SLOVENSKI STANDARD
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Varnost strojev – Varnostne zahteve za načrtovanje in konstrukcijo strojev in opreme za izdelavo papirja – 7. del: Kadi

Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 7: Chests

Sicherheit von Maschinen - Sicherheitstechnische Anforderungen an Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 7: Bütten

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 7 : Cuviers

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Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 7: Chests

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 7 : Cuviers

Sicherheit von Maschinen - Sicherheitstechnische Anforderungen an Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 7: Bütten

This European Standard was approved by CEN on 21 April 2005.

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Foreword

This European Standard (EN 1034-7:2005) 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of an identical text or by endorsement, at the latest by December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005

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 the EU Directive

For relationship with the EU Directive, see informative annex ZA, which is an integral part of this European 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, 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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Introduction

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

The extent to which hazards, hazardous situations and hazard results are covered is indicated in the scope of this standard.

For machines which have been designed and built in accordance with the stipulations of this C type standard, the following applies: where C type standard stipulations deviate from respective stipulations in A or B type standards, the stipulations made in this C type standard take precedence over stipulations in the other standards.

1 Scope

This European Standard applies to chests used in paper making and shall be applied together with EN 1034-1:2000. It deals with all significant hazards, hazardous situations and hazard events relevant to chests when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). This European Standard does not apply to tanks for chemicals, storage tanks for starch and other additives used in paper making or basins or vessels for waste water resulting from the paper making process.

This European Standard does not apply to chests manufactured before the publication date of this European Standard.

2 Normative references

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

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*

EN 547-2:1996, *Safety of machinery — Human body measurement — Part 2: Principles for determining the dimensions required for access openings*

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 components — Hydraulics*

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

EN 1034-1:2000, *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 1127-1:1997, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

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

EN 50144-1:1998, *Safety of hand-held powered electrical devices — Part 1: General requirements*

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

EN 60974-1:1988, *Arc welding equipment - Part 1: Welding power sources (IEC 60974-1:1998)*

EN 61000-6-2:2001, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards; immunity for industrial environment (IEC 61000-6-2:1999, modified)*

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 (ISO 12100-2:2003)*

EN ISO 14122:2001 (all parts), *Safety of machinery — Permanent means of access to machinery*

3 Terms and definitions

For the purposes of this European Standard, the definitions given in EN 1034-1:2000, EN ISO 12100-1:2003, and the following definitions apply:

3.1
chest
vessel usually made of special steel or concrete and equipped with a fixed agitating device, associated measuring and control devices and necessary shutoff devices intended for storing (stacking), collecting and mixing pulp

3.2
agitator
part of the mixing device shaped as a propeller or agitating shaft for optimum distribution of the pulp components used and forming a suspension

3.3
pulp
suspension of fibre, additives and inks for the production of paper and board

4 List of significant hazards

This clause contains all the significant hazards, as far as they are dealt with in this European 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

Hazards	EN 1034-7:2005	EN 1034-1:2000
Mechanical hazards		
Crushing hazard	5.2; 5.4.2; 5.11	5.1; 5.3
Shearing hazard	5.11	5.1
Entanglement hazard	5.2; 5.10.5	5.2
Drawing-in or trapping hazard	5.2	5.1; 5.4
Friction or abrasion hazard	5.2	5.1
High-pressure fluid ejection hazard	5.6	5.24
Ejection of parts	5.2; 5.13	5.2
Slip, trip and fall hazards	5.3; 5.4.1	5.5
Accumulation of energy in machinery	5.10.4	
Electrical hazards, for example:		
Electrical contact (direct or indirect)	5.5	5.23
External influences on electrical equipment	5.5	5.23
Thermal hazards resulting in:		
Burns and scalds	5.10.2	5.13; 5.17
Hazards generated by noise, resulting in:		
Hearing loss (deafness), other physiological disorders	5.9; 7	5.15
Interferences with speech communication, acoustic signals etc.	5.9; 7	5.15
Hazards generated by radiation:		
Ionizing radiation sources	5.7.1	5.20
Hazards generated by materials and substances processed, used or exhausted by machines:		
Hazards resulting from harmful gases and from anoxia	5.4.3; 5.10.3. 5.10.5; 5.10.6, 7	5.16
Explosion hazards	5.13	5.13; 5.18; 5.19; 5.23
Hazards generated by neglecting ergonomic principles in machine design caused for example by:		
Excessive efforts	5.4.2	
Inadequate area lighting	5.8	5.18
Hazards caused by failure of energy supply and other functional disorders, for example		
Failure of energy supply	5.5; 5.10.1	5.8
Unexpected ejection of fluids	5.4.3; 5.7.2	5.24
Malfunction of control system	5.5: 5.6; 5.12	5.14
Emergency measures	5.12	5.7

5 Safety requirements and/or measures

5.1 General

Machinery shall comply with the safety requirements and/or measures of this clause. In addition, the machinery shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant which are not dealt with by this European Standard.

5.2 Power transmission elements

The power transmission elements between drive and agitator that are located outside the chest shall be safeguarded by a fixed enclosure in accordance with 3.2.1 of EN 953:1997 or 5.2 of EN 1034-1:2000. Table 2 of EN 294:1992 shall be noted.

5.3 Working platforms and means of access

5.3.1 Working platforms on open chests and their means of access shall be located or be provided with adequate fall-off protection such that the height of the railing or fall-off protection at the chest is at least 1,20 m. In all other respects, working platforms and their means of access shall comply with 5.5 of EN 1034-1:2000 and EN ISO 14122.

5.3.2 For requirements for the means provided for whole-body access to the chest, see 5.10.4.

5.4 Inspection holes

5.4.1 Open holes provided for testing or inspection shall be dimensioned or provided with fixed insets such as bracing or mesh wires or other types of fall-off protection in such a way as to prevent persons from falling into the chest. This is achieved, for example, where there are no gaps wider than 0,30 m maximum or fall-off protection is provided in accordance with 5.3.1. Inspection holes shall be positioned in such a way that access to the agitator is not possible. Table 1 of EN 294:1992 shall be noted.

5.4.2 Where inspection holes are provided with covers that can be opened by hand, such covers shall be designed in accordance with ergonomic principles, for example, by providing ergonomic handles or, where covers need to be lifted manually and have a weight of more than 200 N, by reducing the weight, for example by the provision of counter weights. Covers shall be secured in the open position against unintentional falling shut by automatic detent pawls, for example.

5.4.3 Where there is the risk of stock being ejected out of inspection holes during the mixing process, covers of inspection holes shall be interlocked with the drive for splash protection.

5.5 Electrical equipment

The requirements of 5.23 of EN 1034-1:2000, EN 60204-1:1997 and EN 61000-6-2:2001 shall be satisfied. Metal chests shall be earthed.

5.6 Hydraulic and pneumatic equipment

Where hydraulic or pneumatic equipment is used, the requirements of EN 982 or EN 983 respectively shall be satisfied.

5.7 Level control devices

5.7.1 Where level measuring equipment with radioactive sources is used, 5.20 of EN 1034-1:2000 shall be complied with. The safety measures required for handling radioactive material shall be described in the instruction handbook.