



# SLOVENSKI STANDARD

## SIST EN 13418:2013

01-november-2013

Nadomešča:

SIST EN 13418:2004+A1:2008

---

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

Plastics and rubber machines - Winding machines for film or sheet - Safety requirements

Kunststoff- und Gummimaschinen - Wickelmaschinen für flache Bahnen - Sicherheitsanforderungen

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

[SIST EN 13418:2013  
https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-28524c7519b/sist-en-13418-2013](https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-28524c7519b/sist-en-13418-2013)

**Ta slovenski standard je istoveten z: EN 13418:2013**

---

**ICS:**

83.200

Oprema za gumarsko industrijo in industrijo polimernih materialov

Equipment for the rubber and plastics industries

**SIST EN 13418:2013**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 13418:2013

<https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-2852f4c7519b/sist-en-13418-2013>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13418**

May 2013

ICS 83.200

Supersedes EN 13418:2004+A1:2008

English Version

**Plastics and rubber machines - Winding machines for film or  
sheet - Safety requirements**

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

Kunststoff- und Gummimaschinen - Wickelmaschinen für  
flache Bahnen - Sicherheitsanforderungen

This European Standard was approved by CEN on 11 April 2013.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

[SIST EN 13418:2013](https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-28524c7519b/sist-en-13418-2013)

<https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-28524c7519b/sist-en-13418-2013>



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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents

Page

Foreword.....	4
Introduction .....	5
1 Scope .....	6
2 Normative references .....	6
3 Terms and definitions .....	8
4 List of significant hazards .....	13
5 Safety requirements and/or protective measures .....	15
5.1 General.....	15
5.2 General safety requirements and/or protective measures .....	15
5.2.1 Protection of danger points/areas .....	15
5.2.2 Safety distances to prevent danger points/areas being reached .....	16
5.2.3 Basic safeguard requirements .....	16
5.2.4 Drive and power transmission systems .....	16
5.2.5 Cutting devices .....	16
5.2.6 Area guarding.....	17
5.2.7 Electrical equipment.....	17
5.2.8 Control systems - Safe design measures .....	17
5.2.9 Safety-related parts of the control system.....	17
5.2.10 Precautions in view of emergency situations.....	18
5.2.11 Unexpected start-up .....	18
5.2.12 Pneumatic systems and their components .....	18
5.2.13 Hydraulic systems and their components .....	18
5.2.14 Electrostatic discharge .....	18
5.2.15 Ergonomics .....	19
5.2.16 Noise .....	19
5.3 Specific safety requirements and/or protective measures in normal operating mode .....	20
5.4 Start-up procedure and manual intervention.....	39
5.4.1 Start-up procedure.....	39
5.4.2 Manual intervention.....	40
6 Verification of the safety requirements and/or protective measures .....	42
7 Information for use .....	51
7.1 Minimum marking on the machine.....	51
7.2 Instruction manual.....	51
Annex A (normative) Noise test code .....	53
A.1 Introduction .....	53
A.2 Determination of the A-weighted emission sound pressure level at the workstation .....	53
A.2.1 Basic standards .....	53
A.2.2 Measurement uncertainty .....	54
A.3 Determination of the A-weighted sound power level.....	54
A.3.1 Basic standards .....	54
A.3.2 Measurement uncertainty .....	54
A.4 Mounting and operating conditions.....	54
A.4.1 General.....	54
A.4.2 Mounting conditions.....	55
A.4.3 Operating conditions.....	55
A.5 Information to be recorded and reported .....	55
A.6 Declaration and verification of noise emission values.....	56

<b>Annex B</b> (informative) <b>Example of area guarding using a combination of distance guarding in conjunction with sensitive protective equipment (SPE)</b> .....	<b>57</b>
<b>Annex C</b> (informative) <b>Example of a safety concept and procedures for a centre turret winder</b> .....	<b>59</b>
<b>Annex ZA</b> (informative) <b>Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC</b> .....	<b>63</b>
<b>Bibliography</b> .....	<b>64</b>

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 13418:2013

<https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-2852f4c7519b/sist-en-13418-2013>

## Foreword

This document (EN 13418:2013) has been prepared by Technical Committee CEN/TC 145 "Plastics and rubber machines", 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 November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

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

This document supersedes EN 13418:2004+A1:2008.

