D2.1 – Technological, building and manufacturing context report

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Technical References

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[1] PU – Public, fully open, e.g. web (Deliverables flagged as public will be automatically published in CORDIS project's page)
SEN – Sensitive, limited under the conditions of the grant agreement
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Classified C-UE/EU-C – EU CONFIDENTIAL under the commission Decision No2015/444
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Document history

V	Date	Author (Beneficiary)	Description
V0.1	03/04/2023	3L	Table of Contents (ToC)
V0.2	10/04/2023	3L	Interview scheme first draft
V0.3	02/05/2023	3L	Transfer of interviews content into the report
V0.4	16/06/2023	3L	Final version
V0.5	29/06/2023	FOCCHI/R2M	Final review

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Executive Summary

Bio-based building materials are derived from renewable sources such as plants, trees, and agricultural waste, and they offer several environmental benefits compared to traditional construction materials. Bio-based building materials that are dealt with in BIO4EEB include:

Posidonia panels and fibres
Complex polyelectrolytes
PLA and bio-polyurethane
Bio-based windows
Pre-fabricated façade elements

When it comes to obtaining permissions related to bio-based building materials, it would depend on the specific regulations and building codes of the country or region you are in. It is important to consult local authorities, architects, or construction professionals to ensure compliance with the applicable regulations and obtain the necessary permissions for using bio-based building materials in construction projects.

In order to avoid any problems in the ongoing application process on demonstration sites and even applicable for future projects this deliverable is meant to assure the compliance with regulations at country, national and international level.

Requirements established by the national and international construction regulations of the different countries and those related to the application of biologically based materials will be analyzed in this deliverable. A standardized approach has been identified and developed to collect and balance needs to create a digital inventory and specific guidelines to ensure the application of bio-based materials and components.

Furthermore, the created inventory should close the gap in terms of lack of information for producers that are eager to exploit their innovative bio-based products internationally. Thanks to the wide-spread exploitation potential of the BIO4EEB consortium additionally to the European level, UK, USA and Latin America are covered at the same time.

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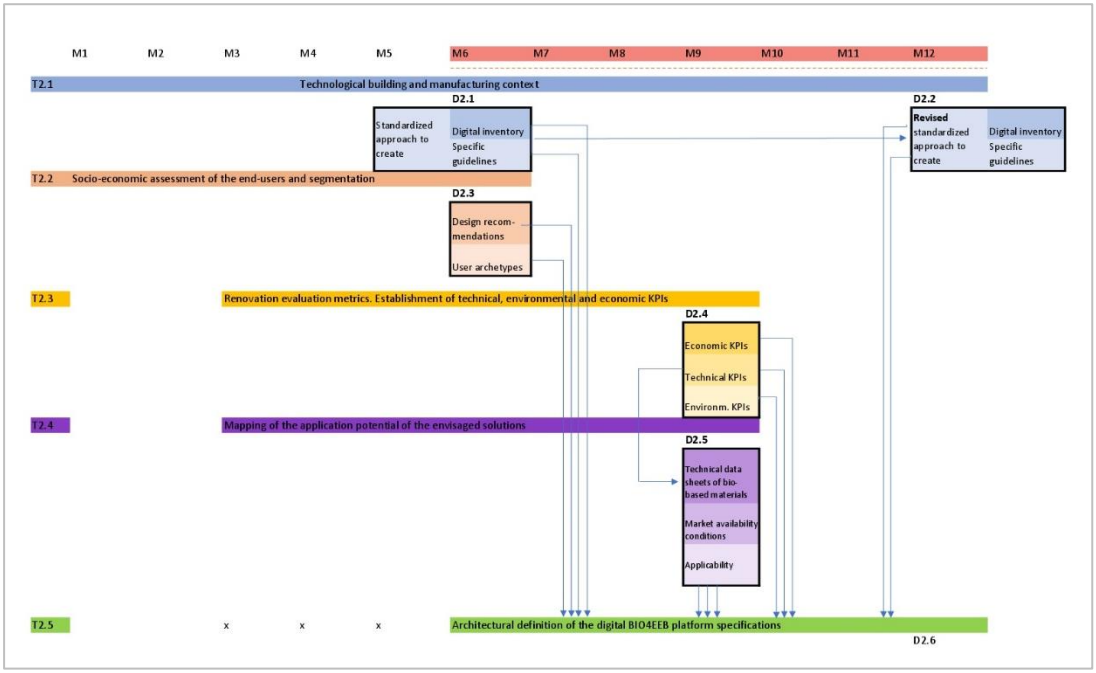

Figure 1: MS1 Masterplan of interaction

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Abbreviations and Acronyms

Abbreviation	Description
aBG	General construction technical permit
abZ	National technical approval
ATec	Avis Techniques
ATex	Appreciations Techniques d'Expérimentation
AVCP	Assessment and Verification of Constancy of Performance
BIM	Brussels Institute for Environment
BRE	Building Research Establishment
C2P	Commission Prévention Produits implemented
CE	Communauté Européenne
CPA	Construction Product Association
CPR	Construction Product Regulation
CSTB	Centre scientifique et technique du bâtiment
CTE	Technical Building Code
DIBt	Deutsches Institut für Bautechnik
DoP	Declaration of Permission
DTA	Document technique d'application
EAD	European Assessment Document
EOTA	European Organization for Technical Assessment
EIA	Environmental Impact Assessment
EPBD	Energy Performance of Buildings Directive
ETA	European Technical Assessment
ETAG	European Technical Approval Guidelines
FPS	Federal Public Service Health, Food Chain Safety and Environment
FSC	Forest Stewardship Council
GBC	Green Building Council
hEN	Harmonized European Standard
ITAB	Italian Technical Assessment Body
ITC-CNR	Institute for Construction Technologies of the National Council of Searches
LoD	Level of Detail
NF DTO	Unified Technical Documents
NTI	National Technical Assessment
OVAM	Public waste agency of Flanders

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PEFC	Program for the Endorsement of Forest Certification
ROI	Return OF Investment
SPSC	Certification Center of Building Products
STO	Stavební Technické Osvědčení
TZUS	Testing and certification organization in the Czech Republic
UNMZ	Czech Accreditation institute
USDA	US Department of Agriculture
USGBC	US Green Building Council

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BIO4EEB project overview

Buildings are responsible for approximately 40% of energy consumption and 36% of CO2 emissions in the EU. Deep Renovation of existing old buildings has the potential to lead to significant energy savings and a tremendous carbon footprint shrinkage. The current EU climate targets open an ample opportunity for exponential growth in the thermal insulation building materials market owing to the increasing number of new residential buildings and current deep renovation needs.

The target is to support residential buildings´ construction performance extraordinary at all three hierarchical levels of construction parts simultaneously (building, component, material) by creating an amplified environmental impact and reducing additionally VOC emissions. BIO4EEB will apply non-hazardous bio-based material as e.g., Posidonia and various bio-based foams to develop and to proof the marketability of smart components for external and internal use as material application, pre-fab panels or windows. The efficiency and effectiveness is quite important to match with market demands and establish a unique selling proposition including a seven years RoI!

BIO4EEB will close the increasing gap of insulation material shortage caused by the regular growing demand and the mismatch caused by lacking production potential and the outcome of the current energy crisis by boosting the use of available bio-based qualified materials as alternative solutions.

The objective is to substitute using fossil resources for components and replace them at a comparable price value positioning. New business models utilizing the complete economic value chain open the market for bio-based BIO4EEB solutions and products uplifting the generic bio-based material use and qualifying their application at a circular economy approach for creating a much greener EU building and construction industry real estate stock.

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1 Introduction

D2.1 -first version- is the first deliverable in BIO4EEB related to T2.1 Technological, building and manufacturing context.
Bio-based building material application and manufacturing of prefab components using these origin products have to match with all compliance demands of national building regulations and technical requirements as e.g., geo-cluster fitting configuration and specific law issues related to building permissions, technological warranties and other regulatory demands as e.g., prototype and serial admissions and national and international building codes. Therefore, the context for the application including certificated manufacturing has to be checked intensively at national and international level in order to avoid basic market entry mistakes or to oversee crucial technical gaps. The objective of this task is not just to sponsor the demonstration cases realisation by this approach but to identify and develop a standardised approach of collecting and balancing the needs to create a digital inventory and specific guidelines that assure the application of bio-based materials and components at almost any place. The international documentation of the material creation and the production process has to be analysed according to national law demands and transfer capabilities at European level and Latin America.

As a follow-up D2.2 -final version- collects additionally the parameters for classification in the context of deep renovation and new buildings and component application. They are for instance: thermal bridges, air leakages, imaging of U-Value distribution, acoustic leakages and vibration transmissibility. In the context of manufacturing the BIM based modeling needs for error-free plug and play prefab components (LoD, product data, component catalogue, timing of pre-fab process, multitude of examinations and testing, quality check, performance warranties) have to be checked and documented. Additional demands caused by a serial production and its certification for bio-based materials and components have to be highlighted and documented to represent the standard in order to encourage the smooth replication at the same time. A special focus is related to circular economy issues balancing the C2C potential at manufacturing level.

2 EU level perspective

The European Technical Assessment allows to market construction products throughout European Countries that are not or not fully covered by a harmonised standard.

The ETA is a product performance assessment that leads to CE marking. With it one can market a product in the entire European Economic Area, Switzerland and Turkey. In many cases, the ETA also opens doors worldwide.

An ETA request can be submitted for any construction product that is not covered or not fully covered by a harmonised standard. In contrast to a harmonised standard, the ETA can be tailored to the product. In addition, the ETA can include product characteristics that have not been addressed in an existing harmonised standard.

Compared to the national technical approval, the advantage of the ETA is in its wider geographical scope. However, with an ETA, comparison of the declared performance with the national requirements for construction works is always required. If one needs advice on

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which route to choose for products there are links available at EU driven platforms and national platforms as e.g. DIBt in Germany.

3 Permission process for bio-based building products and responsible institutions

The following sub-chapters collect as an inventory information on permission processes for bio-based building products at national level. The information is valuable to make sure that the bio-based products developed in BIO4EEB – especially considering that they obtain no ETA currently – can be used and mounted on demonstration sites in different countries. Furthermore, the created inventory should close the gap in terms of lack of information for producers that are eager to exploit their innovative bio-based products internationally. Thanks to the wide-spread exploitation potential of the BIO4EEB consortium additionally to the European level, UK, USA and Latin America areas are expected to be covered in this process.

3.1 Germany

Introduction

In Germany the permission for the application of all building products including bio-based building products follows the same standardized process steered by a national responsible institution called the Deutsches Institut für Bautechnik (DIBt).

Responsible Institution

The DIBt plays a pivotal role in the construction industry: with its approvals and assessments, it ensures the safety of construction works while fostering the development of innovative construction products and techniques. DIBt is a technical authority and a service provider for the construction sector at the same time. As a technical authority based in Berlin, DIBt fulfils numerous public tasks in the field of construction on behalf of the 16 federal states and the Federation. All these tasks are aimed at ensuring a safe, healthy and environmentally friendly built environment.

DIBt can rely on the technical expertise and experience of some 220 staff as well as over 570 external experts from research, the industry and public administration. Cooperation and dialogue with partners and experts – at a national, European and international level – are key to DIBt's work. DIBt is widely known in the industry as the German technical approval body and a leading European Assessment Body. Granting national technical approvals has been a core task of the Institute ever since its foundation in 1968. Over the decades, the range of technical verifications for construction products and techniques prepared by DIBt has widened, including in particular European Technical Assessments, construction technique permits and evaluations.

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Service and support

The DIBt website hosts an information portal for construction products and techniques in English including a search engine offering important information about German and European permission standards (see link and graphic below).

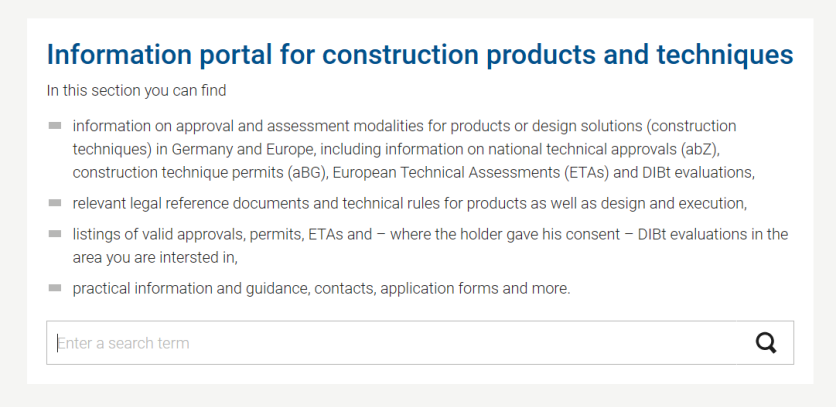

Figure 2: DIBt information portal

Link: European Technical Assessment (ETA) | DIBt - Deutsches Institut für Bautechnik

Standard permission processes

National technical approval (abZ)/ General construction technique permit (aBG)

When covered by an abZ/aBG, non-standard products and design solutions, e.g. innovations, can be used and applied Germany-wide in compliance with the Building Codes. If one wishes to apply for an abZ/aBG, DIBt, as the competent technical authority, is the one stop point of contact. The DIBt experts are used to guide applicants through the procedure.

The abZ
The national technical approval, or abZ for short, is the standard among the verifications of fitness for use of construction products. It has been granted by DIBt since 1968.
The abZ regulates those product properties that are of regulatory relevance as well as the product's fields(s) of use and aspects relating to processing, transport, storage, marking and confirmation of conformity.

The aBG
The Building Codes of the federal states seek to ensure the safety of the built environment. This may require regulating not only the product properties, but also the process of assembling construction products to form construction works or parts thereof ('construction technique'). The aBG regulates aspects relating to planning, design and execution as well as operation and maintenance.

In most cases, the abZ and the aBG are granted in a 'combined decision'. However, they can also be granted separately, where required. The formal distinction between product specifications (abZ) and design and execution specifications (aBG) has been introduced to facilitate the integration of CE-marked construction products into the national regime for

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ensuring the safety of the built environment. The reason is that the European regime only extends to product performance. It is thus possible to combine a suitable declaration of performance for the product, based on a European Technical Assessment (ETA) or a harmonised European standard (hEN), with an aBG or the Technical Building Rules to provide verification of the fulfilment of the national requirements for construction works.

