

**SLOVENSKI STANDARD**  
**SIST EN 1034-6:2006+A1:2010**  
**01-februar-2010**

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**Varnost strojev - Varnostne zahteve za načrtovanje in konstrukcijo strojev in opreme za izdelavo papirja - 6. del: Kalander**

Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 6: Calender

Sicherheit von Maschinen - Sicherheitstechnische Anforderungen für Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 6: Kalander

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 6: Calandres

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**Ta slovenski standard je istoveten z: EN 1034-6:2005+A1:2009**

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**ICS:**

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

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EUROPEAN STANDARD

**EN 1034-6:2005+A1**

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English Version

## Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 6: Calender

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 6: Calandres

Sicherheit von Maschinen - Sicherheitstechnische Anforderungen für Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 6: Kalender

This European Standard was approved by CEN on 4 November 2005 and includes Amendment 1 approved by CEN on 17 November 2009.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN 1034-6:2005+A1:2009 (E)****Foreword**

This document (EN 1034-6:2005+A1:2009) has been prepared by Technical Committee CEN/TC 198 "Printing and paper machinery - Safety", the secretariat of which is held by DIN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2010, and conflicting national standards shall be withdrawn at the latest by June 2010.

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 includes Amendment 1, approved by CEN on 17 November 2009.

This document supersedes EN 1034-6:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\square_{A1}$   $\square_{A1}$ .

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(s).

$\square_{A1}$  For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.  $\square_{A1}$

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

## Introduction

This European Standard is a type C standard as stated in EN ISO 12100-1:2003.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this European Standard.

For machines that have been designed and built according to the provisions of this type C standard, the following stipulation applies: When provisions of this type C standard are different from those which are stated in type A or B standards or from provisions made in <sup>A1</sup> EN 1034-1:2000+A1:2010 <sup>A1</sup>, the provisions of this type C standard take precedence over the provisions of the other standards.

## 1 Scope

This European Standard applies to calenders intended for use in paper making and finishing and shall be used together with <sup>A1</sup> EN 1034-1:2000+A1:2010 <sup>A1</sup>. It deals with all significant hazards listed in clause 4. Related safety requirements and/or measures are described in clause 5.

It does not cover hazards connected with lifting operations required for changing rolls, inserting reels into the unwinding unit, removal of reels from the winding unit and heating systems for heating calender rolls..

This European Standard is not applicable to calenders that have been manufactured before the date of publication of this standard.

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## 2 Normative references

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

prEN 81-41:2004, *Safety rules for the construction and installation of lifts — Special lifts for the transport of persons and goods — Part 41: Vertical lifting platforms intended for use by persons with impaired mobility.*

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 563:1994, *Safety of machinery — Temperatures of touchable surfaces — Ergonomics data to establish temperature limit values for hot surfaces.*

EN 894-1:1997, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 1: General principles for human interactions for displays and control actuators.*

EN 894-2:1997, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 2: Displays.*

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

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 for the human body.*

EN 1034-1:2000+A1:2010 <sup>A1</sup>, *Safety of machinery — Safety requirements for the design and construction of paper making and finishing machines - Part 1: Common requirements.*

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

EN 1050:1996, *Safety of machinery — Principles for risk assessment.*

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

EN 1127-1:1997, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology.*

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

EN 1760-2:2001, *Safety of machinery — Pressure-sensitive safety devices — Part 2: General principles for the design and testing of pressure-sensitive edges and pressure-sensitive bars.*

EN 13023:2003, *Noise measurement methods for printing, paper converting, paper making machines and auxiliary equipment — Accuracy categories 2 and 3.*

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

EN 60024-11:2000, *Safety of machinery — Electrical equipment — Part 11: High-voltage equipment for voltages above 1 000 V AC or 1 500 V DC, but not more than 36 kV (IEC 60204-11:2000).*

EN 61000-6-2:2001, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standard — Immunity — Part 2: Industrial environment (IEC 61000-6-2:1999, modified).*

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

prEN 61496-2:2005, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs) (IEC 61496-2:2005).*

EN ISO 11957:1996, *Acoustics — Determination of sound insulation performance of cabins — Laboratory and in situ measurements (ISO 11957:1996).*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts — General principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003).*



EN ISO 12100-2:2003, *Safety of machinery — Basic concepts — General principles for design — Part 2: Technical principles and specifications (ISO 12100-2:2003)*.

EN ISO 14122-1:2001, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 1: Choice of a fixed means of access between two levels (ISO 14122-1:2001)*.

EN ISO 14122-2:2001, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 2: Working platforms and gangways (ISO 14122-2:2001)*.

EN ISO 14122-3:2001, *Safety of machinery — Permanent means of access to machines and industrial plants — Part 3: Stairways, stepladders and guard-rails (ISO 14122-3:2001)*.

