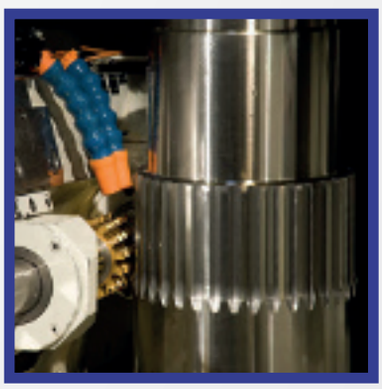
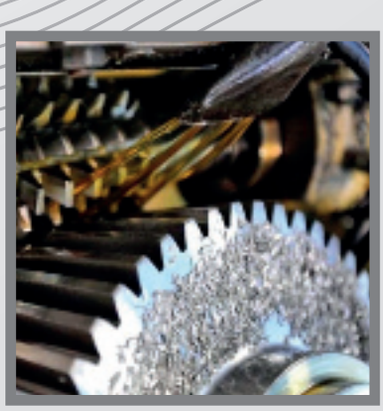
RC-GEAR CUT

CUTTOOLS **DENTATURA**





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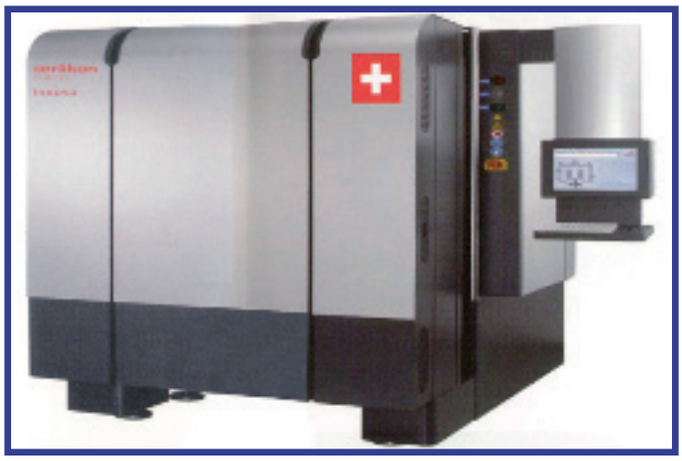


ONISHI HIROCO was set up in 1900, who is a modern enterprise mainly produces gear cutting tool.

For more than 20 years continuos development, we have acquired powerful capability and adeguate production facility.

We have got 13 national patents for invention and utility model.

Our tools are made from the best materials, M2, M35, M42 sintered steel.

Some important operationd in the production process are completed on sophisticated foreign facilities imported from Germany, Switzerland, Italy and Japan.

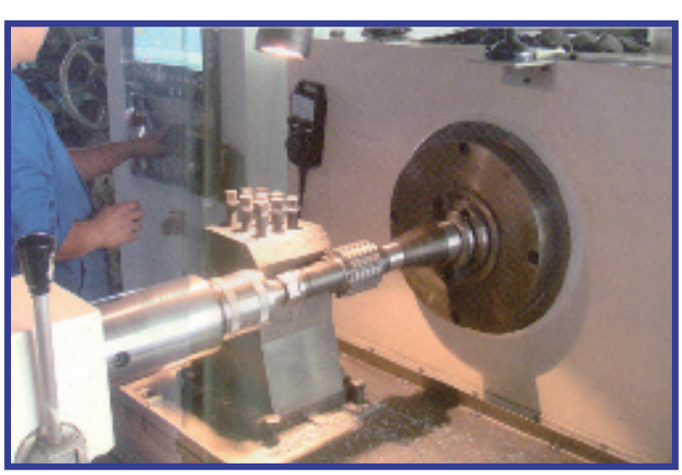
We adopt advanced technology from Germany into heat treatment process according to the material and specifications of different products.

We have introduced the Swiss Balzers coating equipment, which can be used in various caoting to achieve dry cutting.

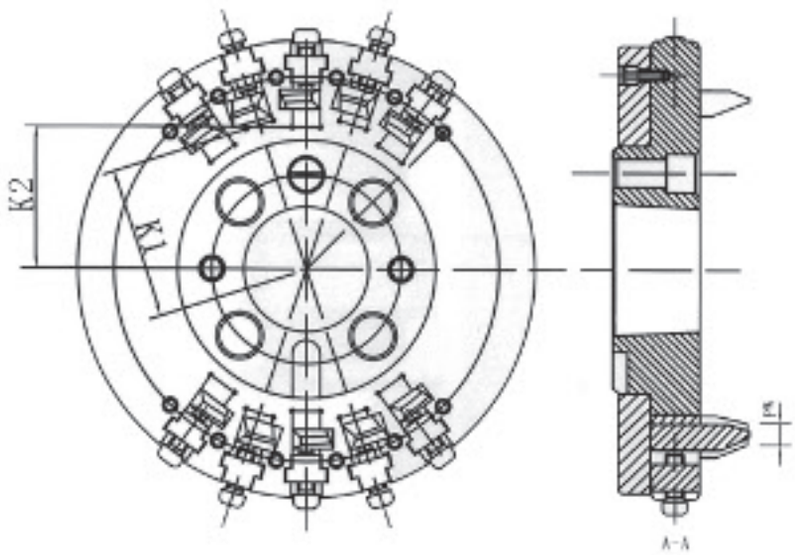
ONISHI HIROCO not only provides high-precision, high-performance products, but also offers comprehensive and high quality service.

After 20 years study in gear industry, we become acquainted with the questions and needs of clients in choosing products, purchasing equipments, booking and using cutter. It is a great fortune for us to serve clients with different needs.

ONISHI HIROCO has been certified by the quality security standard ISO9001:2008



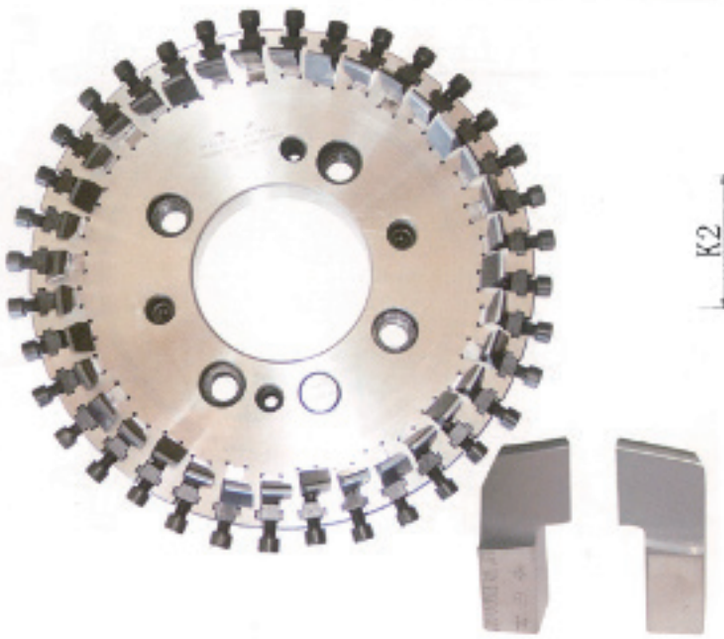
TRIPLEX ROUGHING CUTTER OF NEW STRUCTURE

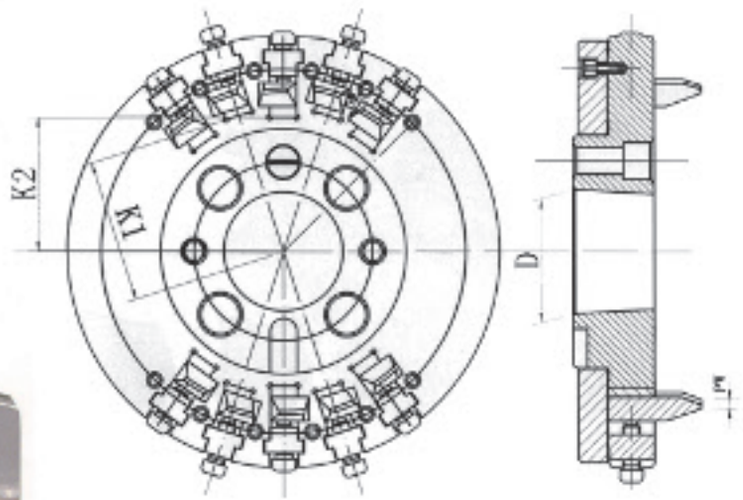


AVG DIAMETER	N. OF TEETH			POINT WIDTH	CUTTING DEPTH	BODY DISTANCE		TAPER-BORE DIAMETER	TAPER
	OUTSIDE BLADE	BOTTOM BLADE	INSIDE BLADE			K1	K2		
6"	5	10	5	1.8~3.8	12.7	68.825	65.025	58.196	1:24
7.5"	6	12	6	2.0~5.0	12.7	88.775	81.925		
9"	7	14	7	2.0~5.0	14.2	107.825	100.975		
10.5"	8	16	8	2.0~6.5	19.4	123.2	119.375	126.966	
12"	9	18	9	2.0~6.5	19.4	142.25	138.425		
14"	9	18	9	2.5~9.5	25.4	167.64	154.94		
16"	10	20	10	2.5~9.5	25.4	193.05	180.35	126.966 126.835 L=22	
18"	10	20	10	2.5~9.5	25.4	217	210	126.835 L=22	

For roughing cutting of spiral bevel gear and hyperbolic gear

ALTERNATE ROUGHING CUTTER OF NEW STRUCTURE

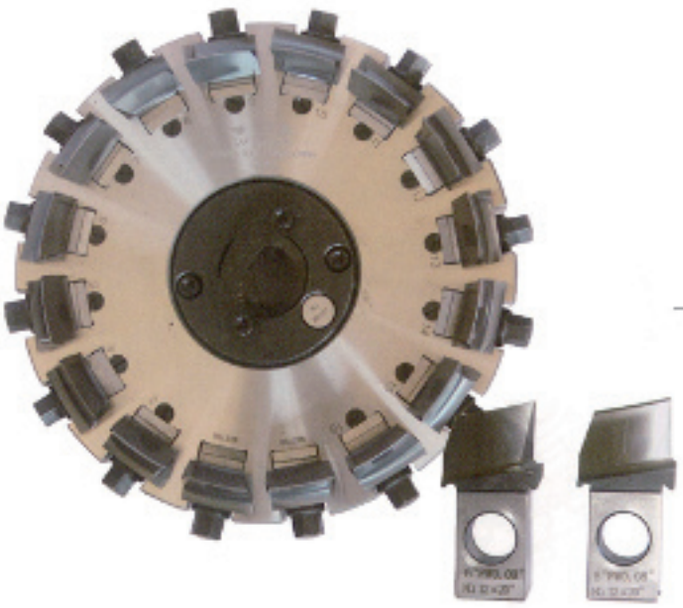


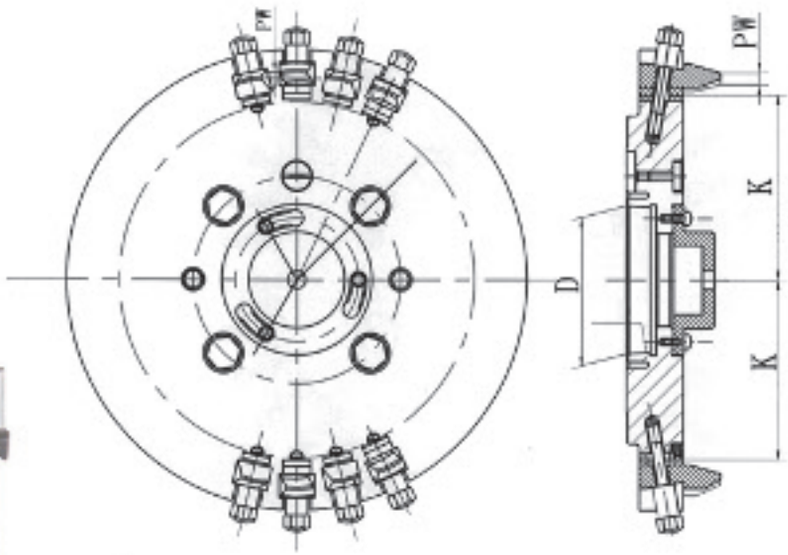


AVG DIAMETER	N. OF TEETH		POINT WIDTH	CUTTING DEPTH	BODY DISTANCE		TAPER-BORE DIAMETER	TAPER
	OUTSIDE BLADE	INSIDE BLADE			K1	K2		
4.5"	6	6	0.5~2.5	9.5	47.325	----	58.221	1:24
5"	8	8	0.5~3.8	9.5	53.675	----		
6"	10	10	0.5~3.8	12.7	68.825	65.025		
7.5"	12	12	0.75~5.0	12.7	88.775	81.925		
9"	14	14	0.75~5.0	14.2	107.825	100.975		
10.5"	16	16	0.75~6.35	19.4	123.2	119.375	126.966	
12"	18	18	0.75~6.35	19.4	142.25	138.425		
14"	18	18	1.27~7.6	25.4	167.64	154.94		
16"	20	20	1.27~7.6	25.4	193.05	180.35	126.966 126.835 L=22	
18"	20	20	1.27~7.6	25.4	217	210	126.835 L=22	

For roughing cutting of spiral bevel gear and hyperbolic gear or pinion

ALTERNATE FINISHING CUTTER OF NEW STRUCTURE

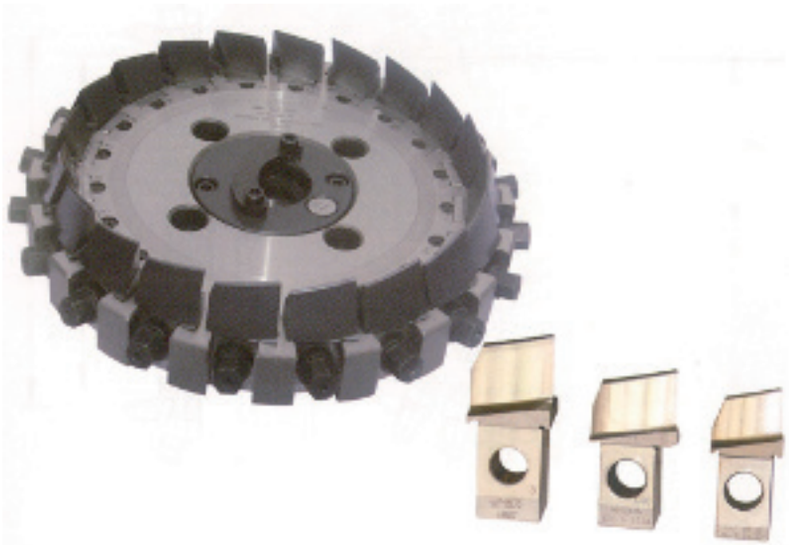


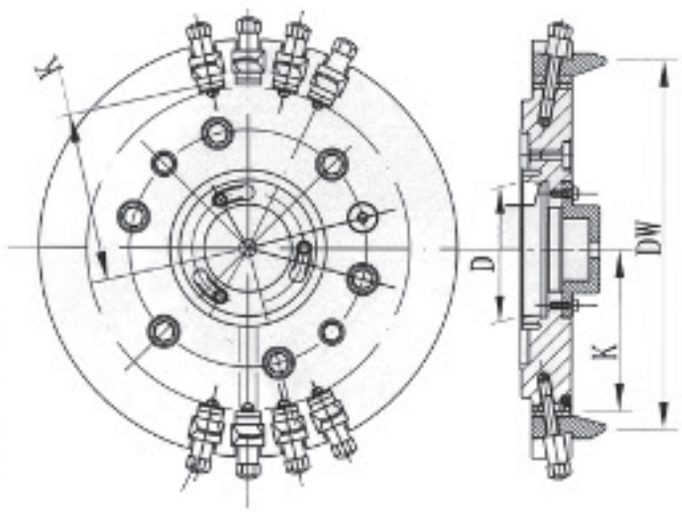


AVG DIAMETER	N. OF TEETH		POINT WIDTH	CUTTING DEPTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER
	OUTSIDE BLADE	INSIDE BLADE					
4.5"	4	4	0.5~2.5	9.5	47.275	58.221	1:24
5"	6	6	0.5~3.8	9.5	53.625		
6"	6	6	0.5~3.8	12.7	65.125		
	8	8					
7.5"	8	8	0.75~5.0	12.7	84.075		
9"	10	10		14.2	103.125		
10.5"	10	10	1.7~7.6	19.4	120	126.966	
12"	14	14	0.75~6.5	19.4	139		
14"	14	14	1.27~7.5	25.4	162.025		
16"	18	18	1.27~7.5	19.4	184.875	126.966 126.835 L=22	
			1.27~10	25.4	184.875		
18"	18	18	1.27~12.7	25.4	215/208	126.835 L=22	
	12	12		38	215/208		

