

Specification for

Continuous mechanical handling equipment — Safety requirements —

Part 19: Belt conveyors —
Examples for guarding of nip points

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British Gear Manufacturers' Association	Institution of Mechanical Engineers
British Internal Combustion Engine Manufacturers' Association	Institution of Plant Engineers
British Pump Manufacturers' Association	Institution of Production Engineers*
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British Rubber Manufacturers' Association	Mechanical Handling Engineers' Association
Chain Testers' Association of Great Britain	Metal Packaging Manufacturers' Association
Coke Oven Managers' Association	Sand and Gravel Association Limited
Electrical, Electronic and Telecommunications Plumbing Union	Society of Dairy Technology

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Executive Board and comes into effect on 30 April 1980

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Foreword

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee.

This Part of this British Standard is technically equivalent to Technical Report 5045:1977 published by the International Organization for Standardization (ISO). ISO TR 5045 was drawn up by Technical Committee ISO/TC 101, *Continuous mechanical handling equipment*, and approved by the majority of its members.

This Part, which forms one of a series, implements a safety code and should be read in conjunction with BS 5667-1.

The aim of this British Standard is to give guidance, in the form of examples, for safety at nip points between belts and pulleys, and between belts and idlers for belt conveyors.

This standard incorporates drawings that show, in principle, how sufficient safety can be achieved without excluding other methods that give the same factor of safety.

For example, for guarding nip points on conveyors and elevators with chain elements, reference should be made to BS 5667-18.

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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 and ii, pages 1 to 14, 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.

1 Scope

This Part of this British Standard gives guidance, in the form of examples, for guarding the dangerous nip points of belt conveyors, which occur between the belt and its pulleys or idlers.

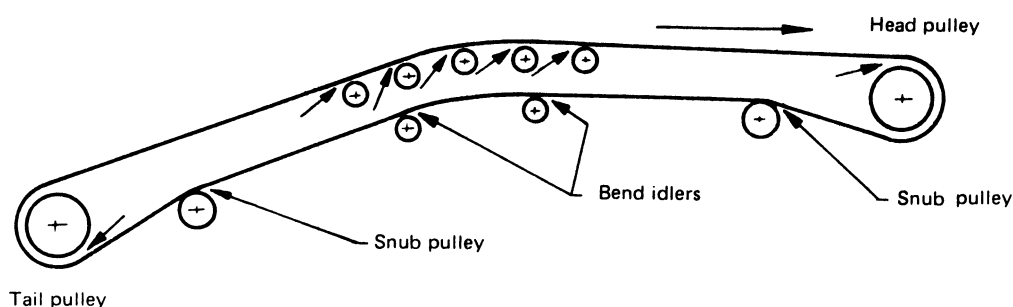
It supplements the international standards dealing with safety of continuous mechanical handling equipment, which have been implemented in other Parts of this standard.

2 References

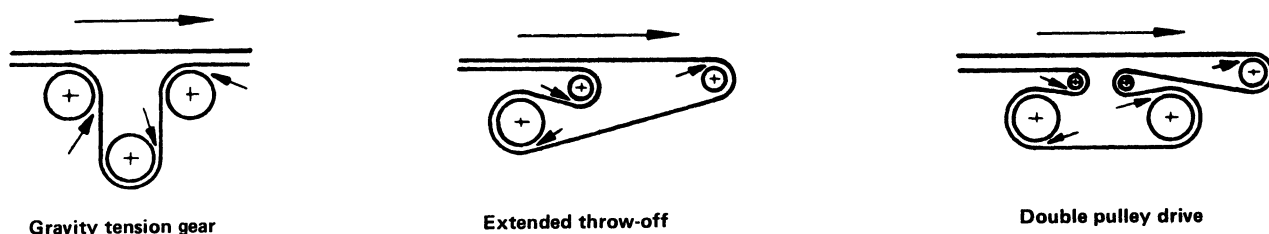
The titles of the publications referred to in this standard are listed on the inside back cover.

3 Dangerous nip points

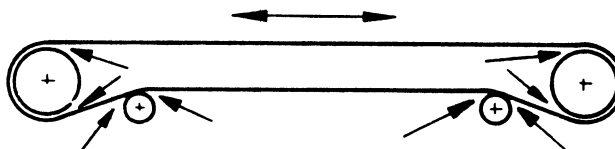
3.1 The most dangerous nip points on belt conveyors occur when the belt is reversed or deflected. Typical examples are shown in the following illustration.



3.2 When there are additional reversal or deflection points on individual sections of the conveyor, the nip points to be guarded are typically as shown below.



3.3 Reversible belts have additional danger points, namely, the in-running nips which were previously run-off points of the pulleys; these points are shown in the illustration below.



4 Safety measures for belt pulleys

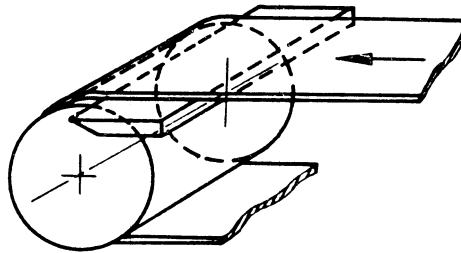
Intakes between the belt and pulley are very dangerous, owing to the considerable forces exerted, and the arc of contact of the belt of 180° or more. Operating conditions, and the method of tensioning, should be taken into account when designing guards, which should prevent all access to the intake.

4.1 Direct safety measures for the nip point. If the type of material conveyed permits, it is preferable to insert devices at the danger point, since the devices protect the danger point directly. They also permit good visual inspection during operation and need not be removed during repair and maintenance work.

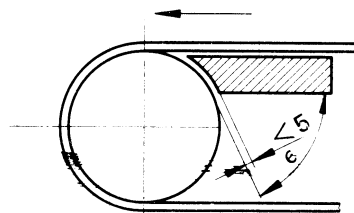
Complete protection is given only when the leading edge is carefully designed, undeformable, and entered as deeply as possible into the nip point.

Guards of solid section may not be used with rod or mesh belts where the mesh aperture or the rod spacing exceeds 10 mm, nor may they be used with bar or cage pulleys in reversible conveyors. For non-reversible conveyors, such solid section guards made from formed sheet as in 4.1.2 are suitable for use with bar or cage pulleys (see also 4.4.2).

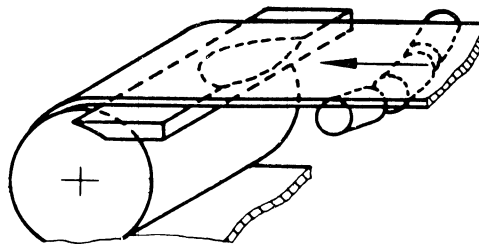
4.1.1 Solid packing material guards. Solid packing material guards are especially suitable when transporting unit loads, since the delivery point is easily accessible.



Solid packing material guards are only suitable when the pulley periphery is smooth and complete. The angle ϵ should be greater than 45° for a smooth pulley and greater than 60° for a coated pulley since otherwise there is a danger of an intake on the lower side of these guards. This can be avoided by using a guard of the appropriate shape or by adding a strengthener of triangular section.



It is possible to make the guard suit a troughed belt conveyor by reducing the length of the guard or by appropriately shaping its upper side.



4.1.2 Sheet metal guards. Sheet metal guards should have reinforcing side pieces carried around the edge of the pulley. For bar cage pulleys the distance a should be greater than 80 mm.

