SLOVENSKI STANDARD
SIST-TS CEN/TS 14541:2013

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Nadomešča:
SIST-TS CEN/TS 14541:2007

Polimerne cevi in fitingi - Lastnosti za uporabo obtočnega materiala, lastnega regenerata in regeneratov tujega izvora iz PVC-U, PP- in PE-materialov

Plastics pipes and fittings - Characteristics for utilisation of non-virgin PVC-U, PP and PE materials

Kunststoffrohrleitungen und Formstücke - Eigenschaften für die Verwendung von Rücklaufmaterial und Recyclat aus PVC-U-, PP- und PE-Materialien

Tubes et raccords en plastique - Caractéristiques pour l'utilisation de matières non vierges en PVC-U, PP et PE

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23.040.20	Cevi iz polimernih materialov	Plastics pipes
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TECHNICAL SPECIFICATION

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Supersedes CEN/TS 14541:2007

English Version

Plastics pipes and fittings - Characteristics for utilisation of non-virgin PVC-U, PP and PE materials

Tubes et raccords en plastique - Caractéristiques pour l'utilisation de matières non vierges en PVC-U, PP et PE

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This Technical Specification (CEN/TS) was approved by CEN on 6 November 2012 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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Foreword

This document (CEN/TS 14541:2013) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

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 document supersedes CEN/TS 14541:2007.

The main changes are:

— definitions brought in line with common practice;

— application “Pressure piping systems” is introduced;

— a general guidance has been added for utilisation of non-virgin materials;

— Annex A “Processing and performance of pipes and characteristics of recyclable material” is deleted.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: 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 Technical Specification specifies definitions and recommended characteristics and test methods for the utilisation of PVC-U, PP and PE non-virgin materials in pipes, fittings and ancillaries for both pressure and non-pressure piping systems.

This Technical Specification specifies the conditions for utilisation of non-virgin material with and without agreed specification

Non-virgin materials may be reformulated by the use of additives and processing techniques to meet an agreed specification. Typically the additives used would be stabilisers and pigments etc.

The WG responsible for the product standard should consider the content of this document and only permit dosage levels which give compliance with the requirements of the product standard. Further, the WG should consider whether extra or more frequent product testing is relevant when using such material in the production of pipes and fittings in accordance with the relevant product standard.

NOTE For the purpose of this specification the term pipes means extruded pipes, gutters and any parts of a fabricated fitting which is made from an extruded pipe. The term fitting means injection- and rotomoulded fittings and injection moulded parts of a fabricated fitting.

For the recycling process, the testing and the use of the non-virgin material National and/or European regulations may apply.

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

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 15346:2007, *Plastics — Recycled Plastics — Characterisation of poly(vinyl chloride) (PVC) recyclates*

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

EN ISO 13229, *Thermoplastics piping systems for non-pressure applications — Unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings — Determination of the viscosity number and K-value (ISO 13229)*

EN 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 1133-1)*

EN ISO 1183-2, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method (ISO 1183-2)*

EN ISO 3451-1:2008, *Plastics — Determination of ash — Part 1: General method (ISO 3451-1:2008)*

EN ISO 3451-5, *Plastics — Determination of ash — Part 5: Poly(vinyl chloride) (ISO 3451-5)*

EN ISO 11357-6, *Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT) (ISO 11357-6)*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
virgin material
material in the form such as granules or powder that have not been subjected to use or processing other than that required for their manufacture and to which no reprocessed or recycled material have been added

3.1.2
own reprocessed material
material prepared from rejected unused pipes, gutters, fittings and ancillaries, including trimmings from the production, that will be reprocessed in a manufacturer's plant after having been previously processed by the same manufacturer by a process such as moulding or extrusion and for which the complete formulation is known

3.1.3
external reprocessed material
material from the production of unused thermoplastic products, regardless of where they are manufactured

3.1.4
recycled material
material from used thermoplastic products which have been cleaned and crushed or ground

3.1.5
agreed specification
specification of the relevant material characteristics agreed between the supplier of the non-virgin material and the pipe, fitting and/or ancillary manufacturer

3.2 Abbreviations

PE : polyethylene

PP : polypropylene

PP-MD : polypropylene modified by minerals

PVC-U : unplasticized poly(vinyl chloride)

MFR : melt mass-flow rate

OIT : oxidation induction time

4 Utilisation of non-virgin material for non-pressure application

4.1 Own reprocessed material

The use of clean, own reprocessed material for the production of pipes, gutters, fittings and ancillaries shall be permitted without limitations unless otherwise specified in the referring standard.

