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JAPANESE INDUSTRIAL STANDARD

Shapes and Dimensions of Helical Gears for General Use

JIS B 1722 -1974

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JAPANESE INDUSTRIAL STANDARD

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Shapes and Dimensions of
Helical Gears for General UseB 1722-1974
(Reaffirmed: 1983)1. Scope

This Japanese Industrial Standard specifies shapes and dimensions of standard helical gears of 1.5 to 4 mm in normal module for general use.

2. Classification

The gears are classified according to the shape into six types as Types 0A, 0B, 0C, 1A, 1B and 1C (see Attached Figs.).

3. Tooth Profile

The tooth profile shall be the involute tooth profile specified in JIS B 1701-Involute Gear Tooth Profile and Dimensions, i. e., the normal pressure angle being 20° , the addendum equal to the normal module, the dedendum equal to 1.25 times the normal module.

4. Shape and Dimensions

The shape and dimensions of the gears shall be as follows:

- (1) Shape The shape shall be as shown in Attached Figure.
- (2) Normal Module The normal module shall conform to the values given below:
1.5 mm, 2 mm, 2.5 mm, 3 mm, 4 mm
- (3) Helix Angle The helix angle shall be of the following three kinds:
 $11^\circ 21' 54''$, $15^\circ 56' 33''$, $19^\circ 22' 12''$

Applicable Standards:

JIS B 0701-Roundness and Chamferdimension of Machine Parts (Machining)

JIS B 0901-Diameter of Shafts

JIS B 1301-Sunk Key

JIS B 1302-Woodruff Keys and Their Corresponding Keyways

JIS B 1701-Involute Gear Tooth Profile and Dimensions

- (4) **Face Width** For the face width* three classes are specified according to the magnitude of helix angle as normal width (N) for $19^{\circ}22'12''$, medium width (M) for $15^{\circ}56'33''$, and wide width (W) for $11^{\circ}21'54''$, and the values of the face width shall conform to Table 1.

Note* Normal width shall be nearly equal to 12 times of the normal module, medium width to 15 times, and wide width to 20 times.

Table 1 Face Width

No. of teeth	Face width (mm)											
32 and over	18	24	30	32	36	38	40	45	50	60	80	
30 and under	20	26	33	35	39	42	45	50	55	65	85	

- (5) **Number of Teeth** The number of teeth shall conform to Table 2. The range of the number of teeth shall be as given in Table 3 according to the normal module, type, helix angle, and face width.

Table 2 Number of Teeth

16	17	18	19	20	21	22	24	26	28	30	32	34	36	38	40	42	45	48	50	55	60	65	70	80	90	100
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Table 3 Range of Number of Teeth

Type	Face width	Module (mm)				
		1.5	2	2.5	3	4
0A	Normal width	18 ~ 50	18 ~ 45	17 ~ 45	16 ~ 36	16 ~ 30
	Medium width	20 ~ 50	17 ~ 48	19 ~ 45	18 ~ 42	17 ~ 38
	Wide width	22 ~ 50	22 ~ 50	20 ~ 45	19 ~ 45	18 ~ 45
0B, 0C	Normal width	20 ~ 50	19 ~ 45	19 ~ 45	18 ~ 36	16 ~ 30
1A	Normal width	—	48 ~ 80	48 ~ 60	38 ~ 60	32 ~ 55
	Medium width	—	50 ~ 100	48 ~ 60	45 ~ 80	40 ~ 70
	Wide width	—	55 ~ 100	48 ~ 80	48 ~ 90	48 ~ 70
1B, 1C	Normal width	55 ~ 80	48 ~ 100	48 ~ 80	38 ~ 90	32 ~ 70

- (6) **Dimensions of Various Parts** The dimensions of various parts [number of teeth z , diameter of pitch circle d , diameter of tip circle d_1 , diameter of root circle d_r , face width b , hole diameter d , chamfer c , outside diameter of hub d_h , length of hub l , dimensions of keyway (width b_2 , depth t_2 , and radius of corner r_2), inside diameter of rim d_i , and thickness of web b_w] shall conform to Attached Tables 1 to 37.

The hole diameter d conforms to JIS B 0901-Diameter of Shafts, chamfer c to JIS B 0701-Roundness and Chamfer dimension of Machine Parts (Machining), dimensions of keyway (b_2 , t_2 , and r_2) to JIS B 1301-Sunk Key and JIS B 1302-Woodruff Keys and Their Corresponding Keyways.

5. Designation

The designation shall be specified by the following:

- (1) JIS number or title of JIS
- (2) Symbol indicating type
- (3) Normal module
- (4) Number of teeth
- (5) Face width (Normal width is expressed by N, medium width by M, and wide width by W.)