To prepare an abZ/aBG or amend, supplement or renew an existing one, an application form is needed. The application forms are already prepared as a standard for this purpose. They include all needed information in this first step. All provided application forms are available at the DIBt web-site.

After the DIBt has received the application, a technical officer will review the documents and request any additional information that might be needed. The opportunity is foreseen to discuss any open technical or procedural questions with DIBt by WebEx, phone, email or – if preferred – in a face-to-face meeting.

Once all the necessary information has been received, DIBt will determine which tests and verifications are needed for the construction product or design solution, develop a tailor-made test plan and recommend competent test laboratories. Commission tests have to be negotiated directly with the accredited test lab and the test results should be forwarded to the DIBt. When all verifications are satisfying, DIBt can grant the abZ/aBG.

Duration of permission

An abZ/aBG is usually granted for a five-year period renewable upon application.

Processing time

The processing time depends on the complexity of the product and the scope of testing required. The application documents – especially for a first-time approval – should be submitted as early as possible. Applications for renewal should be handed in at least six months before the existing approval expires. Good coordination with DIBt, and especially the submission of all required documents, will ensure rapid processing.

Costs

The fee for the procedure depends on the individual construction product/technique. In accordance with the current DIBt Statutes, fees lie between 500 euros and 50,000 euros – considering the work load involved. Expenses for tests and third-party costs are not included. DIBt will inform the applicant in advance of the estimated fee for the project in the application confirmation. This estimate is based on the submitted documents and the hourly rate applicable at the time of application.

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Figure 3:DIBt video tutorial

Even tutorial videos in English explaining the process steps and details are available at the DIBt web page (link: https://youtu.be/HjmXybnwfhM).

3.2 Czech Republic

Introduction

In the Czech Republic the framework for approvals and testing of all building products is provided by the Czech Office for Standards, Metrology and Testing (UNMZ). The permission process for the bio-based building products is following the same standardised process as for any other building products, these products have to fulfil essential requirements of the related legislative acts.

Responsible Institution

The Testing Department of UNMZ is mainly responsible, for ensuring the state testing to the extent provided by the Act No. 22/1997 and No. 90/2016 Coll. on Technical Requirements for Products and on Amendments to Some Acts, as amended; and the governmental orders issued to implement this Act.
Czech Accreditation institute is responsible for accreditations of eligible institutions. The notified bodies are designated by UNMZ. For each group of construction products there are several institutions authorized to perform the testing, inspections, and certification. All the responsible institutions operate in a competent, non-discriminatory, transparent, neutral independent and impartial manner.

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Technický a zkušební ústav stavební (TZÚS) is the largest testing and certification organization in the Czech Republic, another important player on the market is the Institut pro testování a certifikaci, a.s. (ITC).

Service and support

UNMZ launched the information portal to facilitate the process of products placement on the internal market of the Czech and European economic area (see link and graphic below). Available in Czech and English versions.

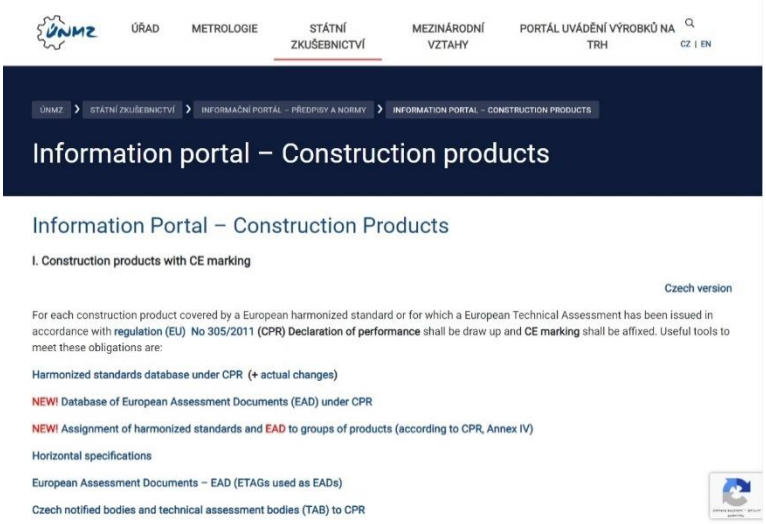

Figure 4: UNMZ information portal

Link: https://www.unmz.cz/statni-zkusebnictvi/informacni-portal-unmz/information-portal-construction-products/

Apart from the above-mentioned information portal, the testing and certification institutions offer in their Downloads section a detailed information for the clients on how to proceed with the application. Expert consultations service is also available.

Standard permission processes

During the conformity assessment process, several aspects are considered: Besides the characteristics of a product itself but especially its influence on fulfilling the basic requirements for the construction work in which it has to be installed are taken into account. It is important to find out whether the product is covered by a harmonized EU standard or where it belongs to the non-harmonized area.

In the “harmonized EU standards” area the Regulation (EU) No 305/2011 – Construction Products Regulation – CPR applies. This means that the harmonized technical specifications for the CPR are fully in line with the European standards and European Assessment Documents.

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According to the Annex IV of the CPR, the construction products are divided into several product areas. For products to which harmonized European standards do not exist but there is a European Assessment Document (EAD) available, the technical assessment body institution may be asked to issue an ETA.

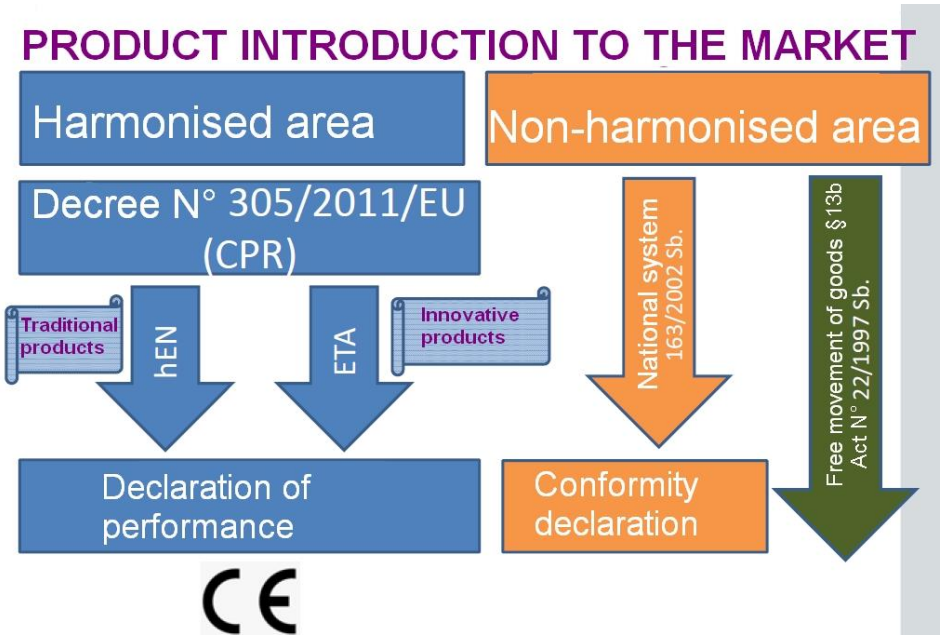

Figure 5: Market introduction scheme

During the conformity assessment process attention is put on the characteristics of a product itself but mainly its influence on fulfilling the basic requirements for the construction work in which it has to be installed are taken into account.

In the “harmonized EU standards” area the Regulation (EU) No 305/2011 – Construction Products Regulation – CPR applies which means that the harmonized technical specifications for the CPR are harmonized European standards and European Assessment Documents. According to the Annex IV of the CPR, the construction products are divided into several product areas. For products to which harmonized European standards do not exist but there is a European Assessment Document (EAD) available, the technical assessment institution may be asked to issue a European Technical Assessment – ETA. Several systems of assessment and verification of constancy of performance (AVCP) are applied, (system 1, 1+, 2+, 3, and 4). In the “harmonized EU standards” area, the manufacturer shall issue a "Prohlášení o vlastnostech" (Declaration of performance). For all construction products to which a harmonized European or Czech standard apply or for which an ETA has been issued, the CE marking is the only marking. It declares that the construction product is in conformity with performance stated in the “Declaration of performance” issued by the manufacturer in relation to essential performance parameters according to the harmonized European or Czech standard or the ETA. Affixing of the CE marking is then obligatory for all construction products for which the manufacturer has drawn up the “Declaration of performance”.

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In the non-harmonized area the regulation through specified technical standards and technical guides applies. Rules for conformity assessment procedures in the non-harmonized area are laid down in the Government decree 163/2002 Coll. By the end of the process "Prohlášení o shodě" (Conformity declaration) is issued. The important document is called STO (Stavební technické osvědčení) that is issued in case of missing Czech standard for the product.

The bio-based products covered within the BIO4EEB project are mainly thermal insulating products and window frames. The bio-based insulating products mostly fall within the non-harmonized area, and thus the conformity assessment procedure is regulated by the national legislation.

Duration of permission

The duration of certificates is not limited, however regular product testing and supervisions are required to be performed at least once a year in most cases. The duration of the STO is 3 years.

Processing time

The processing time depends on the quality of submitted files, the complexity of the product and the scope of testing required. The processing usually takes 2-3 months. Applications for renewal of STO should be handed in at least three months before the expiration date. Regular communication with the testing and certification organization during the process and quick response in case of demand for additional files and information will help to shorten the processing time.

Costs

The fee for the procedure depends on the necessary workload, number of specialists and the equipment used. The information about fees is not openly available. It can be obtained only through the request for quotation. The rough estimation that the costs are ranging from 500 EUR to 30 000 EUR.

3.3 Italy

Introduction

As the world shifts towards more sustainable and eco-friendly building practices, the demand for bio-based building products is on the rise. In Italy, there are several responsible institutions that regulate and oversee the permission process for the use of building products in construction projects and therefore also for bio-based materials. The process is very complex as it requires the intervention of different "actors".

Responsible Institutions

The main actor in the permission process for building product is the manufacturer who assumes the ultimate responsibility for ensuring that the product complies with the

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requirements of the European market. The other institutions that have a key role in the permission process are the following:

- Accredia is the only national accreditation body designated by the Italian Government to certify the competence and impartiality of the certification, inspection, verification and validation bodies, and of the test and calibration laboratories. Accredia is a recognized non-profit association with 587 experts under the supervision of the Ministry for Companies and Made in Italy.

- The Ministry of the Interior has jurisdiction oven public order in its capacity a the highest national public safety authority.

- The Ministry for the Economic Development deals with the organization and management of the functions of the State in the field of industry, crafts, energy and commerce. The main sectors of interest refer to the secondary sector and can be grouped into three thematic areas: development of the production system, foreign trade and internationalization of the economic system, communication and information technologies. The Ministry avails itself of the territorial offices of the government and based on a specific agreement, of the offices of the chambers of commerce, industry, handcrafts and agriculture, of the regions and local authorities.

- The Superior Council of Public Works carries out consultancy activities for the Government for the supervision of public works, for questions of a technical nature and for any other matter for which the Government deems it necessary to request the opinion of the Superior Council.

- The Italian Technical Assessment Body (ITAB/ ITC-CNR) established on 28 June 2016 between the Central Technical Service of the Superior Council of Public Works and the Institute for Construction Technologies of the National Council of Research (CNR). It has the role of qualifying and certifying innovative or complex construction products, thus becoming a point of reference for the investigation and issue of the European Certification. The supervision of the Central Technical Service guarantees a continuous and highly professional service to companies aiming at technological and commercial competitiveness.

Permission Process

The starting point to understand the Italian permission process for building products is the European Regulation UE 305/2011. In Italy the Legislative Decree 106/2017 regulates the adaptation of Italian legislation to the European Regulation 305/2011, which sets harmonized conditions for the marketing of construction products. Published on July 10, 2017, it came into force on the following August 9, same year.
When a building product is compliant with a harmonized standard (EN) or it is compliant with a European Technical Assessment (ETA) issued for that same product, the manufacturer draws up a declaration of performance (DoP) and affixes the CE marking:

- The DoP contains the performances "guaranteed" by the manufacturer for the material/product/construction system, to which the designer, project manager and inspector can/must refer.
- The CE marking ensures that the DoP is done according to EU rules.

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The manufacturer guarantees also that procedures are developed to ensure that series production maintains the declared performance. This process is based on evaluations and verifications of the constancy of performance carried out according to what is set by the European Regulation 305/2011. The regulation defines the Assessment and Verification of Constancy of Performance (AVCP). The AVCP is a harmonised framework containing the rules on how to assess products and control the constancy of the assessment results. This system safeguards the reliability and accuracy of the DOP. According to the European regulation 305/2011 five different systems are in place for construction products.

Table 1: Overview AVCP Systems

AVCP System	Task for manufacturer	Task for notified body
1+	Factory production control. Further testing of samples taken at the factory in accordance with the prescribed test plan.	Certificate of constancy of performance of the product on the basis of: -Determination of the product-type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product. Initial inspection of the manufacturing plant and of factory production control. -Continuous surveillance, assessment and evaluation of factory production control. -Audit-testing of samples taken before placing the product on the market.
1	Factory production control. Further testing of samples taken at the factory by the manufacturer in accordance with the prescribed test plan.	Certificate of constancy of performance of the product on the basis of: -Determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product. -Initial inspection of the manufacturing plant and of factory production control. -Continuous surveillance, assessment and evaluation of factory production control.
2+	Determination of the product-type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product. Factory production control. Testing of samples taken at the factory in accordance with the prescribed test plan.	Certificate of conformity of the factory production control on the basis of: -Initial inspection of the manufacturing plant and of factory production control. -Continuous surveillance, assessment and evaluation of factory production control.
3	Factory production control	Determination of the product-type on the basis of type testing (based on sampling carried out by the manufacturer), type calculation, tabulated values or descriptive documentation of the product.
4	Determination of the product-type based on type testing, type calculation, tabulated values or descriptive documentation of the product. Factory production control.	N/A

The European Commission establishes which systems are applicable for a construction product, a family of construction products, an essential characteristic.
In the case of Assessment and Verification of Constancy of Performance (AVCP) 1+, 1, 2+ and 3 systems, the declaration of performance is based on certificates or test reports issued by notified bodies which have received accreditation from Accredia.
Accredia signed a Convention together with the Ministry of the Interior, the Minist of Economy and Superior Council of Public Works to define the authorization and notification procedures of conformity assessment bodies pursuant to EU Regulation 305/2011.
Accredia has the role of verifying and certifying that certification bodies, test and calibration laboratories have the competence to assess the conformity of products, processes and systems to the reference standards.
If a harmonized European standard exists, the product must have the CE marking.

