
Vrv za električna dela - 1. del: Delo v območju pod napetostjo ali v stiku z deli pod napetostjo

Rope for electrical work - Part 1: work within the live working zone or in contact with live parts

Corde pour travaux électriques - Partie 1: Travaux dans la zone de travaux sous tension ou au contact avec des parties actives

Ta slovenski standard je istoveten z: prEN IEC 62192-1:2026

ICS:

13.260	Varstvo pred električnim udarom. Delo pod napetostjo	Protection against electric shock. Live working
29.240.20	Daljnovodi	Power transmission and distribution lines
29.260.99	Druga električna oprema za delo v posebnih razmerah	Other electrical equipment for working in special conditions

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78/1552/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 62192-1 ED1	
DATE OF CIRCULATION: 2026-03-13	CLOSING DATE FOR VOTING: 2026-06-05
SUPERSEDES DOCUMENTS: 78/1540/RR	

IEC TC 78 : LIVE WORKING	
SECRETARIAT: France	SECRETARY: Mr Jonathan HIRTZ
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED: Electricity transmission and distribution, Safety	
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TITLE:

Rope for electrical work – Part 1: work within the live working zone or in contact with live parts

PROPOSED STABILITY DATE: 2028

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**Rope for electrical work –
Part 1: work within the live working zone or in contact with live parts**

FOREWORD

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IEC 62192-1 has been prepared by IEC technical committee 78: Live working. It is an International Standard.

This edition as part 1 cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Define Category 1 insulating ropes which is for direct energized contact (See 3.1.3);
- b) Introduce Type 1 for Extruded Thermoplastic Jacket Ropes and Type 2 for Overlay Finish Ropes (see Introduction);
- c) Title was adapted to cover Category 1 insulating ropes;
- d) Scope was improved (see 1);
- e) Introduction was improved;
- f) Normative references adapted to the new scope (see 2);
- g) Terms and definitions adjusted (see 3);
- h) Requirements reorganized (see 4);
- i) Addition of requirements and tests for the mechanical properties to be performed, and information to be provided by the manufacturer, recognizing that this document specifies the requirements and tests for the electrical properties of a Category 1 insulating rope (see 4.4).
- j) Revision of the test requirements of the insulating ropes which include (see 5.4):
 - 1) Same test setup for dry and wet electrical tests;
 - 2) Electrodes which provide capacitive current shielding and a uniform voltage stress;
 - 3) Equal voltage stresses and reduced leakage currents when testing the rope dry and wet (Type 1);
 - 4) Reduced maximum leakage currents requirement in first minute to avoid mechanical degradation and perceptible shock (Type 2);
 - 5) Requirement to record the applied voltage and resulting leakage current continuously during the test;
- k) The Annexes were reordered, completed and improved to fit the new structure of the document (see Contents)

The text of this International Standard is based on the following documents:

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

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This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at https://www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at <https://www.iec.ch/publications>.

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INTRODUCTION

Category 1 insulating ropes designed and manufactured according to this document contribute to the safety of the users, provided they are used by trained and qualified persons, in accordance with safe methods of work and the instructions for use.

This document defines the required electrical properties of insulating ropes which already meet other specifications relating to mechanical strength, physical and construction properties, for use as an insulating rope, where the dielectric properties of the insulating rope are required or relied upon, at the power frequency system voltages up to and including 800 kV RMS. The standard testing is performed to reflect AC conditions.

Insulating ropes are needed when working in an energized environment whether utilizing direct-contact live working or in work in the live working zone (Category 1). Applications for insulating ropes include but are not limited to general live working methods, pulling, and stringing of conductor, bare hand methods, helicopter human external cargo, tree trimming, rescue and escape, rope access, tag lines and hand lines.

Natural fibres such as cotton, sisal, hemp and manilla or synthetic fibres untreated or uncoated such as nylon, polyester, liquid crystal polymer and aramid may be unsuitable for this application, as are any other ropes that exhibit electrical conductivity. Examples of ropes which are able to meet the requirements of this document are formed from fibres that have an extruded thermoplastic jacket with sealed ends or other form of coating or additives, such as wax, which enhances their dielectric and hydrophobic properties.

The purpose of this document is to focus on the insulating ropes that are used to insulate the workers from direct contact with energized circuits (Category 1). A part 2 document will focus on ropes used outside of the live working zone (Category 2). This document introduces different testing methods for Type 1 and Type 2 (Category 1) insulating ropes with different acceptance criteria.

This document does not propose to address all the safety factors associated with the use of the insulating rope. It is the responsibility of the user to establish appropriate safety practices. The end user is responsible to validate the testing data and reports provided by the supplier and to ensure the conformity and validation prior to choosing an insulating rope and utilizing it in service. The user is responsible for accurately assessing and testing the dielectric properties of the rope in service.

The product covered by this document may have an impact on the environment during some or all stages of its life cycle. These impacts can range from slight to significant, be of short-term or long-term, and occur at the global, regional, or local level.

This document does not include requirements and test provisions for the manufacturers of the product, or recommendations to the users of the product for environmental improvement. However, all parties intervening in its design, manufacture, packaging, distribution, use, maintenance, repair, reuse, recovery, and disposal are invited to take account of environmental considerations.

NOTE from IEC: The following items were listed in the bibliography but not cited in the text. Please find a suitable place to cite them to justify their inclusion in the bibliography:

IEC 60743:2013; *Live working - Terminology for tools, devices and equipment* IEC 60743:2013 [1]

IEEE Guide for Maintenance Methods on Energized Power Lines," in *IEEE Std 516-2021 (Revision of IEEE Std 516-2009)*, vol., no., pp.1-159, 13 Jan. 2022, doi: 10.1109/IEEESTD.2022.9678146. [2]

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ASTM F1701-12(2018), *Standard Specification for Unused Rope with Special Electrical Properties* [ASTM F1701-12\(2018\) \[3\]](#)

CI 1401-19: June 2019, *Recommended Safety Practices for Use of Fiber Rope*, *Cordage Institute* [\[4\]](#)

J. Laninga, "Comparative Analysis of Dielectric Insulating Ropes for Live Working," *2021 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP)*, Vancouver, BC, Canada, 2021, pp. 426-429, doi: 10.1109/CEIDP50766.2021.9705429. [\[5\]](#)

CI 1500-02: May 2016, *Test Methods for Fiber Rope*, *Cordage Institute* [CI 1500-02:2016 \[6\]](#)

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