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List of abbreviations

<i>AMD</i>	<i>Amendment</i>
<i>AWI</i>	<i>Approved Work Item</i>
<i>CD</i>	<i>Committee Draft</i>
<i>CEN</i>	<i>European Committee for Standardization</i>
<i>CENELEC</i>	<i>European Committee for Standardization in the Electrical Field</i>
<i>CWA</i>	<i>CEN or CENELEC Workshop Agreement</i>
<i>DIS</i>	<i>Draft International Standard</i>
<i>EN</i>	<i>European Standard</i>
<i>EOTA</i>	<i>European Organisation for Technical Assessment</i>
<i>ESO</i>	<i>European Standardisation Organisation</i>
<i>ETAG</i>	<i>European Technical Approval Guideline</i>
<i>ETSI</i>	<i>European Telecommunications Standards Institute</i>
<i>EU</i>	<i>European Union</i>
<i>FDIS</i>	<i>Final Draft International Standard</i>
<i>hEN</i>	<i>Harmonised European Standard</i>
<i>IEC</i>	<i>International Electrotechnical Commission</i>
<i>ISO</i>	<i>International Organization for Standardization; International Standard</i>
<i>LCA</i>	<i>Life Cycle assessment</i>
<i>NMC</i>	<i>National Mirror Committee</i>
<i>NSB</i>	<i>National Standardization Body</i>
<i>NWIP</i>	<i>New Work Item Proposal</i>
<i>PWI</i>	<i>Preliminary Work Item</i>
<i>SC</i>	<i>Subcommittee</i>
<i>TC</i>	<i>Technical Committee</i>
<i>TR</i>	<i>Technical Report</i>
<i>TS</i>	<i>Technical Specification</i>
<i>UNE</i>	<i>Spanish Association For Standardization</i>
<i>WD</i>	<i>Working Draft</i>
<i>WG</i>	<i>Working Group</i>
<i>WI</i>	<i>Work Item</i>
<i>WP</i>	<i>Work Package</i>

0 Executive summary

The Spanish Association for Standardization (UNE), as a European Standardization Body, is a partner in the upPE-T project to provide support regarding the standardization tasks included in the project. A previous deliverable “D7.11 *Standardization contribution*” was prepared to guide the partners about the published standards and standards under development that could be applicable to upPE-T.

The definition of the fields of interest related to UpPE-T project, agreed by its consortium, served as a starting point for the identification and analysis of the standardization technical committees (TCs) related to the project as well as the published standards and standards under development that could be useful and relevant for the project activities. It could also help to identify standardization gaps that might be covered by the results of the project along its development.

“D7.12 *Standardization contribution*” establishes a revised analysis, containing updated information regarding the recent standardization activities which are relevant for the project.

The list of technical committees defined in D7.11 deliverable has been reviewed for D7.12, with the aim to better respond to the characteristics and necessities of the project, with the focus on the potential contribution to the ongoing and future standardization developments.

D7.12 deliverable constitutes the result of the monitoring action of the standardization activities relevant to upPE-T project. It is conceived to offer to the partners updated information about the recent activity developed in the period since the publication of D7.11 deliverable.

1 Introduction and methodology

1.1 Project Presentation Overview

Nowadays, more than 98% of plastics are produced from non-renewable sources. Some plastics are biobased, however not all of them are recyclable, reusable, or biodegradable. Since zero landfilling or incineration is necessary to achieve the circular economy of plastics, a sustainable management of plastic wastes has become a very challenging problem for the recycling industry, where Polyethylene (PE) and Polyethylene terephthalate (PET) are the leading plastic used in food and drink packaging (43% PE and 19% PET).

Due to the durability and resistance to degradation of plastic materials, plastic packaging, which makes up nearly 60% of the total plastic waste in Europe, has become a problematic issue in terms of waste management and from an environmental point of view. Currently, plastic recycling practices have significant limitations. On one hand, mechanical techniques downgrade plastic properties, on the other hand, chemical recycling for plastic depolymerisation requires high energy and long reaction times to be effective.

In this context, upPE-T project aims to become an innovative alternative to the habitual recycling techniques of PE and PET food and drink packaging wastes, involving sustainable strategies, through enzymatic engineering for PE and PET depolymerization. PE and PET waste streams are expected to be turned into raw material to produce biodegradable bioplastics by means of enzymatic degradation and microbial assimilation. In addition, the objectives of the project include simplifying the downstream bioplastic recovery process from cell biomass using an efficient and green extraction approach without the use of toxic solvents.

Finally, together with customers and food and drink brand owners, bio-based end-packaging will be demonstrated and validated to ensure fast market deployment. The intention is to positively impact food and drink packaging recycling rates, achieving the European Union expected objectives.

Additionally, in order to ensure 100% of PE and PET recyclability, plastic rejections not optimal for microbial bioconversion into bioplastics will be valorised by their use in building applications instead of being sent to incineration or landfilling.

For all of the above, upPE-T will be an important part of the actions for compliance with the European Strategy for Plastics in a Circular Economy¹.

¹ https://ec.europa.eu/info/research-and-innovation/research-area/environment/circular-economy/plastics-circular-economy_en#:~:text=%20Plastics%20in%20a%20circular%20economy%20%201,identified%20a%20range%20of%20measures%20to...%20More%20

1.2 Methodology of the document

The preparation of “D7.11 *Standardization contribution*” was initiated with the establishment of a list of key concepts relevant to the project, which was shared, reviewed, and agreed by upPE-T project partners. It served as starting point to identify the corresponding relevant standardization technical committees (TCs).

Recognized the technical bodies, a research work was done to compile the list of published standards and under development standards relevant for upPE-T project.

“D7.12 *Standardization contribution*” establishes a revision of the analysis contained in the previous document. It includes a revision of the list of subjects and technical committees, as well as the result of a research work to identify the relevant published standards and new under development standards registered during this period.

The standardization analysis covers European standardization developed by the European Committee for Standardization (CEN), the European Committee for electrotechnical Standardization (CENELEC), the European Telecommunications Standards Institute (ETSI) and also the International standardization developed by the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC).

Based on the structure of the previous document as a reference, this document is organized in standardization areas. Some information regarding standardization concepts has been omitted and can be consulted in D7.11.

This document updates the list of relevant standards for upPE-T project on the basis of the standards included in D7.11 and also includes the new projects and standards developed by the identified technical bodies during this 6-month period.

2 Standardization related to upPE-T project

2.1 Updating of technical committees overview

The list shown in D7.11 has been taken as a reference. “I+D+I project management” and “Innovation management” concepts have been omitted, since their applicability has not been considered as highly relevant to upPE-T project (The standardization on “Project management” does not refer to the way projects are managed, but to the way R&D&I is applied or enhanced within organizations).

The following table is a reviewed list of the European and international committees which have been identified as the technical bodies working on subjects related to upPE-T project.

Table 1: European and international committees related to upPE-T project

Subject (Key concepts)	Technical committee
PLASTIC MATERIALS AND PROPERTIES Plastics Polyethylene (PE) Polyethylene terephthalate (PET) Biopolyester (PHBV) Biopolymers Biodegradable plastics Recycled plastics Thermoplastics Plastic properties Migration test methods Terephthalic acid Enzymes	CEN/TC 249 Plastics
	CEN/TC 249/WG 11 Plastics recycling
	CEN/TC 249/WG 16 Welding of thermoplastics
	CEN/TC 249/WG 19 Light exposure
	CEN/TC 249/WG 7 Thermoplastic films for use in agriculture
	CEN/TC 249/WG 9 Bio-based and biodegradable plastics
	ISO/TC 61 Plastics
	ISO/TC 61/SC 1 Terminology
	ISO/TC 61/SC 2 Mechanical behaviour
	ISO/TC 61/SC 4 Burning behaviour
	ISO/TC 61/SC 5 Physical-chemical properties
	ISO/TC 61/SC 6 Ageing, chemical and environmental resistance
	ISO/TC 61/SC 9 Thermoplastic materials
	ISO/TC 61/SC 10 Cellular plastics
	ISO/TC 61/SC 11 Products

