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**Textile machinery — Noise test code —**

Part 6:

**Fabric manufacturing machinery**

*Matériel pour l'industrie textile — Code d'essai acoustique —*

*Partie 6: Machines de production des étoffes*

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Published in Switzerland

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 72, *Textile machinery and accessories*, Subcommittee SC 8, *Safety requirements for textile machinery*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

This second edition cancels and replaces the first edition (ISO 9902-6:2001), which has been technically revised. It also incorporates the Amendments ISO 9902-6:2001/Amd 1:2009 and ISO 9902-6:2001/Amd 2:2014.

The main changes compared to the previous edition are as follows:

- the normative references have been updated;
- [Table 1](#) has been revised;
- editorial changes have been made.

This document is intended to be used in conjunction with ISO 9902-1.

A list of all parts in the ISO 9902 series can be found on the ISO website.

# Textile machinery — Noise test code —

## Part 6: Fabric manufacturing machinery

### 1 Scope

This document covers the different types of weaving and knitting machines defined in ISO 5247 (all parts)[2] and ISO 7839[3], respectively.

It is applicable to:

- full-width weaving machines with weft insertion by:
  - shuttles;
  - rigid, telescopic or flexible rapiers;
  - projectiles;
  - hydraulic (waterjet) or by pneumatic (airjet) nozzle;
- narrow fabric weaving machines with weft insertion by shuttles or needles;
- jacquard machines;
- knitting machinery including:
  - circular knitting;
  - flat bed knitting;
  - warp knitting;
  - raschel;
  - cotton (flat weft weaving);
- other fabric manufacturing machines e.g.:
  - multi-phase weaving machines;
  - circular weaving machines;
  - stitch bonding machines.

NOTE Because of the high requirements on measurement conditions, grade 1 methods are normally not feasible for textile machinery.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*

ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 3747, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment*

ISO 8188, *Textile machinery and accessories — Pitches of knitting machines*

ISO 9614-1, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 1: Measurement at discrete points*

ISO 9614-2, *Acoustics — Determination of sound power levels of noise sources using sound intensity — Part 2: Measurement by scanning*

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

ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*

ISO 11202, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying approximate environmental corrections*

ISO 11204, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions applying accurate environmental corrections*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9902-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 4 Defining the test object

See [Tables 1](#) to [3](#) and ISO 9902-1:2001, Clause 4.

### 5 Sound power level determination

#### 5.1 International Standards required for basic measurements

##### 5.1.1 General

See ISO 9902-1:2001, 5.1.

##### 5.1.2 Determination of sound power level by measuring sound intensity

Determination of the A-weighted sound power level,  $L_{WA}$ , using sound intensity measurements shall be in accordance with ISO 9614-1 (discrete points) or ISO 9614-2 (scanning).

### 5.1.3 Determination of sound power level using emission sound pressure levels on a measurement surface

Determination of the A-weighted sound power level,  $L_{WA}$ , by measurement of A-weighted emission sound pressure levels on a prescribed measurement surface shall be in accordance with one of the following:

- ISO 3744;
- ISO 3747; or
- ISO 3746, where use of ISO 3744 or ISO 3747 is not practicable.

Where its conditions are met (e.g. in the case of small narrow fabric weaving machines or knitting machines), ISO 3743-1[1] provides an alternative method which may be used.

## 5.2 Very large machines

See ISO 9902-1:2001, 5.2. Very large machines are designated by the letter “L” in [Tables 1](#) to [3](#).

## 6 Emission sound pressure level determination

### 6.1 International Standards required for basic measurements

See ISO 9902-1:2001, 5.2.

The A-weighted emission sound pressure level,  $L_{pA}$ , shall be determined in accordance with one of the following:

- ISO 11201,
- ISO 11204, or
- ISO 11202, but only where use of ISO 11201 or ISO 11204 is not practicable.

Where its conditions are met (e.g. in the case of small, narrow fabric weaving machines or knitting machines with principally omnidirectional sound radiation) and the sound power level has already been determined, ISO 11203:1995, 6.2.3[4] gives an alternative method which may be used, providing the distance from the machine surface is 1 m.