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 EU Directive.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

List of significant technical changes since the last edition:

- partially modified requirements and/or protective measures for individual functional groups by taking into account the technological changes in the plastics and rubber industry and the development of the safety technology;
- modified requirements for the safety related parts of the machine control system by taking into account the performance levels as specified in EN ISO 13849-1;
- complete revision of the clause on start-up procedure and manual intervention;
- addition of a noise test code in form of a normative annex;
- modified informative annexes showing examples of safety concepts used at winding machines.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

This document is a type C standard as stated in EN ISO 12100:2010.

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.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13418:2013](https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-2852f4c7519b/sist-en-13418-2013)

<https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-2852f4c7519b/sist-en-13418-2013>

## EN 13418:2013 (E)

## 1 Scope

This European Standard deals with all significant hazards, hazardous situations and events relevant to the design and construction of winding machines used for the winding and/or unwinding and/or rewinding and/or slitting of film or sheet manufactured from rubber, plastic and composite materials, when the machines are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4).

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

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

A machine used for unwinding, slitting and re-winding (slitter rewinder) begins at the take-up position of the reel(s) and ends at the discharge positions of the reel(s) and covers one or more integrated slitting/cutting units.

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

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

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

<https://standards.itech.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-28528c7519b/sist-en-13418-2013>

This European Standard is not applicable to winding machines which are manufactured before the date of its publication.

## 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.

EN 953:1997+A1:2009, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 1037:1995+A1:2008, *Safety of machinery — Prevention of unexpected start-up*

EN 1088:1995+A2:2008, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1760-1:1997+A1:2009, *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 1760-3:2004+A1:2009, *Safety of machinery — Pressure sensitive protective devices — Part 3: General principles for the design and testing of pressure sensitive bumpers, plates, wires and similar devices*



EN 60204-1:2006,<sup>1)</sup> *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

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

EN 61496-1:2004,<sup>2)</sup> *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)*

CLC/TS 61496-3:2008, *Safety of machinery — Electro-sensitive protective equipment — Part 3: Particular requirements for Active Opto-electronic Protective Devices responsive to Diffusive Reflection (AOPDDR) (IEC 61496-3:2008)*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 3746:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane (ISO 3746:2010)*

EN ISO 3747:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment (ISO 3747:2010)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components (ISO 4414:2010)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

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

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11202:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections (ISO 11202:2010)*

EN ISO 11204:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections (ISO 11204:2010)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

1) EN 60204-1:2006 is impacted by the stand-alone amendment EN 60204-1:2006/A1:2009, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*.

2) EN 61496-1:2004 is impacted by the stand-alone amendment EN 61496-1:2004/A1:2008, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004/A1:2007 + corrigendum Jul. 2008)*.

## EN 13418:2013 (E)

EN ISO 13849-1:2008,<sup>3)</sup> *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)*

EN ISO 13855:2010, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)*

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions given in EN ISO 12100:2010 and the following apply.

**3.1 winding machine**  
machine to wind up film or sheet material. and/or to unwind and/or rewind it or a combination including a slitting or splitting function

Note 1 to entry: The various kinds of this machine are distinguished by their drive. Distinction is made between centre winder, surface winder and combinations of both.

