

MAASTIKUSUUTLIKUD LAADURID. KATSED  
NÄHTAVUSELE JA VASTAVUSKONTROLL. OSA 2:  
PÖÖRDMEHHANISMIGA TELESKOOPLAADURID

Rough-terrain trucks - Visibility test methods and their  
verification - Part 2: Slewing rough-terrain  
variable-reach trucks (ISO 18063-2:2021)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 18063-2:2021 sisaldab Euroopa standardi EN ISO 18063-2:2021 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 18063-2:2021 consists of the English text of the European standard EN ISO 18063-2:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.09.2021.	Date of Availability of the European standard is 29.09.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 53.060

**Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele**

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autoriõiguse kaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

**The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation**

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about standards copyright protection, please contact the Estonian Centre for Standardisation and Accreditation: Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

**Rough-terrain trucks - Visibility test methods and their  
verification - Part 2: Slewing rough-terrain variable-reach  
trucks (ISO 18063-2:2021)**

Chariots tout-terrain - Méthodes d'essai de la visibilité  
et leur vérification - Partie 2: Chariots tout-terrain  
rotatifs à portée variable (ISO 18063-2:2021)

Geländegängige Flurförderzeuge - Prüfungen der  
Sichtverhältnisse und deren Verifikation - Teil 2:  
Drehbare Flurförderzeuge mit veränderlicher  
Reichweite (ISO 18063-2:2021)

This European Standard was approved by CEN on 6 August 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

This document (EN ISO 18063-2:2021) has been prepared by Technical Committee ISO/TC 110 "Industrial trucks" in collaboration with Technical Committee CEN/TC 150 "Industrial Trucks - Safety" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2022, and conflicting national standards shall be withdrawn at the latest by March 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN websites.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 18063-2:2021 has been approved by CEN as EN ISO 18063-2:2021 without any modification.

## Annex ZA (informative)

### Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC amended by Directive 2009/127/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request "M/396 to CEN and CENELEC for standardisation in field of machinery" to provide one voluntary means of conforming to Essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2016 on machinery, and amending Directive 95/16/EC (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

**Table ZA.1 — Correspondence between this European Standard and  
Annex I of Directive 2006/42/EC**

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.1.2. Principles of safety integration	4.2, 4.3, 5, 6, 7, 8, 9, 10, 11	
1.1.6. Ergonomics	4.1, 5.2	
1.7.4. Instructions	11	
1.7.4.2. Contents of the instructions	11	
3.2.1. Driving position	5.2	
4.1.2.7. Movements of loads during handling	6.3.2, 6.3.4, 7.3.3, 7.3.4, 7.4	
4.4.2 c) advice for use...	11	

**WARNING 1** — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

**WARNING 2** — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

# Contents

Page

<b>Foreword</b>	<b>v</b>
<b>Introduction</b>	<b>vi</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 Basic dimensions</b>	<b>4</b>
4.1 Light bulb spacing dimensions	4
4.2 Masking dimensions	4
4.3 Reference dimensions for the measurement	5
<b>5 Test apparatus</b>	<b>5</b>
5.1 Test load	5
5.2 Light source apparatus	5
5.3 Vertical test object	5
5.4 Observation mirror	5
<b>6 Truck test configuration</b>	<b>6</b>
6.1 Equipment of the truck	6
6.2 Openings	6
6.3 Position of the truck and load handling attachment	6
6.3.1 General	6
6.3.2 Test simulating manoeuvring	6
6.3.3 Test simulating travel	6
6.3.4 Test simulating pick-and-place	7
<b>7 Measurement procedure</b>	<b>7</b>
7.1 Test-surface marking and truck location on the test surface	7
7.2 Positioning of the test apparatus	8
7.3 Measurement of the masking	8
7.3.1 General	8
7.3.2 Measurement in travelling condition	8
7.3.3 Measurement in manoeuvring condition	9
7.3.4 Measurement in pick-and-place condition	11
7.4 Fork arm visibility	11
<b>8 Calculation method and computer simulation</b>	<b>11</b>
8.1 Calculation method	11
8.2 Computer simulation	12
<b>9 Evaluation method and performance criteria</b>	<b>12</b>
9.1 Visibility performance criteria on sector A	12
9.2 Visibility performance criteria for the RB	12
9.3 Visibility maskings that exceed the visibility performance criteria with direct view	13
9.4 Fork arm visibility criteria	13
<b>10 Test reports</b>	<b>13</b>
10.1 Truck details	13
10.2 Drawing	13
<b>11 Information for use</b>	<b>13</b>
<b>Annex A (informative) Light bulb spacing dimensions</b>	<b>14</b>
<b>Annex B (informative) Performance criteria for indirect visibility devices</b>	<b>15</b>
<b>Annex C (informative) Procedure for the determination of maskings at the sector A or the RB</b>	<b>16</b>
<b>Annex D (informative) Examples of drawings for the test report</b>	<b>18</b>

