SLOVENSKI STANDARD
SIST EN 1010-1:2005+A1:2011

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Varnost strojev - Varnostne zahteve za načrtovanje in konstrukcijo tiskarskih strojev in strojev za obdelavo papirja - 1. del: Splošne zahteve

Safety of machinery - Safety requirements for the design and construction of printing and paper converting machines - Part 1: Common requirements

Sicherheit von Maschinen - Sicherheitsanforderungen an Konstruktion und Bau von Druck- und Papierverarbeitungsmaschinen - Teil 1: Gemeinsame Anforderungen

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines d'impression et de transformation du papier - Partie 1: Prescriptions communes

Ta slovenski standard je istoveten z: **EN 1010-1:2004+A1:2010**

ICS:

13.110	Varnost strojev	Safety of machinery
37.100.10	Reprodukcijska oprema	Reproduction equipment
85.100	Oprema za papirno industrijo	Equipment for the paper industry

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EN 1010-1:2004+A1

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Safety of machinery - Safety requirements for the design and construction of printing and paper converting machines - Part 1: Common requirements

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines d'impression et de transformation du papier - Partie 1: Prescriptions communes

Sicherheit von Maschinen - Sicherheitsanforderungen an Konstruktion und Bau von Druck- und Papierverarbeitungsmaschinen - Teil 1: Gemeinsame Anforderungen

This European Standard was approved by CEN on 7 June 2004 and includes Amendment 1 approved by CEN on 30 October 2010.

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Foreword

This document (EN 1010-1:2004+A1:2010) 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of an identical text or by endorsement, at the latest by June 2011, and conflicting national standards shall be withdrawn at the latest by June 2011.

This document includes Amendment 1, approved by CEN on 2010-10-30.

This document supersedes EN 1010-1:2004.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1⟩ ⟨A1].

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 Annexes ZA and ZB, which are integral parts of this document.

[A1⟩ This part of the standard defines the common safety requirements for all kinds of printing and paper converting machines and related common devices and is intended to be used in conjunction with another relevant part of the EN 1010 series. The specific requirements specified in Part 2 and following parts of EN 1010 supplement or amend the requirements of Part 1 and take precedence over the respective requirements in EN 1010-1.

NOTE In addition, where a machine is not covered by a specific part of this standard, Part 1 of EN 1010 may be used in conjunction with a risk assessment to establish an approach for dealing with the relevant risks. However, in this situation this standard will not provide a presumption of conformity with the Essential Requirements. ⟨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, 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 and United Kingdom.

Introduction

This European Standard is a type C standard as stated in [A1] EN ISO 12100:2003 [A1].

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: When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards.

This document consists of the following parts:

Part 1 Common requirements

Part 2 Printing and varnishing machines including pre-press machinery

Part 3 Cutting machines

Part 4 Bookbinding, paper converting and finishing machines

Part 5 Machines for the production of corrugated board and machines for the conversion of flat and corrugated board.

1 Scope

1.1 This document applies to:

— printing machines for printing on paper and similar materials, including screen printing presses; equipment used in the preparation of the printing process and additional equipment on printing machines are also considered to be printing machines. This standard also covers machinery used for the handling of paper, products, printing formes and inks (before and after the printing process) as well as machinery for cleaning printing formes and checking the print quality (auxiliary printing machinery).

— paper converting machines, i. e. machines to process, convert or finish paper, board and similar materials which are processed, converted or finished in a similar manner.

NOTE Similar substrates are, for example, board, corrugated board, plastic film, aluminium foil, sheet metal and photographic paper.

1.2 This document deals with all common significant hazards relevant to printing and paper converting machinery when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). [A1] *deleted text* [A1]

1.3 This document is not applicable to printing and paper converting machines which are manufactured before the date of publication of this document by CEN.

1.4 This document does not apply to:

— winder-slitters and sheeters in paper finishing (sheeters with unwinders) (see EN 1034-1:2000, EN 1034-3:2000, [A1] EN 1034-5:2005 [A1]);

— office-type collating machines equipped with friction feeders;

— mail processing machines;

— machines used for filling packages (such as machines for shaping, filling, and closing the package);

— textile printing presses.

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.

