

Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines —

Part 4: Bookbinding, paper converting and finishing machines

ICS 37.100.10; 85.100

National foreword

This British Standard is the UK implementation of EN 1010-4:2004+A1:2009. It supersedes BS EN 1010-4:2004 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by **A1** **A1**.

The UK participation in its preparation was entrusted by Technical Committee MCE/3, Safeguarding of machinery, to Subcommittee MCE/3/9, Paper and printing machines — Safety.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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English Version

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

Sécurité des machines - Exigences de sécurité pour la
conception et la construction de machines d'impressions et
de transformation du papier - Partie 4: Machines à relier les
livres, machines de transformation et de finition du papier

Sicherheit von Maschinen - Sicherheitsanforderungen an
Konstruktion und Bau von Druck- und
Papierverarbeitungsmaschinen - Teil 4: Buchbinderei,
Papierverarbeitungs- und Papierveredelungsmaschinen

This European Standard was approved by CEN on 21 November 2003 and includes Amendment 1 approved by CEN on 15 September 2009.

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Foreword

This document (EN 1010-4:2004+A1:2009) 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of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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 2009-09-15.

This document supersedes EN 1010-4:2004.

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 Directive(s).

A1 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A1**

Annex A of this standard is normative.

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, 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 document is a type C standard as stated in EN 1070. It defines additional safety requirements and/or deviations from the stipulations in  EN 1010-1:2004+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 C standard.

The EN 1010 series of standards 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

This document applies to

- bookbinding machines:
 - stitching, riveting, eyeletting and attaching machines;
 - gang stitchers;
 - gathering machines;
 - perfect binders;
 - paper drills;
 - book signature presses;
 - book presses;
 - sheet folding machines;
 - book production lines for the production of books with hard covers;
 - back rounding and pressing machines;

- backlining and head banding machines;
- casing-in machines;
- book cover crease forming machines.
- paper converting machines:
 - machines for the production of envelopes;
 - machines for the production of sanitary items;
 - inserting machines;
 - counter-stackers;
 - paper embossing machines.
- paper finishing machines:
 - coaters;
 - laminators.

This document shall be used together with [EN 1010-1:2004+A1](#). Both parts together identify all significant hazards relevant to bookbinding, paper converting and paper finishing machines when they are used as intended and under the conditions foreseen by the manufacturer (see clause 4). The specific requirements in EN 1010-4 take precedence over respective requirements in [EN 1010-1:2004+A1](#).

This document does not deal with risks generated by noise emitted from the machines. These issues are covered basically in [EN 1010-1:2004+A1](#). However, for machines like sheet folding machines and machines for the production of envelopes and sanitary items, some specific proposals for noise reduction measures are given.

This document is not applicable to bookbinding, paper converting and finishing machines manufactured before the date of publication of this document by CEN.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 292-1:1991, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology.*

EN 292-2:1991+A1:1995, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specifications.*

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.*

EN 626-1:1994, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers.*

EN 626-2:1996, *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures.*

EN 954-1:1996, *Safety of machinery — Safety related parts of control systems. Part 1: General principles for design.*

EN 1010-1:2004+A1, *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 1: Common requirements.* ^{A1}

prEN 1010-2:2003, *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 1010-3:2002, *Safety of machinery — Safety requirements for the design and construction of printing and paper converting machines — Part 3: Cutting machines.*

EN 1050:1996, *Safety of machinery — Principles for risk assessment.*

EN 1070:1998, *Safety of machinery — Terminology.*

EN 1539:2000, *Dryers and ovens in which flammable substances are released — Safety requirements.*

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

EN 61000-6-4:2002, *Electromagnetic compatibility (EMC) — Generic standards — Part 6-4: Emission standard for industrial environment (IEC 61000-6-4:1997).*

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

3 Terms and definitions

For the purposes of this European Standard, the definitions given in EN 1070:1998 and ^{A1}EN 1010-1:2004+A1 ^{A1} and the following apply.

