
Polimerni materiali - Priporočila za kakovost in podlaga za specifikacije za uporabo polimernih reciklatov v izdelkih - 4. del: Poli(etilen tereftalat) (PET)

Plastics - Quality recommendations and basis for specifications for application of plastic recyclates in products - Part 4 : Poly(ethylene terephthalate) (PET)

Kunststoffe - Qualitätsempfehlungen und Grundlagen für Spezifikationen für die Verwendung von Kunststoffrecyklaten in Produkten - Teil 4: Poly(ethylenterephthalat) (PET)

Plastiques - Recommandations qualité et base de spécification pour l'application des recyclats de plastiques dans les produits - Partie 4 : Poly(éthylène téréphthalate) (PET)

Ta slovenski standard je istoveten z: prEN 18064-4

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ICS:

13.030.50	Recikliranje	Recycling
83.080.01	Polimerni materiali na splošno	Plastics in general

oSIST prEN 18064-4:2024

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 18064-4

April 2024

ICS 13.030.50; 83.080.01; 83.140.01

English Version

Plastics - Quality recommendations and basis for specifications for application of plastic recyclates in products - Part 4 : Poly(ethylene terephthalate) (PET)

Kunststoffe - Qualitätsempfehlungen und Grundlagen für Spezifikationen für die Verwendung von Kunststoffrecyklaten in Produkten - Teil 5: Poly(ethylenterephthalat) (PET)

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 249.

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European foreword

This document (prEN 18064-4:2024) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by SIS.

This document is currently submitted to the CEN Enquiry.

This document is part of the prEN 18064-series, currently consisting of all parts as listed below. This series of standards consist of a general part 1, and material specific parts for different types of plastics.

This particular part covers typical values (ranges, or min/max values) for Polyethylene terephthalate (PET) general purpose plastics, that can be composed of 100 % recyclates (mechanical and/or chemical), or a combination of recyclates and virgin plastic.

This part is supported by other standards on test methods to which references are made throughout this document.

EN 18064, *Plastics — Quality recommendations and basis for specifications for application of plastic recyclates in products*, is currently composed with the following parts:

— *Part 1: General aspects*

— *Part 2: Polyethylene (PE)*

— *Part 3: Polypropylene (PP)*

— *Part 4: Poly(ethylene terephthalate) (PET)*

— *Part 5: Poly(vinyl chloride) (PVC)*

— *Part 6: Polystyrene (PS)*

— *Part 7: Acrylonitrile-butadiene-styrene (ABS)*

NOTE Part 6 for PS also includes EPS and XPS.

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Introduction

See prEN 18064-1.

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1 Scope

This document provides relevant characteristics and typical values for PET recyclates intended for groups of defined applications (the product families).

The relevant characteristics and typical values for the different product families are derived from the performance requirements of the products belonging to that family, including requirements for product manufacturing processes where applicable.

This document applies to plastic recyclates intended to be used for the manufacturing of (intermediate) products.

This document is intended to be used in conjunction with part 1 of this standard series, which describes the designation system for plastic recyclates. The designation system allows comparison between recycled and virgin material at the level of the polymer's defined designatory properties.

NOTE 1 Examples of designations of plastic recyclates are given in the Annex A.

NOTE 2 The selection of relevant properties for a product family is based on EN ISO 10350-1, extended with specific properties related to plastic recyclates.

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.

prEN 18065¹, *Plastics — Recycled Plastics — Classification of recycled plastics based on Data Quality Levels for use and (digital) trading*

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

prEN 18064-1², *Plastics — Quality recommendations and basis for specifications for application of plastic recyclates in products — Part 1: General aspects (under preparation)*

EN 15348, *Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates*

EN ISO 60, *Plastics - Determination of apparent density of material that can be poured from a specified funnel (ISO 60)*

EN ISO 472:2013, *Plastics - Vocabulary (ISO 472)*

EN ISO 1043-1, *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1)*

EN ISO 1133-2, *Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 2: Method for materials sensitive to time-temperature history and/or moisture (ISO 1133-2)*

EN ISO 1628-5, *Plastics - Determination of the viscosity of polymers in dilute solution using capillary viscometers - Part 5: Thermoplastic polyester (TP) homopolymers and copolymers (ISO 1628-5)*

¹ Under preparation.

² Under preparation.

