
Varnost strojev – Varnostne zahteve za načrtovanje in konstrukcijo strojev in opreme za izdelavo papirja – 4. del: Razpuščevalniki in pripadajoče naprave za polnjenje

Safety of machinery - Safety requirements for the design and construction of paper making and finishing machines - Part 4: Pulpers and their loading facilities

Sicherheit von Maschinen - Sicherheitstechnische Anforderungen an Konstruktion und Bau von Maschinen der Papierherstellung und Ausrüstung - Teil 4: Stofflöser und deren Beschickungseinrichtungen (standards.iteh.ai)

SÉCURITÉ DES MACHINES - Prescriptions de sécurité pour la conception et la construction de machines de fabrication et de finition du papier - Partie 4: Triturateurs et leurs dispositifs d'alimentation

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**Safety of machinery - Safety requirements for the design and
construction of paper making and finishing machines - Part 4:
Pulpers and their loading facilities**

Sécurité des machines - Prescriptions de sécurité pour la
conception et la construction de machines de fabrication et
de finition du papier - Partie 4: Triturateurs et leurs
dispositifs d'alimentation

Sicherheit von Maschinen - Sicherheitstechnische
Anforderungen an Konstruktion und Bau von Maschinen
der Papierherstellung und Ausrüstung - Teil 4: Stofflöser
und deren Beschickungseinrichtungen

This European Standard was approved by CEN on 20 October 2005.

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Foreword

This European Standard (EN 1034-4:2005) 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of an identical text or by endorsement, at the latest by May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

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.

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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EN 1034-4:2005 (E)**Introduction**

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

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 EN 1034-1:2000, the provisions of this type C standard take precedence over the provisions of the other standards.

1 Scope

This European Standard applies to pulpers and their loading facilities intended for use in paper making and shall be used together with EN 1034-1:2000. It deals with all significant hazards, hazardous situations and hazard events relevant to pulpers and their loading facilities, when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4).

This European Standard is not applicable to pulpers and their loading facilities 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 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 — Principles for design*

EN 547 (all Parts), *Safety of machinery — Human body measurements*

EN 617:2001, *Continuous handling equipment and systems — Safety and EMC requirements for the storage of bulk goods in silos, bunkers, bins and hoppers*

EN 618:2002, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of bulk materials except stationary belt conveyors*

EN 619:2002, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for mechanical handling of unit loads*

EN 620:2002, *Continuous handling equipment and systems — Safety and EMC requirements for equipment for stationary belt conveyors for bulk materials*

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

- EN 626-2:1996, *Safety of machinery — Reduction of risk to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures*
- EN 741:2000, *Continuous handling equipment and systems — Safety requirements for equipment for equipment and their components for pneumatic handling of bulk materials*
- 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 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 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*
- EN 1837:1999, *Safety of machinery — Integral lighting of machines*
- 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 61000-6-2:2001, *Electromagnetic compatibility (EMC — Generic standard — Part 6-2: Emission standard 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 and specifications (ISO 12100-2:2003)*
- EN 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 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 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)*

EN 1034-4:2005 (E)

3 Terms and definitions

For the purpose of this European Standard, the terms and definitions of EN 1034-1:2000, EN ISO 12100-1:2003 and the following terms and definitions apply.

3.1 pulper
machine that dissolves raw materials such as wood pulp, pulp, recovery stock and waste paper to form a pumpable defibrated stock suspension to be used for the production of paper and board. Pulpers may be designed either as rotor pulpers, see 3.2, or as drum pulpers, see 3.3

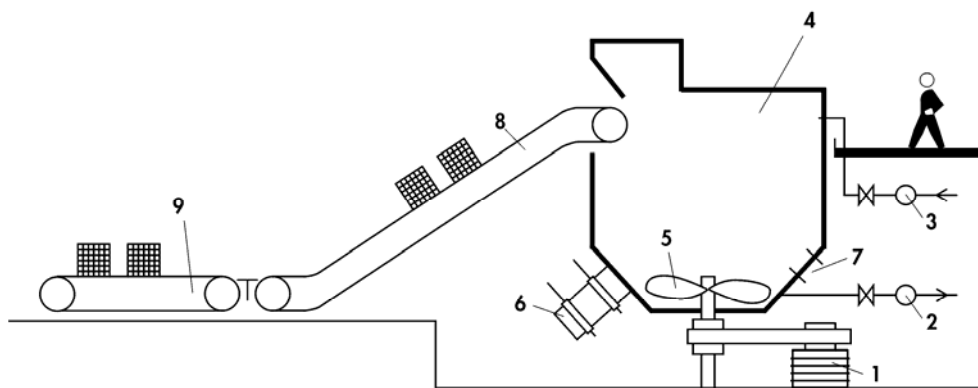
3.2 rotor pulper
pulper consisting of a tank and a power-driven rotor to break down the charged raw material using water. The principle of a rotor pulper is illustrated in Figure 1