For finishing cutting of spiral bevel gear and hyperbolic gear or pinion

OUTSIDE FINISHING CUTTER OF NEW STRUCTURE

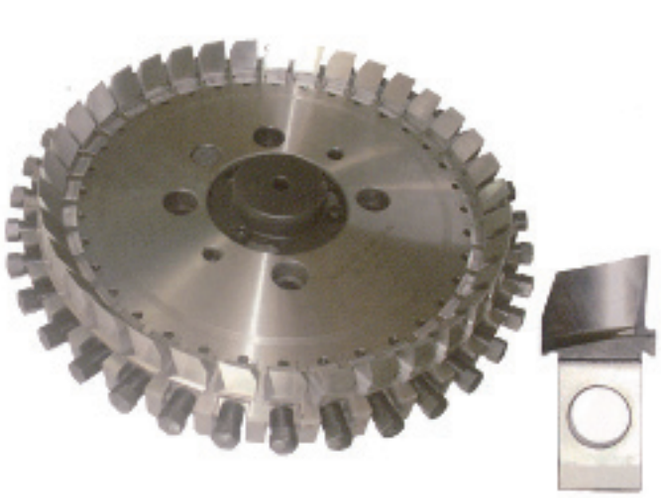


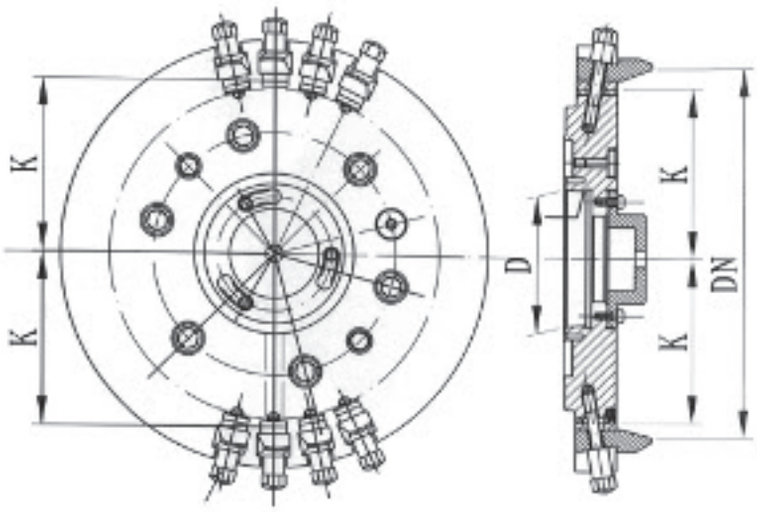


AVG DIAMETER	N. OF TEETH	DW	CUTTING DEPTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER
5"	12	113.5~134.25	9.5	53.625	58.221	1:24
				53.625		
6"	12	135~167.5	12.7	60.625		
				65.125		
	16			67.75		
				72.25		
7.5"	16	156~187.25	12.7	69.5		
				74.5		
				80.875		
				87.25		
9"	20	175.75~260	14.2	93.625		
				96.75		
				103.125		
				108.125		
12"	24	262~333.5	19.4	122.375	126.966	
				130		
	28			138.875		
				146.5		
14"	28	318.6~382	25.4	147.9		
				152.09		
	32			169.15		
				174.15		
16"	32	346.5~451.5	25.4	163.375	126.966 126.835 L=22	
				174.25		
	36			184.875		
				195.25		
				205.25		
18"	36	447.75~517.75	25.4	215.375	126.835 L=22	
				225.5		
				235.625		
	24	438.5~515.75	38	204.5		
				215.875		
				227.375		

For finishing cutting of spiral bevel gear and hyperbolic pinion's concave side

INSIDE FINISHING CUTTER OF NEW STRUCTURE

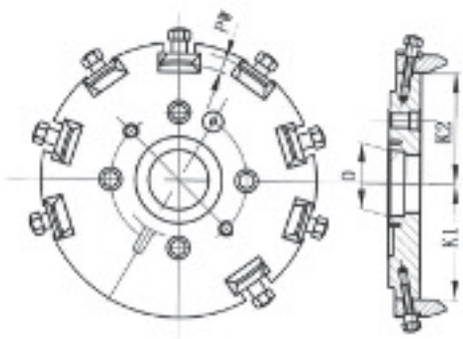




AVG DIAMETER	N. OF TEETH	DN	CUTTING DEPTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER
5"	12	113~136.5	9.5	53.625	58.221	1:24
				55.625		
6"	12	132.75~169.75	12.7	60.625		
	16			65.125		
				67.75		
				72.25		
7.5"	16	153.25~191.75	12.7	69.5		
				74.5		
				80.875		
				87.25		
9"	20	176~271.75	14.2	93.625		
				96.75		
				103.125		
				108.125		
12"	24	262.25~339.75	19.4	122.375	126.966	
	28			130		
				138.875		
				146.5		
14"	28	318.5~394.8	25.4	147.9		
	32			152.09		
				169.15		
				174.15		
16"	32	343.75~459.5	25.4	163.375	126.966 126.835 L=22	
	36			174.25		
				184.875		
				195.25		
				205.25		
18"	36	447.75~538.25	25.4	215.375	126.835 L=22	
				225.5		
				235.625		
	24	443.5~536.25	38	204.5		
				215.875		
				227.375		

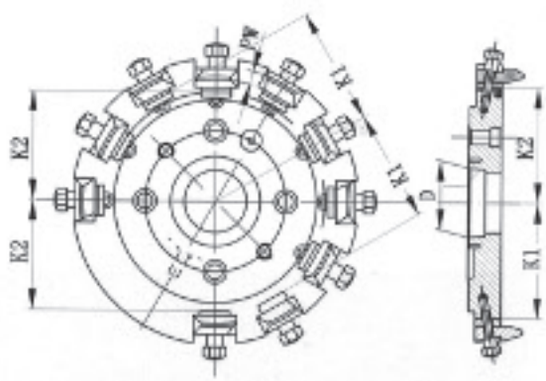
For finishing cutting of spiral bevel gear and hyperbolic pinion's convex side

SINGLE CYCLE FINISHING CUTTER



AVG DIAMETER	N. OF TEETH	αW OUTSIDE BLADE	αN INSIDE BLADE	POINT WIDTH	CUTTING DEPTH	BODY DISTANCE K1	BODY DISTANCE K2	TAPER-BORE DIAMETER	TAPER
5"	8	20°~25°	20°~25°	1.7~3.75	12.7	57.15	53.34	58.221	1:24
6"				1.7~3.75	12.7	69.85	66.04		
7.5"				1.75~5.0	12.6	87.63	83.82		
9"				1.75~5.0	12	106.68	102.87		
12"				1.75~6.5	22.8	146.05	135.89	126.966	

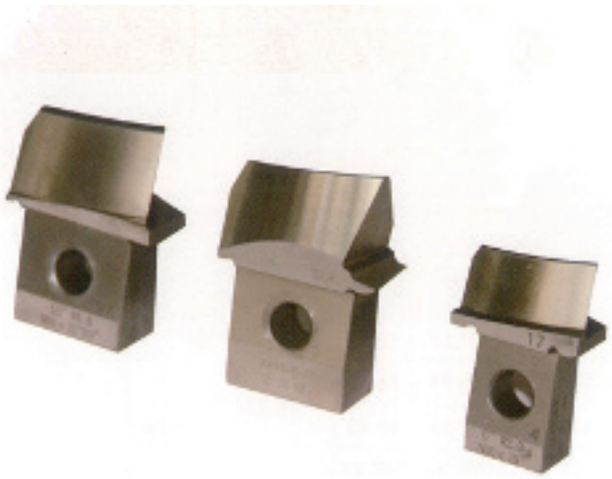
For finishing cutting of spiral bevel gear, cutters are having both axial and radial steps

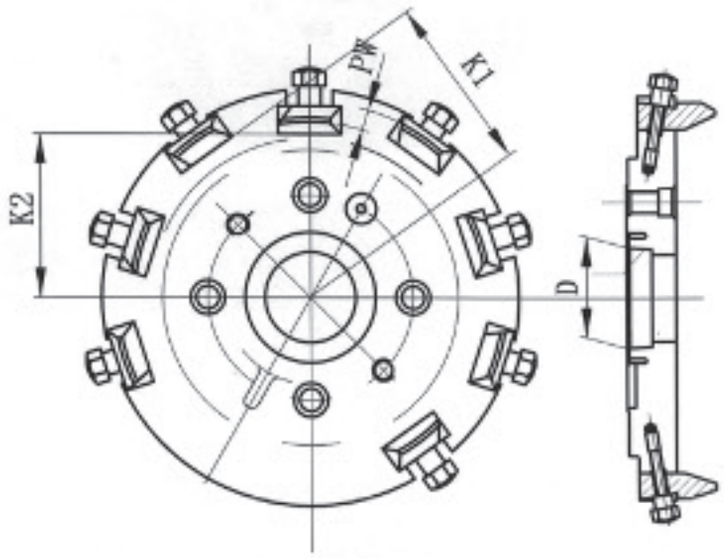


AVG DIAMETER	N. OF TEETH	αW OUTSIDE BLADE	αN INSIDE BLADE	POINT WIDTH	CUTTING DEPTH	BODY DISTANCE K1	BODY DISTANCE K2	TAPER-BORE DIAMETER	TAPER
5"	10	20°~25°	20°~25°	1.7~3.75	12.7	57.15	53.34	58.221	1:24
6"				1.7~3.75	12.7	69.85	66.04		
7.5"				1.75~5.0	12.6	87.63	83.82		
9"				1.75~5.0	12	106.68	102.87		
12"				1.75~6.5	22.8	142.55	135.89	126.966	
14"				1.75~7.5	25.4	172.72	160.02		
16"				1.75~7.5	25.4	191.15	184.15		

For finishing cutting of spiral bevel gear, cutters aren't having both axial and radial steps. The parallels on cutter body are having steps, after assembly the cutters are having radial steps. If it has step tolerance, it can be adjusted by adjusting screw. In one cutter different point width can be adjusted by changing stepped parallel.

HELIXFORM FINISHING CUTTER

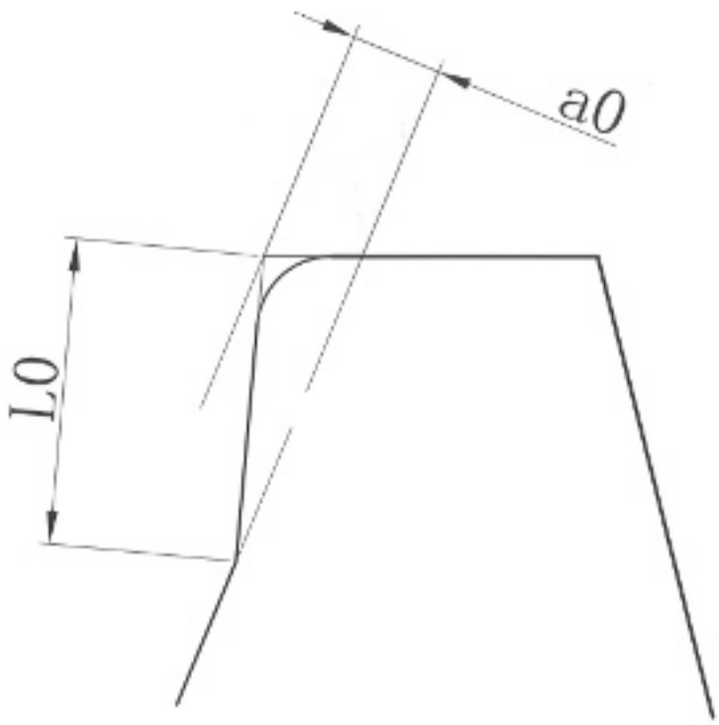




AVG DIAMETER	N. OF TEETH	OUTSIDE BLADE	INSIDE BLADE	POINT WIDTH	CUTTING DEPTH	BODY DISTANCE K1	BODY DISTANCE K1	TAPER-BORE DIAMETER	TAPER
5"	8	24°	10°	1.7~3.75	13	57.15	53.34	58.221	1:24
6"					13	69.85	66.04		
7.5"				1.75~5.0	14.3	87.63	83.82		
9"					17.8	106.68	102.87		

For finishing cutting of spiral bevel gear Helixform, cutters are having both axial and radial seps with axial motion.

