
**Technical systems and aids for disabled or
handicapped persons — Wheelchair
tiedown and occupant-restraint systems —**

**Part 1:
Requirements and test methods for all
systems**

*Assistances et aides techniques pour les personnes invalides ou
handicapées — Systèmes d'attache du fauteuil roulant et de retenue de
l'occupant —*

Partie 1: Exigences générales et méthodes d'essai pour tous les systèmes



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.

This document is a preview generated by EVS

© ISO 2001

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.ch
Web www.iso.ch

Printed in Switzerland

Contents

	Page
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Design requirements	6
5 Identification, labelling, instruction and warning requirements	8
6 Performance requirements	13
7 Test reports	16

Annexes

A Test method for frontal impact	17
B Measurement of WTORS belt lengths and geometry	22
C Test for webbing slippage at adjustment devices of wheelchair tiedown straps	25
D Test method for partial engagement	27
E Surrogate wheelchair specifications	28
F Recommendations for design, performance and documentation	33
G Information sources	38
Bibliography	40

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 3.

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 part of ISO 10542 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 10542-1 was prepared by Technical Committee ISO/TC 173, *Technical systems and aids for disabled or handicapped persons*, Subcommittee SC 1, *Wheelchairs*.

ISO 10542 consists of the following parts, under the general title *Technical systems and aids for disabled or handicapped persons — Wheelchair tiedown and occupant-restraint systems*:

- Part 1: Requirements and test methods for all systems
- Part 2: Four-point strap-type tiedown systems

Annexes A, B, C, D and E form a normative part of this part of ISO 10542. Annexes F and G are for information only.

Introduction

Providing effective protection for the wheelchair-seated occupant of a motor vehicle usually requires that equipment be installed to secure the wheelchair and restrain the occupant of the wheelchair. ISO 10542 is applicable to this motor-vehicle adaptive equipment, which is referred to as wheelchair tiedown and occupant restraint systems (WTORS). The requirements and test methods of this part of ISO 10542 apply to all WTORS that use belt-type occupant-restraint systems. Additional parts of ISO 10542 will address specific types of WTORS, or deal with particular applications, and will supplement and/or modify the requirements of this part of ISO 10542. If an additional part of ISO 10542 exists for a particular type of WTORS, this part of ISO 10542 is not to be used alone for that WTORS.

This part of ISO 10542 places particular emphasis on design requirements, test procedures, and requirements with regard to the performance of WTORS in a frontal impact. Performance of WTORS used with rear-facing wheelchairs involved in frontal impacts, performance of WTORS in rear, side and rollover impacts, and performance of WTORS used with wheelchair-seated children, may be addressed in future versions of this part of ISO 10542 and its additional parts. Transportation-related requirements for wheelchairs that are suitable for occupant seating during motor-vehicle transportation are specified in ISO 7176-19.

The use of only a pelvic belt as an occupant restraint is unlikely to provide adequate safety to a wheelchair user in the event of a frontal impact. Therefore, this part of ISO 10542 only includes test set-ups and procedures for occupant restraints that incorporate both a pelvic and an upper torso restraint.

This document is a preview generated by EVS

Technical systems and aids for disabled or handicapped persons — Wheelchair tiedown and occupant-restraint systems —

Part 1:

Requirements and test methods for all systems

1 Scope

This part of ISO 10542 specifies test methods and requirements for design and performance, for instructions and warnings to installers and users, and for product marking and labelling for wheelchair tiedown and occupant-restraint systems (WTORS). It applies to all WTORS that use belt-type occupant restraints that are intended for adult-occupied wheelchairs used as forward-facing seats by passengers and drivers of motor vehicles.

This part of ISO 10542 applies primarily to complete WTORS, but other parts of ISO 10542 can also be applied to components and subassemblies sold separately and for replacement parts.

This part of ISO 10542 applies to WTORS intended for use with all types of manual and powered wheelchairs intended for use by adults, including three- and four-wheeled scooters.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 10542. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 10542 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*.

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*.

UN/ECE R 16, *Uniform provisions concerning the approval of safety belts and restraint systems for adult occupants of power-driven vehicles*, Revision 3, Amendment 3, 27 February 1996.

FMVSS 209, Standard No. 209; *Seat belt assemblies*. Federal Motor Vehicle Safety Standards, 49 CFR part 571.209, 1 October, 1992.

3 Terms and definitions

For the purposes of this part of ISO 10542, the following terms and definitions apply.

3.1

adult

person having a mass greater than 36 kg