

|            |                                                                                                                                                                                                                                                  |                                                    |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>STN</b> | <b>Plasty</b><br><b>Stanovenie priemernej molekulovej hmotnosti a</b><br><b>distribúcie molekulových hmotností gélovou</b><br><b>permeačnou chromatografiou</b><br><b>Časť 5: Metóda detekcie rozptylom svetla (ISO</b><br><b>16014-5: 2019)</b> | <b>STN</b><br><b>EN ISO 16014-5</b><br><br>64 0180 |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|

Plastics - Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography - Part 5: Light-scattering method (ISO 16014-5:2019)

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. 12/19

Obsahuje: EN ISO 16014-5:2019, ISO 16014-5:2019

Oznámením tejto normy sa ruší  
STN EN ISO 16014-5 (64 0180) z januára 2013

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 16014-5**

June 2019

ICS 83.080.01

Supersedes EN ISO 16014-5:2012

English Version

**Plastics - Determination of average molecular weight and  
molecular weight distribution of polymers using size-  
exclusion chromatography - Part 5: Light-scattering  
method (ISO 16014-5:2019)**

Plastiques - Détermination de la masse moléculaire  
moyenne et de la distribution des masses moléculaires  
de polymères par chromatographie d'exclusion  
stérique - Partie 5: Méthode par diffusion lumineuse  
(ISO 16014-5:2019)

Kunststoffe - Bestimmung der durchschnittlichen  
Molmasse und der Molmassenverteilung von  
Polymeren mittels Gelpermeationschromatographie -  
Teil 5: Lichtstreuendetektionsverfahren (ISO 16014-  
5:2019)

This European Standard was approved by CEN on 26 May 2019.

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**EN ISO 16014-5:2019 (E)**

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## **European foreword**

This document (EN ISO 16014-5:2019) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

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 December 2019, and conflicting national standards shall be withdrawn at the latest by December 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.

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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 16014-5:2019 has been approved by CEN as EN ISO 16014-5:2019 without any modification.

# INTERNATIONAL STANDARD

**ISO**  
**16014-5**

Second edition  
2019-05

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## **Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography —**

### **Part 5: Light-scattering method**

*Plastiques — Détermination de la masse moléculaire moyenne  
et de la distribution des masses moléculaires de polymères par  
chromatographie d'exclusion stérique —*

*Partie 5: Méthode par diffusion lumineuse*



Reference number  
ISO 16014-5:2019(E)

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Published in Switzerland

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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](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)).

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

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 16014-5:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

- publication dates of references have been removed;
- molecular mass has been changed to molecular weight according to IUPAC rule.

A list of all parts in the ISO 16014 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 — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography —

## Part 5: Light-scattering method

### 1 Scope

This document specifies a general method for determining the average molecular weight and the molecular weight distribution of polymers using SEC-LS, i.e. size-exclusion chromatography coupled with light-scattering detection. The average molecular weight and the molecular weight distribution are calculated from molecular weight data and weight concentrations determined continuously with elution time. The molecular weight at each elution time is determined absolutely by combining a light-scattering detector with a concentration-sensitive detector. Therefore, SEC-LS is classified as an absolute method.

This method is applicable to linear homopolymers and to nonlinear homopolymers such as branched, star-shaped, comb-like, stereo-regular and stereo-irregular polymers. It can also be applied to heterophasic copolymers whose molecular composition cannot vary. However, SEC-LS is not applicable to block, graft or heterophasic copolymers whose molecular composition can vary. And the methods are applicable to molecular weights ranging from that of the monomer to 3 000 000, but are not intended for samples that contain > 30 % of components having a molecular weight < 1 000.

### 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 472, *Plastics — Vocabulary*

ISO 16014-1, *Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 1: General principles*

ISO 16014-2, *Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 2: Universal calibration method*

ISO 16014-3, *Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 3: Low-temperature method*

ISO 16014-4, *Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 4: High-temperature method*

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