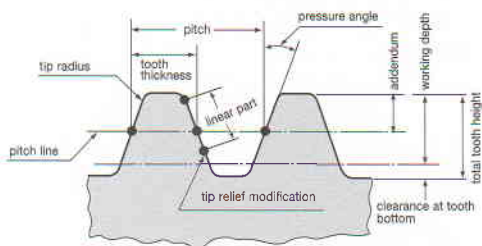
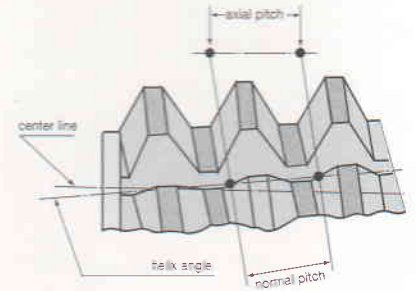
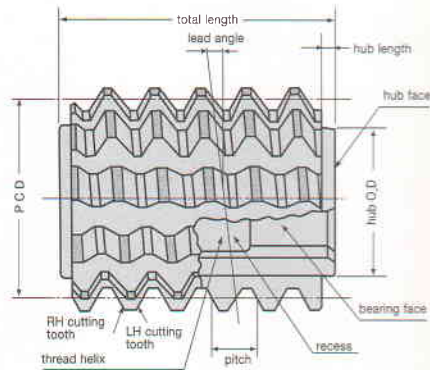
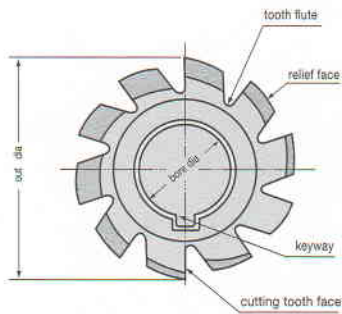
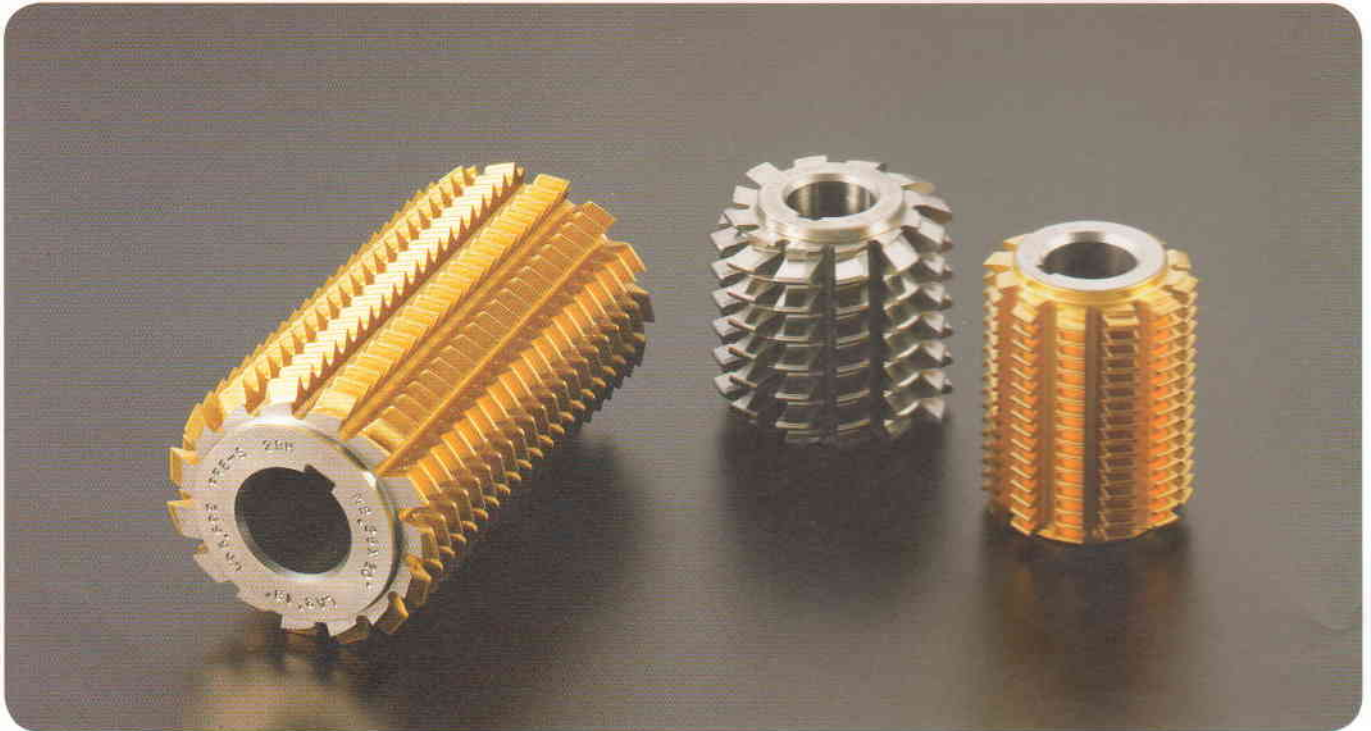


