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ISO/TC **130**

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

Part 4:
Converting equipment and systems

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

Partie 4: Systèmes et équipement de façonnage

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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 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 the following URL: www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 12643-4:2010), which has been technically revised.

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

— In Clause 3, additions to Terms and Definitions, in particular concerning corrugated board production machinery

— Throughout the document, deletion of requirements related to hazards dealt with in ISO/FDIS 12643-1:2019 (e.g. Safeguarding automatic reel loading in 6.2)

— In Clause 6 Revision of the requirements for machinery for the production of corrugated board, e.g. terminological amendments, update of Figure 14

— In 6.3.3,Description of measures to safeguard the movable Splicer module have been revised.

— In 6.8.2, Addition of an exception to the continued running of glue rollers in the gluing unit in case of an emergency stop

— In 6.16.1 Limitation of the speed of the conveyor belt to 45 m/min if access is required for production reasons.

— Comprehensive revision of section 7 on Folder gluer machines

— In Clause 8 on Pre-Feeder, supplement the requirement to safeguard entry into the lift deck with ESPDs.

— In 9.2.4 (In-line machines), requirement for residual pile monitoring as safety device set to PL d / SIL 2, as well as addition of a figure that shows the safeguarding of hazard points outside the sidelays on feeders

— In Clause 10, addition of requirements on safeguarding the delivery on automatic flatbed die-cutting machines (sheet gripper system, analog ISO/FDIS 12643-2:2019)

— In Clause 13 on Requirements Machinery for the production of envelopes, addition of a Clause on Requirements for Interlocks.

— Inclusion of a section 14 on requirements for Handkerchief machines, which is also applicable to machinery for the production of interfolded facial tissues (takeover and adaptation of the requirements from EN 1010-5).

— In Clause 16, Addition of a Table on Verification of the safety requirements and/or protective/risk reduction measures

— List of significant hazards moved to an informative Annex A

— Addition of Annex ZA: Relationship between this European Standard and the essential requirements of Directive 2006/42/EC

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

It is the intent of ISO/TC 130 that there be a transition period between the first and second editions of EN ISO 12643-4:20xx.

Introduction

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

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 organizations, 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 the 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.

The purpose of this part of EN ISO 12643 is to reduce the risk of injury to operating personnel working on converting equipment.

During the development of this document, 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 regulations must be observed. In cases where it was known that there is a national requirement that differs from this document, that has been noted.

This document was developed to harmonize the following US and European safety standards:

ANSI/PMMI B155.1, Safety Requirements for Packaging Machinery and Packaging-Related Converting Machinery

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

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.

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

Part 4: Converting equipment and systems

1 Scope

This document deals with all significant hazards, hazardous situations or hazardous events relevant to converting equipment and systems used in the corrugated board, package printing, converting and graphic technology industries (see clause 5), when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

It is applicable to converting equipment not covered by other parts of ISO 12643. This part of ISO 12643 shall be used in conjunction with ISO/FDIS 12643-1:2020.

This document is not applicable to the machinery or machinery components manufactured before the date of its publication.

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 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO/FDIS 12643-1:2020[1)], *Graphic technology — Safety requirements for graphic technology equipment and systems — Part 1: General requirements*

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

ISO 13854:2017, *Safety of machinery — Minimum gaps to avoid crushing of parts of the human body*

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

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 14122-3:2016, *Safety of machinery — Permanent means of access to machinery — Part 3: Stairs, stepladders and guard-rails*

IEC 60529:1991[2)], *Degrees of protection provided by enclosures (IP code)*

1) Under preparation

2) This document is impacted by the amendments IEC 60529:1989/A1:1991, IEC 60529:1989/A2:2013 and the corrigenda IEC 60529:1989/AC:2016-12 and IEC 60529:1991/A2:2013/AC:2019-02.

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[3)], *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 12100, ISO/FDIS 12643-1:2020 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