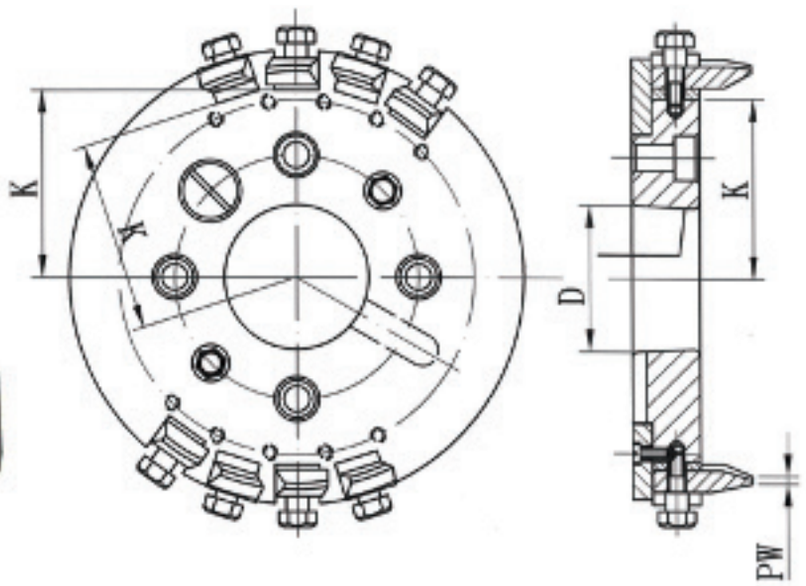
TOPREM'S SYMBOL LETTER AND SIZES FOR FINISHING CUTTER BLADE AND



	A	B	C	D	E	F	M	W	Z
L0	3.180	2.680	2.160	1.910	1.650	1.270	5.970	4.950	3.980
a0	0.144	0.121	0.980	0.086	0.075	0.057	0.270	0.224	0.180

CUTTER N.											
0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2
6	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10	10 1/2	11	11 1/2
12	12 1/2	13	13 1/2	14	14 1/2	15	15 1/2	16	16 1/2	17	17 1/2
18	18 1/2	19	19 1/2	20	20 1/2						

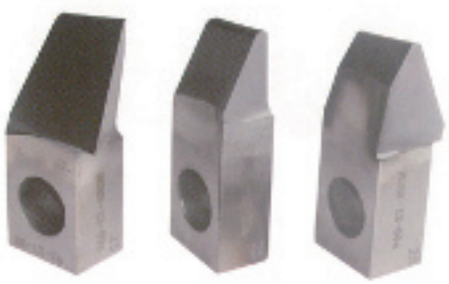
ALTERNATE ROUGHING CUTTER OF OLD STRUCTURE

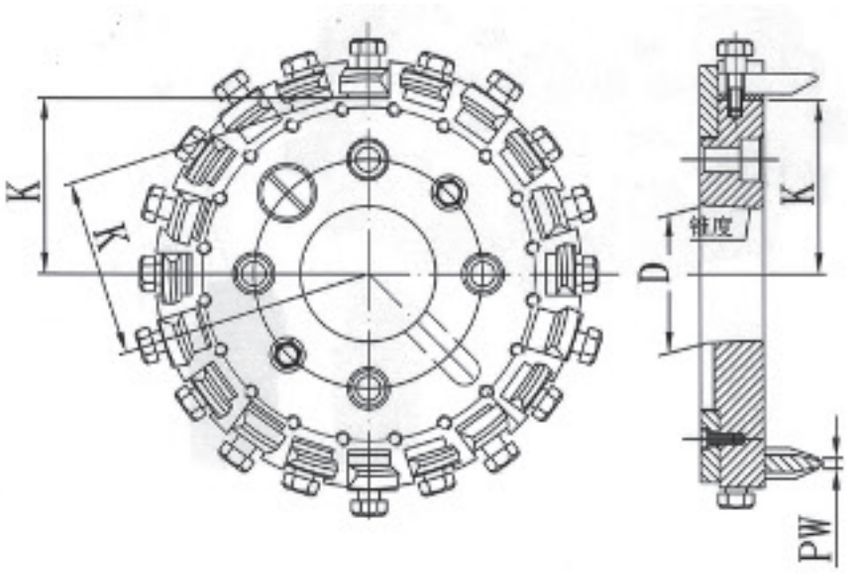


AVG DIAMETER	N. OF TEETH		POINT WIDTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER	CUTTING DEPTH
	OUTSIDE BLADE	INSIDE BLADE					
4.5"	6	6	0.5~2.5	48.674	25.4	1:12	9.5
5"	6	6	0.5~3.25	55.024	25.4	1:12	9.5
6"	8	8	0.5~3.25	67.724	58.196	1:24	12.7
7.5"	10	10	0.5~4.25	85.852	58.196	1:24	12.7
9"	12	12	0.5~4.25	104.902	58.196	1:24	14.2
12"	16	16	0.75~5.5	140.462	126.96	1:24	19.4
14"	16	16	0.75~6.5	161.96	126.96	1:24	25.4
16"	20	20	0.75~6.5	188	126.96	1:24	25.4
18"	12	12	1.27~6.5	210	215.8	-	25.4
	16	16					

For roughing cutting of spiral bevel gear and hyperbolic gear or pinion

TRI-PLEX ROUGHING CUTTER OF OLD STRUCTURE

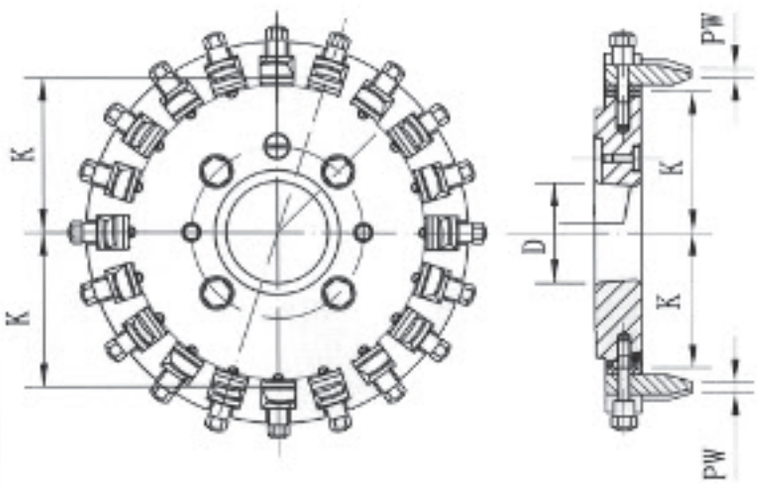




AVG DIAMETER	N. OF TEETH			POINT WIDTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER	CUTTING DEPTH
	OUTSIDE BLADE	INSIDE BLADE						
6"	4	4	8	2.0~3.25	67.724	58.196	1:24	9.5
7.5"	5	5	10	2.0~4.25	85.852	58.196	1:24	12.7
9"	6	6	12	2.0~5.5	104.902	58.196	1:24	14.2
12"	8	8	16	2.0~6.5	140.462	126.96	1:24	19.4
16"	10	10	20	2.0~6.5	188	126.96	1:24	25.4
18"	6	6	12	2.0~6.5	210	215.8	—	25.8
	8	8	16					

For roughing cutting of spiral bevel gear and hyperbolic gear

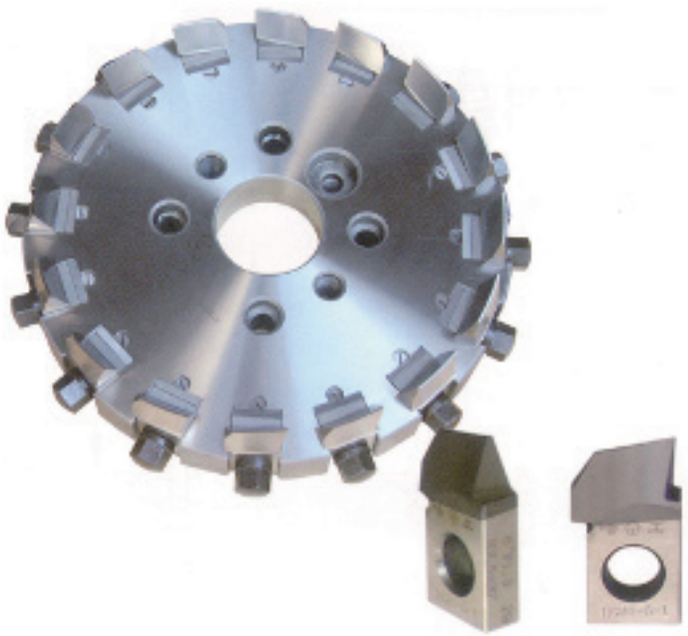
ALTERNATE FINISHING CUTTER OF OLD STRUCTURE

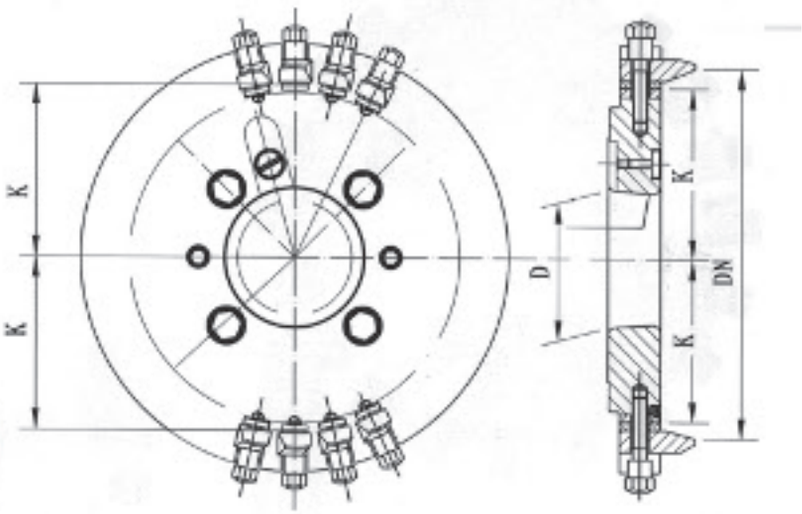


AVG DIAMETER	N. OF TEETH	POINT WIDTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER	CUTTING DEPTH
3.5"	8	0.4~2.5	37.306	25.4	1:12	8
4.5"	8	0.5~3.25	48.674	25.4	1:12	9.5
5"	8	0.5~3.25	55.024	25.4	1:12	9.5
6"	12	0.5~3.25	67.724	58.196	1:24	12.7
7.5"	12	0.65~5.0	84.005	58.196	1:24	12.7
9"	16	0.65~5.0	103.055	58.196	1:24	14.2
12"	20	0.75~6.5	138.94	126.96	1:24	25.4
14"	24	0.75~6.5	161.625	126.96	1:24	25.4
16"	24	0.75~7.5	184.875	126.96	1:24	25.4
18"	24	0.75~7.5	211.362	215.8		25.4
21"	28	1.0~10.0	247.862	215.8		34
24"	32	1.0~10.0	284.362	215.8		37
28"	36	1.5~10.0	334.09	330		42
32"	32	2.0~12.6	375.015	330		49
		2.0~15.5				
40"	36	2.0~11.0	474.665	330		57
		2.0~15.5				

For finishing cutting of spiral bevel gear and hyperbolic gear or pinion.
Maximum productive capacity: 60 inch disc and blade

INSIDE FINISHING CUTTER OF OLD STRUCTURE

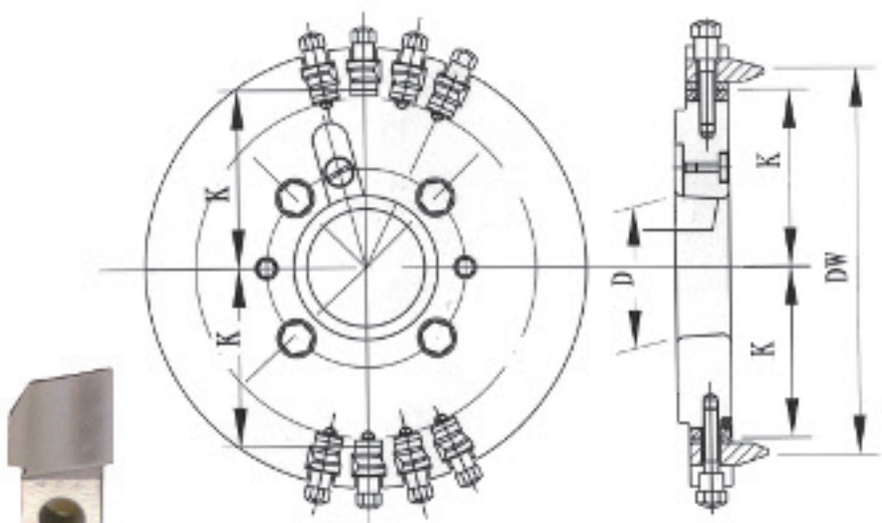




AVG DIAMETER	N. OF TEETH	POINT WIDTH	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER	CUTTING DEPTH
3.5"	8	86.1~96.1	37.306	25.4	1:12	8
4.5"	8	110.5~120.5	48.674	25.4	1:12	9.5
5"	8	123.67~133.17	55.024	25.4	1:12	9.5
6"	12	149.07~158.57	67.724	58.196	1:24	12.7
7.5"	12	166.34~180.84	74.48	58.196	1:24	12.7
		179.04~193.54	80.83			
		191.74~206.24	87.18			
9"	12	204.44~218.94	93.53	58.196	1:24	14.2
	16	210.79~225.29	96.705			
		223.49~237.99	103.055			
		233.65~248.15	108.135			
		246.35~260.85	114.485			
12"	16	265.15~283.65	122.43	126.96	1:24	19.4
	20	280.39~298.89	130.05			
		298.17~316.67	138.94			
		313.41~331.91	146.5			
14"	20	323.2~341.2	152.738	126.96	1:24	25.4
	24	341~357	161.625			
		356.3~372.3	169.245			
16"	24	380.99~403.49	180.35	126.96	1:24	25.4
		398.77~421.27	189.24			
		414.01~436.51	196.86			
18"	24	438.388~466.888	205.524	215.8	—	25.4
		450.004~478.564	211.362			
		458.7~487.2	215.68			
21"	28	510.364~538.864	241.512	215.8	—	34
		523.064~551.564	247.862			
		533.224~561.724	252.942			

For finishing cutting of spiral bevel gear and hyperbolic pinion's convex side.
Maximum productive capacity: 60 inch disc and blade

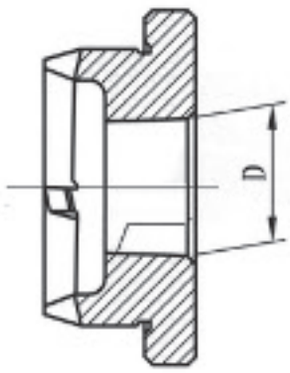
OUTSIDE FINISHING CUTTER OF OLD STRUCTURE

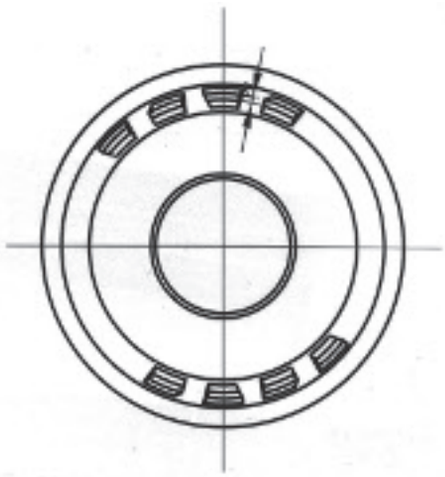


AVG DIAMETER	N. OF TEETH	DW	BODY DISTANCE	TAPER-BORE DIAMETER	TAPER	CUTTING DEPTH
3.5"	8	86.1~96.1	37.306	25.4	1:12	8
4.5"	8	110.5~120.5	48.674	25.4	1:12	9.5
5"	8	123.67~133.17	55.024	25.4	1:12	9.5
6"	12	149.07~158.57	67.724	58.196	1:24	12.7
7.5"	12	166.34~180.84	74.48	58.196	1:24	12.7
		179.04~193.54	80.83			
		191.74~206.24	87.18			
9"	12	204.44~218.94	93.53	58.196	1:24	14.2
	16	210.79~225.29	96.705			
		223.49~237.99	103.055			
		233.65~248.15	108.135			
		246.35~260.85	114.485			
12"	16	265.15~283.65	122.43	126.96	1:24	19.4
	20	280.39~298.89	130.05			
		298.17~316.67	138.94			
		313.41~331.91	146.5			
14"	20	323.2~341.2	152.738	126.96	1:24	25.4
	24	341~357	161.625			
		356.3~372.3	169.245			
16"	24	380.99~403.49	180.35	126.96	1:24	25.4
		398.77~421.27	189.24			
		414.01~436.51	196.86			
18"	24	438.388~466.888	205.524	215.8	—	25.4
		450.004~478.564	211.362			
		458.7~487.2	215.68			
21"	28	510.364~538.864	241.512	215.8	—	34
		523.064~551.564	247.862			
		533.224~561.724	252.942			

For finishing cutting of spiral bevel gear and hyperbolic pinion's concave side.
Maximum productive capacity: 60 inch disc and blade

