



SLOVENSKI STANDARD

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Stroji za predelavo gume in plastike - Navijalniki za folije (filme) in trakove - Varnostne zahteve

Rubber and plastics machines - Winding machines for film or sheet - Safety requirements

Gummi- und Kunststoffmaschinen - Wickelmaschinen für flache Bahnen - Sicherheitsanforderungen

Machines pour le caoutchouc et les matières plastiques - Bobineuses pour films ou feuilles - Prescriptions de sécurité

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EUROPEAN STANDARD
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Rubber and plastics machines - Winding machines for film or sheet - Safety requirements

Machines pour le caoutchouc et les matières plastiques -
Bobineuses pour films ou feuilles - Prescriptions de
sécurité

Gummi- und Kunststoffmaschinen - Wickelmaschinen für
flache Bahnen - Sicherheitsanforderungen

This European Standard was approved by CEN on 2 February 2004.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document EN 13418:2004 has been prepared by Technical Committee CEN/TC 145 "Rubber and plastics machines - Safety", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by October 2004, and conflicting national standards shall be withdrawn at the latest by October 2004.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

Annexes A and C are informative, annex B is normative.

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

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EN 13418:2004 (E)**Introduction**

This document is a type C standard as stated in EN 1070.

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.

1 Scope

This European Standard specifies the safety requirements for the design and construction of winding, unwinding and rewinding machines for film or sheet manufactured from rubber, plastics and composite materials in respect of the significant hazards listed in clause 4.

A winding machine begins at the intake of the film or sheet into the winding machine and ends at the discharge position of the reel(s).

An unwinding machine begins at the take-up position of the reel(s) and ends at the film or sheet take-off point.

A rewinding machine begins at the take-up position of the reel(s) and ends at the discharge position of the reel(s).

In some machines the winding, unwinding and rewinding functions may be combined.

The following functional groups are covered by this European Standard:

- fixed point roll;
- film or sheet tension control;
- winding zone;
- reel change device;
- reel loading and unloading devices;

and the following additional equipment integrated into the winding machine:

- spreader roll device;
- longitudinal cutting unit;
- slitting device;
- film or sheet alignment device;
- static eliminator.

Technical safety requirements for the design and construction of aids for lifting and handling, e.g. of winding cores or reels, are not covered by this standard.

Technical safety requirements for the design and construction of thickness monitoring devices are not covered by this standard.

Hazards due to electro-magnetic radiation, e.g. from the use of thickness monitoring devices, are not covered by this standard.

Toxic or chemical hazards and hazards due to dusts, fumes or gases, which could occur from the materials being wound are not covered by this standard.

NOTE Directive 94/9/EC concerning equipment and protective systems intended for use in potentially explosive atmospheres can be applicable to the type of machine or equipment covered by this European Standard. The present standard is not intended to provide means of complying with the essential health and safety requirements of Directive 94/9/EC.

This standard applies to machines which are manufactured after the date of approval of the standard by CEN.

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).

EN 292-1:1991, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*.

EN 292-2:1991, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications*.

EN 292-2:1991/A1:1995, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications*.

EN 294:1992, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*.

EN 349:1993, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*.

EN 418:1992, *Safety of machinery — Emergency stop equipment, functional aspects — Principles for design*.

EN 574:1996, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*.

EN 614-1:1995, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*.

EN 811:1996, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs*.

EN 953:1997, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*.

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EN 954-1:1996, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design.*

EN 982:1996, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics.*

EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics.*

EN 999:1998, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body.*

EN 1037:1995, *Safety of machinery — Prevention of unexpected start-up.*

EN 1070:1998, *Safety of machinery — Terminology.*

EN 1088:1995, *Safety of machinery — Interlocking devices with and without guard locking — General principles and provisions for design.*

EN 1760-1:1997, *Safety of machinery — Pressure sensitive protective devices — Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors.*

EN 60204-1:1997, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:1997).*

EN 60529:1991, *Degrees of protection provided by enclosures (IP-Code) (IEC 60529:1989).*

EN 61496-1:1997, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and test (IEC 61496-1:1997).*

EN ISO 3743-1:1995, *Acoustics — Determination of sound power levels of noise sources - Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms (ISO 3743-1:1994).*

