
**Textile machinery — Safety
requirements —**

Part 7:
Dyeing and finishing machinery

Matériel pour l'industrie textile — Exigences de sécurité —

Partie 7: Machines de teinture et de finissage

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 11111-7 was prepared by Technical Committee ISO/TC 72, *Textile machinery and machinery for dry-cleaning and industrial laundering*, Subcommittee SC 8, *Safety requirements for textile machinery*.

This first edition of ISO 11111-7, together with ISO 11111-1, ISO 11111-2, ISO 11111-3, ISO 11111-4, ISO 11111-5 and ISO 11111-6, cancels and replaces ISO 11111:1995, which has been technically revised.

ISO 11111 consists of the following parts, under the general title *Textile machinery — Safety requirements*:

- *Part 1: Common requirements*
- *Part 2: Spinning preparatory and spinning machines*
- *Part 3: Nonwoven machinery*
- *Part 4: Yarn processing, cordage and rope manufacturing machinery*
- *Part 5: Preparatory machinery to weaving and knitting*
- *Part 6: Fabric manufacturing machinery*
- *Part 7: Dyeing and finishing machinery*

Introduction

ISO 11111-1 to ISO 11111-7 were prepared simultaneously by ISO/TC 72 and CEN/TC 214 and adopted under the Vienna Agreement in order to obtain identical standards on technical safety requirements for the design and construction of textile machinery.

ISO 11111 as a whole is intended for use by any person concerned with the safety of textile machinery, for example, textile machinery designers, manufacturers and systems integrators. It is also of interest to users of textile machines and safety experts.

This document is a type C standard as stated in ISO 12100-1. The various parts of ISO 11111 deal with frequent and significant hazards generated by machines used in the textile industry. The machinery concerned and the extent to which hazards are covered are indicated in the scope of this standard.

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.

For hazards of machines or machine elements not dealt with in the relevant part of ISO 11111, the designer is to perform a risk assessment according to ISO 14121 and evolve means for reducing the risk from such significant hazards.

This part of ISO 11111 is intended to be used in conjunction with ISO 11111-1. As far as possible the requirements of this part of ISO 11111 are treated by way of reference to Clauses 5 and 6 of ISO 11111-1. Clause 5 of ISO 11111-1 contains safety requirements and/or measures for frequently occurring hazards of textile machinery which apply whenever referred to in this part of ISO 11111, while Clause 6 describes significant hazards and corresponding safety requirements and/or measures for certain machine elements and their combinations (e.g. rollers), which also apply whenever referred to in this part of ISO 11111.

Textile machinery — Safety requirements —

Part 7: Dyeing and finishing machinery

1 Scope

This part of ISO 11111 is intended to be used in conjunction with ISO 11111-1. It specifies significant hazards and corresponding safety requirements and/or measures for dyeing and finishing machinery. By taking into account the scope of ISO 11111-1 as far as is relevant, this part of ISO 11111 is applicable to all machinery, plant and related equipment intended to be used in preparation, dyeing, printing, fixation, wetting, drying, finishing and making-up/presentation, as specified in Clause 5.

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.

ISO 9902-1, *Textile machinery — Noise test code — Part 1: Common requirements*

ISO 9902-7, *Textile machinery — Noise test code — Part 7: Dyeing and finishing machinery*

ISO 11111-1:2005, *Textile machinery — Safety requirements — Part 1: Common requirements*

ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles and specification*

ISO 13849-1:1999, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13852:1996, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*

ISO 14119, *Safety of machinery — Interlocking devices associated with guards — Principle for design and selection*

IEC 60519-1:2004, *Safety in electroheat installations — General requirements*

IEC 60519-9:1987, *Safety in electroheat installations — Particular requirements for high-frequency dielectric heating installations*

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

EN 12198-1:2000, *Safety of machinery — Assessment and reduction of risks arising from radiation emitted by machinery — Part 1: General principles*

3 Terms and definitions

For the purposes of this part of ISO 11111, the terms and definitions given in ISO 11111-1 apply.

4 List of significant hazards

Significant hazards found in dyeing and finishing machines which are common with those frequently occurring with other textile machines or with machine elements of other textile machines shall be considered in accordance with ISO 11111-1:2005, Clauses 5 and 6, whenever referred to under the heading “General safety requirements” in Clause 5 of this part of ISO 11111. Significant hazards which are particular to dyeing and finishing machines are considered as “Specific hazards” in Clause 5 of this part of ISO 11111.

Before using this part of ISO 11111, it is important to carry out a check to ascertain that the specific machine has the significant hazards identified.

NOTE The significant hazards of dyeing and finishing machines are always considered in conjunction with safety requirements.

5 Significant hazards and corresponding safety requirements and/or measures

5.1 General

Machinery shall conform to the safety requirements of ISO 11111-1:2005, Clauses 5 and 6, whenever referred to under the heading “General safety requirements” of this Clause 5 and shall conform to the additional “Specific safety requirements” of this Clause 5.

The safety requirements of ISO 11111-1:2005, 5.4.6.1, apply to steam pipes and their fittings. For external surfaces of equipment containing hot liquids a warning is considered to be acceptable.

5.2 Preparation machines and equipment

5.2.1 Common requirements for preparation machines and equipment

The safety requirements and/or measures shall be in accordance with Table 1.

Table 1 — General safety requirements relating to preparation machines and equipment

Application	Reference ISO 11111-1:2005
All machines:	
Electrical equipment in general	5.4.2.1 and 5.4.2.2
Electrical control systems	5.4.2.3
Starting and stopping	5.4.2.4
Reduction of risks by design	5.3.2
Reduction of risks by safeguarding	5.3.3
— with guards	Table 2
— with safety devices	Table 3
Ergonomics	5.4.13
Devices for special operation	5.5
Fitting of parts	5.8

5.2.2 Brushing machines

General safety requirements

The safety requirements and/or measures shall be in accordance with 5.2.1 and Table 2.