3.1

stitching, riveting, eyeletting and attaching machines

powered machines using tools for

— connecting material by means of metallic items

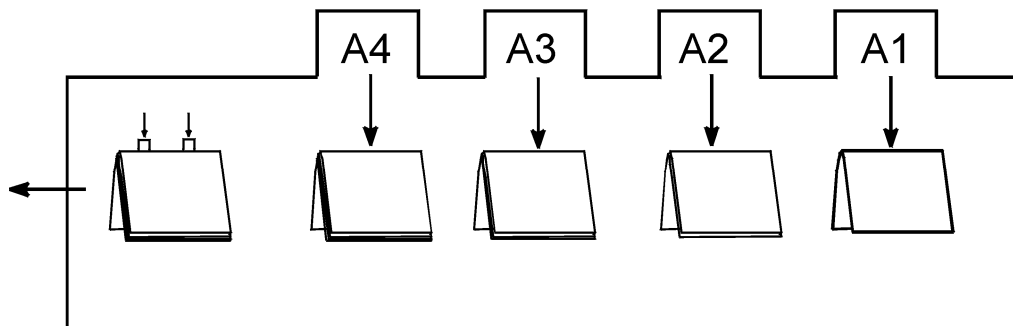
or

— positively fixing metallic items to material

3.2

gang stitchers

machines for stitching folded sheets of paper where 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 (see Figure 1)



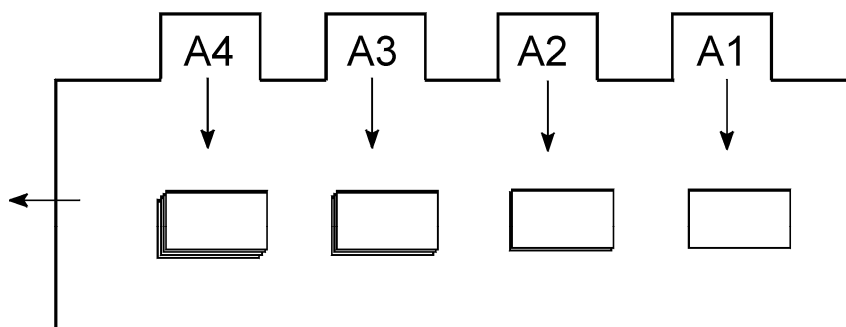
Key

A1 to A4 Feeding grippers

Figure 1 — Principle of a gang stitcher

3.3 gathering machines

machines for gathering folded sheets of paper where individual sheets are removed by feeding grippers and are stacked in the correct order on a transport chain (see Figure 2)



Key

A1 to A4 Feeding grippers

Figure 2 — Principle of a gathering machine

3.4 perfect binders

machines 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

3.5 paper drills

machines to drill holes into piles of paper

3.6 book signature presses

presses used for pressing book signatures: blocks are fed and aligned manually, pressing is power-operated

3.7

book presses

presses used for pressing books after manual binding in order to ensure dimensional stability

3.8

sheet folding machines

machines to apply single or multiple folds to single sheets of paper including cutting, perforating and creasing

3.9

book production lines

machines for the automatic production of books where book signatures consisting of gathered folded sheets or single sheets are put together and trimmed and provided with hard or flexible book covers

3.10

back rounding and pressing machines

machines for rounding book signature backs and completing the forming process by pressing the back

3.11

Back-lining and head banding machines

machines for the automatic production of books with rounded or flat book back where book signatures are glued, gauzed, back-lined and head banded

3.12

casing-in machines

machines for the production of books (hard cover) where rounded or flat book signatures are cased into hard or flexible book covers by gluing the end papers on the front and on the back of the book signatures to the inner sides of the book covers

3.13

book cover crease forming machines (presses)

machines for the production of books (hard cover) where, following the process of gluing book signatures to book covers, book cover creases are formed under heat and pressure and the books are pressed over the entire surface

