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**Synchronous belt drives — Belts and
pulleys**

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Foreword

This Japanese Industrial Standard has been established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishment of Japanese Industrial Standard submitted by The Japan Belting Manufacturers Association (JBMA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act.

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Synchronous belt drives — Belts and pulleys

Introduction

This Japanese Industrial Standard has been prepared based on ISO 21342 : 2019, Edition 1 with some modifications of the technical contents for corresponding parts (profiles and dimensions) but adding some JIS specification contents (measuring method, marking etc.) that are not given in the said corresponding International Standard.

The vertical lines on both sides and dotted underlines indicate additions to the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the profiles/dimensions of synchronous belts (hereafter referred to as belts) and their related pulleys (hereafter referred to as pulleys) for use in automotive applications and general industrial equipment such as internal combustion engines of agricultural machinery.

NOTE The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 21342 : 2019 *Synchronous belt drives — Automotive belts and pulleys* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0601 *Geometrical Product Specifications (GPS) — Surface texture : Profile method — Terms, definitions and surface texture parameters*

JIS B 1757-3 *Evaluation of instruments for the measurement of individual gears — Part 3 : Helix measurement using plane artifacts*

JIS B 1757-4 *Evaluation of instruments for the measurement of individual gears — Part 4 : Pitch measurement using sphere artifacts*

JIS B 1859 *Synchronous belt drives — Vocabulary*

JIS B 7502 *Micrometers*

JIS B 7507 Vernier, dial and digital callipers

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS B 1859**, and the following apply.

3.1

pitch circumference

value obtained by multiplying the pulley tooth pitch (P_b) by the number of pulley teeth (z)

4 Classification

The belts and pulleys are classified into eight types according to the combination of the tooth pitch and basic tooth profile, and their symbols are as given in Table 1.

Table 1 Classification of belts and pulleys

Basic tooth profile		Tooth pitch	
		Z (nominal dimension 9.525 mm)	Y (nominal dimension 8.000 mm)
Trapezoidal profile	A	ZA	—
	B	ZB	—
Curvilinear profile	H	ZH	YH
	R	ZR	YR
	S	ZS	YS

5 Belt designation

A belt is designated by the combination of the number of teeth, tooth pitch, basic tooth profile and nominal width.

Each nominal belt width corresponding to respective reference value specified as a standard belt width shall be in accordance with Table 2, and other nominal belt widths corresponding to belt widths shall be as agreed between the parties concerned.

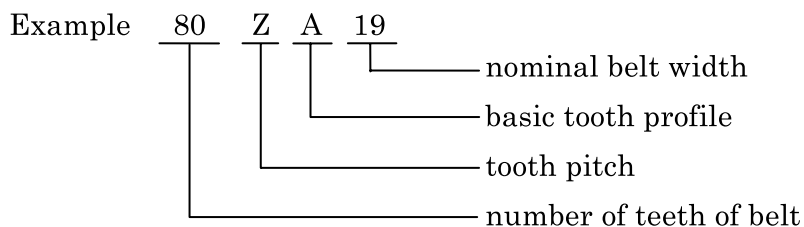
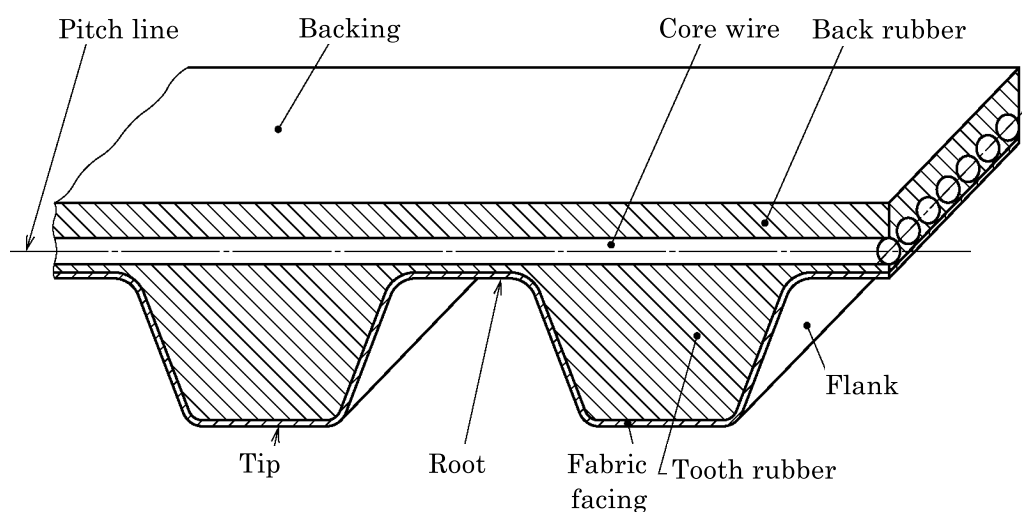


