
4	15	70.7	60	54.3	27.5	50.3	20	62.7		25.4	
	45	181.5	180	57	27.5	80.3	30	20.0	50.5	35	6.5
4.5	15	79.5	67.5	55.2	28.5	55.3	25	72.8		24.8	
	45	204.2	202.5	63.9	28.5	90.3	30	23.1	57	40	6.9
5	15	88.4	75	65.3	33	60.3	25	79.7		30	
	45	226.9	225	66.7	33	90.3	30	25.3	59.2	40	7.5

# Bevel Gear

## Pairs With Usual Axes

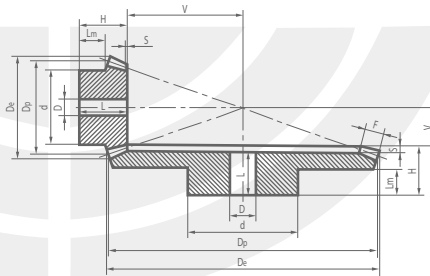
Pressure angle 20°



### Type - B

**1:3.5**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	16	28.1	24	24	12	20.3	8	30.0		11.5	
	56	84.5	84	34.8	12	45.3	14	8.2	32	25	2.8
2	16	37.5	32	30.9	16	25.3	8	40.1		14.1	
	56	112.6	12	37.1	16	55.3	16	10.9	33.3	25	3.8
2.5	16	46.8	40	38.9	20	32.3	14	50.1		17.9	
	56	140.8	140	44.4	20	60.3	20	13.6	40	30	4.4
3	16	56.2	48	49.9	24	40.3	16	60.1		24.9	
	56	169.0	168	52.7	24	80.3	25	16.3	47.5	35	5.2
3.5	16	65.6	56	52	25	45.3	20	73.0		25.5	
	56	197.1	196	55.1	25	80.3	25	19.9	49.1	35	6



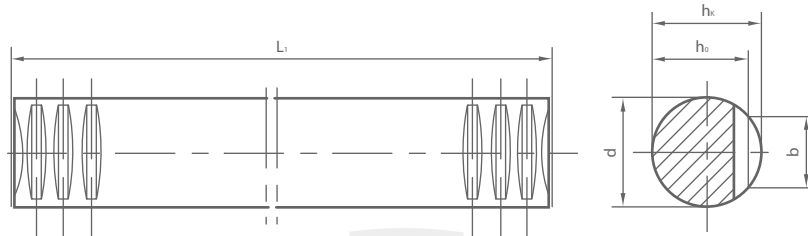
### Type - B

**1:4**

M	Z	De	Dp	H	F	d	D	V	L	Lm	S
1.5	15	26.70	22.5	23	11	20.3	8	34.0		11.7	
	60	90.40	90.0	34	11	50.3	16	8.0	31.2	25	2.8
2	15	35.60	30.0	31	16	25.3	8	44.0		14.4	
	60	120.60	120.0	37.6	16	60.3	16	10.4	34.2	25	3.4
2.5	15	44.50	37.5	38.1	19	32.3	14	55.9		18.4	
	60	150.70	150.0	44.8	19	60.3	20	13.2	40	30	4.8
3	15	53.30	45.0	48.1	23	40.3	16	66.9		24.5	
	60	180.80	180.0	53.2	23	80.3	25	15.8	48.2	35	5
3.5	15	62.20	52.5	52.1	26	45.3	20	78.9		25.1	
	60	211.00	210	60.4	26	90.3	30	18.6	54.4	40	6
4	15	71.10	60.0	55.1	30	50.3	20	89.9		23	
	60	241.10	240.0	60.8	30	90.3	30	21.2	53	40	7.8
4.5	15	79.97	67.5	57	32	52.3	20	102.9		23	
	60	271.24	270.0	62	32	90.3	30	24.3	53.5	40	8.5
5	15	88.80	75.0	62	34	55.3	20	115.7		25	
	60	301.30	300.0	65	34	90.3	30	27.0	55	40	10