3.14

machines for the production of envelopes

machines for the production of envelopes and other kinds of paper bags

3.15

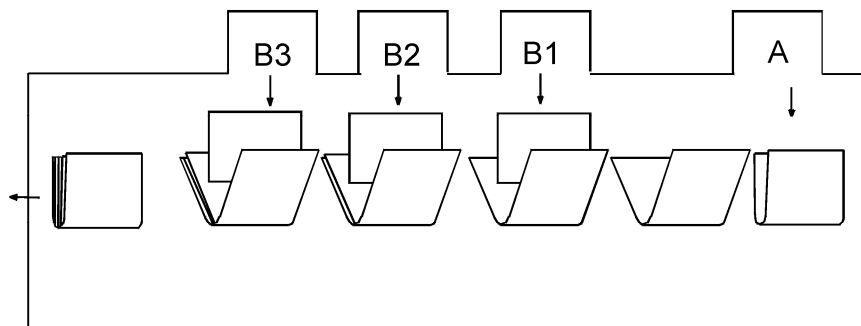
machines for the production of sanitary items

machines for the production of sanitary items from paper, tissue and non-woven fabric such as, for example, paper handkerchiefs, paper napkins, tampons etc.

3.16

inserting machines

machines (for example attached to web-fed rotary printing presses) where printed matter such as leaflets and magazines are inserted at a predetermined position into other printed products, for example newspapers or magazines



Key

A feeder of main product,
B1 to B3 feeder of material to be inserted

Figure 3 — Principle of an inserting machine

3.17

counter-stackers

machines for cross-wise stacking of piles of leaflets, books, magazines or newspapers

3.18

paper embossing machines

machines for forming paper surfaces by using embossing cylinders

3.19

paper finishing machines

machines used for applying liquid or solid coating material on substrates made of paper or similar materials such as board and corrugated boards, plastic film, tinfoil, metal sheets and photo paper. Examples of paper finishing machines are coaters and laminators

3.19.1

coaters

type of paper finishing machine applying a liquid substance (for example glue, varnish, ink) of a predetermined thickness onto a substrate. For dosing the substance applied, a doctor blade (scraper) or the gap between two rollers (dosing gap) is used

3.19.2

laminators

type of paper finishing machine applying a solid material (for example foil, paper) onto a substrate

4 List of significant hazards

4.1 Insofar as they are dealt with in this standard, this clause contains all the significant hazards (noise is dealt with basically in [A1](#) EN 1010-1:2004+A1 [A1](#)), that have been identified by the risk assessment process as being significant for this type of machinery and 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 It is of great importance that the user of this standard, i.e. the designer or manufacturer, takes into account the following basic aspects in accordance with EN 1050:

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

- identification of all hazards existing on the machine.

Table 1 — Significant hazards, danger zones, safety measures

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN 292-1: 1991	EN 1010-1: 2004+A1 ^(A1)
Mechanical hazards crushing shearing cutting or severing entanglement drawing-in impacts	Machines with guards in open position	5.1.2	4.2.1	5.2.2.3
	Interfaces between individual machines	5.1.5, Annex A.1		
	Stitching, riveting, eyeletting and attaching machines			
	- between tools	5.2.1.1 to 5.2.1.3		5.2.8
	Gang stitchers			
	- feeder	5.2.2.1 to 5.2.2.3		5.3.4.8, 5.2.6.1.5
	- stitching section	5.2.2.4		
	- drawing-in zone on thickness control	5.2.2.5		
	- transport chain	5.2.2.7		
	- starting with guards open	5.2.2.8, 7.1.7		
	- trimmer	5.2.2.10		
	Gathering machines			
	- feeder	5.2.3.1 to 5.2.3.3		5.3.4.8
	- hand-feeder, transport chain	5.2.3.4		5.2.10.2
	- gathering device (transport device)	5.2.3.5		
	- starting with guards open	5.2.3.7		
	Perfect binders			
	- book clamps	5.2.4.1		5.3.4.8
	- gluing rollers	5.2.4.2		
	- cover feeder	5.2.4.8		
	- delivery unit	5.2.4.9		
	- starting with guards open	5.2.4.11, 7.1.2.2		
	- milling head cutters	5.2.4.12, 7.1.2.1		
	Paper drills			
	- drill	5.2.5.1		
	- drill/clamp jaws	5.2.5.2		
	Book signature presses			
	- clamping plate/material	5.2.6		
	Book presses			
	- pressing plates	5.2.7.1, 5.2.7.2		5.2.10.2
	- pressing plates/machine enclosure	5.2.7.3		
	Sheet folding machines			
	- drawing-in zones of folding rollers	5.2.8.1		
	- cutting, creasing, perforating unit	5.2.8.2		
	- folding knife	5.2.8.3		
	- starting with guards open	5.2.8.4		
	Book production lines			
	- feed opening	5.2.9.1		
	- preheater, transport device	5.2.9.2		
	- pressing section	5.2.9.3		
	- glue section	5.2.9.4		
	- gauze section	5.2.9.6		
	- head banding section	5.2.9.7		
	- book cover magazine	5.2.9.8		
	- cover bending section	5.2.9.9		
	- casing-in section	5.2.9.10		
	- starting with guards open	5.2.9.11, 7.1.7		5.2.1.1 b) 5.3.4.8

