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Fibre-reinforced plastics — Telescopic ladder — Requirements and test methods

Plastiques renforcés de fibres de verre — Échelle télescopique — Exigences et méthodes d'essai

FDIS stage

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Contents

Foreword

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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 61, *Plastics*, Subcommittee SC 11, *Products.*

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.

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Introduction

This ~~standard~~document relates only to telescopic ladders made of ~~fiber~~fibre-reinforced plastic materials. Therefore, the test methods and technical requirements for the aging performance of the ladders ~~-~~are increased.

This ~~standard~~document is ~~a technical standard~~ applicable to different countries and regions in the world, considering the weight difference between people in different countries and regions, and also in order to reduce the weight of the ladder and more convenient to carry, so the maximum total weight of the ladder is divided into two grades: ~~100kg~~100 kg and ~~150kg.~~

150 kg.

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Fibre- reinforced plastics - — Telescopic ladder — Requirements and test methods

1 Scope

This document specifies the terms and definitions, technical requirements, test methods and inspection rules for telescopic ladders made of fibre-reinforced plastics.

~~It~~This document applies to the manufacture, selection, inspection and use of telescopic ladders made of fibre-reinforced plastics.

~~This~~NOTE 1 Annex A provides guidance for inspection rules of the telescopic ladders.

NOTE 2 Annex B classifies all the tests covered in this document into 8 test blocks and specifies the sequence of tests within the same test block.

It does not apply to ladders with a length over 5 m.

~~Note:~~ NOTE 2 Ladders with a length over 5 m ~~could~~can use this document as a reference.

The scope of this document does not relate to the “live working” and “explosive atmospheres”.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 179-1, Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test

ISO 4892-2:2013, Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps

ISO 7599, Anodizing of aluminium and its alloys — *Method~~General~~ ~~specifications~~* for *specifying decorative and protective* anodic oxidation coatings on aluminium

ISO 14125, Fibre-reinforced plastic composites — Determination of flexural properties

ISO 14644-1, ~~*Clean rooms*~~*Cleanrooms* and associated controlled environments — Part 1: ~~*Air Cleanliness*~~ Classification of ~~*particulate matter concentrations*~~*air cleanliness by particle concentration*

ISO 14713-2, Zinc coatings — Guidelines and recommendations for the protection against corrosion of iron and steel in structures — Part 2: Hot dip galvanizing

ISO 16293-2, Glass in building — Basic soda lime silicate glass products — Part 2: Float glass

IEC 62321~~, *Electrotechnical products*~~-3-1, Determination of ~~*levels of six regulated*~~*certain* substances ~~(~~*in electrotechnical products — Part 3-1: Screening test methods — Screening of electrotechnical products for* lead, mercury, cadmium, ~~*hexavalent*~~*total* chromium~~, *polybrominated biphenyls, polybrominated diphenyl ethers*~~) *andtotal bromine using X-ray fluorescence spectrometry*

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IEC 62321-4, *Determination of certain substances in electrotechnical products — Part 4: Determination of mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP- OES and ICP-MS*

EN 59, Glass reinforced plastics — Determination of indentation hardness by means of a Barcol hardness tester

EN 131--3, Ladders — Part 3: Marking and user instructions

EN 10088--2, Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes

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/obphttps://www.iso.org/obp

— ——IEC Electropedia: available at https://www.electropedia.org/https://www.electropedia.org/

3.1
telescopic ladder
ladder consisting of three or more rung/step sections with telescopic stiles

Note 1 to entry: See Figure 1.Figure 1.

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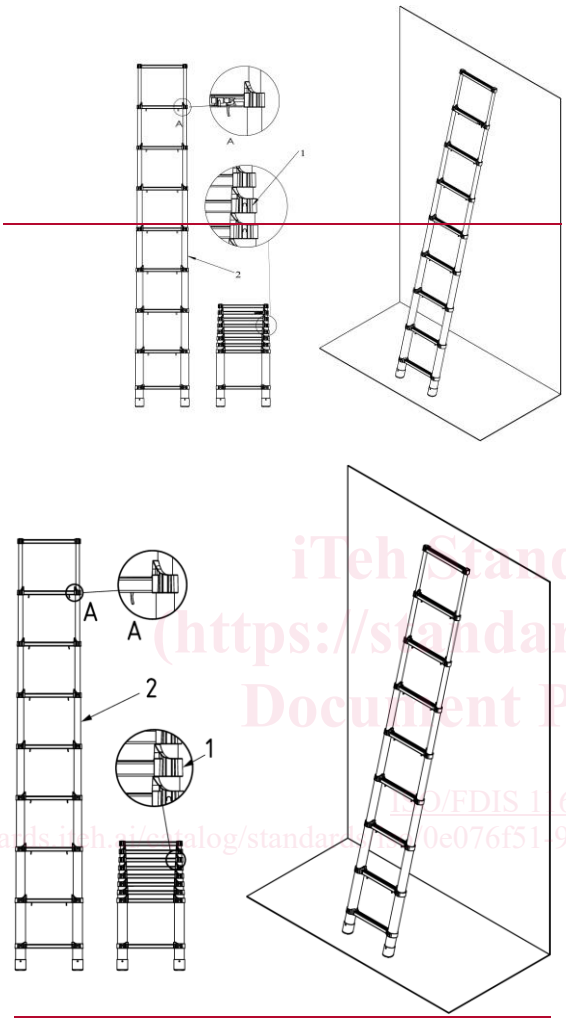

Key

1 bracket
2 stile
3A rung/step section locking mechanism

Figure 1 — Example of structure of a telescopic ladder

3.2
free-standing telescopic ladder
ladder (with rungs or steps) which has its own support with opening restraints.

