



**International
Standard**

ISO 12046

**Synchronous belt drives —
Automotive belts — Determination
of physical properties**

*Transmissions synchrones par courroies — Courroies pour la
construction automobile — Détermination des caractéristiques
physiques*

**Third edition
2025-01**

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 12046:2025](https://standards.iteh.ai/catalog/standards/iso/33753e97-28be-41a7-81d1-6476025a8a81/iso-12046-2025)

<https://standards.iteh.ai/catalog/standards/iso/33753e97-28be-41a7-81d1-6476025a8a81/iso-12046-2025>

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 12046:2025](https://standards.iteh.ai/catalog/standards/iso/33753e97-28be-41a7-81d1-6476025a8a81/iso-12046-2025)

<https://standards.iteh.ai/catalog/standards/iso/33753e97-28be-41a7-81d1-6476025a8a81/iso-12046-2025>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

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.....	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Test methods	1
6 General conditions for testing	2
6.1 Standard environmental conditions.....	2
6.2 Standard conditions of test specimens.....	2
6.3 Rounding off the test results.....	2
6.4 Test report.....	2
7 Static property tests	3
7.1 Test for hardness of rubber core.....	3
7.1.1 Test specimens.....	3
7.1.2 Procedure.....	3
7.1.3 Expression of results.....	3
7.2 Tensile strength test.....	3
7.2.1 Test specimens.....	3
7.2.2 Procedure.....	3
7.2.3 Expression of results.....	4
7.3 Fabric adhesion test.....	4
7.3.1 Test specimens.....	4
7.3.2 Procedure.....	4
7.3.3 Expression of results.....	4
7.4 Tension-cord adhesion test.....	5
7.4.1 Test specimens.....	5
7.4.2 Procedure.....	6
7.4.3 Expression of results.....	6
7.5 Tooth-shear test.....	6
7.5.1 Test specimens.....	6
7.5.2 Apparatus.....	6
7.5.3 Tooth-shearing chip.....	7
7.5.4 Procedure.....	9
7.5.5 Expression of results.....	9
7.6 Test for resistance to high temperature.....	9
7.6.1 Test specimens.....	9
7.6.2 Procedure.....	10
7.7 Test for resistance to low temperature.....	10
7.7.1 Test specimens.....	10
7.7.2 Procedure.....	10
7.8 Test for resistance to oil.....	10
7.8.1 Test specimens.....	10
7.8.2 Procedure.....	10
7.9 Test for resistance to ozone.....	10
7.9.1 Test specimens.....	10
7.9.2 Procedure.....	10
7.10 Test for resistance to water.....	10
7.10.1 Test specimens.....	10
7.10.2 Procedure.....	11

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 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 4, *Synchronous belt drives*.

This third edition cancels and replaces the second edition (ISO 12046:2012), which has been technically revised.

The main changes are as follows:

- [Clause 2](#) has been updated;
- volumetric units have been clarified ([7.9.2](#)).

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.

Synchronous belt drives — Automotive belts — Determination of physical properties

1 Scope

This document specifies test methods for determining the physical properties of synchronous belts used in driving engine parts, such as camshafts, fuel injection pumps, balancing shafts. These test methods are intended to provide a means of characterizing synchronous belt properties for belts which are evaluated and qualified by dynamic laboratory and field testing.

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 48-2, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 5288, *Synchronous belt drives — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5288 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Principle

The objective of the test methods covered in this document is the evaluation of the physical properties of automotive synchronous belts through standardized testing. These test methods are independent of tooth profiles.

5 Test methods

The tests covered in this document are listed in [Table 1](#).

Table 1 — Tests

Test	Subclause
Hardness of rubber core	7.1
Tensile strength	7.2
Fabric adhesion	7.3
Tension-cord adhesion	7.4
Tooth shear	7.5
Resistance to high temperature	7.6
Resistance to low temperature	7.7
Resistance to oil	7.8
Resistance to ozone	7.9
Resistance to water	7.10

6 General conditions for testing

6.1 Standard environmental conditions

Standard conditions in the laboratory shall be maintained at a temperature of (25 ± 5) °C, a relative humidity of (65 ± 20) % and an atmospheric pressure of 86 kPa to 106 kPa. The test conditions should be recorded.

6.2 Standard conditions of test specimens

The test specimens shall be tested at least 16 h after vulcanization and shall be kept for at least 1 h prior to test in a room maintained under standard conditions.

6.3 Rounding off the test results

The results of each test shall be rounded off. Results shall be recorded according to the number of figures specified in [Table 2](#).

Table 2 — Rounding off of results

Test	Unit	Measured test value	Test results to be obtained
Hardness of rubber core	Shore A or IRHD	Integer	Integer
Tensile strength	N	Nearest 10	Nearest 100
Fabric adhesion	N	Integer	Integer
Tension-cord adhesion	N	Nearest 10	Nearest 10
Tooth shear	N	Nearest 10	Nearest 10
EXAMPLES	Nearest tens 3 474 → 3 470 3 475 → 3 480	Nearest hundreds 3 440 → 3 400 3 450 → 3 500	

6.4 Test report

For each test, the test report shall include the following information:

- number of teeth, pitch, tooth profile and width of specimen;
- constituent materials of specimen;
- production code of specimen;
- date of test;
- number of specimens;