

---

---

**Textile machinery — Guide to the  
design of textile machinery for  
reduction of the noise emissions**

*Matériel pour l'industrie textile — Guide pour la réduction de  
l'émission sonore à la conception des machines textiles*

Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)



# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

|                                                                                                        |           |
|--------------------------------------------------------------------------------------------------------|-----------|
| <b>Foreword</b> .....                                                                                  | <b>iv</b> |
| <b>Introduction</b> .....                                                                              | <b>v</b>  |
| <b>1 Scope</b> .....                                                                                   | <b>1</b>  |
| <b>2 Normative references</b> .....                                                                    | <b>1</b>  |
| <b>3 Terms and definitions</b> .....                                                                   | <b>1</b>  |
| <b>4 Concept for noise emission control</b> .....                                                      | <b>2</b>  |
| 4.1 Substantial requirements.....                                                                      | 2         |
| 4.2 Procedure.....                                                                                     | 2         |
| <b>5 Textile machinery with significant noise hazard</b> .....                                         | <b>3</b>  |
| 5.1 General.....                                                                                       | 3         |
| 5.2 List of textile machines with significant noise hazard.....                                        | 3         |
| 5.2.1 Spinning and spinning preparatory machines.....                                                  | 3         |
| 5.2.2 Non-woven machinery.....                                                                         | 3         |
| 5.2.3 Yarn processing, cordage, and rope manufacturing machinery.....                                  | 3         |
| 5.2.4 Weaving and knitting preparatory machinery.....                                                  | 4         |
| 5.2.5 Fabric manufacturing machinery.....                                                              | 4         |
| 5.2.6 Dyeing and finishing machinery.....                                                              | 4         |
| <b>6 Noise sources and noise control measures for particular textile machines</b> .....                | <b>5</b>  |
| 6.1 General.....                                                                                       | 5         |
| <b>7 Determination of compliance with the safety requirements and the efficiency of measures</b> ..... | <b>17</b> |
| 7.1 Verification on the basis of noise emission values.....                                            | 17        |
| 7.2 Verification of noise control.....                                                                 | 17        |
| 7.3 Information for handbook.....                                                                      | 17        |
| <b>Annex A (informative) Design examples</b> .....                                                     | <b>18</b> |
| <b>Bibliography</b> .....                                                                              | <b>28</b> |

## 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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 72, *Textile machinery and accessories*, Subcommittee SC 8, *Safety requirements for textile machinery*.

get full document from [standards.iteh.ai](http://standards.iteh.ai)

## Introduction

This International Standard is a type C standard as stated in ISO 12100. The machinery concerned and the extent to which hazards are covered are indicated in the scope of this International 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 over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)

# Textile machinery — Guide to the design of textile machinery for reduction of the noise emissions

## 1 Scope

This International Standard provides technical information on the design of textile machinery with reduced noise emissions. Textile machines with a significant noise hazard are defined in ISO 11111 (all parts).

This International Standard supports the technical designer with the development of low-noise textile machinery. For this purpose, the significant sources of noise of the individual types of textile machines and suitable noise control measures are described.

Elements needed for the operation of the textile machine, which are, however, not part of the textile machine, are not covered by this International Standard (e.g. elements for transportation of process material, elements for provision of media).

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9902 (all parts), *Textile machinery — Noise test code*

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

ISO/TR 11688-2, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 2: Introduction to the physics of low-noise design*

ISO 11689, *Acoustics — Procedure for the comparison of noise-emission data for machinery and equipment*

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100, ISO 9902 (all parts), and the following apply.

### 3.1

#### **significant noise hazard**

noise hazard corresponding to an A-weighted emission sound pressure level at an operating position higher than 70 dB

Note 1 to entry: In this case, it is probable that for the machine user under real production conditions (environmental correction, environment noise, operation of several machines) an emission value of 80 dB(A) is attained or exceeded.

