INN PRESSME
Open Innovation Test Bed

D9.2 Standardization landscape and applicable standards

30 June 2021

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grand agreement N°952972

Technical References

Project Acronym	INN-PRESSME
Project Title	open INNovation ecosystem for sustainable Plant-based nano-enabled biomateRialsdeploymEnt for packaging, tranSport and conSuMEr goods
Project Coordinator	Ulla Forsström VTT Technical Research Centre of Finland Ltd
Project Duration	01.01.2021 – 31.01.2025 (49 months)

Deliverable No.	9.2
Dissemination level [1]	PU
Work Package	9
Task	9.3
Lead beneficiary	UNE
Contributing beneficiary(ies)	VTT, CIDETEC, IPC. CEA, Fraunhofer, AITIIP, IWNiRZ, AIMPLAS, KCL, Gnanomat S.L., GRANTA, STAM SRL, SDP, IRES, G¡ E, Geonardo, WSVK, SKA, MAIER, Albea, CRF, PODOACTIVA, ARJOWIGGINS, GUARRO CASAS
Due date of deliverable	30th of June 2021
Actual submission date	30th of June 2021

[1] PU = Public

Document history

V	Date	Beneficiary	Author
V0.1	2021-03-30	UNE	UNE
V0.2	2021-06-18	UNE	Miguel Angel Aranda Gomez
V0.3	2021-06-25	Partners	UNE
V1	2021-06-28	UNE	Miguel Angel Aranda Gomez

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°952972

Summary

INN-PRESSME aims at developing and implementing a sustainable OITB to support European companies to scale up their nano-enabled biomaterials and processes from TRL 4-5 to 7. It will focus on (nano)cellulose, bioplastics and natural fibres, combined with nanotechnology approaches to tailor bio-based materials with properties and functionalities (barrier, antibacterial properties, improved corrosion or chemical resistance, etc.) that equal or outperform their fossil counterparts at competitive prices. INNPRESSME gathers 16 pilot lines, organized in routes and processes for feedstock conversion (PLA, PHA, fibre-based, cellulose-based), formulation and transformation and processing of bio-based material to high added-value products.

Standardization is certainly a tool that can support the project to facilitate scaling-up the products covered by this project and could also be a way to contribute to expand the results of INN-PRESSME by providing a summary of best practices or guidance on OITB services. The way that the role of standards in the project is structured responds to three stages:

- Analysis of the existing standards and ongoing works identifying possible relations between INN-PRESSME activities and this selection of standards and works. The organizations, technical bodies or groups, where the works are developed, are to be also identified.
- Contact the identified entities, where standards or works exist, to explain INN-PRESSME project trying to raise awareness and opening ways to further collaboration in view of the progress and results of INN-PRESSME.
- Prepare and perform a contribution to standardization based on INN-PRESSME results looking to the higher possible impact into standardization.

In this aim, this deliverable summarizes the existing standardization landscape, including the standards and ongoing projects, the technical bodies where these documents are developed and maintained and serves as the basis for next steps such us raising awareness of INN-PRESSME results to these bodies.

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Table of contents

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°952972

Table of tables

Table of figures

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1 Short introduction about standardization

1.1 What are standards?

Standards are voluntary technical, consensus-based documents that set out requirements for a specific product, material, component, system or service, or describe in detail a particular method, procedure or best practice. Standards are developed and defined in recognized organizations at national, European or international level, through a process of sharing knowledge and building consensus among technical experts nominated by interested parties and other stakeholders - including businesses, consumers, industry, laboratories, universities and environmental groups, among others and nominated by the national standardization systems. These experts are organized in different bodies, such as Technical Committees (TCs), which are subdivided in Subcommittees (SCs) or Working Groups (WGs). These TCs are included in the structure of the Standardization Organizations (National, European and International). All the TCs´ work is following the regulations of their standardization organization they participate, which are quite similar. When the work is carried in a TC at National or European level with the same scope as an International TC they are called mirror committees. This is frequent as the standardization is prioritised at international level to serve as a common catalogue of solutions worldwide.

The standardization bodies operate at different levels:

- National (UNE, AFNOR, BSI, DIN, etc.)
- Regional (CEN, CENELEC, ETSI). For the scope of INN-PRESSME it is European level.
- International (ISO, IEC, ITU).

Sometimes there are different standardization bodies at the same level but covering different fields. This is the case of ISO (general), IEC (electrical) and ITU (telecommunications) at International level, or CEN, CENELEC and ETSI at European level in the same way. All these organizations respond to the principals and pillars for the standardization activities established by WTO.

There are also different standardization deliverables. The most widespread and the most recognized in terms of support by the participants, is the standard, which has a different code depending on the organization under which it was developed, e.g. EN for European Standards, ISO or IEC for International standards. Other types of documents are Technical Specifications (TS), Technical Reports (TR) and Workshop Agreements (CWA). Further Amendments to the standards are identified by adding A1, A2, etc. at the end of the standard code.

The formal definition of a standard is a “document, established by consensus and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context”. These include requirements and/or recommendations in relation to products, systems, processes or services. European Standards (ENs) are documents that have been ratified by one of the three European Standardization Organizations (ESOs), CEN, CENELEC or ETSI; recognized as competent in the area of voluntary technical standardization as for the EU Regulation 1025/2012. For the already mentioned standardization bodies apply the principles incorporated in the existing Regulation 1025 and those established in the internal regulations any standardization body shall respect to be member of CEN and CENELEC.

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Standardization work is based on consensus building to develop market-driven documents presenting the state of art of products and services. Standardization activity is well standardized and very well based and similar regulations apply to all bodies at national, European and international level.

1.2 Reasons to consider standards and standardization

Standardization activities are relevant in many projects funded by H2020 Program for various reasons. The main ones are because standards help to increase the impact of the project and to stablish a baseline in the initial steps in order to consider interoperability and industry recognised state of the art. Standards are documents developed in an open and regulated process involving relevant stakeholders. Therefore, standards provide confidence and many times are required to reach the market, especially in certain sectors like construction, ITC, etc. In the recently published EU Industrial Strategy accompanied by the Single Market Performance Report 2021 it is recognized by the European Commission that the development of standards is an important tool to sustain the Internal Market. It is common that different European Policies use standards to help their deployment. Furthermore, according to recent studies from US Department of Commerce, standards affect around 92% of global commerce. Standards also aim to ensure compatibility and interoperability with what already exists in the market.

The role of different types of standards in relation with research can be shown and explained in many different ways, such as the one shown in Figure 1.

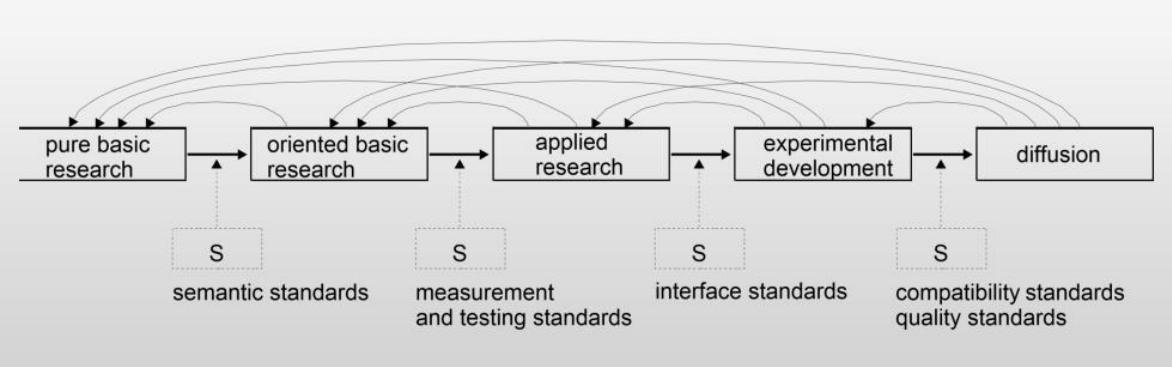

Figure 1. Relation of different types of standards and research

The use of standards and standardization is encouraged in several publications and is widely accepted, especially at European level. More details can be found in the European Commission webpage devoted to standardization policy, included as a reference.

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1.3 Types of deliverables

The different types of standardization deliverables are very similar at the international, European and national level. In particular, a main characteristic at European level, is that all the members of CEN and CENELEC shall adopt EN standards as national standards and have to withdraw any existing national standard which could conflict with them. This obligation is key to assure a harmonization of the catalogues of standards in the different countries and contribute to avoid the inclusion of technical barriers to trade. A summary of the characteristics of the different standardization documents can be found in the following Table 1.

Table 1. Characteristics of different standardization deliverables

Type	International code	European code	National code	Main characteristics
Standard	ISO IEC	EN	UNE, NF, BS, DIN, etc. When adopting: UNE-EN, NF-EN, UNE-ISO, NF-ISO, etc.	Elaboration: 3 years 2 steps of member approval European: compulsory national adoption Revision: every 5 years
Technical Specification	ISO/TS IEC/TS	CEN/TS CLC/TS	When adopting: UNE-CEN/TS, NF-CEN/TS, UNE-ISO/TS, NF-ISO/TS, etc.	Elaboration: 21 months 1 step of member approval or internal approval in TC European: optional national adoption Revision: at 3 years (upgrading to EN or deletion)
Technical Report	ISO/TR IEC/TR	CEN/TR CLC/TR	When adopting: UNE-CEN/TR, NF-CEN/TR, UNE-ISO/TR, NF-ISO/TR, etc.	Elaboration: free timeframe Internal approval in TC European: optional national adoption No revision required
Workshop Agreement	IWA	CWA	Variable	Elaboration: free timeframe (usually few months) Internal approval in the Workshop European: optional national adoption Revision: at 3 years (upgrading to EN or deletion)

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European and International Standardization Organizations (e.g. CEN and ISO and CENELEC and IEC) have signed formal agreements in order to avoid duplication of efforts and promote global relevance of standards, which allows adopting or developing in parallel each other's standards with the same content and code. The different consultations stages are developed at the same time and the results and comments are analysed by the leading organization technical body.

The technical collaboration between ISO and CEN was formalized through the Vienna Agreement (VA). European standards developed through the Vienna Agreement have EN ISO codification while International Standards developed through the Vienna Agreement remain only with ISO code.

In a similar way, CENELEC has close cooperation with its international counterpart, the International Electrotechnical Commission (IEC) through the Frankfurt Agreement (FA). As a result, new electrical standards projects are jointly planned between CENELEC and IEC, and where possible most are carried out at international level. This means that CENELEC will first offer a New Work Item (NWI) to its international counterpart. If accepted, CENELEC will cease working on the NWI. If IEC refuses, CENELEC will work on the standards content development, keeping IEC closely informed and giving IEC the opportunity to comment at the public enquiry stage. European standards developed through the Frankfurt Agreement have EN IEC codification while International Standards developed through the Vienna Agreement remain only with IEC code. CENELEC offers to IEC any new homegrown European standard for its international adoption.

European and international organizations (CEN and ISO or CENELEC and IEC) vote in parallel (both organizations are voting at the same time) during the standardization process. If the outcome of the parallel voting is positive, the standard will be published both at European and International level, leading at the international level. Close to 80% of CENELEC standards are identical to or based on IEC publications and a slightly lower figure is applicable for CEN and ISO.

National standards could also be proposed as a base for new European or International standards. The following Figure 2 shows the possible tracks of the standards.

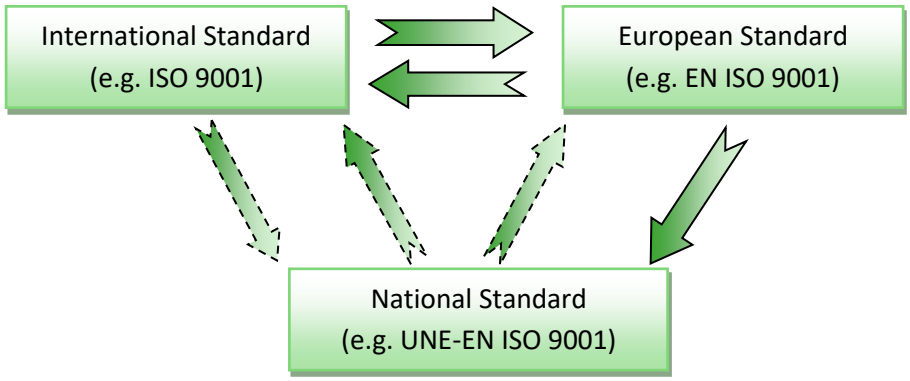

Figure 2. Possible tracks of standards adoption

Therefore, the code of any standard is the combination of the above-mentioned issues and could be explained as shown in Figure 3.

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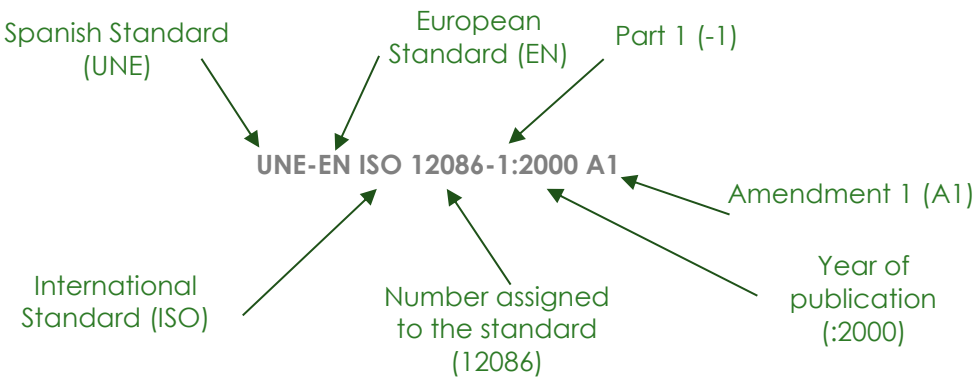

Figure 3. Example of identification of elements in the code of a standard

1.4 European policies, legislation and standards

Standards can be closely linked with legislation all over the world, but there exists a special compromise in Europe. The first pillar is the existence of the Regulation 1025/2012 on European Standardisation, which suppose the framework of the standardization activities in Europe, the formal recognition of CEN, CENELEC and ETSI as European Standards Organizations and the base of the mutual cooperation of the European Commission and the Standards Community. The standards have served for many years as a tool for the deployment of European policies. There are many reasons why this public-private cooperation has been successful. The first one is because standards are usually the simplest and fastest tool to fulfil most of the requirements from European Directives under the New Approach; those standards are called “Harmonized standards” and fulfilling the requirements of the standards guarantees the presumption of conformity with the essential requirements of the related European Directives. The second one is that all the relevant stakeholders participate at European level on the development of the standards. The industry as a major contributor, laboratories, users, regulators, universities, consumer representatives, environmental organizations, and many others seek and reach solutions in documents, which count with the highest level of consensus and support. This key element in the European standards suppose a win-win solution whenever standards are used, also when they support European legislations.

Another way to link standards and the legislative framework is by supporting the public policies and technical development in certain areas: usually this is done by a Standardization Request (SR), formerly known as Mandate. A Standardisation Request is a demand from the European Commission to the European standardisation organisations (ESOs), such as CEN or CENELEC, to draw up and adopt European standards in support of European policies and legislation, such as Directives and Regulations. The first step to define those areas for which standardization requests will be developed every year starts with the development and publication of the Annual Union Work Programme (AUWP) where the EC identifies legislations for which SRs will be developed. The AUWP 2021 is available in this link and the draft AUWP for 2022, here. In this draft it is market the following piece of legislation as a possible area for which and SR will be prepared. This can be of interest of INN-PRESSME project.

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Table 2. Incoming standardization requests in 2022 related to INN-PRESSME. Draft AUWP 2022.

Sorted plastics waste and recycled plastics	Action of Annex I to the European Strategy for Plastics in a Circular Economy COM(2018)28 Actions to boost recycled content: −development of quality standards for sorted plastics waste and recycled plastics in cooperation with the European Standardisation Committee	Develop new European standards or revise existing European standards supporting the quality of the plastics recycling value chain. These standards should set requirements on the quality of recycled plastics and their suitability for the intended uses.	Offer recycled plastics which meet the needs of product brands and manufacturers for a reliable, high-volume supply of materials with constant quality specifications.

Draft standardization requests are drawn up by the Commission services through a process of consultation with a wide group of interested parties (Member States, social partners, consumers, SMEs, relevant industry associations, European and National Standardization Bodies, etc.). The references of harmonised standards must be published in the Official Journal of the European Union.

A database of Standardization Requests may be found in the European Commission related webpage.

2 Overview of the standardization landscape relevant for INN-PRESSME

INN-PRESSME project is divided in several tasks and subtasks that allows to define and overview of the standardization landscape relevant for INN-PRESSME what is the subject of subtask 9.3.1 **Analysis of the applicable standardisation landscape** under **Task 9.3: Standardisation activities.**

2.1 Methodology

The methodology used for the identification of standards and standards under development standardization activities, technical bodies of standard bodies (national, European and international), or working groups of standard developed organizations relevant for INN-PRESSME project is described as follows.

First a list of key concepts was prepared to act as a starting point for the identification of standardization areas, selecting keywords related to the aims and goals of the project. The list was agreed by UNE and INN-PRESSME partners and initially based on the INN-PRESSME project keywords and is reported in Table 3.

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Table 3. Keywords used in the preliminary search

	Keywords used in the preliminary search
Fixed EC keywords	1. Nanotechnology (Fixed EC keyword)
	2. Nano-materials
	3. Nano engineering
Free keywords	4. Plants
	5. Biomaterials
	6. Packaging
	7. Transport
	8. Energy
	9. Consumer goods
	10. Bio-sources
	11. Nano
	12. Formulation
	13. Transformation
	14. Processing
	15. Digitalisation
	16. Pilot lines
	17. Upgrading
	18. Recycling
	19. Reuse
Tasks related identified keywords	20. PLA, PHA, fibre-based, cellulose-based
	21. Bio and fibre-based stand-up pouch,
	22. Bio-based boxes,
	23. Bio-based tubes for cosmetics,
	24. Bio-based adhesive smart labels
	25. Interior automotive bio-based prototypes
	26. Bio-based ultra capacitors
	27. Car side pillar
	28. OITB services (product, process, characterization)
	29. EMMC/EMCC NMBP project infrastructure)
	30. Material and process characterization on the nano micro scale
	31. Smart labels (testing)

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	32. Bio-based automotive components
	33. Bio-based structural / aesthetic car components
	34. Bio-based inner shoe soles
	35. Bio-based antibacterial sport goods.
	36. Road vehicles

A search was used using the aforementioned keywords, provided a significant number of standards. Standardization activities use an additional classification through the International Classification of Standards (ICS). Based on the detected standards, the relevant technical bodies (technical committees TC, subcommittees SC and working groups WG) were identified.

The most relevant field for INN-PRESSME is the standardization technical body. There are various reasons to map the technical bodies and not only the standards. The main one is that a new deliverable with recommendations on how to link the results of INN-PRESSME with standardization is foreseen at the end of the project (M48) and the usual proposal would be addressed to the existing technical bodies. Another reason is that in order to follow the evolution of a particular standard it is also necessary to trace the technical body responsible for it.

Once identified the relevant technical bodies, they were included in a summary table and a list of existing relevant standards was also included in this deliverable. Published standards and standards under development were identified for each standardization area, together with the technical committee responsible for the respective standards.

The standardization study covers European standards developed by the European Committee for Standardization (CEN) and the European Committee for electrotechnical Standardization (CENELEC). Moreover, the study covers also the International standards developed by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). In the topics covered by INN-PRESSME, also the American Society for Testing and Materials (ASTM) is relevant and therefore, it was included in the research. The databases and websites used for the research are included as references. Other standard development organizations and initiatives have been detected and will be used in the different tasks such as FIAT, VDI, TAPPI, KCL, RECYCLASS, Ziegler, CHADA, NMBP, SAE and FINAT. A general information on the activities and bodies of these organizations will be provided.

