SLOVENSKI STANDARD

SIST EN 15342:2008

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Polimerni materiali - Reciklirani polimerni materiali - Karakterizacija recikliranega polistirena (PS)

Plastics - Recycled Plastics - Characterization of polystyrene (PS) recyclates

Kunststoffe - Kunststoff-Rezyklate - Charakterisierung von Polystyrol (PS)-Rezyklaten

Plastiques - Plastiques recyclés - Caractérisation des recyclats de polystyrene (PS)

Ta slovenski standard je istoveten z: **EN 15342:2007**

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Plastics - Recycled Plastics - Characterization of polystyrene (PS) recyclates

Plastiques - Plastiques recyclés - Caractérisation des recyclats de polystyrène (PS)

Kunststoffe - Kunststoff-Rezyklate - Charakterisierung von Polystyrol (PS)-Rezyklaten

This European Standard was approved by CEN on 25 October 2007.

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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 Management Centre has the same status as the official versions.

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Contents

Page

Foreword

This document (EN 15342:2007) has been prepared by 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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

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.

This standard is one part of series of CEN publications on Plastics Recycling which is structured as follows:

— EN 15342 Plastics—Recycled Plastics—Characterization of polystyrene (PS) recyclates

— EN 15343 Plastics—Recycled Plastics—Plastics recycling traceability and assessment of conformity and recycled content

— EN 15344 Plastics—Recycled Plastics—Characterisation of Polyethylene (PE) recyclates

— EN 15345 Plastics—Recycled Plastics—Characterisation of Polypropylene (PP) recyclates

— EN 15346 Plastics—Recycled plastics—Characterisation of poly(vinyl chloride) (PVC) recyclates

— EN 15347 Plastics — Recycled Plastics — Characterisation of plastics wastes

— EN 15348 Plastics—Recycled plastics—Characterization of poly(ethylene terephthalate) (PET) recyclates

— CEN/TR 15353 Plastics — Recycled plastics — Guidelines for the development of standards for recycled plastics

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Recycling of plastics waste is one type of material recovery process intended to save resources (virgin raw materials, water, and energy), while minimising harmful emissions into air, water and soil as well as any impacts on human health. The environmental impact of recycling has to be assessed over the whole life cycle of the recycling system (from the waste generation point to the disposal of final residues). To ensure that recycling constitutes the best environmental option for treating the available waste, some prerequisites should preferably be met:

— recycling scheme being contemplated should generate lower environmental impacts than alternative recovery options;

— existing or potential market outlets should be identified that will secure a sustainable industrial recycling operation;

— collection and sorting schemes should be properly designed to deliver recyclable plastics waste fractions fitting reasonably well with the available recycling technologies and with the (changing) needs of the identified market outlets, preferably at minimum costs to society.

This standard has been produced in accordance with the guidance produced by CEN on Environmental Aspects and in accordance with CEN/TR 15353, Plastics - Recycled plastics - Guidelines for the development of standards for recycled plastics.

NOTE CEN/TR 15353 considers the general environmental aspects which are specific to the recycling process.

It is often impossible to trace back each individual product at the end user stage and to check whether the product has been used correctly through its life. Consequently products are out of industrial control for a period of time. It is possible that during this period contamination with other materials may occur that could affect the product's suitability for recycling into the intended application.

1 Scope

This European Standard defines a method of specifying delivery condition characteristics for polystyrene (PS) recyclates.

It gives the most important characteristics and associated test methods for assessing a single batch of PS recyclates intended for use in the production of semi-finished/finished products.

It is intended to support parties involved in the use of recycled PS to agree on specifications for specific and general applications.

This standard does not cover the characterisation of plastics wastes. See EN 15347.

