# SLOVENSKI STANDARD
# kSIST-TS FprCEN/TS 18084:2025

**01-april-2025**

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**Cestna vozila - Recikliranje s tehnologijo naknadnega drobljenja - Priporočila za načrtovanje izdelkov iz polimernih materialov**

Road vehicles - Post Shredder Technology recycling - Design recommendations for plastic products

Straßenfahrzeuge - Nachgelagerte Shredder Recyclingtechnologie - Gestaltungsempfehlungen für Kunststoffprodukte

Véhicules routiers - Recyclage par technologie post-broyage - Recommandations de conception pour les produits en plastiques



**Ta slovenski standard je istoveten z:** **FprCEN/TS 18084**



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**ICS:**

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| 13.030.50 | Recikliranje | Recycling |
| 83.140.01 | Izdelki iz gume in polimernih materialov na splošno | Rubber and plastics products in general |

**kSIST-TS FprCEN/TS 18084:2025** **en,fr,de**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

# FINAL DRAFT
# FprCEN/TS 18084

February 2025

ICS 13.030.50; 83.140.01

English Version

# Road vehicles - Post Shredder Technology recycling - Design recommendations for plastic products

Véhicules routiers - Recyclage par technologie post-broyage - Recommandations de conception pour les produits en plastiques

Straßenfahrzeuge - Nachgelagerte Shredder Recyclingtechnologie - Gestaltungsempfehlungen für Kunststoffprodukte

This draft Technical Specification is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 301.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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## European foreword

This document (FprCEN/TS 18084:2025) has been prepared by Technical Committee CEN/TC 301 “Road vehicles”, the secretariat of which is held by DIN.

This document is currently submitted to the 2nd Vote on TS.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

# Introduction

This document covers plastic products and components used in the vehicles falling under the scope of the European Directive on End-of-Life Vehicles (ELV Directive) (2000/53/EC) and the European Directive on motor vehicle reusability, recyclability and recoverability (Type 3R Directive) (2005/64/EC).

The usage of plastics in vehicles' components has grown to answer sustainability and fuel-efficiency requirements mandated by national and international legislations and driven internally by many industry stakeholders, to a point where, in absolute terms, plastics became a targeted material for specific waste management recovery operations. The recommendations in this document aim at increasing the recyclability of plastics used in vehicles and the recycling rates from end-of-life vehicles, considering that, on average, plastics account for 14 % to 18 % [1] of the overall weight (1200 kg on average) of Type M1 vehicles.

Manufacturers are required by Union law to place on the market vehicles that are at least 85 % reusable and recyclable and 95 % recoverable [2] [3]. For the recycling of plastic waste these targets lag behind. This can be explained by high technical requirements for plastic automotive parts, which can lead to specifications that make those plastics more challenging to recycle. Notwithstanding existing technical and performance constraints, this document provides automotive engineers with design recommendations to enhance the recyclability of the plastic products and components when the vehicle reaches its end-of-life, hence maximizing the recovery rate and the value of the plastics fraction after the vehicle's shredding, in line with the sustainability requirements stemming from existing and upcoming EU legislation [4].

Due to the diversity of infrastructure across European ELV recycling facilities and the variety of end-of-life scenarios, a vehicle designed today could be recycled in ten or fifteen years at a facility equipped with the bare minimum tooling systems or at a large-scale state-of-the-art shredding and post-shredding recycling facility.

When implemented, these recommendations can ensure that materials specified on new vehicles can be efficiently recycled using available post-shredding technology infrastructure.

The post-shredding technologies are an interesting option for recycling more of the plastics used in vehicles. However, these technologies deserve to be better known by designers, as they require implications for the design of parts. For a better understanding of the post-shredding technologies, see Annex A.

# 1 Scope

This document specifies recommendations for the design of polymeric products used in road vehicles to facilitate separation and recycling after shredding.

This document is not applicable to dismantling of road vehicles and removal of parts and components.

This document is not applicable to elastomers.

# 2 Normative references

There are no normative references in this document.

# 3 Terms, definitions and abbreviations

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 http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

## 3.1 Terms and definitions

**3.1.1**
**plastic**
material which contains as an essential ingredient a *polymer* (3.1.4) and which at some stage in its processing into finished products can be shaped by flow

Note 1 to entry: Additives or other substances may have been added, and which can function as a main structural component of final products.

[SOURCE: EN 17615:2022, 3.184 modified one note to entry has been removed]



**3.1.2**
**foamed plastic**
*plastic* (3.1.1) the density of which is reduced by the presence of numerous small cavities (cells), interconnecting or not, dispersed throughout the mass

Note 1 to entry: A cellular plastic (foamed plastic) is often simply called a foam.

[SOURCE: EN ISO 472:2013, 2.126]

**3.1.3**
**compatibility**
capability of two or more items or components of equipment or material to exist or function in the same system without modification, adaption or mutual interference

[SOURCE: EN ISO 21007-1:2005, 2.14]

**3.1.4**
**polymer**
large molecule, synthetic or natural, characterized by the sequence of one or more types of monomer units which are covalently bound to each other

[SOURCE: EN 17615:2022, 3.190]

**3.1.5**
**single constituent polymer**
Polymers made from a single polymer or copolymer

Note 1 to entry: This term is used in EN ISO 11469:2016, 5.12.

**3.1.6**
**polymer blend**
alloy
two or more polymers blended to create an alloy

Note 1 to entry: This term is used in EN ISO 11469:2016, 5.1.3.