# Gear & Racks

## 20° Pressure angle



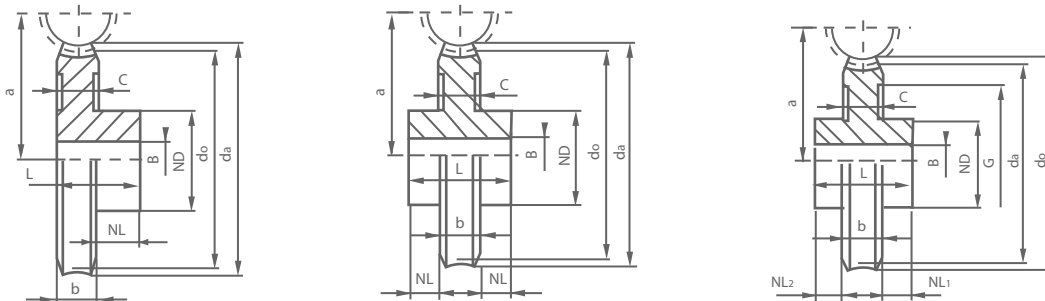
## Straight tooth system

Module	L <sub>1</sub>	∅ d <sub>h11</sub>	b	hk	ho	kg
1	251.3	15	7.5	15	14.0	0.34
	499.5	15	7.5	15	14.0	0.66
	999.0	15	7.5	15	14.0	1.35
1.5	249.8	17	9.6	17	15.5	0.42
	499.5	17	9.6	17	15.5	0.84
	999.0	17	9.6	17	15.5	1.70
2	251.3	20	12.0	20	18.0	0.55
	502.7	20	12.0	20	18.0	1.10
	999.0	20	12.0	20	18.0	2.20
2.5	251.3	25	15.0	25	22.5	0.90
	502.7	25	15.0	25	22.5	1.80
	997.5	25	15.0	25	22.5	3.60
3	254.5	30	18.0	30	27.0	1.30
	499.5	30	18.0	30	27.0	2.50
	999.0	30	18.0	30	27.0	5.10
4	251.3	40	24.0	40	36.0	2.30
	502.6	40	24.0	40	36.0	4.50
	1005.3	40	24.0	40	36.0	9.10
5	251.3	50	30.0	50	45.0	3.80
	502.6	50	30.0	50	45.0	7.10
	1005.3	50	30.0	50	45.0	14.30

### special notice

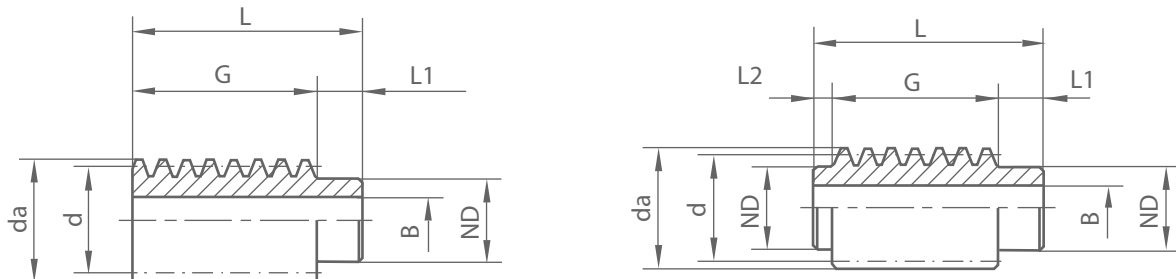
Material C 45k, Mat. No. 1.0503, of specially treated bright steel O<sub>h11</sub> with a tensile strength of approx. 650 N/mm<sup>2</sup>. Both ends of the racks are designed so that several racks can be linked to obtain any desired length. Please also see our guide pages on page E-16.

