INTERNATIONAL STANDARD

ISO 11111-6

First edition
2005-02-15

Textile machinery — Safety requirements —

Part 6: Fabric manufacturing machinery

Matériel pour l'industrie textile — Exigences de sécurité —

Partie 6: Machines de production d'étoffes

Reference number
ISO 11111-6:2005(E)

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

Published in Switzerland

Contents

Page

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 11111-6 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 11111-6, together with ISO 11111-1, ISO 11111-2, ISO 11111-3, ISO 11111-4, ISO 11111-5 and ISO 11111-7, 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 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 6: Fabric manufacturing 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 fabric manufacturing 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 for weaving, knitting and tufting, 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 9902-6, *Textile machinery — Noise test code — Part 6: Fabric manufacturing machinery*

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

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

ISO 13850:1996, *Safety of machinery — Emergency stop — Principles for design*

ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means of access between two levels*

ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*

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

ISO 14122-4, *Safety of machinery — Permanent means of access to machinery — Part 4: Fixed ladders*

IEC 61496-1:1997, *Safety of machinery — Electro-sensitive protective equipment — Part 1: General requirements and tests*

IEC 61496-2:1997, *Safety of machinery — Electro-sensitive protective equipment — Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)*

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

3 Terms and definitions

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

3.1
two-button-control device
device which requires at least simultaneous actuation using two fingers in order to initiate a machine function

4 List of significant hazards

Significant hazards found in fabric manufacturing 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 fabric manufacturing 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 fabric manufacturing 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.

5.2 Weaving machines

Shuttle weaving machines, rigid and flexible rapier, projectile, air and water-jet and similar weaving machines, also pile weaving and narrow fabric weaving machines.

5.2.1 Common requirements of weaving machines

NOTE For some weaving machines, e.g. air jet weaving machines, projectile weaving machines or shuttle type narrow fabric weaving machines, the requirements of this subclause are the only ones, and for that reason are not mentioned specifically later.

General safety requirements

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

Specific hazards

Mechanical, from the sley and associated moving parts including the reed, and from the gears of the let-off motion device, and from the Jacquard machine or shedding machine, in particular, crushing and shearing.

Specific risks

Low probability of moderate-to-severe injury, particularly when a machine is accidentally started up (inadvertent or unintended start) and when mending a broken end (thread).

Table 1 — General safety requirements relating to weaving machines

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
Static electricity	5.4.4
Fluid power systems and components	5.4.5
Hot surfaces (heat setting of selvedge)	5.4.6.1
Noise	5.4.7, 7, 8.2
Emission of dust and fly	5.4.10
Fire	5.4.11
Ergonomics	5.4.13
Devices for special operation	5.5
Fitting of parts	5.8
Particular machine elements:	
Drive and transmission enclosures	6.2
Rollers	6.5
Rotating shafts	6.6
Handwheels	6.7.2
Cutting devices	6.12
Batchers	6.18
Automatic machines and equipment	6.21
Automatic guards	6.21.2
Mobile machines, handling devices, operational parts	6.21.3
	This part of ISO 11111
Other items:	
Jacquard machines	5.2.9

Specific safety requirements

a) Start-up by unintended or inadvertent actuation shall be prevented by start controls designed so as to reduce the risk of an operator either inadvertently actuating the control (e.g. by leaning on it) or actuating the wrong control (e.g. starting at normal speed instead of reduced running speed), see ISO 11111-1:2005, Table 6. Such controls may be

   1) two-button control devices, or

   2) control actuators with a movement different from other control actuators (e.g. pull out instead of press).

b) Guards and/or safety devices shall be provided for the crushing and shearing points between the reed and fixed parts such as temple assembling (including temple cover, temple trough and temple support) or “down-holder” or cloth table in order to prevent the machine starting to move (start-up protection) when the operator's fingers are in the danger zone (see Figure 1). This includes start-up for

   — single pick insertion,

   — normal production speed,

   — reduced running speed, and

   — restart after automatic broken weft removal.

   This safe-guarding may be in the form of the following:

   1) trip device(s), e.g. active-opto-electronic protective devices (AOPD), complying with type 2, as defined in IEC 61496-1 and IEC 61496-2, which, if in the form of AOPD, shall be in accordance with ISO 11111-1:2005, Table 3 — i.e. reaching the hazard zone shall not possible without activating the AOPD (see Figure 1) — and may be deactivated immediately after the machine has reached its normal production speed, unless used additionally to protect the danger zone between the moving sley and fixed machine parts [see 5.2.1 c)];

   2) movable interlocked covers, covering the crushing area between the temple and the reed, designed to prevent finger access.