### 6.2 Selection of work station and other specified positions

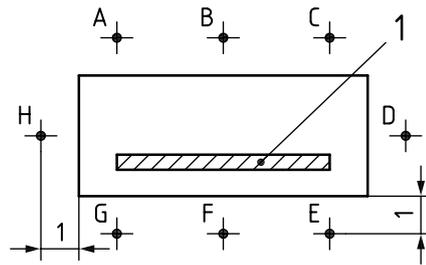
#### 6.2.1 General

See ISO 9902-1:2001, 6.2, and [Tables 1](#) to [3](#).

#### 6.2.2 Weaving machinery other than circular and narrow fabric machines

For weaving machines that are not of the circular or narrow fabric type, select eight measurement positions, as shown in [Figure 1](#), at a distance of 1 m and a height of 1,6 m above the floor or working platform. In areas where space is restricted, the measurement distance from the machine surface may be reduced to 0,5 m or 0,25 m (this shall be reported and declared). Use the eight values measured at the defined positions to calculate  $L_{pA}$  (see ISO 9902-1:2001, 6.1). If the back of the machine is not accessible during operation with material, the first three positions may be excluded.

Dimensions in metres



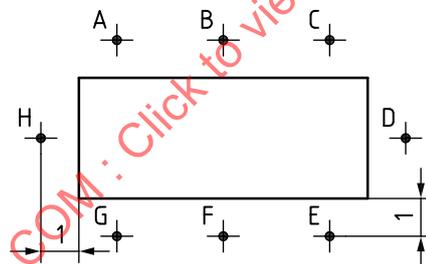
**Key**  
 1 sley  
 A to H measurement positions

**Figure 1 — Weaving machines other than circular and narrow fabric machines**

**6.2.3 Flatbed knitting machine, straight-bar knitting machine and flat warping knitting machine**

For flatbed knitting machines, warp knitting machines, Raschel machines and stitch-bonding machines (including particular warp knitting machines such as carpet warp knitting and cotton machines) with a maximum working width of 8 m, select eight measurement positions, as shown in Figure 2, at a distance of 1 m and a height of 1,6 m above the floor or working platform. For larger machines, increase the number of positions such that the distance between two adjacent positions does not exceed 3 m. Where access to the rear is prevented by the delivered yarn, omit the measurement positions on the rear. Use the eight values measured at the defined positions to calculate  $L_{pA}$  (see ISO 9902-1:2001, 6.1).

Dimensions in metres



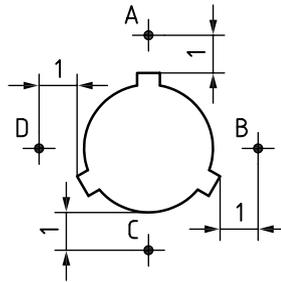
**Key**  
 A to H measurement positions

**Figure 2 — Knitting machines other than circular machines**

**6.2.4 Circular weaving and circular knitting machines**

For circular weaving as well as circular knitting machines, select four measurement positions, as shown in Figure 3, at a distance of 1 m and a height of 1,6 m above the floor or working platform. Use the four values measured at the defined positions to calculate  $L_{pA}$  (see ISO 9902-1:2001, 6.1).

Dimensions in metres

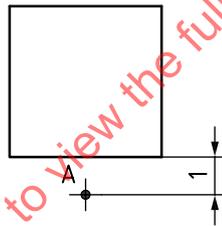
**Key**

A to D measurement positions

**Figure 3 — Circular weaving and circular knitting machines****6.2.5 Narrow fabric weaving machines**

For narrow fabric weaving machines, select a single measurement position, as shown in [Figure 4](#), at a distance of 1 m from the middle of the front of the machine and at a height of 1,6 m above the floor or working platform. Use the value measured at this position to calculate  $L_{pA}$  (see ISO 9902-1:2001, 6.1).