# Worm gear & Worm

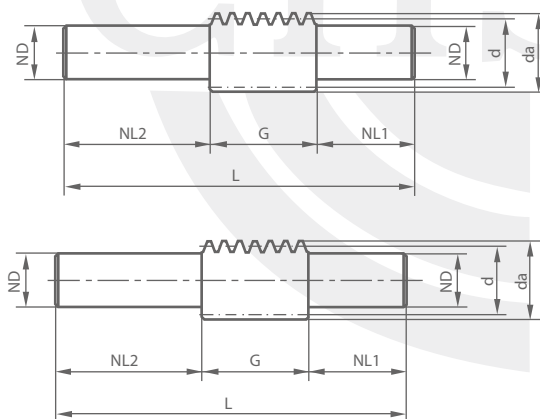


Module	Z	Ttpe		dp	da	ND	N N1/N2	L	G	C	a	BH7	Kg
1.0	16	1	16:1	16	18.8	12	8	14.5	-	-	15	5	0.02
	18	1	18:1	18	20.8	12	8	14.5	-	-	16	5	0.02
	20	1	20:1	20	22.8	16	8	14.5	-	-	17	5	0.03
	25	1	25:1	25	27.8	16	8	14.5	-	-	19.5	5	0.04
	35	1	35:1	35	37.8	16	10	16.5	-	-	24.5	6	0.07
	50	1	50:1	50	52.8	20	10	16.5	-	-	32	6	0.14
	75	1	75:1	75	77.8	30	10	16.5	-	4.5	44.5	6	0.20
	100	1	100:1	100	102.8	30	12	18.5	-	1.5	57	6	0.48
b=6.5	125	1	125:1	125	127.8	40	12	18.5	-	4.5	69.5	8	0.58
	150	1	150:1	150	152.8	40	12	18.5	-	4.5	82	8	0.59
	16	2	16:1	24	28.4	18	6	24	-	-	24.5	8	0.06
	18	2	18:1	27	31.7	20	8	28	-	-	26	8	0.08
	20	2	20:1	30	34.7	25	8	28	-	-	27.5	10	0.13
	30	2	30:1	45	49.7	30	8	28	-	-	35	10	0.26
	40	2	40:1	60	64.7	30	10	32	-	-	42.5	10	0.40
	50	2	50:1	75	79.7	30	10	32	-	10	50	10	0.44
b=12	75	2	75:1	112.5	117.2	40	10	32	-	10	68.75	12	0.86
	100	2	100:1	150	154.7	45	10	32	-	10	87.5	12	1.30
	16	2	16:1	32	37.6	20	8	30	-	-	32	8	0.14
	18	2	18:1	36	41.6	25	8	30	-	-	34	10	0.25
	20	2	20:1	40	45.6	30	10	34	-	-	36	12	0.55
	30	2	30:1	60	65.6	40	10	34	-	-	46	12	0.60
	40	2	40:1	80	85.6	40	10	34	-	11	56	12	0.65
	50	2	50:1	100	105.6	40	10	34	-	11	66	12	0.76
b=14	60	2	60:1	120	125.6	50	10	34	-	11	126	12	1.20
	16	3	16:1	48	57	40	18/4	46	-	-	43	15	0.46
	18	3	18:1	54	63	40	18/14	46	-	-	46	15	0.55
	20	3	20:1	60	69	40	18/14	46	-	-	49	15	0.64
	26	3	26:1	78	87	45	18/14	46	60	12	58	18	1.20
	32	3	32:1	96	105	50	18/14	46	70	12	67	20	1.40
	40	3	40:1	120	129	65	18/14	46	90	12	79	25	2.20
	52	3	52:1	147	156	75	23/4	51	110	12	97	30	3.40
6=24	65	3	65:1	195	204	85	23/4	51	150	12	116.5	35	4.90
	16	3	16:1	64	76	50	21/5	60	-	-	57	20	1.00
	18	3	18:1	72	84	50	21/5	60	-	-	67	20	1.50
	20	3	20:1	80	92	50	21/5	60	-	-	65	20	1.60
	26	3	26:1	104	116	55	21/5	60	80	14	77	22	2.10
	32	3	32:1	128	140	65	21/5	60	90	14	89	25	3.40
	40	3	40:1	160	172	75	21/5	60	125	14	105	30	4.50
	52	3	52:1	208	220	85	26/5	65	175	14	129	35	6.70
b=34	65	3	65:1	260	272	100	26/5	65	225	14	155	40	9.50
	16	3	16:1	80	95	70	27/5	72	-	-	71	20	2.30
	18	3	18:1	90	105	70	27/5	72	-	-	76	20	2.60
	20	3	20:1	100	115	70	27/5	72	-	-	81	25	3.00
	26	3	26:1	130	145	70	27/5	72	99	16	96	28	4.20
	32	3	32:1	160	175	75	27/5	72	125	16	111	30	5.30
	40	3	40:1	200	215	85	27/5	72	160	16	131	35	7.40
	52	3	52:1	260	275	100	32/5	77	220	16	161	40	11.80
b=40	65	3	65:1	325	340	115	32/5	77	280	16	193.5	45	17.00
	16	3	16:1	96	114	70	20/5	65	-	-	88	25	4.90
	18	3	18:1	108	126	70	20/5	65	-	-	94	25	5.85
	20	3	20:1	120	138	75	20/5	65	-	-	100	25	7.11
	25	3	25:1	150	168	75	25/5	70	120	16	115	30	8.95
	30	3	30:1	180	198	80	25/5	70	140	16	130	30	12.70
	40	3	40:1	240	258	85	30/5	75	200	16	160	30	17.85
	50	3	50:1	300	318	90	30/5	75	260	16	190	30	26.31
b=40	60	3	60:1	360	378	90	30/5	75	320	16	220	30	39.70