Secondly a brief questionnaire was circulated to all INN-PRESSME partners to identify the relation of the tasks they participate with standards but also the relation with existing regulations and a request to perform a first exercise seeking for future contributions to standardization. The questionnaire is provided as information as Annex. The answers of this questionnaire have served to better filter the huge amount of results provided by the use of the keywords. As an example, very general keywords as energy can provide in ISO more than 500 hundred standards and a great number of related technical bodies.

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Finally, an **analysis of the INN-PRESSME tasks and subtasks** description has been done to identify where and when some activities can have a relation to standards or a possible output, which could serve as a contribution to standardization.

This study showed that the following subtasks fulfil these conditions:

- Subtask 2.2.2: Implementation of the materials and process information management system. The software in this WP (GRANTA MI) requires configuration and adaptation for the specific domain of nano-enabled bio-material to reach exploitation readiness for the OITB, as well as interoperability with evolving initiatives (**e.g. EMMC/EMCC NMBP project infrastructure)** and searchability for reference dataSchema for standard records for materials/process/characterization pedigree and results, will be established for physical and virtual characterization, and implementation of European initiatives such as the EMMC modelling ontology, **emerging EMCC standards (CHADA, ontologies developed in NMBP-35-2020), and data quality indicators**.

- Task 3.1. Task 3.1 focuses on identifying and understanding the potential to **harmonize characterisation** measurements across Pilot Plants for reproducibility of results, consistent quality which enable data exchange between Pilot Plants, and ensure confidence of SEP clients. **Agreement of quality requirements for the data relative to the maturity of the characterisation technique and application is needed**. This task will identify data and its characteristics (format, volume, velocity, etc.), metadata, data handling or treatment workflows, and sources of uncertainty in intermediary and final result values, **for the purpose of cross-comparison and harmonization of data management** strategies according to characterisation techniques and material/process applications.

- Task 4.2: Demonstration activities for Packaging related TCs .Sub-task 4.2.1 – Demonstrator - bio-based adhesive smart labels. **The smart labels will be first tested** by intensive and specific tests (range of temperature, range of humidity, bending, folding, gluing, crashing, etc.) **as defined in the standards**. Test will be conducted according to the test procedures described in **FINAT Technical handbook**. Labels are then tested in operational environment, glued on packaging and sent in different locations and their functionality tested.

- Sub-task 5.1.1 – Upscaling of functional bio-based automotive components. It is foreseen **to define materials requirements** for the 3D printing application. These materials will need **to be characterized, tested to determine performances**.
- Subtask 5.2.1. Demonstrator – Functional bio-based automotive components fabricated by 3DP.The following tests, will be performed on the demonstrators developed in subtask 5.1.1:
    - 1) Accelerated weathering according **SAE J2412** (up to 1200 kJ/m2),
    - 2) Resistance to various fluids according to LP-463-PB-31-01 and **FIAT 902110,**
    - 3) Thermal cycles 72h (-40 ÷ 80 ° C and RH 95% at 40 ° C) according to **FIAT 9.03109**,
    - 4) Heat shock 2 h at 95 ° C **according to FIAT 9.03109**,

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- 5) Thermal stability 24 h at 80 ° C **according to FIAT 9.03109,**
- 6) Flexural, impact and adhesion tests on samples cut from demonstrators,
- 7) Aesthetic analysis by scratch and mar tests,
- 8) Stick & slip measurements by **Ziegler standard** for noise analysis for materials combination and
- 9) VOC emission **(VDI 277, VDI 278)** also to measure release effect. Thermal and ageing cycles will be performed firstly installing the new material based component in vehicle conditions (frames connection and system integration) and then operating temperature and humidity cycle (-30 ° C - +85 ° C). Specific antimicrobial tests will be performed to mimic final use.

- Subtask 5.2.2 – Demonstrator of bio-based structural / aesthetic car components, **The best solution will be tested** between 1K-injection moulding, nano-coating deposition, at industrial scale, and car side pillars will be produced and **tests on automotive interior and exterior components will be performed**.

- Subtask 5.2.3. Demonstrator – Bio-based ultra capacitors. It will be prepared industrial sized Ultracapacitor cells based on bio carbons. Ultracapacitors will be produced **and evaluated according to industrial standards**. Electrodes will be wound into electrode rolls, which will be welded with current collectors, undergoing cell construction, and being filled with organic electrolytes after which the cells will be closed by laser welding processes. Depending on the exact material choice for binder and separator (T5.1.3), the drying process will have to be adjusted. Evaluation of the industrial Ultracapacitor cells will be done **according to IEC 62391 for capacitance**, equivalent series resistance and behaviour in lifetime.

- Subtask 6.2.2 – Demonstrator – antibacterial sports goods. With a similar approach like described in T4.2.3 the materials developed in T6.1.2 will be tested on industrial production equipment. Sports goods like fascia rolls are produced and both, process (processability, production speed, energy and media consumption, etc.) and **product are evaluated**.

- Task 8.1: Designing products to be more sustainable (eco-design) [Involved partners: will develop an eco-design strategy based on eco-design standards **(e.g. ISO 14006:2020)** and EU directives (e.g. 2009/125/EC). This strategy will provide **guidance to incorporate environmental aspects as an integral part of a product's design and development**. Other areas of improvement, such as enhanced quality and cost-effectiveness will be presented, integrating the INN-PRESSME strategies into external user's value chains will be evaluated. The impact of eco-design principles on the benefits within the entire life cycle of a product will be identified and eco-design concepts will be balanced with requirements of other crucial entities involved in the product (stakeholder requirements, quality, Health and Safety issues). **The ecodesign methodology will be updated/fine-tuned by IRES using data from LCA/LCC studies and nanosafety and upgraded pilot line quality control activities for accurate representation of benefits and risks.** AIMPLAS and KCL will participate **in proposing guidance on designed end-of-life focused**

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on recycling and compostability for packaging and other applications, following RECYCLASS, EN 13430, ISO 18604 and EN 13432.

- Task 8.2: Life Cycle Assessment and Life Cycle Costing Assessment Involved partners: All industrial partners and partners providing pilot services INN-PRESSME project will use LCA based on **ISO 14040& 14044** to perform environmental assessment. Both Cradle –to-gate and Cradle-to-grave LCA studies will be performed on defined test cases in order to evaluate environmental impacts on demo cases while including the development of functional bio-based components and their respective manufacturing processes.

- Task 8.3: Recyclability and biodegradability testing.
  - SubTask 8.3.1. Mechanical **Recyclability assessment KCL will provide recyclability testing of fibre based material (EN 13430).** Methods are: Repulpability of splicing tape, **TAPPI UM 213:2012**, Repulpability of fibre based material, **KCL 301:19 and KCL 303:20,** Repulpability and stickiness of repulpered fibre based material, **KCL 302:19**. Envisioned test cases are Skanem, Walki and Albea in case of fibre based tube materials. AIMPLAS will provide mechanical recyclability assessment of the new formulations containing PLA/PHA and nanomaterials. Test cases are: Albea, WSVK and Fiat-CRF and Maier. **ISO 18604 will be taken into account**. Complementary tests will be carried out to have a better understanding of recyclability.
  - Subtask 8.3.2. Biodegradability and compostability assessment AIMPLAS will do the compostability assessment for PHA and PLA nanocomposites that cannot be recycled. Proposed TCs are WSVK and Podoactiva, **tests according to EN 13432. Anaerobic biodegradability will be evaluated by AIMPLAS through EN ISO 15985:2018**. Generation of biogas (methane production) will be monitored. Side streams from fibre based recycling studies may be considered for biodegradation testing (aerobic or anaerobic).

- Task 8.4: Nanosafety studies Involved partners: CEA, IWN. Nano-related safety issues inherent to the production of nano-enabled biocomposites will be addressed by assessing the exposure scenarios along with the recommendation of specific risk management measures:
  - Release, emission and occupational exposure assessment: CEA will conduct occupational exposure assessment towards airborne nano-particles on IWN pilot line as production of flax/hemp microfibres conducted by IWN in PL4 bears particular risk for workers. Additional risk results from dry particles distribution in ambient air, high density of small fibres particles in air bears risk of explosion in case of setting fire by accident. Two other relevant PLs will be considered as well, depending on the estimated need (i.e. considerable risk expected, no assessment performed before). Field measurements will be conducted to acquire information such as overall concentration and physical-chemical characterization of the airborne particles to assess potential occupational exposure, following **Tier II protocol of the European standard EN 17058:2018**. CEA will propose as a service to other partners and

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SMEs/companies responding to the OITB open calls to assess potential occupational exposure through field measurements.

- Risk management: Based on conducted measurements, specific EHS recommendations will be provided to partners, continuously during the project. **Procedures and collective/personal protective equipment aimed to minimize release and emission in the workplace (and subsequently exposure) will be proposed.** Support will be provided continuously to users, and generic guidelines will be developed and shared with the project partners to enable them to protect workers and the environment.

This analysis will serve as an input for possible contributions in next activities under this work package and also as information to the partners to bear in mind that the results of the different work packages can suppose opportunities, to create, amend or contribute to existing standards or project under development.

2.2 Technical bodies overview

As previously explained, the key topics or key words are the starting point of the research, but the standardization work is carried out and focused on technical bodies, committees, subcommittees or working groups which are not completely aligned with the key words (e.g. the scope of the technical body is not coincident with the key word). Therefore, the following Table 3 offers an overview of the relevant technical bodies for this project.

The recommended actions for each technical body are:

- None: no action is recommended at this stage. Technical body is included because relevant standards could have been identified, the topic is relevant for INN-PRESSME or it is an "umbrella" technical body (technical committee with relevant subcommittees or working groups under it). The recommendation should be revised in the future.
- Follow: such an action foresees the reading of the main documents issued by the technical body and assess their relevance for INN-PRESSME.
- Participate: with the present action, an active participation is recommended; attending meetings and commenting the documents.

The list includes links to the web pages of the technical bodies where more complete information exists. It is not included in this report the scope, the complete structure and other details not to make the document too long allowing at the same time that as it addresses to the most updated information allows it to remain dynamic.

Table 4. Identified technical bodies relevant for INN-PRESSME

Identified technical bodies relevant for INN-PRESSME			
Topic	Organization	Technical committee or subcommittee	Recommended action/Comments
Plastics	CEN	CEN/TC 249 Plastics	None.
		CEN/TC 249/WG 9 Bio-based and biodegradable plastics	None. Not active projects.

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		CEN/TC 249/WG 11 Plastics recycling	Follow the revision of standards. Characterization of recycled materials.
		CEN/TC 249/WG 24 Environmental aspects	Follow. Adoption of an ISO TR and one under development.
	ISO	ISO/TC 61 Plastics	None.
		ISO/TC 61/SC 2 Mechanical behavior	Follow.
		ISO/TC 61/SC 6 Ageing, chemical and environmental resistance	Follow. 38 standards published under this SC. 5 projects under development.
		ISO/TC 61/SC 6/WG 7 Basic standards	Follow.
		ISO/TC 61/SC 11 Products	Follow.
		ISO/TC 61/SC 14 Environmental aspects	Follow. 31 standards published under this SC. 13 projects under development.
		ISO/TC 61/ SC14/WG2, Biodegradability	Follow.
		ISO/TC 61/ SC14/WG3 Biobased plastics	Follow.
		ISO/TC 61/ SC14/WG4 Characterization of plastics leaked into the environment (including microplastics) and quality control criteria of respective methods	Follow.
		ISO/TC 61/ SC14/WG5 Mechanical and chemical recycling	Follow.
	ASTM	ASTM D 20.96 Environmentally Degradable Plastics and Biobased Products	17 standards published and 8 new projects. Follow.
Rubber	ISO	ISO/TC 45/SC 4 Rubber and rubber products. Products (other than hoses)"	Follow. 101 standards published and 18 projects under development. In particular WG 8 Flexible and semi-rigid cellular material.
Packaging	CEN	CEN/TC 261 Packaging	None.
		CEN/TC 261/SC 4 Packaging and the environment	Follow.
		CEN/TC 261/SC 4/WG 1 Terminology, symbols and	Follow. Two TR under development.

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		criteria for life cycle assessment of packaging	
		CEN/TC 261/SC 4/WG 2 Degradability and organic recovery of packaging and packaging materials	Follow. Three standards under revision.
	CEN	CEN/TC 261/SC 4/WG 3 Material recovery	Follow. Three projects ongoing.
		CEN/TC 261/SC 4/WG 4 Energy recovery	Follow. One TR under development.
		CEN/TC 261/SC 4/WG 6 Prevention	None
		CEN/TC 261/SC 4/WG 7 Reuse	None
		CEN/TC 261/SC 4/WG 8 Heavy metals and other dangerous substances	Follow. One project.
	ISO	ISO/TC 122 Packaging	None
		ISO/TC 122/SC 4 Packaging and the environment	Follow. 10 standards published and two ongoing projects.
Biobased products	CEN	CEN/TC 411 Biobased products	Follow. 14 standards published and one active project.
Environment	ISO	ISO/TC 207 Environmental management	None.
		ISO/TC 207/SC 1 Environmental management systems	
		ISO/TC 207/SC 3 Environmental labelling	
		ISO/TC 207/SC 4 Environmental performance evaluation	
		ISO/TC 207/SC 5 Life cycle assessment	
		ISO/TC 207/SC 7 Greenhouse gas management and related activities	
NOTE	Please be aware that at European level, the standardization related to environmental management is discussed at a sector group which decides upon the adoption of ISO standards.		
Nanothechnology	CEN	CEN/TC 352 Nanotechnologies	Follow. 25 standards published and 5 projects and 7 proposed work items.
		CEN/TC 352/WG 2 Commercial and other stakeholder aspects	Follow. One proposed WI.
		CEN/TC 352/WG 3 Health, safety and environmental aspects	Follow. Two proposed WI.

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	ISO	ISO/TC 229 Nanotechnologies	Follow. 87 standards published, 34 projects under development.
		ISO/TC229/JWG2 Measurement and characterization	Follow.
		ISO/TC 229/WG 3 Health, Safety and Environmental Aspects of Nanotechnologies	Follow.
		ISO/TC 229/WG 4 Material specifications	Follow.
		ISO/TC 229/WG 5 Products and Applications	Follow.
	IEC	IEC TC 113 Nanotechnology for electrotechnical products and systems	
Paper	CEN	CEN/TC 172 Pulp, Paper and Board	Follow. Many standards under review.
		CEN/TC 172/WG 2 Paper and board for recycling	Follow. One ongoing project.
		CEN/TC172/WG 3 Analytical methods for the assessment of paper and board in contact with foodstuffs	Follow. Two ongoing projects.
		CEN/WS 096 Mapping of future needs of standardization in the paper and board sector	CWA published
	ISO	ISO/TC 6 Paper, board and pulps	Follow. 195 standards published and 28 ISO standards under development.
		ISO/TC6/TG1 Cellulosic nanomaterials.	Follow.
		ISO/TC 6/ WG 3 Optical properties	Follow.
		ISO/TC 6/ WG 11 Estimation of uncertainty	Follow.
		ISO/TC 6/WG 13 Paper, board, pulps and cellulosic nanomaterials dry matter content	Follow.
		ISO/TC 6/WG 15 Pulp methods	Follow.
		ISO/TC 6/ SC 2 Test methods and quality specifications for paper and board	Follow. 85 published standards and 12 ISO standards under development.
		ISO/TC 6/ SC 2/WG 41 Contact angle	Follow.

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		ISO/TC 6/ SC 2/WG 45 Corrugated fibreboard test methods	Follow.
		ISO/TC 6/ SC 2/WG 47 Water absorptiveness of paper and board	Follow.
	SCAN	SCAN standards	Follow.
	CEPI	CEPI Harmonised European laboratory test method: CEPI recyclability laboratory test method	Follow.
Additive manufacturing	ISO	ISO/TC 261 Additive manufacturing	Follow. 19 standards published and 34 under development.
Bio-based products	CEN	CEN/TC 411 Bio-based products	Follow. 14 standards published and a TR under development.
Batteries	IEC	IEC TC 21 Secondary cells and batteries	Follow. 48 standards published and 7 projects.
	CENELEC	CENELEC/TC 21X Secondary cells and batteries	Follow.
Road vehicles	ISO	ISO TC 22 Road vehicles	Follow.
		ISO/TC 22/SC 36 Safety and impact testing	Follow.
Ultracapacitors	IEC	IEC/TC 40 Capacitors and resistors for electronic equipment	Follow.
Textiles	CEN	CEN/TC 248 - Textiles and textile products	Follow.
	ISO	ISO/TC 38 Textiles	
		ISO/TC 38/SC 23 Fibres and yarns	Follow.

2.3 List of standards identified

In this subclause, relevant standards and standards under development are identified and classified by topic. For each topic, the standards and standards under development are classified by issuing technical body. In order to simplify the table, standards and standards under development are reported under the same name “standards”. The standards presented mainly correspond to those identified by INN-PRESSME partners in the answers to the questionnaire and also those of the technical bodies indicated in the previous subclause. The main sources of this list are CEN, CENELEC, ISO and IEC but also are included other standards developed by consortia, standards developing organizations and in some cases company standards. In some specific areas, where the number of standards is huge, it has been reduced the list to those more related to the project.