3.3 drum pulper
pulper consisting of a horizontal drum rotating round its horizontal axis in which raw material is dissolved with the addition of water. The principle of a drum pulper is illustrated in Figure 2

3.4 loading facility
machinery such as continuous conveyor, lifting device or a combination of these machines intended to charge pulpers with the raw material to be dissolved such as pulp, waste paper or recovery stock

3.5 feeding conveyor
continuous conveyor as part of the loading facility defined in 3.4 onto which the raw material to be dissolved is loaded by means of fork lifts, mechanical shovels or lifting tools, see Figure 1

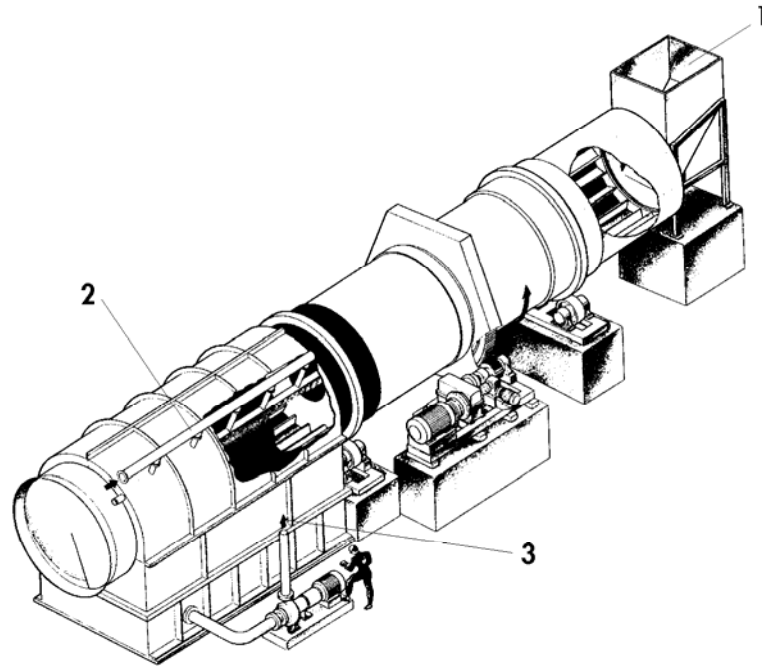
3.6 charging conveyor
continuous conveyor as part of the loading facility defined in 3.4, forwarding the raw material to be dissolved into the pulper, see Figure 1



Key

1 Drive	4 Tank	7 Manhole
2 Discharging pump	5 Rotor	8 Charging conveyor
3 Charging pump	6 Trash discharge gate	9 Feeding conveyor

Figure 1 — Pulper with loading facility (example)



Key

- 1 Loading opening for raw material and water
- 2 Water supply
- 3 Exit of dissolved material

NOTE: Safety devices are not shown

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Figure 2 — Drum pulper (example)

4 List of significant hazards

This clause contains all the significant hazards that, as far as they are dealt with in this standard, are identified by risk assessment in accordance with EN 1050 as significant for this type of machinery and 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 his particular machine.

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Table 1 — List of significant hazards

Hazards	EN 1034-4:2005	EN 1034-1:2000
Mechanical hazards		
Crushing hazard	5.5; 5.20	5.1; 5.3
Entanglement hazard	5.2; 5.3; 5.19	5.2
Drawing-in or trapping hazard	5.2; 5.3; 5.4.2	5.1; 5.4
High-pressure fluid ejection hazard	5.14; 5.15	5.24
Ejection of parts	5.19	5.2
Slip, trip and fall hazards in relationship with machines	5.4; 5.5; 5.6; 5.18	5.5
Electrical hazards caused by, for example:		
Electrical contact (direct or indirect)	5.13	5.23; 5.8
External influences on electrical equipment	5.13	5.23
Hazards generated by noise, resulting in		
Hearing loss (deafness), other physiological disorders	5.16	5.15
Hazards generated by materials and substances processed, used or exhausted by machines		
Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts; lack of oxygen	5.17; 5.18	5.16
Hazards generated by neglecting ergonomic principles in machine design		
Unhealthy postures or excessive efforts	5.6.2; 5.12	5.22
Inadequate consideration of human hand-arm or foot-leg anatomy	5.12; 5.18	5.22
Inadequate area lighting	5.11	5.18
Hazards caused by failure of energy supply and other functional disorders, for example:		
Failure of energy supply	5.9; 5.13	5.8
Malfunction of control system	5.7; 5.8; 5.10.1	5.14
Hazards caused by unexpected start up	5.7; 5.9; 5.10.2	5.6; 5.8
Combination of hazards	5.18	5.6; 5.9; 5.10
Emergency measures	5.8	5.1.3; 5.7; 5.18; 5.19