# Worm gear & Worm

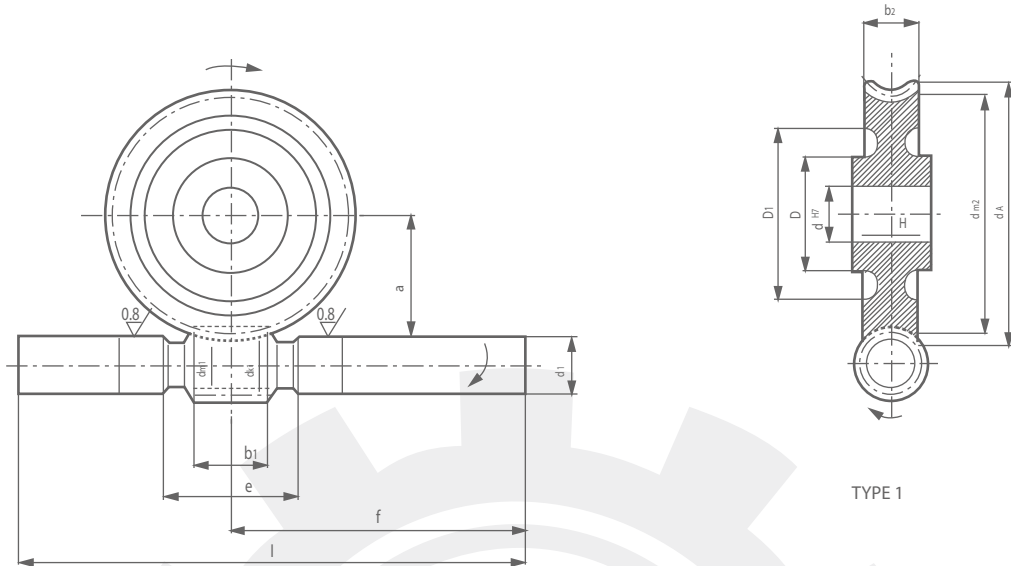


Module	Type	d	da	ND	L1	L2	G	L	B	kg
1.0	1	14	16	11	6	-	24	30	6	0.12
1.5	1	25	28	21	10	-	40	50	8	0.16
2.0	1	32	36	25	10	-	45	55	8	0.30
3.0	2	38	44	30	12	3	46	61	15	0.40
4.0	2	50	58	40	15	4	62	81	20	1.20
5.0	2	62	72	50	18	5	80	103	25	1.80
6.0	2	80	92	65	20	20	80	120	25	3.60



Module	Type	d	da	ND	NL1	G	NL2	L	kg
1.0	1	14	16	10	30	24	2	74	0.06
1.5	1	25	28	20	40	40	30	110	0.30
2.0	1	32	36	25	50	45	36	131	0.62
3.0	2	38	44	30	130	46	90	266	1.60
4.0	2	50	58	40	175	62	120	357	3.80
5.0	2	62	72	50	220	80	150	450	7.60
6.0	2	80	92	65	220	80	150	450	12.80

