

---

---

**Lifts (elevators), escalators and moving  
walks — Risk assessment and reduction  
methodology**

*Ascenseurs, escaliers mécaniques et trottoirs roulants — Méthodologie  
de l'évaluation et de la réduction du risque*



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing 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 Terms and definitions</b> .....	<b>1</b>
<b>3 General principles</b> .....	<b>3</b>
<b>4 Risk analysis procedure</b> .....	<b>5</b>
<b>5 Step 6 — Risk evaluation</b> .....	<b>15</b>
<b>6 Step 7 — Has the risk been sufficiently reduced?</b> .....	<b>15</b>
<b>7 Reduction of risk — Protective measures</b> .....	<b>16</b>
<b>8 Documentation</b> .....	<b>16</b>
<b>Annex A (normative) Risk assessment template</b> .....	<b>18</b>
<b>Annex B (informative) Quick references to hazards (Table B.1), hazardous situations (Table B.2), causes (Table B.3), effects (Table B.4) and harm (Table B.5)</b> .....	<b>19</b>
<b>Annex C (normative) Estimation of risk elements — Severity and probability (see 4.5)</b> .....	<b>23</b>
<b>Annex D (normative) Risk estimation and evaluation</b> .....	<b>24</b>
<b>Annex E (informative) Role of the team moderator</b> .....	<b>26</b>
<b>Annex F (informative) Examples of a risk assessment and protective measures</b> .....	<b>30</b>
<b>Bibliography</b> .....	<b>35</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.

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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 14798 was prepared by Technical Committee ISO/TC 178, *Lifts, escalators and moving walks*.

This second edition cancels and replaces the first edition (ISO/TS 14798:2000), which has been technically revised.

## Introduction

After the first edition of this Technical Specification had been published in 2000, with Resolutions 169/1999 and 186/2001, the Technical Committee ISO/TC178 requested the users of ISO/TS 14798 and the Committee members to report on the use of the document with comments and proposals for any improvements to be considered in a revision within 3 years.

Having received numerous comments and proposals, the Technical Committee ISO/TC178 decided, with Resolutions 186/2001 and 209/2002, to revise ISO/TS 14798 in response to the comments and proposals, with a proviso that the revised document does not change the concept and principles of the original Technical Specification.

The objective of this Technical Specification is to describe principles and set procedure for a consistent and systematic risk assessment methodology relevant to lifts (elevators), escalators, moving walks ("lifts" for short). The risk analysis and assessment principles and process described in this document may, however, be used for assessment of risk relevant to equipment other than lifts.

This risk assessment methodology is a tool used to identify risk of harm resulting from various hazards, hazardous situations, and harmful events. Knowledge and experience of the design, use, installation, maintenance, incidents, accidents, and related harm are brought together in order to assess the risk during all phases of the life of lifts <sup>1)</sup> (elevators), escalators, and moving walks (hereafter referred to as "lifts"), from design and construction up to decommissioning. The users of the methodology do not make medical judgments but, rather, evaluate events that can possibly lead to levels of harm defined in this document. By itself, this Technical Specification does not provide a presumption of conformity to any safety requirements for lifts, including those noted in Clause 1.

NOTE Risk assessment is not an exact science, as there is a certain degree of subjectivity in the process.

It is recommended that this Technical Specification be incorporated into training courses and manuals so as to provide basic instructions on safety aspects to those involved in

- assessing designs, operations, testing, and use of lift equipment; and
- writing specifications or standards incorporating safety requirements for lifts.

Clause 3 describes the concept of safety and risk assessment. Clause 4 describes the procedure of risk analysis, including risk estimation. The procedure for risk evaluation is set out in Clause 5 and for assessment in Clause 6. Clause 7 deals with protective measures. Clause 8 specifies relevant documentation. Annexes A, C, and D form a normative part of this Technical Specification. Annexes B, E, and F are for information only.

---

1) Hereinafter in this ISO/TS 14798, the term "lift" is used instead of the term "elevator". In addition, the term "lift" is also used instead of the terms "lifts, elevators, and moving walks".



# Lifts (elevators), escalators and moving walks — Risk assessment and reduction methodology

## 1 Scope

This Technical Specification establishes general principles and specific procedures for assessing risk.

The purpose of this Technical Specification is to provide a process for making decisions relevant to the safety of lifts during the

- design, construction, and installation of lifts, lift components, and systems;
- developing generic procedures for the use, operation, testing, compliance verification, and servicing of lifts; and
- development of technical specifications and standards affecting the safety of lifts.

While examples in this document refer primarily to risks of harm to persons, the risk assessment procedure set out in this document can be equally effective for assessing other types of risks relevant to lifts, such as the risk of damage to property and environment.

## 2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 2.1

#### **cause**

circumstance, condition, event or action that in a hazardous situation contributes to the production of an effect

### 2.2

#### **effect**

result of a cause in the presence of a hazardous situation

### 2.3

#### **harm**

physical injury or damage to the health of people, or damage to property or the environment

[ISO/IEC Guide 51:1999, 3.3]

### 2.4

#### **harmful event**

occurrence in which a hazardous situation results in harm

[ISO/IEC Guide 51:1999, 3.4]

NOTE In this document, the term “harmful event” is interpreted as a combination of “cause” and “effect”.