



SLOVENSKI STANDARD
SIST EN 17410:2021

01-november-2021

Polimerni materiali - Nadzorovano krožno recikliranje oken in vrat iz profilov PVC-U

Plastics - Controlled loop recycling of PVC-U profiles from windows and doors

Kunststoffe - Geregelter Recyclingkreislauf von Fenster- und Türprofilen aus PVC-U

Plastiques - Recyclage en boucle contrôlée de profilés de fenêtres et portes en PVC-U

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Ta slovenski standard je istoveten z: EN 17410:2021

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ICS:

13.030.50	Recikliranje	Recycling
83.140.01	Izdelki iz gume in polimernih materialov na splošno	Rubber and plastics products in general
91.060.50	Vrata in okna	Doors and windows

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EUROPEAN STANDARD

EN 17410

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English Version

Plastics - Controlled loop recycling of PVC-U profiles from windows and doors

Plastiques - Recyclage en boucle contrôlée de profilés de fenêtres et portes en PVC-U

Kunststoffe - Geregelter Recyclingkreislauf von Fenster- und Türprofilen aus PVC-U

This European Standard was approved by CEN on 9 August 2021.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents	Page
European foreword.....	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	6
4 Methodology, Procedures and Requirements	9
4.1 Life cycle stages of PVC windows and doors.....	9
4.2 Controlled Loop Model and Life Cycle Stages.....	10
4.3 Material Flow along the loop.....	10
4.4 Definition of quality relevant stages in the controlled loop	12
4.5 Requirements, material characteristics and related test methodologies	12
4.6 End of Waste status	14
4.7 Definition of traceability instruments.....	15
4.8 Quality assurance.....	15
4.9 Design for recycling.....	16
Annex A (informative) PVC window/door profiles and window/door fabrication — Description of PVC material flow (virgin material, internally reused material and recycled material) in a controlled loop.....	17
Annex B (informative) Characterization of PVC Recyclates for PVC Profiles	18
Annex C (informative) Optional traceability characteristics of recyclate PVC-U (rPVC-U) for PVC profiles	19
Bibliography.....	20

European foreword

This document (EN 17410:2021) 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 March 2022, and conflicting national standards shall be withdrawn at the latest by March 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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EN 17410:2021 (E)**Introduction**

Recycling of plastics pre- and post-consumer waste is a material recovery process aiming to save resources such as raw materials, water and energy, thus minimizing emissions into air, water and soil and hence contributing to human health and environmental protection.

For a huge number of plastic products, individual recycling schemes have been established. Regarding PVC windows and doors made of un-plasticized PVC, they are subject to an advanced recycling scheme, i.e. a so-called controlled loop. In this particular case, the used windows and doors are collected, the PVC frame separated, shredded and treated. The recyclate obtained therefrom then goes back to the manufacturing of new window and door profiles. To ensure a high quality level of both plastic recycling and finished products in a single market, the control of the recycling process is recommended to be standardized, with regard to (i) process steps such as collection, identification, sorting, cleaning and (ii) sub-process steps such as testing, quality assurance, and traceability.

In that respect, this document forms, together with EN 12608-1, and EN 14351-1, EN 14351-2 and EN 16034 a unique and consistent standardization framework enabling the value chain to act in a circular manner.

NOTE In this document, only EN 12608-1 will be mentioned. However, whenever this is the case reference is made to all subsequent parts of EN 12608, once published as well.

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1 Scope

This document specifies the controlled loop and the definition of those material transformation steps which are relevant for product quality, in particular recycling input and output and profile manufacturing input and output.

Traceability tools are specified to characterize this loop as a controlled loop.

This document references existing quality and test methodologies for recycled PVC to be used in PVC-U profiles for windows and doors.

This document establishes the controlled loop treatment of PVC profiles in line with the general understanding of life cycles as outlined in EN 15804.

NOTE 1 With regard to PVC waste treatment, the present document relates to existing standards EN 15343, EN 15346 and EN 15347.

NOTE 2 With regard to semifinished and/or finished products, it refers to the European Standard PVC-U window profiles (see EN 12608-1) and to the European Standards for windows and doors (see EN 14351-1, EN 14351-2 and EN 16034).

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.

EN 12608-1, *Unplasticized poly(vinyl chloride) (PVC-U) profiles for the fabrication of windows and doors — Classification, requirements and test methods — Part 1: Non-coated PVC-U profiles with light coloured surfaces*

SIST EN 17410:2021

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

EN 15346, *Plastics — Recycled plastics — Characterization of poly(vinyl chloride) (PVC) recyclates*

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

EN 17213, *Windows and doors — Environmental Product Declarations — Product category rules for windows and pedestrian doorsets*

EN 514, *Plastics — Poly(vinyl chloride) (PVC) based profiles — Determination of the strength of welded corners and T-joints*

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

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

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

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

EN 17410:2021 (E)**3 Terms and definitions**

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

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1**material**

PVC-U compound in a form of granules or powder for the production of PVC-U profiles intended to be used for the fabrication of a window or door

[SOURCE: EN 17508:2021, 3.1]

3.2**defined formulation**

formulation which is a specified composition of polymer, additives and pigments

[SOURCE: EN 17508:2021, 3.2]

3.3**virgin unplasticized polyvinylchloride**

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 (3.6) has been added.

Note 1 to entry: Material can be UV-resistant, non-UV-resistant, or reduced UV-resistant.

[SOURCE: EN 17508:2021, 3.3]

3.3.1**UV resistant material**

UVM

material of a defined formulation which fulfills weathering resistance

Note 1 to entry: Weathering resistance shall be defined in the referring standard.