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If there is no harmonized European standard for the specific product, a specific qualification procedure must be followed (e.g. the Steel Qualification Certificate for steel base elements non-covered by a harmonized standard).
Innovative materials and products without a harmonized standard or a specific permission procedure can obtain the CE Marking in compliance with ETA, or, alternatively, have to get a Certificate of Technical Suitability for use which is issued by the Central Technical Service of the Superior Council of Public Works.

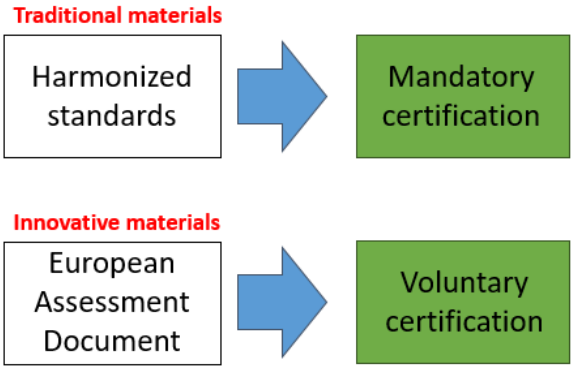

Figure 6: certification scheme traditional/innovative materials

As seen in the previous paragraphs, the ETA was introduced by the EU regulation no. 305/2011 and it is gradually replacing European Technical Approvals which can be used by manufacturers as ETAs to draft the DoP and get CE marking of compliant products.

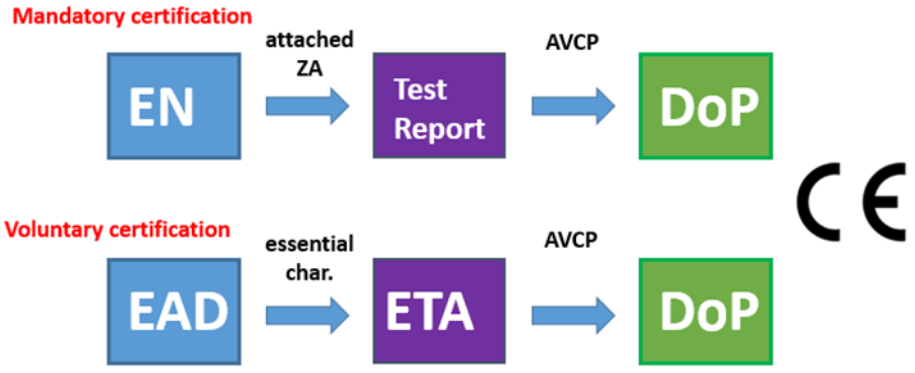

Figure 7: CE certification scheme

The ETA is issued by a technical assessment body, upon the request of a manufacturer, based on the European assessment document prepared in advance. If this European assessment document exists, the technical assessment body uses it as a benchmark to issue the ETA. If missing, first this authorized technical assessment document has to be prepared in coordination with the other authorized technical assessment bodies. This document is drafted and adopted by the EOTA – the European Organisation for Technical Assessment.
Each EU Member State identifies a technical assessment body as its representative for the specification and technical evaluation of construction products.

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In Italy the Technical Assessment Body is ITAB (https://italiantab.it/).
Applying for a European Technical Assessment is a voluntary procedure, required to draft a DoP and to obtain CE marking on a product not covered or not completely covered by a harmonized European standard. The European Technical Approval Guidelines (ETAG) and the European Assessment Documents (EAD) are available on the EOTA website (European Organisation for Technical Assessment - https://www.eota.eu/apply-eta).

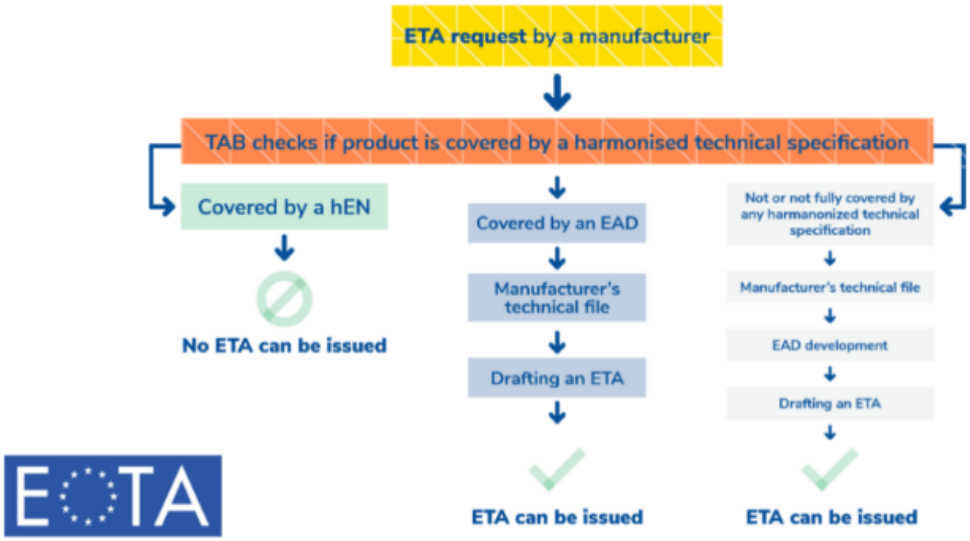

Figure 8: ETA process scheme

Duration of permission

Mandatory certifications do not expire but annual checks are foreseen.
Voluntary certifications have to be renewed after a variable time depending on the product or when a harmonized European standard could be applied.

Processing time

The processing time depends on the complexity of the product and the scope of testing required. The application documents – especially for a first-time approval – should be submitted as early as possible. Applications for renewal should be handed in at least six months before the existing approval expires. Good coordination with ITAB, and especially the submission of all required documents, ensure rapid processing.

Costs

The costs for the procedure depend on the type of product and the type of certificates it requires. In accordance with the current ITC-CNR (that is the body that constitutes ITAB) rate table, costs range from 1000 – 10000 euros plus annual costs when foreseen. Costs for staff travel are to be added (0,50 euros per Km). Expenses for tests and third-party costs are not included. Given the variability of the costs of the process, the table rate is attached (Annex A)

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in which also the test costs are reported. Specific evaluation could be done based on the peculiarity of the product.

3.4 UK

Introduction

In the UK, there is a growing requirement for the use of bio-based products, especially in the construction sector. The regulatory landscape supports the adoption of these products, and their application provides benefit both for the environment and the construction industry.

Responsible Institution

The Institution for the normative and regulatory frameworks for bio-based materials characterization and adoption in the construction sector in the UK are:

- The UK Government is responsible for establishing regulations and policies related to sustainable construction and bio-based materials. The Building Regulations in the UK set out minimum standards for the design, construction, and performance of buildings, including the use of materials. While the Building Regulations do not specifically focus on bio-based materials, they provide a framework for assessing the overall performance and safety of construction materials, including their impact on energy efficiency and environmental sustainability.
- The Building Research Establishment (BRE) conducts research, provides certifications (like BREEAM- BREEAM – which encourages the use of bio-based materials by awarding credits for their incorporation), and develops assessment methods for sustainable construction, including bio-based materials.
- The Construction Products Association (CPA) represents construction product manufacturers and suppliers, advocating for their interests and influencing relevant policies and regulations.
- The Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) promote responsible forestry practices and provide certifications for sustainable sourcing of wood and timber products used in construction.

In UK, the government policy regarding bio-based materials is currently more active in the food industries sector than the construction one. Indeed, norms and requirements has been established for the plastic materials in contact with food (‘Uk-bioplastic-policy-paper-Feb-2022-final-1.pdf’).

Service and support

- *UK Government* establishes regulations and policies to promote sustainable construction practices and the use of bio-based materials, conducts research, and provides guidance on sustainable construction and environmental standards,

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collaborates with industry stakeholders and provides incentives or funding programs to support the adoption of bio-based materials.
- *Building Research Establishment (BRE)* (*BRE Group - World leaders in built environment research and development*, no date) - conducts research and development on sustainable construction practices, including the use of bio-based materials, developed assessment methods and certification schemes such as BREEAM to evaluate and promote sustainability in buildings, offers training, consultancy, and technical support to industry professionals regarding sustainable construction practices and materials.

Standard permission processes

Despite of UK has not a defined regimentation for the bio-based materials application, below the processes for the permission is listed:

- Building Regulations Compliance: Bio-based products must meet relevant building regulations and codes, ensuring they meet performance criteria such as fire safety, structural integrity, and energy efficiency.
- Certification and Testing: Some bio-based products may require third-party certification or testing to demonstrate compliance with standards and performance requirements.
- Material Approvals: Certain bio-based materials may need specific approvals or assessments from regulatory bodies to ensure their safety and suitability, especially if they have unique properties or are used as structural elements.
- Environmental Considerations: Bio-based products often need to undergo environmental assessments, considering factors like carbon footprint, renewable sourcing, biodegradability, and life cycle assessments.
- Documentation and Declaration: Providing appropriate documentation, such as technical data sheets, test reports, certification documents, and declarations of conformity, is necessary to demonstrate the properties and compliance of bio-based products.

Duration of permission

The specific timeframe may depend on the complexity of the project, the type of bio-based product being used, the regulatory requirements involved, and the efficiency of the review and approval processes. Generic considerations are building Regulations Compliance (i), certification and testing (ii), material approvals (iii), environmental considerations (iv).

Processing time

No specific processing time has been found.

Costs

No specific cost has been found.

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3.5 USA

Introduction

In the United States, the use of these materials is guided by various permissions and regulations that aim to ensure their safety, efficacy, and compliance with established standards. These regulations are enforced by government agencies and organizations to promote the responsible adoption of bio-based products in construction, fostering a more sustainable and environmentally friendly built environment.

Responsible Institution

The responsible institutions for overseeing the permissions and regulations related to the application of bio-based products in the construction sector in the United States include:

1. The U.S. Department of Agriculture (USDA) (*BioPreferred*, 2023): the USDA is a federal agency responsible for developing and executing federal laws related to agriculture, forestry, and food. The USDA offers several programs and initiatives that promote the use of bio-based materials in construction, including the Bio Preferred program. USDA BioPreferred Program: The BioPreferred Program, overseen by the United States Department of Agriculture (USDA), encourages the use and purchase of bio-based products. The program does not establish specific regulations, it provides voluntary certification and labeling initiatives for bio-based products.
2. Other institutions involved in the bio-based products applications in building sector are:
    - The *ASTM International* develops and delivery of voluntary consensus standards for a wide range of materials, products, systems, and services. ASTM has developed several standards related to bio-based materials characterization and testing, such as ASTM D6866 (*Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis*, no date), which outlines a test method for determining the biogenic carbon content of solid, liquid, and gaseous samples using radiocarbon analysis.
    - *The United States Green Building Council (USGBC):* The USGBC is a nonprofit organization that promotes sustainable building practices and green building certification programs, such as the Leadership in Energy and Environmental Design (LEED) certification.

Service and support

The United States Department of Agriculture (USDA) encourages the purchase and use of bio-based products by federal agencies and their contractors providing a a voluntary labelling initiative (*The BioPreferred Program)*. To date, USDA has identified minimum biobased content standards for 139 categories of biobased products. Many qualified and certified biobased products are listed in the BioPreferred Program Catalog (*BioPreferred|Product Categories*). This service allows manufacturers to have their products certified and labelled as bio-based, helping consumers easily identify and choose these products. In addition, the USDA offers information and resources on bio-based products, including technical assistance, research

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findings, and market analysis. They promote the development and use of bio-based materials through education, outreach, and collaboration with industry stakeholders.

Standard permission processes

Manufacturers must submit their products for testing and verification of their bio-based content. This process ensures that the products meet the established criteria for bio-based content and can be labelled accordingly. According to the the BioPreferred Program it is possible to ask for assistance in the development and expansion of markets for bio-based products. The program was created by the 2002 Farm Bill (legislation) and expanded as part of the 2014 Farm Bill. This document provides more information about bio-based content and how it is determined. Products participating in the voluntary labelling initiative have their bio-based content measured using ASTM D6866 as part of the certification process. The USDA Certified Bio-based Label could be obtained if the product has at least 25% bio-based content as measured through the ASTM D6866 standardized method.

Duration of permission

The process of obtaining certification and labelling through the USDA's BioPreferred Program typically involves submitting product information, testing data, and documentation. The duration can vary based on the completeness of the submitted information and the workload of the certifying body. It is advisable to allow for several weeks to a few months for the certification process.

Processing time

The iter to obtain the certification is application Submission (i) the application with information about the product, its bio-based content, and supporting documentation, Review and Evaluation (ii) the application to ensure compliance with program requirements, testing and verification (iii) of the product are sent to accredited testing laboratories to verify its bio-based content and other relevant characteristics. Certification Decision (iv) is made by the program administrators.

Costs

Product testing is completed using ASTM D6866, which costs approximately $400 USD per sample, plus shipping costs.

3.6 Spain

Introduction

In Spain, the application of all building products, including bio-based building products, must follow what is described in the Technical Building Code (CTE), established by the General Directorate of Urban Agenda and Architecture of the Ministry of Transport, Mobility and Urban Agenda of the Spanish Government.

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The CTE is the regulatory framework that establishes the basic quality requirements that buildings must meet in relation to the basic safety and habitability requirements [1][1].

Responsible Institution

The General Directorate of the Urban Agenda and Architecture[2] plays a fundamental role in the construction industry and assumes the planning, promotion, management, and coordination of competencies in matters with an impact on housing, architecture, building, urban policies, and ground. With its approvals and assessments, it ensures the safety of construction works while fostering the development of innovative construction products and techniques to ensure a safe, healthy, and environmentally friendly built environment.