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*

[A1] *deleted text* [A1]

EN 574:1996, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*

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

[A1] *deleted text* [A1]

EN 999:1998, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts for the human body*

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

[A1] *deleted text* [A1]

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

[A1] EN 1127-1:2007, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology* [A1]

EN 1760-1:1997:1997, *Safety of machinery — Pressure sensitive 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 devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars*

EN 12198-1:2000, *Safety of machinery — Assessment and reduction of risks arising from radiation emitted by machinery — Part 1: General principles*

〉A1〈 *deleted text* 〉A1〈

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

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*

EN 13463-5:2003, *Non-electrical equipment intended for use in potentially explosive atmospheres — Part 5: Protection by constructional safety "c"*

〉A1〈 EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)* 〉A1〈

〉A1〈 EN ISO 7731:2008, *Ergonomics — Danger signals for public and work areas — Auditory danger signals (ISO 7731:2003)* 〉A1〈

〉A1〈 EN ISO 11553-1:2008, *Safety of machinery — Laser processing machines — Part 1: General safety requirements (ISO 11553-1:2005)* 〉A1〈

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)*

〉A1〈 EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)* 〉A1〈

〉A1〈 EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)* 〉A1〈

〉A1〈 EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* 〉A1〈

〉A1〈 EN ISO 14121-1:2007, *Safety of machinery — Risk assessment — Part 1: Principles (ISO 14121-1:2007)* 〉A1〈

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 — Means of permanent access to machines and industrial plants — Part 2: Working platforms and gangways (ISO 14122-2:2001)*

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

〉A1〈 EN ISO 14122-4:2004, *Safety of machinery — Means of permanent access to machines and industrial plants — Part 4: Fixed ladders (ISO 14122-4:2004)* 〉A1〈

〉A1〈 *deleted text* 〉A1〈

[A1] EN 60079-0:2009, *Explosive atmospheres — Part 0: Equipment — General requirements (IEC 60079-0:2007)* [A1]

[A1] EN 60079-1:2007, *Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures "d" (IEC 60079-1:2007)* [A1]

[A1] EN 60079-2:2007, *Explosive atmospheres — Part 2: Equipment protection by pressurized enclosure "p" (IEC 60079-2:2007)* [A1]

[A1] EN 60079-5:2007, *Explosive atmospheres — Part 5: Equipment protection by powder filling "q" (IEC 60079-5:2007)* [A1]

[A1] EN 60079-6:2007, *Explosive atmospheres — Part 6: Equipment protection by oil immersion "o" (IEC 60079-6:2007)* [A1]

[A1] EN 60079-7:2007, *Explosive atmospheres — Part 7: Equipment protection by increased safety "e" (IEC 60079-7:2006)* [A1]

[A1] EN 60079-10-1:2009, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres (IEC 60079-10-1:2008)*

EN 60079-10-2:2009, *Explosive atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres (IEC 60079-10-2:2009)* [A1]

[A1] EN 60079-11:2007, *Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i" (IEC 60079-11:2006)* [A1]

[A1] EN 60079-14:2008, *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14:2007)* [A1]

[A1] EN 60079-25:2004, *Electrical apparatus for explosive gas atmospheres — Part 25: Intrinsically safe systems (IEC 60079-25:2003)* [A1]

[A1] EN 60079-26:2007, *Explosive atmospheres — Part 26: Equipment with equipment protection level (EPL) Ga (IEC 60079-26:2006)*

EN 60079-28:2007, *Explosive atmospheres — Part 28: Protection of equipment and transmission systems using optical radiation (IEC 60079-28:2006)* [A1]

[A1] EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — General requirements (IEC 60204-1:2005, modified)* [A1]

EN 60825-1:1994, *Safety of laser products — Part 1: Equipment classification, requirements and user's guide*

EN 61000-6-2:2001 *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards; Immunity for industrial environment*

EN 61010-1:2001, *Safety requirements for electrical equipment for measurement, control and laboratory use — Part 1: General requirements (IEC 61010-1:2001)*

[A1] EN 61241-14:2004, *Electrical apparatus for use in the presence of combustible dust — Part 14: Selection and installation (IEC 61241-14:2004)* [A1]

[A1] EN 61241-17:2005, *Electrical apparatus for use in the presence of combustible dust — Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines) (IEC 61241-17:2005)* [A1]

EN 61310-1:1995, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals*

EN 61310-2:1995, *Safety of machinery — Indication, marking and actuation — Part 2: Requirements for marking*

〈A1〉 EN 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)* 〈A1〉

〈A1〉 CLC/TS 61496-2:2006, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs) (IEC 61496-2:2006)* 〈A1〉

〈A1〉 EN 62061:2005, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)* 〈A1〉

〈A1〉 CLC/TR 50404:2003, *Electrostatics — Code of practice for the avoidance of hazards due to static electricity* 〈A1〉

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in 〈A1〉 EN ISO 12100-1:2003 〈A1〉 and the following apply.