	ISO/TC 61/WG 4 Plastics joining
<p>PACKAGING AND USE OF PLASTICS</p> <p>Materials in contact with foodstuffs</p> <p>Plastic packaging</p> <p>Food & drink packaging</p>	CEN/TC 261 Packaging
	CEN/TC 261/WG 1 Management standards for packaging of foodstuffs
	CEN/TC 194 Utensils in contact with food
	CEN/TC 194/WG 1 Cookware
	CEN/TC 194/WG 8 Overall migration
	ISO/TC 122 Packaging
	ISO/TC 122/SC 3 Performance requirements and tests for means of packaging, packages and unit loads (as required by ISO/TC 122)
	ISO/TC 122/WG 5 Terminology and vocabulary
<p>ENVIRONMENTAL MANAGEMENT AND LIFE CYCLE ASSESSMENT</p> <p>Ecodesign</p> <p>Plastic wastes</p> <p>Life Cycle Assessment</p> <p>Packaging and environment</p> <p>Sustainability of construction works</p>	CEN/TC 249/WG 24 Environmental aspects
	CEN/TC 261/SC 4 Packaging and Environment
	CEN/TC 350 Sustainability of construction works
	CEN/SS S26 Environmental management
	CEN/TC 411 Bio-based products
	CEN/TC 411/WG 1 Terminology
	CEN/TC 411/WG 3 Bio-based content
	CEN/TC 411/WG 4 Sustainability criteria, life cycle analysis and related issues
	CEN/TC 411/WG 5 Certification and declaration tools
	ISO/TC 61/SC 14 Environmental aspects
	ISO/TC 122/SC 4 Packaging and the environment
	ISO/TC 59/SC 17 Sustainability in buildings and civil engineering works
	ISO/TC 207 Environmental management
	ISO/TC 207/SC 1 Environmental management systems

	ISO/TC 207/SC 2 Environmental auditing and related environmental investigations
	ISO/TC 207/SC 3 Environmental labelling
	ISO/TC 207/SC 4 Environmental performance evaluation
	ISO/TC 207/SC 5 Life cycle assessment

Please note that, sometimes, under the structure of a technical body, some working groups and subcommittees may cover more than one of the subjects mentioned above. For example, concepts related to environment could be indicated in technical bodies regarding plastics or regarding packaging. To make it clearer, we have considered that concepts once, classified under the most relevant body in each case.

2.2 Updating of the list of standards related to upPE-T project

2.2.1 Updated list of standards related to plastic materials and properties

There are a lot of standards closely related to plastic materials and properties. They are mostly elaborated by CEN/TC 249 *Plastics* and their working groups and, at an international level, ISO/TC 61 *Plastics*.

During this 6-month period, the main changes regarding the standardization in this field have been compiled in Table 2 (the complete updated list of standards can be consulted in Annex A)

Table 2: New standards related to plastic materials and properties for upPE-T project

Reference	Document title
ISO 14632:2021	Extruded sheets of polyethylene (PE-HD) — Requirements and test methods
ISO 11403-1:2021	Plastics — Acquisition and presentation of comparable multipoint data — Part 1: Mechanical properties
ISO 11403-3:2021	Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties
ISO 4589-4:2021	Plastics — Determination of burning behaviour by oxygen index — Part 4: High gas velocity test
ISO 13468-2:2021	Plastics — Determination of the total luminous transmittance of transparent materials — Part 2: Double-beam instrument

ISO 20965:2021	Plastics — Determination of the transient extensional viscosity of polymer melts
ISO 4892-2:2013/Amd 1:2021	Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps — Amendment 1: Classification of daylight filters
ISO 1043-4:2021	Plastics — Symbols and abbreviated terms — Part 4: Flame retardants
ISO 844:2021	Rigid cellular plastics — Determination of compression properties
prEN 15347 rev	Plastics - Recycled Plastics - Characterisation of sorted plastics wastes
ISO/DIS 22526-4	Plastics — Carbon and environmental footprint of biobased plastics — Part 4: Environmental (total) footprint (Life Cycle Assessment)

2.2.2 Updated list of standards related to packaging and use of plastics

Standards regarding packaging and use of plastics, related to upPE-T project, have been developed by several technical committees, which are CEN/TC 261 Packaging, CEN/TC 194 Utensils in contact with food and ISO/TC 122 Packaging.

During this 6-month period, the main changes regarding the standardization in this field have been compiled in Table 3 (the complete updated list of standards can be consulted in Annex B)

Table 3: New standards related to packaging and use of plastics for upPE-T project

Reference	Document title
ISO/TR 18568:2021	Packaging and the environment — Marking for material identification

2.2.3 Updated list of standards related to environmental management and life cycle assessment

Environmental management and life cycle assessment are concepts that are closely linked to upPE-T project. They are specifically covered by technical committees at European and at international level.

In this regard, CEN/TC 249/WG 24 *Environmental aspects*, ISO/TC 61/SC 14 *Environmental aspects*, CEN/TC 261/SC 4 *Packaging and Environment* and ISO/TC 122/SC

4 *Packaging and the environment*, as well as *CEN/TC 350 Sustainability of construction works* and *ISO/TC 59/SC 17 Sustainability in buildings and civil engineering works*, also develop their standardization activity in close connection to environmental issues, in their specific field (plastics, packaging, construction works).

CEN/TC 411 Bio-based products and *ISO/TC 207 Environmental management* are also technical committees to follow-up.

During this 6-month period, the main changes regarding the standardization in this field have been compiled in Table 4 (the complete updated list of standards can be consulted in Annex C)

Table 4: New standards related to environment management and life cycle assessment for upPE-T project

Reference	Document title
CEN/TR 17674:2021	Bio-based products- Use of stable isotope ratios of Carbon, Hydrogen, Oxygen and Nitrogen as tools for verification of the origin of bio-based feedstock and characteristics of production processes - Overview of relevant existing applications
EN 15804:2012+A2:2019/AC:2021	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
ISO 14852:2021	Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium — Method by analysis of evolved carbon dioxide
ISO 14031:2021	Environmental management — Environmental performance evaluation — Guidelines
ISO 23517:2021	Plastics — Soil biodegradable materials for mulch films for use in agriculture and horticulture — Requirements and test methods regarding biodegradation, ecotoxicity and control of constituents
ISO 23832:2021	Plastics — Test methods for determination of degradation rate and disintegration degree of plastic materials exposed to marine environmental matrices under laboratory conditions
ISO 17088:2021	Specifications for compostable plastics

3 Conclusions

Throughout this document, the recent standardization activity related to upPE-T project has been widely revised and updated, having D7.11 deliverable as a reference.

This study has been carried out at both, European and international levels and has taken into consideration the different kinds of standardization document whose scope has been valued as relevant for the upPE-T project.

This analysis of the standardization landscape is useful from the first steps of the project because it reveals already existing material and promotes the alignment with current and under development standardization works, facilitating the compatibility of the outcomes with the current market practises.

This document is expected to be a useful tool for upPE-T partners, who are invited to value the impact of the activity developed by the identified standardization committees on their tasks among the project.

There are different alternatives to benefit from and contribute to standardization. The options must be analysed together with the partners to encounter the optimum option according to the results and the approach of the project.

In a later stage, upPE-T project is expected to contribute to new standard developments in specific topics. The inclusion of the outcomes of the project in new or future standards, external to the consortium will enhance the impact of the project and will contribute to the transmission of the knowledge. In this regard, the development of fast track standards like CEN-CENELEC Workshop Agreements (CWA), or Technical Specifications (TS) will be the most suitable options. Other possibilities would be the contribution to current developments or the proposal of modifications in existing standards.