4.2 External reprocessed and recycled materials with agreed specification

External reprocessed and recycled material with an agreed specification shall be permitted for the production of pipes, gutters, fittings and ancillaries provided that all the following conditions are met:

— it shall at least cover the characteristics given in Tables 1, 2 and 3 for PVC-U, PP/PP-MD and PE, respectively.

— when determined in accordance with the test methods given in Tables 1, 2 and 3 for PVC-U, PP/PP-MD and PE, the actual values from these characteristics shall conform to the values given in the agreed specification.

— each delivery shall be covered by a declaration according to 4.1 of EN 10204:2004, showing conformity to the agreed specification by Inspection certificate 3.1, "type3.1". This declaration can be made by either the material supplier or the product manufacturer as agreed between the parties.

— The quality plan of the supplier of external reprocessed or recycled material should conform to EN ISO 9001 [1].

4.3 External reprocessed and recycled materials without agreed specification

The use of clean external reprocessed and recycled materials without agreed specification for the production of pipes, gutters, fittings and ancillaries shall not be permitted unless otherwise specified in the referring standard.

Table 1 — Characteristics of external reprocessed and recycled PVC-U that should be included in the agreed specification

Characteristic	Unit	Test method [a, b]	Remark
Density	kg/m^3	EN ISO 1183-2	
Filler content by ash rest	% by mass	EN ISO 3451-5	Linked to PVC content
K-value		EN ISO 13229	
Vicat softening temperature	°C	EN ISO 306	
Particle size	mm	Sieve analysis	
Type of pigments and stabiliser		By analysis	
Impurities		Annex C of EN 15346:2007 or evaluation of sheets or evaluation of micronized material	
Extraneous polymers		IR analyses or DSC	Presence

[a] Samples shall be taken from the compounded and pelletised or from each individual material batch source. The frequency of sampling shall be agreed between supplier and product manufacturer and where relevant, the certification body.

[b] If the source of the material is consistent, e.g. pipes and fittings or other products produced under a quality mark. It is not required to test those material characteristics covered by the quality mark.

When deciding the amount of characteristics to be tested, the frequency with which they have to be tested and the related requirements at least the following should be considered:

1) the recycling process and sources of the material because of risk of impurities;
2) the processing of the material into the end product;
3) the wanted characteristics of the end product;
4) possible limitations of sources for the recyclable material;
5) the intended dosage level of the material.

Table 2 — Characteristics of external reprocessed and recycled PP and PP-MD that should be included in the agreed specification

Characteristic	Unit	Test method [a, b]	Remark
Density	kg/m^3	EN ISO 1183-2	
Thermal Stability OIT	min	EN ISO 11357-6 Temperature 200 °C	
MFR	g/10 min	EN ISO 1133-1	
Ash residue	%	EN ISO 3451-1:2008	
Extraneous polymers		IR analyses or DSC	Presence
Impurities		Mesh filtering	Use agreed mesh size
Type of pigments and/or additives		By analysis	Optional; to be agreed between purchaser and supplier
Volatile matter	mg/kg	EN 12099	

[a] Samples shall be taken from the compounded and pelletised or from each individual material batch source. The frequency of sampling shall be agreed between supplier and product manufacturer and where relevant, the certification body.

[b] If the source of the material is consistent, e.g. pipes and fittings or other products produced under a quality mark. It is not required to test those material characteristics covered by the quality mark.

When deciding the amount of characteristics to be tested, the frequency with which they have to be tested and the related requirements at least the following should be considered:

1) the recycling process and sources of the material because of risk of extraneous polymers and impurities;
2) the processing of the material into the end product;
3) the wanted characteristics of the end product;
4) possible limitations of sources for the recyclable material;
5) the intended dosage level of the material.