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2.3.1 Standards about plastics

Table 5. Standards about plastics

Standards about plastics		
Issuing body	Code	Title
CEN/TC 249/WG 9 Bio-based and biodegradable plastics	EN 14995:2006	Plastics - Evaluation of compostability - Test scheme and specifications
	EN 14987:2006	Plastics - Evaluation of disposability in waste water treatment plants - Test scheme for final acceptance and specifications
	CEN/TR 15351:2006	Plastics - Guide for vocabulary in the field of degradable and biodegradable polymers and plastic items
	EN 17228:2019	Plastics - Bio-based polymers, plastics, and plastics products - Terminology, characteristics and communication
	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
CEN/TC 249/WG 11 Plastics recycling	EN 15342:2007	Plastics - Recycled Plastics - Characterization of polystyrene (PS) recyclates
	EN 15343:2007	Plastics - Recycled Plastics - Plastics recycling traceability and assessment of conformity and recycled content
	EN 15345:2007	Plastics - Recycled Plastics - Characterisation of Polypropylene (PP) recyclates
	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
	EN 15346:2014	Plastics - Recycled plastics - Characterization of poly(vinyl chloride) (PVC) recyclates
	EN 15348:2014	Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates
	CEN/TS 16861:2015	Plastics - Recycled plastics - Determination of selected marker compounds in food grade recycled polyethylene terephthalate (PET)
	EN 15344:2021	Plastics - Recycled plastics - Characterization of Polyethylene (PE) recyclates
	CEN/TS 17627:2021	Plastics - Recycled plastics - Determination of solid contaminants content
	CEN/TS 16010:2020	Plastics - Recycled plastics - Sampling procedures for testing plastics waste and recyclates
	CEN/TR 15353:2007	Plastics - Recycled plastics - Guidelines for the development of standards for recycled plastics
	Projects	
	FprEN 17410	Plastics - Controlled loop recycling of PVC-U profiles from windows and doors
	prEN 15348 rev	Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates
	prEN 15347 rev	Plastics - Recycled Plastics - Characterisation of sorted plastics wastes
CEN/TC 249/WG 24	CEN ISO/TR 21960:2020	Plastics - Environmental aspects - State of knowledge and methodologies (ISO/TR 21960:2020)
	Projects	

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Environmental aspects	prEN 17615	Plastics - Environmental Aspects - Vocabulary
ISO/TC 61/SC 2 Mechanical behavior	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 178:2019	Plastics — Determination of flexural properties
	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 180:2019	Plastics — Determination of Izod impact strength
	ISO 306:2013	Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)
	ISO/CD 306	Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)
	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 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 604:2002	Plastics — Determination of compressive properties
	ISO 868:2003	Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)
	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 974:2000	Plastics — Determination of the brittleness temperature by impact
	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 3167:2014	Plastics — Multipurpose test specimens
	ISO 6601:2002	Plastics — Friction and wear by sliding — Identification of test parameters
	ISO 6603-1:2000	Plastics — Determination of puncture impact behaviour of rigid plastics — Part 1: Non-instrumented impact testing

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ISO/TC 61/SC 2 Mechanical behavior	ISO 6603-2:2000	Plastics — Determination of puncture impact behaviour of rigid plastics — Part 2: Instrumented impact testing
	ISO/CD 6603-2	Plastics — Determination of puncture impact behaviour of rigid plastics — Part 2: Instrumented impact testing
	ISO 8256:2004	Plastics — Determination of tensile-impact strength
	ISO 9352:2012	Plastics — Determination of resistance to wear by abrasive wheels
	ISO 10350-1:2017	Plastics — Acquisition and presentation of comparable single-point data — Part 1: Moulding materials
	ISO 10350-2:2020	Plastics — Acquisition and presentation of comparable single-point data — Part 2: Long-fibre-reinforced plastics
	ISO 11403-1:2014	Plastics — Acquisition and presentation of comparable multipoint data — Part 1: Mechanical properties
	ISO 11403-1	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/TC 61/SC 2 Mechanical behavior	ISO/CD 11403-2	Plastics — Acquisition and presentation of comparable multipoint data — Part 2: Thermal and processing properties
	ISO 11403-3:2014	Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties
	ISO 11403-3	Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties
	ISO 13586:2018	Plastics — Determination of fracture toughness (GIC and KIC) — Linear elastic fracture mechanics (LEFM) approach
	ISO 13802:2015	Plastics — Verification of pendulum impact-testing machines — Charpy, Izod and tensile impact-testing
	ISO 15850:2014	Plastics — Determination of tension-tension fatigue crack propagation — Linear elastic fracture mechanics (LEFM) approach
	ISO 16012:2015	Plastics — Determination of linear dimensions of test specimens
	ISO 17281:2018	Plastics — Determination of fracture toughness (GIC and KIC) at moderately high loading rates (1 m/s)
	ISO 17282:2004	Plastics — Guide to the acquisition and presentation of design data
	ISO 17541:2014	Plastics — Quantitative evaluation of scratch-induced damage and scratch visibility
	ISO 18872:2007	Plastics — Determination of tensile properties at high strain rates
	ISO 19252:2008	Plastics — Determination of scratch properties
	ISO/TS 19278:2019	Plastics — Instrumented micro-indentation test for hardness measurement
	ISO 20329:2020	Plastics — Determination of abrasive wear by reciprocating linear sliding motion
	ISO 20753:2018	Plastics — Test specimens
	ISO/DTS 20979	Plastics — Determination of fracture toughness of polyethylene (PE) under plane stress impact conditions
	ISO 21509:2006	Plastics and ebonite — Verification of Shore durometers

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	ISO/CD 22183	Plastics — Validation of force-time curve of tensile testing at high speed
	ISO/CD 23524.2	Plastics — Determination of fracture toughness of films and thin sheets: the essential work of fracture
	ISO 25217:2009	Adhesives — Determination of the mode 1 adhesive fracture energy of structural adhesive joints using double cantilever beam and tapered double cantilever beam specimens
	ISO/DTS 28660	Plastics — Determination of J-R curves
	ISO 29221:2014	Plastics — Determination of mode I plane-strain crack-arrest toughness
ISO/TC 61/SC 6 Ageing, chemical and environmental resistance	ISO 62:2008	Plastics — Determination of water absorption
	ISO 175:2010	Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals
	ISO 176:2005	Plastics — Determination of loss of plasticizers — Activated carbon method
	ISO 177:2016	Plastics — Determination of migration of plasticizers
	ISO 291: 2008	Plastics — Standard atmospheres for conditioning and testing
	ISO 483:2005	Plastics — Small enclosures for conditioning and testing using aqueous solutions to maintain the humidity at a constant value
	ISO 846:2019	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 2578:1993	Plastics — Determination of time-temperature limits after prolonged exposure to heat
	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/TC 61/SC 6 Ageing, chemical and environmental resistance	ISO 4611:2010	Plastics — Determination of the effects of exposure to damp heat, water spray and salt mist
	ISO/DIS 4765	Chemically Induced UPE (ultra-weak photon emission) — Measurement as an analysis method of degradation of polymeric material
	ISO/CD 4768	Measurement method of anti-biofilm activity on non-porous surfaces
	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 4892-3:2016	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

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	ISO/AWI 4892-5	Plastics — Methods of exposure to laboratory light sources — Part 5: Electrodeless Plasma lamps
	ISO 9370:2017	Plastics — Instrumental determination of radiant exposure in weathering tests — General guidance and basic test method
	ISO 10640:2011	Plastics — Methodology for assessing polymer photoageing by FTIR and UV/visible spectroscopy
	ISO 15314:2018	Plastics — Methods for marine exposure
	ISO 16869:2008	Plastics — Assessment of the effectiveness of fungistatic compounds in plastics formulations
	ISO/TR 17801:2014	Plastics — Standard table for reference global solar spectral irradiance at sea level — Horizontal, relative air mass 1
	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/TS 19022:2016	Plastics — Method of controlled acceleration of laboratory weathering by increased irradiance
	ISO/TR 19032:2019	Plastics — Use of polyethylene reference specimens (PERS) for monitoring laboratory and outdoor weathering conditions
	ISO/DIS 19721	Plastics — Abrasion test method for artificial turfs using combined UV exposure and mechanical wear
	ISO 21475:2019	Plastics — Methods of exposure to determine the wavelength dependent degradation using spectrally dispersed radiation
	ISO/TS 21488:2020	Plastics — Test method for exposing polyolefins outdoors combining natural weathering and artificial irradiation
ISO/TC 61/SC 6 Ageing, chemical and environmental resistance	ISO 21702:2019	Measurement of antiviral activity on plastics and other non-porous surfaces
	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 22196:2011	Measurement of antibacterial activity on plastics and other non-porous surfaces

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	ISO 23706:2020	Plastics — Determination of apparent activation energies of property changes in standard weathering test methods
	ISO 23741:2021	Plastics — Determination of spray water delivery during spray cycles when using a xenon arc weathering test apparatus
	ISO 29664:2010	Plastics — Artificial weathering including acidic deposition
ISO/TC 61/SC 11 Products	ISO 17555:2003	Plastics — Film and sheeting — Biaxially oriented polypropylene (PP) films
ISO/TC 61/SC 14 Environmental aspects	ISO/DTR 4763	Plastics — Environmental aspects — Analysis of relevant terms used in the sector and need for standardization
	ISO/DIS 5148	Plastics — Determination of specific aerobic biodegradation rate of solid plastic materials and disappearance time (DT50) under mesophilic laboratory test conditions
	ISO/CD 5412	Biodegradable plastic shopping bags for composting
	ISO/CD 5424	Compostable drinking straws
	ISO/WD 5425	Specifications for use of poly (lactic acid) in specific 3D printing applications
ISO/TC 61/SC 14 Environmental aspects	ISO/WD 5430	Plastics — Marine ecotoxicity testing scheme for biodegradable plastic materials — Test methods and requirements
	ISO/WD 5677	Testing and characterization of mechanically recycled Polypropylene (PP) and Polyethylene (PE) for intended use in different plastics processing techniques
	ISO 10210:2012	Plastics — Methods for the preparation of samples for biodegradation testing of plastic materials
	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 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 14852:2018	Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium — Method by analysis of evolved carbon dioxide
	ISO 14852	Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium — Method by analysis of evolved carbon dioxide
	ISO 14853:2016	Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in an aqueous system — Method by measurement of biogas production
	ISO 14855-1:2012	Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting

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		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 15270:2008	Plastics — Guidelines for the recovery and recycling of plastics waste
	ISO 15985:2014	Plastics — Determination of the ultimate anaerobic biodegradation under high-solids anaerobic-digestion conditions — Method by analysis of released biogas
	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/TC 61/SC 14	ISO 16620-5:2017	Plastics — Biobased content — Part 5: Declaration of biobased carbon content, biobased synthetic polymer content and biobased mass content
	ISO 16929:2021	Plastics — Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test
	ISO 17088:2021	Plastics — Organic recycling — Specifications for compostable plastics
	ISO 17422:2018	Plastics — Environmental aspects — General guidelines for their inclusion in standards
	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 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 20200:2015	Plastics — Determination of the degree of disintegration of plastic materials under simulated composting conditions in a laboratory-scale test

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Environmental aspects		
	ISO/AWI 20200	Plastics — Determination of the degree of disintegration of plastic materials under simulated composting conditions in a laboratory-scale test
	ISO/TR 21960:2020	Plastics — Environmental aspects — State of knowledge and methodologies
	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 22404:2019	Plastics — Determination of the aerobic biodegradation of non-floating materials exposed to marine sediment — Method by analysis of evolved carbon dioxide
	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 CO2 removed from the air and incorporated into polymer molecule
ISO/TC 61/SC 14 Environmental aspects	ISO 22526-3:2020	Plastics — Carbon and environmental footprint of biobased plastics — Part 3: Process carbon footprint, requirements and guidelines for quantification
	ISO/DIS 22526-4	Plastics — Carbon and environmental footprint of biobased plastics — Part 4: Environmental (total) footprint (Life Cycle Assessment)
	ISO 22766:2020	Plastics — Determination of the degree of disintegration of plastic materials in marine habitats under real field conditions
	ISO/FDIS 23517	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/TR 23891:2020	Plastics — Recycling and recovery — Necessity of standards
	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/CD 24187.2	Principles for the analysis of plastic and microplastic present in the environment

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ASTM D 20.96 Environmentally Degradable Plastics and Biobased Products	D3826-18	Standard Practice for Determining Degradation End Point in Degradable Polyethylene and Polypropylene Using a Tensile Test
	D5071-06(2013)	Standard Practice for Exposure of Photodegradable Plastics in a Xenon Arc Apparatus. See also WK75441 proposed revision
	D5208-14	Standard Practice for Fluorescent Ultraviolet (UV) Exposure of Photodegradable Plastics. See also WK75439 proposed revision
	D5272-08(2013)	Standard Practice for Outdoor Exposure Testing of Photodegradable Plastics. See also WK75442 proposed revision
	D5338-15(2021)	Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures
	D5511-18	Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under High-Solids Anaerobic-Digestion Conditions
	D5526-18	Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under Accelerated Landfill Conditions
	D5988-18	Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in Soil
	D6400-19	Standard Specification for Labeling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities
	D6691-17	Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment by a Defined Microbial Consortium or Natural Sea Water Inoculum
ASTM D 20.96 Environmentally Degradable Plastics and Biobased Products	D6866-21	Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis See also WK73306 proposed revision See also WK73307 proposed revision
	D6868-21	Standard Specification for Labeling of End Items that Incorporate Plastics and Polymers as Coatings or Additives with Paper and Other Substrates Designed to be Aerobically Composted in Municipal or Industrial Facilities See also WK63713 proposed revision
	D6954-18	Standard Guide for Exposing and Testing Plastics that Degrade in the Environment by a Combination of Oxidation and Biodegradation. See also WK60874 proposed revision
	D7444-18a	Standard Practice for Heat and Humidity Aging of Oxidatively Degradable Plastics
	D7473/D7473M-21	Standard Test Method for Weight Attrition of Non-floating Plastic Materials by Open System Aquarium Incubations See also WK71923 proposed revision See also WK72912 proposed revision

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	D7475-20	Standard Test Method for Determining the Aerobic Degradation and Anaerobic Biodegradation of Plastic Materials under Accelerated Bioreactor Landfill Conditions
	D7991-15	Standard Test Method for Determining Aerobic Biodegradation of Plastics Buried in Sandy Marine Sediment under Controlled Laboratory Conditions
	WK34780	New Specification for Plastic Materials that Anaerobically Biodegrade in Landfills
	WK41850	New Test Method for Determining the rate and extent of plastics biodegradation in an anaerobic laboratory environment under accelerated conditions
	WK45054	New Practice for preparing samples for ecotoxicity testing after soil degradation
	WK54915	Determination of Aerobic Biodegradability of Single and Multilayer Coatings
	WK73938	Determination Humus Generation during Biodegradation
	WK62355	Test methods to determine bioassimilation of biodegradable plastic materials
	WK75797	Biodegradable Products in the Marine Aqueous Environment
	WK76848	Fluorine

2.3.2 Standards about rubber

Table 6. Standards about rubber

Standards about rubber		
Issuing body	Code	Title
ISO/TC 45/SC 4	ISO 1419:2019	Rubber- or plastics-coated fabrics — Accelerated-ageing tests
ISO/TC 45/SC 4 Rubber and rubber products. Products (other than hoses)	ISO 1420:2016	Rubber- or plastics-coated fabrics — Determination of resistance to penetration by water
	ISO 1421:2016	Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break
	ISO 1798:2008	Flexible cellular polymeric materials — Determination of tensile strength and elongation at break
	ISO 1856:2018	Flexible cellular polymeric materials — Determination of compression set
	ISO 2230:2002	Rubber products — Guidelines for storage
	ISO 2231:1989	Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing
	ISO 2286-1:2016	Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 1: Methods for determination of length, width and net mass
	ISO 2286-2:2016	Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 2: Methods for determination of total

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		mass per unit area, mass per unit area of coating and mass per unit area of substrate
	ISO 2286-3:2016	Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 3: Method for determination of thickness
	ISO 2321:2017	Rubber threads — Methods of test
	ISO 2411:2017	Rubber- or plastics-coated fabrics — Determination of coating adhesion
	ISO 2439:2008	Flexible cellular polymeric materials — Determination of hardness (indentation technique)
	ISO 2440:2019	Flexible and rigid cellular polymeric materials — Accelerated ageing tests
	ISO 3011:1997	Rubber- or plastics-coated fabrics — Determination of resistance to ozone cracking under static conditions
	ISO/PRF 3011	Rubber- or plastics-coated fabrics — Determination of resistance to ozone cracking under static conditions
	ISO 3302-1:2014	Rubber — Tolerances for products — Part 1: Dimensional tolerances
	ISO 3302-2:2008	Rubber — Tolerances for products — Part 2: Geometrical tolerances
	ISO 3303-1:2020	Rubber- or plastics-coated fabrics — Determination of bursting strength — Part 1: Steel-ball method
	ISO 3303-2:2020	Rubber- or plastics-coated fabrics — Determination of bursting strength — Part 2: Hydraulic method
	ISO 3385:2014	Flexible cellular polymeric materials — Determination of fatigue by constant-load pounding
	ISO 3386-1:1986	Polymeric materials, cellular flexible — Determination of stress-strain characteristics in compression — Part 1: Low-density materials
	ISO 3386-1:1986/AMD 1:2010	Polymeric materials, cellular flexible — Determination of stress-strain characteristics in compression — Part 1: Low-density materials — Amendment 1
ISO/TC 45/SC 4 Rubber and rubber products. Products (other than hoses)	ISO 3386-2:1997	Flexible cellular polymeric materials — Determination of stress-strain characteristics in compression — Part 2: High-density materials
	ISO 3386-2:1997/AMD 1:2010	Flexible cellular polymeric materials — Determination of stress-strain characteristics in compression — Part 2: High-density materials — Amendment 1
	ISO 3582:2000	Flexible cellular polymeric materials — Laboratory assessment of horizontal burning characteristics of small specimens subjected to a small flame
	ISO 3582:2000/AMD 1:2007	Flexible cellular polymeric materials — Laboratory assessment of horizontal burning characteristics of small specimens subjected to a small flame — Amendment 1
	ISO 3934:2002	Rubber, vulcanized and thermoplastic — Preformed gaskets used in buildings — Classification, specifications and test methods

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	ISO/FDIS 3934	Rubber, vulcanized and thermoplastic — Preformed gaskets used in buildings — Classification, specifications and test methods
	ISO 4633:2015	Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials
	ISO/CD 4633	Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials
	ISO 4635:2011	Rubber, vulcanized — Preformed joint seals for use between concrete paving sections of highways — Specification
	ISO 4637:1979	Rubber-coated fabrics — Determination of rubber-to-fabric adhesion — Direct tension method
	ISO 4638:1984	Polymeric materials, cellular flexible — Determination of air flow permeability
	ISO 4646:1989	Rubber- or plastics-coated fabrics — Low-temperature impact test
	ISO/DIS 4646	Rubber- or plastics-coated fabrics — Low-temperature impact test
	ISO 4651:1988	Cellular rubbers and plastics — Determination of dynamic cushioning performance
	ISO 4651:1988/AMD 1:2006	Cellular rubbers and plastics — Determination of dynamic cushioning performance — Amendment 1
	ISO 4674-1:2016	Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods
	ISO 4674-2:1998	Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 2: Ballistic pendulum method
	ISO/FDIS 4674-2	Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 2: Ballistic pendulum method
	ISO 4675:2017	Rubber- or plastics-coated fabrics — Low-temperature bend test
	ISO/CD 5462	Rubber latex coated fabric gloves — Specification
	ISO 5470-1:2016	Rubber- or plastics-coated fabrics — Determination of abrasion resistance — Part 1: Taber abrader
ISO/TC 45/SC 4 Rubber and rubber products. Products (other than hoses)	ISO 5470-2:2003	Rubber- or plastics-coated fabrics — Determination of abrasion resistance — Part 2: Martindale abrader
	ISO/FDIS 5470-2	Rubber- or plastics-coated fabrics — Determination of abrasion resistance — Part 2: Martindale abrader
	ISO 5473:1997	Rubber- or plastics-coated fabrics — Determination of crush resistance
	ISO 5892:2013	Rubber building gaskets — Materials for preformed solid vulcanized structural gaskets — Specification
	ISO 5978:1990	Rubber- or plastics-coated fabrics — Determination of blocking resistance
	ISO/CD 5978	Rubber- or plastics-coated fabrics — Determination of blocking resistance
	ISO 5979:1982	Rubber or plastics coated fabrics — Determination of flexibility — Flat loop method
	ISO 5981:2007	Rubber- or plastics-coated fabrics — Determination of resistance to combined shear flexing and rubbing

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	ISO 5999:2013	Flexible cellular polymeric materials — Polyurethane foam for load-bearing applications excluding carpet underlay — Specification
	ISO 6072:2011	Rubber — Compatibility between hydraulic fluids and standard elastomeric materials
	ISO 6123-1:2015	Rubber or plastics covered rollers — Specifications — Part 1: Requirements for hardness
	ISO 6123-2:2015	Rubber or plastics covered rollers — Specifications — Part 2: Surface characteristics
	ISO 6123-3:1985	Rubber- or plastics-covered rollers — Specifications — Part 3: Dimensional tolerances
	ISO 6446:1994	Rubber products — Bridge bearings — Specification for rubber materials
	ISO 6450:2005	Rubber- or plastics-coated fabrics — Determination of resistance to liquids
	ISO/FDIS 6450	Rubber- or plastics-coated fabrics — Determination of resistance to liquids
	ISO 6451:1982	Plastics coated fabrics — Polyvinyl chloride coatings — Rapid method for checking fusion
	ISO 6452:2021	Rubber- or plastics-coated fabrics — Determination of fogging characteristics of trim materials in the interior of automobiles
	ISO 6453:1985	Polymeric materials, cellular flexible — Polyvinylchloride foam sheeting — Specification
	ISO 6915:2019	Flexible cellular polymeric materials — Polyurethane foam for laminate use — Specification
	ISO 6916-1:1995	Flexible cellular polymeric materials — Sponge and expanded cellular rubber products — Specification — Part 1: Sheeting
ISO/TC 45/SC 4 Rubber and rubber products. Products (other than hoses)	ISO 6916-1:1995/AMD 1:2007	Flexible cellular polymeric materials — Sponge and expanded cellular rubber products — Specification — Part 1: Sheeting — Amendment 1
	ISO 6916-1:1995/COR 1:2002	Flexible cellular polymeric materials — Sponge and expanded cellular rubber products — Specification — Part 1: Sheeting — Technical Corrigendum 1: Sheeting
	ISO 6916-2:2001	Flexible cellular polymeric materials — Sponge and expanded cellular rubber products — Specification — Part 2: Mouldings and extrusions
	ISO 7229:2015	Rubber- or plastics-coated fabrics — Measurement of gas permeability
	ISO/DIS 7229	Rubber- or plastics-coated fabrics — Measurement of gas permeability
	ISO 7231:2010	Polymeric materials, cellular, flexible — Determination of air flow value at constant pressure-drop
	ISO/CD 7231	Polymeric materials, cellular, flexible — Determination of air flow value at constant pressure-drop