4 References

For the elaboration of this report, the following sources have been consulted:

- CEN Website (www.cen.eu)
- CENELEC Website (www.cenelec.eu)
- CEN/CENELEC Projex Online database (projex.cen.eu) (restricted to authorized users)
- EOTA Website (www.eota.eu)
- ISO Website (www.iso.org)
- ISO Project Portal (isotc.iso.org) (restricted to authorized users)
- IEC Website (www.iec.ch)
- EUR-Lex (eur-lex.europa.eu)
- European Commission Mandate database (ec.europa.eu/enterprise/standards_policy/mandates/database)

Annex A: Complete list of standards related to plastic materials and properties for upPE-T project

Table A.1: Published standards related to plastic materials and properties for upPE-T project

Reference	Document title
CEN/TR 17219:2018	Plastics - Biodegradable thermoplastic mulch films for use in agriculture and horticulture - Guide for the quantification of alteration of films
CEN/TR 15351:2006	Plastics - Guide for vocabulary in the field of degradable and biodegradable polymers and plastic items
CEN/TS 16861:2015	Plastics - Recycled plastics - Determination of selected marker compounds in food grade recycled polyethylene terephthalate (PET)
CEN/TS 17627:2021	Plastics - Recycled plastics - Determination of solid contaminants content
CEN/TR 15353:2007	Plastics - Recycled plastics - Guidelines for the development of standards for recycled plastics
CEN/TS 16011:2013	Plastics - Recycled plastics - Sample preparation
CEN/TS 16010:2020	Plastics - Recycled plastics - Sampling procedures for testing plastics waste and recyclates
CEN/TS 16892:2015	Plastics - Welding of thermoplastics - Specification of welding procedures
EN 17417:2020	Determination of the ultimate biodegradation of plastics materials in an aqueous system under anoxic (denitrifying) conditions - Method by measurement of pressure increase
EN 12943:1999	Filler materials for thermoplastics - Scope, designation, requirements, tests
EN 14728:2019	Imperfections in thermoplastic welds - Classification
EN 17033:2018	Plastics - Biodegradable mulch films for use in agriculture and horticulture - Requirements and test methods
EN 14995:2006	Plastics - Evaluation of compostability - Test scheme and specifications
EN 16472:2014	Plastics - Method for artificial accelerated photoaging using medium pressure mercury vapour lamps
EN 16795:2015	Plastics - Method for estimating heat build up of flat surfaces by simulated solar radiation

EN 15347:2007	Plastics - Recycled Plastics - Characterisation of plastics wastes
EN 15348:2014	Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates
EN 15344:2021	Plastics - Recycled plastics - Characterization of Polyethylene (PE) recyclates
EN 15343:2007	Plastics - Recycled Plastics - Plastics recycling traceability and assessment of conformity and recycled content
EN 13206:2017+A1:2020	Plastics - Thermoplastic covering films for use in agriculture and horticulture
EN 13655:2018	Plastics - Thermoplastic mulch films recoverable after use, for use in agriculture and horticulture
EN 15860:2018	Plastics - Thermoplastic semi-finished products for machining - Requirements and test methods
EN 13207:2018	Plastics - Thermoplastic silage films and tubes for use in agriculture
EN 13705:2004	Welding of thermoplastics - Machines and equipment for hot gas welding (including extrusion welding)
ISO 9772:2020	Cellular plastics — Determination of horizontal burning characteristics of small specimens subjected to a small flame
ISO 7214:2012	Cellular plastics — Polyethylene — Methods of test
ISO 845:2006	Cellular plastics and rubbers — Determination of apparent density
ISO 1923:1981	Cellular plastics and rubbers — Determination of linear dimensions
ISO 7850:1986	Cellular plastics, rigid — Determination of compressive creep
ISO 7616:1986	Cellular plastics, rigid — Determination of compressive creep under specified load and temperature conditions
ISO 9054:1990	Cellular plastics, rigid — Test methods for self-skinned, high-density materials
ISO 15040:1999	Composites — Prepregs — Determination of gel time
ISO 14632:2021	Extruded sheets of polyethylene (PE-HD) — Requirements and test methods
ISO 22196:2011	Measurement of antibacterial activity on plastics and other non-porous surfaces

ISO 21702:2019	Measurement of antiviral activity on plastics and other non-porous surfaces
ISO 11403-1:2021	Plastics — Acquisition and presentation of comparable multipoint data — Part 1: Mechanical properties
ISO 11403-2:2012	Plastics — Acquisition and presentation of comparable multipoint data — Part 2: Thermal and processing properties
ISO 11403-3:2021	Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties
ISO 10350-1:2017	Plastics — Acquisition and presentation of comparable single-point data — Part 1: Moulding materials
ISO 9702:1996	Plastics — Amine epoxide hardeners — Determination of primary, secondary and tertiary amine group nitrogen content
ISO 3671:1976	Plastics — Aminoplastic moulding materials — Determination of volatile matter
ISO 29664:2010	Plastics — Artificial weathering including acidic deposition
ISO 16869:2008	Plastics — Assessment of the effectiveness of fungistatic compounds in plastics formulations
ISO 293:2004	Plastics — Compression moulding of test specimens of thermoplastic materials
ISO 295:2004	Plastics — Compression moulding of test specimens of thermosetting materials
ISO 15527:2018	Plastics — Compression-moulded sheets of polyethylene (PE-UHMW, PE-HD) — Requirements and test methods
ISO 20329:2020	Plastics — Determination of abrasive wear by reciprocating linear sliding motion
ISO 23706:2020	Plastics — Determination of apparent activation energies of property changes in standard weathering test methods
ISO 60:1977	Plastics — Determination of apparent density of material that can be poured from a specified funnel
ISO 61:1976	Plastics — Determination of apparent density of moulding material that cannot be poured from a specified funnel
ISO 3451-1:2019	Plastics — Determination of ash — Part 1: General methods
ISO 19929:2017	Plastics — Determination of average molecular mass and mixture ratio of poly(ethylene glycol) and its derivatives by MALDI-TOF-MS

ISO 16014-1:2019	Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 1: General principles
ISO 16014-2:2019	Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 2: Universal calibration method
ISO 16014-3:2019	Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 3: Low-temperature method
ISO 16014-4:2019	Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 4: High-temperature method
ISO 16014-5:2019	Plastics — Determination of average molecular weight and molecular weight distribution of polymers using size-exclusion chromatography — Part 5: Light-scattering method
ISO 171:1980	Plastics — Determination of bulk factor of moulding materials
ISO 4589-1:2017	Plastics — Determination of burning behaviour by oxygen index — Part 1: General requirements
ISO 4589-2:2017	Plastics — Determination of burning behaviour by oxygen index — Part 2: Ambient-temperature test
ISO 4589-3:2017	Plastics — Determination of burning behaviour by oxygen index — Part 3: Elevated-temperature test
ISO 4589-4:2021	Plastics — Determination of burning behaviour by oxygen index — Part 4: High gas velocity test
ISO 9773:1998	Plastics — Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source
ISO 9773:1998/Amd 1:2003	Plastics — Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source — Amendment 1: Specimens
ISO 15033:2018	Plastics — Determination of caprolactam and its cyclic and linear oligomers by HPLC
ISO 4582:2017	Plastics — Determination of changes in colour and variations in properties after exposure to glass-filtered solar radiation, natural weathering or laboratory radiation sources
ISO 179-1:2010	Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test
ISO 179-2:2020	Plastics — Determination of Charpy impact properties — Part 2: Instrumented impact test

ISO 604:2002	Plastics — Determination of compressive properties
ISO 899-1:2017	Plastics — Determination of creep behaviour — Part 1: Tensile creep
ISO 899-2:2003	Plastics — Determination of creep behaviour — Part 2: Flexural creep by three-point loading
ISO 899-2:2003/Amd 1:2015	Plastics — Determination of creep behaviour — Part 2: Flexural creep by three-point loading — Amendment 1
ISO 16790:2021	Plastics — Determination of drawing characteristics of thermoplastics in the molten state
ISO 6721-1:2019	Plastics — Determination of dynamic mechanical properties — Part 1: General principles
ISO 6721-10:2015	Plastics — Determination of dynamic mechanical properties — Part 10: Complex shear viscosity using a parallel-plate oscillatory rheometer
ISO 6721-11:2019	Plastics — Determination of dynamic mechanical properties — Part 11: Glass transition temperature
ISO 6721-12:2009	Plastics — Determination of dynamic mechanical properties — Part 12: Compressive vibration — Non-resonance method
ISO 6721-2:2019	Plastics — Determination of dynamic mechanical properties — Part 2: Torsion-pendulum method
ISO 6721-3:2021	Plastics — Determination of dynamic mechanical properties — Part 3: Flexural vibration — Resonance-curve method
ISO 6721-4:2019	Plastics — Determination of dynamic mechanical properties — Part 4: Tensile vibration — Non-resonance method
ISO 6721-5:2019	Plastics — Determination of dynamic mechanical properties — Part 5: Flexural vibration — Non-resonance method
ISO 6721-6:2019	Plastics — Determination of dynamic mechanical properties — Part 6: Shear vibration — Non-resonance method
ISO 6721-7:2019	Plastics — Determination of dynamic mechanical properties — Part 7: Torsional vibration — Non-resonance method
ISO 6721-8:2019	Plastics — Determination of dynamic mechanical properties — Part 8: Longitudinal and shear vibration — Wave-propagation method
ISO 6721-9:2019	Plastics — Determination of dynamic mechanical properties — Part 9: Tensile vibration — Sonic-pulse propagation method
ISO 16770:2019	Plastics — Determination of environmental stress cracking (ESC) of polyethylene — Full-notch creep test (FNCT)