Hob Nomenclature



Clearance of tooth bottom	$CK=0.25m$
Tip radius	$r=Full-R, 0.3m$
Pitch	$nP=\pi \cdot m$
Tooth thickness	$S_n=nP/2$
Module	m
Pressure angle	$PA=20^\circ$
Addendum	$1.25m$
Working depth	$D+F=2.25m$
Total tooth height	$h=2.5m$

Specifications



Unit:

Module M	Diametral Pitch DP	Standard Hob						
		Out dia	Total Length	Bore dia	Hub dia	Hub Width	Bearing Face	N.T
1	24-22	50	50	22(22.225)	34	4	(12)	12
1.25	20	50	50		34		(12)	
1.5	18-16	55	55		36		(14)	
1.75	14	55	55		36		(14)	
2	12	60	60		38		(15)	
2.25	11	60	60		38		(15)	
2.5	10	65	65		38		(16)	
2.75	9	65	65		38		(16)	
3	8	70	70		42		18	
3.25		70	70		42		18	
3.5		75	75	45	20			
3.75	7	80	75	50	20			
4	6	85	80	52	20			
4.5	5.5	90	85	52	22			
5	5	95	90	52	22			
5.5	4.5	100	95	58	24			
6		105	100	60	25			
6.5		110	110	60	28			
7	3.5	115	115	60	28			
8	3	120	130	60	32			
9	2.65	125	145	60	36			
10	2.5	130	160	60	40			
11	2.25	150	175	60	44			
12		160	190	60	48			
13		170	200	70	50			
14	1.75	180	210	70	52			
15		190	220	74	54			
16	1.5	200	230	84	58			
18		220	250	94	62			
20	1.25	240	270	94	65			
22		250	300	94	68			
24		260	320	100	75			
25	1	270	320	100	80			
26		280	340		18			
28		300	360	60				
30		310	380					
32		320	410					
34		360	410	80	20		8	
35		370	420					
36		380	440					
38		390	460					
40		400	480					

► For 32 Module and above, consult sales department.

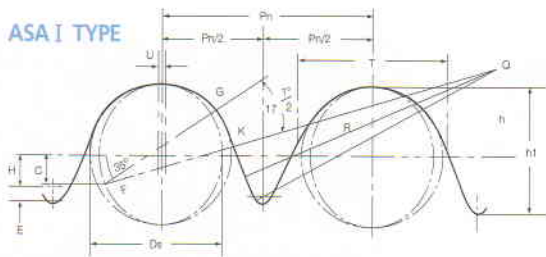
Ordering Specifications



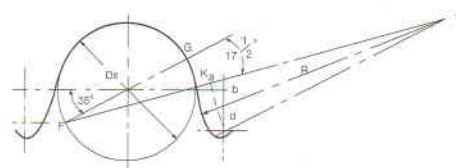
1. Standard for chain(ASA-1, ASA-2, JUS-5, JIS-U, DIN, BS)
2. Pitch for chain
3. Roll diameter
4. No of chain
5. Specification for arbor which uses customer's machine.

