SLOVENSKI STANDARD
oSIST prEN 17410:2019

01-september-2019

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

Plastics - Controlled loop recycling of post-consumer (or post-use) PVC-U windows and doors

Kunststoffe - Geregeltes Verfahren für das Recycling von gebrauchten PVC-U-Fenstern und Türen

Plastiques - Recyclage en boucle contrôlée de fenêtres et portes post-consommation (ou post-utilisation) en PVC-U

Ta slovenski standard je istoveten z: **prEN 17410**

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

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English Version

Plastics - Controlled loop recycling of post-consumer (or post-use) PVC-U windows and doors

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Kunststoffe - Geregeltes Verfahren für das Recycling von gebrauchten PVC-U-Fenstern und Türen

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

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European foreword

This document (prEN 17410:2019) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

This document is currently submitted to the CEN Enquiry.

Introduction

Recycling of plastics waste and scrap is a material recovery process aiming to save resources such as raw materials, water and energy and 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 are collected, the PVC frame separated, shredded and treated. The recyclate obtained therefrom then goes back to the manufacturing of new window 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 standard forms, together with EN 12608-1 and EN 14351-1, a unique and consistent standardization framework enabling the value chain to act in a circular manner.

1 Scope

This document defines quality and test methodologies for recycled PVC to be used in PVC window profile systems.

It contains a description of the controlled loop as such, 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.

With regard to PVC waste treatment, the present document relates to existing standards such as EN 15343, EN 15346 and EN 15347

With regard to semifinished and/or finished products, it refers to the European Standard for un-plasticized PVC window profiles (see EN 12608-1) and to the European harmonized standard for windows and doors (see EN 14351-1).

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 12608-1:2016, *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*

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

EN 15346:2014, *Plastics — Recycled plastics — Characterization of poly(vinyl chloride) (PVC) recyclates*

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

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

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 http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
controlled loop
controlled loop of post-consumer PVC-U windows recycling
controlled process where end-user wastes, such as from windows and doors, are collected and recycled

Note 1 to entry: The controlled loop comprises the collection of the PVC windows, its treatment, the recycling of PVC frames and finally, its use in new profiles used for the manufacturing of windows and doors and related building products.

3.2 Virgin unplasticised poly(vinyl chloride), PVC-U

3.2.1
virgin material
material of a defined formulation, which has not been used or processed other than as required for its manufacture, and to which to which no rPVC-U has been added

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

3.2.2
own reprocessed material
ORM
reprocessed scrap, mismeasured, unused products and offcuts from internally monoextruded virgin material

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

3.3
recycled un-plasticised poly (vinyl chloride)
rPVC
recycled, un-plasticized polymer of poly(vinyl chloride)

Note 1 to entry: Table 1 lists products commonly recycled into rPVCU for the end applications as outlined. Non-listed products with the same quality PVC may likewise be used.

3.4
pre-consumer
descriptive term covering material diverted during a manufacturing process

[SOURCE: EN ISO 472:2013, 3.X]

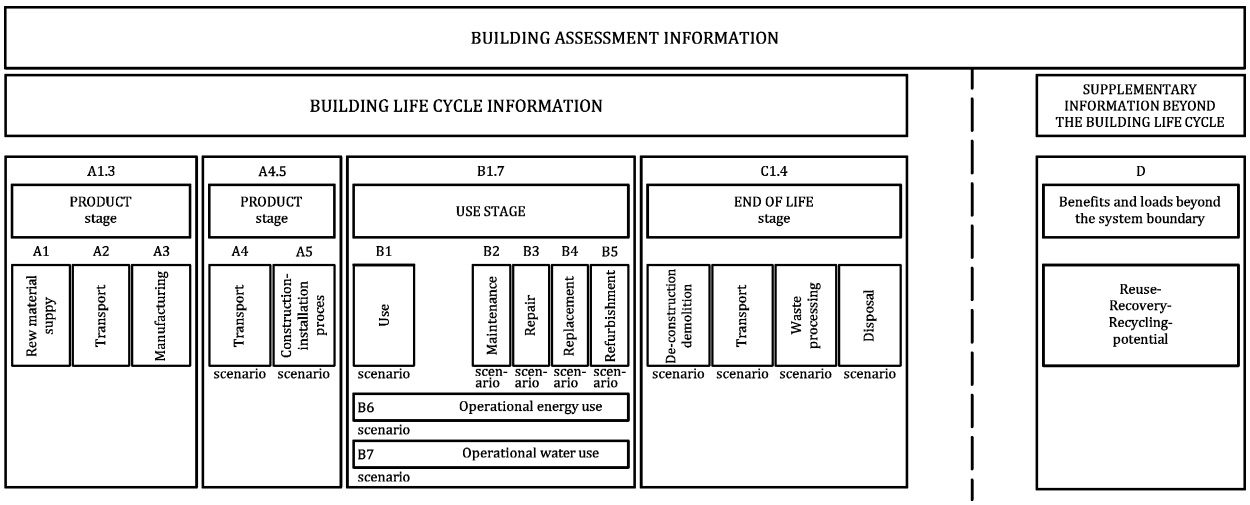
3.5
post-consumer
descriptive term covering material, generated by the end-users of products, that has fulfilled its intended purpose or can no longer be used (including material returned from within the distribution chain)

[SOURCE: EN ISO 472:2013, 3.X]

3.6
components
non-PVC material from window parts such as hardware, panes, and gaskets

3.7
waste
any substance or object which the holder discards or intends to or is required to discard

3.8 Life cycle stages of PVC windows and doors



[SOURCE: EN 15804:2012, 6.2 and Figure 1]

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

3.8.1
product stage
<PVC windows> stage including:

— A1, the forming of raw material, virgin and secondary material into PVC window profiles;

— A2, the transport to the window manufacturer;

— A3, the assembling of components such as profiles, panes and hardware to windows and doors

Note 1 to entry: Included is the provision of all materials, products and energy, as well as the scrap processing up to the end-of waste state, or disposal of final residues during the product stage.