Table 1 (continued)

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN 292-1: 1991	EN 1010-1: 2004+A1 
	Back rounding and pressing machines			
	- drawing-in zones of belts, transport chains, feed opening	5.2.10.1		
	- tipping section	5.2.10.2		
	- preheater	5.2.10.3		
	- pre-forming, back rounding, pressing sections	5.2.10.5		
	Backlining and head banding machines			
	- feed opening, belt feeding	5.2.11.1		
	- glue section, glue rollers	5.2.11.2		
	- gauze section	5.2.11.4		
	- head banding section	5.2.11.5		
	- pressing section	5.2.11.6		
	Casing-in machines			
	- transport finger	5.2.12.1		
	- book cover feeder	5.2.12.2		5.3.4.8
	- cover bending section	5.2.12.3		
	- forming section	5.2.12.4		
	- casing-in, gluing section	5.2.12.6		
	- pressing section	5.2.12.7		
	- delivery unit, delivery opening	5.2.12.8		
	Book cover crease forming machine			
	- feed and delivery openings	5.2.13.1		
	- tipping section, transport devices	5.2.13.2		
	- pressing section	5.2.13.3		
	- starting with guards open	5.2.13.5, 7.1.7		
	Machines for the production of envelopes			
	- reel unwinding unit	5.3.1.1		
	- feeder	5.3.1.2		5.3.5
	- printing unit	5.3.1.3.1, 5.3.1.3.2		5.3.4.8
	- longitudinal and cross scoring	5.3.1.4.1, 5.3.1.4.2		5.2.1.1
	- form cutting section	5.3.1.5		5.3.2.1
	- guide rollers	5.3.1.6.1, 5.3.1.6.2		
	- window cutting section	5.3.1.7		
	- window material conveying section	5.3.1.8.1to 5.3.1.8.4		
	- scraper gluing unit	5.3.1.9.1, 5.3.1.9.2		5.2.1.1
	- separating cutting unit	5.3.1.10.1 to 5.3.1.10.3		5.2.1.1
	- bottom flap folding section	5.3.1.11.1, 5.3.1.11.2		
	- transport rolls	5.3.1.12.1, 5.3.1.12.2		5.2.1.1
	- staggering wheel	5.3.1.13.1, 5.3.1.13.2, 7.1.3.1		5.2.1.1 b)
	- roller gluing unit	5.3.1.14.1to 5.3.1.14.4, 7.1.3.3		5.2.1.1
	- hot air dryers	5.3.1.15.1, 5.3.1.15.2		
	- separation roller before aligner section	5.3.1.16		5.2.1.1
	- aligner section	5.3.1.17		5.2.1.1
	- seal flap folding section	5.3.1.18		
	- separating disc delivery	5.3.1.19.1, 5.3.1.19.2		
	- starting with guards locked open	5.3.1.20.1, 7.1.7, 5.3.1.20.2, 7.1.4.1		
				5.2.3.4
	Machines for the production of sanitary items			
	- reel unwinding unit	5.3.2.1.1 to 5.3.2.1.4		5.3.5.1
	- smoothing and embossing section	5.3.2.2.1, 5.3.2.2.2		5.2.1.1
	- longitudinal cutting section	5.3.2.3		5.3.2

Table 1 (continued)