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

Tooth Profile



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		
50.8 (2")	28.575	160	170	210	40	38.1
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		
101.60 (4")	63.5	64B	300	350	60	63.5
114.30 (4.5")	72.39	72B	320	390		

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 α)

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

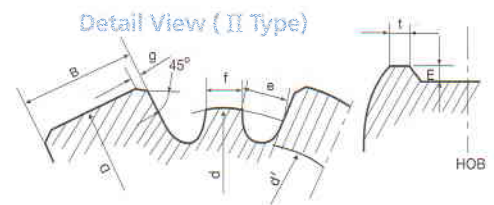
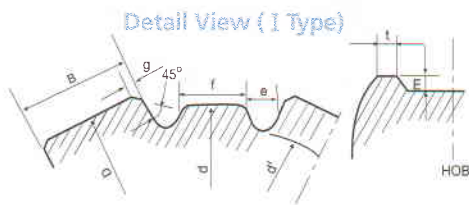
Ordering Specifications (D×d×B×N)



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 ho
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. e
As shown in the table below, it is divided into MAJ dia. and MIN
dia.

Parallel Side Spline Hob Dimensions



Unit:

Disignation	Dimension			Dimension of Spline																										
	Out dia	Total Length (L)	Bore dia (D)	I Type					II Type																					
				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	6	0.3	6	0.4	8	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		0.4																
23										23	28	6																		
26										26	32	6																		
28										28	34	7																		
32										32	36	8																		
36										36	40	8																		
42										42	46	10																		
46										46	50	12																		
52	95	95	32 (31.75)	8	8	0.4	10	0.5	52	60	14	0.5																		
56									56	62	14																			
62									62	68	16																			
72									72	82	18																			
82	135	175	40 (38.1)						10	10	0.5		10	0.5	82	92	20	0.5												
92															92	98	22													
32															75	75	27 (26.988)		8	8	0.5	10	0.5	32	32	6	0.5			
36																								36	40	7				
42	42	46	8																											
46	46	54	9																											
52	95	90	32 (31.75)												10	10	0.5							10	0.5	52		60	10	0.5
56																										56		62	10	
62				62	68	12																								
72				72	78	12																								
82	115	115	32 (31.75)	10	10	0.5	10	0.5				82														88		12	0.5	
92												92														98		14		
102									102	108	16																			
112									112	120	18																			

Tooth Profile for Involute Spline Hob

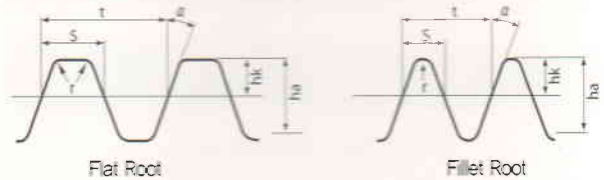


A Spline gear is used when the power transmits in the same rotating direction. The tooth profile is an involute profile. The specification is needed when ordering, as each country has a standard which follows their module value.

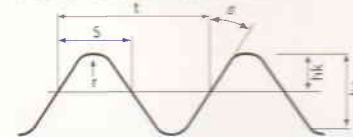
▲ Fitted surface of tooth ▲ Fitted major-diameter

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



Involute Serration Tooth Profile



Unit: mm

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		Flat Root
					DP ≥ 16	DP ≤ 12	
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

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



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.

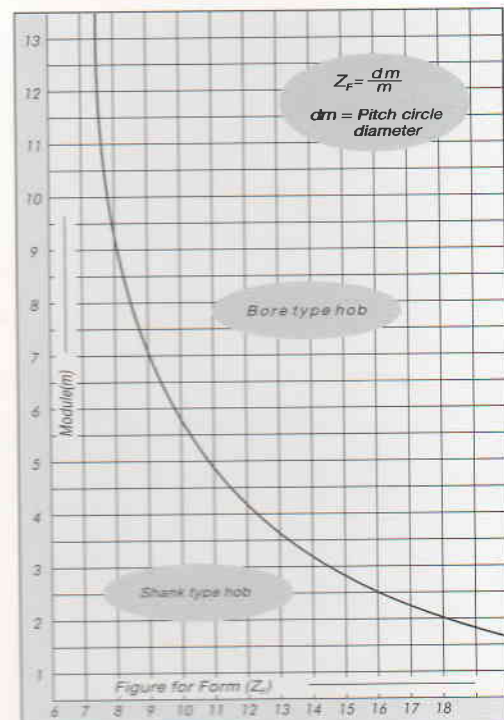
- CAVEX WORM - It's different based on the tooth maker. Please discuss when you order.
- The out-diameter of hob is decided with out-diameter of worm and sometimes it's impossible to produce with an Arbor Type Hob.