ISO 178:2019	Plastics — Determination of flexural properties
ISO 13586:2018	Plastics — Determination of fracture toughness (GIC and KIC) — Linear elastic fracture mechanics (LEFM) approach
ISO 17281:2018	Plastics — Determination of fracture toughness (GIC and KIC) at moderately high loading rates (1 m/s)
ISO 2039-1:2001	Plastics — Determination of hardness — Part 1: Ball indentation method
ISO 2039-2:1987	Plastics — Determination of hardness — Part 2: Rockwell hardness
ISO 14782:1999	Plastics — Determination of haze for transparent materials
ISO 14782:1999/Cor 1:2005	Plastics — Determination of haze for transparent materials — Technical Corrigendum 1
ISO 871:2006	Plastics — Determination of ignition temperature using a hot-air furnace
ISO 17221:2014	Plastics — Determination of image clarity (degree of sharpness of reflected or transmitted image)
ISO 180:2019	Plastics — Determination of Izod impact strength
ISO 16012:2015	Plastics — Determination of linear dimensions of test specimens
ISO 176:2005	Plastics — Determination of loss of plasticizers — Activated carbon method
ISO 6427:2013	Plastics — Determination of matter extractable by organic solvents (conventional methods)
ISO 3146:2000	Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods
ISO 3146:2000/Cor 1:2002	Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods — Technical Corrigendum 1
ISO 177:2016	Plastics — Determination of migration of plasticizers
ISO 29221:2014	Plastics — Determination of mode I plane-strain crack-arrest toughness
ISO 8660:2002	Plastics — Determination of permanganate absorption number of caprolactam — Spectrometric method
ISO 6186:1998	Plastics — Determination of pourability

ISO 6603-1:2000	Plastics — Determination of puncture impact behaviour of rigid plastics — Part 1: Non-instrumented impact testing
ISO 6603-2:2000	Plastics — Determination of puncture impact behaviour of rigid plastics — Part 2: Instrumented impact testing
ISO 489:1999	Plastics — Determination of refractive index
ISO 22088-1:2006	Plastics — Determination of resistance to environmental stress cracking (ESC) — Part 1: General guidance
ISO 22088-2:2006	Plastics — Determination of resistance to environmental stress cracking (ESC) — Part 2: Constant tensile load method
ISO 22088-3:2006	Plastics — Determination of resistance to environmental stress cracking (ESC) — Part 3: Bent strip method
ISO 22088-4:2006	Plastics — Determination of resistance to environmental stress cracking (ESC) — Part 4: Ball or pin impression method
ISO 22088-5:2006	Plastics — Determination of resistance to environmental stress cracking (ESC) — Part 5: Constant tensile deformation method
ISO 22088-6:2006	Plastics — Determination of resistance to environmental stress cracking (ESC) — Part 6: Slow strain rate method
ISO 9352:2012	Plastics — Determination of resistance to wear by abrasive wheels
ISO 19252:2008	Plastics — Determination of scratch properties
ISO 17744:2004	Plastics — Determination of specific volume as a function of temperature and pressure (pvT diagram) — Piston apparatus method
ISO 23741:2021	Plastics — Determination of spray water delivery during spray cycles when using a xenon arc weathering test apparatus
ISO 458-1:1985	Plastics — Determination of stiffness in torsion of flexible materials — Part 1: General method
ISO 458-2:1985	Plastics — Determination of stiffness in torsion of flexible materials — Part 2: Application to plasticized compounds of homopolymers and copolymers of vinyl chloride
ISO 75-1:2020	Plastics — Determination of temperature of deflection under load — Part 1: General test method
ISO 75-2:2013	Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite
ISO 75-3:2004	Plastics — Determination of temperature of deflection under load — Part 3: High-strength thermosetting laminates and long-fibre-reinforced plastics

ISO 527-1:2019	Plastics — Determination of tensile properties — Part 1: General principles
ISO 527-2:2012	Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics
ISO 527-3:2018	Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets
ISO 18872:2007	Plastics — Determination of tensile properties at high strain rates
ISO 8256:2004	Plastics — Determination of tensile-impact strength
ISO 15850:2014	Plastics — Determination of tension-tension fatigue crack propagation — Linear elastic fracture mechanics (LEFM) approach
ISO 974:2000	Plastics — Determination of the brittleness temperature by impact
ISO 4611:2010	Plastics — Determination of the effects of exposure to damp heat, water spray and salt mist
ISO 11443:2021	Plastics — Determination of the fluidity of plastics using capillary and slit-die rheometers
ISO 2556:1974	Plastics — Determination of the gas transmission rate of films and thin sheets under atmospheric pressure — Manometric method
ISO 1133-1:2011	Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method
ISO 1133-2:2011	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 10927:2018	Plastics — Determination of the molecular mass and molecular mass distribution of polymer species by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF-MS)
ISO 13468-1:2019	Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single-beam instrument
ISO 13468-2:2021	Plastics — Determination of the total luminous transmittance of transparent materials — Part 2: Double-beam instrument
ISO 20965:2021	Plastics — Determination of the transient extensional viscosity of polymer melts

ISO 1628-1:2021	Plastics — Determination of the viscosity of polymers in dilute solution using capillary viscometers — Part 1: General principles
ISO 1628-3:2010	Plastics — Determination of the viscosity of polymers in dilute solution using capillary viscometers — Part 3: Polyethylenes and polypropylenes
ISO 22007-1:2017	Plastics — Determination of thermal conductivity and thermal diffusivity — Part 1: General principles
ISO 22007-2:2015	Plastics — Determination of thermal conductivity and thermal diffusivity — Part 2: Transient plane heat source (hot disc) method
ISO 22007-3:2008	Plastics — Determination of thermal conductivity and thermal diffusivity — Part 3: Temperature wave analysis method
ISO 22007-4:2017	Plastics — Determination of thermal conductivity and thermal diffusivity — Part 4: Laser flash method
ISO/TR 22007-5:2011	Plastics - Determination of thermal conductivity and thermal diffusivity - Part 5: Results of interlaboratory testing of poly(methyl methacrylate) samples
ISO 22007-6:2014	Plastics — Determination of thermal conductivity and thermal diffusivity — Part 6: Comparative method for low thermal conductivities using a temperature-modulation technique
ISO 2578:1993	Plastics — Determination of time-temperature limits after prolonged exposure to heat
ISO 26723:2020	Plastics — Determination of total luminous transmittance and reflectance
ISO 12058-1:2018	Plastics — Determination of viscosity using a falling-ball viscometer — Part 1: Inclined-tube method
ISO 62:2008	Plastics — Determination of water absorption
ISO 15512:2019	Plastics — Determination of water content
ISO 17223:2014	Plastics — Determination of yellowness index and change in yellowness index
ISO 15791-1:2014	Plastics — Development and use of intermediate-scale fire tests for plastics products — Part 1: General guidance
ISO/TS 15791-2:2017	Plastics — Development and use of intermediate-scale fire tests for plastics products — Part 2: Use of intermediate-scale tests for semi-finished and finished products
ISO 11357-1:2016	Plastics — Differential scanning calorimetry (DSC) — Part 1: General principles

ISO 11357-2:2020	Plastics — Differential scanning calorimetry (DSC) — Part 2: Determination of glass transition temperature and step height
ISO 11357-3:2018	Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization
ISO 11357-4:2021	Plastics — Differential scanning calorimetry (DSC) — Part 4: Determination of specific heat capacity
ISO 11357-5:2013	Plastics — Differential scanning calorimetry (DSC) — Part 5: Determination of characteristic reaction-curve temperatures and times, enthalpy of reaction and degree of conversion
ISO 11357-6:2018	Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)
ISO 11357-7:2015	Plastics — Differential scanning calorimetry (DSC) — Part 7: Determination of crystallization kinetics
ISO 11357-8:2021	Plastics — Differential scanning calorimetry (DSC) — Part 8: Determination of thermal conductivity
ISO 8985:1998	Plastics — Ethylene/vinyl acetate copolymer (EVAC) thermoplastics — Determination of vinyl acetate content
ISO 846:2019	Plastics — Evaluation of the action of microorganisms
ISO 19095-1:2015	Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies — Part 1: Guidelines for the approach
ISO 19095-2:2015	Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies — Part 2: Test specimens
ISO 19095-3:2015	Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies — Part 3: Test methods
ISO 19095-4:2015	Plastics — Evaluation of the adhesion interface performance in plastic-metal assemblies — Part 4: Environmental conditions for durability
ISO 15015:2011	Plastics — Extruded sheets of impact-modified acrylonitrile-styrene copolymers (ABS, AEPDS and ASA) — Requirements and test methods
ISO 23976:2021	Plastics — Fast differential scanning calorimetry (FSC) — Chip calorimetry
ISO 15988:2003	Plastics — Film and sheeting — Biaxially oriented poly(ethylene terephthalate) (PET) films

