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Synchronous belt drives — Vocabulary

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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This document was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 4, *Synchronous belt drives*.

This fourth edition cancels and replaces the third edition (ISO 5288:2017), of which it constitutes a minor revision. The change is as follows:

— Inclusion of Clause 4.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Synchronous belt drives — Vocabulary

1 Scope

This document specifies the terms and definitions related to the use of synchronous belt drives for mechanical power transmission and where positive indexing or synchronization is required.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 General

3.1.1
synchronous belt drive
system composed of a *synchronous belt* (3.2.1.1) and at least one *synchronous pulley* (3.3.1.1)

Note 1 to entry: Synchronized motion and/or power is transmitted through the engagement of teeth on the belt with *grooves* (3.3.2.1) on the pulleys.

Note 2 to entry: This belt drive has been known in the past by various names such as “timing belt drive”, “positive belt drive” or “gear belt drive”.

3.1.2
centre distance
C
shortest distance between the axes of two *synchronous pulleys* (3.3.1.1) when the belt is under the prescribed measuring force

Note 1 to entry: See Figure 1.

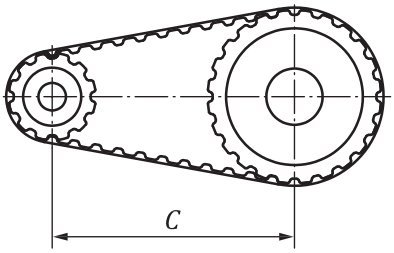


Figure 1

3.1.3
endless synchronous belt drive
synchronous belt drive (3.1.1) with applied endless synchronous belt

Note 1 to entry: See Figure 2.

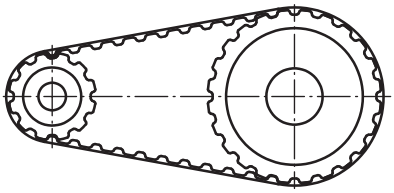


Figure 2

3.1.4
open synchronous belt drive
synchronous belt drive (3.1.1) with applied open synchronous belt

Note 1 to entry: See Figure 3.

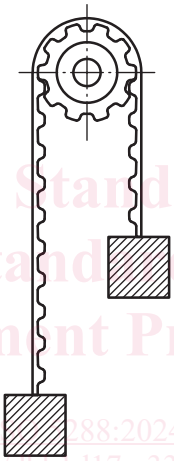


Figure 3

3.2 Synchronous belts

3.2.1 General

3.2.1.1
synchronous belt
belt with transverse teeth of rectangular or curvilinear cross-section extending from the base at regularly spaced intervals

Note 1 to entry: Consult synchronous belt dimensional standards for the full details of belt profiles.

3.2.1.2
tooth pitch
P_b
linear distance between the axes of two consecutive teeth in a section of belt loaded to the prescribed measuring force

Note 1 to entry: See Figure 4.

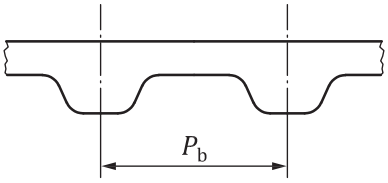


Figure 4

3.2.1.3
pitch line
circumferential line in the belt which keeps the same length when the belt is bent perpendicularly to its base

Note 1 to entry: See Figure 5.

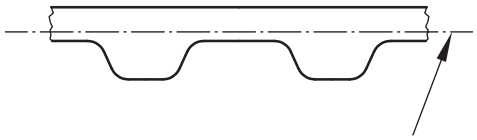


Figure 5

3.2.1.4
pitch line differential
a
<belts> radial distance between the *pitch line* (3.2.1.3) and the *root line* (3.2.5.3)

Note 1 to entry: See Figure 6.

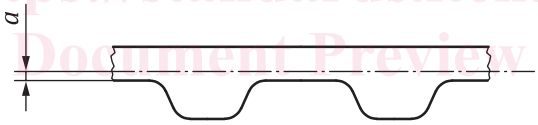


Figure 6

3.2.1.5
belt pitch length
L_p
length of the *pitch line* (3.2.1.3) of a belt

3.2.1.6
width
b_s
transverse dimension of the back of the belt

Note 1 to entry: See Figure 7.