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	ISO 7617-1:2001	Plastics-coated fabrics for upholstery — Part 1: Specification for PVC-coated knitted fabrics
	ISO 7617-2:2003	Plastics-coated fabrics for upholstery — Part 2: Specification for PVC-coated woven fabrics
	ISO 7617-3:1988	Plastics-coated fabrics for upholstery — Part 3: Specification for polyurethane-coated woven fabrics
	ISO/TR 7620:2005	Rubber materials — Chemical resistance
	ISO/TR 7621:1982	Rubber or plastics covered rollers — Enquiries and orders — Recommendations for technical information to be supplied by purchaser
	ISO 7854:1995	Rubber- or plastics-coated fabrics — Determination of resistance to damage by flexing
	ISO 8067:2018	Flexible cellular polymeric materials — Determination of tear strength
	ISO 8095:1990	PVC-coated fabrics for tarpaulins — Specification
	ISO 8096:2005	Rubber- or plastics-coated fabrics for water-resistant clothing — Specification
	ISO 8096:2005/COR 1:2005	Rubber- or plastics-coated fabrics for water-resistant clothing — Specification — Technical Corrigendum 1
	ISO 8307:2018	Flexible cellular polymeric materials — Determination of resilience by ball rebound
	ISO/TR 8517:1988	Rubber- or plastics-covered rollers — Glossary
	ISO 9631:2018	Rubber seals — Joint rings for pipelines for hot-water supply up to 110 ° C — Specification for the material
	ISO 9691:1992	Rubber — Recommendations for the workmanship of pipe joint rings — Description and classification of imperfections
	ISO 10066:1991	Flexible cellular polymeric materials — Determination of creep in compression
	ISO 11752:2000/AMD 1:2006	Flexible cellular polymeric materials — Moulded and extruded sponge or expanded cellular rubber products — Compressibility test on finished parts
	ISO 13362:2000	Flexible cellular polymeric materials — Determination of compression set under humid conditions
ISO/TC 45/SC 4 Rubber and rubber products. Products (other than hoses)	ISO/TR 17051:2020	Rubber, vulcanized — Guidelines for material specification
	ISO 22751:2020	Rubber- or plastic-coated fabrics — Physical and mechanical test — Determination of bending force Elastomeric seismic-protection isolators — Part 6: High-durability and high-performance specifications and test methods
	ISO 22843:2020	Rubber bands — General requirements and test methods
	ISO/PRF 23641	Flexible cellular polymeric materials — Determination of antibacterial effectiveness
	ISO 24999:2008	Flexible cellular polymeric materials — Determination of fatigue by a constant-strain procedure
	ISO 32100:2018	Rubber- or plastics-coated fabrics — Physical and mechanical tests — Determination of flex resistance by the flexometer method

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2.3.3 Standards about packaging

Table 7. Standards about packaging

Standards about packaging		
Issuing body	Code	Title
CEN/TC 261 Packaging	EN 13432:2000	Requirements for packaging recoverable through composting and biodegradation – Test scheme and evaluation criteria for the final acceptance of packaging"
	prEN 17428	Packaging - Determination of the degree of disintegration under simulated home composting conditions
	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
	prEN 13432 rev	Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging
	EN 13430:2004 (WI=00261315)	Packaging - Requirements for packaging recoverable by material recycling
CEN/TC 261/SC 4 Packaging and the environment	CEN/TR 13910:2010	Packaging - Report on criteria and methodologies for life cycle analysis of packaging
	CEN/TR 14520:2007	Packaging - Reuse - Methods for assessing the performance of a reuse system
	CR 12340:1996	Packaging - Recommendations for conducting life-cycle inventory analysis of packaging systems
	CR 14311:2002	Packaging - Marking and material identification system
	EN 13193:2000	Packaging - Packaging and the environment - Terminology
	EN 13427:2004	Packaging - Requirements for the use of European Standards in the field of packaging and packaging waste
	EN 13429:2004	Packaging - Reuse
	EN 14182:2002	Packaging - Terminology - Basic terms and definitions
	prCEN/TR 1460 rev	Packaging - Energy recovery from used packaging
ISO/TC 122/SC 4 · Packaging and the environment	ISO/AWI 4924	Eco-design principle, requirement and guideline for express packaging
	ISO/TR 16218:2013 ISO/TR 17098:2013	Packaging and the environment — Processes for chemical recovery Packaging material recycling — Report on substances and materials which may impede recycling

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	ISO/TR 18568:2021	Packaging and the environment — Marking for material identification
	ISO 18601:2013	Packaging and the environment — General requirements for the use of ISO standards in the field of packaging and the environment
	ISO 18602:2013	Packaging and the environment — Optimization of the packaging system
	ISO 18603:2013	Packaging and the environment — Reuse
	ISO 18604:2013	Packaging and the environment — Material recycling
	ISO 18605:2013	Packaging and the environment — Energy recovery
	ISO 18606:2013	Packaging and the environment — Organic recycling
	ISO/AWI TR 18607	Packaging—Packaging and the environment -- Guidebook for environment conscious designing of packaging based on ISO 18600 series of standards
	ISO 21067-2:2015	Packaging — Vocabulary — Part 2: Packaging and the environment terms

2.3.4 Standards about bio-based products

Table 8. Standards about biobased products

Standards about biobased products		
Issuing body	Code	Title
CEN/TC 411 Biobased products	CEN/TR 16721:2014	Bio-based products - Overview of methods to determine the bio-based content
	CEN/TR 16957:2016	Bio-based products - Guidelines for Life Cycle Inventory (LCI) for the End-of-life phase
	CEN/TR 17341:2019	Bio-based products - Examples of reporting on sustainability criteria
	EN 16575:2014	Bio-based products - Vocabulary
	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 16751:2016	Bio-based products - Sustainability criteria
	EN 16760:2015	Bio-based products - Life Cycle Assessment Packaging - Terminology - Basic terms and definitions
	EN 16766:2017	Bio-based solvents - Requirements and test methods
	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 16848:2016	Bio-based products - Requirements for Business to Business communication of characteristics using a Data Sheet

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	EN 16935:2017	Bio-based products - Requirements for Business-to-Consumer communication and claims
	EN 17351:2020	Bio-based products - Determination of the oxygen content using an elemental analyser
	FprCEN/TR 17674	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
CEN/SS N99 Non-metallic materials	CEN/TR 16208:2011	Biobased products - Overview of standards

2.3.5 Standards about environment

Table 9. Standards about environment

Standards about environment		
Issuing body	Code	Title
ISO/TC 207 Environmental management	ISO GUIDE 64:2008	Guide for addressing environmental issues in product standards
	ISO 14050:2020	Environmental management — Vocabulary
	ISO 14051:2011	Environmental management — Material flow cost accounting — General framework
	ISO 14052:2017	Environmental management — Material flow cost accounting — Guidance for practical implementation in a supply chain
	ISO 14055-1:2017	Environmental management — Guidelines for establishing good practices for combatting land degradation and desertification — Part 1: Good practices framework
	IEC 62430:2019	Environmentally conscious design (ECD) — Principles, requirements and guidance
ISO/TC 207/SC 1 Environmental management systems	ISO 14001:2015	Environmental management systems — Requirements with guidance for use
	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/AWI 14002-2	Environmental management systems — Guidelines for using ISO 14001 to address environmental aspects and conditions within an environmental topic area — Part 2: Water
	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 14007:2019	Environmental management — Guidelines for determining environmental costs and benefits

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	ISO 14008:2019	Monetary valuation of environmental impacts and related environmental aspects
	ISO 14009:2020	Environmental management systems — Guidelines for incorporating material circulation in design and development
	ISO 14053:2021	Environmental management — Material flow cost accounting — Guidance for phased implementation in organizations
ISO/TC 207/SC 3 · Environmental labelling	ISO 14020:2000	Environmental labels and declarations — General principles
	ISO/CD 14020	Environmental labels and declarations — General principles
	ISO 14021:2016	Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling)
	ISO 14021:2016/AMD 1	Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling) — Amendment 1: Carbon footprint, carbon neutral
	ISO 14024:2018	Environmental labels and declarations — Type I environmental labelling — Principles and procedures
	ISO 14025:2006	Environmental labels and declarations — Type III environmental declarations — Principles and procedures
	ISO 14026:2017	Environmental labels and declarations — Principles, requirements and guidelines for communication of footprint information
	ISO/TS 14027:2017	Environmental labels and declarations — Development of product category rules
	ISO/DTS 14029	Mutual recognition agreements between Type III Environmental Declaration (EPD) Programme Operators — Principles and procedures
ISO/TC 207/SC 4 · Environmental performance evaluation	ISO/FDIS 14030-1	Environmental performance evaluation — Green debt instruments — Part 1: Process for green bonds
	ISO/FDIS 14030-2	Environmental performance evaluation — Green debt instruments — Part 2: Process for green loans
	ISO/DIS 14030-3.2	Environmental performance evaluation — Green debt instruments — Part 3: Taxonomy
	ISO/FDIS 14030-4	Environmental performance evaluation — Green debt instruments — Part 4: Verification programme requirements
	ISO 14031:2021	Environmental management — Environmental performance evaluation — Guidelines
	ISO 14033:2019	Environmental management — Quantitative environmental information — Guidelines and examples
	ISO 14034:2016	Environmental management — Environmental technology verification (ETV)
	ISO/CD TR 14035	Environmental technology verification — ETV - Guidance to implement ISO 14034
	ISO 14063:2020	Environmental management — Environmental communication — Guidelines and examples
	ISO/CD 14100	Green Finance: Assessment of Green Financial Projects
ISO/TC 207/SC 5 Life	ISO 14040:2006	Environmental management — Life cycle assessment — Principles and framework

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cycle assessment	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 14045:2012	Environmental management — Eco-efficiency assessment of product systems — Principles, requirements and guidelines
	ISO 14046:2014	Environmental management — Water footprint — Principles, requirements and guidelines
	ISO/TR 14047:2012	Environmental management — Life cycle assessment — Illustrative examples on how to apply ISO 14044 to impact assessment situations
	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/WD TR 14055-2	Environmental management — Guidelines for establishing good practices for combatting land degradation and desertification — Part 2: Regional case studies
	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 14072:2014	Environmental management — Life cycle assessment — Requirements and guidelines for organizational life cycle assessment
	ISO/TR 14073:2017	Environmental management — Water footprint — Illustrative examples on how to apply ISO 14046
	ISO/WD TS 14074	Environmental management — Life cycle assessment — Principles, requirements and guidelines for normalization, weighting and interpretation
	ISO/AWI 14075	Principles and framework for social life cycle assessment
	ISO/AWI 59014	Secondary materials — Principles, sustainability and traceability requirements
ISO/TC 207/SC 7 Greenhouse gas management and related activities	ISO 14067:2018	Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification

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2.3.6 Standards about nanotechnologies

Table 10. Standards about nanotechnologies

Standards about nanotechnologies		
Issuing body	Code	Title
CEN/TC 352 Nanotechnologies	CEN ISO/TR 11811:2012	Nanotechnologies - Guidance on methods for nano- and microtribology measurements (ISO/TR 11811:2012)
	CEN ISO/TR 18401:2020	Nanotechnologies - Plain language explanation of selected terms from the ISO/IEC 80004 series (ISO/TR 18401:2017)
	CEN ISO/TS 12025:2021	Nanomaterials - Quantification of nano-object release from powders by generation of aerosols (ISO/TS 12025:2021)
	CEN ISO/TS 13830:2013	Nanotechnologies - Guidance on voluntary labelling for consumer products containing manufactured nano-objects (ISO/TS 13830:2013)
	CEN ISO/TS 19590:2019	Nanotechnologies - Size distribution and concentration of inorganic nanoparticles in aqueous media via single particle inductively coupled plasma mass spectrometry (ISO/TS 19590:2017)
	CEN ISO/TS 21362:2021	Nanotechnologies - Analysis of nano-objects using asymmetrical-flow and centrifugal field-flow fractionation (ISO/TS 21362:2018)
	CEN ISO/TS 80004-11:2020	Nanotechnologies - Vocabulary - Part 11: Nanolayer, nanocoating, nanofilm, and related terms (ISO/TS 80004-11:2017)
	CEN ISO/TS 80004-12:2017	Nanotechnologies - Vocabulary - Part 12: Quantum phenomena in nanotechnology (ISO/TS 80004-12:2016)
	CEN ISO/TS 80004-13:2020	Nanotechnologies - Vocabulary - Part 13: Graphene and related two-dimensional (2D) materials (ISO/TS 80004-13:2017)
	CEN ISO/TS 80004-1:2015	Nanotechnologies - Vocabulary - Part 1: Core terms (ISO/TS 80004-1:2015)
	CEN ISO/TS 80004-2:2017	Nanotechnologies - Vocabulary - Part 2: Nano-objects (ISO/TS 80004-2:2015)
	CEN ISO/TS 80004-3:2020	Nanotechnologies - Vocabulary - Part 3: Carbon nano-objects (ISO/TS 80004-3:2020)
	CEN ISO/TS 80004-4:2014	Nanotechnologies - Vocabulary - Part 4: Nanostructured materials (ISO/TS 80004-4:2011)
CEN/TC 352 Nanotechnologies	CEN ISO/TS 80004-6:2021	Nanotechnologies - Vocabulary - Part 6: Nano-object characterization (ISO/TS 80004-6:2021)
	CEN ISO/TS 80004-8:2020	Nanotechnologies - Vocabulary - Part 8: Nanomanufacturing processes (ISO/TS 80004-8:2020)
	CEN/TS 16937:2016	Nanotechnologies - Guidance for the responsible development of nanotechnologies
	CEN/TS 17010:2016	Nanotechnologies - Guidance on measurands for characterising nano-objects and materials that contain them
	CEN/TS 17273:2018	Nanotechnologies - Guidance on detection and identification of nano-objects in complex matrices

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	CEN/TS 17274:2018	Nanotechnologies - Guidelines for determining protocols for the explosivity and flammability of powders containing nano-objects (for transport, handling and storage)
	CEN/TS 17275:2018	Nanotechnologies - Guidelines for the management and disposal of waste from the manufacturing and processing of manufactured nano-objects
	CEN/TS 17276:2018	Nanotechnologies - Guidelines for Life Cycle Assessment - Application of EN ISO 14044:2006 to Manufactured Nanomaterials
	CEN/TS 17629:2021	Nanotechnologies - Nano- and micro- scale scratch testing
	EN ISO 10801:2010	Nanotechnologies - Generation of metal nanoparticles for inhalation toxicity testing using the evaporation/condensation method (ISO 10801:2010)
	EN ISO 10808:2010	Nanotechnologies - Characterization of nanoparticles in inhalation exposure chambers for inhalation toxicity testing (ISO 10808:2010)
	EN ISO 17200:2020	Nanotechnology - Nanoparticles in powder form - Characteristics and measurements (ISO 17200:2020)
	EN ISO 29701:2010	Nanotechnologies - Endotoxin test on nanomaterial samples for in vitro systems - Limulus amebocyte lysate (LAL) test (ISO 29701:2010)
ISO/TC 229 Nanotechnologies	ISO/AWI TS 4958	Nanotechnologies — Liposomes terminology
	ISO/AWI TS 4971	Nanotechnologies — Performance evaluation of nanosuspensions containing clay nanoplates for quorum quenching
	ISO/WD TS 4988	Nanotechnologies — Bioavailability assessment of manufactured nanomaterials in an aquatic environment using Tetrahymena sp.
	ISO/WD TS 5094	Nanotechnologies — Assessment of peroxidase-like activity of metal and metal oxide nanoparticles
	ISO/WD TR 5387	Nanotechnologies: Lung burden measurement of nanomaterials for inhalation toxicity studies
	ISO 10801:2010	Nanotechnologies — Generation of metal nanoparticles for inhalation toxicity testing using the evaporation/condensation method
	ISO 10808:2010	Nanotechnologies — Characterization of nanoparticles in inhalation exposure chambers for inhalation toxicity testing
	ISO/TR 11360:2010	Nanotechnologies — Methodology for the classification and categorization of nanomaterials
	ISO/TR 11811:2012	Nanotechnologies — Guidance on methods for nano- and microtribology measurements
	ISO/TS 11931:2012	Nanotechnologies — Nanoscale calcium carbonate in powder form — Characteristics and measurement
	ISO/TS 11937:2012	Nanotechnologies — Nanoscale titanium dioxide in powder form — Characteristics and measurement

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	ISO/TS 12025:2021	Nanomaterials — Quantification of nano-object release from powders by generation of aerosols
	ISO/TR 12802:2010	Nanotechnologies — Model taxonomic framework for use in developing vocabularies — Core concepts
	ISO/TS 12805:2011	Nanotechnologies — Materials specifications — Guidance on specifying nano-objects
	ISO/TR 12885:2018	Nanotechnologies — Health and safety practices in occupational settings
	ISO/TS 12901-1:2012	Nanotechnologies — Occupational risk management applied to engineered nanomaterials — Part 1: Principles and approaches
	ISO/CD TS 12901-1	Nanotechnologies — Occupational risk management applied to engineered nanomaterials — Part 1: Principles and approaches
	ISO/TS 12901-2:2014	Nanotechnologies — Occupational risk management applied to engineered nanomaterials — Part 2: Use of the control banding approach
	ISO/WD TS 12901-2	Nanotechnologies — Occupational risk management applied to engineered nanomaterials — Part 2: Use of the control banding approach
	ISO/TR 13014:2012	Nanotechnologies — Guidance on physico-chemical characterization of engineered nanoscale materials for toxicologic assessment
ISO/TC 229 Nanotechnologies	ISO/TR 13014:2012/COR 1:2012	Nanotechnologies — Guidance on physico-chemical characterization of engineered nanoscale materials for toxicologic assessment — Technical Corrigendum 1
	ISO/TR 13121:2011	Nanotechnologies — Nanomaterial risk evaluation
	ISO/TR 13329:2012	Nanomaterials — Preparation of material safety data sheet (MSDS)
	ISO/TS 13830:2013	Nanotechnologies — Guidance on voluntary labelling for consumer products containing manufactured nano-objects
	ISO/TR 14786:2014	Nanotechnologies — Considerations for the development of chemical nomenclature for selected nano-objects
	ISO/TS 16195:2018	Nanotechnologies — Specification for developing representative test materials consisting of nano-objects in dry powder form
	ISO/TR 16196:2016	Nanotechnologies — Compilation and description of sample preparation and dosing methods for engineered and manufactured nanomaterials
	ISO/TR 16197:2014	Nanotechnologies — Compilation and description of toxicological screening methods for manufactured nanomaterials
	ISO/TS 16550:2014	Nanotechnologies — Determination of silver nanoparticles potency by release of muramic acid from Staphylococcus aureus

