SLOVENSKI STANDARD
SIST EN 1034-3:2000

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Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 3: Winders and slitters, plying machines

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Sicherheit von Maschinen - Sicherheitsanforderungen für Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 3: Umroller, Rollenschneidemaschinen, Doubliermaschinen

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 3: Visiteuses, bobineuses et machines de fabrication du papier multicouches

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13.110	Varnost strojev	Safety of machinery
21.020	Značilnosti in načrtovanje strojev, aparatov, opreme	Characteristics and design of machines, apparatus, equipment
85.100	Oprema za papirno industrijo	Equipment for the paper industry

SIST EN 1034-3:2000 **en**

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This European Standard was approved by CEN on 17 September 1999.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 198 "Printing and paper machinery - Safety", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

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 relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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.

0 Introduction

This European Standard is a C type standard as stated in EN 1070:1998. The extent to which hazards are covered is indicated in the scope of this standard.

1 Scope

This European Standard applies to winders and slitters and plying machines and should be used together with prEN 1034-1. It deals with the significant hazards listed in clause 4. Respective safety requirements and/or measures are specified in clause 5. The specifications made in this standard take precedence over any deviating specification made in prEN 1034-1.

This standard does not apply to machines used in paper converting. See prEN 1010-1 to prEN 1010-5.

This standard applies to machines produced after 17.11.1999.

2 Normative references

This European Standard incorporates dated or undated provisions from other publications. These normative references are cited in 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.

EN 292-1:1991	Safety of machinery - Basic concepts - General principles for design - Part 1: Basic terminology, methodology
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	Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
EN 418	Safety of machinery - Emergency stop equipment, functional aspects - Principles for design

EN 954-1	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design
EN 982	Safety of machinery - Safety requirements for fluid power systems and their components - Hydraulics
EN 983	Safety of machinery - Safety requirements for fluid power systems and their components - Pneumatics
prEN 1034-1:1998	Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 1: Common requirements
EN 1050	Safety of machinery - Principles for risk assessment
EN 1070:1998	Safety of machinery - Terminology
EN 1088	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
EN 1760-1	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 1837	Safety of machinery - Ingetral lighting of machines
EN 60204-1:1992	Safety of machinery - Electrical equipment - Part 1: General requirements
EN 61496-1	Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests

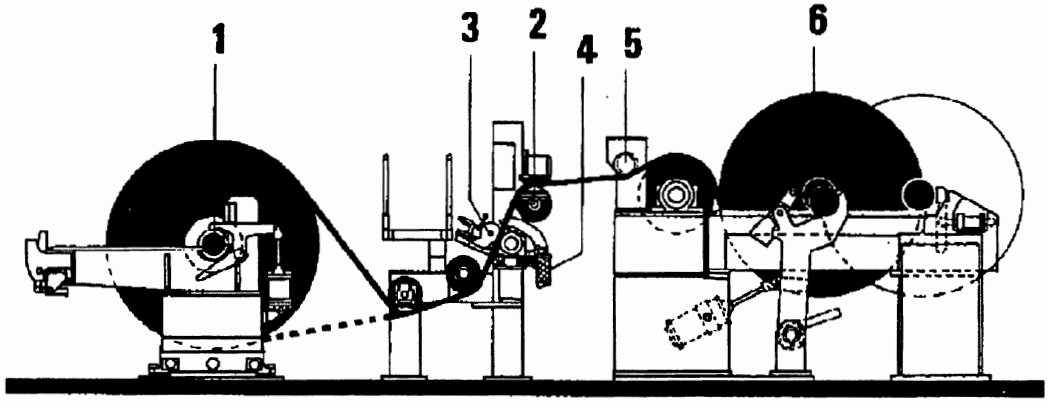
3 Definitions

For the purposes of this standard, the definitions given in prEN 1034-1:1998, EN 1070:1998, EN 292-1:1991, and the following definitions apply:

3.1 **Winders:** machines which prepare the web for subsequent processing, for example by changing the winding hardness, removing broken webs or turning over of the web. Figure 1 illustrates the principle of a winder.

3.2 **Slitters:** machines for cutting web in the length direction and for winding the separate web. They can either have a winding shaft or are shaftless with a core tube. Depending on the type of design, slitters are classified into two-drum and centre-driven slitters. Figure 2 illustrates the principle of a two-drum slitter, figure 3 illustrates the principle of a centre-driven slitter.

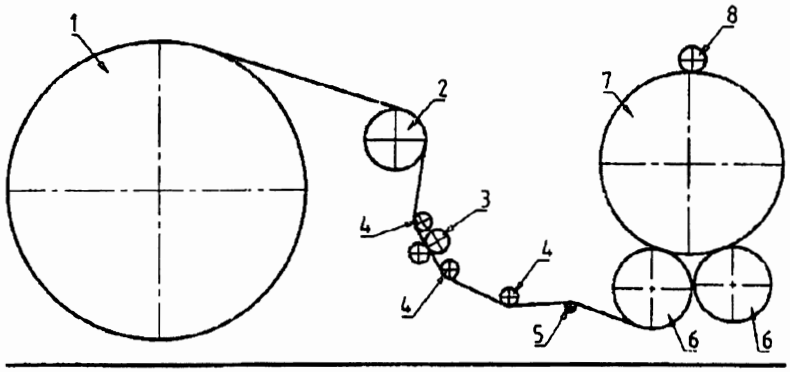
3.3 **Plying machines:** machines which combine, wind and possibly slit 2 or more webs. Figure 4 illustrates the principle of a plying machine.