Table 2 Standard widths

Nominal width	Reference value (mm)
13	12.7
16	15.9
19	19.1
22	22.0
25	25.4
28	28.0
30	30.0
32	32.0
34	34.0
38	38.0

6 Belt structure

The belt shall be of endless configuration having such a cross-sectional structure as shown in Figure 1.

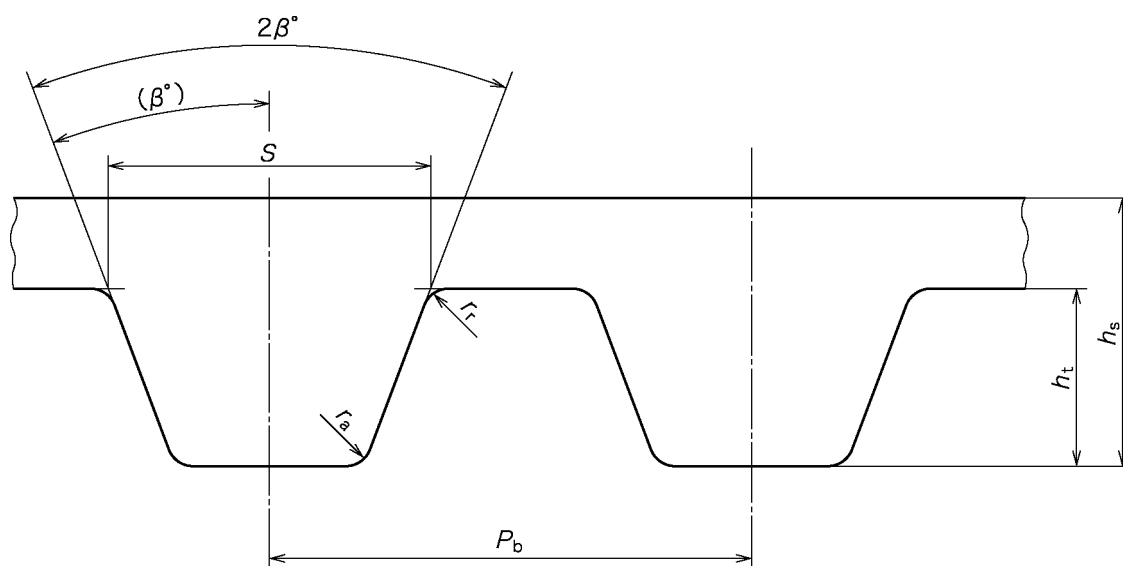
**Figure 1 Cross-sectional structure of synchronous belt**

7 Belt profiles/dimensions and tolerances

7.1 Belt profiles and dimensions — ZA and ZB

The profiles and nominal dimensions of Types ZA and ZB shall be as given in Table 3.

