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JAPANESE INDUSTRIAL STANDARD

**Involute Gear Tooth Profile
and Dimensions**

JIS B 1701 --1973

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standard in Japanese is to be evidence

JAPANESE INDUSTRIAL STANDARD

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Involute Gear Tooth Profile and
DimensionsB 1701-1973
(Reaffirmed: 1979)1. Scope

This Japanese Industrial Standard specifies the tooth profiles and dimensions of involute spur gears and helical gears of general use.

2. Sizes of Teeth

The sizes of teeth shall be expressed in module m . The standard values of module are as given in Table 1.

Applicable Standards:

JIS B 0102-Gear Nomenclature

JIS B 0121-Letter Symbols for Gears

JIS B 1703-Backlash for Spur and Helical Gears

Table 1. Standard Values of Module

Unit: mm

Series No.1	Series No.2	Series No.3	Series No.1	Series No.2	Series No.3
0.1	0.15			3.5	3.75
0.2	0.25		4	4.5	
0.3	0.35		5	5.5	
0.4	0.45		6		6.5
0.5	0.55		8	7	
0.6				9	
	0.7	0.65	10	11	
	0.75		12		
0.8	0.9		16	14	
1				18	
1.25			20		
1.5	1.75		25	22	
2	2.25		32	28	
2.5	2.75		40	36	
3		3.25	50	45	

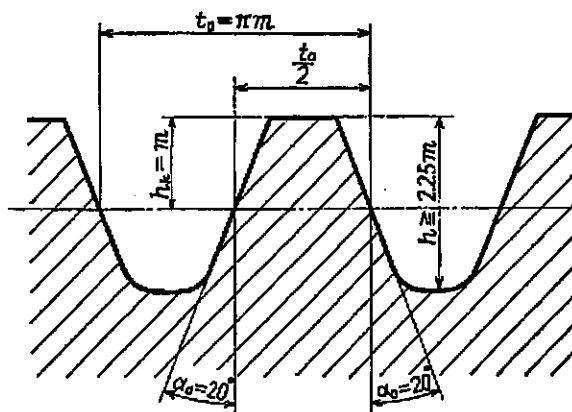
Remark: Series No. 1 is the first choice; series No. 2 and No. 3 are the second and the third choice, respectively.

3. Tooth Profiles and Dimensions

3.1 Tooth Profiles and Dimensions of Involute Spur Gears The tooth profile curves shall be an involute curve with the standard pressure angle α_0 being 20° , and the dimensions shall be as specified in Table 2. However, the profile modification is unspecified in this standard.

The tooth profile and dimensions of the basic rack used in this standard are as shown in the figure below.

Fig. Tooth Profile and Dimensions of Basic Rack



3.2 Tooth Profiles and Dimensions of Involute Helical Gears The tooth profile curves of involute helical gears shall be an involute curve in the transverse plane, and the tooth profiles shall be classified into two systems, as follows:

- (1) Normal System In this system, the normal standard pressure angle α_n shall be 20° , the normal module m_n shall take the standard values given in Table 1, and the dimensions shall conform to Table 2. The tooth profile and dimensions of the basic rack in this system are obtained by replacing α_0 and m in the figure with α_n and m_n , respectively.
- (2) Transverse System In this system, the transverse standard pressure angle α_t shall be 20° , the transverse module m_t shall take the standard values given in Table 1, and the dimensions shall conform to Table 2. The tooth profile and dimensions of the basic rack in this system are obtained by replacing α_0 and m in the figure by α_t and m_t , respectively.

Table 2. Dimensions of Involute Spur Gears and Helical Gears

Item	Spur gear		Helical gear			
			Normal system		Transverse system	
	Standard gear	Profile shifted gear	Standard gear	Profile shifted gear	Standard gear	Profile shifted gear
Module	m		m_n		m_s	
Standard pressure angle	$\alpha_0 = 20^\circ$		$\alpha_n = 20^\circ$		$\alpha_s = 20^\circ$	
Standard pitch circle diameter	zm		$zm_n / \cos \beta_0$		zm_s	
Whole depth (1) (2)	$h \geq 2.25 m$		$h \geq 2.25 m_n$		$h \geq 2.25 m_s$	
Amount of addendum modification	0	xm	0	$x_n m_n$	0	$x_s m_s$
Addendum (1) (2)	m	$(1+x)m$	m_n	$(1+x_n)m_n$	m_s	$(1+x_s)m_s$
Transverse circular thickness (3)	$\frac{\pi m}{2}$	$\left(\frac{\pi}{2} \pm 2x \tan \alpha_0\right)m$	$\frac{\pi m_n}{2 \cos \beta_0}$	$\left(\frac{\pi}{2} \pm 2x_n \tan \alpha_n\right) \frac{m_n}{\cos \beta_0}$	$\frac{\pi m_s}{2}$	$\left(\frac{\pi}{2} \pm 2x_s \tan \alpha_s\right)m_s$

- Notes (1) Applicable only to the engagement between external gears.
- (2) If the sum of the addendum modification coefficients of a pair of gears is large, values smaller than those shown may be adopted.
- (3) The positive of double sign applies to external gears, and the negative to internal gears.

Remark: Notation z indicates the number of teeth, and β_0 the helix angle on the standard pitch cylinder.

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