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	ISO 17200:2020	Nanotechnology — Nanoparticles in powder form — Characteristics and measurements
	ISO/TR 17302:2015	Nanotechnologies — Framework for identifying vocabulary development for nanotechnology applications in human healthcare
	ISO/TS 17466:2015	Use of UV-Vis absorption spectroscopy in the characterization of cadmium chalcogenide colloidal quantum dots
	ISO/TS 18110:2015	Nanotechnologies — Vocabularies for science, technology and innovation indicators
	ISO/TR 18196:2016	Nanotechnologies — Measurement technique matrix for the characterization of nano-objects
	ISO/TR 18401:2017	Nanotechnologies — Plain language explanation of selected terms from the ISO/IEC 80004 series
	ISO/TR 18637:2016	Nanotechnologies — Overview of available frameworks for the development of occupational exposure limits and bands for nano-objects and their aggregates and agglomerates (NOAAs)
	ISO/TS 18827:2017	Nanotechnologies — Electron spin resonance (ESR) as a method for measuring reactive oxygen species (ROS) generated by metal oxide nanomaterials
ISO/TC 229 Nanotechnologies	ISO/TS 19006:2016	Nanotechnologies — 5-(and 6)-Chloromethyl-2’,7’ Dichloro-dihydrofluorescein diacetate (CM-H2DCF-DA) assay for evaluating nanoparticle-induced intracellular reactive oxygen species (ROS) production in RAW 264.7 macrophage cell line
	ISO 19007:2018	Nanotechnologies — In vitro MTS assay for measuring the cytotoxic effect of nanoparticles
	ISO/TR 19057:2017	Nanotechnologies — Use and application of acellular in vitro tests and methodologies to assess nanomaterial biodurability
	ISO/TS 19337:2016	Nanotechnologies — Characteristics of working suspensions of nano-objects for in vitro assays to evaluate inherent nano-object toxicity
	ISO/CD TS 19337	Nanotechnologies — Characteristics of working suspensions of nano-objects for in vitro assays to evaluate inherent nano-object toxicity
	ISO/TS 19590:2017	Nanotechnologies — Size distribution and concentration of inorganic nanoparticles in aqueous media via single particle inductively coupled plasma mass spectrometry
	ISO/WD TS 19590	Nanotechnologies — Size distribution and concentration of inorganic nanoparticles in aqueous media via single particle inductively coupled plasma mass spectrometry
	ISO/TR 19601:2017	Nanotechnologies — Aerosol generation for air exposure studies of nano-objects and their aggregates and agglomerates (NOAA)
	ISO/TR 19716:2016	Nanotechnologies — Characterization of cellulose nanocrystals
	ISO/TR 19733:2019	Nanotechnologies — Matrix of properties and measurement techniques for graphene and related two-dimensional (2D) materials

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	ISO 19749	Nanotechnologies — Measurements of particle size and shape distributions by scanning electron microscopy
	ISO/TS 20477:2017	Nanotechnologies — Standard terms and their definition for cellulose nanomaterial
	ISO/AWI TS 20477	Nanotechnologies — Standard terms and their definition for cellulose nanomaterial
	ISO/TR 20489:2018	Nanotechnologies — Sample preparation for the characterization of metal and metal-oxide nano-objects in water samples
ISO/TC 229 Nanotechnologies	ISO/TS 20660:2019	Nanotechnologies — Antibacterial silver nanoparticles — Specification of characteristics and measurement methods
	ISO/TS 20787:2017	Nanotechnologies - Aquatic toxicity assessment of manufactured nanomaterials in saltwater lakes using Artemia sp. Nauplii
	ISO/TS 21236-1:2019	Nanotechnologies — Clay nanomaterials — Part 1: Specification of characteristics and measurement methods for layered clay nanomaterials
	ISO/TS 21236-2:2021	Nanotechnologies — Clay nanomaterials — Part 2: Specification of characteristics and measurements for clay nanoplates used for gas-barrier film applications
	ISO/TS 21237:2020	Nanotechnologies — Air filter media containing polymeric nanofibres — Specification of characteristics and measurement methods
	ISO/TS 21346:2021	Nanotechnologies — Characterization of individualized cellulose nanofibril samples
	ISO/TS 21356-1:2021	Nanotechnologies — Structural characterization of graphene — Part 1: Graphene from powders and dispersions
	ISO/DTS 21357	Nanotechnologies — Evaluation of the mean size of nano-objects in liquid dispersions by static multiple light scattering (SMLS)
	ISO/TS 21361:2019	Nanotechnologies — Method to quantify air concentrations of carbon black and amorphous silica in the nanoparticle size range in a mixed dust manufacturing environment
	ISO/AWI 21362	Nanotechnologies — Analysis of nano-objects using asymmetrical-flow and centrifugal field-flow fractionation
	ISO/TS 21362:2018	Nanotechnologies — Analysis of nano-objects using asymmetrical-flow and centrifugal field-flow fractionation
	ISO 21363:2020	Nanotechnologies — Measurements of particle size and shape distributions by transmission electron microscopy
	ISO/TR 21386:2019	Nanotechnologies — Considerations for the measurement of nano-objects and their aggregates and agglomerates (NOAA) in environmental matrices
	ISO/TS 21412:2020	Nanotechnologies — Nano-object-assembled layers for electrochemical bio-sensing

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		applications — Specification of characteristics and measurement methods
	ISO/TR 21624:2020	Nanotechnologies — Considerations for in vitro studies of airborne nano - objects and their aggregates and agglomerates (NOAA)
	ISO/PRF TS 21633	Label-free impedance technology to assess the toxicity of nanomaterials in vitro
ISO/TC 229 Nanotechnologies	ISO/TS 21975:2020	Nanotechnologies — Polymeric nanocomposite films for food packaging with barrier properties — Specification of characteristics and measurement methods
	ISO/TR 22019:2019	Nanotechnologies — Considerations for performing toxicokinetic studies with nanomaterials
	ISO/TS 22082:2020	Nanotechnologies — Assessment of nanomaterial toxicity using dechorionated zebrafish embryo
	ISO/TS 22292:2021	Nanotechnologies — 3D image reconstruction of rod-supported nano-objects using transmission electron microscopy
	ISO/TR 22293	Evaluation of methods for assessing the release of nanomaterials from commercial, nanomaterial-containing polymer composites
	ISO/AWI TS 22298	Nanotechnologies — Silica nanomaterials — Specifications of characteristics and measurement methods for nanostructured porous silica samples with ordered nanopore array
	ISO/DTR 22455	Nanotechnologies - High throughput screening method for nanoparticles toxicity using 3D model cells
	ISO/TS 23034	Nanotechnologies — Method to estimate cellular uptake of carbon nanomaterials using optical absorption
	ISO/PRF TS 23151	Nanotechnologies — Particle size distribution for cellulose nanocrystals
	ISO/PRF TS 23302	Nanotechnologies — Requirements and recommendations for the identification of measurands that characterise nano-objects and materials that contain them
	ISO/WD TS 23361	Nanotechnologies — Crystallinity of cellulose nanomaterials by powder X-ray diffraction (Ruland-Rietveld analysis)
	ISO/TS 23362:2021	Nanotechnologies — Nanostructured porous alumina as catalyst support for vehicle exhaust emission control — Specification of characteristics and measurement methods
	ISO/WD TS 23366	Nanotechnologies — Performance evaluation requirements for quantifying biomolecules using fluorescent nanoparticles in immunohistochemistry
	ISO/WD TS 23367	Nanotechnologies — Performance characteristics of nanosensors for chemical and biomolecule detection
	ISO/DTS 23650	Nanotechnologies — Evaluation of the antimicrobial performance of textiles containing manufactured nanomaterials

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	ISO/WD TR 23652	Nanotechnologies — Considerations for radiolabelling methods of nanomaterials for performance evaluation
	ISO/WD TS 23878	Nanotechnologies — Positron annihilation lifetime measurement for nanopore evaluation in materials
	ISO/WD TR 24672	Nanotechnologies — Guidance on the measurement of nanoparticle number concentration
	ISO 29701:2010	Nanotechnologies — Endotoxin test on nanomaterial samples for in vitro systems — Limulus amebocyte lysate (LAL) test
	IEC/CD 62565-3-1	Nanomanufacturing — Material specifications — Part 3-1: Graphene — Blank detail specification
	IEC/TS 62607-2-1:2012	Nanomanufacturing - key control characteristics for CNT film applications - Resistivity
	IEC/TS 62622:2012	Artificial gratings used in nanotechnology — Description and measurement of dimensional quality parameters
	IEC/TR 63258:2021	Nanotechnologies — A guideline for ellipsometry application to evaluate the thickness of nanoscale films
	ISO/AWI 80004-1	Nanotechnologies - Vocabulary — Part 1: Core terms and definitions
	ISO/TS 80004-1:2015	Nanotechnologies — Vocabulary — Part 1: Core terms
	ISO/TS 80004-2:2015	Nanotechnologies — Vocabulary — Part 2: Nano-objects
	ISO/TS 80004-3:2020	Nanotechnologies — Vocabulary — Part 3: Carbon nano-objects
	ISO/TS 80004-4:2011	Nanotechnologies — Vocabulary — Part 4: Nanostructured materials
	ISO/TS 80004-5:2011	Nanotechnologies — Vocabulary — Part 5: Nano/bio interface
	ISO/TS 80004-6:2021	Nanotechnologies — Vocabulary — Part 6: Nano-object characterization
	ISO/TS 80004-8:2020	Nanotechnologies — Vocabulary — Part 8: Nanomanufacturing processes
	IEC/TS 80004-9:2017	Nanotechnologies — Vocabulary — Part 9: Nano-enabled electrotechnical products and systems
	ISO/TS 80004-11:2017	Nanotechnologies — Vocabulary — Part 11: Nanolayer, nanocoating, nanofilm, and related terms
	ISO/TS 80004-12:2016	Nanotechnologies — Vocabulary — Part 12: Quantum phenomena in nanotechnology
	ISO/TS 80004-13:2017	Nanotechnologies — Vocabulary — Part 13: Graphene and related two-dimensional (2D) materials
	ISO/AWI TS 80004-13	Nanotechnologies — Vocabulary — Part 13: Graphene and related two-dimensional (2D) materials
	IEC TS 62565-4-1:2019 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-1: Luminescent nanomaterials - Blank detail specification

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	IEC TS 62565-4-2:2018 Edition 1.0	Nanomanufacturing - Material specifications - Part 4-2: Luminescent nanomaterials - Detail specification for general lighting and display applications
	IEC TS 62607-2-1:2012 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 2-1: Carbon nanotube materials - Film resistance
	IEC TS 62607-2-4:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 2-4: Carbon nanotube materials - Test methods for determination of resistance of individual carbon nanotubes
	IEC 62607-3-1:2014 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 3-1: Luminescent nanomaterials - Quantum efficiency
IEC/TC 113 Nanotechnology for electrotechnical products and systems	IEC TS 62607-3-2:2017 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 3-2: Luminescent nanoparticles - Determination of mass of quantum dot dispersion
	IEC TS 62607-3-3:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 3-3: Luminescent nanomaterials - Determination of fluorescence lifetime of semiconductor quantum dots using time correlated single photon counting (TCSPC)
	IEC TS 62607-4-1:2015 Edition 2.0	Nanomanufacturing - Key control characteristics - Part 4-1: Cathode nanomaterials for nano-enabled electrical energy storage - Electrochemical characterisation, 2-electrode cell method
	IEC TS 62607-4-2:2016 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-2: Nano-enabled electrical energy storage - Physical characterization of cathode nanomaterials, density measurement
IEC/TC 113 Nanotechnology for electrotechnical products and systems	IEC TS 62607-4-3:2015 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-3: Nano-enabled electrical energy storage - Contact and coating resistivity measurements for nanomaterials
	IEC TS 62607-4-4:2016 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-4: Nano-enabled electrical energy storage - Thermal characterization of nanomaterials, nail penetration method
	IEC TS 62607-4-5:2017 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-5: Cathode nanomaterials for nano-enabled electrical energy storage - Electrochemical characterization, 3-electrode cell method
	IEC TS 62607-4-6:2018 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-6: Nano-enabled electrical energy storage devices - Determination of carbon content for nano electrode materials, infrared absorption method
	IEC TS 62607-4-7:2018 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-7: Nano-enabled electrical energy storage - Determination of magnetic impurities in anode nanomaterials, ICP-OES method
	IEC TS 62607-4-8:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 4-8: Nano-enabled electrical energy storage -

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		Determination of water content in electrode nanomaterials, Karl Fischer method
	IEC TS 62607-5-1:2014 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 5-1: Thin-film organic/nano electronic devices - Carrier transport measurements
	IEC TS 62607-5-3:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 5-3: Thin-film organic/nano electronic devices – Measurements of charge carrier concentration
	IEC TS 62607-6-1:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 6-1: Graphene-based material - Volume resistivity: four probe method
	IEC TS 62607-6-3:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 6-3: Graphene-based material - Domain size: substrate oxidation
	IEC TS 62607-6-4:2016 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 6-4: Graphene - Surface conductance measurement using resonant cavity
	IEC TS 62607-6-13:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 6-13: Graphene powder - Oxygen functional group content: Boehm titration method
	IEC TS 62607-6-13:2020/COR1:2020 Edition 1.0	Corrigendum 1 - Nanomanufacturing - Key control characteristics - Part 6-13: Graphene powder - Oxygen functional group content: Boehm titration method
	IEC TS 62607-6-14:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 6-14: Graphene-based material - Defect level: Raman spectroscopy
	IEC TS 62607-8-1:2020 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 8-1: Nano-enabled metal-oxide interfacial devices - Test method for defect states by thermally stimulated current
IEC/TC 113 Nanotechnology for electrotechnical products and systems	IEC TS 62607-8-2:2021 Edition 1.0	Nanomanufacturing - Key control characteristics - Part 8-2: Nano-enabled metal-oxide interfacial devices - Test method for the polarization properties by thermally stimulated depolarization current
	IEC TS 62622:2012 Edition 1.0	Nanotechnologies - Description, measurement and dimensional quality parameters of artificial gratings
	IEC TR 62632:2013 Edition 1.0	Nanoscale electrical contacts and interconnects
	IEC/IEEE 62659:2015 Edition 1.0	Nanomanufacturing - Large scale manufacturing for nanoelectronics
	IEC TR 62834:2013 Edition 1.0	IEC nanoelectronics standardization roadmap
	IEC TS 62844:2016 Edition 1.0	Guidelines for quality and risk assessment for nano-enabled electrotechnical products
	IEC 62860:2013 Edition 1.0	Test methods for the characterization of organic transistors and materials
	IEC 62860-1:2013 Edition 1.0	Test methods for the characterization of organic transistor-based ring oscillators
	IEC TS 62876-2-1:2018 Edition 1.0	Nanotechnology - Reliability assessment - Part 2-1: Nano-enabled photovoltaic devices - Stability test

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	IEC TR 63258:2021 Edition 1.0	Nanotechnologies - A guideline for ellipsometry application to evaluate the thickness of nanoscale films
	IEC TS 80004-9:2017 Edition 1.0	Nanotechnologies - Vocabulary - Part 9: Nano-enabled electrotechnical products and systems
	ISO TS 10797:2012 Edition 1.0	Nanotechnologies - Characterization of single-wall carbon nanotubes using transmission electron microscopy
	ISO TR 12802:2010 Edition 1.0	Nanotechnologies - Model taxonomic framework for use in developing vocabularies - Core concepts
	ISO TR 19733:2019 Edition 1.0	Nanotechnologies - Matrix of properties and measurement techniques for graphene and related two-dimensional (2D) materials
	ISO TS 21356-1:2021 Edition 1.0	Nanotechnologies - Structural characterization of graphene - Part 1: Graphene from powders and dispersions
	ISO TS 80004-1:2015 Edition 2.0	Nanotechnologies -- Vocabulary -- Part 1: Core terms
	ISO TS 80004-2:2015 Edition 1.0	Nanotechnologies - Vocabulary - Part 2: Nano-objects
	ISO TS 80004-3:2020 Edition 2.0	Nanotechnologies - Vocabulary - Part 3: Carbon nano-objects
	ISO TS 80004-4:2011 Edition 1.0	Nanotechnologies - Vocabulary - Part 4: Nanostructured materials
	ISO TS 80004-5:2011 Edition 1.0	Nanotechnologies - Vocabulary - Part 5: Nano/bio interface
IEC/TC 113 Nanotechnology for electrotechnical products and systems	ISO TS 80004-6:2021 Edition 2.0	Nanotechnologies - Vocabulary - Part 6: Nano-object characterization
	ISO TS 80004-7:2011 Edition 1.0	Nanotechnologies - Vocabulary - Part 7: Diagnostics and therapeutics for healthcare
	ISO TS 80004-8:2020 Edition 2.0	Nanotechnologies - Vocabulary - Part 8: Nanomanufacturing processes
	ISO TS 80004-11:2017 Edition 1.0	Nanotechnologies - Vocabulary - Part 11: Nanolayer, nanocoating, nanofilm, and related terms
	ISO TS 80004-13:2017 Edition 1.0	Nanotechnologies - Vocabulary - Part 13: Graphene and related two-dimensional (2D) materials
	PWI 113-78 ED1	IEC TS 62607-7-1: Nanomanufacturing - Key control characteristics - Part 7-1: Nano-enabled photovoltaics measurement of the electrical performance and spectral response of tandem cells
	PWI 113-93 ED1	IEC TS 62565-3-3: Nanomanufacturing - Material specifications - Part 3-3: Graphene-based material - Sectional blank detail specification: Monolayer graphene
	PWI 113-94 ED1	IEC TS 62565-3-4: Nanomanufacturing - Material specifications - Part 3-4: Graphene-based material - Sectional blank detail specification: Bilayer graphene
	PWI 113-95 ED1	IEC TS 62607-6-15: Nanomanufacturing – Key control characteristics – Part 6-15: Sample preparation for the reliability test of sheet

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		resistance and contact resistance for graphene and two-dimensional materials
	PWI 113-118	IEC TS 62607-6-23: Nanomanufacturing - Key control characteristics - Part 6-23: Graphene film - Sheet resistance, Carrier density, Carrier mobility: Hall bar
	IEC TS 62607-6-24	Nanomanufacturing - Key control characteristics - Part 6-24: Graphene film - Number of layers: Optical contrast
	PWI 113-122	Nano-enabled electrical energy storage – Hybrid Supercapacitors for ISG application – Electrochemical characterisations of electrodes and modules
	PWI 113-131	IEC TS 62607-6-28 Nanomanufacturing - Key control characteristics - Part 6-28: Graphene-based material - Number of layers: Raman spectroscopy
	PWI 113-132	IEC TS 62607-6-27 Nanomanufacturing – Key control characteristics – Part 06-27: Two-dimensional materials – Field-effect mobility: 4-terminal measurement
	PWI 113-133	IEC TS 62565-3-6 Nanomanufacturing – Material specification - Part 3-6 Graphene-based material - Blank detail specification: Graphene oxide
	PWI 113-134	IEC TS 62607-8-4 Nanomanufacturing - Key Control Characteristics - Part 8-4: Nano-enabled metal-oxide interfacial devices - Test method for electronic trap states by low-frequency-noise spectroscopy
	PWI 113-135	IEC TS 62876-3-3 Nanomanufacturing – Reliability assessment – Part 3-3: 2D materials – Stability test: Density of interface defects
	PNW TS 113-571 ED1	IEC TS 62565-3-5: Nanomanufacturing - Material specifications - Part 3-5: Graphene-based material - Sectional blank detail specification: Graphene powder and dispersion
	PNW TS 113-580 ED1	Nanomanufacturing - Key control characteristics - Part 6-29: Graphene-based materials - Defectiveness: Raman spectroscopy
	PNW TS 113-581 ED1	IEC TS 62607-6-18: Nanomanufacturing - Key control characteristics - Part 6-18: Graphene-based material - Functional groups: TGA-FTIR
	PNW TS 113-582 ED1	IEC TS 62607-6-22: Nanomanufacturing - Key control characteristics - Part 6-22: Graphene-based materials - Ash content: Incineration
	PNW TS 113-597 ED1	Nanomanufacturing – Reliability and durability assessment – Part 3-2: Graphene - Ellipsometry measurement of Graphene
	PNW 113-598 ED1	IEC TS 62607-6-17: Nanomanufacturing - Key control characteristics - Part 6-17: Graphene-based materials and common carbon material - Order parameter: XRD and TE
	IEC TS 62565-1 ED1	Nanomanufacturing - Material specifications, Part 1 - Basic concept
	IEC 62565-3-1 ED1	Nanomanufacturing - Material specifications - Part 3-1: Graphene - Blank detail specification