# Worm gear & Worm



**Centre distance a = 40mm**

**Type 1**

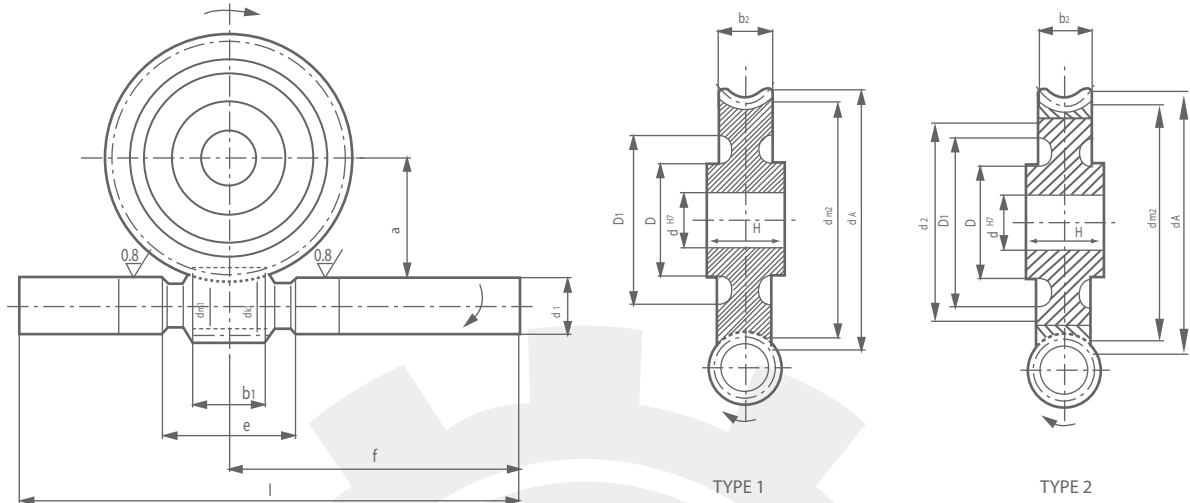
Module	i	Z1	worm							z2	worm gear							Kg
			dm1	dk1	d1	b1	e	f	i		dm2	dA	b2	H	D	D1	dH7	
1.0	62:1	1	18.0	20.0	17.5	2.5	50	100	150	62	62.0	65.0	12	25	40	-	15	0.69
1.25	50:1	1	17.5	20.0	17.5	2.5	50	100	150	50	62.5	66.3	12	25	40	-	15	0.69
1.50	41:1	1	17.0	20.0	17.5	2.5	50	100	150	41	63.0	67.5	12	25	40	-	15	0.68
	20.5:1	2	17.0	20.0	17.5	2.5	50	100	150	41	63.0	67.5	12	25	40	-	15	0.68
20	29:1	1	20.0	24.0	17.5	2.8	50	100	150	29	60.0	66.0	14	25	40	-	15	0.71
	15:1	2	16.0	20.0	17.5	2.5	50	100	150	30	64.0	70.0	14	25	40	-	15	1.72
	6.75:1	4	16.0	20.0	17.5	2.5	50	100	150	27	64.0	70.0	14	25	40	-	15	0.72
2.5	12:1	2	19.5	24.5	17.5	3.0	50	400	150	24	60.5	68.0	16	25	40	-	15	0.73

**Centre distance a = 50mm**

**Type 1**

Module	i	Z1	worm							z2	worm gear							Kg
			dm1	dk1	d1	b1	e	f	i		dm2	dA	b2	H	D	D1	dH7	
1.0	82:1	1	17.0	19.0	17.5	2.5	50	115	180	82	83.0	86	12	30	50	61.0	20	1.00
1.25	62:1	1	23.4	24.9	20.5	2.5	50	115	180	62	77.6	81.0	15	30	50	-	20	1.20
1.5	52:1	1	21.0	24.0	20.5	2.8	60	115	180	52	29.0	83.5	14	30	50	66.0	20	1.20
	26:1	2	21.0	24.0	20.5	2.8	60	115	180	52	79.30	82.4	14	30	50	66.0	20	1.20
2.0	38:1	1	22.4	26.4	20.5	3.2	60	115	180	38	77.6	84.0	18	30	50	71.5	20	1.20
	19:1	2	22.4	26.4	20.5	3.2	60	115	180	38	77.6	84.0	18	30	50	71.5	20	1.20
	9:1	4	22.4	26.4	20.5	3.2	60	115	180	36	27.6	84.0	18	30	50	71.5	20	1.15
2.5	29:1	1	26.5	31.5	20.5	3.6	60	115	180	39	73.5	81.0	20	30	50	-	20	1.30
	14:1	2	26.5	31.5	20.5	3.6	60	115	180	28	73.5	81.0	20	30	50	-	20	1.30
	6.75:1	4	26.5	31.5	20.5	3.6	60	115	180	27	73.5	81.0	20	30	50	-	20	1.45
3.0	12:1	2	25.5	31.5	20.5	3.87	60	115	180	24	74.5	83.5	18	30	50	71.5	20	1.30