**3.1.1 centre winder**  
winding machine with central drive to the winding core

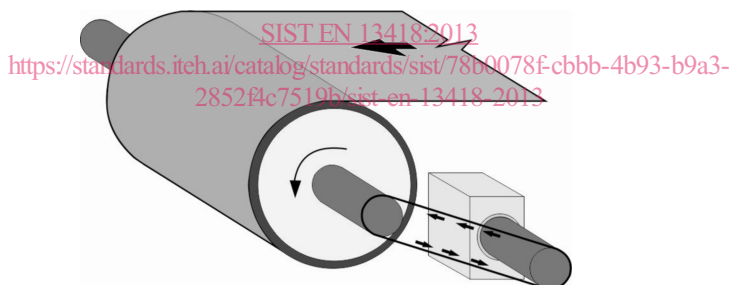


Figure 1 — Centre winder

**3.1.2 surface winder**  
winding machine whose reel drive relies on friction at the driven reel surface

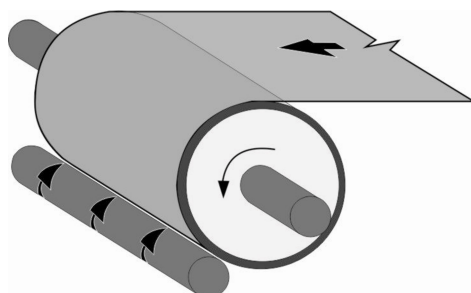


Figure 2 — Surface winder

3) EN ISO 13849-1:2008 is impacted by the corrigendum EN ISO 13849-1:2008/AC:2009.

**3.2****winding core**

element onto which film or sheet is wound or from which film or sheet is unwound

Note 1 to entry: 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.

**3.3****winding**

process of film or sheet being wound

**3.4****reel**

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

**3.5****non-driven roll**

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

**3.6****fixed point roll**

roll or set of rolls that determine the material speed and/or the tension within the winding machine

Note 1 to entry: The following are fixed point rolls: driven roll, vacuum roll, nip roll.

**3.6.1****driven roll**

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

**3.6.2****vacuum roll**

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

**3.6.3****nip rolls**

rolls that are pressed one against the other, one of which at least is driven

Note 1 to entry: The film or sheet is drawn through the nip by the nipping effect.

**3.7****film or sheet tension control**

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

**3.7.1****dancer roll**

guide roll that is pivoted about a point and over which the film or sheet runs, and the load of which determines the film or sheet tension