Service and support

The CTE website hosts an information portal on requirements for construction products and techniques in Spanish, including a search engine offering important information about Spanish permission standards (see link and graphic below).

Figure 9: CTE website

Link: https://www.codigotecnico.org/

Compliance with the CTE of products, equipment, and materials

Article 5.2 of PART I of the CTE[3] defines that:

1. Construction products that are permanently incorporated into buildings, depending on their intended use, will bear the CE marking, in accordance with Directive 89/106/EEC on construction products, transposed by Royal Decree 1630/ 1992 of December 29, modified by Royal Decree 1329/1995 of July 28, and development provisions, or other European Directives that apply to them.
2. In certain cases, and to ensure its sufficiency, the Basic Documents (DB) establish the technical characteristics of products, equipment and systems that are incorporated into buildings, without prejudice to the CE Marking that is applicable to them in accordance with the corresponding European Directives.
3. The marks, seals, certifications of conformity or other voluntary quality marks that facilitate compliance with the basic requirements of the CTE, may be recognized by the competent Public Administrations.
4. In accordance with the provisions of the previous section, the certifications of the final performance of the products, equipment, or systems, or of the finished buildings, the quality management certifications of the agents involved in construction, the environmental certifications that consider the analysis of the life cycle of the products, other environmental evaluations of buildings and other certifications that facilitate compliance with the CTE may also be recognised.

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5. Innovative products, equipment and systems that demonstrate compliance with the basic requirements of the CTE referring to the construction elements in which they are involved will be considered compliant with the CTE, through a favourable technical evaluation of their suitability for the intended use, granted, upon the entry into force of the CTE, by the entities authorized to do so by the competent Public Administrations.
6. The recognition by the competent Public Administrations established in sections 5.2.3, 5.2.4 and 5.2.5 will refer to the marks, seals, certifications of conformity or other voluntary quality marks, as well as the certifications of the final performance of the products, equipment or systems, or of the finished buildings, the quality management certifications of the agents involved in the building, the environmental certifications as well as the authorizations of the entities that grant technical evaluations of the suitability, legally granted in the Member States of the Union and in the signatory States of the Agreement on the European Economic Area.

Within the framework of the BIO4EEB project, in which different bio-insulating solutions are going to be developed to improve the energy performance of buildings including providing them with fire-retardant properties, special attention must be paid to the requirements established in the different DB of the CTE on fire safety[4], energy saving[5] and noise protection[6].
The application of the procedures of these DB are carried out in accordance with the conditions that are established therein and with the general conditions for compliance with the CTE, the project conditions, the conditions in the execution of the works and the conditions of the building that appear in articles 5, 6, 7 and 8, respectively, of Part I of the CTE[3].
All these conditions must be included in the technical report of the rehabilitation project and endorsed by the corresponding competent professional association, where all the necessary sections of the CTE to be justified according to the law and emphasis is placed on the comparative justification of the new materials with the traditional ones.

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3.7 Belgium

Introduction

In Belgium, there are several national regulations that govern the use of construction materials in buildings. Some of the key regulations include:

1. Building Code: The Building Code (Code de la Construction) is the main regulation governing the construction and use of buildings in Belgium. It sets out requirements for safety, health, and usability of buildings, including provisions on fire safety, ventilation, insulation, and more.

2. Environmental Regulations: There are several regulations related to environmental protection that impact the use of construction materials in Belgium. These include regulations on the use of hazardous substances, such as asbestos, lead, and PCBs, and regulations on the disposal of waste materials.

3. Product Certification: The European Union's Construction Products Regulation (CPR) applies in Belgium, which requires manufacturers of construction products to obtain a CE marking indicating that the product meets certain performance standards. In addition, there are other product certification schemes in Belgium, such as the Belgian Technical Approval (ATG) and the Benor label.

4. Energy Performance Regulations: In order to promote energy efficiency and reduce greenhouse gas emissions, there are several regulations related to the energy performance of buildings in Belgium. These regulations set out requirements for the insulation and energy efficiency of building materials and systems.

5. Professional Standards: There are several professional associations in Belgium that set standards for the use of construction materials in different sectors.

It is important to note that regulations may vary depending on the specific type of building and its intended use, and that compliance with regulations is typically the responsibility of the builder or developer.
In Belgium, there are several entities responsible for construction materials regulations, depending on the specific area of regulation.

Responsible Institution

The Federal Public Service Interior is responsible for the Building Code, which sets out requirements for the safety, health, and usability of buildings in Belgium. The Building Code is enforced by local authorities, such as municipalities.

Of this the FPS Health, Food Chain Safety and Environment takes (partly) care of the 4 aspects, particularly:

- Hygiene, health and environment
- Protection against noise nuisance
- Energy saving and retention of heat

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- Sustainable usage of natural resources

(https://www.health.belgium.be/en/environment-and-health-aspects-construction-products-regulation)

In addition, there are several industry organizations and professional associations involved in the development and implementation of construction materials regulations in Belgium, such as the Belgian Building Research Institute (BBRI) and the Royal Association of Belgian Architects (ARB). These organizations provide guidance on best practices in the construction industry and set standards for the use of construction materials in different sectors.

Finally, the regional governments in Belgium also have some responsibility for construction materials regulations, particularly in relation to environmental and energy performance regulations.

New building permission in Belgium:

In Belgium, obtaining permission for a new building typically involves several steps, including:
Initial Consultation: the first step is to consult with the local authorities to determine if the proposed building complies with the local zoning and land-use regulations. This is typically done through a pre-application meeting or consultation with the relevant department of the municipality or city where the building will be located.
Building Design and Plans: once it has been determined that the proposed building complies with local regulations, detailed plans and designs for the building must be prepared by a qualified architect or engineer. These plans must meet the requirements of the Building Code and other relevant regulations, such as those related to energy performance and environmental protection.
Permit Application: once done with the building design and related plans the following step is to submit a permit application to the local authorities, including all necessary documents and plans, such as architectural drawings, a description of the proposed building materials, and proof of compliance with relevant regulations. The permit application must be submitted to the municipality or city where the building will be located.
Review and Approval: local authorities will review the permit application and plans to ensure compliance with all relevant regulations and zoning requirements. This process typically involves consultations with various departments and agencies, such as the fire department, environmental agency, and public works department. The review process can take several weeks to several months, depending on the complexity of the project and the workload of the local authorities.
Construction: once the permit has been approved and issued, construction of the new building can begin. It is important to note that the construction must be carried out in accordance with the approved plans and permit, and that the local authorities may conduct inspections during the construction process to ensure compliance.

It is important to consult with the local authorities and a qualified architect or engineer early in the planning process to ensure that the proposed building complies with all relevant regulations and requirements, and to avoid any potential delays or issues during the permit application process.

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Service and support of FPS

The FPS' activities concerning construction products
The Federal Public Service Health, Food Chain Safety and Environment wants to stimulate sustainable production and consumption and therefore, lays down conditions for bringing products onto the market. These conditions have been laid down in the Law Product Standards (Law of December 21st, 1998 concerning the product standards for the advancement of sustainable production and consumption patterns and for the protection of the environment).

(https://www.health.belgium.be/de/publication-subjects/environment?page=156)

The 3 remaining aspects, for which the FPS Economy carries the responsibility, are the "mechanical resistance and stability", the "fire safety" and the "safety and accessibility when in use".
(https://www.health.belgium.be/en/environment-and-health-aspects-construction-products-regulation)

https://economie.fgov.be/en/themes/enterprises/specific-sectors/construction-products/trading-construction-products

Another regulation applicable on construction products is the regulation concerning fire prevention which is applicable to certain type of constructions (not applicable to small buildings or family houses).
This legislation can be found under this link: https://www.securitecivile.be/fr/arrete-royal-du-7-juillet-1994-fixant-les-normes-de-base-en-matiere-de-prevention-contre-lincendie

The requirements for the insulation materials after implementation of the Energy Performance of Buildings Directive (EPBD) in Belgium are as follows:

In Belgium, the requirements for insulation materials are set out in the Energy Performance of Buildings Directive (EPBD) and the associated regulations, as well as the regional building codes and standards.
The EPBD requires member states to establish minimum energy performance requirements for new and existing buildings, with the aim of reducing energy consumption and greenhouse gas emissions. In Belgium, these requirements are implemented at the regional level, with each region (Flanders, Wallonia, and Brussels-Capital) having its own building code and energy performance requirements.

The minimum thermal resistance (R-value) requirements for insulation materials in Belgium vary depending on the type of building element, such as walls, roofs, and floors, and on the climate zone in which the building is located. For example, the minimum R-value for walls in new residential buildings in Flanders is 3.5 m²K/W, while in Wallonia it is 3.0 m²K/W. The minimum R-value for roofs and floors also varies depending on the building type and use.
In addition to the R-value requirements, there are also requirements for the thermal conductivity (lambda value) of insulation materials, as well as fire resistance and environmental impact. The Belgian Building Research Institute (BBRI) provides guidance on the technical specifications for insulation materials and other building products.

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It is important to ensure that the insulation materials used in a building project in Belgium comply with all applicable regulations and standards, and that they are appropriate for the specific project requirements and goals. It is recommended to consult with building professionals, such as architects and engineers, to ensure that the insulation materials meet all relevant requirements and standards.

In Belgium, there is also Energy Performance of Buildings (EPB) regulation concerning the Energy performance of buildings.
This legislation on the EPB has been regionalized in Belgium.

Additional information can be found at the regions:

- French region: http://energie.wallonie.be/fr/appliquer-la-reglementation-wallonne-peb.html?IDC=6148
- Flemish region: https://www.vlaanderen.be/epb-pedia/epb-beleid/energieprestatieregelgeving
- Brussels region: https://environnement.brussels/thematiques/batiment/la-performance-energetique-des-batiments-peb/construction-et-renovation

The Flemish region:

In Belgium, regulations on building energy performance are set at the regional level. However, the three regions cooperate to establish a common methodology for new and refurbished buildings, leaving each region free to define its own requirements. Also, the three regions use a jointly developed single software tool. The Flemish Energy Agency is the public organization responsible for the energy performance requirements in the Flemish Region.

Table 2: Overview of the maximum U-values for new buildings since 2006

	Maximum U-value (in W/m².K)					
	from 2006 to 31 Dec 2009	**from 2010 to 31 Dec 2011**	**from 2012 to 31 Dec 2013**	**from 2014 to 31 Dec 2014**	**from 2015 to 31 Dec 2015**	**from 2016**
Roofs, ceilings to attics	0.40	0.30	0.27	0.24	0.24	0.24
Outer walls	0.60	0.40	0.32	0.24	0.24	0.24
Floors on the ground, or above cellars	0.40	0.40	0.35	0.30	0.30	0.24
Windows (profile + glazing)	2.50	2.50	2.20	1.80	1.80	1.50
Glazing	1.60	1.60	1.30	1.10	1.10	1.10

In 2015, maximal U-values were added for the insulation of existing walls. These requirements are applicable if the building owner chooses to insulate (in case of a renovation with permit) but do not include any obligations to insulate existing walls.

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Table 3: Overview of maximum U-values for renovations since 2006

Maximum U-value (in W/m².K)						
	from 2006 to 31 Dec 2009	from 2010 to 31 Dec 2011	from 2012 to 31 Dec 2013	from 2014 to 31 Dec 2014	from 2015 to 31 Dec 2015	from 2016
Roofs, ceilings to attics	0.40	0.30	0.27	0.24	0.24	0.24
Outer walls	0.60	0.40	0.32	0.24	0.24	0.24
Floors on the ground, or above cellars	0.40	0.40	0.35	0.30	0.30	0.24
Windows (profile + glazing)	2.50	2.50	2.20	1.80	1.80	1.50
Glazing	1.60	1.60	1.30	1.10	1.10	1.10
Insulated existing walls (outside)	-	-	-	-	0.24	0.24
Insulated existing walls (cavity)	-	-	-	-	0.55	0.55
Insulated existing roofs	-	-	-	-	0.24	0.24
Insulated existing floors in contact with outdoor environment	-	-	-	-	0.30	0.24

Reference: [Implementation of the EPB Belgium – Flemish Region Status in 2020 AUTHORS Marijke De Meulenaer, Kristien Triest, Roel Vermeiren, Lore Stevens, Flemish Energy AgencyBruno Moens, Philippe De Vriendt, Ann Hulsman]

Additional requirements regarding the Renovation obligation for new owners in the Flemish region of Belgium can be found in the link below, where insulation criteria are described.

https://www.vlaanderen.be/bouwen-wonen-en-energie/bouwen-en-verbouwen/renovatieverplichting-voor-nieuwe-eigenaars

Brussels Capital, Belgium:

In the Brussels-Capital Region, the EPBD is under the authority of the Minister of the Government of the Brussels-Capital Region, responsible for Climate Change, Environment, Energy and Participatory Democracy.

Requirements for building components for new buildings Requirements for building components are the same for new buildings as for renovations. Walls, windows and other parts of the building envelope must meet U_max/R_min requirements, which are listed in the table below.

However, in order to meet the envelope global performance requirements, the maximum mean U-value for the opaque wall is around 0.12 W/m².K and the maximum mean U-value for windows is around 1 W/m².K. Moreover, a good sealing of the building is also required to achieve envelope performance requirements with an airtightness around 1.5 m³/h.m². This is not an obligation but is a consequence of the net heating demand requirement for new residential units.

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Progress and current status of existing buildings (regulation overall performance) All types of building units (residential, commercial and public buildings) undergoing renovations are required to obtain a building permit and have to comply with the same U-value requirement level as a new building unit. They also need to comply with a minimum requirement of ventilation rate. In addition, a building undergoing renovation of more than 75% of its surface is subject to the requirements of primary energy consumption (PEC) (considered as new units7).