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN 292-1: 1991	EN 1010-1: 2004+A1 A1
	- longitudinal folding section - waste suction devices on cutting devices - counting and transfer section - product checking section - delivery unit - starting with guards open	5.3.2.4 5.3.2.5 5.3.2.6 5.3.2.7 5.3.2.8.1, 7.1.4.2 5.3.2.9.1, 7.1.7, 5.3.2.9.2, 7.1.4.1		5.2.1.1
	Inserting machines - feeder - transport device/drive elements - starting with guards open	5.3.3.1, 5.3.3.2 5.3.3.3 5.3.3.5, 7.1.5		5.3.4.8
	Counter-stackers - drawing-in zones of belts - waste separator - turntable - delivery units - stored energy (pneumatic system)	5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5		
	Paper embossing machines - danger zones of web threading device - reel unwinding, rewinding units - guide rollers - stretch roller - drawing-in zone of embossing roller/counter roller - movement of counter roller - rotary knives	5.3.5.2 5.3.5.3 5.3.5.4 5.3.5.5 5.3.5.6 5.3.5.7, 7.1.5 5.3.5.9		5.2.3.5 5.3.5 5.2.1.1 5.2.3.2 a) 2)
	Coaters - danger zones of web threading device - reel unwinding, rewinding units - guide rollers - dosing gap - coating unit - engagement and disengagement of rollers - drawing-in zones of belts - continuous flow dryers - entire machine	5.4.1.2 5.4.1.3 5.4.1.4 5.4.1.5 5.4.1.8 5.4.1.9 5.4.1.10 5.4.1.13.2, 5.4.1.13.5, 5.4.1.13.6, 7.1.6.3		5.3.5
	Foil laminators - reel unwinding, rewinding units - manual feeding - guide rollers - engagement and disengagement of laminating rollers - drawing-in zones of laminating rollers - cutting unit	5.4.2.1.1 5.4.2.1.2 5.4.2.1.3, 5.4.2.1.4 5.4.2.1.5 5.4.2.1.6 5.4.2.1.8		5.3.5 5.2.1.1 5.2.1.1
	Laminators with glue application - danger zones of web threading device - reel unwinding, rewinding units - feeder, delivery unit - drawing-in zones of belts - guide rollers - tear-resistant material web - rotary knife - transport rolls - glue unit - laminating rollers	5.4.2.2.2 5.4.2.2.3 5.4.2.2.4 5.4.2.2.5 5.4.2.2.6 5.4.2.2.7 5.4.2.2.8 5.4.2.2.9 5.4.2.2.10 5.4.2.2.11, 5.4.2.2.12		5.3.5 5.3.4 5.2.1.1 5.3.2 5.2.3.2 a) 2)

Table 1 (continued)

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN 292-1: 1991	A ₁) EN 1010-1: 2004+A1 A ₁
	- sheeter - pressing belt - package stop, conveyor belt - turning belt	5.4.2.2.13 5.4.2.2.14, 5.4.2.2.15 5.4.2.2.16 5.4.2.2.17		5.2.1.1 a)
Avoiding direct or pending hazardous situations	Gang stitchers Gathering machine Perfect binders Sheet folding machines Book production lines Back rounding and pressing machines Backlining and head banding machines Casing-in machines Book cover crease forming machines Machines for the production of envelopes Machines for the production of sanitary items Inserting machines Counter-stackers Paper embossing machines Coaters Foil laminators Laminators with glue application	5.2.2.6, 5.2.2.9 5.2.3.6, 5.2.3.8 5.2.4.10, 5.2.4.13 5.2.8.6 5.2.9.12, 5.2.9.13 5.2.10.6 5.2.11.7 5.2.12.9 5.2.13.6 5.3.1.21, 5.3.1.23 5.3.2.11, 5.3.2.12 5.3.3.4, 5.3.3.6 5.3.4.6 5.3.5.1, 5.3.5.10 5.4.1.1, 5.4.1.15 5.4.2.1.9 5.4.2.2.19		5.2.7.2 5.2.7.2 5.2.7.2 5.2.7.2 5.2.7.2 5.2.7.2 5.2.7.2
Electrical hazards Direct or indirect contact	Electrical equipment of all machines	5.1.3	4.3	5.2.5
Thermal hazards Burns due to possible contact	Perfect binders - hotmelt glue reservoirs Book production lines - preheating section Back rounding and pressing machines - preheater Backlining and head banding machines - hotmelt Casing-in machines - heated forming section Book cover crease forming machines (press) - heated crease forming rails Machines for the production of envelopes - hot air nozzles, hot parts of machine Paper embossing machines - heated embossing roller Coaters - hot liquid material - continuous flow dryer Foil laminators - heated laminating rollers	5.2.4.6 5.2.9.2, 7.1.8 5.2.10.4, 7.1.8 5.2.11.3, 7.1.8 5.2.12.5, 7.1.8 5.2.13.4, 7.1.8 5.3.1.15.3 5.3.5.8, 7.1.8 5.4.1.6 5.4.1.13.4 5.4.2.1.7	4.4	5.2.14 5.2.14 5.2.14 5.2.14 5.2.14