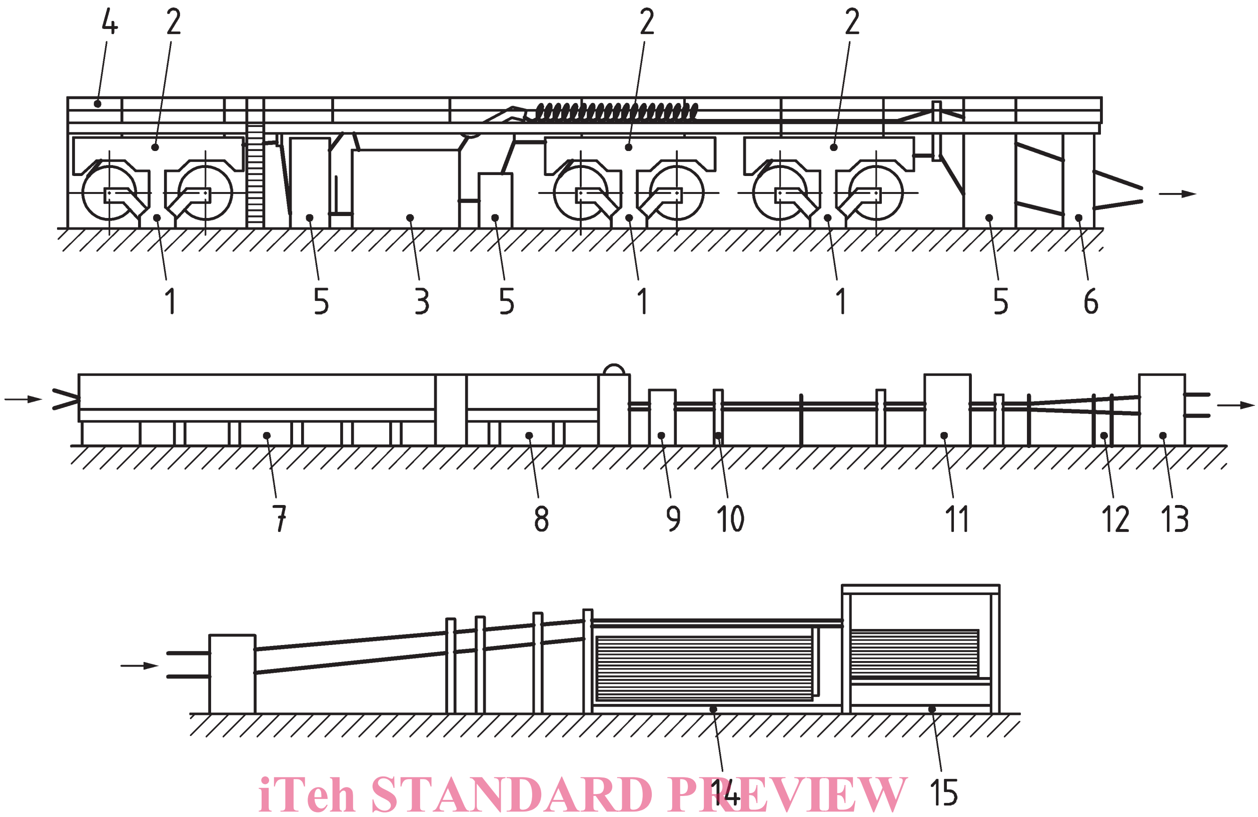
3.1
bridge
transport system positioned in an upper level; e.g. above the single facer, splicer or gluing unit, serving as storage facility

Note 1 to entry: The inclined belt conveyor feeds the single faced corrugated board to the bridge where it is deposited in loops and subsequently fed to the following machines

3.2
corrugated board production machinery
corrugating machine
machinery which produces board consisting of one or more layers of fluted paper glued to one or more layers of flat paper or board and which produces the fluted web to be glued in-line by means of two corrugating rollers

Note 1 to entry: An example of a corrugating machine is shown in Figure 1.

3) This document is impacted by the amendments IEC 62061:2005/A1:2012, IEC 62061:2005/A2:2015 and the corrigendum IEC 62061:2005/Cor.:2010.



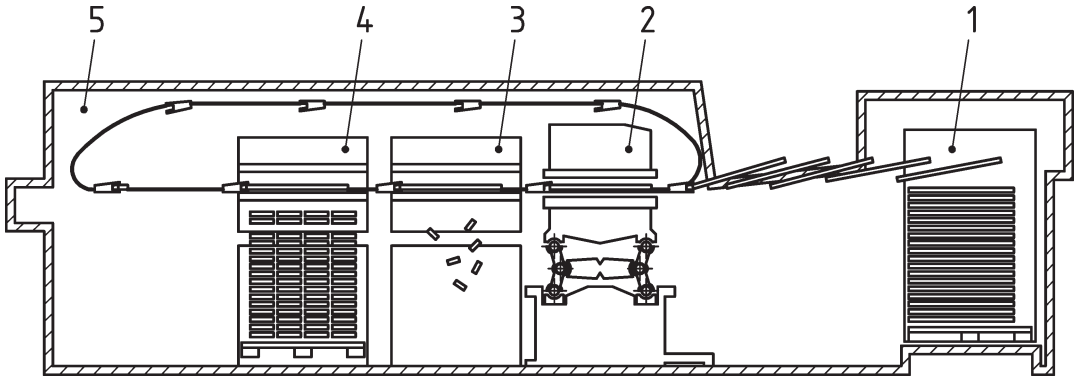
Key

1 unwind
2 splicer
3 single facer
4 bridge
5 preheater
6 gluing machine
7 heating section
8 pulling section
9 rotary shear
10 pulling unit
11 slitter-scorer unit
12 web diverter
13 cut-off
14 upstacker
15 downstacker