- (6) Hole diameter (For corresponding face width, if single diameter is provided, it is expressed by 1, if two diameters are provided, the smaller is expressed by 1, and the larger by 2.)
- (7) Direction of helix (For right hand it is expressed by R and for left hand by L.)

Example: JIS B 1722-0A 3 - 25 N 1 R

Type ———

Normal module ———

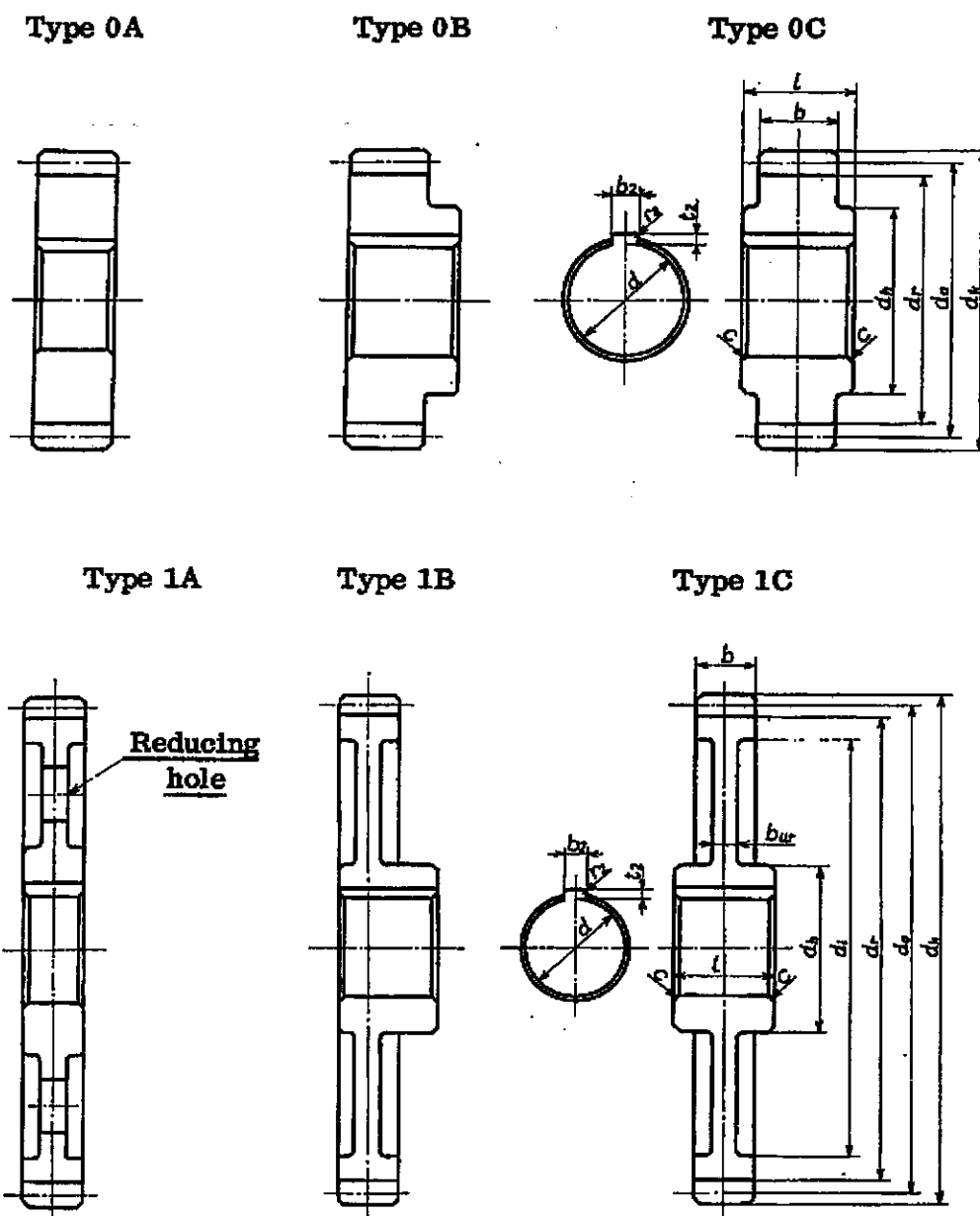
Direction of helix ———

Hole diameter ———

Face width, helix angle ———

No. of teeth ———

Attached Figure



- Remarks 1. The shape of chamfer in the contour is shown as an example.
2. For Type 1 reducing holes may be made suitably.