Regulation on individual parts, distinct from whole building performance the walls, windows and other parts of the building envelope must meet the following U_max/R_min requirements:

Table 4: U_max/R_min requirements

Construction part	U_{max} (W/m²K)
1. **WALLS DEFINING THE PROTECTED VOLUME, with the exception of the walls forming the separation with an adjacent protected volume.**	
1.1. TRANSPARENT / TRANSLUCENT WALLS, except garage doors and doors (see 1.3), curtain walls (see 1.4) and glass bricks (see 1.5)	$U_{W,max}$ = 1.8 *(1)* $U_{g,max}$ = 1.1 *(2)*
1.2. OPAQUE WALLS, except doors and garage doors (see 1.3) and curtain walls (see 1.4)	
1.2.1. Roofs and ceilings	U_{max} = 0.24
1.2.2. Walls not in contact with the ground, with the exception of the walls referred to in 1.2.4.	U_{max} = 0.24
1.2.3. Walls in contact with the ground	R_{min} = 1.5 *(3)*
1.2.4. Vertical and sloping walls in contact with a crawl space or with a cellar outside the protected volume	R_{min} = 1.4
1.2.5. Floors in contact with the outside environment or above an unheated adjacent space	U_{max} = 0.3
1.2.6. Other floors (floors on a median, above a crawl space or above a cellar outside the protected volume, underground cellar floors)	U_{max} = 0.3 or R_{min} = 1.75 *(3)*
1.3. DOORS and GARAGE DOORS (including frame)	$U_{D,max}$ = 2.0
1.4. CURTAIN WALLS	$U_{CW,max}$ = 2.0 $U_{g,max}$ = 1.1 *(2)*
1.5. GLASS BRICKS	U_{max} = 2.0
1.6. TRANSPARENT / TRANSLUCENT WALLS OTHER THAN GLASS, except garage doors and doors (see 1.3), curtain walls (see 1.4)	U_{max} = 2.0 *(1)* $U_{tp,max}$ = 1.4
2. WALLS BETWEEN 2 PROTECTED VOLUMES (4) except garage doors and doors	U_{max} = 1.0
3. THE FOLLOWING OPAQUE WALLS WITHIN THE PROTECTED VOLUME (5) with the exception of garage doors and doors:	
3.1. BETWEEN UNITS 'PEB INDIVIDUAL HOUSING' AND ALL OTHER PEB UNITS	U_{max} = 1.0
3.2 BETWEEN UNITS 'PEB OTHER' AND ALL OTHER PEB UNITS	

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Waloon region:

Since January 2017, the level of regulatory requirements has been tightened. The previous reinforcement dates back to January 2014. A new reinforcement corresponding to NZEB is planned on 1 January 2019 for public buildings and on 1 January 2021 for all other buildings. An overview of the requirements is presented in the table in the part 2.I.ii link below.

https://epbd-ca.eu/ca-outcomes/outcomes-2015-2018/book-2018/countries/belgium-walloon

[Implementation of the EPBD in Belgium Walloon Region January 2017 - February 2017. Authors: Benoit Fourez, Ronald Gilot, Arnaud Collard, Jean-Claude Matagne, Marie-Eve Dorn, Frédéric Dozot, Valérie Martin - Public Service of the Walloon Region – Department of Energy and Sustainable Building]

Additional information regarding The Belgian framework for environment messages concerning construction products and environmental product declarations (EPD):

Belgium is preparing a legislation which will establish rules for environment messages concerning construction products. This legislation will apply to all construction products which are offered in, or launched onto the market in Belgium. The law is effective from 1st January 2015.

What is changing?

If you want to apply an environment message on the construction product, you will first have to draw up a life-cycle analysis (LCA), or an environmental product declaration (EPD). Currently, a manufacturer may also apply declarations concerning the environment on his product, which are not based on an LCA approach. We want to change this.

Environmental product declarations are a standardised way of communicating environment information. For this, first of all a life-cycle analysis (LCA) is carried out. The rules are based on existing European and international standards (EN ISO 14021, EN 15804 etc.).

How do you carry out an LCA or life-cycle analysis?

This is no simple procedure. For the complete life-cycle of your product you look at the possible global impact on the environment. In other words: from the exploration of the raw materials, the transport of the raw materials, the production process, the transport to the Belgian market, the use and maintenance until the final waste processing of the product. Possible impacts are climatic change, ozone formation, acidification and eutrophication. For carrying out an LCA, as manufacturer you need to know both the input and output raw materials.

What are the benefits?

There are mainly 2:

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To get a complete and objective insight into the environmental impact of your product. To also get a better insight into your production process, as a consequence of which you can draw up pathways of improvement.
The improvements for the environment also often lead to cost savings.

Databank with environment information

In 2014, Belgium will also have a federal databank available with environment information on construction products. The manufacturers and branch organizations deliver this information. These actions support the evaluation of the environmental impact of buildings.
- More information about the environmental impact of buildings can be found for Flanders at the “Openbare Vlaamse Afvalstoffenmaatschappij” (OVAM, Public Waste Agency of Flanders);
- for Brussels at the “Brussels Instituut voor Milieubeheer“(BIM, Brussels Institute for Management of the Environment)
- for Wallonia at the “Portail de l’énergie en Wallonie” (Energy Portal in Wallonia, available in French and German).

In the Flemish, Walloon and Brussels Capital Regions, the European directive regarding ‘Environmental Impact Assessment Directive’ (Directive 85/337/EC, recently consolidated as Directive 2011/92/EU) and ‘Strategic Environmental Assessment’ (Directive 2001/12/EC) are applicable to regional law. This means that for certain kinds of individual infrastructure projects, an Environmental Impact Assessment (EIA) is required and is integrated into the building and/or environmental permit procedure. For zoning plans (plans that define the public planning prescriptions that apply in a certain area), an EIA is also required, except in certain well-defined circumstances.
In the Flanders Region, the EIA legislation is contained in the Decree of 5 April 1995 containing the general principles of environmental policy (Title IV), together with its executive decrees.
In the Walloon Region, the EIA for projects and plans is integrated by the Environmental Codex of 27 May 2004 and its Executive Decrees.
In the Brussels Capital Region, the EIA for projects is included in the Environmental Permit Decree of 5 June 1997, and the EIA for plans and programs is included in the Decree of 18 March 2004 regarding EIA for certain plans and programs.
It is important to note that this legislation has been modified, since the European Court of Justice ruled in a judgement of 24 March 2011 (C-435/09, European Commission/ Belgium), that the EIA legislation in the Regions was not in compliance with EU law. By the Decree of 23 March 2012, the Flemish Region adapted its EIA regulation to comply with the judgement. From then on, smaller-scale projects that previously were excluded from the EIA requirement, will be screened for the need for a full EIA. This means that currently, there are EIA-mandatory projects, EIA-exempt projects and projects requiring screening in the Flemish Region.

https://www.dlapiperrealworld.com/law/index.html?t=construction&s=legal-framework&q=environmental-assessment-and-sustainability&c=BE

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3.8 The Netherlands

Introduction

Building regulation in the Netherlands is under the authority of the Ministry of the Interior and Kingdom Relations.

The EU member states set fundamental requirements for construction works in their national legislation. In the Netherlands, these requirements are laid down in the 2012 Building Decree . The building code in the Netherlands is known as the "Building Decree" (in Dutch: "Bouwbesluit"). The Building Decree sets out the minimum legal requirements for the safety, health, usability, energy efficiency, and sustainability of buildings and other constructions in the Netherlands.

Responsible entities for buildings and construction materials:

In the Netherlands, there are several entities responsible for construction materials regulations, depending on the specific area of regulation.
The Ministry of the Interior and Kingdom Relations is responsible for the Building Decree, which sets out the requirements for the safety, health, and usability of buildings. **The Ministry of Infrastructure and Water Management** is responsible for environmental regulations related to construction materials, including the Dutch Building Materials Decree and environmental quality standards.

In addition, there are several other government agencies and organizations involved in construction materials regulations in the Netherlands. For example, the Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland) is responsible for product certification schemes, and the Human Environment and Transport Inspectorate (Inspectie Leefomgeving en Transport) is responsible for enforcement of regulations related to transportation of hazardous materials.
Finally, there are also industry organizations and professional associations involved in the development and implementation of construction materials regulations, such as the Netherlands Standardization Institute (NEN) and the Dutch Green Building Council (DGBC).

New buildings permission:

In the Netherlands, obtaining permission for a new building typically involves several steps, including:

1. Initial Consultation: the first step is to consult with the local authorities to determine if the proposed building complies with the local zoning and land-use regulations. This can be done by contacting the municipality or city where the building will be located, and may involve a pre-application meeting or consultation with the relevant department.
2. Building Design and Plans: Once it has been determined that the proposed building complies with local regulations, detailed plans and designs for the building must be prepared by a qualified architect or engineer. These plans must meet the requirements of the Building Decree (Bouwbesluit) and other relevant regulations, such as those related to energy performance and environmental protection.
3. Permit Application: The next step is to submit a permit application to the local authorities, including all necessary documents and plans, such as architectural drawings, a description of the proposed building materials, and proof of compliance

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with relevant regulations. The permit application must be submitted to the municipality or city where the building will be located.
4. Review and Approval: The local authorities will review the permit application and plans to ensure compliance with all relevant regulations and zoning requirements. This process typically involves consultations with various departments and agencies, such as the fire department, environmental agency, and public works department. The review process can take several weeks to several months, depending on the complexity of the project and the workload of the local authorities.
5. Construction: Once the permit has been approved and issued, construction of the new building can begin. It is important to note that the construction must be carried out in accordance with the approved plans and permit, and that the local authorities may conduct inspections during the construction process to ensure compliance.

It is important to consult with the local authorities and a qualified architect or engineer early in the planning process to ensure that the proposed building complies with all relevant regulations and requirements, and to avoid any potential delays or issues during the permit application process.

Construction materials approval:

In the Netherlands, the responsibility for approving new construction materials lies with the Ministry of Infrastructure and Water Management (Ministerie van Infrastructuur en Waterstaat), more specifically with the department called "Rijksdienst voor Ondernemend Nederland" (Netherlands Enterprise Agency, RVO). RVO is responsible for ensuring that construction products and materials used in the Netherlands meet the requirements of the national building codes and standards.

Before a new construction material can be used in the Netherlands, it must be tested and evaluated by an accredited laboratory in accordance with European or national standards. The manufacturer or importer of the material must also submit technical documentation and other information to the RVO for review and approval.
The process for obtaining approval for a new construction material in the Netherlands typically involves the following steps:

1. Testing and evaluation: The manufacturer or importer of the construction material must have the material tested and evaluated by an accredited testing laboratory in accordance with the relevant European or national standards.
2. Submission of technical documentation: The manufacturer or importer must submit technical documentation and other information about the material to the RVO for review and approval. This documentation must demonstrate that the material meets the requirements of the applicable European and national regulations.
3. Review and approval: The RVO will review the technical documentation and other information submitted by the manufacturer or importer to determine whether the material meets the requirements of the regulations. If the material is found to be complying, the RVO will issue an approval certificate.

It is important to note that the use of construction materials that have not been approved by the RVO is not allowed in the Netherlands. Manufacturers and importers of construction materials must ensure that their products comply with the applicable regulations before they are placed on the market in the Netherlands.

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Annex I of the Building Degree Regulation contains the following fundamental requirements for construction works:

- Mechanical resistance and stability;
- Fire safety;
- Hygiene, health and environment;
- Safety and accessibility when using;
- Noise protection;
- Energy saving and heat preservation;
- Sustainable use of natural resources.

Beginning on 1 January 2021, in accordance with the European Union's Energy Performance in Buildings Directive (EPBD), new buildings are required to apply to stricter rules for energy use. These rules are available (in Dutch) on the Energy Performance – BENG website.

https://www.rvo.nl/onderwerpen/eu-wetgeving/ce-markering/productgroepen/bouwproducten

Bio-based construction materials requirements:

There are no specific regulations for bio-based construction materials, the Netherlands has implemented policies and regulations that support their use in construction and ensure their environmental performance such as certification scheme for bio-based products, called the "Biomass Mark" (Biomassa Keurmerk). This certification is used to verify the origin and quality of bio-based materials used in construction, as well as to ensure that they meet environmental and sustainability criteria and an environmental performance of the product.

Insulation products requirements:

The requirements for insulation materials in the Netherlands are set out in the Building Decree, which establishes the minimum legal requirements for the thermal resistance (R-value) of building elements, such as walls, roofs, and floors.
The insulation requirements in the Building Decree depend on several factors, such as the building type, use, and location. For example, the thermal insulation requirements for exterior walls of new residential buildings and states that the minimum R-value must be 4.7 m^2K/W [reference: Chapter 5, Section 5.2.1, Subsection 3 of the Dutch Building Decree (Bouwbesluit], while the minimum R-value for roofs and floors depends on the building type and use. The Building Decree also specifies the requirements for insulation materials used in the building elements, such as the thermal conductivity (lambda value) and the fire resistance.

In addition to the Building Decree, there are also other regulations and standards that apply to insulation materials in the Netherlands. For example, there are standards for the environmental impact of insulation materials, such as the Dutch Environmental Product Declaration (EPD) scheme, which provides information on the environmental impact of building products, including insulation materials.

It is important to ensure that the insulation materials used in a building project in the Netherlands meet the applicable requirements and standards, and that they are appropriate for the specific project requirements and goals. It is recommended to consult with building professionals, such as architects and engineers, to ensure that the insulation materials comply with all relevant regulations and standards.

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https://business.gov.nl/regulation/building-regulations/

Environmental Licensing Act:

The Environmental Licensing Act (*Wet algemene bepalingen omgevingsrecht*) combines the national regulation of building law, housing law and environmental law and establishes a single procedure, a single governing all-inclusive permit for, among other things, a construction project.

We note that the Dutch government is currently reviewing the Dutch planning (and building legislation) and adopted the new Environmental Act (*Omgevingswet*), which is a complete overhaul of the current existing legal framework. The Environmental Act is envisaged to enter into force on 1 January 2024, however this date is postponed several times and might be postponed again.

https://www.dlapiperrealworld.com/law/index.html?t=construction&s=legal-framework&c=NL

Minimum requirements for the thermal quality of the building envelope in the Netherlands, after the implementation of Energy Performance of Buildings Directive 2010/31/EU:

Since the oil crisis in the 1970s, the Netherlands apply minimum requirements for the thermal quality of the building envelope. In 2011 and 2012, a study has been carried out, to establish cost-optimal minimum requirements for existing buildings subject to major renovation.
These requirements came into effect in 2013-2014. The minimum requirements for individual building components are listed in Table 2 for major renovations (25% envelope), and in Table 3 for minor renovations. These minimum requirements will become slightly more stringent when the new energy performance requirements take effect as of 1 January 2021.