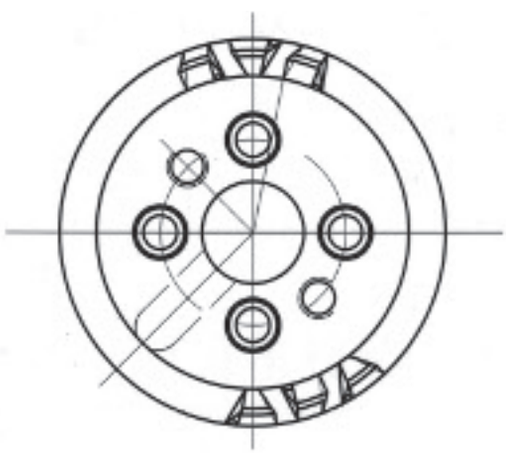
SMALL DIAMETER SOLID CUTTER





SPECIFICATION	N. OF TEETH	CUTTER N.	POINT WIDTH	TAPER-BORE DIAMETER	TAPER	ASSEMBLY STYLE
0.7"~1"	4	0~24.5	0.15~0.7	25.4	1:12	Gland
1.1"	4、8		0.2~0.85			
1.3"	8、10		0.2~1.25			
1.5"	8、12		0.2~1.25			
2"	4、8、16		0.3~1.25			

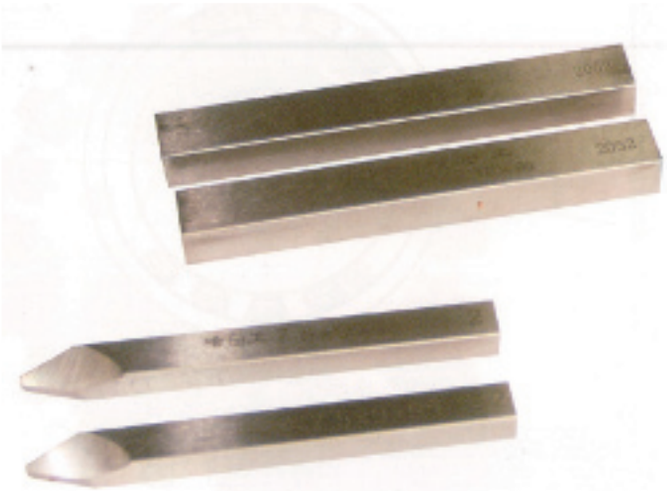
For cutting fine pitch gears and hyperbolic gear

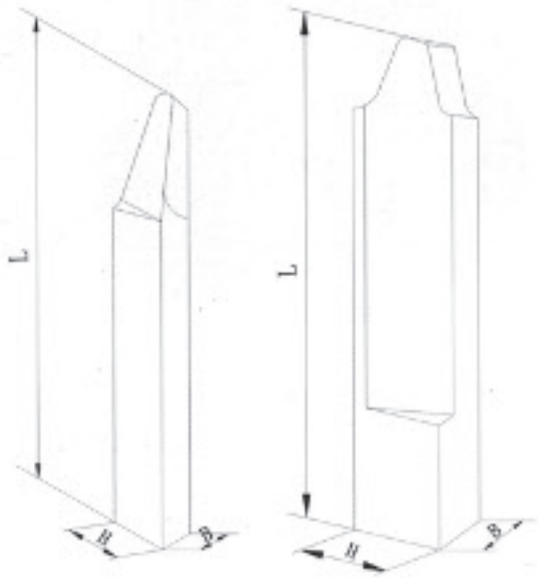


SPECIFICATION	N. OF TEETH	CUTTER N.	POINT WIDTH	TAPER-BORE DIAMETER	TAPER	ASSEMBLY STYLE
2.5"	8、12	0~24.5	0.3~1.25	25.4	1:12	Screw
2.75"	8、12、16、20		0.5~1.5			4 Screw
3"	8、16、20		0.5~1.5			
3.5"	8、16、20		0.5~1.5			
4.5"	16、20		3.2			
5"	20		4.1	58.196/58.221	1:24	
6"	20		4.1			

For cutting fine pitch gears and hyperbolic gear

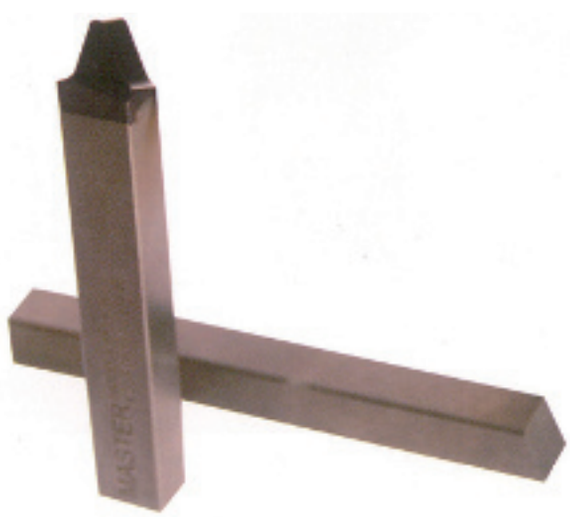
OERLIKON CUTTER BLADE (KLIMGELNBERGER & GLEASOM CUTTER)



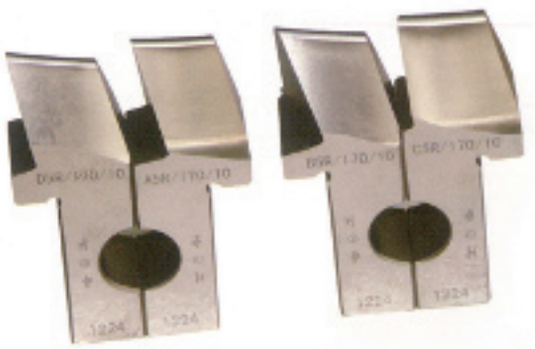


H 9	B 7.5	L 95
12.7	10.16	100
15.24	15.24	104
17	13.5	110
19.69	13.97	108
19.69	15.24	108
20	16	115
21.59	14.732	108
22.8	14.7	108
27.94	13.97	110

CARBIDE OERLIKON CUTTER BLADE



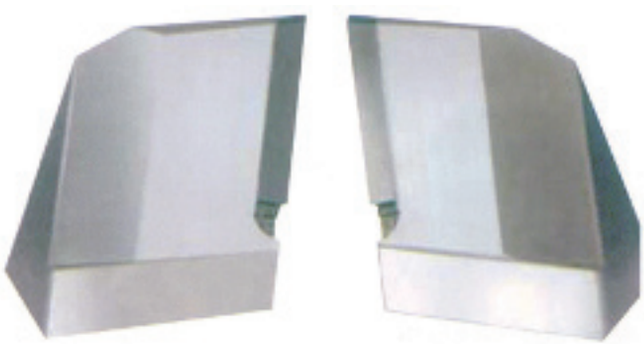
AMK KLINGELNBERG CUTTER BLADE



Klingelnberg cutter blade

Klingelnberg cutter blade
Klingelnberg cutter body and parts

HPG-S KLINGELNBERG CUTTER BLADE



TYPE	MODULE
R75	M1.5
R100	M2.6
	M3.2
	M4
	M5
R135	M4
	M5
	M6
	M7

TYPE	MODULE
R170	M7
	M8
	M10
	M12
R210	M8
	M10
	M12
	M14

TYPE	MODULE
R260	M8
	M10
	M12
	M14
	M17
GMC160	M10
	M12
	M14
	M17
	M24
	M28

Klingelnberg HPG cutting blade is for Klingelnberg cyclo palloid geometry finishing spiral bevel gear after heat treatment.
CUtting edge with CNB and welded the whole body, with the features of consistency and rigidity. The gear area is good, finish high.

KLINGELNBERG CUTTER BLADE

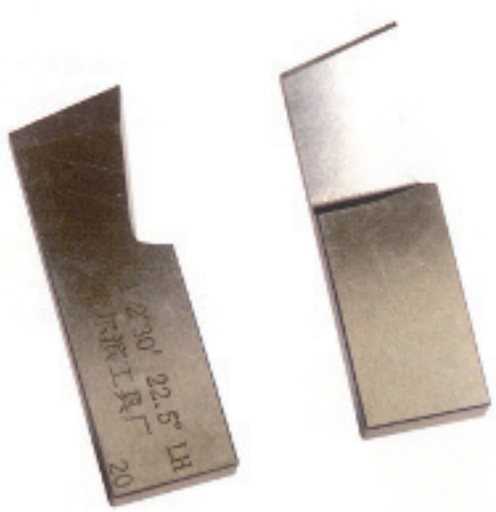
R135: M4 M5 M6 M7
R170: M7 M8 M10 M12
R210: M8 M10 M12 M14
R260: M8 M12

R75 R100 R135 R170 R210 R260

SOLID STRAIGHT BEVEL GEAR CUTTER

G104E (24-110) T-A B C D E F
G104E (24-110) U-A B C D E F

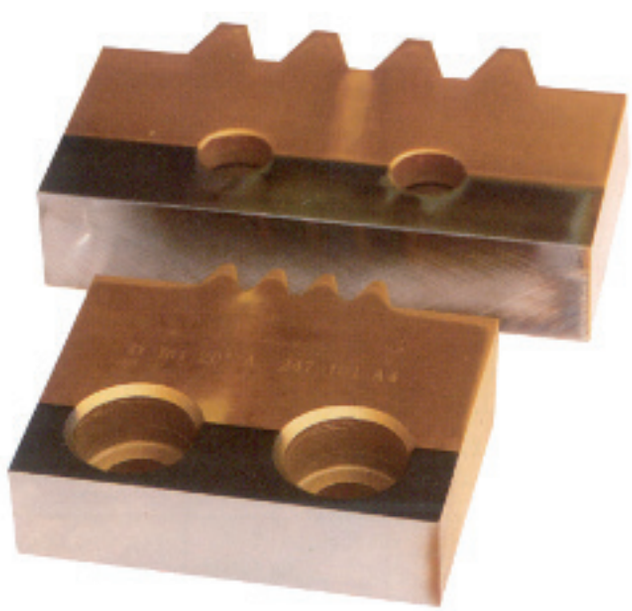
DOUBLE DISC STRAIGHT BEVEL GEAR CUTTER BLADE



concave angle	1°30' 2°30' 5°
blade point	0.4-4
No. of blade	22、28、36

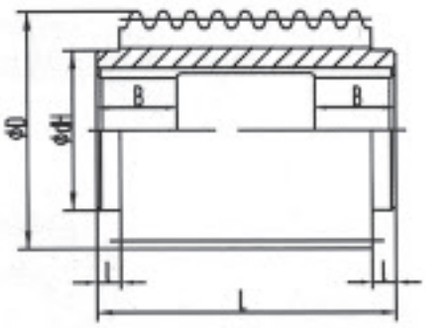
BEVEL GEAR CUTTER BLADE

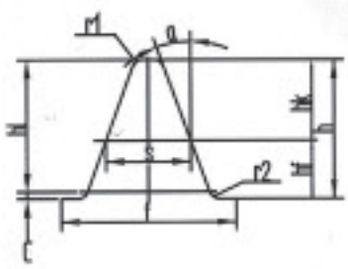
RACK TYPE CUTTER



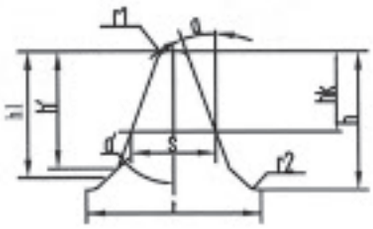
M5~M6

STANDARD GEAR HOB - TYPE I





a=20° or14.5°
hk=1.25m
hf=1.25m
h=2.5m
h1=2.25m
r1=r2=0.3m
C=0.25m
STANDARD TOOTH PROFILE



a=20° or14.5°
hk=1.25m
h1=2.25m
r1=0.3m
h' a' r2
h' a' r2 IS CALCULATED ACCORDING TO WORKPIECE'S DATA.

I TYPE AA CLASS

MODULE	OUTSIDE DIAMETER	LENGTH	DIAMETER OF HOLE	HUB DIAMETER	HUB WIDTH	N. OF TEETH
1	63	63	27	45	5	16
1.25						
1.5	71	71	32	55		
1.75						
2	80	80				
2.25						14
2.5	90	90	40	65		
2.75						
3	100	100				
3.25						
3.5						
3.75						
4	112	112				
4.5						
5	125	125	50	75		12
5.5						
6	140	140				
6.5						
7						
8	160	160	60	85		
9	180	180				
10	200	200				

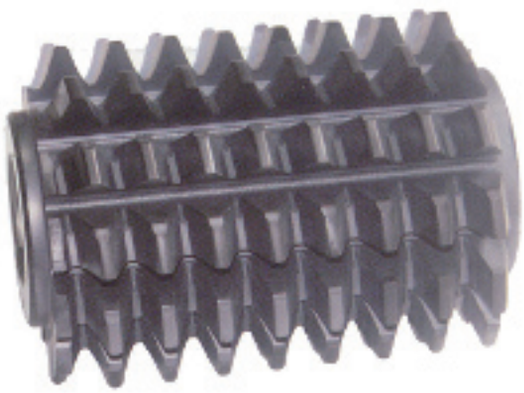
STANDARD GEAR HOB - TYPE II

II TYPE AA, A, B, C CLASS

MODULE	OUTSIDE DIAMETER	LENGTH	DIAMETER OF HOLE	HUB DIAMETER	HUB DIAMETER	N. OF TEETH
1	50	32	22	35	4	14
1.25		40				
1.5	63	40	27	45	5	
1.75						
2	71	50				
2.25						
2.5		63				
2.75						
3	80	71	32	55		12
3.25						
3.5						
3.75	90	90				
4						
4.5						
5	100	100				10
5.5	112	112	40	65		
6						
6.5	118	118				
7						
8	125	132				
9	140	140				
10	150	170	50	75		

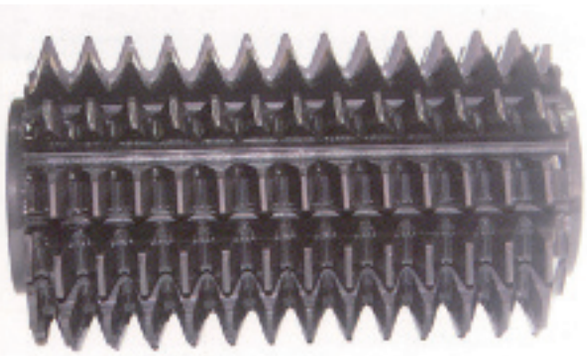
The modules 11 to 25 also accept order
And imperial sizing hole Φ 22.225, Φ 25.4, Φ 31.75, Φ 38.1, Φ 50.8 and JIS, DIN, ANS standard gear hob can also be costumized processing.