# Worm gear & Worm



## Centre distance a = 63mm

## Type 1

Module	i	Z1	worm							z2	worm gear							Kg
			dm1	dk1	d1	b1	e	f	i		dm2	dA	b2	H	D	D1	dH7	
1.0	109:1	1	17.0	19.0	20.5	28	60	130	210	109	109.0	112	13	35	60	91	25	1.70
1.25	82:1	1	22.4	24.9	20.5	28	60	130	210	82	103.0	109	15	35	60	87	25	1.65
1.6	61:1	1	28.0	31.2	25.5	32	60	120	210	61	98.0	103	18	35	60	83	25	2.05
2.0	51:1	1	27.4	26.4	25.5	36	75	130	210	51	103.6	110	18	35	60	86	25	2.10
	25.5:1	2	22.4	26.4	25.5	36	75	130	210	51	103.6	110	18	35	60	86	25	2.10
	12.25:1	4	22.4	26.4	25.5	36	75	130	210	49	103.6	110	18	35	60	86	25	2.00
2.5	39:1	1	26.5	31.5	25.5	40	75	130	210	39	99.5	107	20	35	60	81	25	2.20
	19.5:1	2	26.5	31.5	25.5	40	75	130	210	39	99.5	107	20	35	60	81	25	2.15
	9.25:1	4	26.5	31.5	25.5	40	75	130	210	37	99.5	107	20	35	60	81	25	2.20
3.15	29:1	1	33.5	39.8	25.5	45	75	130	210	29	92.5	102	26	35	60	79	25	2.30
	14.5:1	2	33.5	39.8	28.5	45	75	130	210	29	92.5	102	26	35	60	79	25	2.30
	6.75:1	4	33.5	39.8	25.5	45	75	130	210	27	92.5	102	26	35	60	79	25	2.30

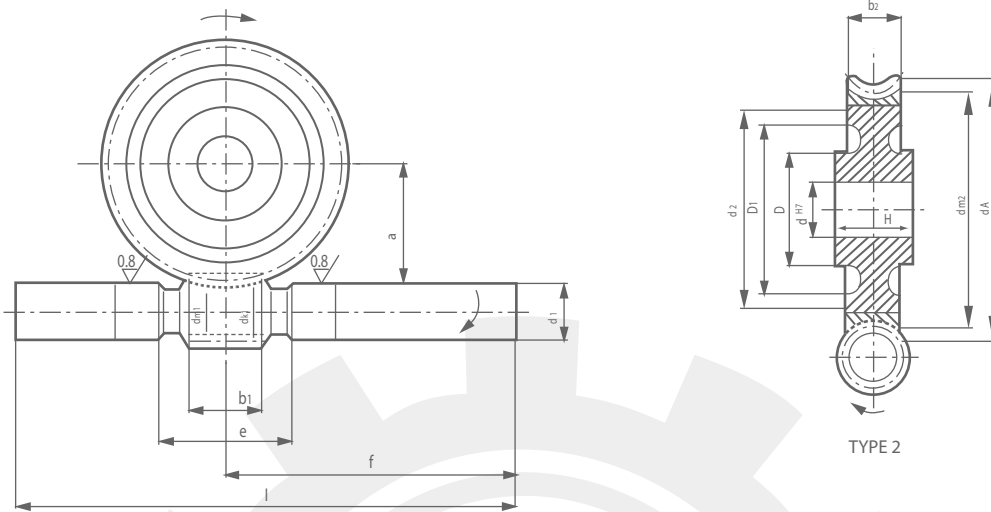
## Centre distance a = 80mm

## Type 2

Module	i	Z1	worm							z2	worm gear							Kg	
			dm1	dk1	d1	b1	e	f	i		dm2	dA	b2	H	dx	D	D1		dH7
1.25	109:1	1	22.4	24.9	25.5	34	70	170	270	109	137.6	141	16	119	50	70	95	30	3.15
1.6	82:1	1	28.0	31.2	30.5	38	80	170	270	82	132.0	137	20	110	50	70	87	30	3.80
2.0	62:1	1	35.5	39.6	30.5	40	80	170	270	62	124.5	131	22	104	50	70	85	30	3.90
2.5	53:1	1	26.5	31.5	30.5	46	95	170	270	53	133.5	141	22	109	50	70	87	30	3.80
	26:1	2	26.5	31.5	30.5	46	95	170	270	52	133.5	141	22	109	50	70	87	30	3.85
	12.25:1	4	26.5	31.5	30.5	46	95	170	270	49	133.5	141	32	109	50	70	87	30	3.95
3.15	40:1	1	33.5	39.8	30.5	50	95	170	270	40	126.5	136	26	100	50	70	80	30	4.10
	19.5:1	2	33.5	39.8	30.5	50	95	170	270	39	126.5	136	26	100	50	70	80	30	4.15
	9.25:1	4	33.5	39.8	30.5	50	95	170	270	37	126.5	136	26	100	50	70	80	30	4.25
4.0	29:1	1	40.0	48.0	30.5	55	95	170	270	29	120.0	132	32	89	50	70	-	30	4.45
	14.5:1	2	40.0	48.0	30.5	55	95	170	270	29	120.0	132	32	89	50	70	-	30	4.45
	6.75:1	4	40.0	48.0	30.5	55	95	170	270	27	120.0	132	32	89	50	70	-	30	4.50



