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EUROPEAN STANDARD

EN 931:1997+A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 931:1997

English Version

Footwear manufacturing machines - Lasting machines - Safety requirements

Machines pour la fabrication de chaussures - Machines à monter - Précriptions de sécurité

Maschinen zur Herstellung von Schuhen - Zwickmaschinen - Sicherheitsanforderungen

This European Standard was approved by CEN on 16 July 1997 and includes Amendment 1 approved by CEN on 16 August 2004, and Amendment 2 approved by CEN on 16 July 2009.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	4
2 Normative references	5
3 Definitions	6
4 List of hazards.....	8
5 Safety requirements and/or measures	15
6 Verification of the safety requirements and/or measures	19
7 Information for use	22
Annex A (normative) Stop and release control device	25
Annex B (normative) Well tried components and principles: category 1 of 7.2 of EN 954-1:1996.....	26
Annex C (informative) Bibliography	27
Annex ZA (informative) Clauses of this European standard addressing essential requirements or other provisions of EU Directives	32

[SIST EN 931:2000+A2:2009](https://standards.iteh.ai/catalog/standards/sist/dc6a2585-985b-49bc-803c-863f412ae9ab/sist-en-931-2000a2-2009)
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Foreword

This document (EN 931:1997+A2:2009) has been prepared by Technical Committee CEN/TC 201 "Leather and imitation leather goods and footwear manufacturing machinery - Safety", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.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 supersedes EN 931:1997.

This document includes Amendment 1, approved by CEN on 2004-08-16 and Amendment 2, approved by CEN on 2009-07-16.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1**, **A1** and **A2**, **A2**.

This European Standard 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).

A2 For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. **A2**

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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

^{A2} This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous 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. ^{A2}

1 Scope

1.1 This standard is applicable to lasting machines used in the footwear manufacturing industry, namely:

- Adhesive fore part lasting machines (see figure 1),
- Hand operated adhesive side lasting machines (see figure 3 A),
- Adhesive seat lasting machines (see figure 2),
- Adhesive seat and side lasting machines (see figure 2),
- Hand operated tack/staple side lasting machines (see figure 3B),
- Tack seat lasting machines (see figure 2),
- Tack seat and side thermocement lasting machines (see figure 2),
- Tack heel seat and thermocent side lasting machines (see figure 2),
- Tack heel seat and thermocent + tack side lasting machines (see figure 2).

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1.2 This standard does not apply to lasting machines which process granular thermocement.

1.3 This standard specifies requirements for safe design, construction and use of the machines. No specific requirements are included for transport, commissioning and decommissioning. It takes account of intended use, foreseeable misuse, component and system failure.

1.4 This standard covers all hazards relevant to the footwear manufacturing industry. The use of machines within the scope of this standard in different industries may give rise to hazards which were not taken into account at the time of its preparation.

1.5 ^{A2} This document is not applicable to lasting machines which are manufactured before the date of its publication as EN. ^{A2}

2 Normative references

^{A2} 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. ^{A2}

^{A2} deleted text ^{A2}

EN 294:1992, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

^{A2} deleted text ^{A2}

^{A2} EN 547-1, *Safety of machinery — Human body measurements — Part 1: Principles for determining the dimensions required for openings for whole body access into machinery* ^{A2}

^{A2} EN 547-2, *Safety of machinery — Human body measurements — Part 2: Principles for determining the dimensions required for access openings* ^{A2}

^{A2} deleted text ^{A2}

^{A2} EN 894-1, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators* ^{A2}

^{A2} EN 953:1997, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards* ^{A2}

^{A2} deleted text ^{A2}

EN 982:1996, *Safety of machinery — Safety requirements for fluid power systems and components — Hydraulics*

EN 983:1996, *Safety of machinery — Safety requirements for fluid power systems and components — Pneumatics*

^{A2} deleted text ^{A2}

^{A2} EN 1005-2, *Safety of machinery — Human physical performance — Part 2: Manual handling of machinery and component parts of machinery* ^{A2}

^{A2} EN 1005-3, *Safety of machinery — Human physical performance — Part 3: Recommended force limits for machinery operation* ^{A2}

