INTERNATIONAL STANDARD

ISO 12643-3

Third edition
2023-11

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

Part 3: Binding and finishing equipment and systems

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

Partie 3: Systèmes et équipement de reliure et de finissage

Reference number
ISO 12643-3:2023(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 document 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).

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For an explanation of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 130, *Graphic technology,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 198, *Printing and paper machinery — Safety,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and the second edition (ISO 12643-3:2010), which has been technically revised.

The main changes are as follows:

— in 5.2, requirements for interlocks have been included (specific clause in ISO 12643-1 has been deleted);

— in 5.3.4, requirements for residual pile monitoring as a safety device on hopper feeders have been revised

— in 5.4.4, requirements on feeders and feeding sections at gathering machines have been added;

— in 5.4.4.4, requirements for residual pile monitoring as a safety device on feeders at gathering machines have been revised

— in 5.4.5, the requirements on safety-related control systems for temperature control and temperature monitoring in the gluing unit at perfect binders have been revised;

— in 5.4.5.7, requirements for safeguarding milling head cutters at perfect binders have been added;

— in 5.4.5.9, requirements for emergency stop at perfect binders have been added;

— requirements related to hazards dealt with in ISO 12643-1 have been deleted throughout the document (inclusion in the list of significant hazards);

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— in 5.4.5, the requirements on safety-related control systems for temperature control and temperature monitoring in the gluing section for hardcover lines have been revised;

— in 5.9.2, requirements for retraction of knife and clamp at guillotine cutters have been added;

— in 5.9.6; Figures 29 and 30 on guillotine cutters have been revised (30 mm added)

— the formula for the calculation of the minimum safety distance at guillotine cutters has been moved to A.1 as it also refers to the new subclause 5.11;

— a new subclause 5.11, Three-knife trimmers with manual infeed, has been added;

— in Clause 6, the table for the verification of the safety requirements and/or protective/risk reduction measures has been added;

— the list of significant hazards has been moved to Annex B;

— a reference to ISO 13849-2 has been added in Bibliography.

This document is intended to be used in conjunction with ISO 12643-1:2023.

A list of all parts in the ISO 12643 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document is a type-C standard as stated in ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organisations, market surveillance, etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e. g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

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 type-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 document, existing relevant standards of other countries were taken into consideration. In cases where it was known that there is a national requirement that differs from this document, that has been noted.

The full set of requirements for graphic technology equipment and systems are those given in the part of ISO 12643 applicable to that type, together with the relevant requirements from ISO 12643-1:2023, to the extent specified in the Scope of the applicable part of ISO 12643.

This document supplements and modifies the general requirements of ISO 12643-1:2023. Where a requirement of this document conflicts with a requirement of ISO 12643-1:2023 the requirement of this document will take precedence.

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

Part 3:
Binding and finishing equipment and systems

1 Scope

This document provides safety requirements specific to binding and finishing equipment and systems. It provides additional safety requirements for the design and construction of new equipment used to convert printed or blank substrates into cut, folded, collated, assembled, bound, or otherwise finished product.

This document is applicable to processes for preparing substrate for the printing process. It is also applicable to a wide range of equipment used in the binding and finishing process.

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 12643-1:2023, *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 1: General requirements*

ISO 13849-1:2023, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13857:2019, *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 14123-1:2015, *Safety of machinery — Reduction of risks to health resulting from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

ISO 14123-2:2015, *Safety of machinery — Reduction of risks to health resulting from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures*

IEC 62061:2021, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12643-1:2023, ISO 13849-1:2023 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

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— IEC Electropedia: available at https://www.electropedia.org/

3.1
anti-repeat device
mechanical or electromechanical mechanism that ensures that only one cutting cycle occurs for each manual activation or automatic cut if the primary stopping system or *single-cycle device* (3.30) fails

3.2
automatic cutting sequence
programmed succession of clamping operations and/or cutting movements that is initiated by the operator and proceeds to a specified point without further intervention by the operator

3.3
back-rounding and pressing machine
apparatus for processing book signatures, i.e. for rounding the spine and the trimmed front edge of book signatures and compressing the resulting signatures

3.4
backgauge
movable device (automatic or manual) on a guillotine cutter, positioned square to the cutting table, used to stop the stack of material to be cut when the material is pushed into the opening under the cutting blade by the operator, as well as to determine the dimensions of the cut

3.5
backlining and head-banding machine
<hard-cover bookbinding> equipment for the automatic production of hard-cover books where the binding together of the signatures is rounded or flat, with glue, gauze, or paper