### 3.2

#### **significant noise source**

noise source which dominates the noise emission generated by a machine

## 4 Concept for noise emission control

### 4.1 Substantial requirements

For reduction of noise emissions from textile machines, the following substantial requirements should be considered for conceiving and designing textile machinery.

The machine shall be conceived and designed so as to reduce hazards from noise emissions to the attainable lowest load by taking into consideration the technical progress and the available means for noise control, primarily at the source.

### 4.2 Procedure

In order to achieve the substantial aims according to 4.1, the following procedure is recommended.

#### Step 1: Detection of noise emission by measurement according to ISO 9902 (all parts)

With an emission value of less than or equal to 70 dB(A) at a workstation, no further measures for noise control are required.

#### Step 2: Identification of significant noise sources

To identify machine elements and physical processes dominating the noise emissions, the following methods might be useful:

- a) evaluation of revolutions and of the dominating frequencies of the radiated sound;
- b) comparative noise measurements with changing the parameters so as to draw conclusions with regard to significant noise sources;
- c) sound intensity measurements to be used for defining the loudest machine ranges;
- d) calculation of structure-borne noise (simulation).

#### Step 3: Specifying and taking noise control measures

Noise control measures should concentrate on significant noise sources to allow good prospect of success of the measures taken. Thus, a favourable relation between expenditure and benefit might be expected.

The measures shall be taken in the following order:

- a) reduction of sound generation;
- b) reduction of sound propagation;
- c) provision of conditions for installation, maintenance, inspection, repair, spare part specification, and quality of the used raw materials to be given for continuous low-noise operation of the machine;
- d) necessity to wear hearing protectors during operation of the machine.

#### Step 4: Verification of the success of measures taken

The success of the measure shall be verified by noise measurements according to ISO 9902 (all parts). For these measurements, the machine should be operating in a mode specified by ISO 9902 (all parts). If the noise control attained is not sufficient, the procedure is repeated beginning with step 2. The measures for noise control may be concluded, if

- the A-weighted emission sound pressure level at a workstation is less than or equal to 70 dB or
- the standard attainable according to the state-of-the-art technology of the machine type has been achieved or is below that level.

NOTE The state-of-the-art technology represents the technical possibilities given at a certain time. The state-of-the-art technology also includes its economic feasibility.

### Step 5: Documentation

The results of the working steps 1 to 4 shall be recorded in the technical documentation.

The information for the machine user, which is obtained during performing working steps 1 to 4, should be included in the instruction handbook

## 5 Textile machinery with significant noise hazard

### 5.1 General

Textile machinery with significant noise hazard is defined in ISO 11111 (all parts) and listed in detail in [5.2. Clause 6](#) shows the significant noise sources and the usual measures for noise generation control and propagation, as well as information for low-noise load during operation, for selected machines.

### 5.2 List of textile machines with significant noise hazard

#### 5.2.1 Spinning and spinning preparatory machines

Spinning and spinning preparatory machines with significant noise hazard are given in [Table 1](#).

**Table 1 — Spinning and spinning preparatory machines with significant noise hazard**

|                                                                   |
|-------------------------------------------------------------------|
| Automated blending bale openers                                   |
| Tearers, willows                                                  |
| Bale breaker, hopper feeder                                       |
| Moving bin emptiers                                               |
| Carding machines                                                  |
| Roller and clearer cards                                          |
| Tape condensers                                                   |
| Converters and stretch breaking converters                        |
| Draw frames for short fibres, ribbon lap machine, and lap formers |
| Gill boxes including “intersecting” and “chain-gill” types        |
| Combers                                                           |
| Speed frames                                                      |
| High-draft finishers                                              |
| Ring spinning machine                                             |
| Open-end spinning machine                                         |

#### 5.2.2 Non-woven machinery

Non-woven machines with significant noise hazard are needle punching machines.

#### 5.2.3 Yarn processing, cordage, and rope manufacturing machinery

Yarn processing, cordage, and rope manufacturing machines with significant noise hazard are given in [Table 2](#).