PRE-GRINDING HOB



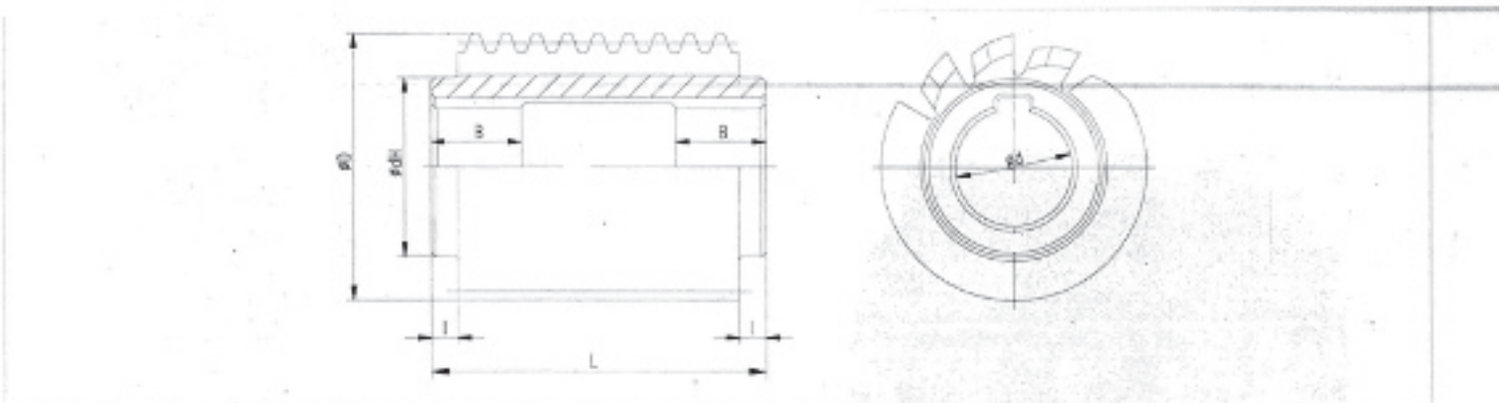
MODULE	OUTSIDE DIAMETER	LENGTH	DIAMETER OF HOLE	HUB DIAMETER	HUB WIDTH	N. OF TEETH
1	50	32	22	35	5	12
1.25		40				
1.5	63	50	27	45		
1.75						
2						
2.25	71	56				
2.5		63				
2.75						
3	80	71	32	55		
3.25						
3.5						
3.75	90	80				10
4						
4.5		90				
5	100	100				
5.5	112	112	40	65		
6						
6.5	118	118				
7		125				
8	125	132				
9	140	150				
10	150	170	50	75		

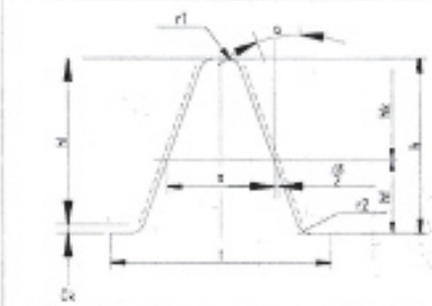
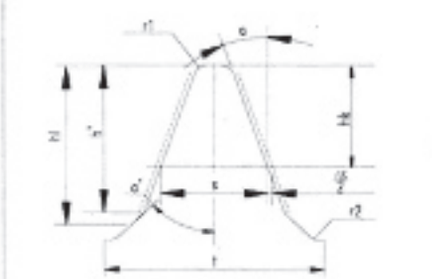
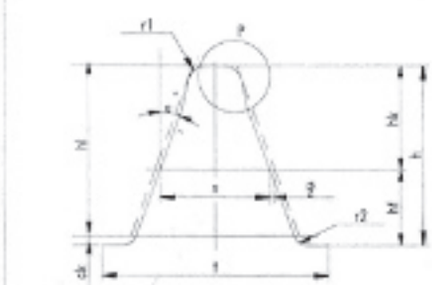
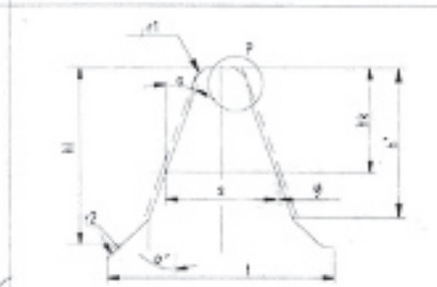
PRE-SHAVING HOB



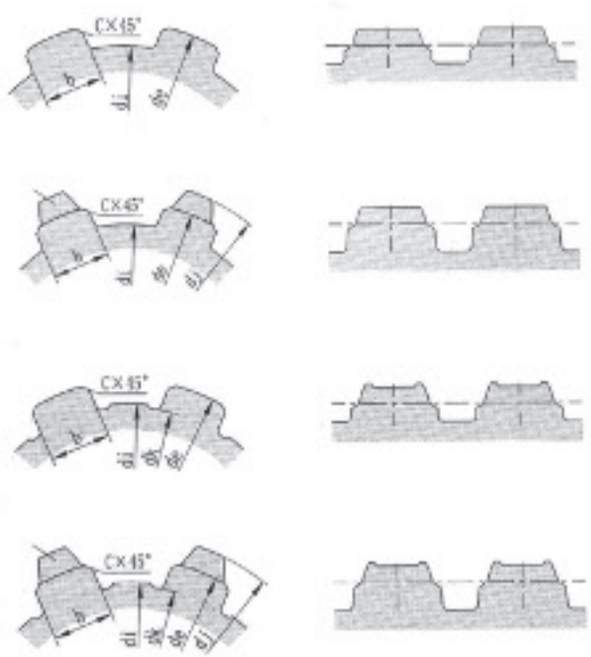
MODULE	OUTSIDE DIAMETER	LENGTH	DIAMETER OF HOLE	HUB DIAMETER	HUB WIDTH	N. OF TEETH
1	50	32	22	35	5	12
1.25		40				
1.5	63	50	27	45		
1.75						
2						
2.25	71	56				
2.5		63				
2.75						
3	80	71	32	55		
3.25						
3.5						
3.75	90	80				10
4						
4.25		90				
4.5						
5	100	100				
5.5	112	112	40	65		
6						
6.5	118	118				
7		125				
8	125	132				

PRE-SHAVING GRINDING HOB TOOTH

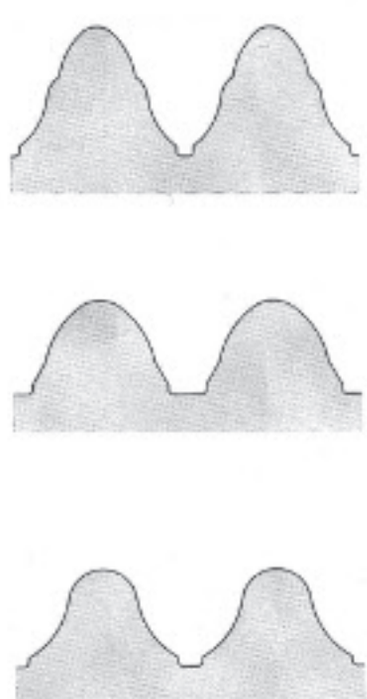


Standard tooth		a=20° or14.5° hk=1.35m hf>1.25m h>2.6m h1=2.35m r1=r2=0.3m Ck=0.25m	After hobbing, It has shaving stock or grinding stock on tooth thickness. It is finished by shaving or grinding.
semi-topping tooth		a=20° or14.5° hk=1.35m h1=2.35m r1=0.3m	H',a',r2 is calculated according to workpiece's data.Chamfer of gear outside diameter can reduce the noise. After hobbing, It has shaving stock or grinding stock on tooth thickness. t is finished by shaving or grinding. The workpiece's tooth point has chamfer.
Protuberance tooth		a=20° or14.5° hk=1.35m hf>1.25m h>2.6m h1=2.35m r2=0.3m Ck=0.25	R1 is calculated according to workpiece's data. After hobbing, It has shaving stock or grinding stock on tooth thickness. It is finished by shaving or grinding. The workpiece's tooth root has undercut.
Protuberance semi-topping tooth		a=20° or14.5° hk=1.35m h1=2.35m r1=0.3m	h' a' r2 is calculated according to workpiece's data. Chamfer of gear outside diameter can reduce the noise After hobbing, It has shaving stock or grinding stock on tooth thickness. It is finished by shaving or grinding. The workpiece's tooth root has undercut and tooth point has chamfer .

RAMT TYPE SPLINE HOB



ARC GEAR HOB



DRY CUTTING HOB

Features

Characteristics

- Increased productivity: Special HSS and multi layer coating increases cutting ability by more than 2 times, compared to a conventional Hob
- Cost savings: Increased tool life and reduced cycle time lead to cost savings
- Environmentally friendly: Cutting oil is not used

Successful Results Require

- a quality Hobbing M/C for Turbo cutting.

Application

- Mass production of gears(high volume)

Comparison of Results in a Hobbing Test between PFAUTER and MITSUBISHI

1. Machine Used : PFAUTER & MITSUBISHI
2. Work Data
   ① Material : CM818H
   ② Gear Specification : M2.95 X PA20° NT62 HA33° width 28mm

Specification		Conventional Hob	Dry Hob
Hob (PGS)	No of Start	4RH	4RH
	No of Teeth	NT16	NT16
	GL	∞	∞
	RA	8°	8°
	Material	PM	DHS2
	Coating	TiN	T.V.C
	OD	90	90
	OAL	150L	150L
	Bore	31.75	31.75
Cutting Condition	Rev	353	530
	Speed(M/Min)	Max. 100	170
	Feed	2	3.2
	Cutting Method	Climb Cutting	Climb Cutting
	Shift	1.5	1.5
	Cutting Oil	Yes	No
	Cycle Time	90.78sec	37.79sec
Cutting Amount		350ea	1,000ea
Wear Amount		Wear : 0.15	Wear : VB 0.29
		Crater : 0.20	Crater : 0.18

▶Climb cutting method should be used if possible.

HEAVY CUTTING HOB

Ordering Specifications

Performance

- Reduction of cycle time: Faster cutting with more hob teeth
- Reduction of hob wear: Reduced hob tooth flank wear and overload because of doubled hob cutting edge compared to a conventional hob
- More savings: Increased productivity through increased tool life

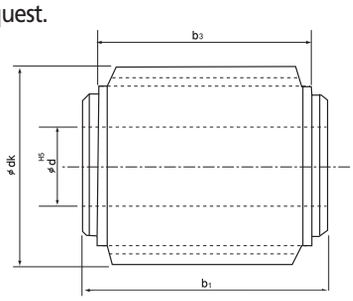
Use

Most effective when cutting large module gears and gears with many teeth

Applicable range

Module 6.0~Module 32 (A bigger module is more effective)

▶The above specification for the hob may be changed at the customer's request.

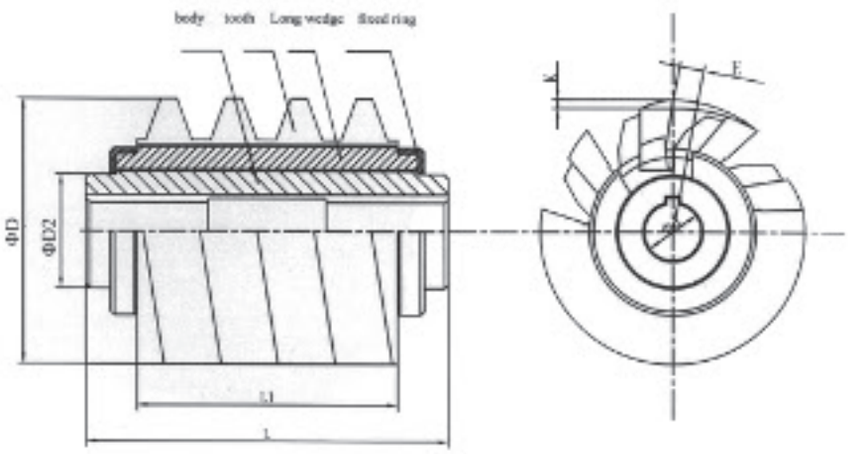


Unit: mm

Module	Pressure Angle	Out Dia (dk)	Use Total Length (b_3)	Total Length (b_1)	Inner Diameter	No of Tooth
5	20°	150	210	220	32	16
6.5	20°	150	210	220	32	16
7	20°	160	210	220	32	16
7.5	20°	160	210	220	32	16
8	20°	160	210	220	32	16
8.5	20°	160	210	220	32	16
9	20°	170	230	240	32	16
9.5	20°	170	230	240	32	16
10	20°	170	230	240	40	16
11	20°	170	230	240	40	16
12	20°	190	252	262	40	16
13	20°	190	252	262	40	16
14	20°	210	252	262	40	16
15	20°	210	252	262	40	16
16	20°	240	288	288	40	16
17	20°	240	288	288	50	16
18	20°	260	318	318	50	16
19	20°	260	318	318	50	16
20	20°	290	360	360	50	16
22	20°	300	396	396	50	16
24	20°	320	400	400	50	16
25	20°	320	400	420	50	16
26	20°	320	400	420	60	16
28	20°	330	420	440	60	16
30	20°	330	420	450	60	16
32	20°	330	420	450	70	16

▶The above indicated specification for hob might be changed with customer's request.

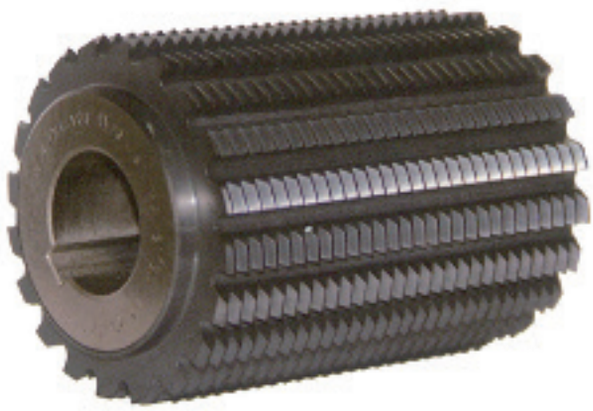
INSERTED BLADE HOB

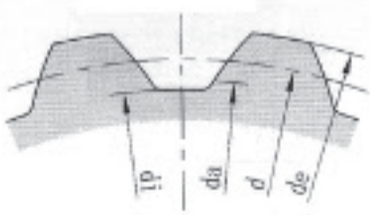


MODULE	OUTSIDE DIAMETER	LENGTH	LENGTH OF CUTTING PARTS	DIAMETER OF HOLE
9	175	170	125	50
10	180	180	135	
11	185	190	145	
12	190	200	155	
13	195	210	165	
14	200	220	175	
15	210	230	185	
16	215	240	195	
18	245	280	235	60
20	255	290	245	
22	300	340	295	80
24	310	350	305	
25	320	360	315	
26	330	370	325	
28	340	380	335	
30	350	390	345	
32	360	420	375	
35	380	530	485	

MODULE	OUTSIDE DIAMETER	LENGTH	LENGTH OF CUTTING PARTS	DIAMETER OF HOLE
10	205	220	175	60
11	215	235	190	
12	220	240	195	
14	235	260	215	
16	250	280	235	
18	265	300	255	
20	280	320	275	
22	315	335	285	
25	330	350	300	80
28	345	365	315	
30	360	385	335	
32	375	405	355	

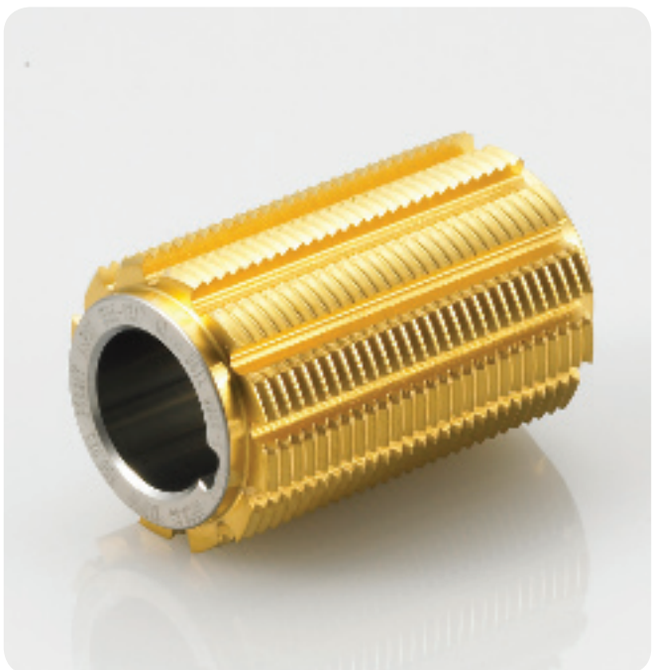
INVOLUTE SPLINE HOB





MODULE	OUTSIDE DIAMETER	LENGTH	DIAMETER OF HOLE	HUB DIAMETER	HUB WIDTH	N. OF TEETH
1	50	35	22	35	4	15
1.25		40				
1.5		50				
1.75	63	63	27	45		
2						12
2.5						
3	71	71			5	
3.5						
4	80	80	32	55		
5	90	90				
6	100	100				10
8	112	112	40	65		
10	125	125				

Tooth Profile for Involute Spline Hob

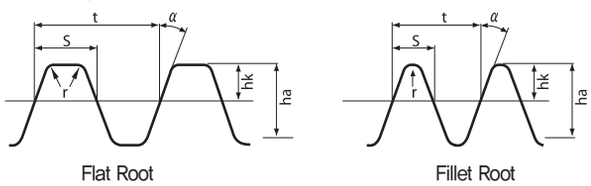


A Spline gear is used when the power transmits in the same rotating direction. The tooth profile is an involute profile. The specification is needed when ordering, as each country has a standard which follows their module value.

