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Fibre ropes — Electrostatic surface potential measuring method

Cordages en fibres — Méthode de mesurage du potentiel électrostatique de surface

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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 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).

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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 jointly by Technical Committee ISO/TC 38, *Textiles*, and Technical Committee IEC/TC 101, *Electrostatics*. The draft was circulated for voting to the national bodies of both ISO and IEC.

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

Heavy duty ropes can be made from metal wire or synthetic fibre or a combination of these two. Historically, fibre ropes were commonly made of natural fibres such as cotton, flax, etc. Recently, synthetic fibres have been used to make heavy duty ropes. Synthetic fibre ropes are lighter and stronger than steel wire ropes and natural fibre ropes.

However, synthetic fibre can acquire electrostatic charge more easily compared to metal wire ropes or natural fibre ropes.

To overcome this disadvantage, different methods have been applied to the manufacture of synthetic fibre ropes, such as combining them with steel wire or blending with conductive yarn, etc. The development of such ropes has taken place without a standard procedure for evaluating their electrostatic propensity.

This document describes a test method that is used to determine tribocharging of fibre ropes by a specified charging mechanism.

This testing method may not be representative of all possible charging mechanisms that are found in use.

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Fibre ropes — Electrostatic surface potential measuring method

1 Scope

This document specifies a method for determining the electrostatic charging propensity of fibre ropes by measuring the surface potential generated by tribocharging.

This document is not intended to be used to evaluate the safety of ropes for use in explosive atmospheres as safety also depends on application conditions.

The test method described in this document is only applicable to fibre ropes of diameter between 12 mm and 20 mm.

The result obtained using this test method is valid only for the charging mechanism and parameters described in the test method. Charging can be different in end-use applications.

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 630-1, *Structural steels — Part 1: General technical delivery conditions for hot-rolled products*

ISO 1968, *Fibre ropes and cordage — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1968 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 http://www.electropedia.org/

4 Principle

A fibre rope specimen is cut to a designated length and both ends spliced by the short splice method to make an endless loop. The rope specimen loop is mounted in a rope driving apparatus and passes around friction cylinders and a non-contacting electrostatic voltmeter. As the rope makes contact with the friction cylinders, rollers and pulleys, it becomes electrostatically charged. The resulting surface potential is measured by the non-contacting electrostatic voltmeter.

5 Test atmosphere

Unless otherwise agreed or specified, the atmosphere for conditioning and testing shall be a temperature of (23 ± 2) °C and a relative humidity of (25 ± 5) %.

A different temperature or relative humidity may be used as appropriate for different geographical regions, but in any case, the atmosphere for conditioning and testing shall include the lowest relative humidity expected in use.

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