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	IEC TS 62565-3-2 ED1	Nanomanufacturing – Material specifications - Part 3-2: Graphene-based material - Sectional blank detail specification: graphene-based ink
	IEC TS 62565-5-1 ED1	Nanomanufacturing - Material specification – Part 5-1: Nanoporous activated carbon for electrochemical capacitor - Blank detail specification
	IEC TS 62565-5-2 ED1	Nanomanufacturing - Material specification – Part 5-2: Nano-enabled electrode of electrochemical capacitor - Blank detail specification
	IEC TS 62607-5-2 ED1	Nanomanufacturing - Key control characteristics - Part 5-2: Thin-film organic/nano electronic devices - Measuring Alternating Current characteristics
	IEC TS 62607-5-4 ED1	Nanomanufacturing – Key control characteristics - Part 5-4: Energy band gap measurement of nanomaterials by electron energy loss spectroscopy (EELS
	IEC TS 62607-6-2 ED1	Nanomanufacturing – Key control characteristics – Part 6-2: Graphene – Evaluation of the number of layers of graphene
	IEC TS 62607-6-4 ED2	Nanomanufacturing - Key control characteristics - Part 6-4: Graphene-based materials - Sheet resistance: Microwave resonant cavity
	IEC TS 62607-6-5 ED1	Nanomanufacturing - Key control characteristics - Part 6-5: Graphene materials - Contact and sheet resistance: Transfer length method
	IEC TS 62607-6-6 ED1	Nanomanufacturing - Key control characteristics - Part 6-6: Graphene-based materials - Strain uniformity: spatially-resolved Raman spectroscopy
IEC/TC 113 Nanotechnology for electrotechnical products and systems	IEC TS 62607-6-7 ED1	Nanomanufacturing – Key control characteristics – Part 6-7: Graphene based material – Sheet resistance: van der Pauw method
	IEC TS 62607-6-8 ED1	Nanomanufacturing – Key control characteristics – Part 6-8: Graphene based material – Sheet resistance: In-line four-point probe
	IEC TS 62607-6-9 ED1	Nanomanufacturing - Key control Characteristics - Part 6-9: Graphene-based material – Sheet resistance: Eddy current method
	IEC TS 62607-6-10 ED1	IEC TS 62607-6-10: Nanomanufacturing - Key control characteristics - Part 6-10: Graphene-based material - Sheet resistance: Terahertz time-domain spectroscopy
	IEC TS 62607-6-11 ED1	Nanomanufacturing - Key control characteristics - Part 6-11: Graphene-based Material - Defect density: Raman spectroscopy
	IEC TS 62607-6-12 ED1	Nanomanufacturing – Key Control Characteristics – Part 6-12: Graphene-based material – Number of layers: Raman spectroscopy, optical reflection
	IEC TS 62607-6-16 ED1	Nanomanufacturing – Key control characteristics – Part 6-16: Two-dimensional materials - Doping concentration: Field effect transistor method

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	IEC TS 62607-6-19 ED1	Nanomanufacturing - Key control characteristics - Part 6-19: Graphene-based material - Elemental composition: CS analyzer, ONH analyser
	IEC TS 62607-6-20 ED1	Nanomanufacturing - Key control characteristics - Part 6-20: Graphene-based material – Metallic impurity content: ICP-MS
	IEC TS 62607-6-21 ED1	IEC TS 62607-6-21: Nanomanufacturing - Key control characteristics - Part 6-21: Graphene-based material – Elemental composition, C/O ratio: XPS
	IEC TS 62607-6-25 ED1	Nanomanufacturing – Keycontrol characteristics – Part 6-25: Two-dimensional materials - Doping concentration: Kelvin Probe Force Microsopy
	IEC TS 62607-6-26 ED1	Nanomanufacturing – key control characteriastics – Part 6-26: 2D materials – Fracture stain and stress, Young’ s modulus, residual strain and stress: Bulge test
	IEC TS 62607-7-2 ED1	Nanomanufacturing - Key Control Characteristics - Part 7-2: Nano-enabled photovoltaics - Device evaluation method for indoor light
	IEC TS 62607-8-3 ED1	Nanomanufacturing - Key Control Characteristics - Part 8-3: Nano-enabled metal-oxide interfacial devices – Test method for the analogue change and resistance fluctuation
	IEC TR 62632/AMD1 ED1	Amendment 1 - Nanoscale electrical contacts and interconnects
IEC/TC 113 Nanotechnology for electrotechnical products and systems	IEC TS 62876-3-1 ED1	Nanomanufacturing - Reliability assessment - Part 3.1: Graphene-based materials - Stability: Temperature and humidity test
	ISO TS 22292 ED1	Nanotechnologies – 3D image reconstruction of rod-supported nano-objects using transmission electron microscopy
	ISO TS 23302 ED1	Nanotechnologies — Guidance on measurands for characterising nano-objects and materials that contain them
	ISO 80004-1 ED1	Nanotechnologies -- Vocabulary -- Part 1: Core terms and definitions
	ISO TS 80004-4 ED2	Nanotechnologies - Vocabulary - Part 4: Nanostructured materials

2.3.7 Standards about paper

Table 11. Standards about paper

Standards about nanotechnologies		
Issuing body	Code	Title
CEN/TC 172 Pulp, Paper and Board	CEN/TR 15645-1:2008	Paper and board intended to come into contact with foodstuffs - Calibration of the odour test - Part 1: Odour
	CEN/TR 15645-2:2008	Paper and board intended to come into contact with foodstuffs - Calibration of the off flavour test - Part 2: Fatty food

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	CEN/TR 15645-2:2008/AC:2008	Paper and board intended to come into contact with foodstuffs - Calibration of the off-flavour test - Part 2: Fatty food
	CEN/TR 15645-3:2008	Paper and board intended to come into contact with foodstuffs - Calibration of the off-flavour test - Part 3: Dry food
	CEN/TR 15645-3:2008/AC:2008	Paper and board intended to come into contact with foodstuffs - Calibration of the off-flavour test - Part 3: Dry food
	CEN/TS 17497:2020	Pulp, paper and paperboard - Determination of bisphenol A in extracts from paper and paperboard
	EN 1104:2018	Paper and board intended to come into contact with foodstuffs - Determination of the transfer of antimicrobial constituents
	EN 12281:2002	Printing and business paper - Requirements for copy paper for dry toner imaging processes
	EN 12283:2002	Printing and business paper - Determination of toner adhesion
	EN 1230-1:2009	Paper and board intended to come into contact with foodstuffs - Sensory analysis - Part 1: Odour
	EN 1230-2:2009	Paper and board intended to come into contact with foodstuffs - Sensory analysis - Part 2: Off-flavour (taint)
	EN 12497:2005	Paper and board - Paper and board intended to come into contact with foodstuffs - Determination of mercury in an aqueous extract
	EN 12498:2018	Paper and board - Paper and board intended to come into contact with foodstuffs - Determination of cadmium, chromium and lead in an aqueous extract
	EN 12858:1999	Paper - Printing and business paper - Requirements for continuous stationery
	EN 13676:2001	Polymer coated paper and board intended for food contact - Detection of pinholes
	EN 14086:2003	Paper and board - Measurement of specular gloss - 45 ° gloss with a parallel beam, DIN method
CEN/TC 172 Pulp, Paper and Board	EN 14338:2003	Paper and board intended to come into contact with foodstuffs - Conditions for determination of migration from paper and board using modified polyphenylene oxide (MPPO) as a simulant
	EN 14719:2005	Pulp, paper and board - Determination of the Diisopropylnaphthalene (DIPN) content by solvent extraction
	EN 1541:2001	Paper and board intended to come into contact with foodstuffs - Determination of formaldehyde in an aqueous extract
	EN 15519:2007	Paper and board intended to come into contact with foodstuffs - Preparation of an organic solvent extra
	EN 15845:2010	Paper and board - Determination of the cytotoxicity of aqueous extracts
	EN 16418:2014	Paper and board - Determination of the cytotoxicity of aqueous extracts using a metabolically competent hepatoma cell line (HepG2)
	EN 16453:2014	Pulp, paper and paperboard - Determination of phthalates in extracts from paper and paperboard
	EN 17085:2019	Paper and board - Sampling procedures for paper and board for recycling

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	EN 17163:2019	Pulp, paper and board - Determination of primary aromatic amines (PAA) in a water extract by a LC-MS method
	EN 20187:1993	Paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples (ISO 187:1990)
	EN 27213:1993	Pulps - Sampling for testing (ISO 7213:1981)
	EN 643:2014	Paper and board - European list of standard grades of paper and board for recycling
	EN 645:1993	Paper and board intended to come into contact with foodstuffs - Preparation of a cold water extract
	EN 646:2018	Paper and board intended to come into contact with foodstuffs - Determination of colour fastness of dyed paper and board
	EN 647:1993	Paper and board intended to come into contact with foodstuffs - Preparation of a hot water extract
	EN 648:2018	Paper and board intended to come into contact with foodstuffs - Determination of the fastness of fluorescent whitened paper and board
	EN 920:2000	Paper and board intended to come into contact with foodstuffs - Determination of dry matter content in an aqueous extract
	EN ISO 12625-11:2019	Tissue paper and tissue products - Part 11: Determination of wet ball burst strength (ISO 12625-11:2019)
	EN ISO 12625-12:2010	Tissue paper and tissue products - Part 12: Determination of tensile strength of perforated lines - Calculation of perforation efficiency (ISO 12625-12:2010)
	EN ISO 12625-15:2015	Tissue paper and tissue products - Part 15: Determination of optical properties - Measurement of brightness and colour with C/2° (indoor daylight) illuminant (ISO 12625-15:2015)
	EN ISO 12625-16:2015	Tissue paper and tissue products - Part 16: Determination of optical properties - Opacity (paper backing) - Diffuse reflectance method (ISO 12625-16:2015)
	EN ISO 12625-17:2021	Tissue paper and tissue products - Part 17: Determination of disintegration in water (ISO 12625-17:2021)
	EN ISO 12625-1:2019	Tissue paper and tissue products - Part 1: Vocabulary (ISO 12625-1:2019)
	EN ISO 12625-3:2014	Tissue paper and tissue products - Part 3: Determination of thickness, bulking thickness and apparent bulk density and bulk (ISO 12625-3:2014)
CEN/TC 172 Pulp, Paper and Board	EN ISO 12625-4:2016	Tissue paper and tissue products - Part 4: Determination of tensile strength, stretch at maximum force and tensile energy absorption (ISO 12625-4:2016)
	EN ISO 12625-5:2016	Tissue paper and tissue products - Part 5: Determination of wet tensile strength (ISO 12625-5:2016)
	EN ISO 12625-6:2016	Tissue paper and tissue products - Part 6: Determination of grammage (ISO 12625-6:2016)
	EN ISO 12625-7:2014	Tissue paper and tissue products - Part 7: Determination of optical properties - Measurement of brightness and colour with D65/10° (outdoor daylight) (ISO 12625-7:2014)
	EN ISO 12625-8:2010	Tissue paper and tissue products - Part 8: Water-absorption time and water-absorption capacity, basket-immersion test method (ISO 12625-8:2010)

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	EN ISO 12625-9:2015	Tissue paper and tissue products - Part 9: Determination of ball burst strength (ISO 12625-9:2015)
	EN ISO 14453:2014	Pulps - Determination of acetone-soluble matter (ISO 14453:2014)
	EN ISO 15318:1999	Pulp, paper and board - Determination of 7 specified polychlorinated biphenyls (PCB) (ISO 15318:1999)
	EN ISO 15320:2011	Pulp, paper and board - Determination of pentachlorophenol in an aqueous extract (ISO 15320:2011)
	EN ISO 15755:1999	Paper and board - Estimation of contraries (ISO 15755:1999)
	EN ISO 186:2002	Paper and board - Sampling to determine average quality (ISO 186:2002)
	EN ISO 1924-2:2008	Paper and board - Determination of tensile properties - Part 2: Constant rate of elongation method (20 mm/min) (ISO 1924-2:2008)
	EN ISO 1974:2012	Paper - Determination of tearing resistance - Elmendorf method (ISO 1974:2012)
	EN ISO 216:2007	Writing paper and certain classes of printed matter - Trimmed sizes - A and B series, and indication of machine direction (ISO 216:2007)
	EN ISO 217:2013	Paper - Untrimmed sizes - Designation and tolerances for primary and supplementary ranges, and indication of machine direction (ISO 217:2013)
	EN ISO 2758:2014	Paper - Determination of bursting strength (ISO 2758:2014)
	EN ISO 2759:2014	Board - Determination of bursting strength (ISO 2759:2014)
	EN ISO 287:2017	Paper and board - Determination of moisture content of a lot - Oven-drying method (ISO 287:2017)
	EN ISO 3035:2011	Corrugated fibreboard - Determination of flat crush resistance
	EN ISO 3037:2013	Corrugated fibreboard - Determination of edgewise crush resistance (unwaxed edge method) (ISO 3037:2013)
	EN ISO 4119:1996	Pulps - Determination of stock concentration (ISO 4119:1995)
	EN ISO 5263-1:2004	Pulps - Laboratory wet disintegration - Part 1: Disintegration of chemical pulps (ISO 5263-1:2004)
	EN ISO 5263-2:2004	Pulps - Laboratory wet disintegration - Part 2: Disintegration of mechanical pulps at 20 degrees C (ISO 5263-2:2004)
	EN ISO 5263-3:2004	Pulps - Laboratory wet disintegration - Part 3: Disintegration of mechanical pulps at > 85 degrees C (ISO 5263-3:2004)
	EN ISO 5264-2:2011	Pulps - Laboratory beating - Part 2: PFI mill method (ISO 5264-2:2011)
CEN/TC 172 Pulp, Paper and Board	EN ISO 5267-1:2000	Pulps - Determination of drainability - Part 1: Schopper-Riegler method (ISO 5267-1:1999)
	EN ISO 5267-1:2000/AC:2002	Pulps - Determination of drainability - Part 1: Schopper-Riegler method (ISO 5267-1:1999/Cor.1:2001)
	EN ISO 5269-1:2005	Pulps - Preparation of laboratory sheets for physical testing - Part 1: Conventional sheet-former method (ISO 5269-1:2005)

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	EN ISO 5269-2:2004	Pulps - Preparation of laboratory sheets for physical testing - Part 2: Rapid-Köthen method (ISO 5269-2:20)
	EN ISO 5270:2012	Pulps - Laboratory sheets - Determination of physical properties (ISO 5270:2012)
	EN ISO 534:2011	Paper and board - Determination of thickness, density and specific volume (ISO 534:2011)
	EN ISO 5350-1:2006	Pulps - Estimation of dirt and shives - Part 1: Inspection of laboratory sheets by transmitted light (ISO 5350-1:2006)
	EN ISO 5350-2:2006	Pulps - Estimation of dirt and shives - Part 2: Inspection of mill sheeted pulp by transmitted light (ISO 5350-2:2006)
	EN ISO 535:2014	Paper and board - Determination of water absorptiveness - Cobb method (ISO 535:2014)
	EN ISO 536:2020	Paper and board - Determination of grammage (ISO 536:2019)
	EN ISO 638-1:2021	Paper, board, pulps and cellulosic nanomaterials - Determination of dry matter content by oven-drying method - Part 1: Materials in solid form (ISO 638-1:2021)
	EN ISO 638-2:2021	Paper, board, pulps and cellulosic nanomaterials - Determination of dry matter content by oven-drying method - Part 2: Suspensions of cellulosic nanomaterials (ISO 638-2:2021)
	EN ISO 7263-1:2019	Corrugating medium - Determination of the flat crush resistance after laboratory fluting - Part 1: A-flute (ISO 7263-1:2019)
	EN ISO 7263-2:2019	Corrugating medium - Determination of the flat crush resistance after laboratory fluting - Part 2: B-flute (ISO 7263-2:2018)
	EN ISO 801-1:1996	Pulps - Determination of saleable mass in lots - Part 1: Pulp baled in sheet form (ISO 8001-1:1994)
	EN ISO 801-3:1996	Pulps - Determination of saleable mass in lots - Part 3: Unitized bales (ISO 801-3:1994)
	EN ISO 8254-1:2009	Paper and board - Measurement of specular gloss - Part 1: 75 degree gloss with a converging beam, TAPPI method (ISO 8254-1:2009)
	EN ISO 8254-2:2016	Paper and board - Measurement of specular gloss - Part 2: 75 degree gloss with a parallel beam, DIN method (ISO 8254-2:2016)
	EN ISO 9706:1998	Information and documentation - Paper for documents - Requirements for permanence (ISO 9706:1994)
	CEN/TS 17630:2021	Pulp, paper and paperboard - Determination of anthraquinone in extracts from pulp, paper and paperboard
	FprEN ISO 12625-7	Tissue paper and tissue products - Part 7: Determination of optical properties - Measurement of brightness and colour with D65/10° (outdoor daylight) (ISO/FDIS 12625-7:2021)
	prEN 17545	Paper and board - Determination of Composition of Paper and Board for Recycling by gravimetric analysis
	prEN 17600	Paper and board intended to come into contact with foodstuffs - Determination of the fastness of fluorescent whitened paper and board - Analysis by high-performance liquid chromatography with fluorescence detection

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CEN/TC 172 Pulp, Paper and Board	prEN ISO 12625-4	Tissue paper and tissue products - Part 4: Determination of tensile strength, stretch at maximum force and tensile energy absorption (ISO/DIS 12625-4:2021)
	prEN ISO 187 rev	Paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples
	prEN ISO 3037 rev	Corrugated fibreboard - Determination of edgewise crush resistance (unwaxed edge method)
	prEN ISO 5263-3 rev	Pulps - Laboratory wet disintegration - Part 3: Disintegration of mechanical pulps at > 85 degrees C
	prEN ISO 5270 rev	Pulps - Laboratory sheets - Determination of physical properties
	prEN ISO 535 rev	Paper and board - Determination of water absorptiveness - Cobb method
ISO/TC 6 Paper, board and pulps	ISO 216:2007	Writing paper and certain classes of printed matter — Trimmed sizes — A and B series, and indication of machine direction
	ISO 217:2013	Paper — Untrimmed sizes — Designation and tolerances for primary and supplementary ranges, and indication of machine direction
	ISO 302:2015	Pulps — Determination of Kappa number
	ISO 638-1:2021	Paper, board, pulps and cellulosic nanomaterials — Determination of dry matter content by oven-drying method — Part 1: Materials in solid form
	ISO 638-2:2021	Paper, board, pulps and cellulosic nanomaterials — Determination of dry matter content by oven-drying method — Part 2: Suspensions of cellulosic nanomaterials
	ISO 692:1982	Pulps — Determination of alkali solubility
	ISO 699:2015	Pulps — Determination of alkali resistance
ISO/TC 6 Paper, board and pulps	ISO 776:2011	Pulps — Determination of acid-insoluble ash
	ISO 801-1:1994	Pulps — Determination of saleable mass in lots — Part 1: Pulp baled in sheet form
	ISO 801-2:1994	Pulps — Determination of saleable mass in lots — Part 2: Pulps (such as flash-dried pulps) baled in slabs
	ISO 801-3:1994	Pulps — Determination of saleable mass in lots — Part 3: Unitized bales
	ISO 838:1974	Paper — Holes for general filing purposes — Specifications
	ISO 1762:2019	Paper, board, pulps and cellulose nanomaterials — Determination of residue (ash content) on ignition at 525 ° C
	ISO 2144:2019	Paper, board, pulps and cellulose nanomaterials — Determination of residue (ash content) on ignition at 900 ° C
	ISO/AWI 2469	Paper, board and pulps — Measurement of diffuse radiance factor (diffuse reflectance factor)
	ISO 2469:2014	Paper, board and pulps — Measurement of diffuse radiance factor (diffuse reflectance factor)
	ISO 2470-1:2016	Paper, board and pulps — Measurement of diffuse blue reflectance factor — Part 1: Indoor daylight conditions (ISO brightness)
	ISO 2470-2:2008	Paper, board and pulps — Measurement of diffuse blue reflectance factor — Part 2: Outdoor daylight conditions (D65 brightness)