# Worm gear & Worm



## Centre distance a = 100mm

## Type 2

Module	i	Z1	worm							z2	worm gear							Kg	
			dm1	dk1	d1	b1	e	f	i		dm2	dA	b2	dx	H	D	D1		dH7
1.6	107:1	1	28.0	31.2	30.5	42	90	22.5	35.0	107	172	177	20	152	60	85	128	40	6.10
2.0	82:1	1	35.5	39.5	40.5	46	90	225	350	82	164.5	171	24	142	60	85	118	40	17.40
2.5	62:1	1	42.5	47.5	40.5	50	90	225	350	62	157.5	165	28	134	60	85	112	40	7.60
3.15	52:1	1	33.5	39.8	40.5	58	110	225	350	52	166.5	176	26	140	60	85	115	40	7.70
	36:1	2	33.5	39.8	40.5	58	110	225	350	52	166.5	176	26	140	60	85	115	40	7.50
	12.25:1	4	33.5	39.8	40.5	58	110	225	350	49	166.5	176	26	140	60	85	115	40	7.60
4.0	39:1	1	40.0	48.0	40.5	64	110	225	350	39	160.0	172	32	128	60	85	-	40	8.30
	19.5:1	2	40.0	48.0	40.5	64	110	225	350	39	160.0	172	32	128	60	85	-	40	8.30
	9.25:1	4	40.0	48.0	40.5	64	110	225	350	37	160.0	172	32	128	60	85	-	40	8.30
5.0	29:1	1	50.0	60.0	40.5	70	110	225	350	29	150.0	165	38	112	60	85	-	40	9.10
	14.5:1	2	50.0	60.0	40.5	70	110	225	350	29	150.0	165	38	112	60	85	-	40	9.10
	6.75:1	4	50.0	60.0	40.5	70	110	225	350	27	150.0	165	38	112	60	85	-	40	9.00

## Centre distance a = 125mm

## Type 2

Module	i	Z1	worm							z2	worm gear							Kg	
			dm1	dk1	d1	b1	e	f	i		dm2	dA	b2	dx	H	D	D1		dH7
2.0	107:1	1	35.5	39.5	40.5	52	105	255	410	107	214.5	221	24	192	70	105	168	50	4.9
2.5	82:1	1	42.5	47.5	45.5	58	105	255	410	82	207.5	215	28	184	70	105	160	50	13.0
3.15	62:1	53.0	59.3	50.5	64	105	255	410	62	197.0	207	34	169	70	105	145	50	14.60	
4.0	52:1	1	40.0	48.0	50.5	75	135	205	410	52	210.0	222	32	179	70	105	155	50	14.2
	25.5:1	2	40.0	48.0	50.5	75	135	255	410	51	210.0	222	32	179	70	105	155	50	14.5
	12:1	4	40.0	48.0	50.5	75	135	275	410	48	210.0	222	32	179	70	105	155	50	14.5
5.0	39:1	1	50.0	60.0	50.5	82	135	255	410	39	200.0	215	38	160	70	105	136	50	15.5
	19.5:1	2	50.0	60.0	50.5	82	135	255	410	39	200.0	215	38	160	70	105	136	50	13.7
	9:1	4	50.0	60.0	50.5	82	135	255	410	36	200.0	215	38	160	70	105	136	50	15.5
6.3	29:1	1	63.0	75.6	50.5	85	135	255	410	29	187.0	206	50	142	70	105	117	50	17.7
	14.5:1	2	63.0	75.6	50.5	85	135	255	410	29	187.0	206	50	142	70	105	117	50	17.6
	6.75:1	4	63.0	75.6	50.5	85	135	255	410	27	187.0	206	142	142	70	105	117	50	18.0