EN 931:1997+A2:2009 (E)

A2 EN 1037, *Safety of machinery — Prevention of unexpected start-up* **A2**

A2 *deleted text* **A2**

A2 EN 1088:1995, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection* **A2**

A1 EN 12545:2000, *Footwear, leather and imitation leather goods manufacturing machines — Noise test code — Common requirements* **A1**

A1 *deleted text* **A1**

A1 EN ISO 11688-1, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)* **A1**

A2 *deleted text* **A2**

A2 EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)* **A2**

A2 EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)* **A2**

A2 EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)* **A2**

A2 EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)* **A2**

A2 EN ISO 13850, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* **A2**

A2 EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005 (modified))* **A2**

A2 EN 60947-4-1, *Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (IEC 60947-4-1:2000)* **A2**

A2 EN 60947-5-1, *Low-voltage switchgear and control gear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices (IEC 60947-5-1:2003)* **A2**

A2 EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)* **A2**

A2 3 **A2** Terms and definitions **A2**

A2 For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply. **A2**

3.1

pincer (see figure 1 zone 1 – figure 2 zone 2 – figure 3B zone 1)

device for gripping, pulling or holding the upper and/or lining

3.2

wiper (see figure 1 zone 2 – figure 2 zone 1)

an assembly used for moulding and attaching the upper and lining to the insole

3.3**injector (see figure 1 zone 2 – figure 2 zone 1 and 3 – figure 3A zone 1)**

device for applying cement onto the insole, upper or lining

3.4**lasting finger, lasting band, roll (see figure 2 zone 2 – figure 3A zone 1)**

a tool for moulding and attaching the upper/lining edge to the insole

3.5**driver (see figure 2 zone 1 and 3 – figure 3B zone 1)**

tacking hammer

3.6**heel band**

heel seat moulding device

3.7**toe band (see figure 1 zone 2)**

upper holding and moulding device in the toe area

3.8**side clamp (see figure 1 zone 2 – figure 2 zone 2)**

device for holding the side upper/lining

3.9**toe pad (see figure 1 zone 2)**

device for holding and pressing the last in the toe area against the wipers

3.10**heel rest (see figure 1 zone 3)**

device for holding the back of the shoe last

3.11**wiper-head (see figure 1 zone 2)**

support for the wiper assembly

3.12**jack post (see figure 2 zone 1)**

shoe last support

3.13**sensor foot (see figure 2 zone 1)**

device for aligning the shoe last with the wipers

3.14**toe holder (see figure 2 zone 4)**

device for clamping the toe of the shoe last

3.15**driver clamp (see figure 3B zone 1)**

device for guiding and supporting the driver

3.16**thermocement melting chamber (see figure 3A zone 1)**

enclosure where thermocement is melted prior to application

3.17**working area**

the zone of the machine which comprises:

EN 931:1997+A2:2009 (E)

- a) The area where lasting takes place by means of the wipers, pincers, side clamps, toe pads, jack post and heel rest;
- b) The loading area where the loading takes place;
- c) The operator standing area.

3.18**stop and release control**

device which stops the machine at any point in its cycle and returns the machine to rest

4 A2 List of significant hazards A2

4.1 A2 This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this document, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk. A2

4.2 A2 The significant hazards at lasting machines are outlined in 4.3 to 4.9. A2

The danger zones which give rise to mechanical hazards are illustrated in figures 1, 2, 3A, 3B. The figures are informative only.