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	ISO 2471:2008	Paper and board — Determination of opacity (paper backing) — Diffuse reflectance method
	ISO 3260:2015	Pulps — Determination of chlorine consumption (Degree of delignification)
	ISO 3688:1999	Pulps — Preparation of laboratory sheets for the measurement of diffuse blue reflectance factor (ISO brightness)
	ISO/CD 3688	Pulps - Preparation of laboratory sheets for the measurement of optical properties
	ISO 4046-1:2016	Paper, board, pulps and related terms — Vocabulary — Part 1: Alphabetical index
	ISO 4046-2:2016	Paper, board, pulps and related terms — Vocabulary — Part 2: Pulping terminology
	ISO 4046-3:2016	Paper, board, pulps and related terms — Vocabulary — Part 3: Paper-making terminology
	ISO 4046-4:2016	Paper, board, pulps and related terms — Vocabulary — Part 4: Paper and board grades and converted products
	ISO 4046-5:2016	Paper, board, pulps and related terms — Vocabulary — Part 5: Properties of pulp, paper and board
	ISO 4094:2017	Paper, board and pulps — General requirements for the competence of laboratories authorized for the issue of optical reference transfer standards of level 3
	ISO 4119:1995	Pulps — Determination of stock concentration
ISO/TC 6 Paper, board and pulps	ISO/AWI 4989	Cellulose Nanomaterial (CNM) — Sample Preparation of Pressed CNM Powder for Determination of Optical Properties — ISO Brightness and L*a*b* Colour
	ISO 5263-1:2004	Pulps — Laboratory wet disintegration — Part 1: Disintegration of chemical pulps
	ISO 5263-2:2004	Pulps — Laboratory wet disintegration — Part 2: Disintegration of mechanical pulps at 20 degrees C
	ISO 5263-3:2004	Pulps — Laboratory wet disintegration — Part 3: Disintegration of mechanical pulps at > 85 degrees C
	ISO/CD 5263-3	Pulps — Laboratory wet disintegration — Part 3: Disintegration of mechanical pulps at > 85 degrees C
	ISO 5264-1:1979	Pulps — Laboratory beating — Part 1: Valley beater method
	ISO 5264-2:2011	Pulps — Laboratory beating — Part 2: PFI mill method
	ISO 5267-1:1999	Pulps — Determination of drainability — Part 1: Schopper-Riegler method
	ISO 5267-1:1999/COR 1:2001	Pulps — Determination of drainability — Part 1: Schopper-Riegler method — Technical Corrigendum 1
	ISO 5267-2:2001	Pulps — Determination of drainability — Part 2: "Canadian Standard" freeness method
	ISO/WD 5267-2	Pulps — Determination of drainability — Part 2: "Canadian Standard" freeness method
	ISO 5269-1:2005	Pulps — Preparation of laboratory sheets for physical testing — Part 1: Conventional sheet-former method
	ISO 5269-2:2004	Pulps — Preparation of laboratory sheets for physical testing — Part 2: Rapid-Köthen method
	ISO 5269-3:2008	Pulps — Preparation of laboratory sheets for physical testing — Part 3: Conventional and Rapid-Köthen sheet formers using a closed water system

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	ISO 5270:2012	Pulps — Laboratory sheets — Determination of physical properties
	ISO/CD 5270	Pulps — Laboratory sheets — Determination of physical properties
	ISO 5350-1:2006	Pulps — Estimation of dirt and shives — Part 1: Inspection of laboratory sheets by transmitted light
	ISO 5350-2:2006	Pulps — Estimation of dirt and shives — Part 2: Inspection of mill sheeted pulp by transmitted light
	ISO 5350-3:2007	Pulps - Estimation of dirt and shives — Part 3: Visual inspection by reflected light using Equivalent Black Area (EBA) method
	ISO 5350-4:2006	Pulps — Estimation of dirt and shives — Part 4: Instrumental inspection by reflected light using Equivalent Black Area (EBA) method
	ISO 5351:2010	Pulps — Determination of limiting viscosity number in cupri-ethylenediamine (CED) solution
	ISO 5631-1:2015	Paper and board — Determination of colour by diffuse reflectance — Part 1: Indoor daylight conditions (C/2 degrees)
	ISO 5631-2:2015	Paper and board — Determination of colour by diffuse reflectance — Part 2: Outdoor daylight conditions (D65/10 degrees)
ISO/TC 6 Paper, board and pulps	ISO 5631-3:2015	Paper and board — Determination of colour by diffuse reflectance — Part 3: Indoor illumination conditions (D50/2 degrees)
	ISO 5647:2019	Paper and board — Determination of titanium dioxide content
	ISO/AWI TS 5733	Paper, board and pulps — Estimation of uncertainty for test methods by interlaboratory comparisons
	ISO 6587:1992	Paper, board and pulps — Determination of conductivity of aqueous extracts
	ISO/DIS 6587	Paper, board and pulps — Determination of conductivity of aqueous extracts
	ISO 6588-1:2020	Paper, board and pulps — Determination of pH of aqueous extracts — Part 1: Cold extraction
	ISO 6588-2:2020	Paper, board and pulps — Determination of pH of aqueous extracts — Part 2: Hot extraction
	ISO 7213:1981	Pulps — Sampling for testing
	ISO 8254-1:2009	Paper and board — Measurement of specular gloss — Part 1: 75 degree gloss with a converging beam, TAPPI method
	ISO 8254-2:2016	Paper and board — Measurement of specular gloss — Part 2: 75 degree gloss with a parallel beam, DIN method
	ISO 8254-3:2016	Paper and board — Measurement of specular gloss — Part 3: 20 degree gloss with a converging beam, TAPPI method
	ISO 9184-1:1990	Paper, board and pulps — Fibre furnish analysis — Part 1: General method
	ISO/AWI 9184-1	Paper, board and pulps — Fibre furnish analysis — Part 1: General method
	ISO 9184-2:1990	Paper, board and pulps — Fibre furnish analysis — Part 2: Staining guide

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	ISO 9184-3:1990	Paper, board and pulps — Fibre furnish analysis — Part 3: Herzberg staining test
	ISO 9184-4:1990	Paper, board and pulps — Fibre furnish analysis — Part 4: Graff "C" staining test
	ISO 9184-5:1990	Paper, board and pulps — Fibre furnish analysis — Part 5: Lofton-Merritt staining test (modification of Wisbar)
	ISO 9184-6:1994	Paper, board and pulps — Fibre furnish analysis — Part 6: Determination of fibre coarseness
	ISO 9184-7:1994	Paper, board and pulps — Fibre furnish analysis — Part 7: Determination of weight factor
	ISO 9197:2016	Paper, board and pulps — Determination of water-soluble chlorides
	ISO 9198:2020	Paper, board and pulp — Determination of water-soluble sulfates
	ISO 9416:2017	Paper — Determination of light scattering and absorption coefficients (using Kubelka-Munk theory)
	ISO 10376:2011	Pulps — Determination of mass fraction of fines
	ISO/TR 10688:2015	Paper, board and pulps — Basic terms and equations for optical properties
	ISO 10716:1994	Paper and board — Determination of alkali reserve
	ISO 10775:2013	Paper, board and pulps — Determination of cadmium content — Atomic absorption spectrometric method
	ISO 11093-1:1994	Paper and board — Testing of cores — Part 1: Sampling
ISO/TC 6 Paper, board and pulps	ISO 11093-2:1994	Paper and board — Testing of cores — Part 2: Conditioning of test samples
	ISO 11093-3:1994	Paper and board — Testing of cores — Part 3: Determination of moisture content using the oven drying method
	ISO 11093-4:2016	Paper and board — Testing of cores — Part 4: Measurement of dimensions
	ISO/DIS 11093-4	Paper and board — Testing of cores — Part 4: Measurement of dimensions
	ISO 11093-5:2016	Paper and board — Testing of cores — Part 5: Determination of characteristics of concentric rotation
	ISO 11093-6:2005	Paper and board — Testing of cores — Part 6: Determination of bending strength by the three-point method
	ISO 11093-7:2011	Paper and board — Testing of cores — Part 7: Determination of flexural modulus by the three-point method
	ISO 11093-8:2017	Paper and board — Testing of cores — Part 8: Determination of natural frequency and flexural modulus by experimental modal analysis
	ISO 11093-9:2019	Paper and board — Testing of cores — Part 9: Determination of flat crush resistance
	ISO/TR 11371:2013	Pulps — Basic guidelines for laboratory refining
	ISO 11475:2017	Paper and board — Determination of CIE whiteness, D65/10 degrees (outdoor daylight)
	ISO 11476:2016	Paper and board — Determination of CIE whiteness, C/2° (indoor illumination conditions)
	ISO 11480:2017	Pulp, paper and board — Determination of total chlorine and organically bound chlorine

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	ISO 12830:2019	Paper, board, pulps and cellulose nanomaterials — Determination of acid-soluble magnesium, calcium, manganese, iron, copper, sodium and potassium
	ISO 13542:2006	Paper and board — Specification for internal diameters of cores for reels
	ISO 14436:2010	Pulps — Standard tap water for drainability measurements — Conductivity 40 mS/m to 150 mS/m
	ISO 14453:2014	Pulps — Determination of acetone-soluble matter
	ISO 14487:1997	Pulps — Standard water for physical testing
	ISO 15318:1999	Pulp, paper and board — Determination of 7 specified polychlorinated biphenyls (PCB)
	ISO 15320:2011	Pulp, paper and board — Determination of pentachlorophenol in an aqueous extract
	ISO 15360-1:2000	Recycled pulps — Estimation of Stickies and Plastics — Part 1: Visual method
	ISO 15360-2:2015	Recycled pulps — Estimation of Stickies and Plastics — Part 2: Image analysis method
	ISO/AWI 15360-3	Recycled pulps — Estimation of Stickies and Plastics — Part 3: Determination by applying near-infrared measurement
	ISO 15361:2000	Pulps — Determination of zero-span tensile strength, wet or dry
	ISO 16065-1:2014	Pulps — Determination of fibre length by automated optical analysis — Part 1: Polarized light method
ISO/TC 6 Paper, board and pulps	ISO 16065-2:2014	Pulps — Determination of fibre length by automated optical analysis — Part 2: Unpolarized light method
	ISO 17812:2007	Paper, board and pulps — Determination of total magnesium, total calcium, total manganese, total iron and total copper
	ISO 18522:2016	Paper and board — Automated off-line testing of physical properties for CD (cross direction) profiles
	ISO/TS 20460:2015	Paper and board — Automated on-line testing — Metrological comparability between standardized measurements and output of on-line gauges
	ISO/TS 21331:2020	Graphic technology and deinked pulp — Guidance for assessing the deinking performance of printed paper products
	ISO 21400:2018	Pulp — Determination of cellulose nanocrystal sulfur and sulfate half-ester content
	ISO 21436:2020	Pulps — Determination of lignin content — Acid hydrolysis method
	ISO 21437:2020	Pulps — Determination of carbohydrate composition
	ISO 21896:2020	Paper, pulp, and recycling — Decolouration test of dye coloured paper products and paper products printed using dye inks
	ISO 21993:2020	Paper and pulp — Deinkability test for printed paper products
	ISO 22754:2008	Pulp and paper — Determination of the effective residual ink concentration (ERIC number) by infrared reflectance measurement
	ISO 22891:2013	Paper — Determination of transmittance by diffuse reflectance measurement
	ISO 23713:2005	Pulps — Determination of fibre coarseness by automated optical analysis — Polarized light method

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	ISO/TR 24498:2019	Paper, board and pulps — Estimation of uncertainty for test methods by interlaboratory comparisons
	ISO/TR 25477:2008	Paper, board and pulps - Basic guidelines for image analysis measurements
	ISO 29681:2009	Paper, board and pulps — Determination of pH of salted water extracts
ISO/TC 6/SC 2 . Test methods and quality specifications for paper and board	ISO 186:2002	Paper and board — Sampling to determine average quality
	ISO 187:1990	Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples
	ISO/CD 187	Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples
	ISO 287:2017	Paper and board — Determination of moisture content of a lot — Oven-drying method
	ISO 534:2011	Paper and board — Determination of thickness, density and specific volume
	ISO 535:2014	Paper and board — Determination of water absorptiveness — Cobb method
	ISO/CD 535	Paper and board — Determination of water absorptiveness — Cobb method
	ISO 536:2019	Paper and board — Determination of grammage
	ISO 1924-2:2008	Paper and board — Determination of tensile properties — Part 2: Constant rate of elongation method (20 mm/min)
	ISO 1924-3:2005	Paper and board — Determination of tensile properties — Part 3: Constant rate of elongation method (100 mm/min)
	ISO 1974:2012	Paper — Determination of tearing resistance — Elmendorf method
	ISO 2493-1:2010	Paper and board — Determination of bending resistance — Part 1: Constant rate of deflection
	ISO 2493-2:2020	Paper and board — Determination of resistance to bending — Part 2: Taber-type tester
	ISO 2528:2017	Sheet materials — Determination of water vapour transmission rate (WVTR) — Gravimetric (dish) method
	ISO 2758:2014	Paper — Determination of bursting strength
	ISO 2759:2014	Board — Determination of bursting strength
	ISO 3034:2011	Corrugated fibreboard — Determination of single sheet thickness
	ISO 3035:2011	Corrugated fibreboard — Determination of flat crush resistance
	ISO 3036:1975	Board — Determination of puncture resistance
	ISO 3037:2013	Corrugated fibreboard — Determination of edgewise crush resistance (unwaxed edge method)
	ISO/CD 3037	Corrugated fibreboard — Determination of edgewise crush resistance (non-waxed edge method)
	ISO 3038:1975	Corrugated fibreboard — Determination of the water resistance of the glue bond by immersion
	ISO 3039:2010	Corrugated fibreboard — Determination of grammage of the component papers after separation

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	ISO 3689:1983	Paper and board — Determination of bursting strength after immersion in water
	ISO 3781:2011	Paper and board — Determination of tensile strength after immersion in water
	ISO 3783:2006	Paper and board — Determination of resistance to picking — Accelerated speed method using the IGT-type tester (electric model)
	ISO 5626:1993	Paper — Determination of folding endurance
	ISO 5627:1995	Paper and board — Determination of smoothness (Bekk method)
	ISO 5627:1995/COR 1:2002	Paper and board — Determination of smoothness (Bekk method) — Technical Corrigendum 1
ISO/TC 6/SC 2 . Test methods and quality specifications for paper and board	ISO 5628:2019	Paper and board — Determination of bending stiffness — General principles for two-point, three-point and four-point methods
	ISO 5629:2017	Paper and board — Determination of bending stiffness — Resonance method
	ISO 5630-1:1991	Paper and board — Accelerated ageing — Part 1: Dry heat treatment at 105 degrees C
	ISO 5630-3:1996	Paper and board — Accelerated ageing — Part 3: Moist heat treatment at 80 degrees C and 65 % relative humidity
	ISO 5630-4:1986	Paper and board — Accelerated ageing — Part 4: Dry heat treatment at 120 or 150 degrees C
	ISO 5630-5:2008	Paper and board — Accelerated ageing — Part 5: Exposure to elevated temperature at 100 degrees C
	ISO 5630-6:2009	Paper and board — Accelerated ageing — Part 6: Exposure to atmospheric pollution (nitrogen dioxide)
	ISO 5630-7:2014	Paper and board — Accelerated ageing — Part 7: Exposure to light
	ISO 5633:1983	Paper and board — Determination of resistance to water penetration
	ISO 5635:1978	Paper — Measurement of dimensional change after immersion in water
	ISO 5636-3:2013	Paper and board — Determination of air permeance (medium range) — Part 3: Bendtsen method
	ISO 5636-4:2013	Paper and board — Determination of air permeance (medium range) — Part 4: Sheffield method
	ISO 5636-5:2013	Paper and board — Determination of air permeance (medium range) — Part 5: Gurley method
	ISO 5636-6:2015	Paper and board — Determination of air permeance (medium range) — Part 6: Oken method
	ISO 5637:1989	Paper and board — Determination of water absorption after immersion in water
	ISO 5638:1978	Solid fibreboard — Determination of grammage of single layers
	ISO 7263-1:2018	Corrugating medium — Determination of the flat crush resistance after laboratory fluting — Part 1: A-flute
	ISO 7263-2:2018	Corrugating medium — Determination of the flat crush resistance after laboratory fluting — Part 2: B-flute
	ISO 8226-1:1994	Paper and board — Measurement of hygroexpansivity — Part 1: Hygroexpansivity up to a maximum relative humidity of 68 %

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	ISO 8226-2:1990	Paper and board — Measurement of hygroexpansivity — Part 2: Hygroexpansivity up to a maximum relative humidity of 86 %
	ISO 8784-1:2014	Pulp, paper and board — Microbiological examination — Part 1: Enumeration of bacteria and bacterial spores based on disintegration
	ISO/WD 8784-2	Pulp, paper and board — Microbiological examination — Part 2: Enumeration of bacteria, yeast and mould on surface
	ISO/DIS 8784-3	Pulp, paper and board — Microbiological examination — Part 3: Enumeration of yeast and mould based on disintegration
ISO/TC 6/SC 2 . Test methods and quality specifications for paper and board	ISO 8787:1986	Paper and board — Determination of capillary rise — Klemm method
	ISO 8791-1:1986	Paper and board — Determination of roughness/smoothness (air leak methods) — Part 1: General method
	ISO 8791-2:2013	Paper and board — Determination of roughness/smoothness (air leak methods) — Part 2: Bendtsen method
	ISO 8791-3:2017	Paper and board — Determination of roughness/smoothness (air leak methods) — Part 3: Sheffield method
	ISO 8791-4:2021	Paper and board — Determination of roughness/smoothness (air leak methods) — Part 4: Print-surf method
	ISO 8791-5:2020	Paper and board — Determination of roughness/smoothness (air leak methods) — Part 5: Oken method
	ISO 9895:2008	Paper and board — Compressive strength — Short-span test
	ISO 9932:2021	Paper and board — Determination of water vapour transmission rate of sheet materials — Dynamic sweep and static gas methods
	ISO 11556:2005	Paper and board — Determination of curl using a single vertically suspended test piece
	ISO 12192:2011	Paper and board — Determination of compressive strength — Ring crush method
	ISO 12625-1:2019	Tissue paper and tissue products — Part 1: Vocabulary
	ISO 12625-3:2014	Tissue paper and tissue products — Part 3: Determination of thickness, bulking thickness and apparent bulk density and bulk
	ISO 12625-4:2016	Tissue paper and tissue products — Part 4: Determination of tensile strength, stretch at maximum force and tensile energy absorption
	ISO/DIS 12625-4	Tissue paper and tissue products — Part 4: Determination of tensile strength, stretch at maximum force and tensile energy absorption
	ISO 12625-5:2016	Tissue paper and tissue products — Part 5: Determination of wet tensile strength
	ISO 12625-6:2016	Tissue paper and tissue products — Part 6: Determination of grammage