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Table 5: Minimum requirements for building components for minor renovations (source: Building Decree 2012

Minimum requirements for the thermal quality of the building envelope by 1 January 2015 for new buildings and major renovation (> 25% envelope).	
Roofs	R-value ≥ 6 m^2.K/W
Floors	R-value ≥ 3.5 m^2.K/W
Façades	R-value ≥ 4.5 m^2.K/W
On average for all transparent elements in a façade section	U-value < 1.65 W/m^2.K
Individual transparent element (window, door)	U-value < 2.2 W/m^2.K

Table 2. Minimum requirements for building components for new buildings and major renovations (source: Building Decree 2012).

Roofs	R-value ≥ 2 m^2.K/W
Floors	R-value ≥ 2.5 m^2.K/W
Façades	R-value ≥ 1.3 m^2.K/W
Individual transparent element (window, door)	U-value < 2.2 W/m^2.K

Similar to new buildings, major renovations are required to have a building permit that meets minimum requirements for building components, e.g., the R-value of walls, roof and floor, and the U-value of windows and doors.
For minor renovations, there are only minimum requirements for the R-value of walls, roof and floor, and U-value of windows and doors. In such cases, no energy performance calculation or building permit is required. The requirements for the individual building components are listed in the table above.

3.9 Luxembourg

Introduction

In Luxembourg, both **Ministry of Sustainable Development and Infrastructure** (Ministère du Développement durable et des Infrastructures) and Ministry of Economy are responsible for the regulations related to construction materials. The Ministries oversee the implementation of national and European regulations related to construction products, and work to ensure the safety, health, and environmental protection of Luxembourg's built environment. The Ministries also maintain a database of construction products that have been tested and certified for use in Luxembourg and provide guidance and information to stakeholders in the construction industry on the regulatory requirements related to construction materials.

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National regulations on construction materials

The national regulations on construction materials are governed by the following laws and regulations:

1. Law of 21 December 2007 on the marketing of construction products: This law establishes the framework for the marketing of construction products in Luxembourg. It requires that construction products meet certain safety, health, and environmental protection requirements, and provides for the establishment of a system for the assessment and verification of the performance of construction products.
2. Grand-Ducal Regulation of 12 February 2010 on the performance of construction works: This regulation sets out the performance requirements that buildings and their components must meet in Luxembourg. It covers areas such as structural safety, fire safety, and thermal performance, and specifies the minimum performance standards that construction products must meet in order to be used in construction projects.
3. Grand-Ducal Regulation of 20 December 2013 on the classification of construction products according to their reaction to fire: This regulation establishes the classification system for construction products according to their reaction to fire. It requires that construction products be classified based on their ability to resist fire, and specifies the testing methods and performance criteria that must be used to determine a product's fire resistance rating.
4. Grand-Ducal Regulation of 10 July 2002 on the disposal of waste resulting from construction and demolition activities: This regulation sets out the requirements for the disposal of waste generated by construction and demolition activities in Luxembourg. It requires that waste be disposed of in an environmentally responsible manner, and provides for the separation, recovery, and recycling of certain types of waste.
5. Grand-Ducal Regulation of 18 December 2015 on energy performance of buildings: This regulation establishes the requirements for the energy performance of buildings in Luxembourg. It requires that buildings meet certain energy efficiency standards and specifies the minimum requirements for the thermal insulation of building components, such as walls, roofs, and windows.

Buildings permission:

In Luxembourg, the responsibility for giving permission to new buildings lies with the local municipalities or communes (communes). The process for obtaining permission for a new building in Luxembourg typically involves several steps, including:

1. Preliminary Consultation: The first step is to consult with the relevant commune to determine if the proposed building complies with the local zoning and land-use regulations. This can be done by contacting the commune's urban planning department, which is responsible for issuing building permits.
2. Building Design and Plans: Once it has been determined that the proposed building complies with local regulations, detailed plans and designs for the building must be prepared by a qualified architect or engineer. These plans must meet the requirements of the applicable regulations, including the Grand-Ducal Regulation of 17 October 2018 on the placing on the market of construction products.
3. Permit Application: The next step is to submit a permit application to the urban planning department of the relevant commune, including all necessary documents and plans,

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such as architectural drawings, a description of the proposed building materials, and proof of compliance with relevant regulations. The permit application must be submitted in accordance with the procedures and deadlines established by the commune.

4. Review and Approval: The commune's urban planning department will review the permit application and plans to ensure compliance with all relevant regulations and zoning requirements. This process typically involves consultations with various departments and agencies, such as the fire department, environmental agency, and public works department. The review process can take several weeks to several months, depending on the complexity of the project and the workload of the urban planning department.
5. Construction: Once the permit has been approved and issued, construction of the new building can begin. It is important to note that the construction must be carried out in accordance with the approved plans and permit, and that the urban planning department may conduct inspections during the construction process to ensure compliance.

It is important to consult with the relevant commune and a qualified architect or engineer early in the planning process to ensure that the proposed building complies with all relevant regulations and requirements, and to avoid any potential delays or issues during the permit application process.

New construction products permission:

In Luxembourg, the responsibility for approving new construction materials lies with the **Ministry of the Economy**, more specifically with the department called **"Direction de la sécurité des produits et des services" (Directorate for Product and Service Safety, DSPS)**. This department is responsible for ensuring the safety and quality of construction products and materials used in Luxembourg, in compliance with European and national regulations.

Before a new construction material can be used in Luxembourg, it must be tested and evaluated by an accredited laboratory in accordance with European standards. The manufacturer or importer of the material must also submit technical documentation and other information to the DSPS for review and approval.

The process for obtaining approval for a new construction material in Luxembourg typically involves the following steps:

1. Testing and evaluation: The manufacturer or importer of the construction material must have the material tested and evaluated by an accredited testing laboratory in accordance with the relevant European standards.

2. Submission of technical documentation: The manufacturer or importer must submit technical documentation and other information about the material to the DSPS for review and approval. This documentation must demonstrate that the material meets the requirements of the applicable European and national regulations.

3. Review and approval: The DSPS will review the technical documentation and other information submitted by the manufacturer or importer to determine whether the material meets the requirements of the regulations. If the material is found to be complying, the DSPS will issue an approval certificate.

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It is important to note that the use of construction materials that have not been approved by the DSPS is not allowed in Luxembourg. Manufacturers and importers of construction materials must ensure that their products comply with the applicable regulations before they are placed on the market in Luxembourg.

Requirements for the insulation materials:

In Luxembourg, the requirements for insulation materials are set out in the national building code, known as the Règlement grand-ducal modifié du 30 novembre 1976 concernant la construction d'habitations et de bâtiments assimilés (RGD), as well as the national energy performance regulations.
The RGD sets out minimum thermal resistance (R-value) requirements for insulation materials in building elements such as walls, roofs, and floors, as well as requirements for the thermal conductivity (lambda value) of insulation materials. The specific requirements depend on the type of building element and the building's location and use.

U values for new buildings whose building permit is asked starting from 1st of January 2017:

- walls: 0.13
- roofs: 0.11
- floors: 0.17
- windows: 0.9
- doors: 1.35

[https://www.iea.org/policies/8648-luxembourg-building-code-2017-update (last updated Last updated: 3 October 2019]

3.10 Latin America

Introduction

Latin America is a region located south of the United States of America, comprising 20 independent countries with its own regulations and entities. This document will be focused especially on 4 countries: Colombia, Mexico, Chile and Peru.

Responsible Institutions

In the specific case of Latin America, there does not exist any institution inside each of the 4 countries previously mentioned, however, there are some private entities, guilds and/or initiatives aimed at validating solutions and developing new materials, shown below.

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Table 6: Initiatives for development of new materials in Latin America

COUNTRY	INITIATIVE
COLOMBIA	Consejo Colombiano de Construcción Sostenible Cámara Colombiana de la Construcción
MEXICO	Sustentabilidad para México - SUMe Centro de Análisis de Ciclo de Vida y Diseño Sustentable
CHILE	Consejo Chileno de Construcción Sostenible Ministerio de Vivienda y Urbanismo Construye 2025 - CETEC
PERÚ	GBC Perú – Consejo Peruano de Construcción Sostenible

Previous counties have some regulations in terms of assurance that construction companies and new buildings in general adopt good practices of sustainable construction. This is the case of Colombia with 0549 Resolution 2015 of MVCT, in México with the General Law of Ecological Balance and Environmental Protection, and finally in Chile has the Sustainable housing Certification

Service and support

As it mentioned before, each country has its own regulation and indeed its own entities. Those entities mentioned before do not give any certification in terms of providing an official document that validates the correct usage of biomaterials products in buildings, but establishes some instructions, directions and recommendations to align and ensure that new buildings are implemented in the best way.

In the table below you can find all websites for each entity to take a look:

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Table 7: overview initiatives in Latin American countries

COUNTRY	INITIATIVE	WEBSITE
COLOMBIA	Consejo Colombiano de Construcción Sostenible	https://www.cccs.org.co/wp/
	Cámara Colombiana de la Construcción	https://camacol.co/productividad-sectorial/sostenibilidad/edge
MEXICO	Sustentabilidad para México - SUMe	https://www.sume.org.mx/
	Centro de Análisis de Ciclo de Vida y Diseño Sustentable	https://www.centroacv.mx/nosotros.php
CHILE	Consejo Chileno de Construcción Sostenible	https://cchc.cl/sostenibilidad
	Ministerio de Vivienda y Urbanismo	https://csustentable.minvu.gob.cl/
	Construye 2025 - CTeC	https://construye2025.cl/iniciativa/ctec/
PERÚ	GBC Perú – Consejo Peruano de Construcción Sostenible	https://gbcpe.org/site/

Standard permission processes

According with theory and some representants of each country and its entities, there is not any process aligned with official institutions to certify biomaterials in main Latin American markets but as it was mentioned before, nowadays there are private initiatives that are allowed to certify some buildings as energy labelling and sustainable constructions.

Several meetings have been organized with the representatives of each country to validate information and clarify indications (as per figure 9).

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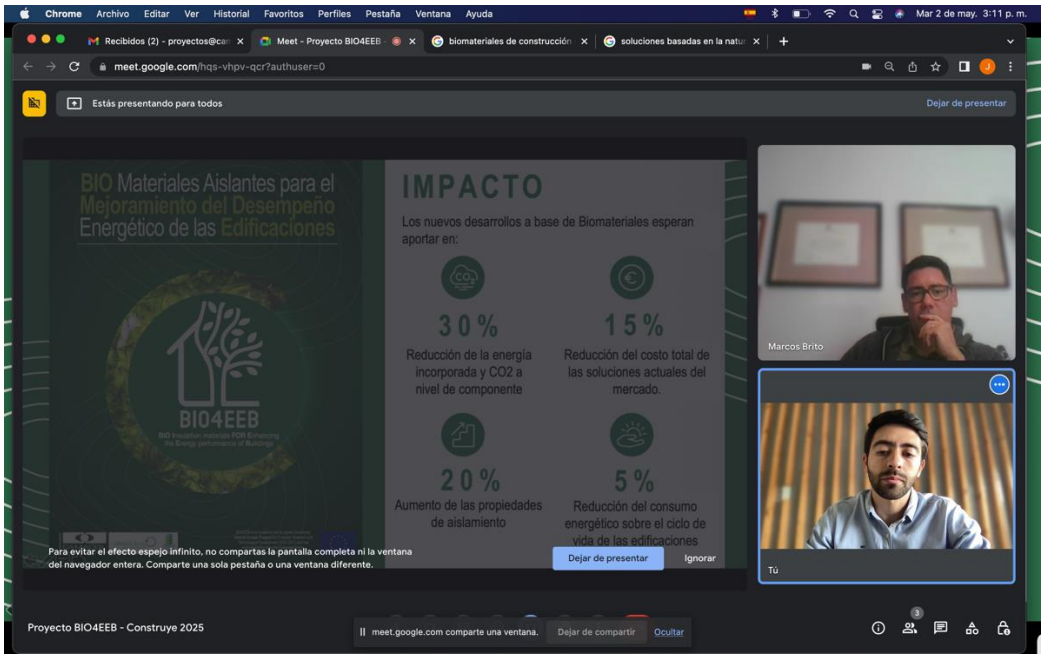