3.8.2
construction process stage
stage including:

— A4, the transport of windows and doors to the building site;

— A5, the installation of windows and doors into the building

Note 1 to entry: Included is the provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage. These information modules also include all impacts and aspects related to any losses during this construction process stage (i.e. production, transport, and scrap processing and disposal of the lost products and materials).

Note 2 to entry: See Figure 1.

3.8.3
use stage related to the building fabric
stage including:

— B1, the use of windows and doors;

— B2, their maintenance;

— B3, repair;

— B4, replacement; or

— B5, refurbishment

Note 1 to entry: Included is the provision and transport of all materials, products and related energy and water use, as well as scrap and waste processing up to the end-of-waste state or disposal of final residues during this part of the use stage. These information modules also include all impacts and aspects related to the losses during this part of the use stage (i.e. production, transport, scrap and waste processing and disposal of the lost products and materials).

Note 2 to entry: See Figure 1.

3.8.4
use stage related to the operation of the building
stage including:

— B6, the operational energy use (e.g. operation of heating system and other building related installed services);

— B7, the operational water use

Note 1 to entry: These information modules include provision and transport of all materials, products, as well as energy and water provisions, scrap and waste processing up to the end-of-waste state or disposal of final residues during this part of the use stage.

Note 2 to entry: See Figure 1.

3.8.5
end of life stage
stage including:

— C1, de-construction, demolition;

— C2, transport to waste processing;

— C3, waste processing for reuse, recovery and/or recycling;

— C4, disposal

Note 1 to entry: Transportation, provision of materials, products, related energy and water use are also included.

Note 2 to entry: See Figure 1.

3.8.6
benefits and loads beyond the system boundary
module D includes reuse, recovery and/or recycling potentials, expressed as net impacts and benefits

Note 1 to entry: See Figure 1.

4 Methodology, Procedures and Requirements

4.1 Controlled Loop Model and Life Cycle Stages

Life cycle stages as described in Introduction, Figure 1 refer to a linear model. Conceptually, when using recycled PVC from stage D for the manufacturing of new PVC window profiles, the linear model turns into a circular one and forms a controlled loop, as described in Figure 2.

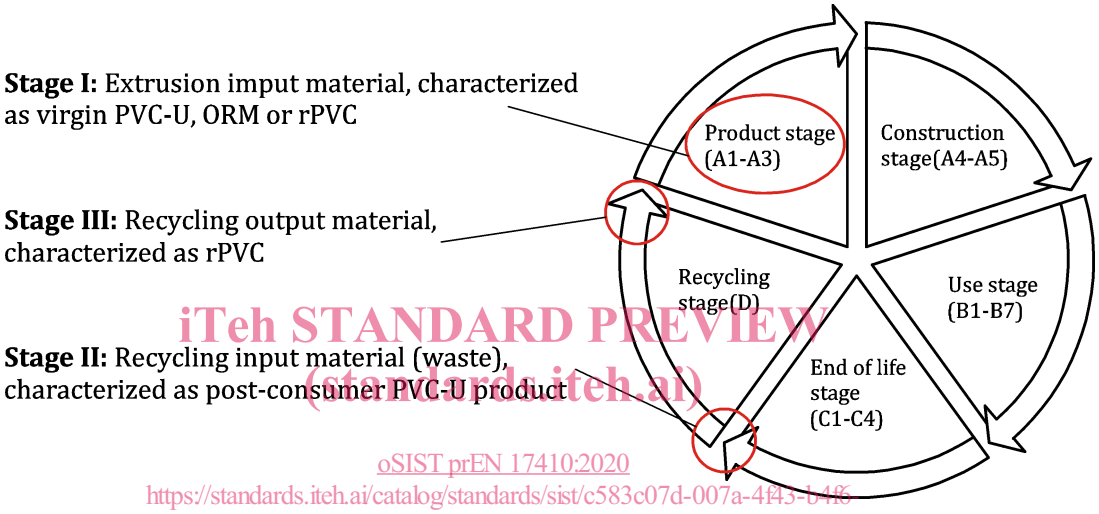


Figure 2 — Controlled Loop, Life Cycle Stages and raw material input

4.2 Material Flow along the loop

4.2.1 Product stage A1 – A3 (stage I)

The loop shall start with product stage (A1 → A3), where raw materials are converted into finished products. The product stage outlined here comprises first the manufacturing of PVC window profiles and then their assembly to PVC windows, respectively PVC doors.

According to EN 12608-1, the raw material used for the profile production (extrusion) can be characterized as follows:

— For visible surfaces:

  — UV resistant virgin PVC-U compound respectively dryblend,

  — Own re-processed PVC material, and

— For the non-visible surfaces:

  — rPVC-U.

NOTE While incoming virgin PVC-U compound usually is ready to use, rPVC might have to be mixed with additives such as fillers, pigments, stabilizers etc. to prepare a compound ready for extrusion.