3.1
danger points
danger points are defined locations in the danger zone of machines where persons can be injured by movements of

— parts of machines;

— tools of machines or parts of tools;

— workpieces or parts of workpieces or

— materials being processed.

NOTE Danger points can exist, for example, on gear, chain and worm drives, V-belt, flat belt, cord and rope drives, pulling and supporting elements on continuous conveyors, spoke wheels and fly wheels, shafts and shaft ends, rollers, slides, push rods and similar parts, tools and clamping devices.

Particular points of danger are:

— crushing and shearing points;

— trapping points;

— inrunning nips;

— cutting, punching and impact points.

3.2
inrunning nips
nips caused by rotating rollers, cylinders, rolls or drums creating the hazard for parts of the body or the whole body to be drawn in. The risks exist between:

a) two counter-rotating rollers, powered or non-powered;

b) one rotating roller and an adjacent fixed part of the machine;

c) rollers rotating and conveyer belts in the same direction, but with different peripheral speeds or surface properties (friction);

d) guide roller and driving belt, conveyor belt and possibly the web (see Figure 1).

Inrunning nips also exist on non-powered riding rollers (guide rollers) which are driven by the movement of the web. This hazard may depend on a number of factors, e.g. type and strength of material, wrapping angle, web speed, inertia.

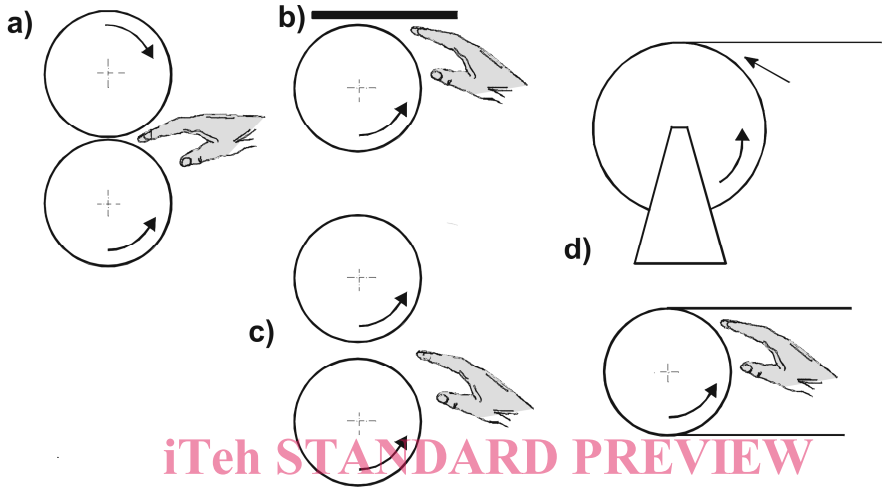

Figure 1 — Examples of inrunning nips

3.3
integrated pile lifting and lowering devices
devices integrated into sheet and blank feeders or deliveries for lifting and lowering the sheet pile

3.4
format size
maximum size of blanks (maximum length times maximum width) that can be printed or converted by the machine

3.5
routine and regular access
access to a danger point required for production reasons after each tool closing movement

3.6
web-type materials
webs of paper, board, foil or similar material which is to be handled or processed

3.7
reel unwinding devices
those parts of a machine used for unwinding web-type material for processing

3.8
reel rewinding devices
those parts of a machine used for rewinding the processed web-type material

3.9
separating elements
elements on feeders of sheets or blanks or similar materials which separate the individual sheets, blanks etc.

3.10
raised workplaces
workplaces that are at least 0,5 m above the reference plane

3.11
infrequently used access
access to workplaces which are used for adjustments, make-ready and maintenance operations, but which are not used for production purposes

3.12
smooth cylinders/rollers
rotationally symmetric smooth bodies (cylinders or rollers) without indentations and with no sharp or cutting edges

3.13
residual pile monitoring
sensing devices monitoring the residual pile in the feeder. The machine is stopped before the last blank is fed so that the blank safeguards the separating elements of the feeder

3.14
ESPD
electro-sensitive protective device

3.15
hold-to-run control device
control device where the actuator automatically returns to the start position when released and where machine operation is started and maintained only as long as the actuator is held depressed

3.16
accessible danger zones
areas provided with guards or ESPDs, for example, for safeguarding which allow whole-body access

4 List of significant hazards

4.1 [A1] This clause contains all the significant hazards, as far as they are dealt with in this European Standard, identified by risk assessment during the development of this European Standard as significant to the type of machinery within the scope and which require action to eliminate or reduce the risk.

