SLOVENSKI STANDARD
SIST EN 972:2000+A1:2011

01-maj-2011

Strojarski stroji - Valjčni stroji - Varnostne zahteve

Tannery machines - Reciprocating roller machines - Safety requirements

Gerberei-Maschinen - Walzenmaschinen - Sicherheitsanforderungen

Machines de tannerie - Machines à cylindres alternatifs - Prescriptions de sécurité

Ta slovenski standard je istoveten z: **EN 972:1998+A1:2010**

ICS:

59.140.40	Stroji in oprema za proizvodnjo usnja in krzna	Machines and equipment for leather and fur production

SIST EN 972:2000+A1:2011 **en,fr**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 972:1998+A1

October 2010

ICS 59.140.40

Supersedes EN 972:1998

English Version

Tannery machines - Reciprocating roller machines - Safety requirements

Machines de tannerie - Machines à cylindres alternatifs - Prescriptions de sécurité

Gerberei-Maschinen - Walzenmaschinen - Sicherheitsanforderungen

This European Standard was approved by CEN on 4 March 1998 and includes Amendment 1 approved by CEN on 28 September 2010.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 972:1998+A1:2010: E

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Foreword

This (EN 972:1998+A1:2010) has been prepared by Technical Committee CEN/TC 200 “Tannery 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of an identical text or by endorsement, at the latest by April 2011, and conflicting national standards shall be withdrawn at the latest by April 2011.

This document includes Amendment 1, approved by CEN on 2010-09-28.

This document supersedes EN 972:1998.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟨A1⟩ ⟨A1⟩.

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For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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Introduction

〈A1〉 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. 〈A1〉

1 Scope

This European Standard specifies safety requirements for all the phases of the life of a machine listed in 〈A1〉 5.3 a) of EN ISO 12100-1:2003 〈A1〉.

Reciprocating roller machines are machines used for the processing of animal hides and skins. They have a reciprocating opening and closing motion of the feed rollers or conveyors which, if required, may also reverse their direction.

This standard covers the following reciprocating roller machines (see figures 1 to 13 for typical configurations and annex D for descriptions):

a) Buffing machines (see figures 1a and 1b)

b) Polishing machines (see figures 1a and 1b)

c) Ironing machines (woolskins and fur) (see figures 2a and 2b)

d) Carding machines (see figures 3a and 3b)

e) Shearing machines (woolskins and fur) (see figures 4a and 4b)

f) Cylinder universal staking machines (see figures 5a and 5b)

g) Setting-out machines (see figures 6a and 6b)

h) Dewooling machines (see figures 6a and 6b)

i) Scudding machines (see figures 6a and 6b)

j) Unhairing (dehairing) machines (see figures 6a and 6b)

k) Sammying machines (see figures 6a and 6b)

l) Cylinder ironing machines (see figures 7a and 7b)

m) Cylinder staking machines (see figures 8a and 8b)

n) Fleshing machines (see figures 9a and 9b)

o) Demanuring machines (see figures 10a and 10b)

p) Wet wheeling machines (see figures 11a and 11b)

q) Shaving machines (feed-out) (see figures 12a and 12b)

r) Shaving machines (feed-in) (see figures 13a and 13b)

It takes account of intended use, foreseeable misuse, component and systems failure.

[A1] This European Standard is not applicable to reciprocating roller machines which are manufactured before the date of its publication as EN. [A1]

[A1] This European Standard provides provisions for the reduction of noise emission at the design stage (see 5.2.4 and Annex A). However, it does not provide a noise test code for the determination by measurement of noise emission values for the machines it covers. Without such a code the manufacturer cannot fulfil his obligation to provide the noise emission values of the machines put on the market. [A1]

[A1] All the significant hazards (see Clause 4) are dealt with in this European Standard except the following: [A1]

— Dust, smoke and vapour emissions (see Annex B);

— Fire (see Annex C).

For these hazards general guidelines are proposed in [A1] normative annexes [A1]. Designers and manufacturers shall verify directly that the methods adopted to reduce these hazards have been successful.

2 Normative references

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.

[A1] *deleted text* [A1]

EN 349:1993, *Safety of machinery — Minimum gaps to avoid crushing of the human body*

[A1] EN 388:2003, *Protective gloves against mechanical risks* [A1]

[A1] *deleted text* [A1]

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

[A1] *deleted text* [A1]

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*

[A1] EN 999:1998, *Safety of machinery — The positioning of protective equipment in respect of approach speeds of parts of the human body* [A1]

[A1] EN 1037:1995 *Safety of machinery — Prevention of unexpected start-up* [A1]

[A1] *deleted text* [A1]

EN 1088:1995, *Safety of machinery — Interlocking devices with and without guard locking; general principles and provisions for design*

[A1] EN 1760-2:2001, *Safety of machinery — Pressure sensitive protective devices — Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars* [A1]

[A1] *deleted text* [A1]

[A1] EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)* [A1]

[A1] EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)* [A1]

[A1] EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)* [A1]

[A1] EN 61496-1:2004, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests (IEC 61496-1:2004, modified)* [A1]

[A1] CLC/TS 61496-2:2006, *Safety of machinery — Electro-sensitive protective equipment — Particular requirements for equipment using active optoelectronic protective devices (AOPDs) (IEC 61496-2:2006)* [A1]

[A1] EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)* [A1]

[A1] EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)* [A1]

[A1] 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)* [A1]

[A1] EN ISO 13849-1:2008, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)* [A1]

[A1] EN ISO 13850:2008, *Safety of machinery — Emergency stop — Principles for design (ISO 13850:2006)* [A1]

[A1] EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)* [A1]

3 [A1] Terms and definitions [A1]

[A1] For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply. [A1]

Descriptions of each machine type are given in annex D.

