SLOVENSKI STANDARD
SIST EN 1010-2:2006+A1:2010

01-oktober-2010

Varnost strojev - Varnostne zahteve za načrtovanje in konstrukcijo tiskarskih strojev in strojev za obdelavo papirja - 2. del: Tiskarski in lakirni stroji, vključno s stroji za predtiskanje

Safety of machinery - Safety requirements for the design and construction of printing and paper converting machines - Part 2: Printing and varnishing machines including pre-press machinery

Sicherheit von Maschinen - Sicherheitsanforderungen an Konstruktion und Bau von Druck- und Papierverarbeitungsmaschinen - Teil 2: Druck- und Lackiermaschinen einschließlich Maschinen der Druckvorstufe

Sécurité des machines - Prescriptions de sécurité pour la conception et la construction de machines d'impression et de transformation du papier - Partie 2: Machines d'impression et de vernissage ycompris les équipementsde pré-press

Ta slovenski standard je istoveten z: **EN 1010-2:2006+A1:2010**

ICS:

37.100.10	Reprodukcijska oprema	Reproduction equipment
85.100	Oprema za papirno industrijo	Equipment for the paper industry

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English Version

Safety of machinery - Safety requirements for the design and construction of printing and paper converting machines - Part 2: Printing and varnishing machines including pre-press machinery

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Foreword

This document (EN 1010-2:2006+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of an identical text or by endorsement, at the latest by February 2011, and conflicting national standards shall be withdrawn at the latest by February 2011.

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 2010-06-18.

This document supersedes EN 1010-2:2006.

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

For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

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Introduction

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

It defines additional safety requirements and/or deviations from the stipulations in [A1] EN 1010-1:2004+A1 [A1].

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

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 for machines that have been designed and built according to the provisions of this type C standard.

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of one or more patents:

- *German Patent DE 103 10 236 B3*
- *PCT patent application*

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1 Scope

This document applies to:

— Pre-press machinery (machinery and devices for the production of master copies and printing forms):

  — exposure equipment for the production of films and printing forms;

  — equipment for developing films and printing forms;

  — washing machines for printing forms;

  — machines for bending printing forms;

  — punching machines for film and printing forms;

  — cutting machines for film and printing forms;

  — machines for the production of gravure printing forms;

  — scanners.

— Printing and varnishing machines:

  — proofing presses;

  — sheet-fed printing presses and varnishing machines including digital printing presses;

  — web-fed rotary presses and varnishing machines including digital printing presses;

  — screen printing presses.

— Auxiliary devices:

  — cylinder and roller washing devices;

  — continuous flow drying devices;

  — powder spraying devices;

  — auxiliary devices on inking and damping units;

  — automatic plate clamping devices;

  — washing equipment for printing forms, rollers and scrapers;

  — pile turners;

  — measuring and control devices.

This document shall be used together with [A1] EN 1010-1:2004+A1 [A1]. Both parts together identify all significant hazards relevant to printing and varnishing machines including pre-press machinery and auxiliary

devices, when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). The specific requirements specified in prEN 1010-2 take precedence over respective requirements in this standard.

This document does not deal with risks generated by noise emitted from the machines. These issues are fundamentally covered in [A1⟩ EN 1010-1:2004+A1 ⟨A1]

This document does not apply to high-pressure cleaning devices and screen printing presses for textile substrates.

This document is not applicable to printing and varnishing machines including pre-press machinery which are manufactured before the date of publication of this document by CEN.

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.

[A1⟩ *deleted text* ⟨A1]

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

[A1⟩ EN 378-1:2008 ⟨A1], *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 1: Basic requirements, definitions, classification and selection criteria*

[A1⟩ *deleted text* ⟨A1]

[A1⟩ EN 1088, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection* ⟨A1]

[A1⟩ EN 1010-1:2004+A1 ⟨A1], *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 1: General requirements*

[A1⟩ *deleted text* ⟨A1]

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

[A1⟩ EN 1539:2009 ⟨A1], *Dryers and ovens, in which flammable substances are released — Safety requirements*

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

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

[A1⟩ EN 60825-1:2007, *Safety of laser products — Part 1: Equipment classification and requirements (IEC 60825-1:2007)* ⟨A1]

[A1⟩ EN 60950-1:2006, *Information technology equipment — Safety — Part 1: General requirements (IEC 60950-1:2005, modified)* ⟨A1]

[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] EN 62061:2005, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)* [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 13849-1:2008, *Safety of machinery — Safety related parts of control systems — General principles for design (ISO 13849-1:2006)* [A1]

[A1] EN ISO 13855:2010, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)* [A1]

[A1] EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)* [A1]

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

EN ISO 14122-4:2004, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders (ISO 1422-4:2004)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003, [A1] EN 1010-1:2004+A1 [A1] and the following apply.