<b>Bibliography .....</b>	<b>21</b>
---------------------------	-----------

This document is a preview generated by EVS

## 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 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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 110, *Industrial trucks*, Subcommittee SC 4, *Rough-terrain trucks*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 150 *Industrial Trucks – Safety*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 18063 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](http://www.iso.org/members.html).



## Introduction

This document is a type-C standard as stated in ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organisations, market surveillance etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e. g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard."

Acknowledging that, at the time of publication, the requirements included in this document do not represent the state of the art, a transition period of 24 months is permitted after the date of publication, such that manufacturers can develop their products sufficiently to meet the requirements of this standard.

The purpose of this document is to address the operator's visibility in such a manner that the operator can see around the slewing rough-terrain variable-reach truck to enable proper, effective and safe operation that can be quantified in objective engineering terms. This document includes a test method that uses two lights placed at the location of the operator's eyes. The maskings due to the truck, its components and attachments and a standard test load are determined around the truck, starting at a boundary line 1 m away from the smallest rectangle that encompasses the truck out to the visibility test circle. The radius of the circle is 12 m. The method used does not capture all of the aspects of the operator's visibility but provides information to assist in determining the acceptability of visibility from the truck. Criteria are included in this document to provide guidance for designers as to the extent of visibility maskings that are acceptable.

Due to the truck's capability and the intended operation mode of the truck, the test method is divided into 4 tests representing the main utilisation:

- driving between 2 work sites, at high speed: visibility is checked in the front sector of the 12m boundary. Crab steering and 4-wheel steering are not permitted at high speed, so there is no need to check visibility at the sides of the truck, neither at the rear-side;
- pick-and-carry: manoeuvring and slewing at low speed on work site, with possible crab or 4-wheel steering, in both forward and backward direction. The risk is then in close proximity of the truck and visibility is checked at 1 m rectangular boundary all around the truck except for trucks with an operating mass greater than 20 tons or a maximum lift height above 20 m, where the distance is greater than 1 m to the front of the truck;

- pick-and-place: slewing the upper structure at low speed, the truck being on stabilisers (if any) in static position. The risk is in close proximity of the boom and/or the tail. The test can be performed in any position of the upper structure, and this document considers the worst case, i.e. when in forward aligned position. Therefore, visibility is checked at 1 m rectangular boundary except for trucks with an operating mass greater than 20 tons or a maximum lift height above 20 m, where the distance is greater than 1 m to the front of the truck;
- on forks: the market is now offering trucks with long reach (up to 40 m and more). Visibility to the forks is then of high importance to ensure visibility to the overall front size of the truck.

For the eye spacing, adjustments (up to the limits specified in [Tables 1](#) and [2](#)) can be made considering that the operator has the capability to turn their head and move their body torso side to side. The eye spacings used are less than the maximum permitted values based on the ergonomics of the operator. This is done to maintain the current state-of-the-art of trucks.

Standard test loads are carried on devices on the truck during the visibility tests. They are intended to be dimensionally representative of typical loads carried by slewing rough-terrain variable-reach trucks and are used to determine their masking effects and to define representative boom geometry of the truck in normal uses.

The established visibility performance criteria are based on the physical aspects of the human operators and ground personnel using various representative dimensions and the design of trucks that have provided acceptable visibility. To establish the visibility criteria, a combination of the eye spacings and masking widths are used. Multiple maskings in sectors are acceptable where there is adequate spacing between the individual maskings. Where the direct visibility is considered inadequate, additional devices for indirect visibility [mirrors or closed-circuit television cameras (CCTV)], can be used to achieve acceptable visibility. For the rectangular boundary (RB) additional devices for indirect visibility (mirrors or CCTV) are preferred. Other aids (see ISO 16001) can be used exceptionally.