▲Fitted surface of tooth ▲Fitted major-diameter

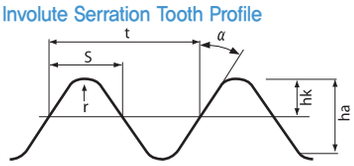
ex) Germany's industrial spline standard (pressure angle 30° ANSI B92.2: USA, inch system standard JIS/KS: D2001, B1603 standard)

Involute Spline Hob Tooth Profile



Flat Root Fillet Root

Involute Serration Tooth Profile



Unit: mm

Terms \ Standard	Old JIS Tooth Profile D2001-1959	New JIS Tooth Profile B1603-1995 ANSI B92.2M-1980 (meter system)		ANSI B92.2-1980 (inch system)			DIN Tooth Profile DIN 5480-1964
	Flat Root	Flat Root	Fillet Root	Flat Root	Fillet Root DP□16	Fillet Root DP□12	Flat Root
Module/DP	m	m		DP/DPS			m
Standard Pressure Angle(α)	20°	30°		30°			30°
Tooth Height(hk)	1.0m	0.75m	0.9m	1.35/DPS	2.0/DPS	1.8/DPS	0.6m
Cutting Length(WD)	1.2m	1.25m	1.4m	2.35/DPS	3.0/DPS	2.8/DPS	1.2m
Edge of Tooth(r)	0.3m	0.2m	0.4m	0.075/DPS	0.36/DPS	0.46/DPS	0.16m
Pitch(t)	πm	πm		25.4π/DP			πm
Tooth Thickness(s)	t/2	t/2		t/2			t/2

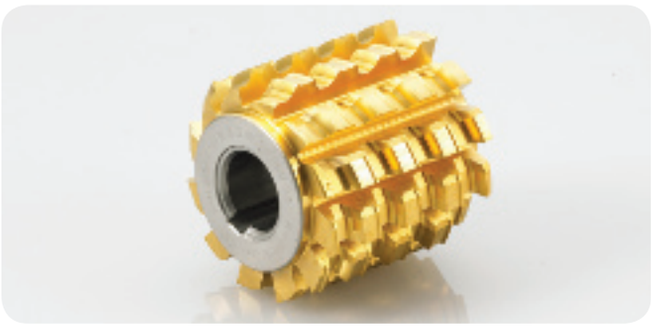
Tooth Profile for Involute Serration

Unit: mm

Terms \ Standard	Old JIS Tooth Profile D1602–1960	New JIS Tooth Profile B1603–1995 ANSI B92.2M (meter system)		ANSI B92.2-1980 (inch system)	
Module/DP	m			DP/DPS	
Standard Pressure Angle(α)	45°	37.5°	45°	37.5°	4.5°
Tooth Height(hk)	0.5m	0.7m	0.6m	1.53/DPS	1.1/DPS
Cutting Length(WD)	1.0m	1.15m	1.0m	2.53/DPS	2.1/DPS
Edge of Tooth(r)	0.4476m	0.3m	0.25m	0.4/DP	0.327/Dp
Pitch(t)	πm	πm		25.4π/DP	
Tooth Thickness(s)	1.3708m	t/2		t/2	1.3708/DP

PARALLEL SIDE SPLINE HOB

Ordering Specifications (D×d×B×N)

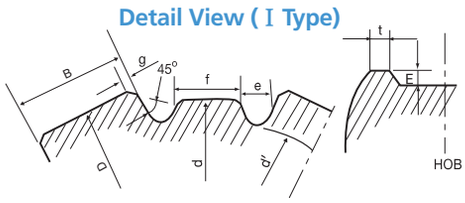


1. Out-diameter and tolerance for Parallel Side Spline(D)
2. Root-diameter and tolerance for Parallel Side Spline(d)
3. The width and tolerance for Parallel Side Spline(B)
4. No of tooth for Parallel Side Spline(N)
5. Amount of chamfer, grinding and LUG for Parallel Side Spline hob
6. Amount of grinding when it grinds during the process
7. Standard and type for Hob

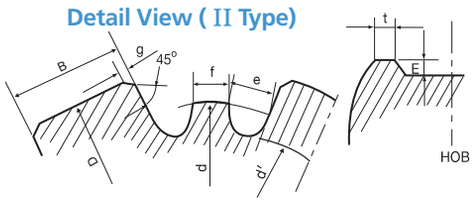
Parallel Side Spline Hob can be divided into 1 type and 2 type. ex. As shown in the table below, it is divided into MAJ dia. and MIN dia.

Parallel Side Spline Hob Dimensions

Detail View (I Type)



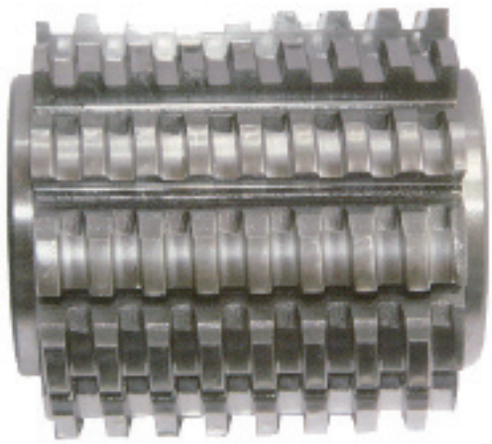
Detail View (II Type)

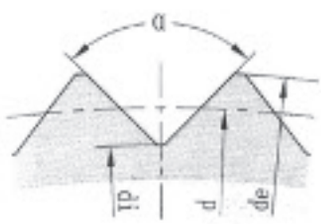


Unit: mm

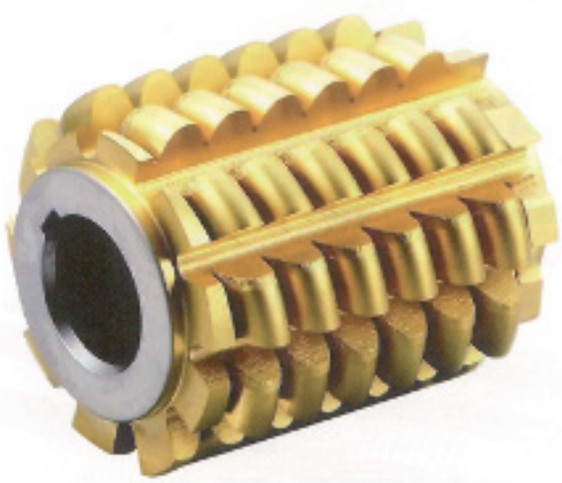
Disignation	Dimension			Dimension of Spline										
				I Type						II Type				
	Out dia	Total Length (L)	Bore dia (D)	NT N	MIN dia d	MAJ dia D	width B	chamfer amount g	NT N	MIN dia d	MAJ dia D	width B	chamfer amount g
11	60	60	22 (22.225)	6				0.3	6	11	14	3	0.3
13										13	16	3.5	
16										16	20	4	
18										18	22	5	
21	75	75	27 (25.4)							21	25	5	
23					23	26	6			23	28	6	
26					26	30	6			26	32	6	0.4
28					28	32	7			28	34	7	
32					32	36	8			32	38	8	
36					36	40	8			36	42	8	
42					42	46	10			42	48	10	
46	95	95	32 (31.75)		46	50	12			46	54	12	0.5
52					58	14	0.4	0.4		52	60	14	
56	115	115			56	62	14			56	65	14	
62					62	68	16			62	72	16	
72	135	175	40 (38.1)		78	18	18			72	82	18	
82					82	88	20			82	92	20	
92	145	190			92	98	22			92	102	22	
32	75	75	27 (26.988)	8	36	6	6		8	32	32	6	0.4
36					36	40	7			36	42	7	
42					42	46	8			42	48	8	
46	95	90	32 (31.75)		50	9	9			46	54	9	0.5
52					52	58	10	0.5		52	60	10	
56					56	62	10			56	65	10	
62					62	68	12			62	72	12	
72					72	78	12		10	10	72	82	
82	115	115		10	82	88	12			82	92	12	
92					92	98	14			92	102	14	
102					102	108	16			102	112	16	
112					112	120	18			112	125	18	

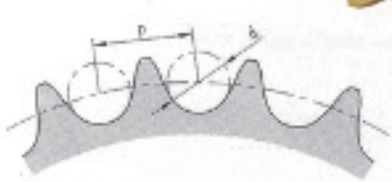
INVOLUTE SPLINE HOB





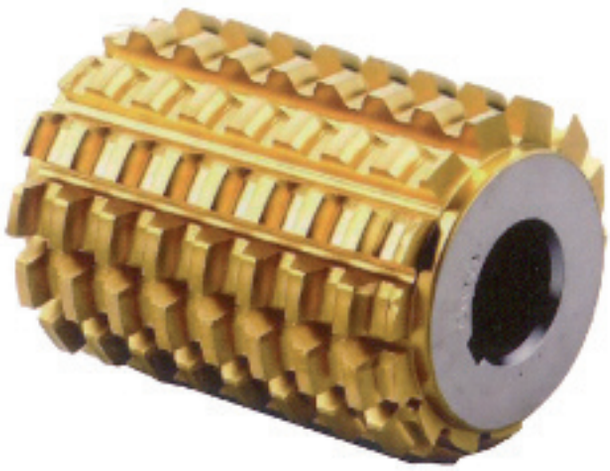
ROLLER CHAIN SPROCKET HOB

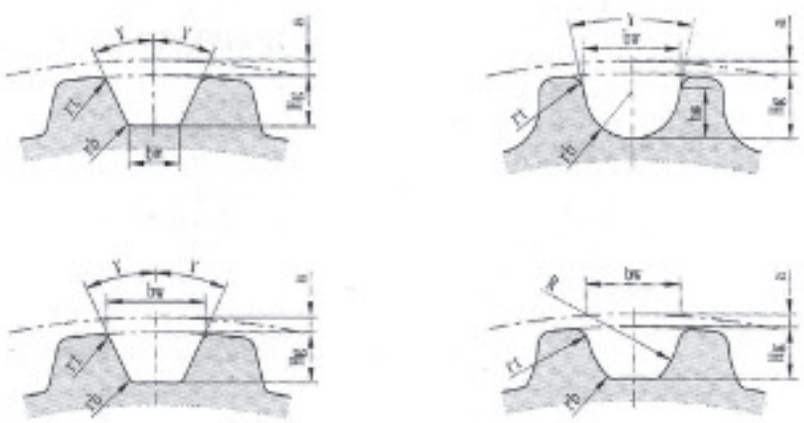




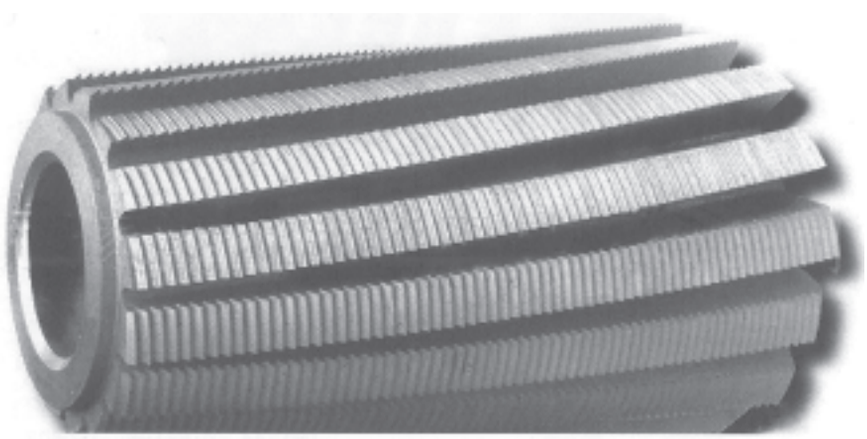
GB1244 DIN8196 ISO606 BS228
ANSI B29.1M JIS B1802

TIMING PULLEY HOB





RACK TYPE GEAR HOB



Ordering Specifications

1. Belt specification (Pitch & Belt Type)
2. Belt maker's instructions
3. NT of pulley
4. Pulley profile (Detail View)
5. Hob dimensions (OD X L X d)

Note: When you order please provide the name of the belt maker because each manufacturer's tooth profile varies.
Even if the standard for the timing hob you request is the same tooth profile, it may be different according to the belt maker.

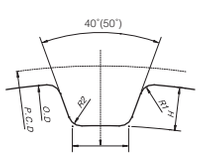
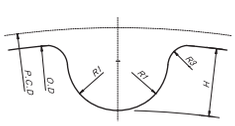
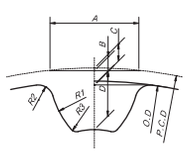
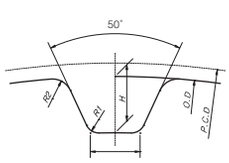
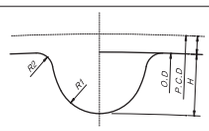
▶ Standard formula for pulley gear

$m = CP \div \pi$

$PCD = m \times Z$

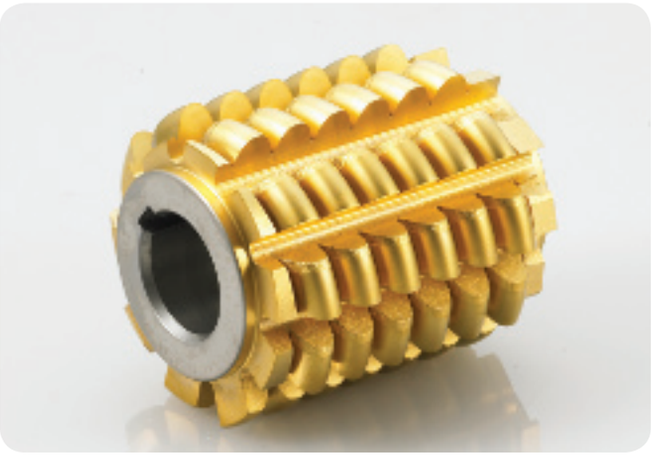
$OD = PCD - (CK \times 2)$

Timing Pulley Profile

Timing Belt Profile		Belt Type	Common Use Ranges
S.T.D		MXL(2.032)	10-23T, 24-R
		XL(5.08)	10-R
		L(9.525)	10-R
		H(12.7)	14-19T, 20-R
		XH(22.225)	18-R
		XXH(31.75)	18-R
H.T.D		2M	
		3M	9-15T, 16-25T, 26-80T, 81-R
		5M	11-16T, 17-31T, 32-79T, 80-200T
		8M	18-27T, 28-40T, 41-89T, 90-200T
		14M	28-40T, 41-89T, 90-R
		20M	28-40T, 41-R
S.T.S		2M	
		3M	16-25T, 26-80T
		5M	19-22T, 23-28T, 29-39T, 40-69T
		8M	18-23, 24-69, 49-120
		14M	28-36T, 37-51T, 52-100T, 100-200T
		20M	
(A.T)D.T		AT5	10-14T, 15-20T, 21-R
		AT10	12-15T, 16-20T, 21-R
		AT20	15-20T, 21-R
		(D) T5	13-17T, 18-25T, 26-40T, 41-R
		(D)T10	12-15T, 16-20T, 21-45T, 46-114T
		(D)T20	15-20T, 21-R
G.T		2GT	16-25T, 26-80T
		3GT	16-25T, 26-50T
		5GT	17-31T, 32-79T
		8GT	18-28T, 29-89T

ROLLER CHAIN SPROCKET HOB

Ordering Specifications

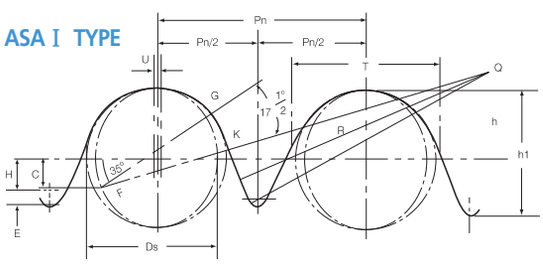


1. Standard for chain(ASA-1, ASA-2, JUS-S, JIS-U, DIN, BS)
2. Pitch for chain
3. Roll diameter
4. No of chain
5. Specification for arbor which uses customer's machine.