Figure 1 — Example of a machine for the production of corrugated board

3.3
cut-off
machine which cuts the material to a pre-determined length

3.4
die-cutter
flatbed die-cutting machine
machine which cuts and/or creases the material and/or strips the waste from the material



Key

1 feeder
2 punching section
3 breaking section
4 blank separating section, delivery
5 trimming of gripper edge, delivery

Figure 2 — Example of an automatic flatbed die-cutting machine

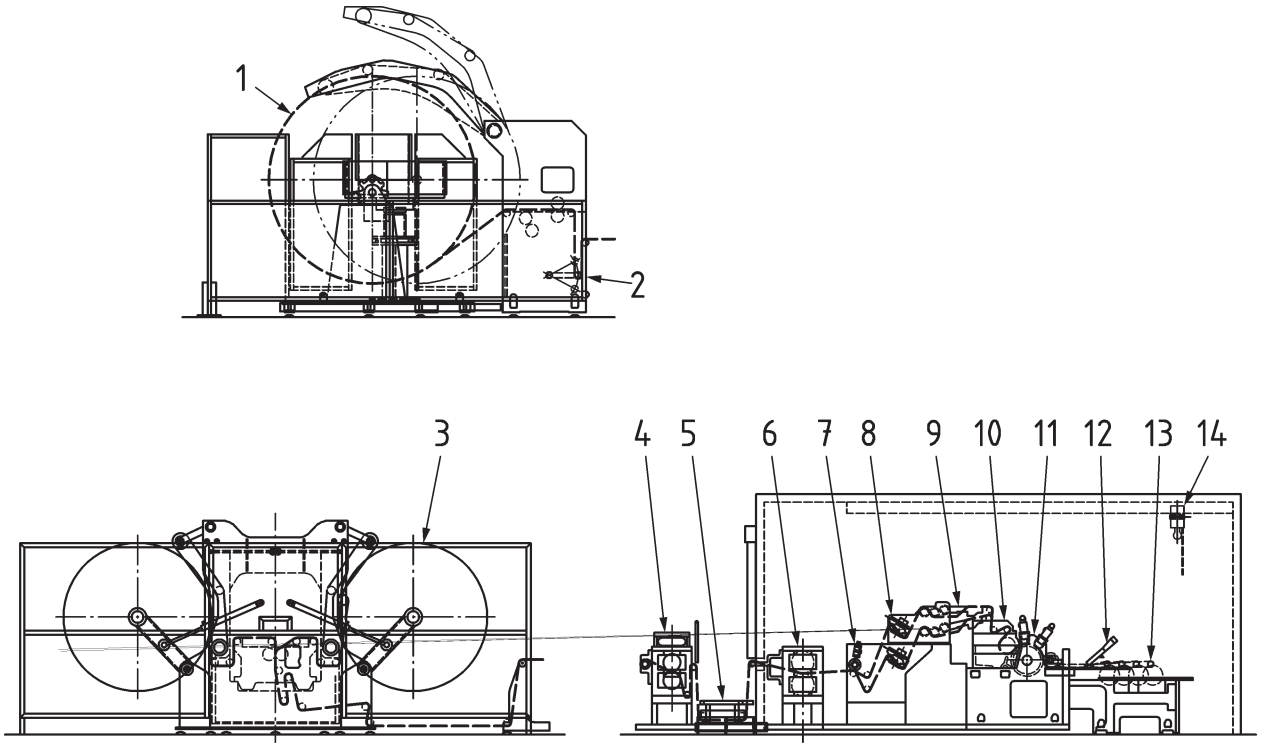
3.5
folding section
part of a folder gluer which folds the substrate to its required position

3.6
gluing machine
separate machine for applying an even layer of glue onto the top of the corrugations of one or more single faced board webs

3.7
gluing unit
part of a single facer or gluing machine which applies a layer of adhesive to the fluted board peaks

3.8
handkerchief machine
machine for the in-line production of tissue-based handkerchiefs, which includes calendaring, embossing, folding and cutting

Note 1 to entry: An example of a handkerchief machine is shown in Figure 3



Key

1 Star-type unwinding
2 Dancer roller
3 Unwinding device
4 Smoothing section
5 Web guide control
6 Embossing section
7 Longitudinal cutting section
8 Aligning section
9 Longitudinal folding section
10 Sheeter cylinder
11 Cross folding cylinder
12 Waste suction device
13 Counting and transfer section
14 Noise hood

Figure 3 — Machine for the production of handkerchiefs

3.9
hole punching machine
machine that punches holes in materials

3.10
inclined belt conveyor
transport system for feeding the single-faced corrugated board onto the bridge

3.11
inclined belt conveyor side
that side of a single facer where the corrugated board is delivered and fed onto the bridge by the inclined belt conveyor

3.12
In-line machine
machine for producing packaging from corrugated cardboard sheets