Attached Table 1 Dimensions of Gears, Normal Module 1.5 mm Type 0A
(Helix Angle $19^{\circ}22'12''$)

Unit: mm

Notation		No. of teeth z	Diameter of pitch circle d_0	Diameter of tip circle d_t	Diameter of root circle d_r	Face width b	Hole dia- meter d	Cham- fer c	Keyway			
									b_2	t_2	r_2	
0A1.5-	18 N 1	R or L	18	28.62	31.62	24.87	20	14	0.5	3*	1.4*	0.08~0.16
	19 N 1		19	30.21	33.21	26.46						
	20 N 1		20	31.80	34.80	28.05						
	21 N 1		21	33.39	36.39	29.64						
	22 N 1		22	34.98	37.98	31.23		16		4	1.8	
	24 N 1		24	38.16	41.16	34.41						
	25 N 1		25	39.75	42.75	36.00						
	26 N 1		26	41.34	44.34	37.59						
	28 N 1		28	44.52	47.52	40.77						
	30 N 1		30	47.70	50.70	43.95	18	18	5	2.3	0.16~0.25	
	32 N 1		32	50.88	53.88	47.13						
	34 N 1		34	54.06	57.06	50.31						
	36 N 1		36	57.24	60.24	53.49						
	38 N 1		38	60.42	63.42	56.67						
	40 N 1		40	63.60	66.60	59.85						
	42 N 1		42	66.78	69.78	63.03						
45 N 1	45	71.55	74.55	67.80	20	1						
48 N 1	48	76.32	79.32	72.57								
50 N 1	50	79.50	82.50	75.75								

Note: Dimensions marked with * show the keyway for which woodruff key is used.

Attached Table 2 Dimensions of Gears, Normal Module 1.5 mm Types 0B and 0C
(Helix Angle 19°22'12")

Unit: mm

Notation		No. of teeth z	Diameter of pitch circle d_0	Diameter of tip circle d_t	Diameter of root circle d_r	Face width b	Hole diameter d	Chamfer c	Outside diameter of hub d_h	Length of hub l	Keyway			
											b_2	t_2	r_2	
0B1.5- 0C1.5	20 N 1	20	31.80	34.80	28.05	20	14	0.5	24	25	3*	1.4*	0.08~ 0.16	
	21 N 1	21	33.39	36.39	29.64		16		28		4	1.8		
	22 N 1	22	34.98	37.98	31.23				30					
	24 N 1	24	38.16	41.16	34.41				35					
	25 N 1	25	39.75	42.75	36.00									
	26 N 1	26	41.34	44.34	37.59									
	28 N 1	28	44.52	47.52	40.77									
	30 N 1	30	47.70	50.70	43.95	18	20	1	35.5	22	5	2.3	0.16~ 0.25	
	32 N 1	32	50.88	53.88	47.13									
	34 N 1	34	54.06	57.06	50.31									
	36 N 1	36	57.24	60.24	53.49									
	38 N 1	38	60.42	63.42	56.67									
	40 N 1	40	63.60	66.60	59.85					25				
	42 N 1	42	66.78	69.78	63.03		42							6
	45 N 1	45	71.55	74.55	67.80									
	48 N 1	48	76.32	79.32	72.57									
	50 N 1	50	79.50	82.50	75.75									

Note: Dimensions marked with * show the keyway for which woodruff key is used.

Attached Table 3 Dimensions of Gears, Normal Module 1.5 mm Types 1B and 1C
(Helix Angle 19°22'12")

Unit: mm

Notation			No. of teeth <i>z</i>	Diameter of pitch circle <i>d₀</i>	Diameter of tip circle <i>d_t</i>	Diameter of root circle <i>d_r</i>	Face width <i>b</i>	Hole diameter <i>d</i>	Chamfer <i>c</i>	Outside diameter of hub <i>d_h</i>	Length of hub <i>l</i>	Keyway			Inside diameter of rim <i>d_i</i>	Thickness of web <i>b_w</i>
												<i>b₂</i>	<i>l₂</i>	<i>r₂</i>		
1B1.5- 1C1.5	55 N 1	R or L	55	87.45	90.45	83.70	18	20	1	35.5	25	5	2.3	0.16~ 0.25	74	5
	55 N 2							22		42.5		6	2.8			
	60 N 1		60	95.40	98.40	91.65		22		42.5		6	2.8	0.16~ 0.25	82	
	60 N 2							25		45						
	65 N 1		65	103.35	106.35	99.60		25		45		6	2.8	0.16~ 0.25	90	
	65 N 2							28		50		8	3.3			
	70 N 1		70	111.30	114.30	107.55		25		45		6	2.8	0.16~ 0.25	98	
	70 N 2							28		50		8	3.3			
	80 N 1		80	127.20	130.20	123.45		25		45		6	2.8	0.16~ 0.25	114	
	80 N 2							28		50		8	3.3			