



SLOVENSKI STANDARD
SIST EN 14973:2007+A1:2008
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Conveyor belts for use in underground installations - Electrical and flammability safety requirements

Fördergurte für die Verwendung unter Tage - Elektrische und brandtechnische Sicherheitsanforderungen

Courroies transporteuses pour usage dans les installations souterraines - Exigences de sécurité électrique et protection contre l'inflammabilité

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Ta slovenski standard je istoveten z: **EN 14973:2006+A1:2008**

ICS:

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
53.040.10	Transporterji	Conveyors

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English Version

Conveyor belts for use in underground installations - Electrical and flammability safety requirements

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This European Standard was approved by CEN on 19 June 2006 and includes Corrigendum 1 issued by CEN on 24 January 2007 and Amendment 1 approved by CEN on 21 February 2008.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14973:2006+A1:2008) has been prepared by CEN /TC 188, "Conveyor belts", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

This document supersedes EN 14973:2006.

This document includes Corrigendum¹ issued by CEN on 24 January 2007 and Amendment 1, approved by CEN on 2008-02-21.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags \boxed{AC} \boxed{AC} .

$\boxed{A_1}$ This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EC Directive(s).

For relationship with EC Directives, (see informative Annexes ZA, ZB and ZC, which are integral parts of this document. $\boxed{A_1}$)

These Directives each require a risk assessment to be made to ensure that the equipment meets the essential health and safety requirements of the relevant Directive.

The risk, or probable rate of occurrence of a hazard and the degree of harm that the hazard might cause, will vary depending upon the particular circumstances or site of application. Depending upon the risks judged to be pertinent, the measures taken to ensure a satisfactory level of safety may also vary. Annex A gives practical guidance on the identification of hazards, subsequent risk assessment and how these can be addressed.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

¹ Applicable to the French version only.

Introduction

This document is a type C standard as stated in EN ISO 12100-1.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

The approach taken in this European Standard is to identify the main hazards encountered in underground conveying applications and to specify requirements for conveyor belts that will provide the necessary operational safety. Three Classes are specified, A, B and C, as defined in 3.9 to 3.11.

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1 Scope

This European Standard specifies electrical and flammability safety requirements for conveyor belts intended for use in underground installations, in the presence of flammable or non-flammable atmospheres.

Conveyor belts covered by this European Standard and intended for use in flammable atmospheres are intended for use on conveyor belt installations (machinery in mines). The belt is a component, which will be incorporated into the conveyor, which is an equipment of Group I, Category M2, as defined in 3.2.2 of EN 13463-1:2001.

This European Standard is not applicable to light conveyor belts as described in EN 873 nor is it applicable to conveyor belts which are manufactured before the date of publication of this document by CEN.

This European Standard deals with those significant hazards detailed in A.1.

Attention is drawn to Annexes ZA and ZB.

NOTE A summary of the requirements of this European Standard is given in Table 1.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1050, *Safety of machinery – Principles for risk assessment*.

EN 1554:1998, *Conveyor belts – Drum friction testing*.

EN 12881-1:2005, *Conveyor belts – Fire simulation flammability testing – Part 1: Propane burner tests*.

EN 12881-2, *Conveyor belts - Fire simulation flammability testing - Part 2: Large-scale fire test*.

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres – Part 1: Basic method and requirements*.

EN ISO 284, *Conveyor belts - Electrical conductivity - Specification and test method (ISO 284:2003)*.

EN ISO 340, *Conveyor belts - Laboratory scale flammability characteristics - Requirements and test method (ISO 340:2004)*.

EN ISO 12100-1:2003, *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1:2003)*.

prEN ISO 15236-3:2005, *Steel cord conveyor belts - Part 3: Special safety requirements for belts for use in underground installations (ISO/DIS 15236-3:2005)*.

prEN ISO 22721:2005, *Conveyor belts - Specification for rubber or plastics covered conveyor belts of textile construction for underground mining (ISO/DIS 22721:2005)*.