3.1
alcohol dosing equipment
equipment for dosing the amount of alcohol in the damping water of offset printing presses

3.2
proofing presses
machines for printing a small number of copies, mostly used for assessing print quality before the printing form is mounted in the machine. Feeding and delivery is done manually

3.3
automatic plate clamping devices
devices for automatic or semi-automatic changing of printing plates

3.4
exposing equipment
machinery used for taking images by exposing photo-sensitive material, for example, as master copy or printing forms

3.5
sheet-fed printing presses and varnishing machines
machines for printing, numbering and/or varnishing of sheet-size substrates (paper sheets, board, film, sheet metal or similar material) including proofing presses. Numbering and varnishing machines may be integrated into printing presses or they may be used as stand-alone machines. The sheets may be fed by feeders or from sheeters attached to unwinding units

3.6
powder spraying devices
devices for spraying powder onto the printed material on the delivery side of sheet-fed printing presses

3.7
printing forms
base material which stores the image to be printed (pictures and/or text) and transfers ink on a substrate (such as printing plates, printing cylinders, screens), thus printing the image

3.8
washing equipment for printing forms
machines for washing printing forms outside the printing press (for example, screen washing equipment)

3.9
printing forms bending machines
machines for bending or folding printing forms before they are clamped in the printing press

3.10
printing tables
tables to hold the substrate to be printed during the printing process (as on certain types of screen printing presses)

3.11
master copy
copy from which the image is taken for preparing the printing form

3.12
continuous flow drying devices
devices built into printing presses for drying substrates after the printing process (for example, by hot air, IR or UV radiation)

3.13
digital printing presses
printing presses used in professional printing shops where the printing image is produced in the machine from data stored in digital form (for example, by exposing a photo-sensitive drum or film in the machine)

3.14
forms printing presses
machines for the production of continuous forms where paper webs printed with one or multiple colours are concertina-folded or wound onto a reel. In addition to the printing section, the machine normally consists of different devices for converting such as, for example, devices for punching, punching for traction feeding, cross perforation, longitudinal perforation and concertina-folding

3.15
pre-press machinery
machines and equipment for the production of master copies and/or printing forms

3.16
web-fed rotary printing presses and varnishing machines
machines for printing, numbering and/or varnishing of webs (for example webs of paper, films)

3.17
bypass function
bypass sequence
temporary, time-limited suppression or bypassing of one (or several) safety function(s) by safety-related parts of a control system

3.18
access height in the sheet-fed press delivery zone
maximum opening into the area below the sheet gripper, measured between access level (floor, fixed platform or footboard) and lower edge of fixed machine parts (e.g. fixed guard, fixed cover, fixed parts such as sheet stops); (see Figure 3)

3.19
screen printing presses
printing presses using printing forms with woven material (screens) which partially allow ink to penetrate through the material. A doctor blade is used to press the ink through the screen onto the underlying substrate. Ink will pass only through the „printing„ parts of the screen, thus creating the desired image. Screen printing may be applied to sheets, webs or solid substrates

Depending on the degree of automation of the individual steps of the printing process (feeding - flooding - printing - delivery), screen printing presses are defined as:

— semi automatic (manual feeding and manual delivery);

— three-quarter automatic (manual feeding, automatic delivery);

— fully automatic (automatic feeding and delivery).

Screen printing presses with flat screens are classified according to their design as:

— printing unit, hinged or with parallel or inclined withdrawal, fixed feeding table as printing basis (substrate is placed manually on the feeding table below the printing unit);

— short-stroke printing unit (substrate is placed on a movable feeding table as printing basis; substrate is placed on a fixed feeding table, transfer to the printing basis by means of gripper system);

— movable printing unit with fixed blade unit and counterpressure cylinder, feeding via gripper system (cylinder screen printing presses)

3.20
screen frames
frames upon which printing screens are mounted

3.21
printing basis of screen printing presses
counterpressure element taking up the substrate for printing. It can be a flat plate (printing table) or a rotating cylinder

3.22
doctor blade unit
unit for pressing the screen printing form against the substrate with the blade forcing the printing ink through the open areas of the screen printing form onto the substrate and scraping excessive ink off the screen. It consists of the blade holder and the blade

3.23
printing unit of screen printing presses
designation for the screen printing form and the doctor blade unit

3.24
pile turners
devices for turning piles of substrate. They are associated with sheet-fed printing presses in order to turn piles of printed paper for further processing, for example, for back printing in a second run

3.25
engraving machines for gravure cylinders
machines for cutting images on printing forms used for gravure printing where the engraved parts hold the ink for the printing process

3.26
newspaper printing presses
machines which are designed and constructed primarily for printing newspapers

3.27
auxiliary devices for printing presses
devices used for the production process which are either built in or attached to the printing press

3.28
enabling devices
actuating devices which shall be operated in addition to at least one other actuator or enabling device in order to start a machine under hold-to-run control. The machine movement is stopped as soon as one of the hold-to-run controls or enabling devices respectively is released

3.29
roller/cylinder washing devices
devices integrated into the printing press for washing cylinders and rollers, for example, ink rollers, blanket cylinders, printing cylinders, plate cylinders

3.30
cylinder screen printing presses
sheet-fed screen printing presses where the substrate (sheet) is guided along the screen by a printing cylinder

3.31
ESPD
electro-sensitive protective device

3.32
knurl rollers
rollers with a pattern surface with indents less than 1 mm, without sharp or cutting edges.