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EN ISO 11357-3, *Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization (ISO 11357-3)*

EN ISO 14021, *Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling) (ISO 14021)*

EN ISO 15512, *Plastics - Determination of water content (ISO 15512:2019)*

EN ISO 20028-2, *Plastics - Thermoplastic polyester (TP) moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 20028-2)*

ASTM D1895, *Standard Test Methods for Apparent Density, Bulk Factor, and Pourability of Plastic Materials*

ASTM F2013, *Standard Test Method for Determination of Residual Acetaldehyde in Polyethylene Terephthalate Bottle Polymer Using an Automated Static Head-Space Sampling Device and a Capillary GC with a Flame Ionization Detector*

ASTM D4603, *Standard Test Method for Determining Inherent Viscosity of Poly(Ethylene Terephthalate) (PET) by Glass Capillary Viscometer*

ASTM D6980-12, *Standard Test Method for Determination of Moisture in Plastics by Loss in Weight*

3 Terms, definitions and abbreviations**3.1 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN ISO 472:2013 and CEN/TR 15353 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1**typical value**

indicative value intended for first contact, e. g. between converter and recycler

Note 1 to entry: Final values to be agreed e.g. between converter and recycler.

3.2 Abbreviations

For the purposes of this document, abbreviated terms related to recyclates given in EN ISO 1043-1 and prEN 18064-1 apply.

4 Categorization of Polyethylene terephthalate (PET) applications and requirements

The product families in combination with the relevant converting technologies are given in the dedicated annexes. In here description is given of the intended use(s) of these product families (for example impact resistant application), and for which products can these be used (e.g. containers, sheet materials).

5 Selection of relevant properties for Polyethylene terephthalate (PET) recyclates

The mandatory characteristics are given in EN 15348.

Relevant characteristics per product family in combination with the relevant production technologies are given in Annex B.

NOTE Next to mandatory characteristics from EN 15348, this can also include the optional characteristics given in EN 15348, EN ISO 20028-2 and EN ISO 10350-1

6 Typical range for characteristics of product families

The relevant typical characteristics are specified in Annex B, which provides typical values (min/max values or a range as applicable) for the relevant characteristics for that product family in combination with the relevant production technologies. This information is intended to be used for material selection by buyers of recycle.

NOTE This part is not intended for use as a specification system, and hence cannot be used as a means to guarantee a certain recycle quality to a buyer of plastic recycle.

7 Designation of Polyethylene terephthalate (PET) recyclates

The principle for this designation system is given in prEN 18064-1³, the ISO/IEC Directives, Part 2, 2021, and Annex A.

This designation provides a code describing how to declare characteristics and related typical values for recycle materials, intended to be used for a defined category group (product family), enabling effective communication between supplier and purchaser of recycle materials, based on the intended use (product family in combination with the relevant production technologies).

Annex A provides designatory properties of Polyethylene terephthalate recyclates given in EN ISO 20028-1.

Under A.2.7 examples of designation of a Polyethylene terephthalate thermoplastic material are given.

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³ Under preparation.

Annex A (informative)

Designatory properties Polyethylene terephthalate recycle

A.1 Generic and additional designatory properties

The types of Polyethylene terephthalate are differentiated from each other by a classification system based on appropriate levels of the designatory properties (EN ISO 20028-1) and the following additional designatory properties related to *Polyethylene terephthalate*.

- a) viscosity number,
- b) tensile modulus of elasticity and
- c) information about chemical structure, method of processing, important properties, additives, colour, fillers and reinforcing materials. See prEN 18064-1 block 1 – 5, based on ISO 17855-1.

A.2 Designation of Polyethylene terephthalate recycle

A.2.1 General

The designation and specification system for thermoplastics is based on the following standardized pattern.

Designation					
Identity Block					
Description block (optional)	International Standard Block	Individual Item Block			
		Data Block 1	Data Block 2	Data Block 3	Data Block 4

The designation consists of an optional description block, reading “Thermoplastics”, and an identity block comprising the International Standard number and an individual-item block. For unambiguous designation, the individual-item block is subdivided into five data blocks comprising the following information.

For further information on this designation system refer to prEN 18064-1, EN ISO 20028-1 and ISO/IEC Directives, Part 2, 2021, Annex C.

A.2.2 Data block 1

Data block 1 contains information on Polymer “PET” and DQL.

Furthermore, the Data Quality Level (DQL) should be added to data block 1 after another hyphen. To reach a certain DQL, several characteristics shall be added to a technical data sheet of the material. These characteristics are listed in prEN 18065.

In terms of the designation system a higher number of the DQL indicates a need for more information from the supplier.