First edition 2019-03

Robotics — Application of ISO 13482 —

Part 2: **Application guidelines**

Robotique — Application de l'ISO 13482 — Partie 2: Lignes directrices sur l'application



ISO/TR 23482-2:2019(E)

This is a preview of "ISO/TR 23482-2:2019". Click here to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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 CP 401 • Ch. de Blandonnet 8 CH-1214 Vernier, Geneva Phone: +41 22 749 01 11 Fax: +41 22 749 09 47 Email: copyright@iso.org Website: www.iso.org

Published in Switzerland

Contents			Page
For	eword		iv
Intr	oductio	n	v
1	Scop	e	1
2	Normative references		1
3		Terms and definitions	
4	Guidance on the scope of ISO 13482 and gaps or overlaps with other standards		
	4.1	General	
	4.2	Guidance on the definition of service robots	
	4.3	Guidance on the definition of personal care robots	4
	4.4	Guidance on the distinction between personal care robots and other robots	5
5	Concepts in ISO 13482		6
	5.1	General	6
	5.2	Interaction without guards	
	5.3	Intended physical contact	
	5.4	Autonomous functions	6
6	Meth	nodology	7
	6.1	Risk reduction methodology of ISO 13482 in the context of other safety standards	7
	6.2	Approach adopted for the working examples	
	6.3	Application of wording examples to other robots	
7		king examples	
	7.1	Description policy	
	7.2	Example 1 — Mobile servant robot (high risk)	
		7.2.1 Overview 7.2.2 Risk assessment	
		7.2.3 Safety-related control system	
	7.3	Example 2 — Mobile servant robot (low risk)	
		7.3.1 Overview	
		7.3.2 Risk assessment	
		7.3.3 Safety-related control system	
	7.4	Example 3 — Restraint type physical assistant robot	
		7.4.1 Overview	
		7.4.3 Safety-related control system	
	7.5	Example 4 — Person carrier robot	
	, 10	7.5.1 Overview	
		7.5.2 Risk assessment	41
		7.5.3 Safety-related control functions	
	7.6	Example 5 — Restraint-free type physical assistant robot	
		7.6.1 Overview	
		7.6.2 Risk assessment 7.6.3 Safety-related control system	
	_	, and the second	
Bibl	liograpł	ıy	55

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).

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).

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.

This document was prepared by Technical Committee ISO/TC 299, *Robotics*.

A list of all parts in the ISO 23482 series can be found on the ISO website.

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.

Introduction

ISO 13482 is the first safety standard developed for the area of service robots. It allows close human-robot interaction, including human-robot contact. Although ISO 13482 follows well-established principles and practices from standards for industrial robots and machines in general, additional guidance can facilitate its rapid and successful adoption by manufacturers and other stakeholders.

This document clarifies which robots fall under the definition of personal care robots and what distinguishes personal care robots from robots in other areas, such as medical robots or industrial robots. This document also provides further guidance on the risk assessment and risk reduction process to be conducted for a personal care robot. It contains examples of risk assessments for different types of personal care robots that can serve as an example for the user of ISO 13482 for their own risk assessment.