

SVENSK STANDARD

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Maskinsäkerhet – Säkerhetskrav vid konstruktion och tillverkning av maskiner för pappers- och massatillverkning – Del 16: Pappersmaskiner

Safety of machinery – Safety requirements for the design and construction of paper making and finishing machines – Part 16: Paper and board making machines



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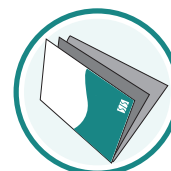
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Denna standard är framtagen av kommittén för Tryckeri- och pappersmaskiner, SIS/TK 253.

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EUROPEAN STANDARD

EN 1034-16

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2012

ICS 85.100

English Version

Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 16: Paper and board making machines

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 16: Machines à papier et carton

Sicherheit von Maschinen - Sicherheitstechnische Anforderungen an Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 16: Papier- und Kartonmaschinen

This European Standard was approved by CEN on 8 January 2012.

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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.

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

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Foreword

This document (EN 1034-16:2012) 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 September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

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 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 document.

EN 1034 *Safety of machinery — Safety requirements for the design and construction of paper making and finishing machines* consists of the following parts:

Part 1: Common requirements;

Part 2: Barking drums;

Part 3: Winders and slitters, plying machines;

Part 4: Pulpers and their loading facilities;

Part 5: Sheeters;

Part 6: Calender;

Part 7: Chests;

Part 8: Refining plants;

Part 13: Machines for de-wiring bales and units;

Part 14: Reel splitter;

Part 16: Paper and board making machines;

Part 17: Tissue making machines;

Part 21: Coating machines;

Part 22: Wood grinders;

Part 26: Roll packaging machines;

Part 27: Roll handling systems.

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

SS-EN 1034-16:2012 (E)**1 Scope**

This European Standard applies to machines for the production of paper and board, including head box, wire section (former), press section, drying section, film size press, coating unit, flotation and infrared dryer, smoothing unit, integrated calender, measuring device, reel-up, integrated sheeter, drives and control system (paper and board making machines) and applies together with EN 1034-1:2000+A1:2010. It deals with all significant hazards, hazardous situations and hazard events relevant to machines for the production of paper and board, when used as intended and under the conditions foreseen by the manufacturer (see Clause 4).

This document does not deal with pressure hazards in steam-heated drying cylinders.

NOTE Directive 97/23/EC gives essential safety requirements for equipment under pressure.

This document does not apply to:

- tissue making machines,
- cardboard making machines,
- coating machines,
- machines for the production of corrugated board,
- integrated conveyors and cranes designed for transporting reels/shells (reel spools) and for machine maintenance, and
- integrated fire extinguishing equipment.

This European Standard is not applicable to paper and board making machines which are manufactured before the date of publication of this European Standard by CEN.

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 349:1993+A1:2008, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

EN 547-1:1996+A1:2008, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery*

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 614-2:2000+A1:2008, *Safety of machinery — Ergonomic design principles — Part 2: Interactions between the design of machinery and work tasks*

EN 626-1:1994+A1:2008, *Safety of machinery — Reduction of risk to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

EN 746-1:1997+A1:2009, *Industrial thermoprocessing equipment — Part 1: Common safety requirements for industrial thermoprocessing equipment*

EN 746-2:2010, *Industrial thermoprocessing equipment — Part 2: Safety requirements for combustion and fuel handling systems*

- EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*
- EN 894-2:1997+A1:2008, *Safety of machinery — Ergonomic requirements for the design of displays and control actuators — Part 2: Displays*
- EN 953:1997+A1:2009, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*
- EN 1034-1:2000+A1:2010, *Safety of machinery — Safety requirements for the design and construction of paper making and finishing machines — Part 1: Common requirements*
- EN 1034-4:2005+A1:2009, *Safety of machinery — Safety requirements for the design and construction of paper making and finishing machines — Part 4: Pulpers and their loading facilities*
- EN 1034-5:2005+A1:2009, *Safety of machinery — Safety requirements for the design and construction of paper making and finishing machines — Part 5: Sheeters*
- EN 1034-6:2005+A1:2009, *Safety of machinery — Safety requirements for the design and construction of paper making and finishing machines — Part 6: Calender*
- EN 1037:1995+A1:2008, *Safety of machinery — Prevention of unexpected start-up*
- EN 1088:1996+A2:2008, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*
- EN 13478:2001+A1:2008, *Safety of machinery — Fire prevention and protection* 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 1760-2:2001+A1:2009, *Safety of machinery — Pressure sensitive protective devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars*
- EN 1837:1999+A1:2009, *Safety of machinery — Integral lighting of machines*
- EN 12198-1:2000+A1:2008, *Safety of machinery — Assessment and reduction of risks arising from radiation emitted by machinery — Part 1: General principles*
- EN 12453:2000, *Industrial, commercial and garage doors and gates — Safety in use of power operated doors — Requirements*
- EN 13023:2003+A1:2010, *Noise measurement methods for printing, paper converting, paper making machines and auxiliary equipment — Accuracy grades 2 and 3*
- EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*
- EN 60204-11:2000, *Safety of machinery — Electrical equipment of machines — Part 11: Requirements for HV equipment for voltages above 1 000 V a.c. or 1500 V d.c and not exceeding 36 kV (IEC 60204-11:2000)*
- EN 61000-6-2:2005, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environment (IEC 61000-6-2:2005)*
- EN 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)*
- EN 61511-1:2004, *Functional safety — Safety instrumented systems for the process industry sector — Part 1: Framework, definitions, system, hardware and software requirements (IEC 61511-1:2003 + Corrigendum 2004)*