ISO 4591:1992	Plastics — Film and sheeting — Determination of average thickness of a sample, and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness)
ISO 11502:2018	Plastics — Film and sheeting — Determination of blocking resistance
ISO 8570:1991	Plastics — Film and sheeting - Determination of cold-crack temperature
ISO 11501:1995	Plastics — Film and sheeting — Determination of dimensional change on heating
ISO 15105-1:2007	Plastics — Film and sheeting — Determination of gas-transmission rate — Part 1: Differential-pressure methods
ISO 15105-2:2003	Plastics — Film and sheeting — Determination of gas-transmission rate — Part 2: Equal-pressure method
ISO 4592:1992	Plastics — Film and sheeting — Determination of length and width
ISO 6383-1:2015	Plastics — Film and sheeting — Determination of tear resistance — Part 1: Trouser tear method
ISO 6383-2:1983	Plastics — Film and sheeting — Determination of tear resistance — Part 2: Elmendorf method
ISO 8295:1995	Plastics — Film and sheeting — Determination of the coefficients of friction
ISO 4593:1993	Plastics — Film and sheeting — Determination of thickness by mechanical scanning
ISO 15106-1:2003	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 1: Humidity detection sensor method
ISO 15106-2:2003	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 2: Infrared detection sensor method
ISO 15106-3:2003	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 3: Electrolytic detection sensor method
ISO 15106-4:2008	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 4: Gas-chromatographic detection sensor method
ISO 15106-5:2015	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 5: Pressure sensor method
ISO 15106-6:2015	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 6: Atmospheric pressure ionization mass spectrometer method

ISO 15106-7:2015	Plastics — Film and sheeting — Determination of water vapour transmission rate — Part 7: Calcium corrosion method
ISO 8296:2003	Plastics — Film and sheeting — Determination of wetting tension
ISO 23559:2011	Plastics — Film and sheeting — Guidance on the testing of thermoplastic films
ISO 15989:2004	Plastics — Film and sheeting — Measurement of water-contact angle of corona-treated films
ISO 15989:2004/Cor 1:2007	Plastics — Film and sheeting — Measurement of water-contact angle of corona-treated films — Technical Corrigendum 1
ISO 13636:2012	Plastics — Film and sheeting — Non-oriented poly(ethylene terephthalate) (PET) sheets
ISO 10093:2020	Plastics — Fire tests — Standard ignition sources
ISO 6601:2002	Plastics — Friction and wear by sliding — Identification of test parameters
ISO 11469:2016	Plastics — Generic identification and marking of plastics products
ISO 10840:2008	Plastics — Guidance for the use of standard fire tests
ISO 17282:2004	Plastics — Guide to the acquisition and presentation of design data
ISO/TR 13883:1995	Plastics — Guide to the writing of test methods
ISO 14616:1997	Plastics — Heatshrinkable films of polyethylene, ethylene copolymers and their mixtures — Determination of shrinkage stress and contraction stress
ISO 9370:2017	Plastics — Instrumental determination of radiant exposure in weathering tests — General guidance and basic test method
ISO/TS 19278:2019	Plastics — Instrumented micro-indentation test for hardness measurement
ISO 23512:2021	Plastics — Joining of thermoplastic moulded components — Specification of variables for thermal joining processes
ISO 3915:1981	Plastics — Measurement of resistivity of conductive plastics
ISO/TS 19022:2016	Plastics — Method of controlled acceleration of laboratory weathering by increased irradiance
ISO 10640:2011	Plastics — Methodology for assessing polymer photoageing by FTIR and UV/visible spectroscopy

ISO 1183-1:2019	Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method
ISO 1183-2:2019	Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method
ISO 1183-3:1999	Plastics — Methods for determining the density of non-cellular plastics — Part 3: Gas pycnometer method
ISO 15314:2018	Plastics — Methods for marine exposure
ISO 21475:2019	Plastics — Methods of exposure to determine the wavelength dependent degradation using spectrally dispersed radiation
ISO 4892-1:2016	Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance
ISO 4892-2:2013	Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps
ISO 4892-2:2013/Amd 1:2021	Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps — Amendment 1: Classification of daylight filters
ISO 4892-3:2016	Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps
ISO 4892-4:2013	Plastics — Methods of exposure to laboratory light sources — Part 4: Open-flame carbon-arc lamps
ISO 877-1:2009	Plastics — Methods of exposure to solar radiation — Part 1: General guidance
ISO 877-2:2009	Plastics — Methods of exposure to solar radiation — Part 2: Direct weathering and exposure behind window glass
ISO 877-3:2018	Plastics — Methods of exposure to solar radiation — Part 3: Intensified weathering using concentrated solar radiation
ISO 175:2010	Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals
ISO 18263-1:2015	Plastics — Mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging — Part 1: Designation system and basis for specification
ISO 18263-2:2015	Plastics — Mixtures of polypropylene (PP) and polyethylene (PE) recyclate derived from PP and PE used for flexible and rigid consumer packaging — Part 2: Preparation of test specimens and determination of properties
ISO 3167:2014	Plastics — Multipurpose test specimens

ISO 15038:1999	Plastics — Organic-perester crosslinking agents for unsaturated-polyester thermosetting materials — Determination of active-oxygen content
ISO/TR 18486:2018	Plastics — Parameters comparing the spectral irradiance of a laboratory light source for weathering applications to a reference solar spectral irradiance
ISO 24047:2021	Plastics — Polyethylene (PE) and polypropylene (PP) thermoplastics — Determination of metal content by ICP-OES
ISO 17855-1:2014	Plastics — Polyethylene (PE) moulding and extrusion materials — Part 1: Designation system and basis for specifications
ISO 17855-2:2016	Plastics — Polyethylene (PE) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties
ISO 15373:2001	Plastics — Polymer dispersions — Determination of free formaldehyde
ISO 4576:1996	Plastics — Polymer dispersions — Determination of sieve residue (gross particle and coagulum content)
ISO 2115:1996	Plastics — Polymer dispersions — Determination of white point temperature and minimum film-forming temperature
ISO 9113:2019	Plastics — Polypropylene (PP) and propylene-copolymer thermoplastics — Determination of isotactic index
ISO 12418-1:2012	Plastics — Post-consumer poly(ethylene terephthalate) (PET) bottle recyclates — Part 1: Designation system and basis for specifications
ISO 12418-2:2012	Plastics — Post-consumer poly(ethylene terephthalate) (PET) bottle recyclates — Part 2: Preparation of test specimens and determination of properties
ISO 2818:2018	Plastics — Preparation of test specimens by machining
ISO 8604:1988	Plastics — Prepregs — Definitions of terms and symbols for designations
ISO 25337:2010	Plastics — Production quality control — Statistical method for using single measurements
ISO 17541:2014	Plastics — Quantitative evaluation of scratch-induced damage and scratch visibility
ISO 21367:2007	Plastics — Reaction to fire — Test method for flame spread and combustion product release from vertically oriented specimens

ISO 9782:1993	Plastics — Reinforced moulding compounds and prepregs — Determination of apparent volatile-matter content
ISO 13927:2015	Plastics — Simple heat release test using a conical radiant heater and a thermopile detector
ISO 483:2005	Plastics — Small enclosures for conditioning and testing using aqueous solutions to maintain the humidity at a constant value
ISO 11907-1:2019	Plastics — Smoke generation — Determination of the corrosivity of fire effluents — Part 1: General concepts and applicability
ISO 11907-4:1998	Plastics — Smoke generation — Determination of the corrosivity of fire effluents — Part 4: Dynamic decomposition method using a conical radiant heater
ISO 5659-2:2017	Plastics — Smoke generation — Part 2: Determination of optical density by a single-chamber test
ISO 291:2008	Plastics — Standard atmospheres for conditioning and testing
ISO/TR 17801:2014	Plastics — Standard table for reference global solar spectral irradiance at sea level — Horizontal, relative air mass 1
ISO 1043-1:2011	Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics
ISO 1043-1:2011/Amd 1:2016	Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics — Amendment 1: New symbol ST for syndiotactic
ISO 1043-2:2011	Plastics — Symbols and abbreviated terms — Part 2: Fillers and reinforcing materials
ISO 1043-3:2016	Plastics — Symbols and abbreviated terms — Part 3: Plasticizers
ISO 1043-4:2021	Plastics — Symbols and abbreviated terms — Part 4: Flame retardants
ISO 19935-1:2018	Plastics — Temperature modulated DSC — Part 1: General principles
ISO 19935-2:2020	Plastics — Temperature modulated DSC — Part 2: Measurement of specific heat capacity cp
ISO 20753:2018	Plastics — Test specimens
ISO 11358-1:2014	Plastics — Thermogravimetry (TG) of polymers — Part 1: General principles