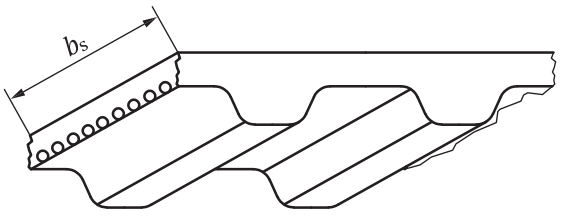
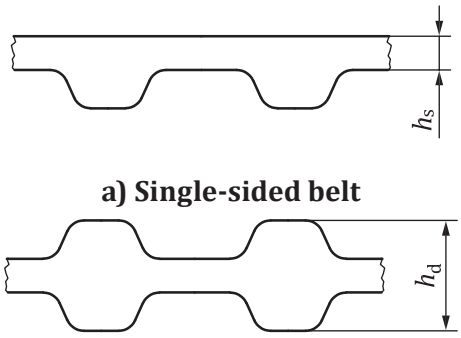


Figure 7

3.2.1.7
height
h_s/h_d
total height of a single-sided or double-sided belt

Note 1 to entry: See Figure 8.



a) Single-sided belt

b) Double-sided belt

Figure 8

3.2.2 Tooth profile

3.2.2.1
trapezoidal profile
transverse *tooth* (3.2.5.1) profile formed by a tooth *flank* (3.2.5.5) and tip with only straight lines

Note 1 to entry: See Figure 9.

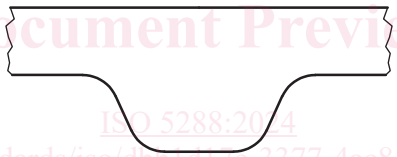


Figure 9

3.2.2.2
curvilinear profile
transverse *tooth* (3.2.5.1) profile formed by a tooth *flank* (3.2.5.5) or tip that contains curved lines

Note 1 to entry: See Figure 10.

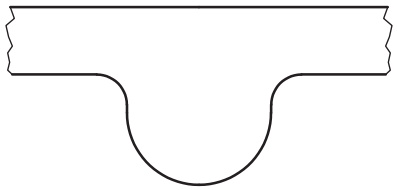


Figure 10

3.2.3 Type of belt drive

3.2.3.1
endless synchronous belt
closed *synchronous belt* (3.2.1.1)

Note 1 to entry: See Figure 11.

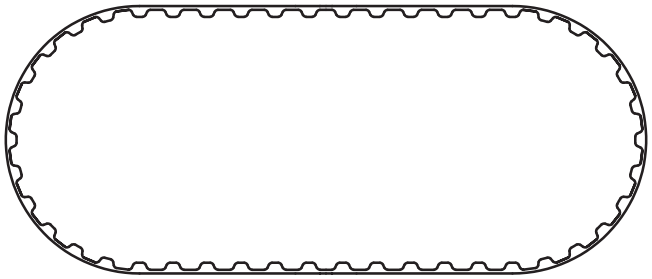


Figure 11

3.2.3.2
open synchronous belt
synchronous belt (3.2.1.1) with two ends

Note 1 to entry: See Figure 12.

Figure 12

3.2.4 Structure

3.2.4.1
single-sided synchronous belt
synchronous belt (3.2.1.1) with teeth located inside of the *pitch line* (3.2.1.3) at regularly spaced intervals

Note 1 to entry: See Figure 13.

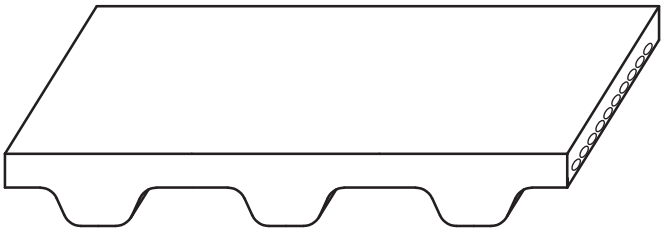
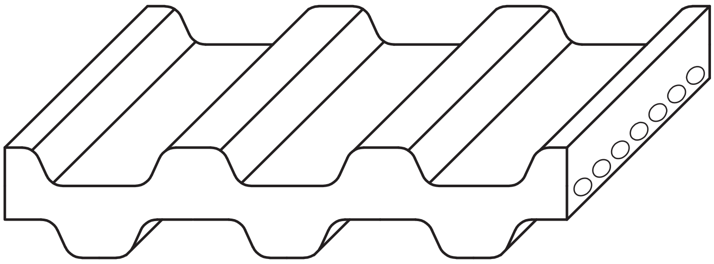