NOTE: Safety devices are not shown.

1 unwinding unit
2 web tension measurement
3 cutting section (individual knives)
4 trim suction unit
5 spreader roll
6 winding unit

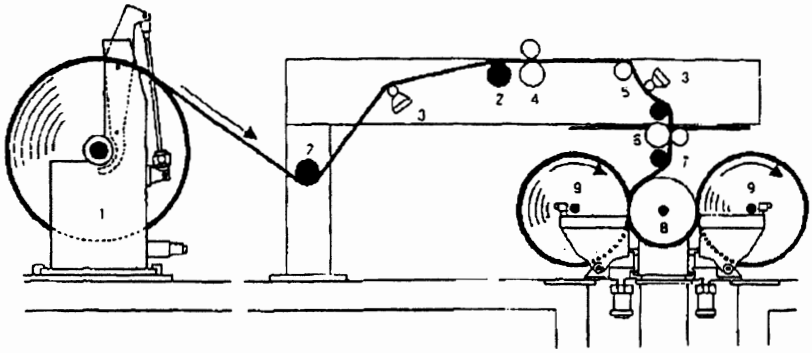
Figure 1: Principle of a winder



NOTE: Safety devices are not shown.

1 unwinding unit
2 guide roller
3 knife
4 guide roller
5 spreader roll
6 drum
7 winding head
8 pressure roller

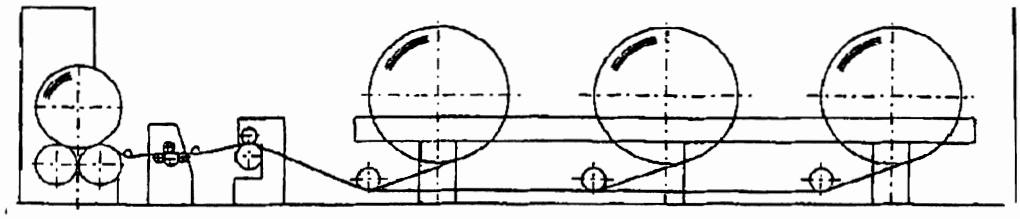
Figure 2: Principle of a two-drum slitter



NOTE: Safety devices are not shown.

1	reel unwinding unit with core ejection mechanism	5	tension measuring roller
2	guide roller	6	slitting device
3	spreading device with automatic threading	7	slit web
4	pretrimming device	8	supporting drum
		9	reel winding heads

Figure 3: Principle of a centre-driven slitter



NOTE: Safety devices are not shown.

Figure 4: Principle of a plying machine

4 List of significant hazards

This clause contains all the significant hazards, as far as they are dealt with in this standard, identified by risk assessment in accordance with EN 1050 as significant for this type of machinery and which require action to eliminate or reduce the risk.

Table 1: List of significant hazards

Hazards	prEN 1034-3	prEN 1034-1
Mechanical hazards		
Crushing hazard	5.15; 5.16; 5.17; 5.21	5.1; 5.3
Shearing hazard	5.21; 5.27	5.1
Cutting or severing hazard	5.18; 5.25; 5.26; 5.27	5.1; 5.11; 5.12
Entanglement hazard	5.28; 5.29	5.2
Drawing-in or trapping hazard	5.3; 5.15; 5.19; 5.20	5.1; 5.4
Impact hazard	5.11.2; 5.20; 5.23; 5.24	5.1
Stabbing or puncture hazard		5.1; 5.12
Friction or abrasion hazard	5.29	5.1
High-pressure fluid ejection hazard	5.13	5.24
Ejection of parts (parts of machines or processed material/workpieces)	5.16; 5.21; 5.22	5.2
Loss of stability (of machines or machine parts)	5.8.3; 5.22	clause 7
Slip, trip and fall hazards in relationship with machines (because of their mechanical nature)	5.4	5.5
Electrical hazards, for example		
Electrical contact (direct or indirect)	5.12	5.23
Electrostatic phenomena	5.12	5.23
Thermal radiation or other phenomena such as ejection of molten particles, and chemical effects from short-circuits, overloads etc.	5.5; 5.12	5.8; 5.23
External influences on electrical equipment	5.12	5.23
Thermal hazards resulting in:		
Burns and scalds, by a possible contact of persons, by flames or explosions and also by the radiation of heat sources		5.13; 5.17
Health-damaging effects by hot or cold work environment		5.22
Hazards generated by noise, resulting in:		
Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness)	5.9; clause 7	5.15
Interferences with speech communication, acoustic signals etc.	5.9	5.15
Hazards from vibration	5.8.3	
Hazards generated by radiation, especially:		
Electric arcs		5.8; 5.23
Lasers		5.21
Ionizing radiation sources		5.20
Hazards generated by materials and substances processed, used or exhausted by machines, for example		
Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts		5.16