Figure 10Meeting CONSTRUYE 2025

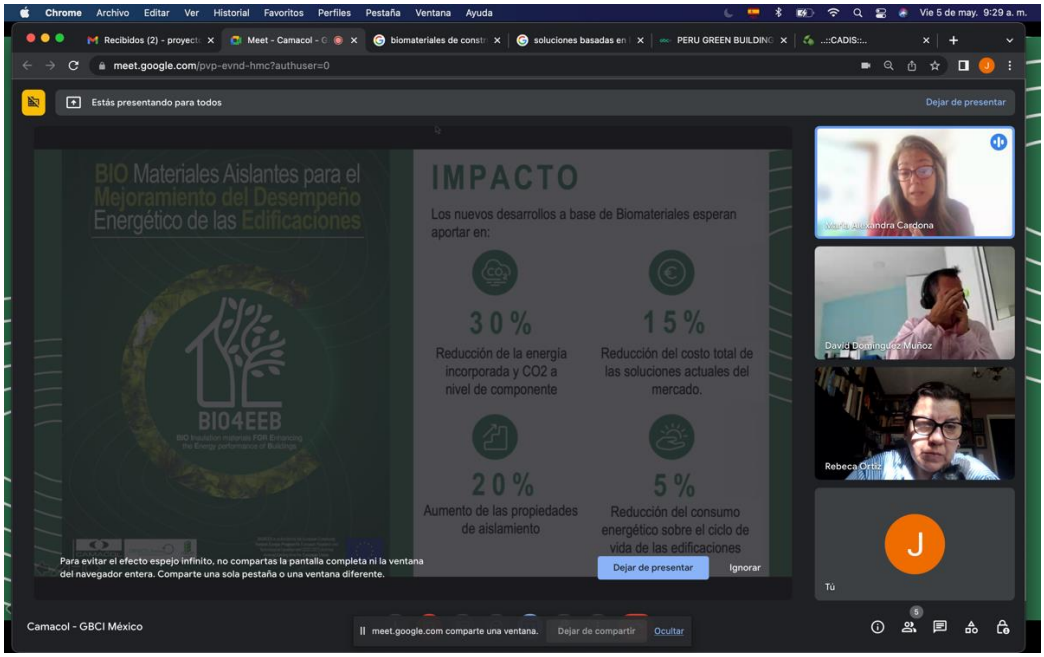

Figure 11: Meeting GBC Colombia and Mexico

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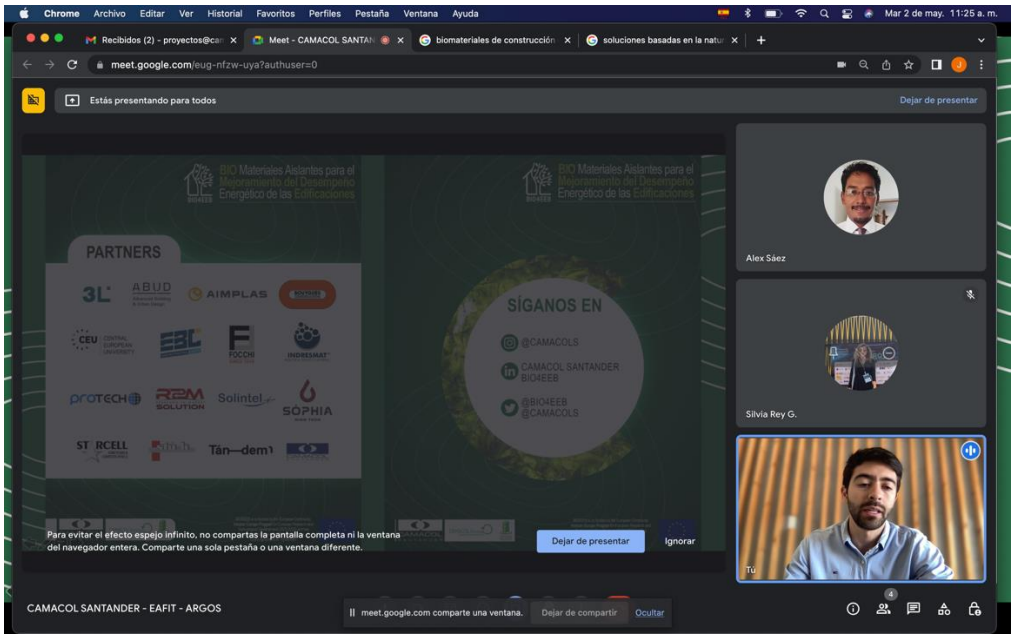

Figure 12: Meeting EAFIT Colombia

Duration of permission

There is no established duration of permission, inasmuch as in Latin American region at date there are not any public institutions that provide special certifications focused on biomaterials for construction.

Processing time

There is no processing time established to accomplish permissions related with biomaterials.

Costs

Private entities have their own rates to certify some products or buildings but not for biomaterials.

3.11 France

Introduction

In terms of French regulations, the Construction and Housing Code is the code that brings together the legislative and regulatory rules relating to construction, real estate development, social housing and other real estate issues. At the same time, the French normative system applicable to the construction sector is largely based on professional technical standards (rules of the art, professional standards, etc.) deemed to be voluntary but in reality, imposed by the clauses governing public and private works contracts on the one hand, and construction insurance contracts on the other.

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From an insurance point of view, the French Spinetta Law obliges any builder (contractor, prime contractor, architect, or other person linked to the client by a contract of lease) to take out ten-year insurance to cover damage that may affect the solidity of the work and its inseparable equipment or that make the construction unfit for the use for which it is intended. If the work carried out uses processes considered by the insurer as **routine techniques ("techniques courantes"),** they are normally covered by the ten-year insurance taken out by the company. In the event that the procedures used are considered to be **non-routine techniques ("techniques non courantes"),** the insurer must be notified and a surcharge may be applied, or even a refusal of coverage. The challenge for an innovative product is therefore to implement the steps allowing it to be classified as a common technique.

French normative and insurance context

To determine their current technical / non-current technical classification, insurers rely on the French normative system, and on the analysis of processes from **traditional and non-traditional fields ("domaine traditionnel" et "domaine non traditionnel")**. Indeed, in France, construction companies can implement two types of processes and constructive products: those belonging to the traditional domain on the one hand, those belonging to the non-traditional domain on the other hand. The so-called traditional processes include techniques benefiting from a sufficiently broad and convincing feedback, covered by rules of the art codified in the following reference documents:

- Standards and NF DTU (Unified Technical Documents). NF DTUs have the status of standard and propose standard technical clauses for works contracts. They are developed and amended by the General Commission for Building Standards / DTU (CGNB / DTU), under the control of AFNOR (French Association for Standardization).
- Professional rules. They are drawn up by the representative professional organisations and sometimes constitute the preparatory stage for the preparation or revision of a DTU.
- Professional recommendations accepted by the C2P (Commission Prévention Produits implemented). They are technical reference documents, prefiguring a preliminary NF DTU project, on a key technical solution improving the performance of buildings.

The application of these rules is indicated voluntary, but most often required in works contracts.

The so-called non-traditional processes, (e.g. those which have been recently developed and which do not yet benefit from sufficient feedback), may be the subject of a voluntary technical evaluation procedure by an independent body to prove their suitability for use, such as:

- ATec (Avis Techniques) and DTA (Document technique d'application). They constitute an official document of suitability for use of innovative construction processes. They are examined by the CSTB (Centre Scientifique et Technique du Bâtiment) on behalf of the Commission Chargée de Formuler les Avis Techniques (CCFAT), attached to the Ministry in charge of construction and housing. The CCFAT issues the ATec for a specified period after which they must be renewed.
- ATex (Appreciations Techniques d'Expérimentation). They are issued by the CSTB and concern innovative techniques that cannot yet be the subject of an ATec, their development requiring experimental implementation on site.

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- ETN (Enquêtes de Technique Nouvelle). They shall be carried out by an approved inspection office on the basis of specifications drawn up by the manufacturer.
- ETA (European Technical Assessment). Formerly ATE (European Technical Approval), it constitutes the recognition of the suitability for use of a product intended to be CE marked, not covered by harmonized European standards.
- ETPM (Technical Evaluation of Products and Materials). It makes it possible to provide an evaluation on a material, even before defining a precise field of use.

A transitional system has also been created for processes considered as traditional techniques by the CCFAT, without however having all the reference texts essential for a satisfactory deployment as a traditional technique: the ATT (Transitional Technical Assessment).

At the same time, the Product Prevention Commission (C2P), bringing together the building professions and construction insurance, has a mission to prevent claims related to products and processes as well as the texts that govern their implementation. In this context, the C2P decides to put under observation families of products from traditional and non-traditional domains with a high loss rate or a risk of serious or repetitive losses. The list of product families under observation is revised and published semi-annually by C2P.
This risk analysis for construction stakeholders allows insurance companies to complete their own classification between current and non-current techniques.

Synthesis provisional - to be redone:

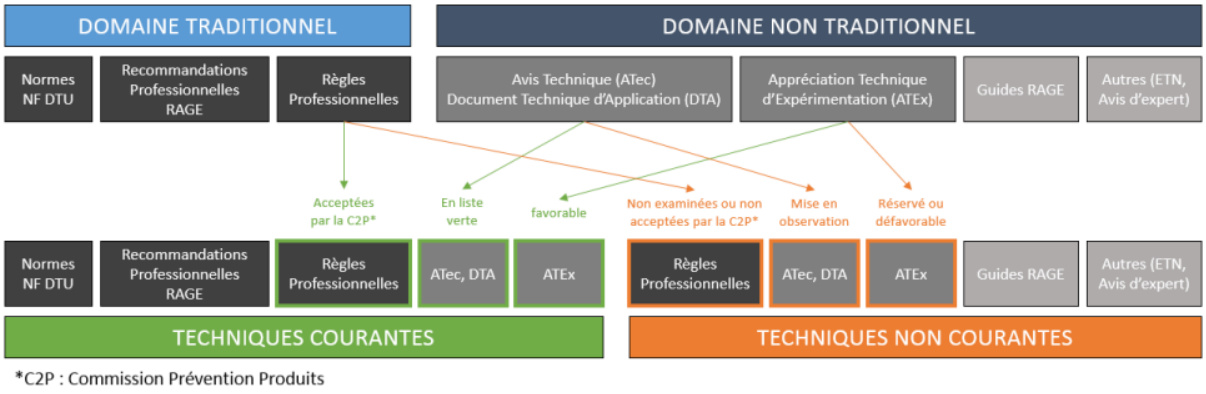

Figure 13: traditional and non-traditional domains

Source : https://www.codifab.fr/uploads/media/61af7e5e32784/guide-bbse-nov20.pdf

Responsible Institution
The CSTB has a pivotal role in the process of deploying innovations in the building industry in France. The key activity it carries out is evaluation: it provides construction stakeholders with reliable information on the performance and durability levels of components (processes, materials, elements or equipment, etc.), in a well-defined field of use and implementation conditions. The CSTB supports construction players by promoting the emergence of innovations and their access to the market, while securing them. It examines ATec files in support of public authorities, technically evaluates innovations with ATEX, or prepares CE evaluations of French products at European level through a European Technical Assessment (ETA).

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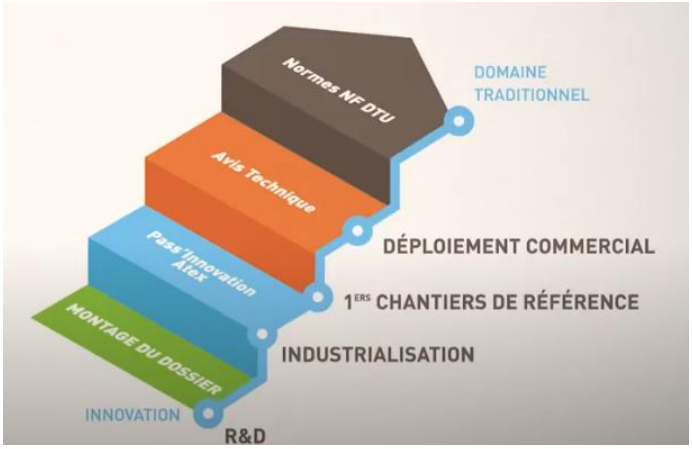
At the same time, the CSTB conducts research to enrich the knowledge base of the profession, it also develops a certification offer to promote the adoption of the most efficient solutions, it also carries out the technical tests necessary to establish performance proofs, and finally plays an important role in dissemination.

Another actor can be mentioned as the key player on a building construction or renovation project: the project inspector (bureau de contrôle). Mandated by the client (building owner), it is responsible for guaranteeing the latter that the building to be delivered to it will comply with all regulatory requirements. At the level of a project, he is the interlocutor who decides on the permission approach to be followed according to the processes and products planned for the project.

Standard permission processes for non-traditional products

If a product or construction process does not belong to the traditional field, it is necessary to demonstrate its suitability for use by engaging in a technical evaluation process. The technical evaluation, by studying the quality, safety and durability of a product and its proper integration into the structure, makes it possible to secure the limits of use of the innovation when it is placed on the market and to specify the contribution of the product to the performance of the structure.
A committee of experts gives its opinion on innovation, which is usually made public. A favourable opinion helps to justify the suitability for use of the product to the actors of the profession.

The evaluation process follows the industrial and commercial development of the innovation. The preparation of the evaluation dossier can begin during the R&D phase of the innovation and makes it possible to choose the procedure best suited to the needs according to the degree of maturity of the innovation and the field of use targeted.



Source: CSTB

Figure 14: traditional evaluation process

Thus, the ETPM or ATex are often intermediate steps before the use of the ATec. The Technical Evaluation of Products and Materials includes all the technical characteristics on a material that does not belong to the traditional field. The ATex, which is faster than the ATec, allows a new technique to be used in the very first workings for a specified limited period (case "a"), or on a specific site (case "b"). The ATex type "c" applies to a new experimental realization of techniques which have previously been the subject of an ATEx type "b" of favorable character. These reference experiences are very useful when requesting Technical Advice.
Then, the ATec procedure requires many elements (description of the product or process, representative sites already carried out, performance and aging tests carried out, etc.).

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Whichever evaluation procedure is chosen, it will always take place in 3 steps:

- The setup of the technical file: it is possible to request the support of a professional for this step, for example via the support services "Ariane", "ID+ International" or "ID+ Development" of the CSTB,
- The instruction by the CSTB: the instructor specifies the requirements applying to the process, analyses the technical relevance of the evidence provided, and warns of any shortcomings in the file. The applicant was responsible for providing the scientific and technical evidence to assess the suitability of the innovation for use and for deciding when the dossier was considered complete for submission to the Committee of Experts. Providing evidence on the suitability of a process or product can be time-consuming and costly. It may be useful to contact an independent body such as a Cofrac accredited laboratory to carry out studies and tests.
- The check by the commission of experts for the assessment of the request for evaluation: an independent commission of experts composed of actors in the construction industry (installation companies, inspection offices, manufacturers, architects, technical centers such as the CSTB, etc.) examines the file and delivers an opinion on the suitability for use of the innovative product or process.

The committee's opinion may be favourable, reserved or unfavourable. In the event of a reserved or unfavourable opinion, the innovation may be reviewed following the submission of the additional elements requested. This is a new request. It is therefore important to define the field of employment beforehand according to the evidence possibly provided by the applicant.

Service and support

At the French level, standards and DTUs are not freely available. They are sold in the shops of the French Association for Standardization (AFNOR) and the Scientific and Technical Centre for Building (CSTB).
ATecs and DTAs are also available from the CSTB as well as on the C2P green list.
The ATEx are accessible from the CSTB website.

