



SLOVENSKI STANDARD
SIST EN 13743:2004
01-september-2004

Varnostne zahteve za brusilna sredstva

Safety requirements for coated abrasives

Sicherheitsanforderungen für Schleifmittel auf Unterlagen

Prescriptions de sécurité pour les produits abrasifs appliqués

Ta slovenski standard je istoveten z: EN 13743:2001

[SIST EN 13743:2004](https://standards.iteh.ai/catalog/standards/sist/0539fe6a-3866-4a32-b553-cfb7295990ae/sist-en-13743-2004)

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ICS:

25.100.70 Brusiva Abrasives

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EUROPEAN STANDARD

EN 13743

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2001

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English version

Safety requirements for coated abrasives

Prescriptions de sécurité pour les produits abrasifs
appliqués

Sicherheitsanforderungen für Schleifmittel auf Unterlagen

This European Standard was approved by CEN on 26 October 2001.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

Annex A is normative, and annex B is informative.

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

Introduction

This standard is addressed to designers, manufacturers, and suppliers of the abrasive products described in the scope. It also provides a means of supporting designers, manufacturers, and suppliers of grinding machines in the selection of abrasive products under the aspect of risk reduction and achievement of compliance of the corresponding machines with the essential safety requirements of the Machinery Directive.

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

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1 Scope

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This European Standard applies to the following coated 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. It specifies requirements and/or measures for removal or reduction of hazards related to the design and application of the abrasive products and clamping devices.

This standard covers also methods and tests for the assessment of conformity with the requirements as well as information for use which the manufacturer shall make available to the user.

The hazards taken into account are indicated in clause 4 of this standard.

The standard does not apply to non-woven web abrasive products.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

EN 13743:2001 (E)**3 Terms, definitions and symbols**

For the purposes of this European Standard the following terms, definitions and symbols apply.

3.1**coated abrasives**

abrasive products composed of backing, abrasive, and bond

3.2**clamping devices**

devices for fixing and positioning the abrasive product on the spindle of the grinding machine including e.g. back-up pads for vulcanised fibre discs, and chucking flanges for flap wheels

3.3 Grinding machines**3.3.1****stationary grinding machines**

machines fixed to their position during operation due to their nature or their mechanical attachment. They also include e.g. stationary swing-frame grinding machines and mobile machines maintained in position during operation by clamping elements

3.3.2**mobile grinding machines**

machines guided manually (but not hand-held) during grinding, e.g. floor grinding machines

3.3.3**hand-held grinding machines**

machines, including those with flexible shaft, held in the hand during the grinding process

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3.4 Type of application

See Table 1.

3.4.1**mechanically guided grinding**

feed movements of the abrasive product and/or workpiece are guided by mechanical means

3.4.2**manually guided grinding**

feed movements of the abrasive product and/or the workpiece are manually guided by the operator

3.4.3**hand-held grinding**

grinding machine is entirely guided by the operators hands

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

3.5 Dimensional abbreviations

Table 2 — Dimensional abbreviations

Symbol	Designation
D	Outside diameter of abrasive products
D_1	Diameter of support of flap wheels with fixed flange and of ring groove of flap wheels with loose flange
H	Abrasive product bore diameter
l_s	Length of cross slots of vulcanised fibre discs
L_2	Length of spindle of spindle mounted flap wheels
S_d	Diameter of spindle of spindle mounted flap wheels
T	Thickness of abrasive products

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3.6 Symbols for speeds of rotation, operating speeds and safety factors

Table 3 — Speed and testing

Symbol	Designation	Definition	Unit
n	Speed of rotation	Revolutions per minute (rpm)	min^{-1} or $\frac{1}{\text{min}}$
n_{ab}	Deflection speed of mounted wheels	Speed or rotation at which the spindle of mounted wheels is deflecting under centrifugal stress	min^{-1} or $\frac{1}{\text{min}}$
n_{max}	Maximum permissible speed of rotation	Revolutions per minute (rpm) of the new abrasive product at maximum operating speed	min^{-1} or $\frac{1}{\text{min}}$
v	Peripheral surface speed	Speed at the periphery of the abrasive product	m/s
v_s	Maximum operating speed	The maximum permissible peripheral speed of a rotating abrasive product	m/s
v_{pr}	Safety test speed	Peripheral speed at which abrasive products are tested by the manufacturer	m/s
f_{pr}	Test speed factor	The ratio of the safety test speed divided by the maximum operating speed	—
v_{br}	Bursting speed	The peripheral surface speed at which the abrasive product breaks due to centrifugal force	m/s
$v_{\text{br min}}$	Minimum bursting speed	Peripheral speed which the abrasive product shall at least reach without bursting due to centrifugal force	m/s
S	Safety factor against bursting due to centrifugal force	The bursting speed, divided by the maximum operating speed, all squared. The formula for S is: $S = \left(\frac{v_{\text{br}}}{v_s} \right)^2$	—
S_{ab}	Safety factor against deflection of the spindle of spindle mounted flap wheels	The deflection speed divided by the admissible speed of rotation. The formula is: $S_{\text{ab}} = \frac{n_{\text{ab}}}{n_{\text{max}}}$	—