This standard is applicable without prejudice to any existing legislation.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 12099, *Plastics piping systems — Polyethylene piping materials and components — Determination of volatile content*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178:2001)*

EN ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1:2000)*

EN ISO 179-2, *Plastics — Determination of Charpy impact properties — Part 2: Instrumented impact test (ISO 179-2:1997)*

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

EN ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST) (ISO 306:2004)*

EN ISO 472:2001, *Plastics — Vocabulary (ISO 472:1999)*

EN ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1:1993 including Corr 1:1994)*

EN ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994)*

EN ISO 1133, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics (ISO 1133:2005)*

EN ISO 3451-1, *Plastics — Determination of ash — Part 1: General Methods (ISO 3451-1:1997)*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1:2004)*

CEN/TR 15353:2007, *Plastics — Recycled plastics — Guidelines for the development of standards for recycled plastics*

3 Terms, definitions and abbreviated terms

For the purposes of this European Standard, the terms and definitions given in EN ISO 472:2001 and CEN/TR 15353:2007 apply. The abbreviated terms are given in EN ISO 1043-1:2001.

4 Characterisation of PS recyclates

A single batch is the quantity of recyclate that has homogeneous characteristics within the specified tolerances.

The characteristics of PS recyclates, which shall be determined for every batch of recyclate, are given in Table 1, and are divided into two types:

— Required characteristics, needed to define PS recyclates in general, and required for all recyclates.

— Optional characteristics, needed to define PS recyclates according to customer specifications and applications.

NOTE Polystyrene, or polystyrene-containing, plastics wastes for recycling may contain a variety of styrenic polymers, such as General Purpose (crystal or expanded) PS, and Impact-modified PS (usually containing grafted rubber particles). There may also be copolymers containing α-methyl styrene, butadiene, isoprene, acrylonitrile etc., and there may even be other non-styrenic polymers. The properties and performance of recyclates derived from such wastes will depend on the relative proportions of those polymers. Some of these copolymers (MBS, SAN for example) are not miscible with polystyrene, and can have adverse effects on the recyclate properties.

These characteristics shall be assessed using the test methods given in Table 1. Where possible, the supplier should provide information on the original application of the material.

A Certificate of Analysis, giving the test results for each batch of recyclate shall be provided by the supplier to the purchaser on request.

The polystyrene content of the recyclate may be measured by a method agreed between the parties, who will also agree the required level of polystyrene.

To secure the legal use of the recyclate, the supplier shall provide the necessary information about the material composition of the recyclate, as specified by the purchaser.

Table 1 — Characterisation of PS recyclates

Characteristic	Unit	Test method	PS	PS-I	Comment
Required					
Colour		Visual inspection	X	X	
Impact strength	kJ/m^2	EN ISO 179-1, EN ISO 179-2 or EN ISO 180		X	
Melt mass flow rate	g/10 min	EN ISO 1133 Condition H	X	X	
Particle size determination	mm		X	X	Using a method appropriate to the particle type and size range
Shape		Visual	X	X	For example, ground, micronized, pellets, flakes.
Vicat softening temperature	°C	EN ISO 306 Method A	X	X	
Optional					
Ash content	%	EN ISO 3451-1	O	O	
Bulk density	Kg/m^3	See Annex A	O	O	
Density	Kg/m^3	EN ISO 1183-1, Method A	O	O	
Filtration level	µm	Mesh size	O	O	
Flexural modulus	MPa	EN ISO 178	O	O	
Original application		Supplier to declare	O	O	
Presence of modifying additives		Supplier to declare	O	O	For example, fire retardants, fillers and reinforcements, heat and light stabilisers etc.
Residual Humidity	%	EN 12099	O	O	Although the scope of EN 12099 is limited, it is considered relevant
Tensile stress at yield	MPa	EN ISO 527-1 EN ISO 527-2	O	O	
Tensile strain at break	%	EN ISO 527-1 EN ISO 527-2	O	O	
Volatile Content	%	Weight loss at 200 °C	O	O	
X: required characteristic to be quantified. O: optional characteristic to be quantified.					
NOTE Other tests may be carried out by agreement between the purchaser and the supplier and the results reported.					

5 Quality assurance

To ensure the purchaser of the recyclate may have confidence in the quality of the product, the supplier shall maintain records of the quality control carried out, including incoming materials, processes and finished products.

NOTE 1 A quality management system certified to EN ISO 9001 may be a suitable guarantee of consistent recyclate quality.

The specification and the standard deviation or range of values within and between batches of material shall be agreed between the supplier and the purchaser.