EN ISO 3743-2:1996, *Acoustics — Determination of sound power levels of noise sources using sound pressure - Engineering methods for small, movable sources in reverberant fields — Part 2: Methods for special reverberation test rooms (ISO 3743-2:1994).*

EN ISO 3744:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994).*

EN ISO 3746:1995, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:1995).*

EN ISO 3747:2000, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Comparison method for use in situ (ISO 3747:2000).*

EN ISO 4871:1996, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996).*

EN ISO 9614-1:1995, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points (ISO 9614-1:1993).*

EN ISO 9614-2:1996, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement by scanning (ISO 9614-2:1996).*

EN ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane (ISO 11201:1995).*

EN ISO 11202:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Survey method in situ (ISO 11202:1995).*

EN ISO 11203:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions from the sound power level (ISO 11203:1995).*

EN ISO 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections (ISO 11204:1995).*

EN ISO 11688-1:1998, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995).*

3 Definitions

For the purposes of this document, the definitions given in EN 1070:1998 and the following definitions apply:

3.1 working zone

this zone includes any place where the operator of the machine stands or passes in order to carry out operations and includes catwalks, working pits and devices firmly mounted to the machine like stairs, platforms and pedestals of all kinds

3.2 winding machines

machines to wind up film or sheet material and/or to unwind and/or rewind it. The various kinds of machines are distinguished by their drives. A distinction is made between centre winder, surface winder and combinations of both

3.2.1 centre winder

winding machine with central drive to the winding core

3.2.2 surface winder

winding machine whose winding or reel drive relies on friction at the driven roll surface

3.3 winding core

element onto which film or sheet is wound or from which film or sheet is unwound. It may be a solid shaft or a hollow core, for example made of cardboard, or a combination of the two where the core is sleeved onto the shaft

3.4 winding

film or sheet in the process of being wound

3.5 reel

film or sheet material which is wound with or without a winding core

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EN 13418:2004 (E)**3.6****area guarding**

one or a combination of safety measure(s) for several danger points/areas

3.7**non-driven roll**

roll for guiding film or sheet through the machine and which is driven by the film or sheet

3.8**fixed point roll**

roll or set of rolls that determine the material speed and/or the tension within the winding machine. The following are fixed point rolls: driven roll, vacuum roll, nip roll

3.8.1**driven roll**

roll that pulls the film or sheet by means of surface contact (friction)

3.8.2**vacuum roll**

driven roll against which the film or sheet is held by means of a vacuum which creates adherence

3.8.3**nip rolls**

rolls that are pressed one against the other; one at least is driven. The film or sheet is drawn through the nip by the nipping effect

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3.9**film or sheet tension control**

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driven or non-driven roll systems that control the film or sheet tension

3.9.1**dancer roll**

guide roll that is pivoted about a point and over which the film or sheet runs. The load of the dancer roll determines the film or sheet tension (see annex A, Figure A.1)

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3.9.2**suspended roll**

guide roll that reciprocates between guides in a linear direction and over which the film or sheet runs. The load of the suspended roll determines the film or sheet tension (see annex A, Figure A.2)

3.9.3**measuring roll**

guide roll the axis of which is supported in load cell mounted bearings which measure the film or sheet tension

3.10**winding zone**

area in which the winding and/or unwinding and/or rewinding is undertaken

3.10.1**winding position**

position where film or sheet material is wound to form a reel.

3.10.2**unwind position**

position where film or sheet material is unwound from a reel

3.10.3**pivot arm**

pair of arms that support a reel and insert or discharge it in a pivoting movement

3.10.4**turret device**

device that changes the positions of the winding core and the reel in the winding position e. g. by rotation. The following distinction is made:

- for winding machines: the winding core is moved from the take-up position to the winding position and the reel is moved from the winding position to the discharge position,
- for unwinding machines: the reel is moved from the take-up position to the unwind position and the winding core is moved from the unwind position to the discharge position.