ISO 11358-2:2021	Plastics — Thermogravimetry (TG) of polymers — Part 2: Determination of activation energy
ISO 11358-3:2021	Plastics — Thermogravimetry (TG) of polymers — Part 3: Determination of the activation energy using the Ozawa-Friedman plot and analysis of the reaction kinetics
ISO 11359-1:2014	Plastics — Thermomechanical analysis (TMA) — Part 1: General principles
ISO 11359-2:1999	Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature
ISO 11359-3:2019	Plastics — Thermomechanical analysis (TMA) — Part 3: Determination of penetration temperature
ISO 306:2013	Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)
ISO 2577:2007	Plastics — Thermosetting moulding materials — Determination of shrinkage
ISO 7808:1992	Plastics — Thermosetting moulding materials — Determination of transfer flow
ISO 11248:1993	Plastics — Thermosetting moulding materials — Evaluation of short-term performance at elevated temperatures
ISO 21304-1:2019	Plastics — Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials — Part 1: Designation system and basis for specifications
ISO 21304-2:2021	Plastics — Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties
ISO/TR 19032:2019	Plastics — Use of polyethylene reference specimens (PERS) for monitoring laboratory and outdoor weathering conditions
ISO 13802:2015	Plastics — Verification of pendulum impact-testing machines — Charpy, Izod and tensile impact-testing
ISO 12992:2017	Plastics — Vertical flame spread determination for film and sheet
ISO 472:2013	Plastics — Vocabulary
ISO 472:2013/Amd 1:2018	Plastics — Vocabulary — Amendment 1: Additional items
ISO 868:2003	Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)

ISO 21509:2006	Plastics and ebonite — Verification of Shore durometers
ISO 7765-1:1988	Plastics film and sheeting — Determination of impact resistance by the free-falling dart method — Part 1: Staircase methods
ISO 7765-2:1994	Plastics film and sheeting — Determination of impact resistance by the free-falling dart method — Part 2: Instrumented puncture test
ISO 20457:2018	Plastics moulded parts — Tolerances and acceptance conditions
ISO 4604:2011	Reinforcement fabrics — Determination of conventional flexural stiffness — Fixed-angle flexometer method
ISO 3344:1997	Reinforcement products — Determination of moisture content
ISO 3374:2000	Reinforcement products — Mats and fabrics — Determination of mass per unit area
ISO 3343:2010	Reinforcement yarns — Determination of twist balance index
ISO 4602:2010	Reinforcements — Woven fabrics — Determination of number of yarns per unit length of warp and weft
ISO 844:2021	Rigid cellular plastics — Determination of compression properties
ISO 1209-1:2007	Rigid cellular plastics — Determination of flexural properties — Part 1: Basic bending test
ISO 1209-2:2007	Rigid cellular plastics — Determination of flexural properties — Part 2: Determination of flexural strength and apparent flexural modulus of elasticity
ISO 6187:2001	Rigid cellular plastics — Determination of friability
ISO 1922:2018	Rigid cellular plastics — Determination of shear properties
ISO 1926:2009	Rigid cellular plastics — Determination of tensile properties
ISO 4590:2016	Rigid cellular plastics — Determination of the volume percentage of open cells and of closed cells
ISO 1663:2007	Rigid cellular plastics — Determination of water vapour transmission properties

Table A.2: Under development standards related to plastic materials and properties for upPE-T project

Reference	Document title
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prEN 15348 rev	Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates
prEN 15347 rev	Plastics - Recycled Plastics - Characterisation of sorted plastics wastes
prEN 17679	Testing of plastic films Tear test using trapezoidal test specimen with incision
ISO/DIS 4765	Chemically Induced UPE (ultra-weak photon emission) — Measurement as an analysis method of degradation of polymeric material
ISO/DIS 22526-4	Plastics — Carbon and environmental footprint of biobased plastics — Part 4: Environmental (total) footprint (Life Cycle Assessment)
ISO/DIS 15527	Plastics — Compression-moulded sheets of polyethylene (PE-UHMW, PE-HD) — Requirements and test methods
ISO/DIS 6721-12	Plastics — Determination of dynamic mechanical properties — Part 12: Compressive vibration — Non-resonance method
ISO/PRF 14782	Plastics — Determination of haze for transparent materials
ISO/DIS 871	Plastics — Determination of ignition temperature using a hot-air furnace
ISO/DIS 3146	Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods
ISO/DIS 489	Plastics — Determination of refractive index
ISO/DIS 22007-2	Plastics — Determination of thermal conductivity and thermal diffusivity — Part 2: Transient plane heat source (hot disc) method
ISO/DIS 11357-7	Plastics — Differential scanning calorimetry (DSC) — Part 7: Determination of crystallization kinetics
ISO/FDIS 8985	Plastics — Ethylene/vinyl acetate copolymer (EVAC) thermoplastics — Determination of vinyl acetate content
ISO/DIS 3915	Plastics — Measurement of resistivity of conductive plastics
ISO/DIS 11358-1	Plastics — Thermogravimetry (TG) of polymers — Part 1: General principles
ISO/DIS 11359-2	Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature

Annex B: Complete list of standards related to packaging and use of plastics for upPE-T project

Table B.1: Published standards related to packaging and use of plastics for upPE-T project

Reference	Document title
CEN/TR 16353:2012	Packaging - Safety guidelines for flexible plastic packaging to minimize the risk of suffocation to children
CR 1460:1994	Packaging - Energy recovery from used packaging
EN 13045:2009	Packaging - Flexible cylindrical plastic tubes - Dimensions and tolerances
EN 13461:2009	Packaging - Cylindrical flexible laminated tubes - Dimensions and tolerances
EN 13628-1:2002	Packaging - Flexible packaging material - Determination of residual solvents by static headspace gas chromatography - Part 1: Absolute methods
EN 13628-2:2002	Packaging - Flexible packaging material - Determination of residual solvents by static headspace gas chromatography - Part 2: Industrial methods
EN 14477:2004	Packaging - Flexible packaging material - Determination of puncture resistance - Test methods
EN 14479:2004	Packaging - Flexible packaging material - Determination of residual solvents by dynamic headspace gas chromatography- Absolute method
EN 14867:2005	Packaging - Plastic freezer bags - Specifications and test methods
EN 14979:2006	Packaging - Flexible plastic/metal laminate tubes - Dimensions and tolerances of nozzle S 13
EN 15593:2008	Packaging - Management of hygiene in the production of packaging for foodstuffs - Requirements
EN 16063:2011	Packaging - Rigid plastic containers - Nomenclature of plastic finishes
EN 16064:2011	Packaging - Rigid plastic containers - PET finish 30/25 High (18,5)
EN 16065:2011	Packaging - Rigid plastic containers - PET finish 30/25 Low (16,8)
EN 16066:2011	Packaging - Rigid plastic containers - PET finish 26,7 (lead 6,35)
EN 16067:2011	Packaging - Rigid plastic containers - PET finish 26,7 (lead 9,00)
EN 16068:2011	Packaging - Rigid plastic containers - PET finish 38

