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Pinion type cutters

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Pinion type cutters

1 Scope This Japanese Industrial Standard specifies the pinion type cutters (hereafter referred to as "cutters") to be used for working the involute spur gears of 0.75 mm to 12 mm in module m and 20° in standard pressure angle α .

Remarks: The standards cited in this Standard are as given in the following:

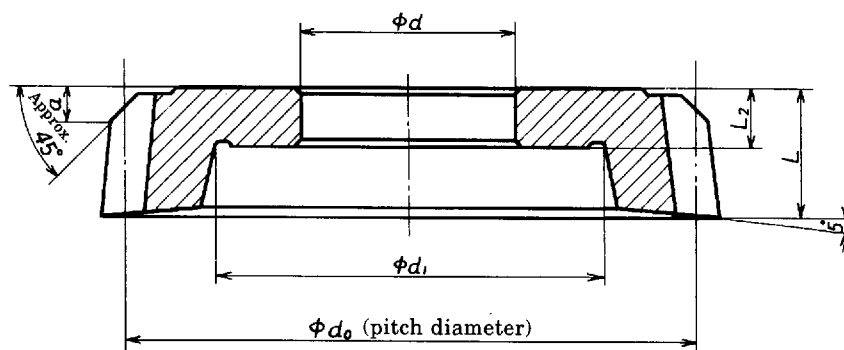
- JIS B 0102 *Glossary of gear terms*
- JIS B 0174 *Gear cutters — Vocabulary*
- JIS B 0401 *System of limits and fits*
- JIS B 0405 *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*
- JIS B 0601 *Surface roughness — Definitions and designation*
- JIS B 0659 *Roughness comparison specimens*
- JIS B 1701 *Involute gear tooth profile and dimensions*
- JIS B 4350 *Gear cutter — Tooth profiles and dimensions*
- JIS B 7153 *Measuring microscopes*
- JIS B 7502 *Micrometer callipers*
- JIS B 7503 *Dial gauges*
- JIS B 7506 *Gauge blocks*
- JIS B 7513 *Precision surface plates*
- JIS B 7519 *Microindicators*
- JIS B 7523 *Sine bars*
- JIS B 7531 *Gear tooth vernier callipers*
- JIS B 7533 *Dial test indicators (lever type)*
- JIS B 7535 *Flow type air gauges*
- JIS B 7725 *Vickers hardness testing machines*
- JIS B 7726 *Rockwell and Rockwell superficial hardness testing machines*
- JIS G 4403 *High speed tool steels*
- JIS Z 2244 *Method of Vickers hardness test*
- JIS Z 2245 *Method of Rockwell and Rockwell superficial hardness test*
- JIS Z 8401 *Rules for rounding off of numerical values*

2 Definitions The definitions of main terms to be used in this Standard are in accordance with JIS B 0102 and JIS B 0174.

3 Types and grades The types of the cutters shall be classified into 3 types of disc type, bell type and shank type according to the shapes, and the grades shall be 3 grades of AA grade, A grade and B grade according to the accuracy.

4 Shapes and dimensions The shapes and dimensions of cutters shall be in accordance with Tables 1 to 3. The tooth profiles thereof shall be those capable of producing the spur gears specified in JIS B 1701, and the basic rack tooth profile shall be in accordance with JIS B 4350.

Table 1 Disc type



Unit: mm

Unit: mm

Nominal size	Module <i>m</i>			Number of teeth <i>Z</i>	Pitch diam. <i>d</i> (<i>m</i> × <i>Z</i>)	Bore diam. <i>d</i>	Width <i>L</i>	Web thickness <i>L</i> ₂	Informative reference	
	Series ⁽¹⁾								Counter bore diam. <i>d</i> ₁	Chamfer width <i>a</i>
	1	2	3							
75		0.75		100	75	31.742	16	8	50	3
	0.8			94	75.2					
		0.9		84	75.6					
	1			75	75					
		1.25		60	75		18			
	1.5			50	75					
		1.75		43	75.25					
	2			38	76					
		2.25		34	76.5		20			
	2.5			30	75					
		2.75		28	77					
	3			25	75					
			3.25	24	78					
		3.5		22	77					
			3.75	20	75		22			
	4			19	76		10			
	4.5		17	76.5						
5			16	80						
100	1			100	100	31.742 or 44.450	18	10	65	4.5
	1.25			80	100		20			
	1.5			67	100.5					
		1.75		58	101.5					
	2			50	100					
		2.25		45	101.25		22			
	2.5			40	100					
		2.75		37	101.75					
	3			34	102					
			3.25	31	100.75					
		3.5		29	101.5					
			3.75	27	101.25		24			
	4			25	100					
		4.5		23	103.5					
	5			20	100					
		5.5		19	104.5					
	6			17	102					
			6.5	16	104		28			
		7		15	105		12			

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Table 1 (continued)