Table 1 (concluded)

Significant hazards	Danger zone	Safety measures: reference to clauses in		
		this standard	EN 292-1: 1991	EN 1010-1: 2004+A1 ^{A1}
Hazards generated by noise e. g. resulting in hearing loss (deafness)	Sheet folding machines	5.2.8.5	4.5	
	Machines for the production of envelopes	5.3.1.22		
	Machines for the production of sanitary items	5.3.2.10		
Hazards generated by radiation UV radiation, laser	Perfect binders - radiation dryers (UV- HF-dryers)	5.2.4.7	4.7	5.2.16.2
Hazards from fire and explosion	Machines for the production of sanitary items	5.3.2.5	4.8	5.2.4
	Coaters	5.4.1.11, 5.4.1.13.1, 7.1.6.2, 5.4.1.13.3		
	Laminators with glue application	5.4.2.2.18		
Hazards from substances and materials used for processing, machine operation or which are emitted during the process Hazards resulting from contact with or inhalation of harmful fluids, gases, fumes, dusts	Perfect binders - polyurethane hotmelt	5.2.4.3 to 5.2.4.5, 7.1.2.3	4.8	
	Book production lines - hotmelt	5.2.9.5		
	Coaters - hazardous substances	5.4.1.7, 7.1.6.1		
Hazards generated by neglect of ergonomic principles in machine design unhealthy body postures	Stitching, riveting, eyeletting and attaching machines - adjustments	5.2.1.2	4.9	8
	Book production lines - glue replenishment	5.2.9.4		
Failure, malfunction of control system Faults or failures in safety circuits	Control systems of all machines	5.1.4		5.2.6.1
	Stitching, riveting, eyeletting, attaching machines	5.2.1.1, 5.2.1.4		5.2.6
	Gathering machines	5.2.3.1, 5.2.3.4		5.2.6.1.5, 5.2.10.1
	Perfect binders	5.2.4.8		5.2.6.1.5
	Paper drills	5.2.5.2		5.2.8
	Machines for the production of sanitary items	5.3.2.8.2		5.2.6.2.1
	Water jet knives Inserting machines, residual pile monitoring	5.3.3.1		5.2.6.1.5

5 Safety requirements and/or measures

5.1 General

5.1.1 Machinery shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN 292 for hazards that are relevant but not significant and that are not dealt with by this document (e. g. sharp edges of machine frame).

The common requirements of  EN 1010-1:2004+A1  shall also be satisfied.

5.1.2 Guards that have to be removed frequently or for making ready shall be interlocked with the hazardous movement in accordance with 5.2.2.3 of  EN 1010-1:2004+A1 .

5.1.3 The electrical equipment shall comply with the requirements of 5.2.5 of  EN 1010-1:2004+A1 .

5.1.4 The safety-related control circuits shall comply with the requirements of 5.2.6.1 of  EN 1010-1:2004+A1 .

5.1.5 Where machines are set up to form integrated lines (production lines) with one overall control system, annex A.1 shall be applied.

5.2 Bookbinding machines

5.2.1 Stitching, riveting, eyeletting and attaching machines (with manual feeding)

5.2.1.1 Danger zones between tools on stitching, riveting, eyeletting and attaching machines (see Figure 4) shall be avoided or safeguarded.