4 List of significant hazards

4.1 This clause contains all the significant hazards (noise is fundamentally dealt with in [A1] EN 1010-1:2004+A1 [A1]), as far as they are dealt with in this standard, identified by the risk assessment 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 shall check whether the list of hazards in Table 1 is complete and applicable with respect to the particular machine.

4.2 [A1] It is of great importance that the manufacturer, takes into account the following principal aspects in accordance with EN ISO 14121-1:2007: [A1]

— the intended use of the machine including setting-up (make-ready), cleaning and maintenance, including foreseeable misuse;

— identification of the significant hazards.

Table 1 — Significant hazards, danger zones, safety measures

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN ISO 12100-1:2003	[A1] EN ISO 14121-1:2007, Table A.1 [A1]
Mechanical hazards crushing shearing cutting or severing entanglement drawing-in impacts	**Pre-press machinery**		4.2	1
	— inrunning nips on rollers and cylinders	5.2.8		
	— inrunning nips between engraving tools and form cylinder	5.2.9		
	— trapping hazards on chuck jaws of engraving machines	5.2.9		
	— printing forms bending devices	5.2.10, 5.2.11, 7.1.1.2		
	— printing forms punching devices	5.2.12		
	Sheet-fed printing presses and varnishing machines			
	— sheet gripping devices, rollers, cylinders, perforating tools, feed openings	5.3.1		
	— inrunning nips behind interlocking guards during cleaning and make-ready	5.3.2		
	— damping unit, varnishing unit, inking unit	5.3.4, 5.3.5		
	— sheet delivery	5.3.8 to 5.3.10, 7.1.2.2		
	— sheet delivery	5.3.11		
	— material feeding for board and plate printing	5.3.12, 7.1.2.4		
	— sheet stops, suction head on automatic format setting	5.3.13		
	— pile changing device	5.3.14		
	— powered movable guards	5.3.16		
	— upper and lower tool on offset proofing presses	5.3.17		
	Web-fed rotary printing presses and varnishing machines			
	— inrunning nips on rollers and cylinders, feed openings	5.4.2, 5.4.3		
	— inrunning nips behind interlocking guards during cleaning and make-ready	5.4.4		
	— powered movable guards	5.4.5		
	— damping unit, varnishing unit, inking unit	5.4.8, 5.4.9		
	— automatic format setting, area of turner bars	5.4.10, 7.1.3.1		
	— transport carriages for cylinders	5.4.12, 5.4.13		

Table 1 *(continued)*

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN ISO 12100-1: 2003	EN ISO 14121-1:2007, Table A.1
	— folding unit	5.4.14		
	— material feeding	5.4.15		
	— material webs	5.4.16		
	— reel unwinding unit	5.4.17		
	— forms printing with guards open	5.4.18, 7.1.3.3		
	— rollers, guide rollers	5.4.19		
	— digital printing presses	5.4.21		
	Screen printing presses			
	— printing unit, printing basis	5.5.2, 7.1.4.5		
	— feeding table, gripper systems	5.5.3		
	— doctor blade/screen frame	5.5.4, 5.5.5		
	— doctor blade/screen frame	5.5.6		
	— feeding unit, delivery	5.5.7		
	— screen frames on cylinder screen printing presses	5.5.8		
	— pressure cylinder	5.5.9		
	Auxiliary devices for printing and varnishing machines	5.6		
	Powder spraying devices	5.6.4		
	Auxiliary devices on inking and damping units			
	— refrigerating devices	5.6.5.3		
	Plate clamping devices	5.6.6		
	Pile turners			
	— load lifting device	5.6.8.1		
	— hydraulic, pneumatic lifting device	5.6.8.2		
	Measuring and control devices	5.6.8		
Slipping, tripping, falling	**Sheet-fed printing presses and varnishing machines**		4.10	1
	— accessible floor plates with low slip resistance	5.3.21		
Ejection of parts	**Pre-press machinery**			1
	— safety screen on exposing equipment	5.2.3		
Thermal hazards Burns due to possible contact	**Continuous flow drying devices**		4.4	3
	— surface temperature	5.6.3.6		