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Title: Draft BS ISO 18646-6 Robotics - Performance criteria and related test methods for service robots. Part 6: Lower-limb wearable robots.

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 18646-6

Robotics — Performance criteria and related test methods for service robots —

Part 6: Lower-limb wearable robots

*Robotique — Critères de performance et méthodes d'essai
correspondantes pour robots de service —*

Partie 6: -

ICS: 25.040.30

ISO/TC 299

Secretariat: **SIS**

Voting begins on:
2025-04-28

Voting terminates on:
2025-07-21

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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 document 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).

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

A list of all parts in the ISO 18646 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

This document is intended to specify test facility, test methods and related performance index for the lower-limb wearable robot performance evaluation. In this proposed test method, human subject who wears and conducts the test motions is replaced with an anthropomorphic test dummy robot (ATDR). An ATDR is controlled to perform the test motion accurately and repeatedly even under the influence of the wearable robot attached to the ATDR for the test, thereby the objectivity and repeatability of the test are secured.

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning the test apparatus referred to throughout the document.

The holders of these patent rights have assured ISO that they are willing to grant a free of charge license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and under other reasonable terms and conditions to make, use, and sell implementations of the above document. Information may be obtained from the patent database available at www.iso.org/patents.

Robotics — Performance criteria and related test methods for service robots —

Part 6: Lower-limb wearable robots

1 Scope

This document specifies performance criteria and related test methods to evaluate the assistance/enhancement performance of the lower-limb wearable robots by using an anthropomorphic test dummy robot (ATDR).

This document is applicable to any wearable robots that are operated by being attached to lower limbs regardless of the purpose of use and the driving method (powered/non-powered, electric/hydraulic).

This document does not apply to the lower-limb wearable robots that operate based on biosignals such as electromyography (EMG)

2 Normative references

The following normative references are essential for its application of this International Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 18646-4:2021, *Robotics — Performance criteria and related test methods for service robots — Part 4: Lower-back support robots*

ISO 13482, *Robots and robotic devices — Safety requirements for personal care robots*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 <https://www.electropedia.org/>

3.1 wearable robot

robot that supplements or augments physical capabilities by driving human body while attached to a human

Note 1 to entry: Wearable robots are referred to as restraint-type physical assistant robots in ISO 13482:2014

[SOURCE: ISO 18646-4:2021, 3.2, modified — The words “while attached to a human during use” have been replaced with “by driving human body while attached to a human”]

3.2 lower-limb wearable robot

wearable robot attached to (part of) human lower-limbs