Table 3 Profiles and nominal dimensions of ZA and ZB



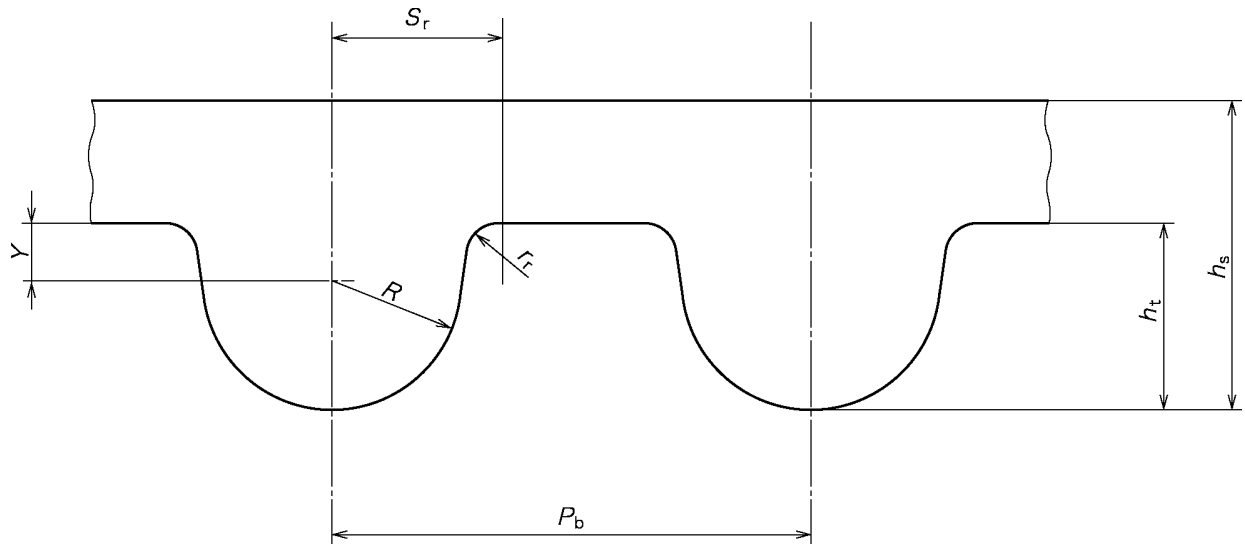
Dimensions in millimetres
Angles in degrees

Item	Symbol	Nominal dimension	
		ZA	ZB
Tooth pitch	P_b	9.525	9.525
Tooth angle	2β	40	40
Height	h_s	4.1	4.5
Root radius	r_r	0.51	1.02
Tip radius	r_a	0.51	1.02
Tooth height	h_t	1.91	2.29
Width at tooth root	S	4.65	6.12

7.2 Belt profiles and dimensions — ZH and YH

The profiles and nominal dimensions of Types ZH and YH shall be as given in Table 4.