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 machine shall be designed according to the principles of EN ISO 12100 for relevant but not significant hazards that are not dealt with by this document, e. g. avoidance of sharp edges.

5.2 Requirements for safety devices

5.2.1 The requirements of 5.1 of EN 1034-1:2000 shall be satisfied.

5.2.2 The instruction handbook shall contain instructions for checking the safety devices.

5.3 Power transmission elements

Safety devices for power transmission elements between the drive and rotor or drum of the pulper shall be selected and designed as specified in 5.2 of EN 1034-1:2000.

5.4 Workplaces, access stairs, catwalks, passageways

5.4.1 The requirements of 5.5 of EN 1034-1:2000 and EN ISO 14122-1:2001, EN ISO 14122-2:2001, EN ISO 14122-3:2001 as well as of 5.4.2, 5.4.3 and 5.6.4 shall be satisfied.

5.4.2 Stairs and catwalks on drum pulpers shall be fitted in such a way that in-running nips between these elements and the drum are avoided. The safety distances specified in 5.4 of EN 1034-1:2000 and in Table 2 of EN 294:1992 shall be applied.

5.4.3 Where access is required to parts of the machine, but is prevented or made difficult by the position of the loading facility, crossovers or passageways shall be provided so that access to the loading facility is avoided.

5.5 Falling hazard on pulpers

5.5.1 Pulpers shall be located and designed in such a way that persons cannot fall into the pulper, if necessary by providing additional safety measures. Safeguards against falling shall be at least 1,20 m high (measured from possible standing level) and shall be designed so that climbing and falling through is impossible.

Persons are prevented from falling into the pulper if:

- on pulpers with a tank open at the top, the upper edge of the tank is at least 1.20 m above standing level and the outer pulper walls are designed so that stepping up on them is not possible. If the upper edge of the tank is lower, an additional safety barrier shall be provided to meet the requirements mentioned above, see Figure 4; <https://standards.iteh.ai/catalog/standards/sist/636b3ed6-2666-4e16-8257-2d0ef72313e8/sist-en-1034-4-2006>
- on closed or covered pulpers with cover openings, these openings are closed by covers and, with the cover in open position, are protected by fixed grilles designed so that persons cannot fall through. Covers shall be provided with side handles as well as adequate means for securing them in the open position to prevent their falling shut;
- on pulpers with an access door at the top allowing whole-body access, e.g. by means of a ladder, the door is only capable of being opened outwards and by means of a tool; by interlocking the door with the pulper drive, it shall be ensured that the door can only be opened with the pulper at standstill; this interlocking shall meet the requirements of EN 1088:1995; the associated control system shall comply with at least category 3 of EN 954-1:1996. For safety measures for access to the pulper, see 5.18;
- on pulpers with side openings for manually feeding stock admixtures, dump equipment, chutes or similar facilities are designed so that persons cannot climb onto them or fall through, for moving parts, the safety distances of Table 2 and Table 4 of EN 294:1992 shall be applied;
- on pulpers with a mechanical loading facility, the charging opening is designed so that no blockages of the loaded material can occur. This may be achieved by providing diverting bars arranged at an appropriate distance in front of the charging opening; working platforms at the end of the charging conveyor shall be designed so that there is no risk of falling onto the conveyor or into the pulper;
- on pulpers with manual or gravity loading (e.g. web unwinding from a drum), the dimensions given in Figures 3 and 4 are adhered to;
- on pulpers located below paper making, board making or tissue making machines for the recovery of waste (recovery stock) and which have a feed opening with a movable cover, this cover is provided with interlocking with guard locking in accordance with EN 1088:1995 so that access to the walkway is only