3.6
book-cover crease-forming machine
<hard-cover bookbinding> apparatus for creating, under heat and pressure, a permanent bend in the cover of a hard-cover book, then pressing the entire cover surface

3.7
book press
device used for flattening books

3.8
book signature press
power-operated device used for flattening book signatures, which are fed and aligned manually

3.9
casing-in machine
<hard-cover bookbinding> apparatus for gluing the end papers of the book signatures to the interior surfaces of the book cover

3.10
clamp bar
device using pressure to secure product so that it does not move during an operation

3.11
coater
finishing machine that applies a predetermined thickness of a liquid substance (e.g. glue, varnish, ink) on substrates made of paper or a similar material

3.12
counter-stacker
machine for stacking piles of leaflets, books, magazines or newspapers such that the successive layers are positioned at 180° to the previous layer

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3.13
cutting cycle
<machines with a manually driven clamp bar> programmed succession of operations that begins when the knife drive is activated and ends when the knife returns to its retracted position

3.14
cutting cycle
<machines with a power-driven clamp bar> programmed succession of operations that begins when high-pressure clamping is initiated and ends when the knife and *clamp bar* (3.10) return to their retracted positions after a single clamp bar/knife stroke

3.15
cutting zone
three-dimensional space through which any part of the knife (knives) and/or *clamp bar(s)* (3.10) travels during the entire *cutting cycle* (3.14)

3.16
gang stitcher
machine for stitching folded sheets of paper, during the operation in which individual folded sheets are removed by feeding grippers and the open sheets are stacked on top of each other on a transport chain for subsequent back-stitching

3.17
gathering machine
apparatus that assembles sheets or folded sheets in a binding line

3.18
guillotine cutter
power-driven machine having a single knife that is used primarily to cut paper products, stacks of paper, or other substrates, as specified by the manufacturer

3.19
high-pressure clamping
operation of *clamp bar(s)* (3.10) with a dynamic force in excess of 300 N for machines up to and including 1,6 m in width, or in excess of 500 N for machines greater than 1,6 m in width, when measured at 75 % of the clamp bar opening (e.g. with the clamp bar at 25 % of its maximum travel distance measured from the retracted position)

Note 1 to entry: The 75 % value is to ensure that the measurement is made at the position that approximates to the size of an operator's hand.

3.20
inserting machine
apparatus that inserts printed matter such as leaflets and magazines at a predetermined position in other printed products, such as newspapers or magazines

3.21
knife drive
mechanism by which the knife of the guillotine is forced through the material to be cut

3.22
laminator
paper-finishing machine that applies a solid material (e.g. foil, paper) to a substrate made of paper or a similar material

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3.23
low-pressure clamping
<for machines with a power-driven clamp bar> operation of *clamp bar(s)* (3.10) with a dynamic force not exceeding 300 N for machines up to and including 1,6 m in width, or not exceeding 500 N for machines greater than 1,6 m in width, when measured at 75 % of the clamp bar opening (with the clamp bar at 25 % of its maximum travel measured from the retracted position)

Note 1 to entry: The 75 % value is to ensure that the measurement is made at the position that approximates to the size of an operator's hand.

3.24
manual clamping
operation of *clamp bar(s)* (3.10) in which the dynamic and static forces and motion of the clamp bar are directly supplied by the operator

3.25
paper drill
machine used to drill holes into piles of paper

3.26
paper-embossing machine
machine for finishing paper surfaces by using cylinders to press a design in relief into the paper

3.27
perfect binder
machine for the automatic production of brochures (soft-cover) or book signatures (hard-cover) where gathered folded sheets or single sheets are bound to form book or brochure signatures by applying glue on the pre-processed book back, and where book or brochure signatures are inserted into covers by gluing the cover on the back and/or sides

3.28
safety distance
minimum distance a protective device is required to be placed from a hazard zone

3.29
sheet-folding machine
apparatus to cut, perforate and/or crease single or multiple folds in single sheets of paper

3.30
single-cycle device
mechanism that ensures that only one cutting cycle occurs for each manual activation or automatic cut

Note 1 to entry: See *anti-repeat device* (3.1).

3.31
stored energy
potential energy that can be released without actuation of the machine drive or controls

4 Significant hazards

The list of significant hazards covered in this document is given in Annex B.

5 Guarding of significant hazards

5.1 General

Guarding, consistent with operation of the machine, shall be provided in those areas where it is recognized that operators are exposed to significant hazards. The guarding requirements of ISO 12643-1:2023 apply.

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