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.

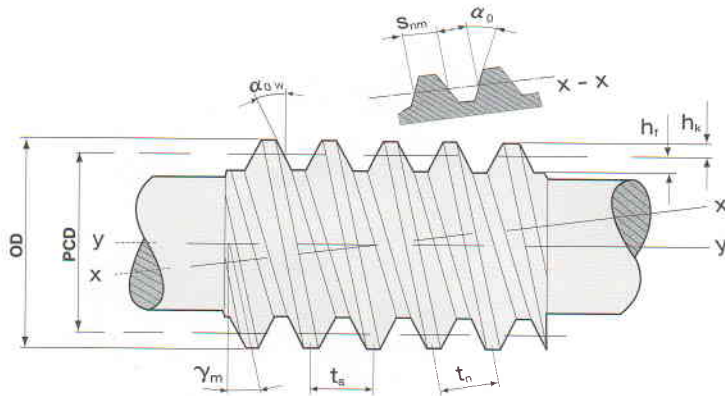
In addition specify whether the contact of the arbor is right or left.



■ Selection Graph for Worm Hob

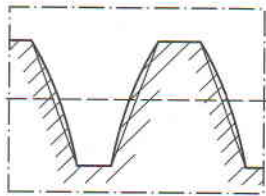
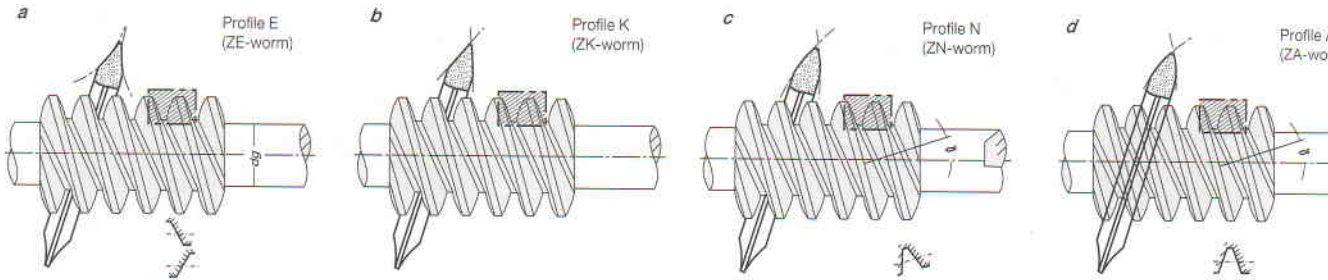


Worm Wheel & Shaft

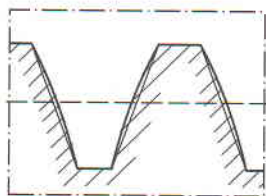


x-x	normal section
y-y	axial section
PCD	pitch diameter
OD	outside diameter
t_n-t_a	normal & axial pitch
s_{nm}	normal tooth thickness on the pitch circle
γ_m	helix angle
$\alpha_o-\alpha_o w$	normal & axial pressure angle
h_k	addendum
h_f	dedendum
m_n-m_s	normal & axial module
Z_1	number of threads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

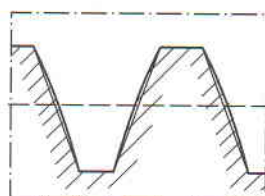
Profile of Worm Shaft



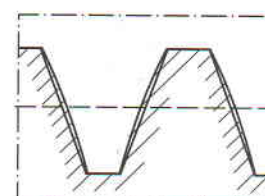
ZE-TYPE
Involute form profile of worm shaft profile



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

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

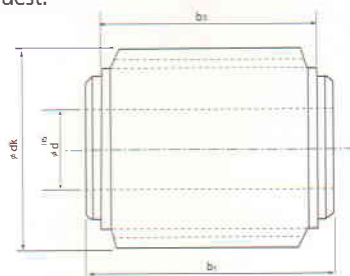
Use

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 ₂)	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.