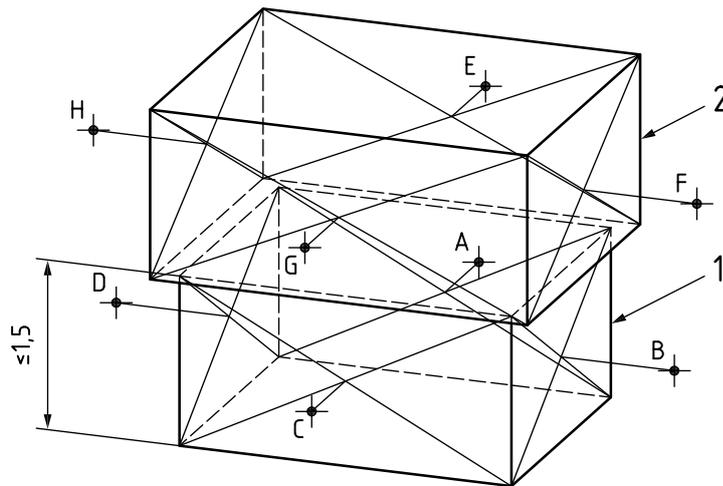
Dimensions in metres

**Key**

A measurement position

**Figure 4 — Narrow fabric weaving machines****6.2.6 Jacquard machines**

For Jacquard machines, select eight measurement positions, as shown in [Figure 5](#). Take two series of measurements at a distance of 1 m from the centre of each side. The height of measurement positions 1 to 4 shall be half the height of the frame, while the height of measurement positions 5 to 8 shall be that of the height of the centreline of the Jacquard. Use the eight values to calculate  $L_{pA}$  (see ISO 9902-1:2001, 6.1).



- Key**
- 1 frame
  - 2 jacquard machine
  - A to H measurement positions

Figure 5 — Jacquard machines

## 7 Installation and mounting conditions

See ISO 9902-1:2001, Clause 7.

## 8 Operating conditions

See ISO 9902-1:2001, Clause 8 and [Tables 1 to 3](#).

For weaving machines having two or more variable parameters, as an alternative to the method given in [Table 1](#) (see ISO 9902-1:2001, Clause 8), the noise emission values depending on speed and other variable parameters (e.g. width and number of heald frames) can be determined. In such cases, the values shall be reported and declared, preferably in tabular or graphical form, or by means of a correction factor, or both.

## 9 Measurement uncertainties

See ISO 9902-1:2001, Clause 9.

## 10 Information to be recorded

See ISO 9902-1:2001, Clause 10.

## 11 Information to be reported

See ISO 9902-1:2001, Clause 11. The information required to be reported includes that contained in [Tables 1 to 3](#).

## 12 Declaration and verification of noise emission values

See ISO 9902-1:2001, Clause 12.

If the alternative given in [Clause 8](#) is chosen, provide an explanation of how  $L_{pA}$  and  $L_{WA}$  can be obtained from the table or graph, or, using the correction factor, for the specified values of the variable parameters. In addition, the uncertainties  $K_{pA}$  and  $K_{WA}$  shall be declared.

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Table 1 — Measurement conditions for weaving machinery

Machine family	Test object definition (see Clause 4)		Very large machinery L (see 5.2)	Work station (see 6.2)	Operating conditions (see ISO 9902-1:2001, Clause 8)		
	Equipment included for the test if applicable	Equipment excluded from the test <sup>a</sup>			Machine configuration (see ISO 9902-1:2001, Clause 4)	Design features to be reported	Prescribed parameters
Shuttle weaving machines	see Notes 1 and 2	—	a)	see 6.2.2	with material	speed in weft insertions per minute	number of heald frames fabric data working width used in centimetres shuttle dimensions in millimetres shuttle mass in grams shuttle material type and material of the picker type and material of the back stop
Projectile weaving machines	see Notes 1 and 2	—	a)	see 6.2.2	with material	speed in weft insertions per minute	number of heald frames fabric data working width used in centimetres

Table 1 (continued)

Machine family	Test object definition (see Clause 4)		Very large machinery L (see 5.2)	Work station (see 6.2)	Operating conditions (see ISO 9902-1:2001, Clause 8)			
	Equipment included for the test if applicable	Equipment excluded from the test <sup>a</sup>			Machine configuration (see ISO 9902-1:2001, Clause 4)	Design features to be reported	Prescribed parameters	Variable parameters
Rapier weaving machines	see Notes 1 and 2	—	a)	see 6.2.2	with material	speed in weft insertions per minute	number of heald frames fabric data working width used in centimetres	
Weaving machines with weft insertion by nozzle	see Notes 1 and 2	air preparation or water preparation	a)	see 6.2.2	with material	speed in weft insertions per minute	number of heald frames fabric data nozzle pressure in pascals working width used in centimetres	
Multi-phase weaving machines with weft insertion by nozzle	see Note 1	air preparation	a)	see 6.2.2	with material	speed in weft insertions per minute	fabric data air pressure in pascals working width used in centimetres	

Table 1 (continued)