In addition the following definitions apply:

3.1 Machine Parts

3.1.1
working parts
parts carrying out the process for which the machine was designed

3.1.2
transmission parts
parts in motion acting singly or in combination which transmit motion to the working parts

3.1.3
other parts
all other parts not defined above

3.2 〚A1〛 Danger zones (as 3.10 of EN ISO 12100-1:2003) 〚A1〛

NOTE The following specific danger zones are distinguished in order to better identify in this Standard the various hazards and relevant requirements.

3.2.1
working zone
zone around a power driven working part in which the work process takes place for the treatment and processing or manufacturing of products.

Part of the working zone, in which operators introduce their hands whilst placing the skin prior to machine closure, defined as the "feeding zone", has particular hazards and needs particular safety devices.

NOTE In the text, where "feed rollers" are mentioned, it is intended to also cover "feed conveyors" unless otherwise stated.

3.2.2
accessible zone
any other danger zone

4 List of significant hazards

〚A1〛 This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this European Standard, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

The significant hazards for moving platen machines are outlined in 4.1 to 4.18.

The danger zones which give rise to mechanical hazards are illustrated in Figures 1 to 13. The figures are informative only. 〚A1〛

The danger zones, operating conditions and situations that may lead to the hazards are detailed in clause 5.

Table 1 — List of significant hazards

Hazards	Danger zones, operating conditions, hazardous situations and safety requirements
4.1 Buffing machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.6, 5.4.1.2, 5.4.4
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.2 Polishing machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.6, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.3 Ironing machines (woolskin and fur)	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2

(continued)

Table 1 — (continued)

Hazards	**Danger zones, operating conditions, hazardous situations and safety requirements**
Thermal hazard	
burns and scalds	5.4.1.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.4 Carding machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.2, 5.3.6, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.5 Shearing machines (woolskins and fur)	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2, 5.4.2
shearing hazard	5.4.1.2, 5.4.2
cutting hazard	5.3.6, 5.4.1.2, 5.4.2
entanglement hazard	5.3.2, 5.3.6, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Hazards generated by neglecting ergonomic principles in machinery design	5.4.2
Falling or ejected objects or fluids	5.4.1.2
4.6 Cylinder universal staking machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2

(continued)

Table 1 — (continued)

Hazards	Danger zones, operating conditions, hazardous situations and safety requirements
entanglement hazard	5.3.2, 5.3.6, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.7 Setting out machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Thermal hazard	
burns and scalds	5.3.4, 5.4.1.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.8 Dewooling machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
biological or microbiological hazard	5.2.5
Falling or ejected objects or fluids	5.4.1.2
slip, trip and fall of persons	5.2.3

(continued)

Table 1 — (continued)

Hazards	Danger zones, operating conditions, hazardous situations and safety requirements
4.9 Scudding machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by materials and substances processed	
Hazards generated by noise	5.2.4, annex A
biological or microbiological hazard	5.2.5
Falling or ejected objects or fluids	5.4.1.2
slip, trip and fall of persons	5.2.3
4.10 Unhairing (dehairing) machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
Biological or microbiological hazard	5.2.5
Falling or ejected objects or fluids	5.4.1.2
slip, trip and fall of persons	5.2.3
4.11 Sammying machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2

(continued)

Table 1 — (continued)

Hazards	Danger zones, operating conditions, hazardous situations and safety requirements
Hazards generated by noise	5.2.4, annex A
Falling or ejected objects or fluids	5.4.1.2
4.12 Cylinder ironing machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Thermal hazard	
burn and scalds	5.3.4, 5.4.1.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.13 Cylinder staking machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.3.1, 5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts	5.3.5, annex B
Falling or ejected objects or fluids	5.4.1.2
4.14 Fleshing machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2, 5.4.2
shearing hazard	5.4.1.2, 5.4.2
cutting hazard	5.3.1, 5.4.1.2, 5.4.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2

(continued)

Table 1 — (continued)

Hazards	Danger zones, operating conditions, hazardous situations and safety requirements
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
biological or microbiological hazard	5.2.5
Hazards generated by neglecting ergonomic principles in machinery design	5.4.2
Falling or ejected objects or fluids	5.4.1.2
slip, trip and fall of persons	5.2.3
4.15 Demanuring machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2, 5.4.2
shearing hazard	5.4.1.2, 5.4.2
cutting hazard	5.3.1, 5.4.1.2, 5.4.2
entanglement hazard	5.3.1, 5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
biological or microbiological hazard	5.2.5
Hazards generated by neglecting ergonomic principles in machinery design	5.4.2
Falling or ejected objects or fluids	5.4.1.2
slip, trip and fall of persons	5.2.3
4.16 Wet wheeling machines	
Mechanical hazards	
hazards generated by machine parts or workpiece	5.1
crushing hazard	5.3.2, 5.3.3, 5.4.1.1, 5.4.1.2
shearing hazard	5.4.1.2
cutting hazard	5.4.1.2
entanglement hazard	5.3.2, 5.4.1.2
trapping hazard	5.3.2
impact hazard	5.4.1.2
friction or abrasion hazard	5.4.1.2
high pressure fluid injection or ejection hazard	5.2.1
Electrical hazard	5.2.2
Hazards generated by noise	5.2.4, annex A
Hazards generated by materials and substances processed	
Falling or ejected objects or fluids	5.4.1.2

(continued)