Table 2 — Additional safety requirements relating to brushing machines

Application	Reference ISO 11111-1:2005
All machines:	
Noise	5.4.7, 7, 8.2
Emission of dust	5.4.10
Fire	5.4.11
Escape and rescue of trapped persons	5.7
Particular machine elements:	
Drive and transmission enclosures	6.2
Electrical control system	6.3 f)
Rollers	6.5
Observation windows	6.9
Batchers	6.18
Pilers and plaiters	6.20
Complex installations	6.22

Specific hazards

Mechanical, from the rotating brushing rollers, in particular, trapping, drawing-in or entanglement.

Specific risks

Access during normal operation, leading to low probability of severe injury.

Specific safety requirements

Enclosing guards shall be provided for the brushing rollers, which may be a combination of fixed and movable guards (e.g. full-width movable guards) to allow access for cleaning. The movable guards shall be interlocked with guard locking.

5.2.3 Cropping machines, shearing machines

General safety requirements

The safety requirements and/or measures shall be in accordance with 5.2.1 and Table 3.

Table 3 — Additional safety requirements relating to cropping and shearing machines

Application	Reference ISO 11111-1:2005
All machines:	
Noise	5.4.7, 7, 8.2
Emission of dust	5.4.10
Fire	5.4.11
Escape and rescue of trapped persons	5.7
Particular machine elements:	
Drive and transmission enclosures	6.2
Electrical control system	6.3 f)
Rollers	6.5
Observation windows	6.9
Fans	6.11
Batchers	6.18
Pilers and plaiters	6.20
Complex installations	6.22

Specific hazards

Mechanical, from the spiral cutting/cropping blades, in particular, cutting or severing.

Specific risks

Access during normal and special operation, in particular, when cleaning, leading to a low probability of severe injury.

Specific safety requirements

- a) Enclosing guards shall be provided to prevent access to the spiral cutting/cropping blades. These shall be movable interlocking guards with guard locking. The interlock shall operate when the cutters are in motion, whether in the cutting or raised position.
- b) There shall be no finger or hand access to the cutting/cropping blades from the rear of the machine.
- c) Provisions shall be made to enable the blades to be sharpened while mounted in the machines. This may be achieved by designing the machine so that the spiral cutting blade can be run in the reverse direction at a reduced running speed when the guard is open.

5.2.4 Slitting machines

This type of machine can perform its function by way of steel knives (moving or stationary blades) and heated knives. This provision is not applicable to slitting machines specified in ISO 11111-1:2005, 1.4.

General safety requirements

The safety requirements and/or measures shall be in accordance with 5.2.1 and Table 4 .

Table 4 — Additional safety requirements relating to slitting machines

Application	Reference ISO 11111-1:2005
All machines:	
Lasers	5.4.8
Fumes	5.4.10
Particular machine elements:	
Drive and transmission enclosures	6.2
Rollers	6.5
Conveyors	6.10
Cutting devices	6.12
Batchers	6.18
Pilers and plaiters	6.20

Specific hazards

Mechanical, from the rotating cutting device.

Specific risks

Low probability of severe injury from contact with the rotating cutting device, particularly while it is running down.

Specific safety requirements

- a) A braking device shall be fitted to the drive motor.
- b) Visual indication of blade rotation shall be provided.
- c) The blade shall be fully guarded when in the raised position.

5.2.5 Singeing machines

The safety requirements and/or measures shall be in accordance with 5.2.1 and Table 5.

Table 5 — Additional safety requirements relating to singeing machines

Application	Reference ISO 11111-1:2005
All machines:	
Noise	5.4.7, 7, 8.2
Fumes	5.4.10
Fire	5.4.11
Elevated servicing positions	5.6
Particular machine elements:	
Drive and transmission enclosures	6.2
Rollers	6.5
Fans	6.11
Work platforms and walkways	6.13
Burners	6.14
Batchers	6.18
Pilers and plaiters	6.20

5.2.6 Desizing (scouring) machines

The safety requirements and/or measures shall be in accordance with 5.2.1 and Table 6.

Table 6 — Additional safety requirements relating to desizing machines

Application	Reference ISO 11111-1:2005
All machines:	
Hot processing materials: liquor or steam	5.4.6.2
Chemicals	5.4.10
Elevated servicing positions	5.6
Escape and rescue of trapped persons	5.7
Particular machine elements:	
Drive and transmission enclosures	6.2
Rollers	6.5
Work platforms and walkways	6.13
Devices for steam heating of liquors	6.15
Liquor preparatory equipment	6.16
Dancing rollers	6.17
Batchers	6.18
Mangles	6.19
Pilers and plaiters	6.20
Complex installations	6.22
	This part of ISO 11111
Other items:	
Hot surfaces	5.1
Contact with steam	5.2.12 b)
Atmospheric dyeing machines and apparatus	5.3.2

5.2.7 Discontinuous bleaching plants (open kiers)

The safety requirements and/or measures shall be in accordance with 5.2.1 and Table 7.

Table 7 — Additional safety requirements relating to discontinuous bleaching plants (open kiers)

Application	Reference ISO 11111-1:2005
All machines:	
Fluid power systems and components	5.4.5
Chemicals	5.4.10
Elevated servicing positions	5.6
Particular machine elements:	
Doors and lids, opening and closing	6.8.2
Doors and lids, locking and unlocking	6.8.3
Work platforms and walkways	6.13
Devices for steam heating of liquors	6.15
	This part of ISO 11111
Other items:	
Hot surfaces	5.1
Atmospheric dyeing apparatus	5.3.2