This requirement is satisfied by

— observing a maximum distance of 4 mm between the tools in the open position

or

— ensuring that the closing force of the movable tool is less than 50 N and a higher closing force is allowed to become effective only after it has been ensured by means of a sensing device that there is no part of a human body present between the two tools.

The sensing device may, for example, function on the basis of the difference in electrical resistance between the workpiece and parts of the body or the difference in thickness. Control systems shall comply at least with category B of EN 954-1:1996.

Danger zones are safeguarded if

— guards are provided with apertures and safety distances in accordance with Table 4 of EN 294:1992

or

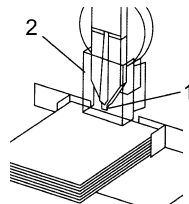
— the machine can only be started by two-hand control. A device shall be provided for supporting and fixing the product to be processed. Two-hand controls shall comply with the requirements specified in 5.2.8 of  EN 1010-1:2004+A1 .

5.2.1.2 On flat and saddle stitching machines (see Figures 4 and 5) and on combined flat and saddle stitching machines, adjustable guards are required for operational reasons. Where power-operated movable guards are used, the requirements of 5.2.2.4 of  EN 1010-1:2004+A1  shall be satisfied.

Adjustable guards shall extend to the product surface for flat stitching and to the upper edge of the lower tool for saddle stitching. The upper tool shall be enclosed snugly by the guard.

Instructions that describe the safe adjustment of the guards in a clear and easily understandable form shall be provided on the machine. This requirement is satisfied by labels provided with sketches and dimensional data, for example, for identifying the guard adjustment required for a specific stitching thickness.

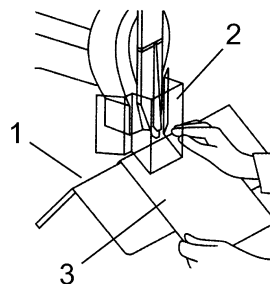
The required information on this in the instruction handbook is given in 7.1.1.



Key

- 1 Upper tool
- 2 Guard

Figure 4 — Flat stitching



Key

- 1 Upper edge of saddle
- 2 Guard
- 3 Workpiece

Figure 5 — Saddle stitching

5.2.1.3 For machines that can only be started by two-hand control, 5.2.8 of [EN 1010-1:2004+A1](#) [A1](#) shall apply. A workpiece support is required.

If the shape or size of the workpiece requires the operator to use both hands to hold the workpiece outside the danger zone or if the workpiece needs to be held outside the danger zone with one hand, a hold-to-run control shall be provided for starting the machine instead of the two-hand control.

5.2.1.4 Safety-related control circuits shall comply with 5.2.6 of [EN 1010-1:2004+A1](#) [A1](#).

5.2.2 Gang stitchers

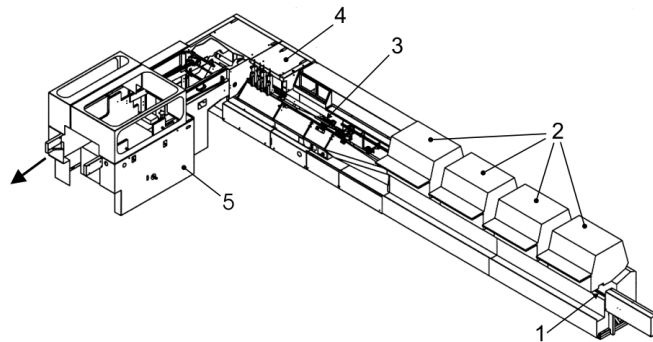
5.2.2.1 When gang stitcher feeding hoppers are fed manually, the danger zones of the separating elements of the feeder shall be safeguarded in accordance with 5.3.4.8 of [EN 1010-1:2004+A1](#) and the residual risk monitoring device designed in accordance with 5.2.6.1.5 of [EN 1010-1:2004+A1](#).

5.2.2.2 With automatic feeding of the feeding hopper, tunnel-type guards with a safety distance of 550 mm from the nearest danger zone shall be provided instead of the measures specified in 5.2.2.1

5.2.2.3 The feeder shall be provided with fixed guards on all sides or with guards interlocked with the hazardous movement.

