



SLOVENSKI STANDARD
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SIST EN 13743:2009

Varnostne zahteve za brusna sredstva na podlagah

Safety requirements for coated abrasive products

Sicherheitsanforderungen für Schleifmittel auf Unterlagen

Prescriptions de sécurité pour les produits abrasifs appliqués

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ICS:

25.100.70 Brusiva

Abrasives

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EUROPEAN STANDARD

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Safety requirements for coated abrasive products

Prescriptions de sécurité pour les produits abrasifs
appliquésSicherheitsanforderungen für Schleifmittel auf
Unterlagen

This European Standard was approved by CEN on 14 November 2016.

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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-CENELEC 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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 13743:2017) has been prepared by Technical Committee CEN/TC 143 “Machine tools - Safety”, the secretariat of which is held by SNV.

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of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13743:2009.

Significant changes against EN 13743:2009 are as follows:

- a) the scope was clarified and the types of permissible abrasive grains were specified;
- b) Table 3 was updated with additional hazard designations;
- c) Table 5 was revised according to current scientific and technical knowledge;
- d) Clause 7 was modified in order to avoid overlap with European legislation;
- e) the short signs on the restriction of use were removed from Annex A.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 13743:2017 (E)

Introduction

This European Standard has been prepared to provide one means of conforming to essential safety requirements, e.g. of the General Product Safety Directive and associated EFTA regulations.

This European Standard is addressed to manufacturers, suppliers and importers of the coated abrasive products and back-up pads described in the scope. In addition, it helps manufacturers, suppliers and importers of grinding machines in the selection of abrasive products, in order to reduce the risks and achieve conformity of the respective machinery with the Essential Safety Requirements of the Machinery Directive.

The extent to which hazards are covered is indicated in the scope of this European Standard.

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1 Scope

This European Standard is applicable to the following coated abrasive products and a combination of coated and non-woven abrasive products: flap wheels, flap discs, vulcanised fibre discs and spindle mounted flap wheels. It also applies to back-up pads for vulcanised fibre discs. These products are manufactured using the following abrasive grains: aluminium oxide, silicon carbide, diamond, or CBN.

This European Standard specifies requirements and/or measures for removal or reduction of hazards resulting from the design and application of the coated abrasive products and clamping devices.

This European Standard also contains procedures and tests for verification of compliance with the requirements as well as safety information for use, which is to be made available to the user by the manufacturer.

The hazards taken into consideration are listed in Clause 4 of this standard.

This European Standard does not apply to abrasive products entirely of non-woven web.

2 Normative references

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

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

3 Terms and definitions (standards.iteh.ai)

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

3.1 General

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3.1.1

coated abrasive product

abrasive product composed of backing, abrasive particles and bond and optionally a supporting element

Note 1 to entry: Examples for supporting elements are pads and spindles.

3.1.2

clamping device

device for fixing and positioning the abrasive product on the spindle of the grinding machine

Note 1 to entry: Clamping devices include e.g. back-up pads for vulcanised fibre discs, and clamping flanges for flap wheels.

3.2 Grinding machines

3.2.1

stationary grinding machine

grinding machine being fixed in position during operation

Note 1 to entry: See for example EN ISO 16089.

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3.2.2

mobile grinding machine

grinding machine not being fixed in position during operation

Note 1 to entry: Mobile grinding machines are manually guided (but not supported) by hand during use, e.g. floor grinding machines.

3.2.3

hand-held grinding machine

grinding machine being held in the hand during the grinding process

Note 1 to entry: See for example EN ISO 11148-7, EN ISO 11148-9, EN 60745-2-3 and EN ISO 19432.

3.3 Type of application

3.3.1 General

See Table 1.

3.3.2

mechanically guided grinding

grinding process with feed movements of the abrasive product and/or workpiece guided by mechanical means

3.3.3

manually guided grinding

grinding process with feed movements of the abrasive product and/or the workpiece manually guided by the operator

3.3.4

hand-held grinding

grinding process with grinding machine entirely guided by the operator's hands

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Table 1 — Type of application

Type of machine	Type of application	Abrasive product	Workpiece
Stationary grinding machines	Mechanically guided grinding	Fixed	Guided mechanically
		Guided mechanically	Fixed
		Guided mechanically	Guided mechanically
Stationary and mobile grinding machines	Manually guided grinding	Guided by hand	Fixed
		Fixed	Guided by hand
Hand-held grinding machines	Hand-held grinding	Guided by hand	Fixed

3.4 Symbols

The symbols used in this European Standard are listed in Table 2.