NOTE A manufacturer should check using risk assessment to determine whether the list of hazards in Table 1 is complete and applicable with respect to the particular machine. Risk assessment procedures and guidance on the application of measures to reduce risk are given in EN ISO 14121-1 and EN ISO 12100. [A1]

4.2 [A1] *deleted text* [A1]

Table 1 — Significant hazards, danger zones, safety measures

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		[A1] this standard	EN ISO 12100-1: 2003	EN ISO 14121-1:2007 Annex A Table A.1 [A1]
Mechanical hazards crushing shearing cutting or severing entanglement drawing-in trapping impacts	Production area: – between rollers, cylinders, drums – short linear movements – wheels for floor travel – revolving handwheels – crushing hazards with parts of building – guards – accessible danger zone – make-ready, cleaning, maintenance operations and trouble shooting (hold-to-run) – safe threading of web-type material – impact hazards in passageways, access ways – stationary knives – rotary tools – transport of hazardous tools – on feeding and delivery units (pile lifting and lowering devices) – unwinding and rewinding units for web-type material	5.2.1.1, 5.2.1.2 5.2.1.3 5.2.1.4 5.2.1.5 5.2.1.6 5.2.2 5.2.3.1 5.2.3.2, 5.2.3.3, 5.2.3.4 5.2.3.5 5.2.12.1.4 5.3.1 5.3.2 5.3.3 5.3.4.3 to 5.3.4.10 5.3.5	4.2.1	1
Mechanical hazards generated by: Mass and stability, Mass and velocity	– stability – movable machines – feeding units, delivery units	5.2.13.1 5.2.13.2 5.3.4.1, 5.3.4.2, 5.3.4.11, 7.2.5	4.2	1
[A1] Slipping, tripping, falling	Work platforms, access stairs, passageways, steps, floor coverings	5.2.12	4.2.3	1 [A1]
Electrical hazards Direct or indirect contact Thermal radiation (burns)	– electrical equipment (equipment made live under electrical fault conditions) – supply disconnection device, stop category – rectifier drives – degree of protection – measuring devices	5.2.5.1, [A1] 5.2.5.8 [A1] 5.2.5.2, 5.2.5.3 5.2.5.4 [A1] 5.2.5.6 [A1] [A1] 5.2.5.9 [A1]	4.3	2
Thermal hazards Burns due to possible contact	Hot machine parts	5.2.14, 7.2.4	4.4	3

Table 1 (concluded)

Significant hazards	**Danger zone**	**Safety measures: reference to clauses in**		
		[A1⟩ this standard	**EN ISO 12100-1: 2003**	**EN ISO 14121-1:2007 Annex A Table A.1 ⟨A1]**
Hazards generated by noise Hearing damage Interference with speech communication Accidents due to interference with the perception of acoustic signals Stress	All machines	5.2.15, 7.2.4	4.5	4
Hazards generated by radiation UV-radiation, laser [A1⟩ Hazards from explosion	Machines with laser and UV-light – machinery using flammable liquids or dusts	5.2.16, 7 5.2.4, 7.2.4	4.7 4.8	6 3 ⟨A1]
Hazards generated by neglect of ergonomic principles in machine design Unhealthy body postures Unsuitable construction, place or identification of actuators	– design of actuators and displays – safety access, workplaces, catwalks, passageways – footsteps, handles – balance of weight – avoidance of irritating reflection	5.2.7 Annex B 5.2.12.1.1, 5.2.12.1.3, 5.2.12.1.4, 5.2.12.1.5 5.2.12.2 5.2.2.5 5.2.2.6	4.9	8
[A1⟩ Failure, malfunction of control system Faults or failures in safety circuits Malfunction of software	– machinery with safety circuits – conductor identification – separation of chucking cones	5.2.6 5.2.8 to 5.2.11 5.2.5.7 5.3.5.4		⟨A1]
[A1⟩ External effects on electrical devices	immunity to electromagnetic disturbances	5.2.17		2 ⟨A1]