In the sheet-feeding area (transport chain side), the feeder shall be guarded in order to prevent direct access to the danger zones from the transport chain side. Where transport chains cannot be entirely enclosed for functional reasons (e.g. where air vortices are used) (see Figure 7), the lower edges of the guards on the transport chain side shall be extended as low as technically feasible.

5.2.2.4 Danger zones of the stitching section shall be safeguarded by guards interlocked with the hazardous movement on the operator side, otherwise by fixed guards or guards interlocked with the hazardous movement. Guard apertures on the in-running side of the stitching unit may be adequately guarded by elastic material (e.g. brushes).

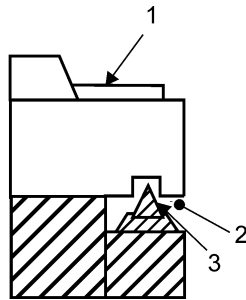


Key

- 1 Transport chain
- 2 Feeder
- 3 Thickness control

- 4 Stitching unit,
- 5 Trimmer (three-knife trimmer)

Figure 6 — Gang stitcher



Key

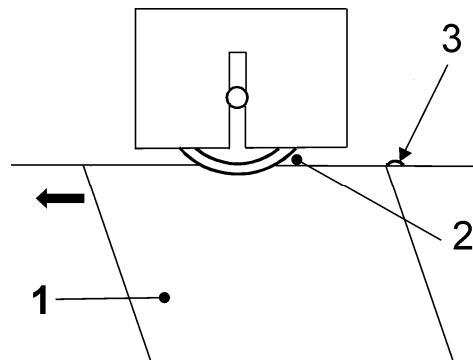
- | | | | |
|---|------------------|---|-----------------|
| 1 | Manual feeding | 3 | Transport chain |
| 2 | Bottom of feeder | | |

Figure 7 — Feeder

5.2.2.5 Where a drawing-in zone exists in the calliper roll used for thickness control (see Figure 8), one of the following requirements shall be applied:

- maximum clamping force of 50 N or
- displacement of at least 20 mm or
- guard.

5.2.2.6 Gang stitchers shall be provided with a start-up warning device according to 5.2.7.2 of [EN 1010-1:2004+A1](#).



Key

- | | |
|---|----------------------------------|
| 1 | Folded sheets |
| 2 | Drawing-in zone of calliper roll |
| 3 | Gripper |

Figure 8 — Calliper roll for thickness control

5.2.2.7 A safety distance of at least 25 mm is required between transport chain grippers and fixed machine parts.

5.2.2.8 Starting the machine with the interlocking guards in the open position and with a hold-to-run speed higher than 10 m/min shall be possible only by means of two-hand control and only if

- zones with restricted view and mutual interlocking as described in 5.2.3.4 of  EN 1010-1:2004+A1  are provided and
- a selector switch for this kind of operation is provided and
- the hold-to-run speed is the slowest speed possible under procedural requirements.

For further information in the instruction handbook, see 7.1.7.

5.2.2.9 An emergency stop system shall be provided with emergency stop buttons located on each main control panel. In the area of the feeders, emergency stop buttons shall be provided at 5 m intervals.

5.2.2.10 The three-knife trimmer shall be safeguarded according to 5.5 of prEN 1010-3:2002.

When the interlocking guard is opened, it shall only be possible to start the trimmer by means of two-hand controls. Operation of the two-hand control shall allow only a single stroke of the knives.

5.2.3 Gathering machines

5.2.3.1 With manual feeding of the feeders, the danger zones of the separating elements of the feeder shall be safeguarded in accordance with 5.3.4.8 of  EN 1010-1:2004+A1  and the residual pile monitoring device shall be provided in accordance with 5.2.6.1.5 of  EN 1010-1:2004+A1 .

5.2.3.2 For feeding sections that are not used and cannot be stopped, blanking boards of maximum format size shall be provided to safeguard the danger zones at the separating elements instead of the blanks. Such boards shall ensure that the machine is not stopped by the residual pile monitoring system.

5.2.3.3 With automatic feeding of the feeding hopper, tunnel-type guards with a safety distance of 550 mm from the nearest danger zone shall be provided instead of the measures required in 5.2.2.1.