Table 1 — A2 List of significant hazards A2
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Danger zone or source of hazard	Type of hazard	Zone	Figure/Machine
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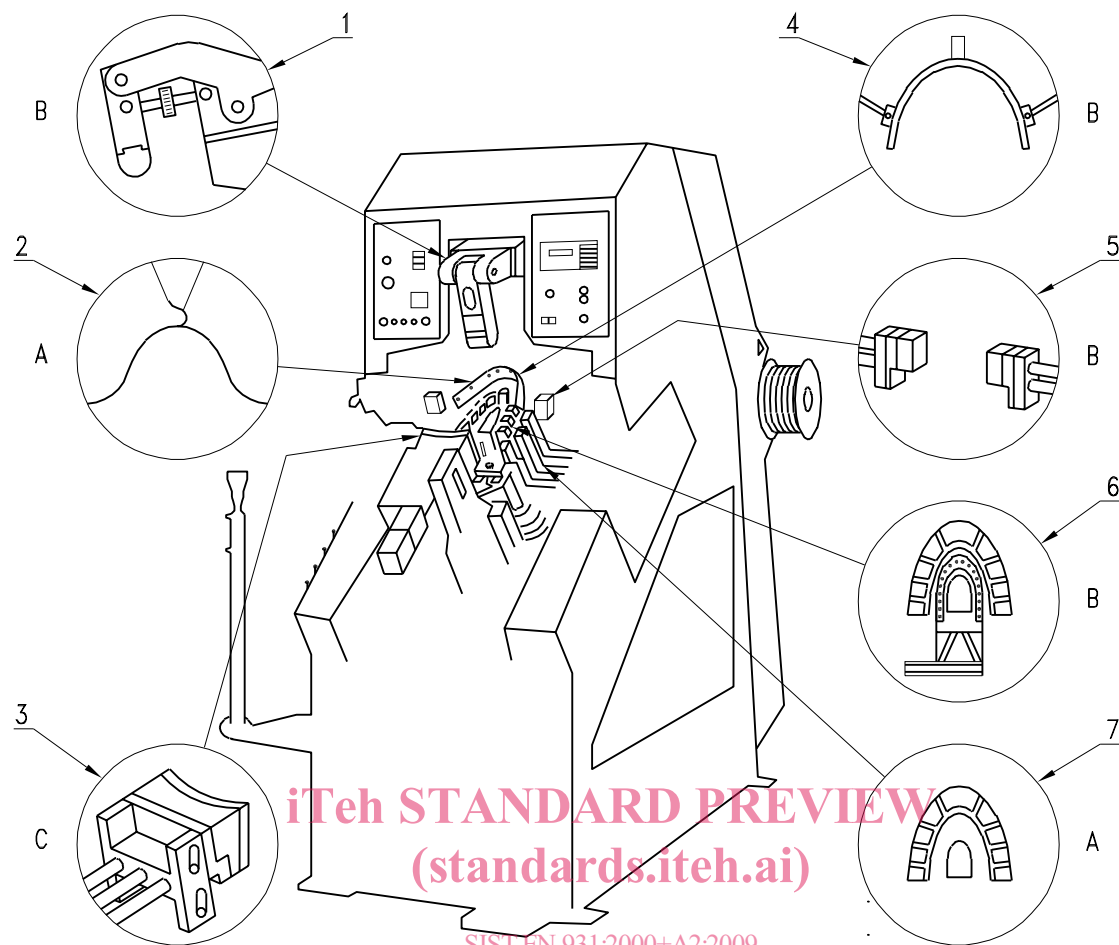
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4.3 Mechanical hazards			
4.3.1	Lasting area including		1 and 3B
		1	2
—	pincers,	Crushing and/or shearing	2
			1
—	wipers, wiper head,	"	2
			1 and 2
—	side clamps,	"	2
			2
—	toe pads, toe band, heel rest,	"	1
			3
—	driver(s), driver clamp,	"	2 and 3B
			1 and 3
—	sensor foot, jack post,	"	2
			1
—	toe holder,	"	2
			4
—	lasting finger, lasting band	shearing and	2
	Crushing and/or rolls	entanglement	2 and 1
			2 and 3A
4.3.2	Movements of injectors or drivers	Impact and stabbing	2
			3B
			1
4.3.3	Other movements within the side lasting unit	Entanglement	2
			2
4.3.4	Driver clamp	Ejection of machine parts	3B
			1

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Key

- A zone 1
- B zone 2
- C zone 3
- 1 toe pad
- 2 wipers - wiper head
- 3 heel rest
- 4 toe band
- 5 side lamps
- 6 injector
- 7 pincers

Figure 1 — Fore part lasting machine