Machine family	Test object definition (see Clause 4)			Very large machinery L (see 5.2)	Work station (see 6.2)	Operating conditions (see ISO 9902-1:2001, Clause 8)		
	Equipment included for the test if applicable	Equipment excluded from the test <sup>a</sup>	Machine configuration (see ISO 9902-1:2001, Clause 4)			Design features to be reported	Prescribed parameters	Variable parameters
Narrow fabric weaving machines	see Note 1 Jacquard machine with harness	—	a)	—	see 6.2.5 and 6.1	with material	speed in weft insertions per minute	number of heald frames fabric data working width used in centimetres number of pieces
Narrow fabric weaving machines with integrated Jacquard machine	Jacquard machine	—	a)	—	see 6.2.5 and 6.1	with material	speed in weft insertions per minute	number of Jacquard ends working width used in centimetres fabric data number of pieces
Circular weaving machines	See Note 1	—	a)	—	see 6.2.4	without material 80 % of the maximum diameter in millimetres	machine speed in revolutions per minute	—

NOTE 1 If measurement is possible on the complete machine, the Jacquard device (including the harness) can be considered as part of the weaving machine.

NOTE 2 In most cases the noise measurements are carried out in weaving machines and Jacquard machines separately. However, in order to be able to operate the weaving machine with material, a dobby having the minimum of heald frames can be used to simulate the Jacquard machine. Knowledge of the final installation configuration can then enable calculation of the noise emission of the combined weaving machine and Jacquard machine.

If measurement of the complete machine, consisting of Jacquard device and weaving machine, is possible, the Jacquard device can be considered as part of the measuring object. In this case the complete unit of Jacquard device and weaving machine can be measured according to 6.2.2.

<sup>a</sup> However, such equipment can be necessary for running the machine with material.

Table 2 — Measurement conditions for Jacquard machines

Machine family	Test object definition (see Clause 4)		Very large machinery L (see 5.2)	Work station (see 6.2)	Operating conditions (see ISO 9902-1:2001, Clause 8)		
	Equipment included for the test if applicable	Equipment excluded from the test			Machine configuration (see ISO 9902-1:2001, Clause 4)	Design features to be reported	Prescribed parameters
Jacquard machines mechanically or electronically controlled	—	harness and drive (see Note 2, Table 1)	—	see 6.2.6	without material lift pattern 1:1 hook load in upper position 5 N	speed in weft insertions per minute	—

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Table 3 — Measurement conditions for knitting machinery

Machine family	Test object definition (see Clause 4)		Very large machinery L (see 5.2)	Work station (see 6.2)	Operating conditions (see ISO 9902-1:2001, Clause 8)		
	Equipment included for the test if applicable	Equipment excluded from the test <sup>a</sup>			Machine configuration (see ISO 9902-1:2001, Clause 4)	Design features to be reported	Prescribed parameters
Circular knitting machines	integrated creel	remote creel		see 6.2.4 and 6.1	with material pattern: machine with 1 needle carrier: RL; machine with 2 needle carriers: RR 80 % to 85 % of the maximum operation speed in revolutions per minute closed hoods or covers maximum number of needles and knitting systems	—	material data
					nominal diameter of the machine in millimetres type of drive (e.g. electric hydraulic) type of machine (needle cylinder or cam box ring rotating) type of needles (latch type or compound) number of needle carriers pitch in millimetres (gauge E according to ISO 8188) number of needle carriers (sections) type of fabric take-up and take-down (doff) device type of needle selector if appropriate with/without yarn changer with or without fans	a)	

<sup>a</sup> However, such equipment can be necessary for running the machine with material.

Table 3 (continued)

Machine family	Test object definition (see Clause 4)			Very large machinery L (see 5.2)	Work station (see 6.2)	Operating conditions (see ISO 9902-1:2001, Clause 8)		
	Equipment included for the test if applicable	Equipment excluded from the test <sup>a</sup>	Machine configuration (see ISO 9902-1:2001, Clause 4)			Design features to be reported	Prescribed parameters	Variable parameters
Flat bed knitting machines	integrated creel	remote creel	a)	—	see 6.2.3	with material pattern: machine with 1 needle carrier: RL, machine with 2 or more needle carriers: RR working width: 80 % to 85 % of the maximum working width 80 % to 85 % of the maximum operation speed closed hoods or covers maximum number of needles and knitting systems	—	material data

<sup>a</sup> However, such equipment can be necessary for running the machine with material.