

JIS

JAPANESE INDUSTRIAL STANDARD

**Synchronous belt drives—
Pulleys**

JIS B 1856—1993

Translated and Published

by

Japanese Standards Association

Printed in Japan

**In the event of any doubt arising,
the original Standard in Japanese is to be final authority.**

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Synchronous belt drives — Pulleys

B 1856-1993

1. Scope This Japanese Industrial Standard specifies pulleys produced by gear cutting machine, among the synchronous pulleys (hereafter referred to as "pulleys") working with the synchronous belts (hereafter referred to as "belts") specified in JIS K 6372 and JIS K 6373.

In addition, straight-sided teeth among the tooth profile specified in ISO 5294 are specified in Annex to this Standard.

Further, as to the pulleys of which type is of being fixed to the shaft also, using the pulleys and taper bushings manufactured by sintering, they should be preferable to apply this Standard as appropriate.

Remarks 1. The standards cited in this Standard are as given in the following:

JIS B 0021 Indications of geometrical tolerances on drawings

JIS B 0102 Glossary of gear terms

JIS B 0601 Surface roughness — Definitions and designation

JIS B 1752 Methods of measurement for spur and helical gears

JIS B 7502 Micrometer callipers

JIS K 6372 Synchronous belts for general power transmission

JIS K 6373 Synchronous belts for light duty power transmission

ISO 5294 Synchronous belt drives — Pulleys

2. The International standard corresponding to this Standard is as follows:

ISO 5294 Synchronous belt drives — Pulleys

2. Definitions For the purposes of this Standard, the definitions given in JIS B 0102 and the following definitions apply:

- (1) pitch circle The circle to be the reference of working of belt with pulley, being outside the tip circle of pulley and corresponds to the position of pitch line (centre line of core wire of belt) of belt wound around the pulley.
- (2) pitch The length of circular arc between the centre lines of adjacent teeth on the pitch circle.
- (3) involute tooth profile The tooth profile of which tooth flank working with the belt is composed of the curved surface based on the involute curve.
- (4) straight-sided tooth profile The tooth profile of which tooth flank working with the belt is composed of the plane.

2

B 1856-1993

3. Classification The pulleys shall be classified into the following seven types⁽¹⁾ according to the types of corresponding belt.

MXL, XXL, XL, L, H, XH, XXH

Note ⁽¹⁾ These types coincide with the types specified in JIS K 6372 and JIS K 6373.

4. Performances

4.1 Appearance The pulleys shall have teeth working with the teeth of the belt on the outer peripheral surface of the cylinder, and be free from harmful defects in use such as flaws, cracks, cavities and others.

4.2 Pitch variation and cumulative pitch deviation The pitch variation and the cumulative pitch deviation in an arbitrary section of 90°, when measured in accordance with the method of 6.3, shall satisfy the requirements of Table 1.

Table 1. Permissible values of pitch variation
and cumulative pitch deviation

Unit: mm

Tip circle diameter of pulley d_0 ⁽²⁾	Permissible values	
	Pitch variation	Cumulative pitch deviation
5.96 or over to 25.40 or under	0.03	0.05
Over 25.40 to 50.80 or under	0.03	0.08
Over 50.80 to 101.60 or under	0.03	0.10
Over 101.60 to 177.80 or under	0.05	0.13
Over 177.80 to 304.80 or under	0.05	0.15
Over 304.80 to 508.00 or under	0.08	0.18
Over 508.00 to 762.00 or under	0.08	0.20
Over 762.00 to 967.16 or under	0.08	0.23

Note ⁽²⁾ See Fig. 3.

4.3 Parallelism of teeth in respect to shaft bore centre line The parallelism of the teeth of the pulley in respect to the shaft bore centre line, when measured in accordance with the method of 6.4, shall satisfy the requirements of Table 2.

Table 2. Tolerances on parallelism

Unit: mm

Nominal widths of pulley ⁽³⁾		Tolerance
MXL, XXL	XL, L, H, XH, XXH	
3.2 to 6.4	025 to 150	0.03
—	200 · 300	0.04
—	400 · 500	0.05

Note ⁽³⁾ The nominal width of the pulley is that given in Table 9 and corresponds to the nominal width of belt of JIS K 6372 and JIS K 6373.

4.4 Run-out of side face The run-out of the side face in respect to the shaft bore centre line of the pulley, when measured in accordance with the method of 6.5, shall satisfy the requirements of Table 3.

Table 3. Tolerances on run-out of side face

Unit: mm

Tip circle diameter of pulley d_0	Tolerance on run-out (TIR) ⁽⁴⁾
5.96 or over to 101.60 or under	0.10
Over 101.60 to 254.00 or under	Tip circle diameter $d_0 \times 0.001$
Over 254.00 to 967.16 or under	$0.25 + [(\text{Tip circle diameter } d_0 - 254.00) \times 0.0005]$

Note ⁽⁴⁾ TIR is the abbreviation of Total Indicator Reading, and it means the difference between the maximum value and the minimum value of the readings in the measurements of run-out.

4.5 Run-out of tip circle periphery The run-out of the tip circle periphery in respect to the shaft bore centre line of the pulley, when measured in accordance with the method of 6.6, shall satisfy the requirements of Table 4.

Table 4. Tolerances on run-out of tip circle periphery

Unit: mm

Tip circle diameter of pulley d_0	Tolerance on run-out (run-out of periphery) ⁽⁵⁾
5.96 or over to 203.20 or under	0.13
Over 203.20 to 967.16 or under	$0.13 + [(\text{Tip circle diameter } d_0 - 203.20) \times 0.0005]$

Note ⁽⁵⁾ See JIS B 0021.

4.6 Cylindricity of tip cylinder The cylindricity of tip cylinder, when measured in accordance with the method of 6.8, shall satisfy the requirements of Table 5.