3.7 Other definitions

3.7.1

labels

carrier of information linked or added to the abrasive product containing essential safety information on the abrasive product

4 List of hazards

Table 4 — List of hazards

Designation of hazard	Hazardous situations (Examples)	Relevant clauses in the standard
Ejection of parts	1. Abrasive product breakage caused by:	
	— Improper design of abrasive product	5.1, 5.2, 5.3, 5.4
	— Manufacturing defects	6
	— Wrong selection of abrasive products	5.5, 7, annex A
	— Improper handling and storage	7
	— Improper use (mounting and grinding process)	7
	2. Loosening of grinding particles during grinding	7

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5 Requirements

5.1 Maximum operating speeds

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Abrasive products shall be manufactured for maximum operating speeds classified in the following way:

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

Conversion table for speeds of rotation and peripheral speeds as a function of outside diameter D of the abrasive products, see annex B.

5.2 Safety factors

Abrasive products are subjected to high stresses during grinding. Therefore they shall fulfil specified safety factors and bursting speeds at their maximum operating speed.

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

Flap wheels, flap discs and vulcanised fibre discs shall fulfil safety factors and bursting speeds as a function of type of machine, type of application and maximum operating speed according to Table 5.

Table 5 — Maximum operating speeds, safety factors and minimum bursting speeds for flap wheels, flap discs and vulcanised fibre discs

Type of machine	Type of application	Maximum operating speed v_s in m/s	Safety factor S	Minimum bursting speed $v_{br \text{ min}}$ in m/s
Stationary and mobile grinding machines	Mechanically and manually guided grinding	< 16	3	—
		16	3	28
		20	3	35
		25	3	43
		32	3	55
		35	3	61
		40	3	69
		45	3	78
		50	3	87
Hand-held grinding machines	Hand-held grinding	63	3	109
		16	3	28
		20	3	35
		25	3	43
		32	3	55
		35	3	61
		40	3	69
		45	3	78
		50	3	87
		63	3,5	118
		80	3,5	150

5.2.2 Safety factors for spindle mounted flap wheels

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

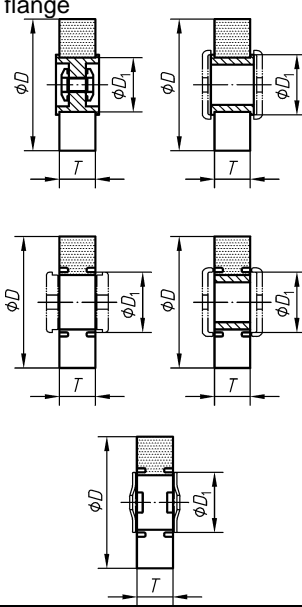

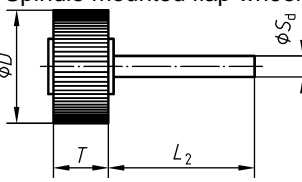
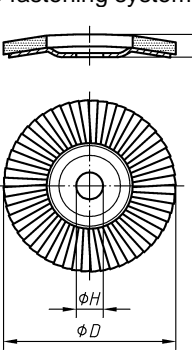
5.3 Maximum operating speeds, dimensions and dimensional limitations

With respect to shape, type of machine and type of application, the abrasive products shall comply with the dimensions and dimensional limitations as specified in Table 6.

The abrasive products shall be designed, tested, and marked by the manufacturer in accordance with the standard maximum operating speeds according to Table 6 if no maximum operating speeds are specified by the purchaser.

On specific request by the purchaser, flap wheels may be designed, tested and marked with a maximum operating speed not higher than the special maximum operating speeds as specified in Table 6.

Table 6 — Standard and special maximum operating speeds

Shape, designation, dimensional abbreviations	Type of machine	Type of application	Maximum operating speeds, dimensions and dimensional limitations			
			Dimensions in mm and dimensional limitations	Standard operating speeds in m/s	Dimensions in mm and dimensional limitations	Special operating speeds in m/s
Flap wheel with or without flange 	Stationary grinding machines	Mechanically and manually guided grinding	$D \leq 600$ $T \leq 300$ $D_1 \geq 0,5D$	40	$D \leq 600$ $T \leq 300$ $D_1 \geq 0,5D$	
	Hand-held grinding machines	Hand-held grinding	$D_{max} \times T_{max}$ 250×50 200×75 160×75 125×100 100×125 $D_1 \geq 0,33D$	40	—	50 and 63
Spindle mounted flap wheel 	Hand-held grinding machines	Hand-held grinding	$D \leq 80$ $T \leq 50$	40	—	—
Flap disc without hook and loop fastening system 	Hand-held grinding machines	Hand-held grinding	$D \leq 230$ $T \leq 22$ $H \leq 22,23$	80	—	—
Flap disc with hook and loop fastening system See figure above	Hand-held grinding machines	Hand-held grinding	$D \leq 230$ $T \leq 22$ $H \leq 22,23$	63	—	—