Reciprocity of the ATec with its foreign counterparts

The evidence provided for foreign "approvals" formulated by one of the members of the UEAtc (European Union for Technical Approval in Construction), may be taken into account when examining the request for ATec.
Conversely, the ATec can facilitate obtaining an "approval" outside France. It is also possible to examine the Technical Opinion simultaneously with one or more of its counterparts, considering the specificities of the chosen countries, in particular from the point of view of implementation requirements.

Duration of permission

The period of validity of type "a" ATex is defined on a case-by-case basis (usually 2 to 3 years).
The validity of type "b" and "c" ATex is site-specific.
ATec are issued for a period of validity of between two and seven years depending in particular on the feedback acquired.

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Processing time

Regarding the ATex application, the duration of the assembly of the technical file by the applicant varies from 1 to 12 months depending on the requests, with an average delay of 6 months. The CSTB has 15 days to respond to the feasibility of the ATEx and define the specific justifications on the basis of a 1st technical file submitted by the applicant, then 1 month between receipt of the final file and the commission.
An ATec application is processed in 9 months, but it requires work and a significant preliminary experimentation time to gather the necessary documents for the assembly of the technical file.

Costs

The cost of an evaluation must distinguish:

- the cost of compiling the technical file,
- the cost of any tests or studies intended to prove compliance of the innovative process or product with the regulations in force,
- the cost of any additional tests or studies to prove the suitability for use of the innovative process or product,
- the cost of the evaluation procedure itself, including the examination of the file.

For an ATex application, the administrative cost varies, depending on the size of the project, from 15 to 21 k€ HT in case "a", from 9 to 12 k€ HT in case "b", and amounts to about 3.5 k€ HT in case "c". To these costs must be added the necessary tests and studies.

3.12 Lithuania

Introduction

In Lithuania the permission for the application of all building products including innovative or non-standard construction products is following the same standardized process steered by a national responsible institution called Statybos Produkcijos Sertifikavimo Centras SPSC (Certification Center of Building Products).

Responsible Institution

SPSC is an independent state enterprise established by the Ministry of Construction and Urban Development (currently Ministry of Environment) performing it‘s activity from 1996. The main goal of SPSC is to provide services of certification of construction products, assessment of consistency of performance, testing and assessment of internal production control upon clients‘ applications. Providing these services SPSC follows the requirements of legal acts and standards of the Republic of Lithuania and of the European legal acts and standards. The quality policy of enterprise is based on principles of impartiality, objectivity, efficiency, expedition and regularity. The company fulfils the requirements of the standards LST EN ISO/IEC 17065 and LST EN ISO/IEC 17025 and is accredited by the Lithuanian National Accreditation Bureau in the fields of construction products certification and testing.

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SPSC is designated by the Minister of Environment of the Republic of Lithuania to perform assessment and inspection of consistency performance of construction products in the regulated area. SPSC is also a notified body in the European Union according to the Regulation (EC) No. 305/2011 of the European Parliament and of the Council. SPSC is a member of the Group of Notified Bodies for the Construction Products, a member of European Organisation for Technical Assessment EOTA and co-operates with the most certification bodies of other countries.

Service and support

The SPSC website hosts an information portal for construction products and techniques in English including a search engine offering important information about Lithuanian and European permission standards (see link: SPSC).

Standard permission processes

Construction Technical Regulation STR 2.04.01:2018 “Partitions of buildings. Walls, roofs, windows and exterior entrance doors“ specifies that only external ventilated thermal insulation systems that have a European Technical Assessment (ETA) and are CE marked or have a National Technical Assessment (NTĮ) can be used for the design and construction of buildings (including Building Renovation).

Technical Assessment means the documented assessment of the performance of a construction product, in relation to its essential characteristics. Technical Assessment may be prepared and issued according the clause 4 of chapter 8 of Law on Construction when: there are no appropriate Lithuanian or International or European standards prepared; such standards are not in preparation; for at least one essential characteristic of that product, the assessment method provided in such standard is not appropriate or the standard does not provide for any assessment method in relation to at least one essential characteristic of the construction product.

There may be two kinds of Technical Assessments:
European Technical Approval (valid in all EU member states);
National Technical Approval (valid in Lithuania).

SPSC is the only organization technical assessment body in Lithuania, which can prepare European technical assessments and National Technical Assessments in the construction products area. SPSC is a full member of EOTA since 2004 and it is designated and notified to act as Technical Assessment Body for preparation and issue of European Technical Assessments (ETAs).

European Technical Assessment (ETA) is issued by the member of European Organisation for Technical Assessments EOTA according to the order defined in the Regulation (EU) No.305/2011 of the European Parliament an of the Council. Preparation of ETA for a building product or system (kit) shall be based on research, testing, calculation and evaluation, in accordance with national legislation and European Assessment Documents EAD (or European Technical Approval Guidance - ETAG used as EAD).

National Technical Assessment (NTĮ) is issued by designated technical assessment body for Lithuania. NTĮ are prepared in accordance with the Construction Technical Regulation STR

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1.01.04:2015 "Assessment, verification and declaration of the constancy of performance of construction products without harmonised technical specifications - Designation of testing laboratories and certification bodies - National technical assessments; designation and publication of technical assessment bodies".

To prepare an ETA/NTĮ or amend, supplement or renew an existing one, an application form is needed. The application forms are already prepared as a standard for this purpose. They include all needed information in this first step. All provided application forms are available at the Annex. SPSC may provide consultations in connection with the preparation of the Application.

After all the necessary information have been received, SPSC will determine which tests and verifications are needed for the construction product or design solution, develop a tailor-made test plan and recommend accredited test laboratories. When all testing and evaluation processes are completed the SPSC expert committee will verify and assess draft documents prepared by Technical Assessment Body, the decision for approval of the documents of the Technical Assessment Body is taken by the director.

Duration of permission

ETA/NTĮ is usually granted for a five-year period renewable upon application.

Processing time

The processing time depends on the complexity of the product and the scope of testing required.

Costs

The price for preparation of Technical Assessment is determined individually. Specific financial offer is made to the client after review of his application. The Application registration fee can be found in the appropriate Application blank forms (Annex).

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Conclusion

D2.1 is covering the certification process at national, international level and intercontinental level at the highest extent. To avoid any problems in the ongoing application process on demonstration sites and even applicable for future projects this deliverable is meant to assure the compliance with regulations at country, national and international level. D2.2 will cover a range of related KPIs for technical performance needs.

Requirements established by the national and international construction regulations of the different countries and those related to the application of biologically based materials are analysed and documented in this deliverable. Following the needs of any kind of standards and the deducted scheme of the certification process a standardized approach has been identified and developed to collect and balance needs to create a digital inventory and specific guidelines to ensure the application of bio-based materials and components. The collected material and the links to information will be embedded in the BIO4EEB platfor5m to ensure that actual information is always provided. However, quite often the process of certification is driven by characteristics at national level following its own demands.

The created inventory closes the gap in terms of lack of information for producers that are eager to exploit their innovative bio-based products internationally. Thanks to the wide-spread exploitation potential of the BIO4EEB consortium additionally to the European level, UK, USA and Latin America are covered at the same time.

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Annexes

BLANK FORM FOR THE APPLICATION OF A EUROPEAN TECHNICAL ASSESSMENT UNDER ARTICLE 26 OF REGULATION (EU) No. 305/2011

1. **To**
SE STATYBOS PRODUKCIOS SERTIFIKAVIMO CENTRAS (SPSC)
Linkmenų str. 28, LT-08217 Vilnius, Lithuania
Tel. +370 5272 8078, +370 5272 8077; e-mail: centras@spsc.lt; website www.spsc.lt
Company code: 110068926; VAT code: LT100689219
AB SEB bank; SWIFT CBVI LT 2X; bank code 70440; IBAN LT53 7044 0600 0112 4829

2. **Applicant**
a) Manufacturer[1]:

b) Authorized representative, were appropriate (established in the European Union)[2]:

according to the attached written power of attorney, dated

3. **Type of the construction product**

4. **Trade name(s) of the product, as will be given in the European Technical Assessment**

5. **Description of the construction product, the intended use and the essential characteristics of the product**

6. **Assessment of the essential characteristics of the product with methods and criteria used in other harmonised technical specification(s)**
Case 1. The construction product is covered by the following European Assessment Document (EAD) :
Reference number and version of the EAD:

Case 2: The construction product is covered by the following Guideline for European technical approval (ETAG) (transitional arrangement referred to in Article 66(3) of Regulation (EU) No. 305 / 2011):
ETAG No:

Case 3: The construction product is partially covered by an existing harmonised standard (hEN) or a European Assessment Document (EAD):
hEN or reference number and version of the EAD:

Case 4: For the construction product there are no usable harmonized methods and criteria for assessing the performances of the product under a hEN, an EAD or an ETAG available:
YES or NO:

7. **Documents required for application**
Technical documentation shall be presented with the application (product description, intended use(s), essential characteristics (expected declared performances) to allow judgment that the said EAD or the said ETAG can be applied to the construction product.
For the cases 3 and 4 of clause 6 the application additionally shall be accompanied by a technical file describing the product in detail, its use as foreseen by the manufacturer and details of the factory production control the manufacturer intends to apply (e.g. details of product or product variants with declared specific performance characteristics, test methods, composition of the product, and (or) mechanical-physical properties of materials) shall be submitted by the manufacturer).
SPSC may provide consultations in connection with the preparation of the Application.

8. **Manufacturing plant (s)**

9. **Declaration of the applicant**
I hereby declare that I have not filed an application for a European Technical Assessment for the construction product with any other Technical Assessment Body:
YES or NO (in case of NO fill in field below):

I have filed an application with (Name of the Technical Assessment Body)
for the issue of a European Technical Assessment, this application was denied.
Furthermore, I declare that I:
- when submitting an application for European Technical Assessment I am obliged to follow all the requirements for providing the information required for preparation of the European Technical Assessment and to pay non-refundable application registration and analysis service fee of 588,91 Eur (when appropriate 712,58 Eur with VAT included) to the account referred in the clause 1 of the application;
- will bear the costs of issuing the European Technical Assessment according to the scale of fees of SPSC;
- will provide the necessary support in the process of issuing the European Technical Assessment;
- ensure that the production facilities can be visited any time during operating hours by representatives of SPSC for ETA preparation;
- agree that the Organization of Technical Assessment Bodies (EOTA) and the European Commission be informed about the content of this application;
- I am prepared to inform SPSC without delay of the first making available of the product on the market with CE marking.

Consent to the processing of personal data
I hereby confirm that I have read and understood the Policy of SPSC on the Processing of Personal Data, which is published at SPSC website, and I give my consent to the processing of my personal data by SPSC with the purpose and scope of SPSC services provision. I hereby acknowledge that I have the existence of the right to request access to the personal data; rectification or erasure of personal data or restriction of processing the personal data in case of violation of the requirements for processing of personal data; the processing of personal data for direct marketing purposes may be regarded as carried out for a legitimate interest.

.....

(Place and date) (Authorized signature)

[1] According to Article 2(19) of the Regulation 'manufacturer' means any natural or legal person who manufactures a construction product or who has such a product designed or manufactured, and markets that product under his name or trademark the indication of the manufacturing place(s) of construction product or in case of the kit manufacturing place(s) of components is performed under clause 8

[2] When appropriate, manufacturer's authorized representative established in the European Union; where the application is made by the authorized representative, it has to be accompanied by the power of attorney given by the manufacturer

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(FORM TL-001EN)

For the Statybos Produkcijos
Sertifikavimo Centras (SPSC),
Linkmenu 28, LT-08217 Vilnius
Tel.: +370-5-272 80 78, +370-5-272 80 77
El. p.: centras@spsc.lt

APPLICATION
For National Technical Assessment (NTĮ)

20__ -____-____ No. ______

1. Applicant, his address and all requisites:

Applicant:					
Address:					
Tel.:		Fax:			
Company code:		Account No.:		Bank code:	
Bank name:					
Contact person for NTĮ	Name:		Tel.:		
	Surname:		Fax:		

2. Producer, his address and requisites:

Producer:				
Address:				
Tel.:		Fax:		
Contact Person for NTĮ	Name:		Tel.:	
	Surname:		Fax:	

3. Product:

Name and type of product:	
Technical characteristics:	
Intended use:	

4. Annexes:

Test data and reports:	
Other evaluation documents:	
Work drawings:	
Other information:	

When submitting an Application for National Technical Assessment (NTĮ), the applicant (manufacturer) is obliged to follow all the requirements, to provide the information needed to prepare the NTĮ, to pay non-refundable application registration fee of 191,49 Eur (when appropriate 231,70 Eur with VAT included) and to pay the costs of NTĮ preparation according to the contract.

Consent to the processing of personal data
I hereby confirm that i have read and understood the Policy of SPSC on the Processing of Personal Data, which is published at SPSC website, and i give my consent to the processing of my personal data by SPSC with the purpose and scope of SPSC services provision. I hereby acknowledge that i have the existence of the right: to request access to the personal data; rectification or erasure of personal data or restriction of processing the personal data in case of violation of the requirements for processing of personal data; the processing of personal data for direct marketing purposes may be regarded as carried out for a legitimate interest.

. . . . (Position) . . . . (Signature) . . . . (Name, surname)

(Stamp place)

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Logo and requisites of the enterprise

APPLICANT'S DECLARATION

201....-....-.... No. ....

I claim, that:

1. Application for the National Technical Assessment (NTĮ) is submitted to the State Enterprise "Statybos Produkcijos Sertifikavimo Centras" (SPSC) only.
2. Application for the NTĮ was submitted to other organizations or enterprises, but it was rejected:

_____

_____

(Indicate the names)

3. The building product already has a Technical Assessment (Approval) granted by EOTA and/or EC country:

_____

_____

(Indicate the date of granting and registration number)

4. I agree that other Technical Assessment Bodies shall be informed about the application for the NTĮ.
5. I will pay the expenses connected with the preparation of the NTĮ.
6. I will follow the defined procedures of preparation of NTĮ.
7. I will ensure that persons preparing the NTĮ or authorized representatives will be allowed to visit the production site during the working hours.

_____	_____	_____
(Job title of the head)	(Signature)	(Name, surname)

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