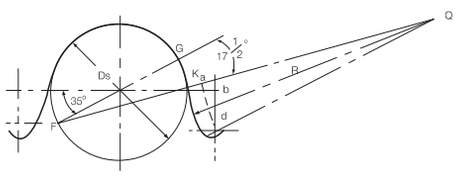
Note: The measurement for standard DIN/BS (8180, 8187, 8188, 8197) is different so it needs to be specified when you order.

Tooth Profile

ASA I TYPE



ASA II TYPE



Unit: mm

Dimension of chain sprocket			Hob dimension			
CP	RD	KS, ASA I, II Chain No.	OD	Total Length	Bore dia	
					A type	B type
6.35 (1/4")	3.30	RS25	60	60	22	22.225
9.525 (3/8")	5.08	35	65	65		
9.525 (3/8")	6.35	35	65	65		
12.7 (1/2")	7.77 (Agricultural M/C)	41	75	75	27	25.4 (26.988)
12.7 (1/2")	7.95 (Standard Industry)	40	75	75		
12.7 (1/2")	8.5(Autobicycle)	40	75	75		
15.875 (5/8")	10.16	50	85	90		
19.05 (3/4")	11.907	60	90	105		
25.4 (1")	15.875	80	110	125	32	31.75
31.75 (1 1/4")	19.05	100	120	140		
38.1 (1 1/2")	22.225	120	130	170		
44.45 (1 3/4")	25.4	140	160	190	40	38.1
50.8 (2")	28.575	160	170	210		
57.15 (2 1/4")	35.72	180	190	240		
63.5 (2 1/2")	39.688	200	210	260	50	50.8
76.2 (3")	47.625	240	240	310		
88.9 (3.5")	53.98	56B	280	310	60	63.5
101.60 (4")	63.5	64B	300	350		
114.30 (4.5")	72.39	72B	320	390		

Ordering Specifications

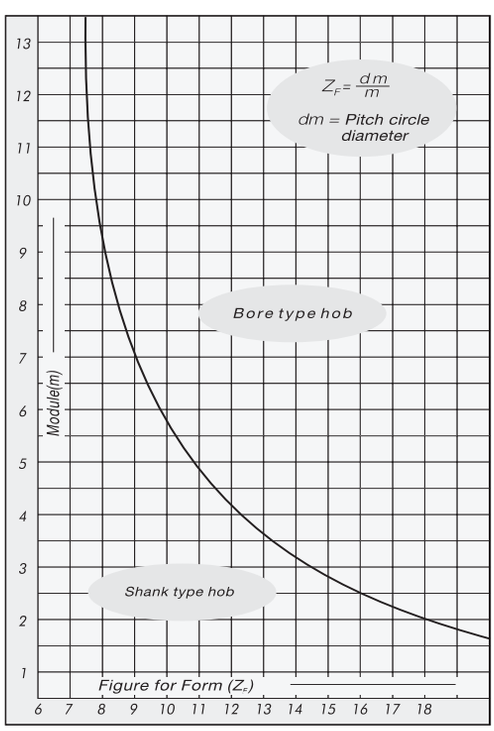
A worm hob is designed based on the worm shaft specification. There are no standards for worm gear hobs.
Generally this hob is manufactured as 'ZK' type. Since the overall dimensions of the hob are determined by the worm shaft and worm wheel data, please specify the following data when ordering:

1. Normal or axial module, DP
2. Out dia or pitch dia of worm
3. Worm lead angle
4. Number of threads and hand of thread
5. In case of shank type, shank standard
6. Contact ratio (Non-Standard): Standard contact ratio is generally 20~30%, and users can select either hole or shank type.

- CAVEX WORM - It's different based on the tooth maker. Please discuss when you order.
- The out-diameter of hob is decided with out-diameter of worm and sometimes it's impossible to produce with an Arbor Type Hob.

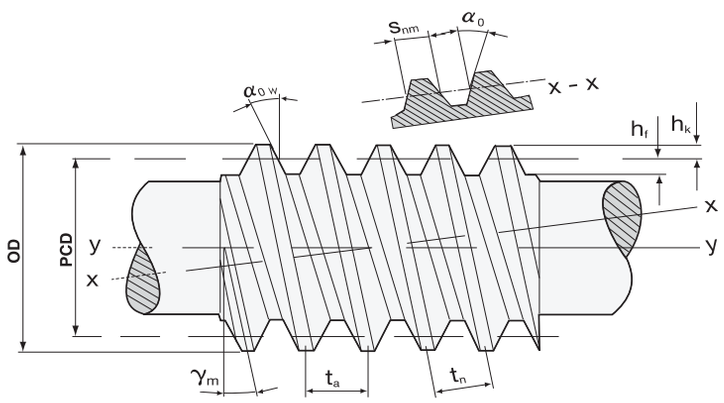
When ordering a combination worm hob and arbor, please provide the arbor specification, taper of the hobbing machine, setting bolt standard and hob rotating direction.
In addition specify whether the contact of the arbor is right or left.

Selection Graph for Worm Hob



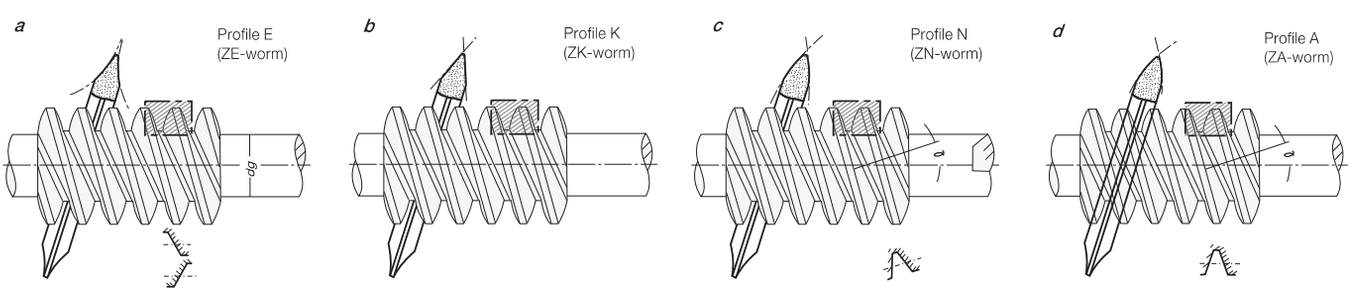
WORM WHEEL & SHAFT

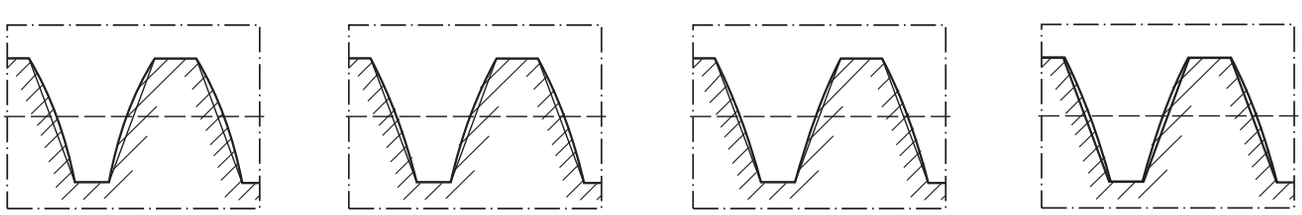
Worm Wheel & Shaft



x–x	normal section
y–y	axial section
PCD	pitch diameter
OD	outside diameter
t_n–t_a	normal & axial pitch
s_{nm}	normal tooth thickness on the pitch circle
γ_m	helix angle
α_0– α_{0w}	normal & axial pressure angle
h_k	addendum
hf	dedendum
m_n–m_s	normal & axial module
Z_1	number of threads
R–L	hand of thread-right or left
Z_2	number of teeth in mating worm gear

Profile of Worm Shaft





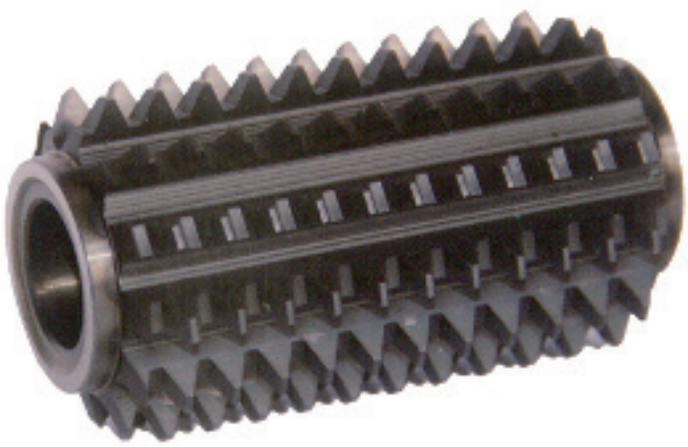
ZE-TYPE
Involute form profile of worm shaft profile

ZK-TYPE
The profile is generated by the pressure angle of grinding wheel

ZN-TYPE
A straight pressure angle in the normal plane

ZA-TYPE
A straight pressure angle in the axial plane

CARBIDE HOB



（module）：M0.5–M3.0
（accuracy class）：DIN3968,classA/AA/AAA

Carbide Hob's Characteristics

High cutting speeds

Short machining times

A longer tool life than conventional HSS cutter（≈ HRC60）

High hardness gear machining

Shorter replacement cycle to reducing gear processing cycle

High efficiency and accuracy gear can be processed

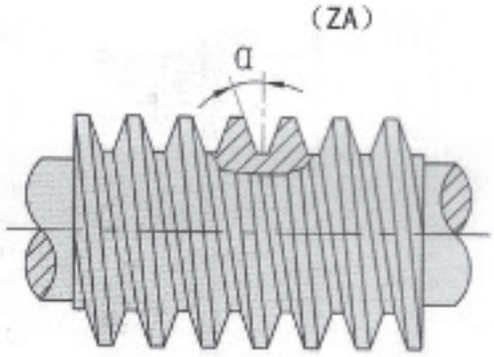
High suitability for dry machining

Lower gear generation costs

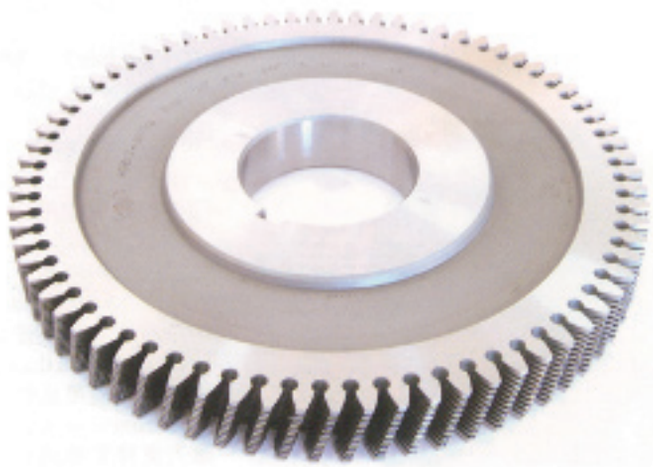
WORM GEAR HOB

m1.0-10.0
DP24~2.50

M2 M42 M35 ASP2030 S390



DISC TYPE GEAR SHAVING CUTTER



Nominal Pitch Diameter 180 mm α 20° β 5°

MODULE	N. OF TEETH	HELIX	PITCH DIAMETER	OUTSIDE DIAMETER	THICKNESS	DIAMETER OF HOLE
1.25	115	5°	144.299	149.25	20	63.5
1.50	115	5°	173.159	178.66		
1.75	100	5°	175.668	181.72		
2.00	83	5°	166.634	171.714	20	63.5
2.25	73	5°	164.877	170.518		
2.50	67	5°	168.140	174.32		
2.75	61	5°	168.391	175.131		
3.00	53	5°	159.607	167.307		
3.25	53	5°	172.908	181.948		
3.50	47	5°	165.128	175.728		
3.75	43	5°	161.866	174.006		
4.00	41	5°	164.626	177.726		
4.50	37	5°	167.136	182.136		
5.00	31	5°	155.592	173.492		
5.50	29	5°	160.109	179.709		
6.00	27	5°	162.619	184.319		

Nominal Pitch Diameter 180 mm α 20° β 15°

MODULE	N. OF TEETH	HELIX	PITCH DIAMETER	OUTSIDE DIAMETER	THICKNESS	DIAMETER OF HOLE
1.25	115	15°	148.821	153.77	20	63.5
1.50	115	15°	178.585	184.09		
1.75	100	15°	181.173	187.22		
2.00	83	15°	171.856	176.936	20	63.5
2.25	73	15°	170.044	175.685		
2.50	67	15°	173.409	179.590		
2.75	61	15°	173.668	180.408		
3.00	53	15°	164.609	172.310		
3.25	53	15°	178.326	186.567		
3.50	47	15°	170.303	179.763		
3.75	43	15°	166.938	178.159		
4.00	41	15°	169.785	181.866		
4.50	37	15°	172.373	186.394		
5.00	31	15°	160.468	177.369		
5.50	29	15°	165.127	183.827		
6.00	27	15°	167.715	187.856		

Nominal Pitch Diameter 240 mm α 20° β 5°

MODULE	N. OF TEETH	HELIX	PITCH DIAMETER	OUTSIDE DIAMETER	THICKNESS	DIAMETER OF HOLE
2.00	115	5°	230.879	235.819	25	63.5
2.25	103	5°	232.635	238.135		
2.50	91	5°	228.369	234.549		
2.75	83	5°	229.122	235.862		
3.00	73	5°	219.837	227.536		
3.25	67	5°	218.582	226.822		
3.50	61	5°	214.316	223.115		
3.75	61	5°	229.624	238.964		
4.00	53	5°	212.810	222.71		
4.50	51	5°	230.377	241.377		
5.00	43	5°	215.821	229.921		
5.50	41	5°	226.361	241.901		
6.00	37	5°	222.848	240.708		
6.50	35	5°	228.369	247.989		
7.00	31	5°	217.829	240.189		
8.00	27	5°	216.825	243.445		