(continued)

Table 1 (concluded)

Hazards	prEN 1034-3	prEN 1034-1
Fire or explosion hazards	5.12	5.13; 5.18; 5.19; 5.23
Hazards generated by neglecting ergonomic principles in machine design (mismatch of machinery with human characteristics and abilities) caused for example by:		
Unhealthy postures or excessive efforts	5.11	5.22
Inadequate consideration of human hand-arm or foot-leg anatomy	5.3; 5.11	5.22
Neglected use of personal protection equipment	5.9; clause 7	5.8; 5.9; 5.17; clause 7
Inadequate area lighting	5.10	5.18
Mental overload or underload, stress etc.	5.11	5.22
Human error	clause 7	clause 7
Hazard combinations	5.1; 5.3	5.6
Hazards caused by failure of energy supply, breaking down of machines parts and other functional disorders, for example		
Failure of energy supply (of energy and/or control circuits)	5.5	5.8
Unexpected ejection of machine parts or fluids	5.16; 5.21	5.24
Failure, malfunction of control system (unexpected start up, unexpected overrun)	5.5; 5.8	5.14
Errors of fitting	clause 7	clause 7
Overturn, unexpected loss of machine stability	5.8	5.14
Hazards caused by missing and/or incorrectly positioned safety related measures/means, for example:		
All kinds of guards	5.28; clause 7	5.1; 5.2
All kinds of safety related (protection) devices	5.28; 5.29	5.1; 5.14
Start-up and braking devices	5.2; 5.8	5.14
Safety signs and signals	5.1; 5.9; 5.11; 5.23	5.21
All kinds of information or warning devices	5.1; 5.8	5.6
Energy supply disconnecting devices	5.5	5.8
Emergency devices	5.2; 5.15	5.7; 5.18; 5.19
Feeding/removal means of workpieces	5.26	5.10
Essential equipment and accessories for safe adjusting and/or maintaining	5.6	5.5; 5.9
Equipment evacuating gases etc.		5.13; 5.16

5 Safety requirements and/or measures

Machinery shall comply with the safety requirements and/or measures of this clause. In addition, the machines shall be designed according to the principles of EN 292 for hazards relevant but not significant which are not dealt with by this standard.

5.1 Start-up warning devices

5.1.1 Start-up warning devices shall comply with category B specified in clause 5.6 of prEN 1034-1:1998.

5.1.2 The control system of start-up warning devices shall comply with at least category 1 of EN 954-1.

5.2 Emergency stop devices and braking systems

5.2.1 Emergency stop devices shall comply with the requirements of 5.7 of prEN 1034-1:1998.

5.2.2 Machines shall be provided with braking devices which operate on the actuation of the emergency stop device. This requirement can be fulfilled for example by mechanical brakes or electro-dynamic brakes. In this case the emergency stop device shall function according to stopping category 1 of EN 418. See 4.1.5 of EN 418:1992.

Braking devices shall operate in such a way that the stopping time of the machine following activation of the emergency stop is as short as possible. Stopping time shall not exceed the shortest possible start-up time.

5.2.3 The control system of emergency stop devices shall comply with category 3 of EN 954-1.

5.2.4 The control system of electro-dynamic braking systems shall comply with category 2 of EN 954-1. Any fault in the brake control circuit shall lead to a category 0 stop according to EN 418 and EN 60204-1.

5.3 Web threading

5.3.1 Threading devices shall be provided for safe threading of the web, such as rope and tape threading systems, compressed air and vacuum threading systems.

5.3.2 Wrapping points on belts or straps on web threading devices shall be safeguarded in accordance with 5.4.2 of prEN 1034-1:1998 and 5.1 of prEN 1034-1:1998.

5.3.3 Power transmission elements between the web threading device and the respective drive motor shall be safeguarded in accordance with 5.2 of prEN 1034-1:1998.

5.4 Workplaces, means of access, catwalks, passageways

The requirements laid down in 5.5 of prEN 1034-1:1998 shall be complied with.

5.5 Isolation and energy dissipation, prevention of unexpected start-up

5.5.1 For isolation and energy dissipation of electric, pneumatic and hydraulic equipment from their respective power source the devices specified in 5.8 of prEN 1034-1:1998 shall be provided.

5.5.2 Where the supply disconnecting device according to EN 60204-1 is not arranged in the immediate vicinity of the machine, the main control panel shall be equipped with a device ensuring prevention of unexpected start-up according to 5.8.2 of prEN 1034-1:1998 or 5.4 of EN 60204-1:1992 respectively.

5.6 Equipment for make-ready and repair

5.6.1 The requirements laid down in 5.9 of prEN 1034-1:1998 shall be satisfied where applicable.

5.6.2 For changing circular knives, tools shall be provided, if necessary, to avoid operator contact. Figure 5 shows a tool for changing slitting knives.

NOTE: Protective gloves are not deemed to be a tool.