EN 16284:2013	Packaging - Flexible laminate and plastic tubes - Test method to determine the adhesive strength of the membrane
EN 16565:2014	Packaging - Flexible tubes - Test method to determine the orientation of the flip-top cap
EN 16592:2014	Packaging - Rigid plastic containers - PET finish 29/25 (12,6)
EN 16593:2014	Packaging - Rigid plastic containers - PET finish BVS 30H60
EN 16594:2014	Packaging - Rigid plastic containers - PET finish 26/22 (12,0)
EN 862:2016	Packaging - Child-resistant packaging - Requirements and testing procedures for non-reclosable packages for non-pharmaceutical products
CEN/TR 15356-1:2006	Validation and interpretation of analytical methods, migration testing and analytical data for materials and articles in contact with food - Part 1: General considerations
EN 13130-1:2004	Materials and articles in contact with foodstuffs - Plastics substances subject to limitation - Part 1: Guide to test methods for the specific migration of substances from plastics to foods and food simulants and the determination of substances in plastics and the selection of conditions of exposure to food simulants
EN 13130-2:2004	Materials and articles in contact with foodstuffs - Plastics substances subject to limitation - Part 2: Determination of terephthalic acid in food simulants
EN 13130-7:2004	Materials and articles in contact with foodstuffs - Plastics substances subject to limitation - Part 7: Determination of monoethylene glycol and diethylene glycol in food simulants
EN 1183:1997	Materials and articles in contact with foodstuffs - Test methods for thermal shock and thermal shock endurance
EN 1186-1:2002	Materials and articles in contact with foodstuffs - Plastics - Part 1: Guide to the selection of conditions and test methods for overall migration
EN 1186-12:2002	Materials and articles in contact with foodstuffs - Plastics - Part 12: Test methods for overall migration at low temperatures
EN 1186-13:2002	Materials and articles in contact with foodstuffs - Plastics - Part 13: Test methods for overall migration at high temperatures
EN 12546-1:2000	Materials and articles in contact with foodstuffs - Insulated containers for domestic use - Part 1: Specification for vacuum ware, insulated flasks and jugs
EN 12546-1:2000/AC:2005	Materials and articles in contact with foodstuffs - Insulated containers for domestic use - Part 1: Specification for vacuum ware, insulated flasks and jugs

EN 12546-2:2000	Materials and articles in contact with foodstuffs - Insulated containers for domestic use - Part 2: Specification for insulated bags and boxes
EN 12546-3:2000	Materials and articles in contact with foodstuffs - Insulated containers for domestic use - Part 3: Specification for thermal packs
EN 14481:2003	Materials and articles in contact with foodstuffs - Plastics - Test methods for the determination of fatty contact
EN 15284:2007	Materials and articles in contact with food stuffs - Test method for the resistance to microwave heating of ceramic, glass, glass-ceramic or plastics cookware
ISO 11156:2011	Packaging — Accessible design — General requirements
ISO 11897:1999	Packaging — Sacks made from thermoplastic flexible film — Tear propagation on edge folds
ISO 15119:2000	Packaging — Sacks — Determination of the friction of filled sacks
ISO 17480:2015	Packaging — Accessible design — Ease of opening
ISO 22015:2019	Packaging — Accessible design — Handling and manipulation
ISO 6590-2:1986	Packaging — Sacks — Vocabulary and types — Part 2: Sacks made from thermoplastic flexible film
ISO 6591-2:1985	Packaging — Sacks — Description and method of measurement — Part 2: Empty sacks made from thermoplastic flexible film
ISO 7023:1983	Packaging — Sacks — Method of sampling empty sacks for testing
ISO 780:2015	Packaging — Distribution packaging — Graphical symbols for handling and storage of packages
ISO 7965-2:1993	Sacks — Drop test — Part 2: Sacks made from thermoplastic flexible film
ISO 8351-2:1994	Packaging — Method of specification for sacks — Part 2: Sacks made from thermoplastic flexible film
ISO 8367-2:1993	Packaging — Dimensional tolerances for general purpose sacks — Part 2: Sacks made from thermoplastic flexible film
ISO/TR 18568:2021	Packaging and the environment — Marking for material identification

Table B.2: Under development standards related to packaging and use of plastics for upPE-T project

Reference	Document title
prEN 13045	Packaging - Flexible cylindrical plastic tubes - Dimensions and tolerances
prEN 12374	Packaging - Flexible tubes - Terminology
prEN 12377	Packaging - Flexible tubes - Test method for the air tightness of closures
prEN 16565	Packaging - Flexible tubes - Test method to determine the orientation of the flip-top cap
prEN 16592 rev	Packaging - Rigid plastic containers - PET finish 29/25 (12,6)
prEN 17665	Packaging - Test methods and requirements to demonstrate that plastic caps and lids of single-use beverage containers with a capacity of up to three litres remain attached to the containers during the product's intended use stage
prEN 1186- 2	Materials and articles in contact with foodstuffs - Plastics - Part 2: Test methods for overall migration in vegetable oils
prEN 1186- 3	Materials and articles in contact with foodstuffs - Plastics - Part 3: Test methods for overall migration in evaporable simulants

Annex C: Complete list of standards related to environment management and life cycle assessment for upPE-T project

Table C.1: Published standards related to environment management and life cycle assessment for upPE-T project

Reference	Document title
CEN/TR 17341:2019	Bio-based products - Examples of reporting on sustainability criteria
CEN/TR 16957:2016	Bio-based products - Guidelines for Life Cycle Inventory (LCI) for the End-of-life phase
CEN/TR 16721:2014	Bio-based products - Overview of methods to determine the bio-based content
CEN/TR 13688:2008	Packaging - Material recycling - Report on requirements for substances and materials to prevent a sustained impediment to recycling
CEN/TR 13910:2010	Packaging - Report on criteria and methodologies for life cycle analysis of packaging
CEN/TR 13695-2:2019	Packaging - Requirements for measuring and verifying the four heavy metals and other dangerous substances present in packaging, and their release into the environment - Part 2: Requirements for measuring and verifying dangerous substances present in packaging, and their release into the environment
CEN/TR 14520:2007	Packaging - Reuse - Methods for assessing the performance of a reuse system
CEN/TR 17005:2016	Sustainability of construction works - Additional environmental impact categories and indicators - Background information and possibilities - Evaluation of the possibility of adding environmental impact categories and related indicators and calculation methods for the assessment of the environmental performance of buildings
CEN/TR 15941:2010	Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data
CEN/TR 16970:2016	Sustainability of construction works - Guidance for the implementation of EN 15804
CR 13504:2000	Packaging - Material recovery - Criteria for a minimum content of recycled material

CR 13686:2001	Packaging - Optimization of energy recovery from packaging waste
CR 12340:1996	Packaging - Recommendations for conducting life-cycle inventory analysis of packaging systems
CR 13695-1:2000	Packaging - Requirements for measuring and verifying the four heavy metals and other dangerous substances present in packaging and their release into the environment - Part 1: Requirements for measuring and verifying the four heavy metals present in packaging
EN 16640:2017	Bio-based products - Bio-based carbon content - Determination of the bio-based carbon content using the radiocarbon method
EN 16640:2017/AC:2017	Bio-based products - Bio-based carbon content - Determination of the bio-based carbon content using the radiocarbon method
EN 16785-1:2015	Bio-based products - Bio-based content - Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis
EN 16785-2:2018	Bio-based products - Bio-based content - Part 2: Determination of the bio-based content using the material balance method
EN 17351:2020	Bio-based products - Determination of the oxygen content using an elemental analyser
EN 16760:2015	Bio-based products - Life Cycle Assessment
EN 16751:2016	Bio-based products - Sustainability criteria
CEN/TR 17674:2021	Bio-based products- Use of stable isotope ratios of Carbon, Hydrogen, Oxygen and Nitrogen as tools for verification of the origin of bio-based feedstock and characteristics of production processes - Overview of relevant existing applications
EN 16575:2014	Bio-based products - Vocabulary
EN 16766:2017	Bio-based solvents - Requirements and test methods
EN 14047:2002	Packaging - Determination of the ultimate aerobic biodegradability of packaging materials in an aqueous medium - Method by analysis of evolved carbon dioxide
EN 14048:2002	Packaging - Determination of the ultimate aerobic biodegradability of packaging materials in an

	aqueous medium - Method by measuring the oxygen demand in a closed respirometer
EN 14045:2003	Packaging - Evaluation of the disintegration of packaging materials in practical oriented tests under defined composting conditions
EN 14046:2003	Packaging - Evaluation of the ultimate aerobic biodegradability of packaging materials under controlled composting conditions - Method by analysis of released carbon dioxide
EN 13193:2000	Packaging - Packaging and the environment - Terminology
EN 13439:2003	Packaging - Rate of energy recovery - Definition and method of calculation
EN 13440:2003	Packaging - Rate of recycling - Definition and method of calculation
EN 13430:2004	Packaging - Requirements for packaging recoverable by material recycling
EN 13431:2004	Packaging - Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value
EN 13432:2000	Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging
EN 13432:2000/AC:2005	Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging
EN 13427:2004	Packaging - Requirements for the use of European Standards in the field of packaging and packaging waste
EN 13428:2004	Packaging - Requirements specific to manufacturing and composition - Prevention by source reduction
EN 13429:2004	Packaging - Reuse
EN 14182:2002	Packaging - Terminology - Basic terms and definitions
EN 13437:2003	Packaging and material recycling - Criteria for recycling methods - Description of recycling processes and flow chart

