SLOVENSKI STANDARD
oSIST prEN ISO 12643-1:2018

01-november-2018

Grafična tehnologija - Varnostne zahteve za grafično tehnološko opremo in sisteme - 1. del: Splošne zahteve (ISO/DIS 12643-1:2018)

Graphic technology - Safety requirements for graphic technology equipment and systems - Part 1: General requirements (ISO/DIS 12643-1:2018)

Graphische Technik - Sicherheitstechnische Anforderungen an Ausrüstungen und Systeme der graphischen Technik - Teil 1: Gemeinsame Anforderungen (ISO/DIS 12643 -1:2018)

Technologie graphique - Exigences de sécurité pour les systèmes et l'équipement de technologie graphique - Partie 1: Exigences générales (ISO/DIS 12643-1:2018)

Ta slovenski standard je istoveten z: **prEN ISO 12643-1**

ICS:

37.100.10	Reprodukcijska oprema	Reproduction equipment

oSIST prEN ISO 12643-1:2018 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 12643-1

ISO/TC **130**

Secretariat: **SAC**

Voting begins on:
2018-09-20

Voting terminates on:
2018-12-13

Graphic technology — Safety requirements for graphic technology equipment and systems —

Part 1:
General requirements

Technologie graphique — Exigences de sécurité pour les systèmes et l'équipement de technologie graphique —

Partie 1: Exigences générales

ICS: 37.100.10

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 12643-1:2018(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC *130, Graphic technology*.

This third edition cancels and replaces the second edition (ISO 12643-1:2009), which has been technically revised..

The main changes compared to the previous edition are as follows:

— xxx xxxxxxx xxx xxxx

ISO 12643 consists of the following parts, under the general title *Graphic technology — Safety requirements for graphic technology equipment and systems*:

— Part 1: General requirements

— Part 2: Prepress and press equipment and systems

— Part 3: Binding and finishing equipment and systems

— Part 4: Converting equipment and systems

— Part 5: Stand-alone platen presses

Requirements specific to printing prepress and press equipment and systems, binding and finishing equipment and systems, converting equipment and systems and stand-alone platen presses that are not included in this part of ISO 12643, are given in subsequent parts of ISO 12643 that contain additional requirements specific to that type of equipment.

Introduction

This part of ISO 12643 is a type-C standard as stated in ISO 12100.

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

When requirements of this type-C standard are different from those which are stated in type-A or B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

During the development of this part of ISO 12643, existing relevant standards of other countries were taken into consideration. An effort has been made to take into consideration the requirements of many countries, recognizing that national standards or laws may dictate national requirements. In cases where it was known that there is a national requirement that differs from this part of ISO 12643, that has been noted.

This part of ISO 12643 was developed to harmonize the requirements of the following U.S. and European safety standards:

— ANSI B65-1 *Graphic technology – Safety requirements for graphic technology equipment and systems – Part 1: General requirements*

— ANSI B65-2, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 2: Prepress and press equipment and systems*;

— ANSI B65-3, *Graphic technology — Safety requirements for graphic technology equipment and systems – Part 3: Binding and finishing equipment and systems*;

— ANSI B65-5, *Safety requirements for graphic technology equipment and systems — Part 5: Stand-alone platen presses*

— EN 1010-1, *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 1: Common requirements*;

— EN 1010-2, *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*;

— EN 1010-3, *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 3: Cutting machines*;

— EN 1010-4, *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 4: Bookbinding, paper converting and finishing machines*.

— EN 1010-5, *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 5: Machines for the production of corrugated board and machines for the conversion of flat and corrugated board*.

Graphic technology — Safety requirements for graphic technology equipment and systems — Part 1: General requirements

1 Scope

This part of ISO 12643 provides safety specifications for the design and construction of new equipment used in prepress systems, printing press systems, binding and finishing systems, converting systems, corrugated board manufacturing systems and stand-alone platen presses. It is applicable to equipment used in stand-alone mode, or in combination with other machines, including ancillary equipment, in which all the machine actuators (e.g. drives) of the equipment are controlled by the same control system.