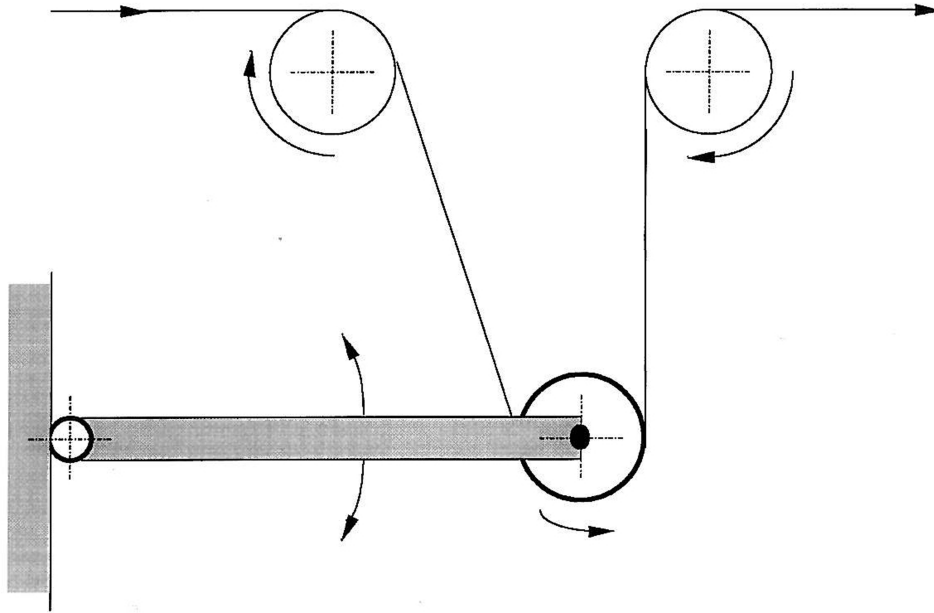


Figure 3 — Schematic drawing of a dancer roll

### 3.7.2

#### 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.

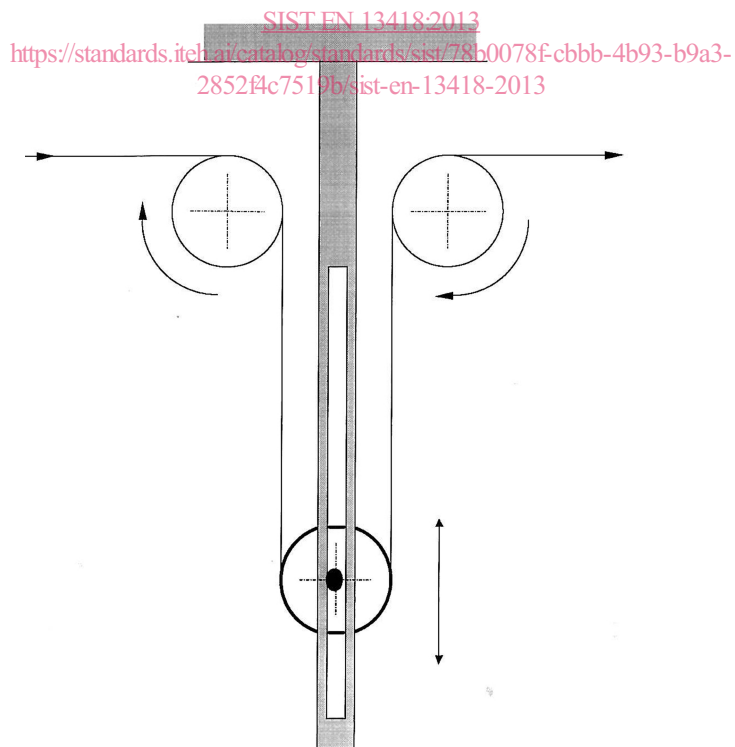


Figure 4 — Schematic drawing of a suspended roll

**3.7.3****force measuring roll**

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

**3.8****winding zone**

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

**3.8.1****winding position**

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

**3.8.2****unwind position**

position where film or sheet material is unwound from a reel

**3.8.3****pivot arm**

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

**3.8.4****turret device**

device that changes the positions of the winding core and the reel in the winding position e.g. by rotation

Note 1 to entry: 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.

<https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-28524c7519b/sist-en-13418-2013>

**3.8.5****guide carriage device**

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

**3.8.6****contact/pressure roll**

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

**3.8.7****winding core support**

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

**3.8.8****winding core loading device**

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

**3.8.9****winding core unloading device**

device that extracts and/or removes winding cores from the unwind position

**3.9****reel change device**

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

**EN 13418:2013 (E)****3.10****lay on device**

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

**3.11****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

**3.12****cross cutting device**

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

**3.12.1****impact cutting device**

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

**3.12.2****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

**3.13****reel loading device**

device for loading reels on to the unwind station

**3.14****reel unloading device**

device for unloading reels from the winding station

**3.15****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

**3.16****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

Note 1 to entry: There are different kinds of cutting knives, for example: fixed knives and circular knives.

**3.17****splitting device**

device that slits a tubular film in a fold

**3.18****film or sheet alignment device**

device that controls the alignment of the film or sheet in relation to its centre or its edges

**3.19****static eliminator**

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

**3.20****working zone**

zone which includes any place where the operator of the machine stands or passes in order to carry out operations

Note 1 to entry: This includes catwalks, working pits and devices firmly mounted to the machine like stairs, platforms and pedestals of all kinds.

### 3.21

#### **area guarding**

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

## **4 List of significant hazards**

This clause contains all 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.

Table 1 and Table 2 list the hazards on winding machines and include cross-references to the safety requirements and/or protective measures in Clause 5.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 13418:2013](https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-2852f4c7519b/sist-en-13418-2013)

<https://standards.iteh.ai/catalog/standards/sist/78b0078f-cbbb-4b93-b9a3-2852f4c7519b/sist-en-13418-2013>