IEC 60300-3-9, *Dependability management – Part 3: Application guide – Section 9: Risk analysis of technological systems*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

- 3.1 afterflame**
flame which persists after the ignition source has been removed
- 3.2 afterglow**
persistence of glowing, after cessation of flaming or, if no flaming occurs, after the ignition source has been removed
- 3.3 flame (noun)**
zone of combustion in the gaseous phase usually with emission of light
- 3.4 to flame (verb)**
to undergo combustion in the gaseous phase with emission of light
- 3.5 glowing**
made luminous by heat (without flame)
- 3.6 undamaged**
that part of a conveyor belt remaining after the termination of the fire tests described in EN 12881 and which shows no evidence of embrittlement, cracking, blistering or other blemishes not originally present
- 3.7 secondary safety device**
equipment or apparatus provided for the purpose of assisting in the provision of a safe working environment, e.g. slip detectors, heat detectors, water fire extinguishing systems
- 3.8 incomplete ignition**
situation in which the part of the conveyor belt above the burner burns only on the bottom side and not on the top side when the burner is removed
- 3.9 Class A belt**
conveyor belt intended for general use where the only hazard is limited access and means of escape
- 3.10 Class B belt**
conveyor belt intended for use where there is limited access and means of escape, where a potentially explosive atmosphere is present and where secondary safety devices are either not present (Class B1) or present (Class B2)
- 3.11 Class C belt**
conveyor belt intended for use where there is limited access and means of escape, where a potentially explosive atmosphere is present, where other combustible material or dust is either being conveyed or is a potential source of additional fuel and where secondary safety devices are either not present (Class C1) or present (Class C2)

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4 Ignition hazard assessment

An ignition hazard assessment shall be carried out and documented as described in Annex A.

NOTE An example of an ignition hazard assessment for a conveyor belt intended for use in a potentially explosive atmosphere is given in Annex B.

5 Electrical resistance

When tested in accordance with EN ISO 284, conveyor belts intended for use in underground installations shall have an electrical surface resistance not greater than 300 M Ω .

6 Frictional heating

6.1 Belts intended for general use in underground installations (Class A), and for use in hazardous installations where secondary safety devices are present (Classes B2 and C2)

When tested in accordance with EN 1554:1998, Method B2, or Method B1 if the use of Method B2 is impossible, e.g. when testing steel cord belts, conveyor belts intended for use in these applications shall exhibit no flame whatsoever, although glowing is permissible. No requirements are included for the maximum temperature of the drum.

6.2 Belts intended for use in installations where there is a potentially flammable atmosphere and where secondary safety devices are not present (Class B1)

When tested in accordance with EN 1554:1998, Method B2, or Method B1 if the use of Method B2 is impossible, e.g. when testing steel cord belts, conveyor belts intended for use in flammable atmospheres shall exhibit no flame or glow whatsoever and at no time shall the temperature of the drum exceed 450 °C.

NOTE If the intrinsic properties of the belt alone are to be used to give a safe situation in the presence of flammable atmospheres, it is important to limit the temperature of the drum and not to allow glow. The temperature of 450 °C was chosen as being adequately below the ignition temperature of methane-air mixtures when in the presence of a hot drum surface.

6.3 Belts intended for use in installations where there is a potentially flammable atmosphere plus combustible dust or material conveyed, and where secondary safety devices are not present (Class C1)

When tested in accordance with EN 1554:1998, Method B2, or Method B1 if the use of Method B2 is impossible, e.g. when testing steel cord belts, conveyor belts intended for use in the presence of coal dust shall exhibit no flame or glow whatsoever and at no time shall the temperature of the drum exceed 325 °C.

NOTE If the intrinsic properties of the belt alone are to be used to give a safe situation in the presence of combustible dusts or material conveyed, it is important to limit the temperature of the drum and not to allow glow to avoid the possibility of combustion of dust on the belt. The drum temperature of 325 °C was chosen as being adequately below the ignition temperature of coal dust on the belt when in the presence of a hot drum surface. However, if the belt is to be used in the presence of other dusts, the purchaser/user and manufacturer may agree alternative requirements on the basis of experience, e.g. a different maximum drum temperature that will give an adequate margin of safety over the ignition temperature of the dust in question.