SLOVENSKI STANDARD
SIST EN 13900-6:2014

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Pigmenti in polnila - Metode disperzije in ugotavljanje disperzivnosti v plastičnih masah - 6. del: Ugotavljanje s preskusom prevleke

Pigments and extenders - Methods of dispersion and assessment of dispersability in plastics - Part 6: Determination by film test

Pigmente und Füllstoffe - Dispergierverfahren und Beurteilung der Dispergierbarkeit in Kunststoffen - Teil 6: Bestimmung mit dem Folientest

Pigments et matières de charge - Méthodes de dispersion et évaluation de l'aptitude à la dispersion dans les plastiques - Partie 6: Détermination par essai de film

Ta slovenski standard je istoveten z: **EN 13900-6:2012**

ICS:

83.040.30	Pomožni materiali in aditivi za polimerne materiale	Auxiliary materials and additives for plastics

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Pigments and extenders - Methods of dispersion and assessment of dispersability in plastics - Part 6: Determination by film test

Pigments et matières de charge - Méthodes de dispersion et évaluation de l'aptitude à la dispersion dans les plastiques - Partie 6: Détermination par essai de film

Pigmente und Füllstoffe - Dispergierverfahren und Beurteilung der Dispergierbarkeit in Kunststoffen - Teil 6: Bestimmung mit dem Folientest

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Foreword

This document (EN 13900-6:2012) has been prepared by Technical Committee CEN/TC 298 “Pigments and extenders”, 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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.

EN 13900, *Pigments and extenders — Methods of dispersion and assessment of dispersibility in plastics*, contains the following parts:

— *Part 1: General introduction*;

— *Part 2: Determination of colouristic properties and ease of dispersion in plasticized polyvinyl chloride by two-roll milling*;

— *Part 3: Determination of colouristic properties and ease of dispersion of black and colour pigments in polyethylene by two-roll milling*;

— *Part 4: Determination of colouristic properties and ease of dispersion of white pigments in polyethylene by two-roll milling*;

— *Part 5: Determination by filter pressure value test*;

— *Part 6: Determination by film test* (the present document).

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a method assessing the degree of dispersion of colorants[1)] and/or extenders in a thermoplastic polymer.

The method is suitable for testing colorants and/or extenders in the form of concentrates or compounds in all polymers used for extrusion processes.

NOTE Defects like gels, black specks, holes in the test film etc. are not in the scope of this standard.

The film test result determined according to this method is valid only for the equipment, conditions and test polymer being used. The use of test conditions differing from those specified might give different results. The preparation methods of concentrates or compounds are not specified in this standard. The results obtained for individual colorants and/or extenders are therefore comparable only when the same conditions of preparation for concentrates or compounds and a comparable detection system are used.

2 Terms and definitions

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

2.1
speck
defect caused by agglomerates, aggregates and primary particles of the colorant and/or extender, impurities of basic test polymer

2.2
primary particle of the colorant
smallest single unit detectable by physical methods

Note 1 to entry: Suitable physical methods are, for example, optical and electron microscopy.

2.3
aggregate
particle comprising strongly bonded or fused particles where the resulting external surface area may be significantly smaller than the sum of calculated surface areas of the individual components

Note 1 to entry: The forces holding an aggregate together are strong forces, for example, covalent bonds, or those resulting from sintering or complex physical entanglement.

Note 2 to entry: Aggregates are also termed secondary particles and the original source particles are termed primary particles.

[SOURCE: ISO/TS 27687:2008, 3.3]

2.4
agglomerate
collection of weekly bound particles or aggregates or mixtures of the two where the resulting external surface area is similar to the sum of the surface areas of the individual components

Note 1 to entry: The forces holding an agglomerate together are weak forces, for example van der Waals forces, or simple physical entanglement.

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1) For the definition of colorant see, ISO 4618:2006, 2.58 colouring material.

Note 2 to entry: Agglomerates are also termed secondary particles and the original source particles are termed primary particles.

[SOURCE: ISO/TS 27687:2008, 3.2]

2.5
total speck size range
specified upper and lower limits of particle sizes

2.6
speck size class
one or more categories defined by a minimum and maximum value of speck sizes within the total speck size range

2.7
inspected film area
film area from the beginning to the end of the measurement

Note 1 to entry: The unit is square metres.

2.8
speck area ratio
total speck area divided by inspected film area

Note 1 to entry: The unit is mm^2/m^2.

2.9
transmission illumination
illumination whereby light source and optical sensor are arranged on opposite sides of the film

2.10
pixel
smallest image-forming element to which a grey level is assigned

[SOURCE: ISO 21227-1:2003, 3.4.5]

2.11
grey level
shade of grey assigned to a pixel

Note 1 to entry: The shades are usually positive integer values taken from the grey scale.