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in [EN 1034-1:2000+A1:2010](#), EN ISO 12100-1:2003, and the following terms and definitions apply:

#### 3.1

##### **calender**

machine using two or more adjacent rolls for glazing, smoothing, calibrating or embossing of paper, including the winding unit and unwinding unit if fitted, see 3.2

#### 3.2

##### **off-line calender**

calender with winding and unwinding unit. An example is illustrated in Figure 1

#### 3.3

##### **on-line calender**

calender integrated into a paper making or coating machine. An example is illustrated in Figure 2

#### 3.4

##### **sheet calender**

calender used for glazing individual sheets of paper

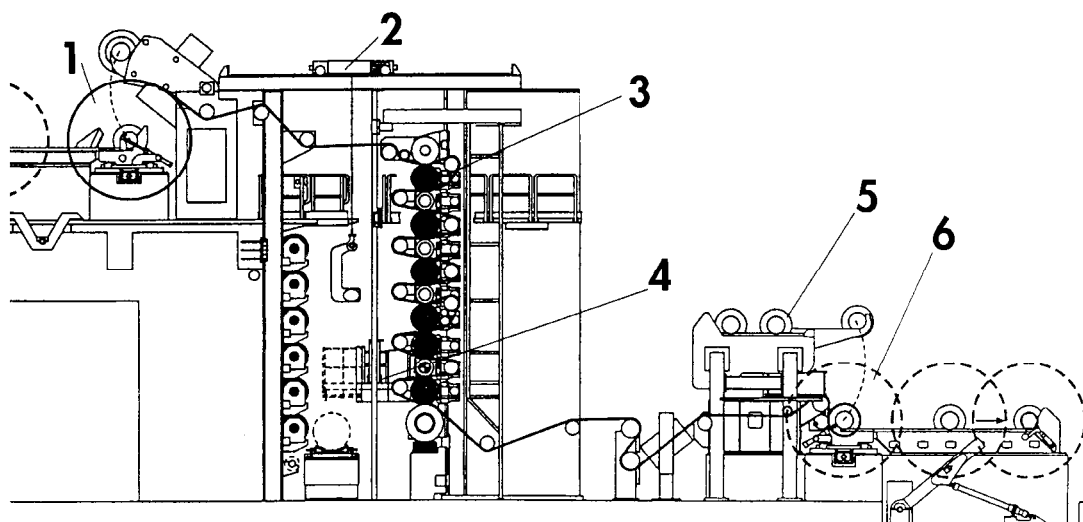
#### 3.5

##### **lifting platform**

lifting device integrated into a calender for people to carry out specific tasks, e.g. web threading, cleaning, maintenance. Often two lifting platforms are provided on the roll stack

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NOTE Safety devices are not shown.

**Key**

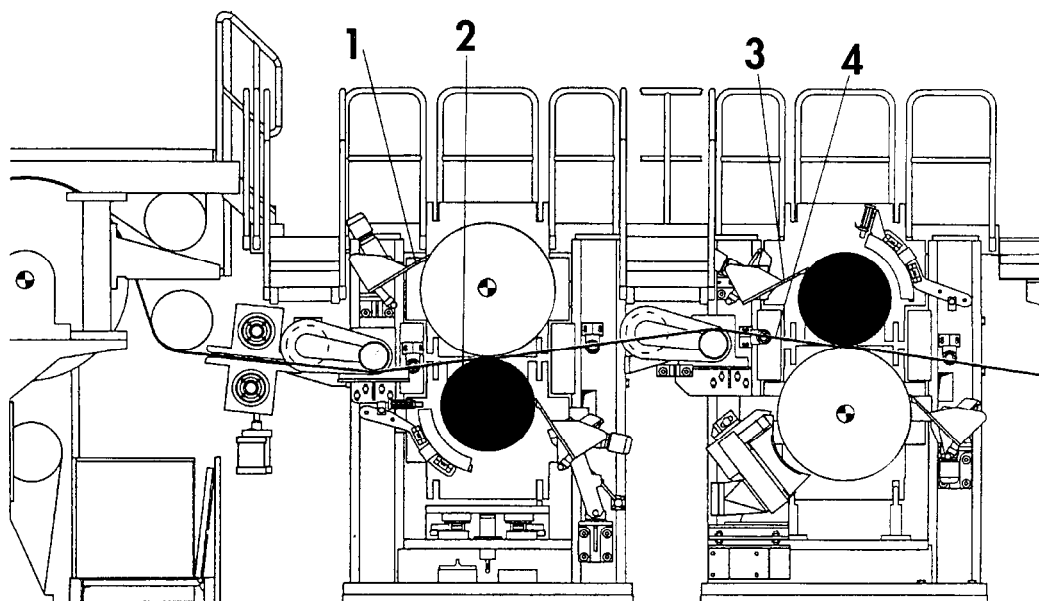
- 1 Unwinding unit
- 2 Lifting appliance
- 3 Roll stack
- 4 Lifting platform
- 5 Shell storage
- 6 Winding unit

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**Figure 1 — Off-line calender (example)**



NOTE: Safety devices are not shown.

#### Key

- 1 Doctor
- 2 First nip
- 3 Doctor
- 4 Second nip

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Figure 2 — On-line calendar (example)  
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## 4 List of hazards

This clause contains all the significant hazards, as far as they are dealt with in this standard, which are 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. When carrying out the risk assessment, the machine designer has to check whether the list of hazards in Table 1 is complete and applicable with respect to the particular machine.

**Table 1 — List of significant hazards**

No. from Table A.1 of EN 1050:1996	Hazards	EN 1034-6:2005	EN 1034-1: 2000+A1:2010 
<b>1</b>	<b>Mechanical hazards due to:</b>		
1.1	Crushing hazard	5.16.3; 5.16.4; 5.16.8; 5.16.9; 5.17.3; 5.19.3; 5.19.4; 5.19.5; 5.19.6; 5.19.8; 5.19.9; 5.25; 5.27.1	5.1; 5.3;
1.2	Shearing hazard	5.16.8; 5.19.5; 5.19.8; 5.25	5.1
1.3	Cutting or severing hazard	5.16.8; 5.22.1; 5.22.2; 5.26.2; 5.27.1; 5.27.2	5.11; 5.12