Unit: mm

Nominal size	Module <i>m</i>			Number of teeth <i>Z</i>	Pitch diam. <i>d</i> ₀ (<i>m</i> × <i>Z</i>)	Bore diam. <i>d</i>	Width <i>L</i>	Web thickness <i>L</i> ₂	Informative reference	
	Series (1)								Counter bore diam. <i>d</i> ₁	Chamfer width <i>a</i>
	1	2	3							
125	1.5			84	126	44.450	22	10	85	4.5
		1.75		72	126		24			
	2			63	126					
		2.25		56	126					
	2.5			50	125					
		2.75		46	126.5					
	3			42	126					
			3.25	39	126.75					
		3.5		36	126					
			3.75	34	127.5					
	4			32	128					
		4.5		28	126					
	5			25	125					
		5.5		23	126.5					
	6			21	126					
			6.5	20	130					
		7		19	133					
				17	136					
150		1.75		86	150.5	44.450		24	12	95
	2			75	150		26			
		2.25		67	150.75					
	2.5			60	150					
		2.75		55	151.25					
	3			50	150					
			3.25	47	152.75					
		3.5		43	150.5					
			3.75	40	150					
	4			38	152					
		4.5		34	153					
	5			30	150					
		5.5		28	154					
	6			25	150					
			6.5	24	156					
		7		22	154					
				19	152					
		9		17	153					
			15	150						

Table 1 (continued)

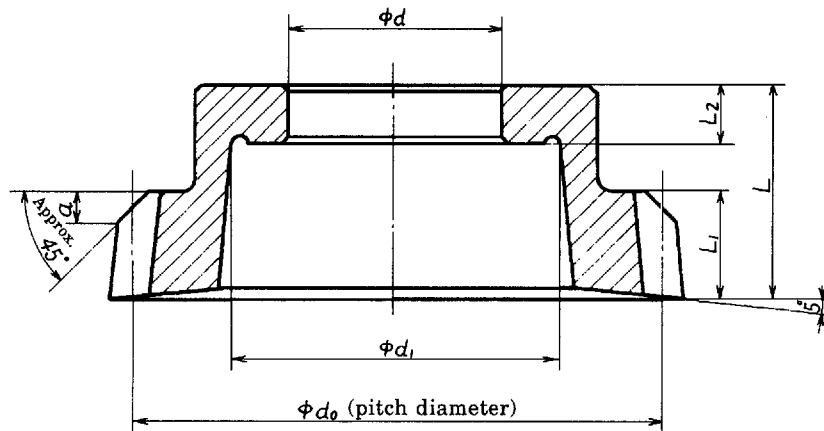
Unit: mm

Nominal size	Module <i>m</i>			Number of teeth <i>Z</i>	Pitch diam. <i>d</i> ₀ (<i>m</i> × <i>Z</i>)	Bore diam. <i>d</i>	Width <i>L</i>	Web thickness <i>L</i> ₂	Informative reference	
	Series (1)								Counter bore diam. <i>d</i> ₁	Chamfer width <i>a</i>
	1	2	3							
175	2			88	176	44.450	26	14	110	4.5
		2.25		78	175.5		28			
	2.5			70	175					
		2.75		64	176					
	3			58	174					
			3.25	54	175.5					
		3.5		50	175					
			3.75	47	176.25		30			
	4			44	176					
		4.5		39	175.5					
	5			35	175					
		5.5		32	176					
	6			29	174					
			6.5	27	175.5		34			
		7		25	175					
	8			22	176					
		9		19	171					
	10			18	180					
	11		16	176	36	16				
12			15	180						

Note ⁽¹⁾ The series of module shall be in accordance with JIS B 1701.

- Remarks 1 The tolerances on bore diameter d shall be H3, H4 and H5 specified in JIS B 0401 respectively corresponding to AA grade, A grade and B grade (the numerical values of tolerances are given in Table 4).
- 2 The tolerances on width L and web thickness L_2 shall be the tolerance class c (coarse) specified in JIS B 0405.
- 3 The shape and dimensions for clearance of bottom face shall not be specified particularly.

Table 2 Bell type



Unit: mm

Nominal size	Module m			Number of teeth Z	Pitch diam. d_0 ($m \times Z$)	Bore diam. d	Width L	Cutting width L_1	Web thickness L_2	Informative reference		
	Series ⁽¹⁾									Counter bore diam. d_1	Chamfer width a	
	1	2	3									
50		0.75		67	50.25	19.050	30	12	8	28	3	
	0.8			63	50.4							
		0.9		56	50.4							
	1			50	50							
	1.25			40	50		32	14				
	1.5			34	51							
		1.75		29	50.75							
	2			25	50							
		2.25		23	51.75		34	16				
	2.5			24	60							
		2.75		22	60.5							
	3			20	60							
			3.25	19	61.75							
		3.5		18	63							
			3.75	16	60		38	18				
	4			15	60							
75		0.75		100	75	31.742	34	16	8	50	3	
	0.8			94	75.2							
		0.9		84	75.6							
	1			75	75							
	1.25			60	75		36	18				
	1.5			50	75							
		1.75		43	75.25							
	2			38	76							
		2.25		34	76.5		38	20				
	2.5			30	75							
		2.75		28	77							
	3			26	78							
			3.25	24	78							
		3.5		23	80.5							
			3.75	21	78.75		42	22				10
	4			20	80							
		4.5		18	81							
	5			16	80							