



SLOVENSKI STANDARD
oSIST prEN 18066:2024
01-maj-2024

Polimerni materiali - Oblikovanje za recikliranje profilov na osnovi PVC za gradbene izdelke

Plastics - Design for recycling of PVC based profiles for construction products

Kunststoffe - Recyclingorientierte Gestaltung von PVC-basierten Profilen für Bauprodukte

Plastiques - Conception en vue du recyclage des profilés à base de PVC pour les produits de construction

Ta slovenski standard je istoveten z: prEN 18066

<https://standards.iteh.ai/catalog/standards/sist/6a0a94e6-5f52-4bc8-9e27-33e5f3ef8124/osist-pren-18066-2024>

ICS:

83.080.01	Polimerni materiali na splošno	Plastics in general
83.140.99	Drugi izdelki iz gume in polimernih materialov	Other rubber and plastics products
91.060.50	Vrata in okna	Doors and windows

oSIST prEN 18066:2024

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 18066

March 2024

ICS 83.080.01; 83.140.99; 91.060.50

English Version

Plastics - Design for recycling of PVC based profiles for construction products

Kunststoffe - Profile auf Basis von PVC zur Anwendung
im Bauwesen - Leitlinien zur recyclingorientierten
Gestaltung

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

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European foreword

This document (prEN 18066:2024) 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 has been prepared under a standardization request addressed to CEN and CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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Introduction

An important step to achieve circularity in the plastics industry is to pave the way for more use of recycled materials in plastic products. To this aim, unplasticized poly(vinyl chloride) (PVC-U) window system suppliers commit to raise the uptake of PVC-U recyclate (rPVC-U) in window profiles and related building products. Above all, this can be realized by improving the design of plastic products in two directions: first, to make them recyclable and second, to increase the content of recycled plastics.

EN 45560:—¹, *Method to achieve circular designs of products*, proposes a method to achieve circular-ready designs of products. EN 45560:—, Table A.1, contains a list of circular-ready attributes including rationale and objectives.

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¹ Under preparation. Stage at the time of publication: prEN 45560:2023.

1 Scope

This document applies to unplasticized poly(vinyl chloride) (PVC-U) profiles that are intended to be used for the fabrication of windows and doors in accordance with the EN 14351 series or EN 16034, shutters according to EN 13659 and other construction profiles in accordance with the EN 13245 series. Furthermore, this document is also applicable for profiles used in other PVC-U products, which can include recyclates. This document gives references and specifies general and product-specific design for recycling principles.

NOTE 1 In this document, the term “PVC-U profiles” is used to refer to construction profiles made from PVC-U, PVC-UE, and PVC-U-based natural fibre composites (NFC).

Criteria for the use of materials, process conditions, and recyclability are defined, which are considered during the design process.

This document defines principles to

- obtain the highest possible share of recyclability of the PVC-U part in the profile, and
- increase the share of PVC-U recyclate in the profile,

while complying with requirements for the final product, where existent and defined elsewhere. This document establishes flowcharts which help to assess, (i) how recyclability is evaluated and (ii) whether inclusion of rPVC-U is possible.

The following components of the final PVC-U construction product are considered in this document:

- profiles;
- reinforcements;
- gaskets;
- insulations;
- coverings.

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This document specifies only the technical connection of the profile to other components (such as glazing or hardware) and their impact on the recyclability of the PVC-U profiles. The recyclability of the other components (e.g. glazing, aluminium cover, hardware) is excluded from this document.

NOTE 2 Examples for profiles included in this document and their intended use can be found in Figure 1.



Figure 1 — Examples for profiles included in this document and their intended use (frame and sash profile with reinforcements, window, door, cladding and shutter box with shutter)

2 Normative references

There are no normative references in this document.

prEN 18066:2024 (E)**3 Terms and definitions**

For the purposes of this document, the following terms and definitions 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 Material definitions**3.1.1****internally reused material****IRM**

reused material from internally extruded, virgin material; this includes mismeasured, unused products and offcuts

Note 1 to entry: “Internally” refers to the same profile manufacturing company group even if located at different sites.

[SOURCE: EN 17508:2021, 3.4, modified – Note 1 and Note 2 to entry removed.]

3.1.2**natural fibre composites****NFC**

material or product made thereof being the result of the combination of one or several natural fibre or cellulose-based material(s) with PVC-U, intended to be or being processed through plastic processing techniques

Note 1 to entry: Wood Plastics Composites (WPC) is a particular form of NFC.