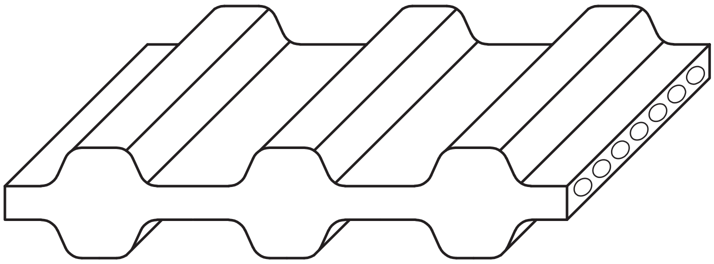
Figure 13

3.2.4.2
double-sided synchronous belt
synchronous belt (3.2.1.1) with teeth located on both sides of the *pitch line* (3.2.1.3) at regularly spaced intervals

Note 1 to entry: See Figure 14.



a) Staggered double-sided synchronous belt



b) Symmetrical double-sided synchronous belt

Figure 14

3.2.5 Teeth

3.2.5.1
tooth
generally transverse element protruding from the root of the belt which have the profile necessary to mesh with the *grooves* (3.3.2.1) in a *synchronous pulley* (3.3.1.1)

Note 1 to entry: See Figure 15.

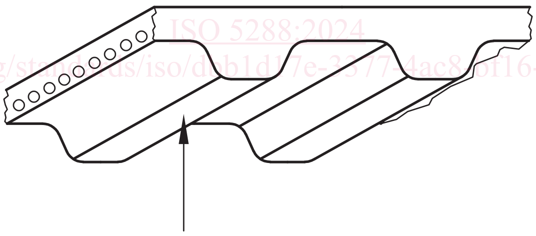


Figure 15

3.2.5.2
tip line
line joining the tips of the belt teeth

Note 1 to entry: See Figure 16.

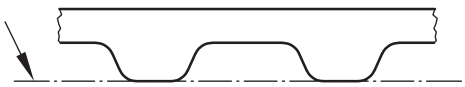


Figure 16

3.2.5.3
root line
line joining the roots between the belt teeth

Note 1 to entry: See Figure 17.

Figure 17

3.2.5.4
tooth height
h_t
distance between the *tip line* (3.2.5.2) and the *root line* (3.2.5.3)

Note 1 to entry: See Figure 18.

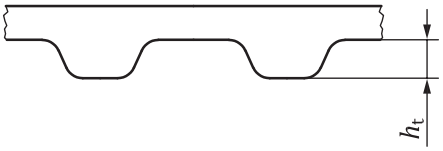
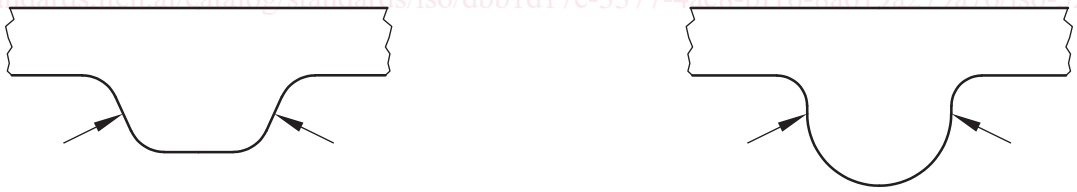


Figure 18

3.2.5.5
flank
area defined by the *width* (3.2.1.6) of the belt *tooth* (3.2.5.1) and the portion of the tooth section contained between the tooth tip radius and the tooth root radius or, if there is no tooth tip radius, contained between the *tip line* (3.2.5.2) and the tooth root radius

Note 1 to entry: See Figure 19.



a) Timing tooth flank

b) Curvilinear tooth flank

Figure 19

3.2.5.6
working flank
<teeth> *flank* (3.2.5.5) of a belt *tooth* (3.2.5.1) in contact with the pulley groove flank when it is transmitting power

Note 1 to entry: See Figure 20.