[SOURCE: ISO 21227-1:2003, 3.4.7]

2.12
grey scale
series of grey levels between white and black

EXAMPLE The 8-bit grey scale has 2^8 (=256) grey levels. Grey level 0 corresponds to black, grey level 255 (the 256^{th} level) to white.

[SOURCE: ISO 21227-1:2003, 3.4.8]

2.13
resolution
number of pixels per unit length on the surface of an object

Note 1 to entry: If the resolution in the X- and Y-direction is different, both values have to be reported.

[SOURCE: ISO 21227-1:2003, 3.4.6]

2.14
brightness
average grey level of a specified part of the image

[SOURCE: ISO 21227-1:2003, 3.5.3]

2.15
contrast
difference between the grey levels of two specified parts of the image

[SOURCE: ISO 21227-1:2003, 3.5.4]

2.16
calibration film
film with specified amount of defects which has already been assessed

Note 1 to entry: It is used to check the reproducibility and repeatability of the parameter settings.

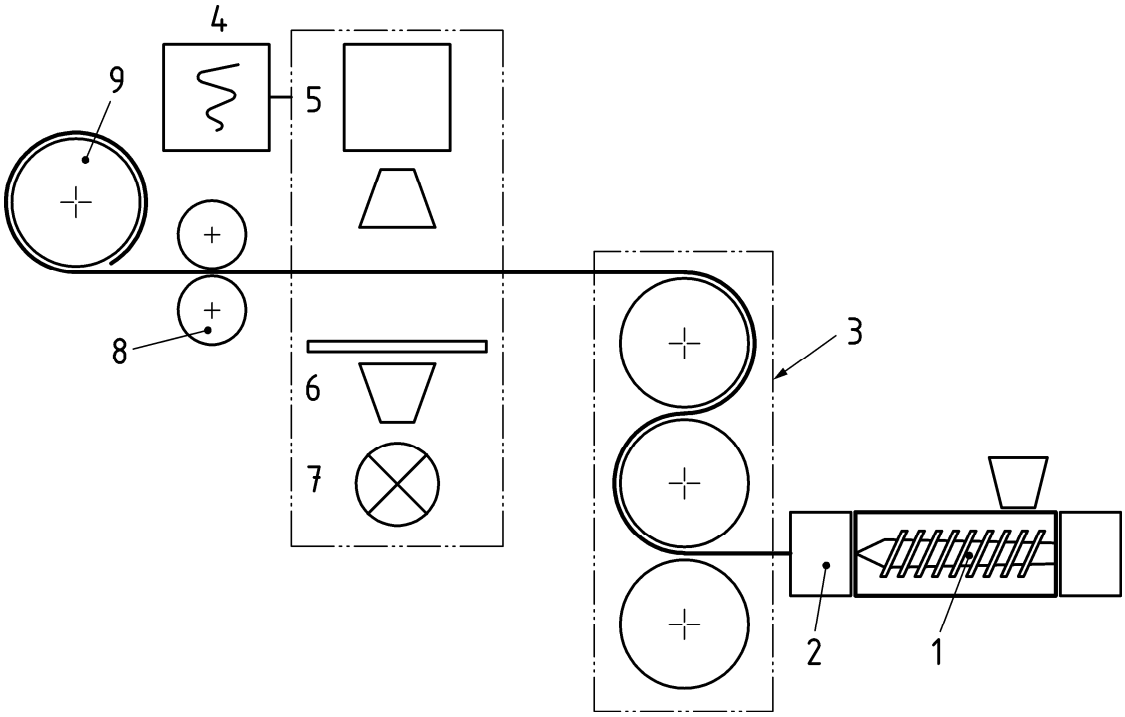
3 Principle

The test mixture, consisting of a colour concentrate and a basic test polymer or the compound, is passed through an extruder fitted with a blown film unit or a cast film unit followed by appropriate downstream equipment.

After extrusion, the transmission illumination enables the detection of specks within the film by means of a camera inspection system.

The resulting variations in contrast or brightness, caused by the presence of particles (primary particles, aggregates, agglomerates), are assessed using appropriate software.

Figure 1 illustrates the principle construction of the apparatus.



Key

1 extruder
2 die
3 take off unit[2)]
4 data processing
5 camera system
6 diffuser, optional
7 light source
8 speed determination[3)]
9 winder

Figure 1 — Scheme for cast film extrusion

4 Materials

4.1 Concentrate

Homogeneous preparation of colorants and/or extenders in an appropriate thermoplastic polymer.

4.2 Basic test polymer

Thermoplastic polymer of a type and grade to be agreed between the interested parties, preferably of a film grade.

NOTE The development work on this standard was carried out in low density polyethylene (LDPE).

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2) Take off units with two rollers are also possible.

3) Different kinds of speed controller systems are possible.