
Testing method for steel tyre cord —
Part 1:
General requirements

Méthode d'essai pour les câbles de pneumatiques en acier —
Partie 1: Exigences générales



This document is a preview generated by EKO



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Dimension	1
4.1 Cord diameter	1
4.1.1 Measure with micrometre	1
4.1.2 Measure with profile projector	3
4.2 Unravelled filament diameter	4
4.2.1 Principle	4
4.2.2 Apparatus	4
4.2.3 Procedure	5
4.2.4 Expression of results	5
4.2.5 Test report	5
4.3 Linear density	5
4.3.1 Principle	5
4.3.2 Apparatus	5
4.3.3 Procedure	6
4.3.4 Test report	6
4.4 Lay direction and lay length	6
4.4.1 Lay direction/direction of lay	6
4.4.2 Trace method for lay length	6
4.4.3 Untwisting method for lay length	8
5 Process property	9
5.1 Straightness	9
5.1.1 Principle	9
5.1.2 Apparatus	9
5.1.3 Procedure	9
5.1.4 Test report	9
5.2 Arc height	9
5.2.1 Principle	9
5.2.2 Apparatus	10
5.2.3 Procedure	10
5.2.4 Test report	10
5.3 Flare	10
5.3.1 Principle	10
5.3.2 Apparatus	10
5.3.3 Procedure	10
5.3.4 Test report	11
5.4 Residual torsion	11
5.4.1 Principle	11
5.4.2 Apparatus	11
5.4.3 Procedure	11
5.4.4 Test report	11
6 Mechanical property	12
6.1 Breaking load and elongation at fracture	12
6.1.1 Principle	12
6.1.2 Apparatus	12
6.1.3 Procedure	12
6.1.4 Test report	13
6.2 Elongation between defined forces (EDF)	13
6.2.1 Principle	13

6.2.2	Apparatus.....	14
6.2.3	Procedure.....	15
6.2.4	Test report.....	15
6.3	Loop test (Elasticity).....	15
6.3.1	Principle.....	15
6.3.2	Apparatus.....	15
6.3.3	Procedure.....	16
6.3.4	Test report.....	17
7	Determination of mass and composition of coating by X-Ray fluorescence spectroscopy	17
7.1	Principle.....	17
7.2	Apparatus.....	17
7.2.1	WDXRFS or EDXRFS.....	17
7.2.2	Analytical balance, which can be read to the nearest 0,001 g.....	17
7.2.3	Dispenser, with the accuracy of 25,00 ml ± 0,05 ml.....	17
7.2.4	X/Y shaker, with variable frequency.....	17
7.3	Reagents.....	17
7.3.1	Acetone or diethyl ether.....	17
7.3.2	Ammonium persulphate (mass fraction >98 %).....	17
7.3.3	Ammonia (mass fraction >25 %, not more than “ <i>d</i> =0,91” at temperature 20 °C).....	17
7.3.4	Stripping solution, for 1 l: weigh 16 g ammonia persulphate into a beaker of 600 ml and dissolve in 400 ml demineralized water. Transfer quantitatively into a 1 l volumetric flask. Add 120 ml ammonia. Fill up to the mark with demineralized water. Shake well.....	17
7.3.5	Standard, the matrix and range should cover the sample range. Prepare the calibration standards according to the XRFS user’s manual or according to an example in Table 1	17
7.4	Preparation of test samples.....	18
7.5	Procedure.....	18
7.6	Expression of results.....	18
7.7	Test report.....	19

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).

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.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 17, *Steel wire rod and wire products*.

A list of all parts in the ISO 23475 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.

Testing method for steel tyre cord —

Part 1: General requirements

1 Scope

This document specifies test methods of steel cords which are used for tyre reinforcement. Dimension, process properties, mechanical properties and coating test method are all included.

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 17832, *Non-parallel steel wire and cords for tyre reinforcement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17832 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 Dimension

4.1 Cord diameter

4.1.1 Measure with micrometre

4.1.1.1 Principle

Hold the sample between two parallel circular faced anvils of a micrometre. Close the movable anvil gradually and gently until it is in contact with the specimen. Read the value on the micrometre.

4.1.1.2 Apparatus

4.1.1.2.1 Micrometre

A precision disk micrometre with non-rotate spindle is suggested. This micrometre may have a hole (maximum 8 mm) in the centre of the anvils (see [Figure 1](#)).

Measuring range is from 0 mm to 25 mm. Resolution is 0,001 mm.

Anvil type: the diameter of the anvils shall be greater than one lay length (min. 20 mm in diameter). Measuring force range: <10 N. It is suggested from 3 N to 5 N.