3.10.5**guide carriage**

device that provides linear direction to the reel or the contact/pressure roll to maintain the winding parameters

3.10.6**contact/pressure roll**

a driven or non-driven roll that is used for controlling the winding of the film or sheet

3.10.7**winding core support**

device for supporting and fixing winding cores, for example, three-point bearing, tilting bearing, spindle, trunnion bearing or expanding mandrel

3.10.8**winding core loading device**

device that feeds empty winding cores either into a magazine or directly to the winding start position

3.10.9**winding core unloading device**

device that extracts winding cores from the unwind position

3.11**reel change device**

device that ensures continuous winding, unwinding or rewinding of the film or sheet during the reel change sequence

3.11.1**lay on device**

device that lays the film or sheet against an empty winding core during reel change

3.11.2**film or sheet splicing device**

device that splices the end of the film or sheet from one reel to the start of the film or sheet of a new reel

3.11.3**cross cutting device**

device that finishes the winding cycle by cutting the film or sheet across its width

3.11.3.1**impact cutting device**

device that cuts the film or sheet by an impact movement across its width

EN 13418:2004 (E)**3.11.3.2****draw-type cutting device**

device in which either a rotating or fixed knife/blade is moved to cut the film or sheet across its width

3.12**reel loading device**

device for loading reels on to the unwind station

3.13**reel unloading device**

device for unloading reels from the winding station

3.14**spreader roll**

roll that prevents the film or sheet being wound from getting narrower or from getting wrinkled and maintains the spread of multiple lanes of film or sheet

3.15**longitudinal cutting device**

device for cutting film or sheet to a certain width. It allows the film or sheet to be cut into two or more lanes or to trim the edges. There are different kinds of cutting knives, for example:

- fixed knives;
- circular knives.

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3.16**slitting device**

device that slits a tubular film in a fold

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3.17**film or sheet alignment device**

device for alignment of the film or sheet

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3.18**static eliminator**

device for eliminating electrostatic charges built up on the film or sheet during winding or unwinding or rewinding

4 List of significant hazards**4.1 Mechanical hazards**

This clause contains the significant hazards and hazardous situations, as far as they are dealt with in this European Standard, identified by a risk assessment significant for this type of machinery and which require action to eliminate or reduce the risk.

When using this standard, it is important to carry out a risk assessment of the individual functional groups in accordance with EN 1050 to check whether it has hazards additional to the ones covered by this standard.

The letters a – k in Table 1 below that indicate the hazards are referred to in Table 2, column 3.

Table 1 — List of mechanical hazards

		Hazards									
		a	b	c	d	e	f	g	h	j	k
Danger points/areas		Drawing-in between film or sheet and moving part, e. g. roll	Drawing-in between film or sheet and winding	Drawing-in between film or sheet and winding/reel and fixed or moving machine parts or floor	Drawing-in between moving parts, e. g. roll/roll	Drawing-in between fixed and moving machine parts	Crushing and/or shearing between moving machine parts	Crushing and/or shearing between fixed and moving machine parts and floor	Crushing and/or shearing when inserting/chucking machine parts	Drawing-in or trapping by moving machine parts	Cutting by knives
4.1.1	Non-driven web roll(s)	x			x	x				x	
4.1.2	Fixed point roll(s)										
4.1.2.1	Driven roll(s)	x			x	x					
4.1.2.2	Vacuum roll(s)	x				x					
4.1.2.3	Nip roll(s)	x			x		x	x			
4.1.3	Film or sheet tension control (e.g. dancer roll, suspended roll, measuring roll)	x						x			
4.1.4	Winding zone										
4.1.4.1	Winding position										
4.1.4.2	Unwind position										
4.1.4.3	Pivot arm						x	x			
4.1.4.4	Turret device							x		x	
4.1.4.5	Guide carriage							x		x	
4.1.4.6	Contact/pressure roll	x			x		x	x			
4.1.4.7	Winding core support								x	x	
4.1.4.8	Winding core loading device							x			
4.1.4.9	Winding core unloading device							x			
4.1.5	Reel change device										
4.1.5.1	Lay on device			x	x		x				
4.1.5.2	Film or sheet splicing device			x			x				x
4.1.5.3	Cross cutting device										
4.1.5.3.1	Impact cutting device							x			x
4.1.5.3.2	Draw cutting device						x				x
4.1.6.	Reel loading device							x			
4.1.7	Reel unloading device							x			
4.1.8	Spreader roll device			x							
4.1.9	Longitudinal cutting device				x						x
4.1.10	Slitting device										x
4.1.11	Film or sheet alignment	x						x			
4.1.12	Drive and power transmission systems				x	x	x	x		x	