[SOURCE: EN 15534-1:2014+A1:2017, 3.1, modified – replaced “one or several thermoplastics” with “PVC-U”, Note 1 to entry added]

[oSIST prEN 18066:2024](https://standards.iteh.ai/catalog/standards/sist/6a0a94e6-5f52-4bc8-9e27-33e5f3cf8124/osist-pren-18066-2024)

3.1.3**rPVC-U****PVC-U recyclate**

recycled or recovered unplasticized or unplasticized expanded poly vinyl chloride based material

[SOURCE: EN 17508:2021, 3.6, modified – Note 1 and Note 2 to entry removed, added “unplasticized expanded”]

3.1.4**virgin material****virgin PVC-U**

material of a defined formulation, which has not been used or processed other than required for its manufacture and to which no rPVC-U (3.1.3) has been added

[SOURCE: EN 17508:2021, 3.3, modified – “virgin material” has been added and Note 1 to entry removed.]

3.2 General definitions

3.2.1

additive

substance which is used to process or to modify end use properties of plastics

Note 1 to entry: Mentioned substances are normally included in the carrier matrix.

Note 2 to entry: Mentioned final use properties are e.g. rigidity, flexibility, colour etc.

[SOURCE: EN 17615:2022, 3.4, modified – Notes to entry adapted]

3.2.2

coextruded profile

profile produced by using more than one extruder with different PVC-U based materials in one production process without mixing them

[SOURCE: EN 12608-1:2016+A1:2020, 3.2.8, modified – added “based”]

3.2.3

component

part of a window and/or door such as hardware, glazing and gaskets, including profiles

[SOURCE: EN 17410:2021, 3.7]

3.2.4

covered profile

profile with a non-separable covering, e.g. foil, paint, PMMA layer (polymethylmethacrylate)

3.2.5

covering shell

separable component attached to the profile, e.g., an aluminium shell

3.2.6

design for recycling

design of product, including its individual components, in order to ensure its recyclability under the state-of-the-art collection, sorting and recycling systems

3.2.7

end of life treatment criteria

end of life of used PVC-U construction profiles commonly characterized through the end of its use, hence its replacement in the course of renovation, modernisation or demolition

3.2.8

profile

product produced by extrusion of PVC-U, PVC-UE or/and PVC-U-based NFC virgin and recycled materials and/or internally reused materials (IRM) intended to be used in construction

[SOURCE: EN 12608-1:2016+A1:2020, 3.2.1, modified – materials and use added]

prEN 18066:2024 (E)**3.2.9****recyclability**

degree to which a PVC-U product can be sorted and recycled in practice and at scale with state-of-the-art recycling technology and infrastructure, and deliver recycled PVC-U of suitable quality to be integrated into new PVC-U products, respecting product standards and regulations in force

Note 1 to entry: The adjective of “recyclability” is “recyclable”.

[SOURCE: M/584 COMMISSION IMPLEMENTING DECISION of 1.8.2022 on a standardisation request to the European Committee for Standardisation and the European Committee for Electrotechnical Standardisation as regards plastics recycling and recycled plastics - modified]

3.2.10**recycling**

any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes

Note 1 to entry It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Note 2 to entry: ‘Plastics secondary raw material’ is a synonym of recyclate.

[SOURCE: Article 3(17) of Directive 2008/98/EC of the European Parliament and of the Council]

3.2.11**reinforcement**

material inserted in the profile or added to profile material to provide stability, where the reinforcement is mineral (e.g. glass), organic (e.g. wood) or metallic (steel, aluminium)

3.2.12**state-of-the-art recycling technology**

recycling technology that is a developed stage of technical capability at a given time as regards processes, based on the relevant consolidated findings of science, technology and experience

Note 1 to entry An indicative list of such technology in scope of this document can be found in Annex B.

[SOURCE: EN 45020:2006, 1.4, modified - recycling technology added, Note to entry added]

4 Design for recycling**4.1 General**

Depending on the specific construction product, the profiles are only a small part of the entire product. The scope of the following design-for-recycling assessment is the design of the construction profile only.

EN 45560:—² defines as set of circular-ready attributes, intended to be applicable horizontally, to all products on the market. Annex A shows all circular-ready attributes defined by EN 45560:— and lines out those attributes which are in scope of this document. The non-recycling-related circular-ready attributes are not considered.

For PVC-U profiles, design for recycling refers to the process that makes the profile recyclable and enables its processing into recyclates characterized following the characteristics defined in EN 15346 with the

² Under preparation. Stage at the time of publication: prEN 45560:2023.