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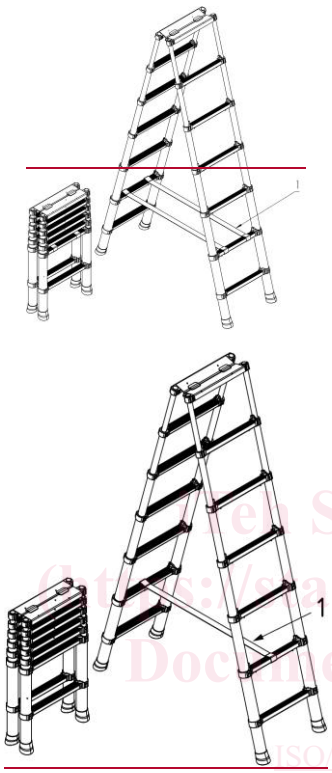
Note 1 to entry: See Figure 2.



Key

1 one of the opening restraints

Figure 2 — Example of structure of free-standing telescopic ladder

3.3
rung/step section
section of ladder that consists of one rung/step connected to two telescopic stiles

3.4
bracket
part that attaches the rung/step to the stile.

Note 1 to entry: See Figure 1.

3.5
locking indicator
mechanism or part that indicates that one rung/step section or part of one rung/step section is locked/unlocked

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3.6
rung/step section locking mechanism
mechanism that locks a rung/step section

Note :-1 to entry: See Figure 1.Figure 1.

3.7
locking pin
part that locks each rung/step section and that is engaged when the locking mechanism is locked

3.8
protection system against squeezing
mechanism or part that minimizes the risk of squeezing when the ladder is shortened

3.9
release function
function which releases the locking mechanism

3.10
ascendable partside
part of the ascending leg consisting only of fully extended rung/step sections

3.11
storage position
position where none of the rung/step sections are extended

3.121.12
~~**working state**~~
~~leaning ladder is fully extended and leaning on a supporting surface, or a standing ladder is fully extended on the ground.~~

~~**3.1.13**~~
acceptance test
contractual test to prove to the customer that the item meets certain conditions of its specification

3.1.13
type test
conformity test made on one or more items representative of the production

4 Technical requirement

4.1 Functional dimension

The size mark of the telescopic ladder is shown in Figure 3,Figure 3, and the numerical relationship between dimensions is shown in Table 1.Table 1. It shall meet the requirements in Table 1.Table 1.

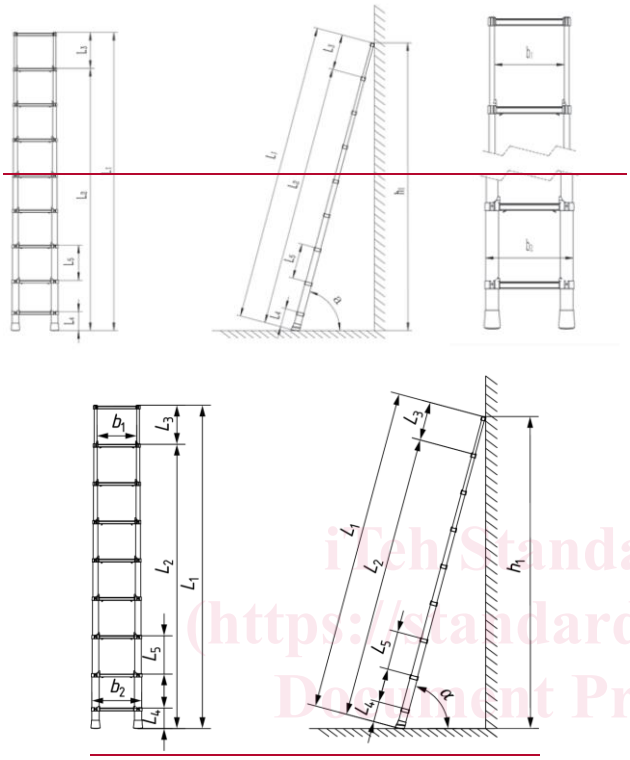

Figure 3- — Dimension of telescopic ladder

Table 1- — Functional sizes

Dimensions in millimetres

	b_1	b_2 where $L_1 < 3\,000$	b_2 Where $L_1 > 3\,000$	L_3 and L_4	L_5	α
min.	280	340	$b_1 + 0{,}1 \times L_1$	0,5 L_5	250	65°
max.	—	—[a]	—[a]	$L_5 + 15$	300	75°

[a] The dimension b_2 for leaning ladders may be limited to a maximum of 1 200 mm at the discretion of the manufacturer.

4.2 Total load

The telescopic ladder is divided into two grades: I and II. The maximum total load that telescopic ladders can bear are shown in ~~Table 2~~Table 2.

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