The requirements given in this part of ISO 12643 are applicable to the equipment covered by all parts of ISO 12643, unless otherwise noted. This part of ISO 12643 is intended to be used in conjunction with the applicable part of ISO 12643 that contains additional requirements specific to a particular type of equipment.

This part of ISO 12643 addresses recognized significant hazards specific to equipment and systems in the following areas:

— mechanical;

— electrical;

— slipping, tripping, falling;

— ergonomics;

— noise;

— UV and laser radiation;

— fire and explosion;

— thermal;

— substances and material used for processing;

— failure, malfunction of control system

— other types of emissions [e.g. ozone, ink mist, volatile organic compounds (VOCs), etc.].

This standard is not applicable to:

— equipment manufactured before the date of its publication.

— ordinary office equipment for digital printing and paper processing, such as digital printers, copiers, sorters, binders and staplers, which is intended for use outside the printing and paper industry;

— winder-slitters and sheeters in paper finishing (sheeters with unwinders);

— 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); and

— textile printing presses.

The safety principles established in this part of ISO 12643 can also be applicable to the design of equipment within areas of technology that are not specified in ISO 12643.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO/DIS 3691-4, *Industrial trucks — Safety requirements and verification — Part 4: Driverless industrial trucks and their systems*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-2, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*

ISO 3864-3, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 7010, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 8031, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance and conductivity*

ISO 11553-1, *Safety of machinery — Laser processing machines — Part 1: General safety requirements*

ISO/TR 11688-1, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning*

ISO 11689, *Acoustics — Procedure for the comparison of noise-emission data for machinery and equipment*

ISO 12100:2010, *Safety of machinery – General principles for design – Risk assessment and risk reduction*

ISO 12643-2, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 2: Prepress and press equipment and systems*

ISO 12643-3, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 3: Binding and finishing equipment and systems*

ISO 12643-4, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 4: Converting equipment and systems*

ISO 12643-5, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 5: Stand-alone platen presses*

ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13849-2, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation*

ISO 13850, *Safety of machinery — Emergency stop — Principles for design*

ISO 13851:2018, *Safety of machinery — Two-hand control devices — Functional aspects and design principles*

ISO 13854, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

ISO 13855, *Safety of machinery — Positioning of safeguards with respect to the approach speeds of parts of the human body*

ISO 13856-1, *Safety of machinery — Pressure-sensitive protective devices — Part 1: General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors*

ISO 13856-2, *Safety of machinery — Pressure-sensitive protective devices — Part 2: General principles for the design and testing of pressure-sensitive edges and pressure-sensitive bars*

ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels*

ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*

ISO 14122-3, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails*

ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders*

ISO/TR 15847, *Graphic technology — Graphical symbols for printing press systems and finishing systems, including related auxiliary equipment*

IEC 60079-0:2011, *Explosive atmospheres — Part 0: Equipment — General requirements*

IEC 60079-1, *Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures "d"*

IEC 60079-7, *Explosive atmospheres — Part 7: Equipment protection by increased safety "e"*

IEC 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*

IEC 60079-10-2, *Explosive atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres*

IEC 60079-11, *Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i"*

IEC 60079-14, *Explosive atmospheres — Part 14: Electrical installations design, selection and erection*

PD CLC/TR 60079-32-1, *Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance*

IEC 60079-32-2, *Explosive atmospheres - Part 32-2: Electrostatics hazards - Tests*

EN 60204-1:2009, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60825-1, *Safety of laser products — Part 1: Equipment classification and requirements*

IEC 60947-2, *Low-voltage switchgear and controlgear — Part 2: Circuit-breakers*

IEC 60947-3, *Low-voltage switchgear and controlgear — Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*

IEC 60947-5-1, *Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices*

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

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

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

IEC 61310-3, *Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators*

IEC 61496-1:2012, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

IEC 61496-2:2013, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

IEC 62061:2005, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems*

ISO 80079-36:2016; *Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements*

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

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 ISO 4871 *Acoustics — Declaration and verification of noise emission values of machinery and equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13849-1:2015, ISO 12100:2010 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/
— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
actuator
part of a device to which an external action is to be applied

Note 1 to entry: The actuator can take the form of a handle, knob, pushbutton, roller, plunger, trip wire, pressure-sensitive mat, etc.

