



Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 13206:2017

**Plastics - Thermoplastic covering films
for use in agriculture and horticulture**

Kunststoffe - Thermoplastische
Abdeckfolien für den Einsatz in der
Landwirtschaft und im Gartenbau

Plastiques - Films de couverture
thermoplastiques pour utilisation en
agriculture et horticulture

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National Foreword

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**Plastics - Thermoplastic covering films for use in
agriculture and horticulture**

Plastiques - Films de couverture thermoplastiques
pour utilisation en agriculture et horticulture

Kunststoffe - Thermoplastische Abdeckfolien für den
Einsatz in der Landwirtschaft und im Gartenbau

This European Standard was approved by CEN on 14 November 2016.

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European foreword

This document (EN 13206:2017) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

This document supersedes EN 13206:2001.

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of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

The following technical changes have been made in comparison to EN 13206:2001:

- a minimum thickness of the film is fixed;
- the test methods have been updated as appropriate;
- this revision specifies also test methods for the determination of the chlorine and sulfur contents of the films subjected to use and defines guidelines for installation, use and disposal;
- the classification for the durability of the covering films is extended to a further class.

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

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.

1 Scope

This European Standard specifies the requirements related to dimensional, mechanical, optical and thermal characteristics of thermoplastic films used for covering permanent or temporary greenhouses and walking tunnels and low tunnels used for forcing and semi-forcing vegetable, fruit and flower crops.

Lay-flat perforated cover films are also in the scope of this European Standard.

It specifies a classification for the durability of covering films and the test methods referred to in this standard.

This European Standard specifies also test methods for the determination of the chlorine and sulfur contents of films subjected to use.

This European Standard is applicable to thermoplastic covering films used in agriculture and horticulture in Europe, in the thickness range 20 µm up to more than 250 µm, based on polyethylene and/or ethylene copolymers materials, of the following types: non-thermal films, thermal clear films and thermal diffusing films.

This European Standard also defines guidance for installation, use and disposal of covering films. It defines the conventional expected lifetime, as well as rules that allow evaluating the remaining use potential in the event of a failure before the normal end-of-use date.

NOTE These rules allow estimating the residual value of the films. These provisions only apply to the film itself and the damage it has undergone. Any other problem falls within the scope of professional practices and the general terms and conditions of sale.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10244-2, *Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 2: Zinc or zinc alloy coatings*

EN 13031-1, *Greenhouses - Design and construction - Part 1: Commercial production greenhouses*

EN 16472, *Plastics - Method for artificial accelerated photoageing using medium pressure mercury vapour lamps*

EN ISO 527-1, *Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1)*

EN ISO 527-3, *Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets (ISO 527-3)*

EN ISO 4892-2:2013, *Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps (ISO 4892-2:2013)*

EN ISO 4892-3:2016, *Plastics - Methods of exposure to laboratory light sources - Part 3: Fluorescent UV lamps (ISO 4892-3)*

EN ISO 7765-1:2004, *Plastics film and sheeting - Determination of impact resistance by the free-falling dart method - Part 1: Staircase methods (ISO 7765-1:1988)*

ISO 4591, *Plastics — Film and sheeting — Determination of average thickness of a sample, and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness)*

ISO 4592, *Plastics — Film and sheeting — Determination of length and width*

ISO 4593, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning*

ASTM D 1003-13, *Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

width

overall width of a film when laid flat

Note 1 to entry: It is expressed in millimetres.

3.2

nominal width

width of a film, as declared by the manufacturer/supplier

Note 1 to entry: It is expressed in millimetres.

3.3

nominal thickness

thickness of a film, as declared by the manufacturer/supplier

Note 1 to entry: It is expressed in micrometres (μm).

3.4

roll length

largest dimension of the film corresponding to the length of the unwinded roll

Note 1 to entry: It is expressed in metres.

3.5

nominal length

length of a film roll or sheet, as declared by the manufacturer/supplier

Note 1 to entry: It is expressed in metres.

3.6

nominal mass

mass of a roll or sheet, as declared by the manufacturer/supplier

Note 1 to entry: It is expressed in kilograms.

3.7

longitudinal direction

MD

direction parallel to the roll length, corresponding to the extrusion direction

3.8

transverse direction

TD

direction parallel to the width (at right angle to the length)

3.9**conventional expected lifetime**

expected lifetime defined by agreement between the manufacturer/supplier and the customer or, by default, the minimum use duration that the film needs to satisfy

Note 1 to entry: It is expressed in years, months or seasons.

3.10**actual useful lifetime**

time interval defined as beginning from the installation date of a film until its removal or an earlier date in case of its failure

Note 1 to entry: It is expressed in months, years or seasons.

3.11**use ratio**

ratio of the actual useful lifetime of a film to its conventional expected lifetime

Note 1 to entry: It is expressed as a dimensionless ratio or as a percentage (%).

3.12**remaining use potential**

difference between the conventional expected lifetime of a film and its actual useful lifetime

Note 1 to entry: It is expressed in months.

3.13**radiant exposure** **H**

time integral of irradiance, measured in joules per square metre (J/m^2)

[SOURCE: ISO 9370:2009 [1], definition 3.27]

4 Types and use

The different types of covering films, their optical and thermal characteristics and use are given in Table 1.

Table 1 — Characteristics and use of covering films

Type	Optical and thermal characteristics	Use
Non-thermal (NTh)	Low IR effectiveness	Forcing and semi forcing crops
Thermal clear (ThC)	High transparency High IR effectiveness	Same use as normal film, when higher IR effectiveness is requested
Thermal diffusing (ThD)	Diffusing light High IR effectiveness	Same use as normal film, when higher IR effectiveness and diffusing light effect are requested