Table 4 Profiles and nominal dimensions of ZH and YH



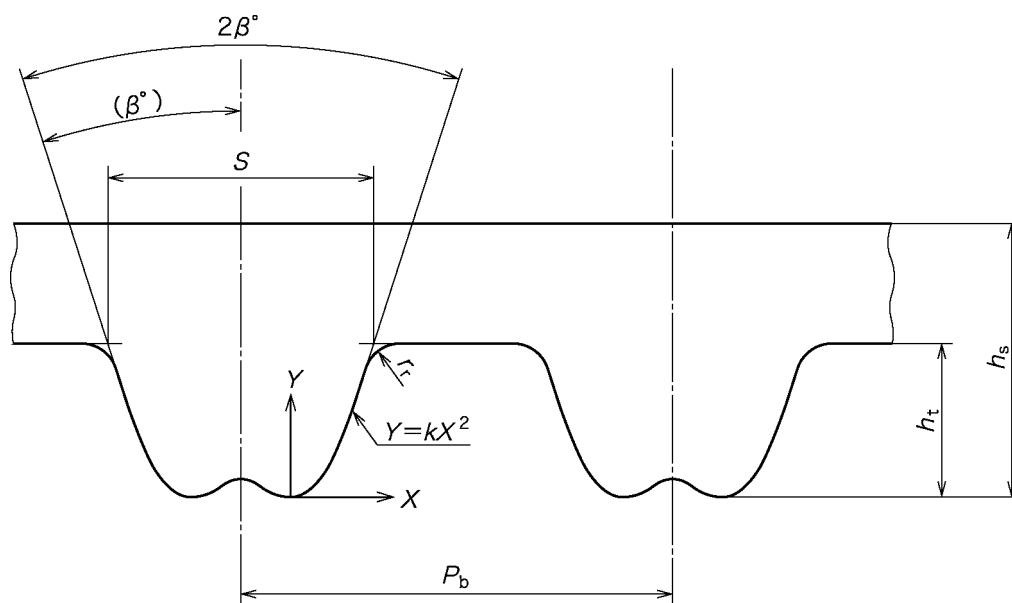
Unit: mm

Item	Symbol	Nominal dimension	
		ZH	YH
Tooth pitch	P_b	9.525	8.000
Height	h_s	5.5	5.2
Root radius	r_r	0.76	0.64
Tooth height	h_t	3.50	3.04
Tooth radius	R	2.45	2.11
Vertical offset	Y	1.05	0.93
Root radius distance	S_r	3.27	2.84

7.3 Belt profiles and dimensions — ZR and YR

The profiles and nominal dimensions of Types ZR and YR shall be as given in Table 5.

Table 5 Profiles and nominal dimensions of ZR and YR



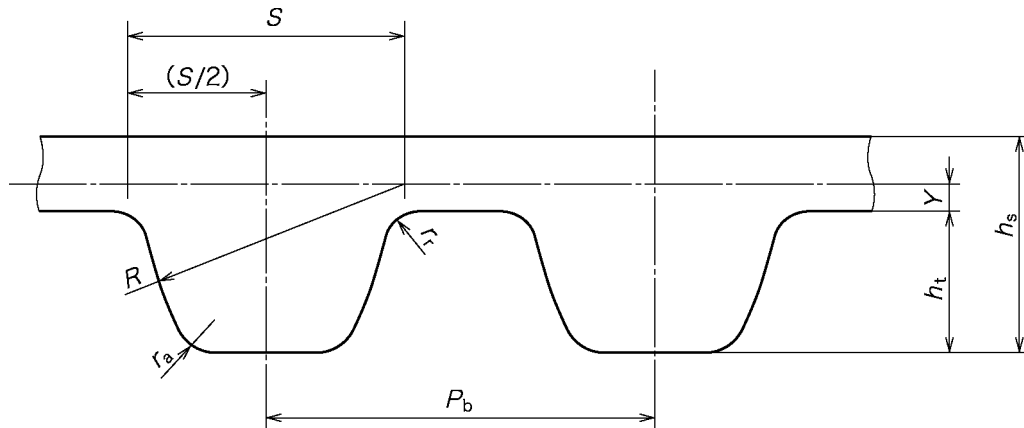
Dimensions in millimetres
Angles in degrees

Item	Symbol	Nominal dimension	
		ZR	YR
Tooth pitch	P_b	9.525	8.000
Tooth angle ^{a)}	2β	32	30
Height	h_s	5.4	5.1
Root radius	r_r	1.0	0.8
Tooth height	h_t	3.2	2.8
Width at tooth root	S	5.5	5.3
Tooth form parameter	k	1.228	1.692
Note ^{a)} An angle made by the tooth centreline and the tangent line to the curve constituting the mating flank at the contact point of the curve and the root radius.			

7.4 Belt profiles and dimensions — ZS and YS

The profiles and nominal dimensions of Types ZS and YS shall be as given in Table 6.

Table 6 Profiles and nominal dimensions of ZS and YS



Unit: mm

Item	Symbol	Nominal dimension	
		ZS	YS
Tooth pitch	P_b	9.525	8.000
Height	h_s	5.7	5.2
Root radius	r_r	0.95	0.80
Tip radius	r_a	0.95	0.80
Tooth height	h_t	3.53	2.95
Width at tooth root	S	6.19	5.20
Tooth radius	R	6.19	5.20
Vertical offset	Y	0.686	0.686

7.5 Tolerances for belt pitch length and centre distance variation

The tolerances for length which differs depending on the belt pitch length and the centre distance variation shall be measured in accordance with Clause 8 and shall comply with Table 7. The belt pitch length shall be as agreed between the parties concerned.