Note 2 to entry: There are some actuating means that do not require an external actuating force, but only an action; e.g. light beams. Such actuating means are not considered to be actuators.

Note 3 to entry: See also definition for *machine actuator* (3.35)

3.2
armed condition
machine status in which machine motion can be automatically initiated

Note 1 to entry: *Zero speed* (3.88) is considered to be an armed condition.

3.3
audible alarm
horn, bell or other distinctive audible warning device that sounds to indicate impending machine motion

3.4
auxiliary device
mechanism or machine, either built-in or attached, used for the production process

Note 1 to entry: Examples of auxiliary devices include:

— continuous flow drying devices,

— pre-melter on a binder.

— Gluers,

— perforating units,

— die cutters,

— numbering devices,

— imprinters,

— registration systems,

— prefolder,

— prefeeder,

— breakers (i.e. blank sheet separator), etc.

3.5
barrier guard
guard (3.24) that reduces or prevents physical access to a hazard zone by closing off access to an area containing one or more hazards

EXAMPLE A perimeter fence or tunnel guard.

3.6
binding and finishing system
combination of machines functioning in an integrated configuration to turn an incomplete printed product into a finished product by means of one or more processes, such as cutting, folding, binding, stitching, gluing, wrapping, etc.

3.7
bypass
temporary, time-limited suppression of one or more safety functions through the use of safety-relevant parts of a control system

3.8
chucking cones
rotating parts of shaftless winding and unwinding devices, which are inserted into the ends of the core of the roll and enable the winding or unwinding of the roll of material

3.9
contact/pressure roller on reel rewinding devices
driven or non-driven roller that is in contact with the material reel and is used to guide and ensure the winding hardness of the flat web that is to be rewound

3.10
continuous run
machine motion at a sustained speed until changed by the operator

3.11
control station
assembly of one or more control actuators that initiates or stops machine movement or potential of machine movement (torque at *zero speed* (3.88)), or places the machine in the *armed condition* (3.2)

3.12
control zone
control configuration of single or multiple machine motions using the same control devices

Note 1 to entry: See 5.6.

3.13
doctor blade
blade that wipes the excess (surface) ink from a gravure cylinder or anilox roller before printing or the excess coating from a cylinder during finishing operations

[SOURCE: ISO 12637-3]

3.14
drive
mechanism, divided into the following two general categories, which causes a machine or any of its elements to move:

— drives with no stored energy, e.g. direct-motor drives;

— drives having stored energy, e.g. motor-flywheel-clutch drives and hydraulic-pneumatic drives

3.15
electrical hazard
source of potential injury or death from electric shock or burn

3.16
electro-sensitive protective device
ESPD
assembly of devices and/or components working together for protective tripping or presence-sensing purposes (person, part of person, object) using non-contact detection means

Note 1 to entry: ESPDs are, e.g., light curtain, light beam, ultrasonic proximity sensor, vision-based protective devices, scanner etc.

3.17
emergency stop command
change of signal state, the direct result of actuation of an *emergency stop device* (3.18)

3.18
emergency stop device
manually actuated control device used to initiate an *emergency stop function* (3.19)

[SOURCE: ISO 13850:2015]3.19
emergency stop function
initiated by a mechanism actuated by a single human motion and intended to halt machine activity in order to avoid injury to persons, damage to machinery or damage to work in progress

3.20
emergency stop pushbutton
type of *emergency stop device* (3.18) comprised of an extended mushroom-head or palm-type actuator, positive opening contact element(s) and an engagement or latching-in feature

3.21
explosive atmosphere

mixture, under atmospheric conditions, of air and one or more flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the unburned mixture3.22
exposing device
machinery used for creating images by exposing photo-sensitive material such as printing plates or printing formes

3.23
fixed guard
guard (3.24) that is securely affixed by fasteners that require a tool(s) to remove in order to gain access to an area with a significant hazard