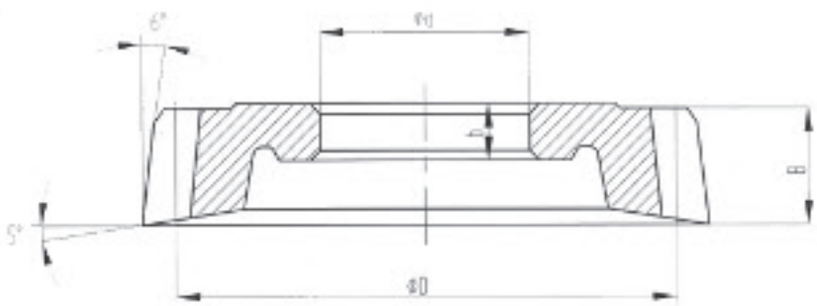
Nominal Pitch Diameter 240 mm α 20° β 15°

MODULE	N. OF TEETH	HELIX	PITCH DIAMETER	OUTSIDE DIAMETER	THICKNESS	DIAMETER OF HOLE
2.00	115	15°	238.114	243.054	25	63.5
2.25	103	15°	239.925	245.425		
2.50	91	15°	235.525	241.705		
2.75	83	15°	236.302	243.042		
3.00	73	15°	226.725	234.425		
3.25	67	15°	225.431	233.671		
3.50	61	15°	221.031	229.831		
3.75	61	15°	236.819	246.159		
4.00	53	15°	219.479	229.379		
4.50	51	15°	237.596	248.596		
5.00	43	15°	222.584	234.684		
5.50	41	15°	233.455	246.655		
6.00	37	15°	229.831	246.471		
6.50	35	15°	235.525	253.885		
7.00	31	15°	224.655	245.815		
8.00	27	15°	223.620	249.06		

PLUNGE METHOD GEAR SHAVING CUTTER

MODULE	HELIX	PITCH DIA	WIDTH
1.5~8	5°~30°	180~240	17~73

DISC TYPE SHAPER CUTTER



Nominal Pitch Diameter Φ 75 mm m1~4 α 20°

m	z	D		b	ha*	B
1.00	76	76.00	31.743	10	1.25	15
1.25	60	75.00				
1.50	50	75.00				
1.75	43	75.25				17
2.00	38	76.00				
2.25	34	76.50				
2.50	30	75.00				
2.75	28	77.00				
3.00	25	75.00				
3.25	24	78.00				20
3.50	22	77.00				
3.75	20	75.00				
4.00	19	76.00				

Nominal Pitch Diameter Φ 100 mm m1~6 α 20°

m	z	D	d	b	ha*	B
1.00	100	100.00	31.743	10	1.25	18
1.25	80	100.00				
1.50	68	102.00		12		22
1.75	58	101.50				
2.00	50	100.00				
2.25	45	101.25				
2.50	40	100.00				
2.75	36	99.00				
3.00	34	102.00				
3.25	31	100.75				
3.50	29	101.50				24
3.75	27	101.25				
4.00	25	100.00				
4.50	22	99.00			1.3	
5.00	20	100.00				
5.50	19	104.50				
6.00	18	108.00				

Nominal Pitch Diameter Φ 125 mm m4~8 α 20°

m	z	D	d	b	ha*	B
4.0	31	124.0	31.743	13	1.3	30
4.5	28	126.0				
5.0	25	125.0				
5.5	23	126.5				
6.0	21	126.0				
6.5	19	123.5				
7.0	18	126.0				
8.0	16	128.0				

Nominal Pitch Diameter Φ 160 mm m6~10 α 20°

m	z	D	d	b	ha*	B
6.0	27	162.0	88.9	18	1.25	35
6.5	25	162.5				
7.0	23	161.0				
8.0	20	160.0				
9.0	18	162.0				
10.0	16	160.0				

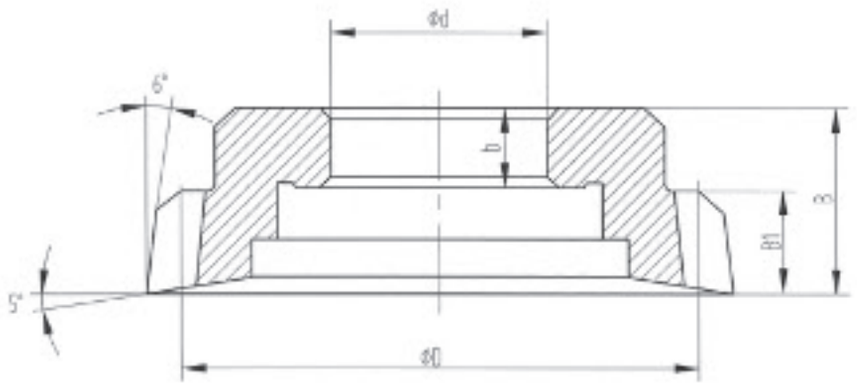
Nominal Pitch Diameter Φ 200 mm m8~12 α 20°

m	z	D	d	b	ha*	B
8	25	200	101.6	20	1.25	40
9	22	198				
10	20	200				
11	18	198				
12	17	204				

Nominal Pitch Diameter Φ 240 mm m14~16 α 20°

m	z	D	d	b	ha*	B
14	17	238	101.6	20	1.25	45
16	15	240				

DEEP COUNTERBORE TYPE SHAPER CUTTER



Nominal Pitch Diameter Φ 50 mm m1~3.5 α 20°

m	z	d	d	ha*	B1	B
1.00	50	50.00	20	1.25	14	25
1.25	40	50.00				
1.50	34	51.00			17	
1.75	29	50.75				
2.00	25	50.00				
2.25	22	49.50				
2.50	20	50.00				
2.75	18	49.50				
3.00	17	51.00			20	27
3.25	15	48.75				
3.50	14	49.00				

Nominal Pitch Diameter Φ 75 mm m1~4 α 20°

m	z	d	d	ha*	B1	B
1.00	76	76.00	31.743	1.25	15	30
1.25	60	75.00				
1.50	50	75.00			17	
2.00	38	76.00				
2.25	34	76.50				
2.50	30	75.00				
2.75	28	77.00				
3.00	25	75.00			20	32
3.25	24	78.00				
3.75	20	75.00				
4.00	19	76.00				

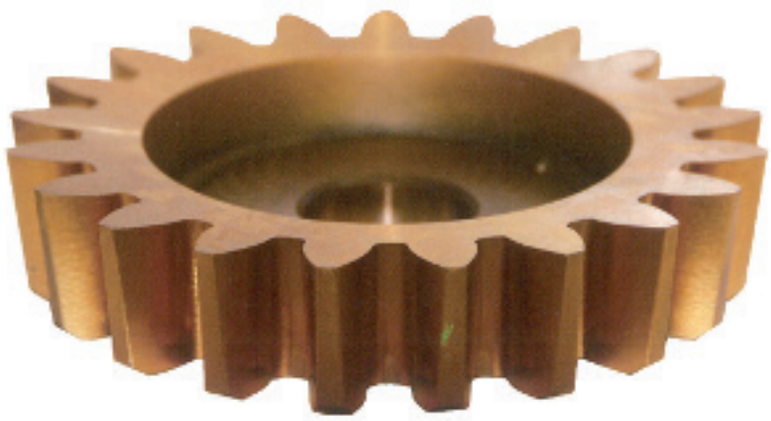
Nominal Pitch Diameter Φ 100 mm m1~6 α 20°

m	z	d	d	ha*	B1	B
1.00	100	100.00	31.743	1.25	18	32
1.25	80	100.00				
1.50	68	102.00			22	34
2.00	50	100.00				
2.25	45	101.25				
2.50	40	100.00				
2.75	36	99.00				
3.00	34	102.00				
3.25	31	100.75			24	36
3.75	27	101.25				
4.00	25	100.00				
4.50	22	99.00		1.3		
5.00	20	100.00				
5.50	19	104.50				
6.00	18	108.00				

Nominal Pitch Diameter Φ 125 mm m4~8 α 20°

m	z	d	d	ha*	B1	B
4.0	31	124.0	31.743	1.3	28	40
4.5	28	126.0				
5.0	25	125.0				
6.0	21	126.0				
6.5	19	123.5				
7.0	18	126.0				
8.0	16	128.0				

INVOLUTE INSIDE SPLINE SHAPER CUTTER



Nominal Pitch Diameter Φ 50 mm m3~5 α 30°

MODULE	N. OF TEETH	PITCH DIAMETER	DIAMETER OF HOLE	INNER HOLE TICKNESS	TEETH TICKNESS	TICKNESS
3.0	16	48	20	10	20	27
3.5	14	49				
4.0	13	52				
5.0	11	55				

Nominal Pitch Diameter Φ 75 mm m3.5~6 α 30°

MODULE	N. OF TEETH	PITCH DIAMETER	DIAMETER OF HOLE	INNER HOLE TICKNESS	TEETH TICKNESS	TICKNESS
3.5	21	73.5	31.743	10	20	32
4	19	76.0				
5	15	75.0				
6	13	78.0				

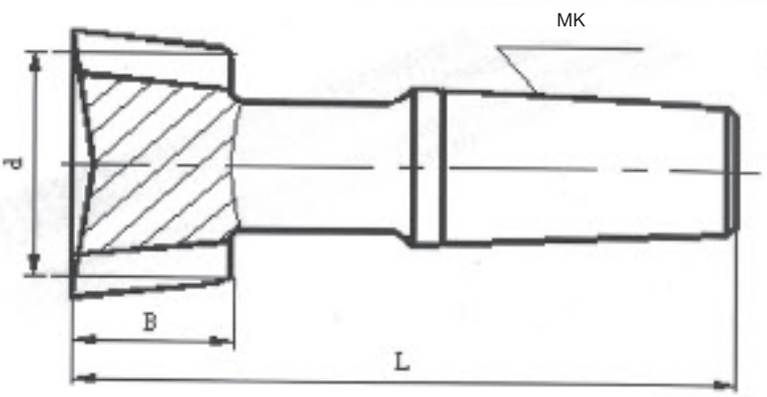
Nominal Pitch Diameter Φ 100 mm m5~10 α 30°

MODULE	N. OF TEETH	PITCH DIAMETER	DIAMETER OF HOLE	INNER HOLE TICKNESS	TEETH TICKNESS	TICKNESS
5	20	100	31.743	10	24	36
6	17	102				
8	12	96				
10	10	100				

Nominal Pitch Diameter Φ 125 mm m5~10 α 30°

MODULE	N. OF TEETH	PITCH DIAMETER	DIAMETER OF HOLE	INNER HOLE TICKNESS	TEETH TICKNESS	TICKNESS
8	16	128	31.743	13	28	40
10	13	130				

TAPER SHANK TYPE SHAPER CUTTER



Nominal Pitch Diameter Φ 25 mm m1~2.5 α 20°

m	z	d	L	B		
1.00	26	26.00	75	10	17.981	2#
1.25	20	25.00				
1.50	18	27.00				
1.75	15	26.25				
2.00	13	26.00	80	12		
2.25	12	27.00				
2.50	10	25.00				
2.75	10	27.50		15		

Nominal Pitch Diameter Φ 38 mm m1~3.75 α 20°

m	z	d	L	B		
1.00	38	38.00	90	12	24.051	3#
1.25	30	37.50				
1.50	25	37.50				
1.75	22	38.50		15		
2.00	19	38.00				
2.25	16	36.00				
2.50	15	37.50				
2.75	14	38.50				
3.00	12	36.00				
3.25	12	39.00				
3.50	11	38.50				
3.75	10	37.50				

ROUND BROACH

AVERAGE DIAMETER	LENGTH
Φ10-Φ80	10-110

RAMT TYPE SPLINE BROACH

AVERAGE WIDTH OF KEY	NUMBER OF KEY	LENGTH
4-36	4-48	30-320

INVOLUTE SPLINE BROACH

MODULE	NUMBER OF KEY	LENGTH
M1-M5	12-36	20-180

In 2013, our company introduced a complete set of Oerlikon Balzers coating system INNOVA.

The powerful coating system which comes from Liechtenstein will provide to you BALINIT® A (TiN), BALINIT® FUTNRA NANO (TiAIN), BALINIT® ALCRONA PRO (AlCrN) and BALINIT® ALDURA (AlCrXN-Si)-All rounder at the top level.

THE ADVANTAGE OF INNOVA

INNOVA is the top level coating system from Oerlikon Balzers for now.

The unique etching technology to furtherimprove coating adhesion.

Advenced coating technology makes INNOVA overcomes the traditional composite layer with wear and reduce the disadvantages of the hardness, the hardness of surface layer and base is consistent, greatly improve the wearability of the cutting tool.

The properties of the coating (such as hardness, structure, chemical and temperature resistance, adhesion) can be accurately controller to the customer different processing environment to provide personalized service.

RECOMENDED APPLICATIONS

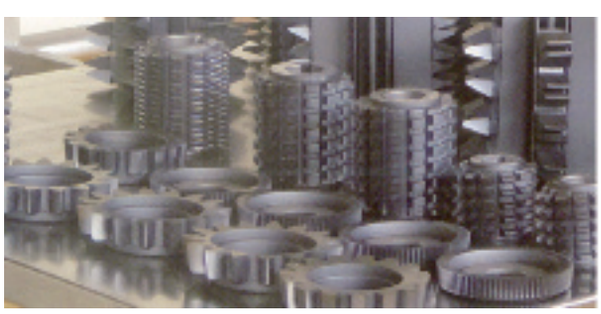
HSS spiral bevel gear cutter

Carbide and HSS hobs

Carbide cutter blade

Solid carbide end mills and modular milling tools for roughing and finishing

HSS ens mills for roughing and finishing



ALCRONA PRO coating cutters

ORDERING INFORMATION FOR HOBS		ONISHI HIROCO		
Reference part number		Hob data		
☐ Module ☐ DP ☐ CP		Hob number		
Number of teeth		Hob specification	☐ Precision ☐ Pre-Shaving	☐ Pre-Grinding
Pressure angle		Thread number		
Helix angle		Hand of helix	☐ LH	☐ RH
Hand of helix		Outside diameter		
Outside diameter		Lenght		
Root diameter		Bore diameter	☐ Ø 16 ☐ Ø 22 ☐ Ø 27 ☐ Ø 32 ☐ Ø 40 ☐ Ø 50	
☐ _____ After finishing base tangent length ☐ _____ Over pin distance ☐ _____ Normal circular thickness	_____ Given number of teeth _____ Pin diameter			
☐ _____ Start of active profile diameter ☐ _____ Number of teeth on mating gear _____ Root diameter _____ normal center distance _____ modification coefficient	_____ Outside diameter	Number of teeth		
Hobbing process requirement		Accuracy class	☐ GB6084 ☐ DIN5480 ☐ _____	☐ AA ☐ A ☐ B
☐ _____ Hobbing process base tangent length ☐ _____ Over pin distance ☐ _____ Normal circular tooth thickness ☐ _____ Single sidenormal to finishing allowance	_____ Given number of teeth _____ Pin diameter	Hob material	☐ M2 ☐ M35 ☐ M42 ☐ _____	
Topping hob		Coating	☐ TIN ☐ TIALN ☐ _____	
Dedendum arc		Order quantity	☐ 1 ☐ 2 ☐ 3 ☐ _____	
☐ _____ Hobbing process chamfer ofrodius direction _____ Width of the chamfered _____ Height of the chamfered ☐ _____ Finishing stock on tooth chamfer ofrodius direction _____ Width of the chamfered _____ Height of the chamfered		According to the requirement of user selected in ☐		

RC-GEAR CUT

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