Table 2 — Symbols

Symbol	Designation	Definition	Unit
n_{ab}	Deflection speed of a spindle mounted flap wheel	Revolutions per minute at which the spindle of a rotating spindle mounted flap wheel is deflecting under centrifugal force	1/min
n_{max}	Maximum permissible speed of rotation	Revolutions per minute of a rotating new abrasive product at maximum operating speed	1/min
S_{ab}	Safety factor against spindle deflection for a spindle mounted flap wheel	Deflection speed divided by maximum permissible speed of rotation: $S_{ab} = \frac{n_{ab}}{n_{max}}$	—
v_s	Maximum operating speed	Maximum permissible peripheral speed of a rotating abrasive product	m/s
v_{br}	Bursting speed	Peripheral speed at which a rotating abrasive product breaks due to centrifugal force	m/s
$v_{br\ min}$	Minimum bursting speed	Peripheral speed, which a rotating abrasive product shall at least reach without bursting due to centrifugal force	m/s
f_{br}	Burst speed factor	Bursting speed divided by maximum operating speed: $f_{br} = \frac{v_{br}}{v_s}$	—
S_{br}	Safety factor against bursting due to centrifugal force	Bursting speed divided by maximum operating speed, all squared: $S_{br} = \left(\frac{v_{br}}{v_s} \right)^2$	—

4 List of significant hazards

The significant hazards are given in Table 3.

Table 3 — List of significant hazards

Hazard designation	Hazardous situation (Examples)	Relevant clauses in the standard
Ejection of parts	1. Abrasive product breakage caused by:	
	— improper design	5.1, 5.2, 5.3 and 5.4
	— manufacturing defects	5.1
	— wrong selection	5.4, Clause 7 and Annex A
	— improper handling and storage	Clause 7
	— improper use (mounting and grinding process)	Clause 7
	2. Grinding debris	Clause 7
	— dust, airborne particles	Clause 7
	— solid particles	Clause 7
Vibration	Hand arm vibration on hand-held machines caused by:	
	— improper use	Clause 7
	— incorrect mounting	Clause 7
Contact with the rotating/oscillating abrasive product	Improper use https://standards.iteh.ai/catalog/standards/sist/8807c180-e834-47ac-b074-45205513af33/sist-en-13743-2017	Clause 7
Noise	Insufficient ear protection	Clause 7

5 Safety requirements

5.1 General requirements

5.1.1 General

Coated abrasive products shall be designed and manufactured in such a way that they resist the forces and loads that are to be expected when used as intended. They shall not present visible defects affecting safety and shall comply with the requirements listed in the following clauses.

5.1.2 Sequence of maximum operating speeds

Coated abrasive products shall be manufactured for maximum operating speeds according to the following sequence:

< 16 — 16 — 20 — 25 — 32 — 35 — 40 — 45 — 50 — 63 — 80 in m/s

For conversion of maximum operating speeds into speeds of rotation for different outside diameters D of the abrasive product, see Annex C.

5.2 Safety factors

5.2.1 Safety factors for flap wheels, flap discs and vulcanised fibre discs

Flap wheels, flap discs and vulcanised fibre discs shall have a safety factor against bursting due to centrifugal forces at their maximum operating speed as given in Table 4.

Table 4 — Safety factors

Type of machine	Type of application	Dimensional limitation for the outside diameter D of the abrasive product mm	Maximum operating speed v_s m/s	Safety factor S_{br}	Burst speed factor f_{br}
Stationary and mobile grinding machines	Mechanically and manually guided grinding	none	≤ 63	3,0	1,73
Hand-held grinding machines	Hand-held grinding	none	≤ 50	3,0	1,73
		≤ 125	$50 < v_s \leq 80$	3,0	1,73
		> 125	$50 < v_s \leq 80$	3,5	1,87

5.2.2 Safety factors for spindle mounted flap wheels

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Spindle mounted flap wheels shall have a safety factor against bursting due to centrifugal forces of $S_{br} = 3$ at their maximum operating speed. The spindle shall have a safety factor against deflection of $S_{ab} = 1,3$.

5.2.3 Safety factor for back-up pads for vulcanised fibre discs

Back-up pads for vulcanised fibre discs shall fulfil a safety factor against bursting due to centrifugal force of $S_{br} = 3,5$ at their maximum permissible speed of rotation.

5.3 Dimensional limitations and maximum operating speeds

Coated abrasive products shall comply with the dimensional limitations and maximum operating speeds as specified in Table 5.