[SOURCE: EN 17508:2021, 3.3.1]

3.3.2**reduced-UV resistant material**

RUVM

material of a defined formulation which fulfills reduced weathering resistance

Note 1 to entry: Weathering resistance shall be defined in the referring standard.

[SOURCE: EN 17508:2021, 3.3.2]

3.3.3

non-UV resistant material

NUVM

material of a defined formulation which does not necessarily satisfy the requirements of the resistance to weathering

Note 1 to entry: Weathering resistance shall be defined in the referring standard.

[SOURCE: EN 17508:2021, 3.3.3]

3.4

internally reused material

IRM

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

Note 1 to entry: Different defined formulations cannot be mixed.

Note 2 to entry: Material can be UV resistant, non-UV resistant, or reduced UV-resistant.

Note 3 to entry: "Internally" refers to the same profile manufacturing company group even if located at different sites.

[SOURCE: EN 17508:2021, 3.4]

3.5

PVC-U waste

PVC-U profile material which the holder discards or intends or is required to discard

[SOURCE: EN 17508:2021, 3.5]

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3.5.1

PVC-U pre-consumer waste

material diverted during a manufacturing process of profiles and/or windows/doors and which the holder discards or intends or is required to discard

Note 1 to entry: The term post-industrial waste is sometimes used synonymously.

[SOURCE: EN 17508:2021, 3.5.1]

3.5.2

PVC-U post-consumer waste

material, generated by the end-users of products, that has fulfilled its intended purpose or can no longer be used and which the holder discards or intends or is required to discard (including PVC-U waste from installation)

[SOURCE: EN 17508:2021, 3.5.2]

3.5.3

PVC-U waste from installation

material which the holder discards or intends or is required to discard generated during the installation process of the window or door into the building

[SOURCE: EN 17508:2021, 3.5.3]

EN 17410:2021 (E)**3.6****PVC-U recyclate**

recovered PVC-U

rPVC-U

recycled or recovered, unplasticized polyvinylchloride

Note 1 to entry: Material can be UV resistant, non-UV resistant, or reduced UV-resistant.

Note 2 to entry: Table 1 lists products commonly recycled into rPVC-U of a quality for use in the end applications as outlined.

Table 1 — Products commonly recycled into rPVC-U for profiles in windows and doors

PVC-U product (PVC-U pre-consumer waste and PVC-U post-consumer waste)^a	
1)	window profiles
2)	door profiles
3)	roller shutter profiles
4)	roller shutter boxes
5)	blinds
6)	claddings
7)	window boards
8)	building profiles
^a	Non listed PVC products with the same material quality as those listed may likewise be used.

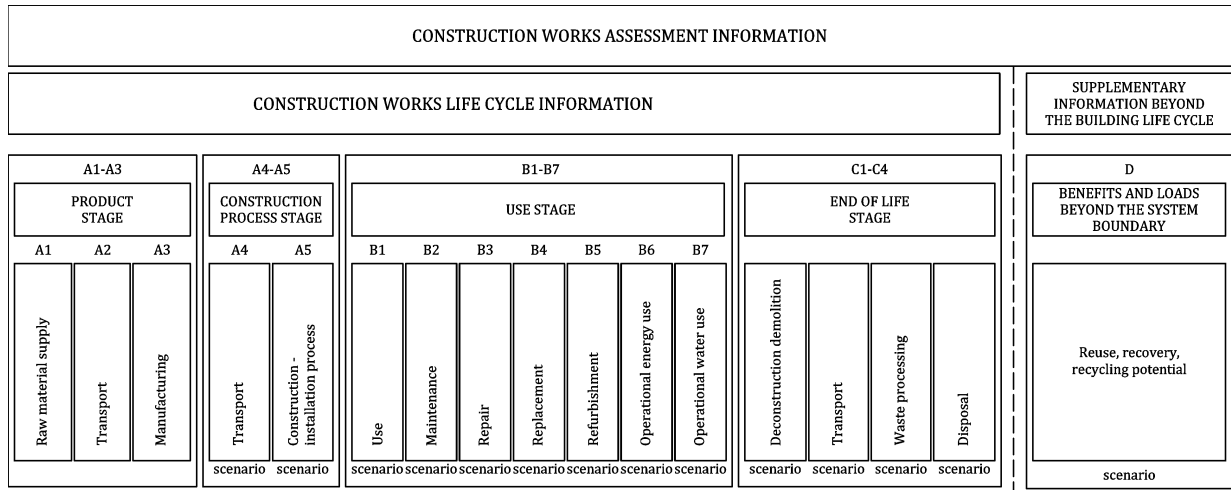
3.7**component**

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

4 Methodology, Procedures and Requirements

4.1 Life cycle stages of PVC windows and doors

4.1.1 General



[SOURCE: EN 15804:2012+A2:2019, Clause 5.2, Figure 1]

Figure 1 — Life cycle stages and modules for the building assessment

4.1.2 Production stage of PVC-U windows and doors

- A1, the forming of raw material, virgin and recycled material into PVC window or door profiles;
- A2, raw material, profiles and components are transported in the course of the production process;
- A3, the assembling of components such as profiles, glass and hardware to windows and doors.

4.1.3 Construction stage of PVC-U windows and doors

- A4, the transport of windows and doors to the building site;
- A5, the installation of windows and doors into the building

4.1.4 PVC-U windows and doors use stage related to the building fabric stage

- B1, the use of windows and doors;
- B2, their maintenance;
- B3, repair;
- B4, replacement; or
- B5, refurbishment.