EN 17228:2019	Plastics - Bio-based polymers, plastics, and plastics products - Terminology, characteristics and communication
EN 15942:2011	Sustainability of construction works - Environmental product declarations - Communication format business-to-business
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
EN 15804:2012+A2:2019/AC:2021	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
ISO 14852:2021	Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium — Method by analysis of evolved carbon dioxide
ISO 14851:2019	Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium — Method by measuring the oxygen demand in a closed respirometer
ISO 14855-1:2012	Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide — Part 1: General method
ISO 14855-2:2018	Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide — Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test
ISO/TS 14027:2017	Environmental labels and declarations — Development of product category rules
ISO 14045:2012	Environmental management — Eco-efficiency assessment of product systems — Principles, requirements and guidelines
ISO 14063:2020	Environmental management — Environmental communication — Guidelines and examples
ISO 14031:2021	Environmental management — Environmental performance evaluation — Guidelines
ISO 14034:2016	Environmental management — Environmental technology verification (ETV)

ISO 14007:2019	Environmental management — Guidelines for determining environmental costs and benefits
ISO 14016:2020	Environmental management — Guidelines on the assurance of environmental reports
ISO/TS 14071:2014	Environmental management — Life cycle assessment — Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006
ISO/TS 14048:2002	Environmental management — Life cycle assessment — Data documentation format
ISO/TR 14049:2012	Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis
ISO/TR 14047:2012	Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to impact assessment situations
ISO 14040:2006	Environmental management — Life cycle assessment — Principles and framework
ISO 14040:2006/Amd 1:2020	Environmental management — Life cycle assessment — Principles and framework — Amendment 1
ISO 14044:2006	Environmental management — Life cycle assessment — Requirements and guidelines
ISO 14044:2006/Amd 1:2017	Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 1
ISO 14044:2006/Amd 2:2020	Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 2
ISO/TS 14072:2014	Environmental management — Life cycle assessment — Requirements and guidelines for organizational life cycle assessment
ISO 14033:2019	Environmental management — Quantitative environmental information — Guidelines and examples
ISO 14050:2020	Environmental management — Vocabulary
ISO/TR 14073:2017	Environmental management — Water footprint — Illustrative examples on how to apply ISO 14046

ISO 14046:2014	Environmental management — Water footprint — Principles, requirements and guidelines
ISO 14004:2016	Environmental management systems — General guidelines on implementation
ISO 14005:2019	Environmental management systems — Guidelines for a flexible approach to phased implementation
ISO 14006:2020	Environmental management systems — Guidelines for incorporating ecodesign
ISO 14009:2020	Environmental management systems — Guidelines for incorporating material circulation in design and development
ISO 14002-1:2019	Environmental management systems — Guidelines for using ISO 14001 to address environmental aspects and conditions within an environmental topic area — Part 1: General
ISO 14001:2015	Environmental management systems — Requirements with guidance for use
ISO Guide 64:2008	Guide for addressing environmental issues in product standards
ISO 14008:2019	Monetary valuation of environmental impacts and related environmental aspects
ISO 21067-1:2016	Packaging — Vocabulary — Part 1: General terms
ISO 21067-2:2015	Packaging — Vocabulary — Part 2: Packaging and the environment terms
ISO 18605:2013	Packaging and the environment — Energy recovery
ISO 18601:2013	Packaging and the environment — General requirements for the use of ISO standards in the field of packaging and the environment
ISO 18604:2013	Packaging and the environment — Material recycling
ISO 18606:2013	Packaging and the environment — Organic recycling
ISO/TR 16218:2013	Packaging and the environment — Processes for chemical recovery
ISO 18603:2013	Packaging and the environment — Reuse
ISO/TR 17098:2013	Packaging material recycling — Report on substances and materials which may impede recycling

ISO 22403:2020	Plastics — Assessment of the intrinsic biodegradability of materials exposed to marine inocula under mesophilic aerobic laboratory conditions — Test methods and requirements
ISO 16620-1:2015	Plastics — Biobased content — Part 1: General principles
ISO 16620-2:2019	Plastics — Biobased content — Part 2: Determination of biobased carbon content
ISO 16620-3:2015	Plastics — Biobased content — Part 3: Determination of biobased synthetic polymer content
ISO 16620-4:2016	Plastics — Biobased content — Part 4: Determination of biobased mass content
ISO 16620-5:2017	Plastics — Biobased content — Part 5: Declaration of biobased carbon content, biobased synthetic polymer content and biobased mass content
ISO 22526-1:2020	Plastics — Carbon and environmental footprint of biobased plastics — Part 1: General principles
ISO 22526-2:2020	Plastics — Carbon and environmental footprint of biobased plastics — Part 2: Material carbon footprint, amount (mass) of CO ₂ removed from the air and incorporated into polymer molecule
ISO 22526-3:2020	Plastics — Carbon and environmental footprint of biobased plastics — Part 3: Process carbon footprint, requirements and guidelines for quantification
ISO 18830:2016	Plastics — Determination of aerobic biodegradation of non-floating plastic materials in a seawater/sandy sediment interface — Method by measuring the oxygen demand in closed respirometer
ISO 19679:2020	Plastics — Determination of aerobic biodegradation of non-floating plastic materials in a seawater/sediment interface — Method by analysis of evolved carbon dioxide
ISO 23977-1:2020	Plastics — Determination of the aerobic biodegradation of plastic materials exposed to seawater — Part 1: Method by analysis of evolved carbon dioxide
ISO 23977-2:2020	Plastics — Determination of the aerobic biodegradation of plastic materials exposed to seawater — Part 2: Method by measuring the oxygen demand in closed respirometer

ISO 22766:2020	Plastics — Determination of the degree of disintegration of plastic materials in marine habitats under real field conditions
ISO 16929:2021	Plastics — Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test
ISO 20200:2015	Plastics — Determination of the degree of disintegration of plastic materials under simulated composting conditions in a laboratory-scale test
ISO 17556:2019	Plastics — Determination of the ultimate aerobic biodegradability of plastic materials in soil by measuring the oxygen demand in a respirometer or the amount of carbon dioxide evolved
ISO 14853:2016	Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in an aqueous system — Method by measurement of biogas production
ISO 13975:2019	Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in controlled slurry digestion systems — Method by measurement of biogas production
ISO 15985:2014	Plastics — Determination of the ultimate anaerobic biodegradation under high-solids anaerobic-digestion conditions — Method by analysis of released biogas
ISO 17422:2018	Plastics — Environmental aspects — General guidelines for their inclusion in standards
ISO/TR 21960:2020	Plastics — Environmental aspects — State of knowledge and methodologies
ISO 15270:2008	Plastics — Guidelines for the recovery and recycling of plastics waste
ISO 10210:2012	Plastics — Methods for the preparation of samples for biodegradation testing of plastic materials
ISO/TR 23891:2020	Plastics — Recycling and recovery — Necessity of standards
ISO 23517:2021	Plastics — Soil biodegradable materials for mulch films for use in agriculture and horticulture — Requirements and test methods regarding biodegradation, ecotoxicity and control of constituents
ISO 23832:2021	Plastics — Test methods for determination of degradation rate and disintegration degree of plastic

	materials exposed to marine environmental matrices under laboratory conditions
ISO 17088:2021	Specifications for compostable plastics
ISO 21931-1:2010	Sustainability in building construction — Framework for methods of assessment of the environmental performance of construction works — Part 1: Buildings
ISO 21930:2017	Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services

Table C.2: Under development standards related to environment management and life cycle assessment for upPE-T project

Reference	Document title
prCEN/TR 13695-1	Packaging - Requirements for measuring and verifying the four heavy metals and other dangerous substances present in packaging and their release into the environment - Part 1: Requirements for measuring and verifying the four heavy metals present in packaging
prEN 17615	Plastics - Environmental Aspects - Vocabulary
prEN 15941	Sustainability of construction works - data quality for environmental assessment of products and construction works - Selection and use of data
FprEN 15942	Sustainability of construction works - Environmental product declarations - Communication format business-to-business