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	ISO 12625-7:2014	Tissue paper and tissue products — Part 7: Determination of optical properties — Measurement of brightness and colour with D65/10° (outdoor daylight)
	ISO/FDIS 12625-7	Tissue paper and tissue products — Part 7: Determination of optical properties — Measurement of brightness and colour with D65/10° (outdoor daylight)
	ISO 12625-8:2010	Tissue paper and tissue products — Part 8: Water-absorption time and water-absorption capacity, basket-immersion test method
	ISO 12625-9:2015	Tissue paper and tissue products — Part 9: Determination of ball burst strength
	ISO 12625-11:2019	Tissue paper and tissue products — Part 11: Determination of wet ball burst strength
ISO/TC 6/SC 2 . Test methods and quality specifications for paper and board	ISO 12625-12:2010	Tissue paper and tissue products — Part 12: Determination of tensile strength of perforated lines — Calculation of perforation efficiency
	ISO 12625-15:2015	Tissue paper and tissue products — Part 15: Determination of optical properties — Measurement of brightness and colour with C/2° (indoor daylight) illuminant
	ISO 12625-16:2015	Tissue paper and tissue products — Part 16: Determination of optical properties — Opacity (paper backing) — Diffuse reflectance method
	ISO 12625-17:2021	Tissue paper and tissue products — Part 17: Determination of disintegration in water
	ISO/CD 12625-19.2	Tissue paper and tissue products — Part 19: Determination of surface friction
	ISO 13820:2014	Paper, board and corrugated fibreboard — Description and calibration of compression-testing equipment
	ISO/DIS 13820	Paper, board and corrugated fibreboard — Description and calibration of fixed platen compression-testing equipment
	ISO 13821:2020	Corrugated fibreboard — Determination of edgewise crush resistance — Waxed edge method
	ISO/TS 14778:2021	Paper and board — Measurement of water contact angle by optical methods
	ISO 14968:1999	Paper and board — Cut-size office paper — Measurement of curl in a pack of sheets
	ISO 15359:1999	Paper and board — Determination of the static and kinetic coefficients of friction — Horizontal plane method
	ISO 15754:2009	Paper and board — Determination of z-directional tensile strength
	ISO 15755:1999	Paper and board — Estimation of contraries
	ISO 16260:2016	Paper and board — Determination of internal bond strength
	ISO 16532-1:2008	Paper and board — Determination of grease resistance — Part 1: Permeability test
	ISO 16532-2:2007	Paper and board — Determination of grease resistance — Part 2: Surface repellency test
	ISO 16532-3:2010	Paper and board — Determination of grease resistance — Part 3: Turpentine test for voids in glassine and greaseproof papers

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	ISO 16945:2014	Corrugating medium — Determination of the edge crush resistance after laboratory fluting
	ISO/TS 17958:2013	Paper and board — Determination of fracture toughness — Constant rate of elongation method (1,7 mm/s)
	ISO/TS 19857	Paper, board and printing inks – Printability – Laboratory test method for offset ink setting
	ISO 20494:2017	Paper — Requirements for stability for general graphic applications
	ISO 22414:2004	Paper — Cut-size office paper — Measurement of edge quality
	ISO/CD 23885-1	Paper, Board and Graphic Technology — Determination of the coating strength in the fold — Part 1: Inner fold test
	ISO/CD 24118-1	Paper and board — Stylus contact method — Part 1: Determination of surface roughness
	TAPPI	TAPPI standards

2.3.8 Standards about additive manufacturing

Table 12. Standards about additive manufacturing

Standards about additive manufacturing		
Issuing body	Code	Title
ISO/TC 261 Additive manufacturing	ISO 17296-2:2015	Additive manufacturing — General principles — Part 2: Overview of process categories and feedstock
	ISO 17296-3:2014	Additive manufacturing — General principles — Part 3: Main characteristics and corresponding test methods
	ISO 27547-1:2010	Plastics — Preparation of test specimens of thermoplastic materials using mouldless technologies — Part 1: General principles, and laser sintering of test specimens
	ISO/ASTM 52900:2015	Additive manufacturing — General principles — Terminology
	ISO/ASTM DIS 52900	Additive manufacturing — General principles — Fundamentals and vocabulary
	ISO/ASTM 52901:2017	Additive manufacturing — General principles — Requirements for purchased AM parts
	ISO/ASTM 52902:2019	Additive manufacturing — Test artifacts — Geometric capability assessment of additive manufacturing systems
	ISO/ASTM CD 52902	Additive manufacturing — Test artifacts — Geometric capability assessment of additive manufacturing systems
	ISO/ASTM 52903-1:2020	Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 1: Feedstock materials
	ISO/ASTM 52903-2:2020	Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 2: Process equipment
	ISO/ASTM CD 52903-2	Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 2: Process equipment
	ISO/ASTM 52904:2019	Additive manufacturing — Process characteristics and performance — Practice for metal powder bed fusion process to meet critical applications

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	ISO/ASTM CD 52904	Additive manufacturing of metals — Process characteristics and performance — Metal powder bed fusion process to meet critical applications
	ISO/ASTM AWI TR 52905	Additive manufacturing of metals — Non-destructive testing and evaluation — Defect detection in parts
	ISO/ASTM DTR 52906	Additive manufacturing — Non-destructive testing and evaluation — Intentionally seeding flaws in parts
	ISO/ASTM 52907:2019	Additive manufacturing — Feedstock materials — Methods to characterize metal powders
	ISO/ASTM CD 52908	Additive Manufacturing of Metals — Post-processing methods — Quality assurance and post processing of powder bed fusion metallic parts
	ISO/ASTM CD 52909	Additive manufacturing of metals — Finished part properties — Orientation and location dependence of mechanical properties for powder bed fusion
	ISO/ASTM 52910:2018	Additive manufacturing — Design — Requirements, guidelines and recommendations
ISO/TC 261 Additive manufacturing	ISO/ASTM CD 52910	Additive manufacturing — Design — Requirements, guidelines and recommendations
	ISO/ASTM 52911-1:2019	Additive manufacturing — Design — Part 1: Laser-based powder bed fusion of metals
	ISO/ASTM 52911-2:2019	Additive manufacturing — Design — Part 2: Laser-based powder bed fusion of polymers
	ISO/ASTM AWI 52911-3	Additive Manufacturing — Design — Part 3: Electron beam powder bed fusion of metals
	ISO/ASTM TR 52912:2020	Additive manufacturing — Design — Functionally graded additive manufacturing
	ISO/ASTM DTR 52913-1	Additive manufacturing — Feedstock materials — Part 1: Parameters for characterization of powder flow properties
	ISO/ASTM 52915:2020	Specification for additive manufacturing file format (AMF) Version 1.2
	ISO/ASTM DTR 52916	Additive Manufacturing for Medical — Data — Optimized medical image data
	ISO/ASTM DTR 52917	Additive manufacturing — Round Robin Testing — General Guidelines
	ISO/ASTM CD TR 52918	Additive manufacturing — Data formats — File format support, ecosystem and evolutions
	ISO/ASTM AWI 52919-1	Additive manufacturing — Qualification principles — Part 1: Mechanical properties of sand mold for metalcasting
	ISO/ASTM AWI 52919-2	Additive manufacturing — Qualification principles — Part 2: Physical properties of sand mold for metalcasting
	ISO/ASTM DIS 52920	Additive manufacturing — Qualification principles — Requirements for industrial additive manufacturing sites
	ISO/ASTM 52921:2013	Standard terminology for additive manufacturing — Coordinate systems and test methodologies
	ISO/ASTM DIS 52921	Additive manufacturing — General principles — Part positioning, coordinates and orientation
	ISO/ASTM DIS 52924	Additive manufacturing of polymers — Feedstock materials — Qualification of materials for laser-based powder bed fusion of parts
	ISO/ASTM DIS 52925	Additive manufacturing of polymers - Qualification principles - Classification of part properties
	ISO/ASTM CD 52926-1	Additive manufacturing of metals — Qualification principles — Part 1: General qualification of machine operators

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	ISO/ASTM CD 52926-2	Additive manufacturing of metals — Qualification principles — Part 2: Qualification of machine operators for PBF-LB
	ISO/ASTM CD 52926-3	Additive manufacturing of metals — Qualification principles — Part 3: Qualification of machine operators for PBF-EB
	ISO/ASTM CD 52926-4	Additive manufacturing of metals — Qualification principles — Part 4: Qualification of machine operators for DED-LB
	ISO/ASTM CD 52926-5	Additive manufacturing of metals — Qualification principles — Part 5: Qualification of machine operators for DED-Arc
	ISO/ASTM CD 52927	Additive manufacturing — General principles — Main characteristics and corresponding test methods
	ISO/ASTM CD 52928	Additive manufacturing — Feedstock materials — Powder life cycle management
	ISO/ASTM PRF TS 52930	Additive manufacturing — Qualification principles — Installation, operation and performance (IQ/OQ/PQ) of PBF-LB equipment
	ISO/ASTM CD 52931	Additive manufacturing — Environmental health and safety — Standard guideline for use of metallic materials
ISO/TC 261 Additive manufacturing	ISO/ASTM CD 52932	Additive manufacturing — Environmental health and safety — Standard test method for determination of particle emission rates from desktop 3D printers using material extrusion
	ISO/ASTM WD 52933	Additive manufacturing — Environment, health and safety — Consideration for the reduction of hazardous substances emitted during the operation of the non-industrial ME type 3D printer in workplaces, and corresponding test method
	ISO/ASTM CD 52935	Additive manufacturing of metals — Qualification principles — Qualification of coordinators for metallic parts production
	ISO/ASTM DIS 52936-1	Additive manufacturing of polymers — Powder bed fusion — Part 1: General principles and preparation of test specimens for PBF-LB
	ISO/ASTM AWI 52937	Additive Manufacturing of metals — Qualification principles — Qualification of designers
	ISO/ASTM AWI 52938-1	Additive manufacturing of metals — Environment, health and safety — Part 1: Safety requirements for PBF-LB machines
	ISO/ASTM 52941:2020	Additive manufacturing — System performance and reliability — Acceptance tests for laser metal powder-bed fusion machines for metallic materials for aerospace application
	ISO/ASTM 52942:2020	Additive manufacturing — Qualification principles — Qualifying machine operators of laser metal powder bed fusion machines and equipment used in aerospace applications
		ISO/ASTM 52950:2021 Additive manufacturing — General principles — Overview of data processing

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2.3.9 Standards about batteries

Table 13. Standards about batteries

Standards about batteries		
Issuing body	Code	Title
	IEC 61056-2:2012/COR1:2012 Edition 3.0	Corrigendum 1 - General purpose lead-acid batteries (valve-regulated types) - Part 2: Dimensions, terminals and marking
	IEC 61427-1:2013 Edition 1.0	Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid application
	IEC 61427-2:2015 Edition 1.0	Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 2: On-grid applications
	IEC 61429:1995 Edition 1.0	Marking of secondary cells and batteries with the international recycling symbol ISO 7000-1135
	IEC 61982:2012 Edition 1.0	Secondary batteries (except lithium) for the propulsion of electric road vehicles - Performance and endurance tests
	IEC 61982-4:2015 Edition 1.0	Secondary batteries (except lithium) for the propulsion of electric road vehicles - Part 4: Safety requirements of nickel-metal hydride cells and modules
	IEC 62485-1:2015 Edition 1.0	Safety requirements for secondary batteries and battery installations - Part 1: General safety information
	IEC 62485-2:2010 Edition 1.0	Safety requirements for secondary batteries and battery installations - Part 2: Stationary batteries
	IEC 62485-3:2014 Edition 2.0	Safety requirements for secondary batteries and battery installations - Part 3: Traction batteries
	IEC 62902:2019 Edition 1.0	Secondary cells and batteries - Marking symbols for identification of their chemistry
	IEC 62932-1:2020 Edition 1.0	Flow battery energy systems for stationary applications - Part 1: Terminology and general aspects
	IEC 62932-2-1:2020 Edition 1.0	Flow battery energy systems for stationary applications - Part 2-1: Performance general requirements and test methods
	IEC 62932-2-2:2020 Edition 1.0	Flow battery energy systems for stationary applications - Part 2-2: Safety requirements
	IEC 62984-1:2020 Edition 1.0	High-temperature secondary batteries - Part 1: General requirements
	IEC 62984-2:2020 Edition 1.0	High-temperature secondary batteries – Part 2: Safety requirements and tests
IEC TC 21 Secondary cells and batteries	IEC 62902 ED2	Secondary cells and batteries - Marking symbols for identification of their chemistry
	IEC 63330 ED1	Requirements for reuse of secondary batteries

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2.3.10 Standards about vehicles

Table 14. Standards about vehicles

Standards about vehicles		
Issuing body	Code	Title
ISO/TC 22/SC 37 Electrically propelled vehicles	ISO 6469-1:2019	Electrically propelled road vehicles — Safety specifications — Part 1: Rechargeable energy storage system (RESS)
	ISO 6469-2:2018	Electrically propelled road vehicles — Safety specifications — Part 2: Vehicle operational safety
	ISO 6469-3:2018	Electrically propelled road vehicles — Safety specifications — Part 3: Electrical safety
	ISO 6469-3:2018/AMD 1:2020	Electrically propelled road vehicles — Safety specifications — Part 3: Electrical safety — Amendment 1: Withstand voltage test for electric power sources
ISO/TC 22/SC 37 Electrically propelled vehicles	ISO 6469-4:2015	Electrically propelled road vehicles — Safety specifications — Part 4: Post crash electrical safety

2.3.11 Standards identified of different sectors

Table 15. Standards identified of different sectors

Standards identified of different sectors		
Issuing body	Code	Title
	BSI PAS 9017	Plastics Biodegradation of polyolefins in an open-air terrestrial environment
ISO/TC 190/SC 4 Biological characterization	EN ISO 11266:2020 ISO 11266:1994	Soil quality — Guidance on laboratory testing for biodegradation of organic chemicals in soil under aerobic conditions
CEN/TC 137 - Assessment of workplace exposure to chemical and biological agents	EN 17058:2018	Workplace exposure - Assessment of exposure by inhalation of nano-objects and their aggregates and agglomerates
ISO/TC 160/SC 1 Product considerations	ISO 18543:2017	Glass in building — Electrochromic glazings — Accelerated ageing test and requirements
	ISO/DIS 18543	Glass in building — Electrochromic glazings — Accelerated ageing test and requirements
ISO/TC 130 Graphic technology	ISO 12647-5:2015	Graphic technology — Process control for the manufacture of half-tone colour separations, proof and production prints — Part 5: Screen printing

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	ISO 12637-3:2009	Graphic technology — Vocabulary — Part 3: Printing terms
IEC/TC 40 Capacitors and resistors for electronic equipment	IEC 62391-1:2015	Fixed electric double-layer capacitors for use in electric and electronic equipment - Part 1: Generic specification
	IEC 62391-1:2015/COR1:2016	Corrigendum 1 - Fixed electric double-layer capacitors for use in electric and electronic equipment - Part 1: Generic specification
	IEC 62391-1:2015/COR2:2019	Corrigendum 2 - Fixed electric double-layer capacitors for use in electric and electronic equipment - Part 1: Generic specification
	IEC 62391-2:2006	Fixed electric double-layer capacitors for use in electronic equipment - Part 2: Sectional specfication - Electric double layer capacitors for power application
	IEC 62391-2-1:2006	Fixed electric double-layer capacitors for use in electronic equipment - Part 2-1: Blank detail specification - Electric double-layer capacitors for power application - Assessment level EZ
FINAT		FINAT technical handbook
CEN/TC 248 - Textiles and textile products	EN ISO 1973:1995 (WI=00248003)	Textile fibres - Determination of linear density - Gravimetric method and vibroscope method (ISO 1973:1995).
	prEN ISO 1973 (WI=00248709)	Textile fibres - Determination of linear density - Gravimetric method and vibroscope method (ISO/DIS 1973:2020)
	EN 14119:2003 (WI=00248214)	Testing of textiles - Evaluation of the action of microfungi
ISO/TC 38 Textiles	ISO 20645:2004 EN ISO 20645:2004	Textile fabrics — Determination of antibacterial activity — Agar diffusion plate test
ISO/TC 38/SC 23 Fibres and yarns	ISO 6989:1981	Textile fibres — Determination of length and length distribution of staple fibres (by measurement of single fibres)
TAPPI	TAPPI UM 213:2012	Repulpability of splicing tape, ,
KCL	KCL 301:19 and KCL 303:20	Repulpability of fibre based material,
	KCL 302:19	Repulpability and stickiness of repulpered fibre based material
SAE	SAE J2412	Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Xenon-Arc Apparatus
LP	LP-463-PB-31-01	Resistance to various fluids
Fiat	FIAT 902110	Resistance to various fluids
	FIAT 9.03109	Thermal cycles 72h (-40 ÷ 80 ° C and RH 95% at 40 ° C) Heat shock 2 h at 95 ° C Thermal stability 24 h at 80 ° C
Ziegler	Ziegler standard	Noise analysis for materials combination

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VDA	VDA 277	Non-metallic materials of vehicle interiors. Determination of the emission of organic compounds.
	VDA 278	Thermal Desorption Analysis of Organic Emissions for the Characterization of Non-Metallic Materials for Automobiles

3 Conclusion

The present deliverable concerning the standardization landscape and applicable standards has identified the standardization technical bodies and also the main standards relevant for the INN-PRESSME project.

INN-PRESSME will involve several tests and characterization of materials and products using different standards. Most of the standards for “traditional” properties are currently used and well known by the stakeholders. These “traditional” properties consist in mechanical properties, physical-chemical properties, etc. Therefore, the analysis of standards for “traditional” properties has foreseen the identification and elaboration of a full list of standards, which have been included in the previous subclauses.

Besides that, the added-value of the project is focused on standards and properties related to the circular economy, and therefore related to “environmental” properties. The standardization map is focused on these topics, identifying the most relevant standards and standards under development by different standardization bodies.

The deliverable has identified three main topics of interest: plastics, packaging and environment, selecting almost 30 technical bodies with relevant standards, from different standards developing organizations, namely CEN, CENELEC, ISO, IEC and ASTM. The technical bodies range from broad technical committees with hundreds of standards to very specific working groups, with just a few standards under their scope. Table 4 summarizes the findings for this and for each technical body includes a recommended action.

For each topic and each technical body, the most relevant standards have been identified and reported in Tables 5 to Table 15, with a general comment on them. Moreover, the most relevant standards for each work package have been identified.

With this first deliverable the landscape of the existing works is presented but also a first analysis of the tasks and subtasks for which standardization clan play a relevant role are included. INN-PRESSME partners will maintain a permanent dialogue with the standardization body in order to select and prepare possible contributions to standardization as part of the latest part of INN-PRESSME project.

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Annex: Questionnaire Contribution to standardization

ORGANIZATION:
1. Is your INN-PRESSME component/task affected by any European legislation (Directives, regulations...)?
2. Is your organisation participating in any European or international standardisation technical committee, working group related to INN-PRESSME project or related to the product/data model/service/standard used in INN-PRESSME project?
2.1 Based in your previous answer, please specify the technical committee, working group or similar your organisation is participating or is willing to participate or is already participating:
2.2 Please specify the reasons why you are participating or want to participate in a TC or working group or project team (several answers are possible): One could be the projects that are of your interest.
3. Within the framework of the INN-PRESSME project and (directly or indirectly) related to your component/tasks in the project, is your organisation using European or international standards? Which standards are used in relation to INN-PRESSME?
3.1 Please specify the reasons why you are using standards/documents related to your component/tasks (several answers are possible):
3.2 The use of these standards has promoted any modification to their existing version or adaptation to cover further functionalities/characteristics:
3.3 Are there any new standardized products/tests/services/customized solutions developed for INN-PRESSME that could promote to new standards?
4. Do you think some aspect (technical, performance, efficiency, reliability, interoperability or quality requirements) of your component/task not included in a standard/document should be standardised and to facilitate design, manufacturing, trade, safety, relation among stakeholders, etc.?
5. In order to market your component/deliverable in the future, a standard/document Europe-wide or world-wide may be useful?
6. Do you think any in future developed INN-PRESSME deliverable could be interesting for being applied Europe-wide or world-wide as guidance or recommendations?
7. An increasing number of standards based on patented technology are being successfully and widely developed. Nevertheless, to avoid patent rights problems that may arise when developing standards, CEN-CENELEC has developed a document to provide practical guidance on this subject. Do you know the IPR & Patents policies applied by CEN,CENELEC and ISO and IEC? (Link to CEN CENELEC IPR website: https://www.cencenelec.eu/ipr/Pages/default.aspx , Link to ISO IPR website: https://www.iso.org/iso-standards-and-patents.html) and IEC website https://www.iec.ch/members_experts/tools/patents/patent_policy.htm .
8. CEN and CENELEC Workshop agreements are usual contributions to standardization as a result of R&D projects. Do you find INN-PRESSME deliverables susceptible to be promoted to this kind of documents?
9. Please add here any other information regarding your task/deliverables and standardisation that you may deem relevant:

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