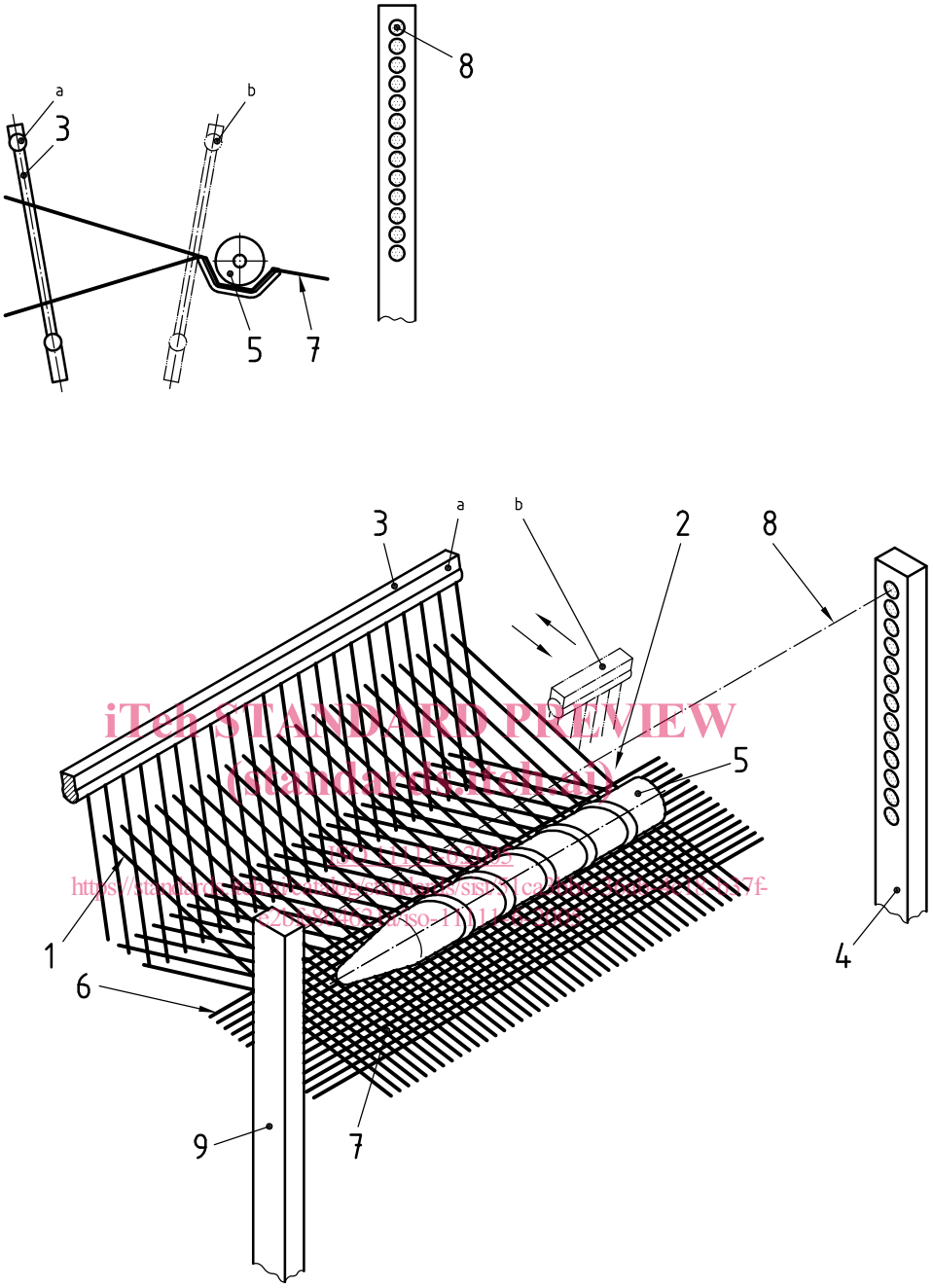
c) Guards or safety devices shall be provided for the crushing, shearing and impact points to the left and right of the shed between the ends of the moving sley and fixed parts of the machine, during both start-up and normal running. These may be in the form of one of the following:

   1) adjustable fixed guards;

   2) movable interlocked guards;

   3) trip devices so positioned that the danger zones cannot be reached before the machine has stopped and so designed that the machine cannot be restarted as long as parts of the body are inside the danger zone, and which type of safety device may, for example, be fitted to slow-running, wide-width heavy-duty weaving machines, such as paper felt weaving machines.

Dimensions in millimetres



Key

1	warp threads	6	fell
2	crushing zone: reed/temple	7	fabric
3	reed	8	light beam
4	AOPD transmitters	9	AOPD receivers
5	temple		

[a] Reed position during weft insert.

[b] Reed position during beat-up.

Figure 1 — Safeguard between temples and reed