

<b>STN</b>	<b>Plasty</b> <b>Materiály z etylén-vinylalkoholového (EVOH)</b> <b>kopolyméru na tvárnenie a vytlačanie</b> <b>Časť 2: Príprava skúšobných telies a stanovenie</b> <b>vlastností (ISO 21309-2: 2019)</b>	<b>STN</b> <b>EN ISO 21309-2</b>  64 3320
------------	---	--

Plastics - Ethylene/vinyl alcohol (EVOH) copolymer moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 21309-2:2019)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/19

Obsahuje: EN ISO 21309-2:2019, ISO 21309-2:2019

Oznámením tejto normy sa ruší  
STN EN ISO 14663-2 (64 3320) zo septembra 2006

**129260**

EUROPEAN STANDARD

**EN ISO 21309-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2019

ICS 83.080.20

English Version

Plastics - Ethylene/vinyl alcohol (EVOH) copolymer  
moulding and extrusion materials - Part 2: Preparation of  
test specimens and determination of properties (ISO  
21309-2:2019)

Plastiques - Matériaux à base de copolymères  
éthylène/alcool vinylique (EVOH) pour moulage et  
extrusion - Partie 2: Préparation des éprouvettes et  
détermination des propriétés (ISO 21309-2:2019)

Kunststoffe - Ethylen-Vinylalkohol (EVOH)-Copolymer-  
Werkstoffe - Teil 2: Herstellung von Probekörpern und  
Bestimmung von Eigenschaften (ISO 21309-2:2019)

This European Standard was approved by CEN on 1 February 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN ISO 21309-2:2019 (E)**

<b>Contents</b>	<b>Page</b>
<b>European foreword.....</b>	<b>3</b>
<b>Endorsement notice .....</b>	<b>3</b>

## **European foreword**

This document (EN ISO 21309-2:2019) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2019, and conflicting national standards shall be withdrawn at the latest by September 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 14663-2:2006.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Endorsement notice**

The text of ISO 21309-2:2019 has been approved by CEN as EN ISO 21309-2:2019 without any modification.

**INTERNATIONAL  
STANDARD**

**ISO  
21309-2**

First edition  
2019-02

---

---

**Plastics — Ethylene/vinyl alcohol  
(EVOH) copolymer moulding and  
extrusion materials —**

**Part 2:  
Preparation of test specimens and  
determination of properties**

*Plastiques — Matériaux à base de copolymères éthylène/alcool  
vinylique (EVOH) pour moulage et extrusion —*

*Partie 2: Préparation des éprouvettes et détermination des propriétés*



Reference number  
ISO 21309-2:2019(E)

© ISO 2019

**ISO 21309-2:2019(E)****COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

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  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Preparation of test specimens</b> .....	<b>3</b>
4.1 General.....	3
4.2 Treatment of the material before moulding.....	3
4.3 Injection moulding.....	3
4.4 Preparation of film specimens.....	4
<b>5 Conditioning of test specimens</b> .....	<b>4</b>
5.1 General.....	4
5.2 Dry-as-moulded (DAM) state.....	4
5.3 Moist state.....	4
5.4 Film conditioning.....	4
<b>6 Determination of properties</b> .....	<b>5</b>
<b>Annex A (normative) Determination of volatile matter (including water)</b> .....	<b>7</b>
<b>Annex B (normative) Determination of ethylene content</b> .....	<b>9</b>
<b>Annex C (normative) Determination of steady-state rate of transmission of oxygen gas through ethylene/vinyl alcohol copolymer in the form of film using a coulometric sensor</b> .....	<b>13</b>

## ISO 21309-2:2019(E)

### 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](http://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](http://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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This first edition of ISO 21309-2 cancels and replaces ISO 14663-2:1999, which has been technically revised. The main changes compared to the previous edition are as follows:

- the number of the standard has been changed;
- the normative references have been updated.

A list of all parts in the ISO 21309 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](http://www.iso.org/members.html).



# Plastics — Ethylene/vinyl alcohol (EVOH) copolymer moulding and extrusion materials —

## Part 2: Preparation of test specimens and determination of properties

### 1 Scope

This document specifies the methods of preparation of test specimens and the test methods to be used in determining the properties of ethylene/vinyl alcohol (EVOH) copolymer moulding and extrusion materials. It gives requirements for handling test material and for conditioning both the test material before moulding and the specimens before testing.

This document describes procedures and conditions for the preparation of test specimens, and procedures for measuring properties of the materials from which these specimens are made. Properties and test methods which are suitable and necessary to characterize EVOH moulding and extrusion materials are listed in this document.

The properties have been selected from the general test methods in ISO 10350-1. Other test methods in wide use for or of particular significance to these moulding and extrusion materials are also included in this document, as is the melt mass-flow rate designatory property specified in ISO 21309-1.

In order to obtain reproducible and comparable test results, it is intended to use the methods of specimen preparation and conditioning, the specimen dimensions and the test procedures specified herein. Values determined will not necessarily be identical to those obtained using specimens of different dimensions or prepared using different procedures.

### 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 75-1:2013, *Plastics — Determination of temperature of deflection under load — Part 1: General test method*

ISO 75-2:2013, *Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite*

ISO 178, *Plastics — Determination of flexural properties*

ISO 179-1:2010, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test*

ISO 180:2000, *Plastics — Determination of Izod impact strength*

ISO 291:2008, *Plastics — Standard atmospheres for conditioning and testing*

ISO 294-2, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 2: Small tensile bars*

ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

**ISO 21309-2:2019(E)**

ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles*

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 899-1, *Plastics — Determination of creep behaviour — Part 1: Tensile creep*

ISO 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method*

ISO 1183-1:2012, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pyknometer method and titration method*

ISO 2039-2, *Plastics — Determination of hardness — Part 2: Rockwell hardness*

ISO 3146:2000, *Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods*

ISO 3451-1:2008, *Plastics — Determination of ash — Part 1: General methods*

ISO 10350-1, *Plastics — Acquisition and presentation of comparable single-point data — Part 1: Moulding materials*

ISO 20753, *Plastics — Test specimens*

ISO 21309-1, *Plastics — Ethylene/vinyl alcohol (EVOH) copolymer moulding and extrusion materials — Part 1: Designation system and basis for specifications*

IEC 60112, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60243-1, *Electrical strength of solid insulating materials — Test methods — Part 1: Tests at power frequencies*

IEC 60250, *Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths*

IEC 60296, *Specification for unused mineral insulating oils for transformers and switchgear*

IEC 60695-11-10, *Fire hazard testing — Part 11-10: Test flames — 50 W horizontal and vertical flame test methods*

IEC 62631-3-1, *Dielectric and resistive properties of solid insulating materials — Part 3-1: Determination of resistive properties (DC methods) — Volume resistance and volume resistivity — General method*

IEC 62631-3-2, *Dielectric and resistive properties of solid insulating materials — Part 3-2: Determination of resistive properties (DC methods) — Surface resistance and surface resistivity*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**