**3.1.7**
**thermoplastic**
type of plastic that can repeatedly be melted when heated and solidified when cooled down

[SOURCE: EN 17615:2022, 3.245]

**3.1.8**
**thermoset**
type of plastic that have undergone a chemical reaction by the action of heat, catalyst, ultraviolet light, etc., resulting in an irreversibly cross-linked material which can no longer be melted

[SOURCE: EN 17615:2022, 3.246]



**3.1.9**
**shredding**
mechanical process by which plastics waste is fragmented into irregular pieces of any dimension or shape



Note 1 to entry: Shredding usually signifies the tearing or cutting of materials that cannot be crushed by fragmentation methods applicable to brittle materials, as typically carried out in a hammer mill.

[SOURCE: ISO 15270:2008, 3.33]

**3.1.10**
**post-shredder technology**
techniques and technologies used to process materials from end-of-life vehicles, after they have been shredded, for further recovery

[SOURCE: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on circularity requirements for vehicle design and on management of end-of-life vehicles, amending Regulations (EU) 2018/858 and 2019/1020 and repealing Directives 2000/53/EC and 2005/64/EC, Brussels, 13.7.2023 COM (2023) 451 final 2023/0284 (COD) [4]]

**3.1.11**
**mixed plastics**
commingled plastics
mixture of materials or products consisting of different types of *plastic* (3.1.1)

[SOURCE: EN 17615:2022, 3.58]

**3.1.12**
**composite material**
solid product consisting of two or more distinct phases, including a binding material (matrix) and a particulate or fibrous material

EXAMPLE moulding material containing reinforcing fibres, particulate fillers or hollow spheres

[SOURCE: EN ISO 472:2013, 2.182.1]

**3.1.13**
**recycling of plastics**
**recycling**
process of recovering waste plastics into products, materials or substances to be used again but excluding energy recovery and materials intended to be used as fuels

Note 1 to entry: Recycling can be mechanical, chemical, physical or organic.

Note 2 to entry: Recycling is also defined in Directive 2008/98/EC, Article 3 (17).

[SOURCE: EN 17615:2022, 3.211, modified – "recycling" has been added as a synonym term]

**3.1.14**
**recyclability**
potential of items or materials to be recycled as defined by the relevant standards and regulations in force

Note 1 to entry: The adjective of *recyclability* (3.1.14) is *recyclable* (3.1.15).

[SOURCE: EN 17615:2022, 3.208]

**3.1.15**
**recyclable**
characteristic of a product, packaging, or associated component that can be diverted from the waste stream through available processes and programmes and can be collected, processed, and returned to use in the form of raw materials or products

Note 1 to entry: This term is used in EN ISO 14021:2016, 7.7.1.

**3.1.16**
**elastomers**
macromolecular material which returns rapidly to its initial dimensions and shape after substantial deformation by a weak stress and release of the stress

Note 1 to entry: The definition applies under room temperature test conditions.

[SOURCE: EN 17615:2022, 3.97]

**3.1.17**
**adhesive**
substance with the capability of bonding materials to each other by chemical or mechanical action or both

[SOURCE: ISO 5127:2017, 3.3.5.2.35]

**3.1.18**
**biodegradability**
potential for a polymeric material to undergo a *biodegradation* (3.1.19) process

Note 1 to entry: Biodegradable is the adjective of *biodegradability* (3.1.18).

[SOURCE: EN 17615:2022, 3.29 modified, one note to entry has been removed]

**3.1.19**
**biodegradation**
process leading to the breakdown of an organic compound by microorganisms in the presence of oxygen to carbon dioxide, water, mineral salts and new biomass, or in the absence of oxygen to carbon dioxide, methane, mineral salts and new biomass

Note 1 to entry: Breakdown of organic compounds by microorganisms into inorganic compounds is called mineralization.

[SOURCE: EN 17615:2022, 3.30]

**3.1.20**
**removal**
manual, mechanical, chemical, thermal or metallurgic handling with the result that the targeted parts, components or materials from end-of-life vehicles are individually identifiable as a separate output stream or part of an output stream;



[SOURCE: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on circularity requirements for vehicle design and on management of end-of-life vehicles, amending Regulations (EU) 2018/858 and 2019/1020 and repealing Directives 2000/53/EC and 2005/64/EC, Brussels, 13.7.2023 COM (2023) 451 final 2023/0284 (COD) [4]]

**3.1.21**
**dismantling**
process whereby a product is taken apart in such a way that some parts can be reused, although the product (and the parts not intended to be reused) can no longer be reassembled and made operational



[SOURCE: EN 17615:2022,3.90 modified, one note to entry has been removed]

## 3.2 Abbreviations

| | | |
|---|---|---|
| 1. | ABS | Acrylonitrile butadiene styrene |
| 2. | ABS/PC blend | Acrylonitrile butadiene styrene/Polycarbonate blend |
| 3. | ABS/PET blend | Acrylonitrile butadiene styrene/ Polyethylene terephthalate blend |
| 4. | ASA | Acrylonitrile styrene acrylate |
| 5. | ASR | Automotive shredder residue |
| 6. | ELV | End-of-Life Vehicles |
| 7. | EP | Ethylene Propylene |
| 8. | EPDM | Ethylene propylene diene monomer rubber |
| 9. | FTIR | Fourier-transform infrared spectroscopy |