

Specification for

Synchronous belt drives for industrial applications

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- British Gear Association
- British Rubber Manufacturers' Association
- British Coal
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Foreword

This British Standard has been prepared under the direction of the Machinery and Components Standards Committee. It specifies the dimensional and other features of synchronous belt drives and pulleys that are in the most general use for a wide range of industrial applications. It is a revision of BS 4548:1970 which is withdrawn.

Racks used for generating tooth forms on the pulleys are of specific interest to pulley manufacturers rather than designers or users of the drive systems. It has been convenient therefore to assemble the requirements for racks in a separate standard BS 6889.

In view of the widespread use of synchronous belt drives in many countries, particular account has been taken of discussion and standards published by the International Organization for Standardization (ISO) and specifically ISO 5294 and ISO 5296.

Synchronous belt drives are used for mechanical power transmission where positive indexing or synchronous speeds are required. The serviceability of the drives depends to a degree upon satisfactory choice of dimensions and proper installation practice. Methods for measuring belt pitch length, determining axial and radial run-out and checking the pulley groove profile are given in Appendix A, Appendix B and Appendix C. Appendix D gives recommendations for the use of idlers.

The terminology used generally follows that adopted in ISO specifications for synchronous drive systems. However, the term “tooth space” is used in the International Standards, but the synonymous term “groove” has been retained in this standard to conform to established UK practice.

This standard does not apply to automotive synchronous belt drives which are specified in BS AU 218.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 22, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1.1 Scope

This British Standard specifies requirements for synchronous belt drives and pulleys of the types designated by the pitch codes XL, L, H, XH and XXH and used for industrial applications.

Appendix D given recommendations for the use of idler pulleys.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

1.2 Definitions

For the purposes of this British Standard, the definitions given in Table 1 apply. Where appropriate, diagrams are included to further define specific features.

Table 1 — Terms and definitions

Term	Symbol	Definition
<i>Term relating to drives using synchronous belts</i> synchronous belt drive ^a	—	A system composed of a synchronous belt and two or more synchronous pulleys. Synchronized motion and/or power is transmitted through the engagement of teeth on the belt with grooves on the pulleys
<i>Terms relating to synchronous belts</i> synchronous belt	—	A belt, the cross section of which is in the general form of a rectangle, but with transverse teeth extending from the lower base at regularly spaced intervals
belt pitch	P_b	The linear distance between the axes of two consecutive teeth in a section of belt loaded to the prescribed measuring force
pitch length	L_p	The length of the pitch line of a belt
pitch line	—	Any circumferential line in the belt that keeps the same length when the belt is bent perpendicularly to its base

^a This belt drive has been known in the past by various names such as timing belt drive, positive belt drive, or gear belt drive.

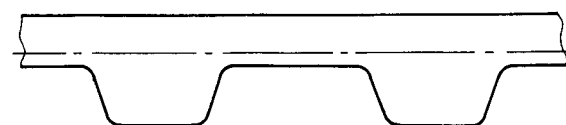
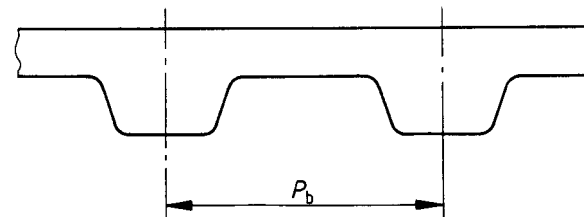
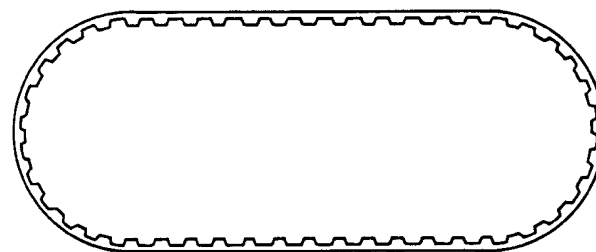
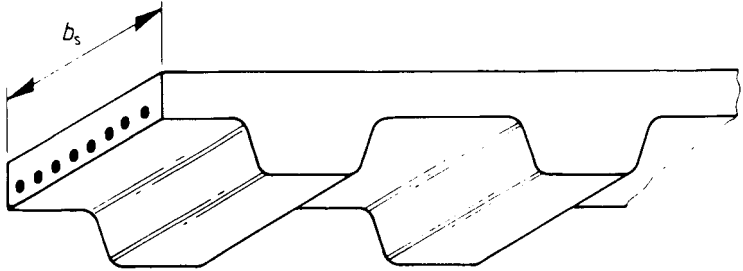


Table 1 — Terms and definitions

Term	Symbol	Definition
width	b_s	The transverse dimension of the belt that can be used to transmit power 
height	h_s	The total height of the belt 
<i>Terms relating to synchronous belt teeth</i> tooth height	h_t	The distance between the tip line and the root line 
tooth angle	2β	The included angle between the flanks of the belt tooth 