# INTELLECTUAL OUTPUT 1

# TASK O1-A1.2

# SPANISH REGULATIONS REGARDING NEW TECHNOLOGIES IN THE BUILT ENVIRONMENT

*This project has been funded with support from the European Commission.*
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# INTRODUCTION

This report is included in the task *"O1-A1. Comparative study on the normative for appliance of the new technologies in the built environment",* corresponding to Intellectual Output 1 *"Establishment of common learning outcomes on industrial areas restoration with new technologies, Life Cycle Assessment (LCA) and relative regulations"* of the RecoverIND project.

A comparative study report has been prepared on the existing normative related to the new technologies' application in construction sites in the partner and EU countries, which include technical, safety and environment protection requirements, as well as aesthetics ones. It was considered the regulations about the industrial heritage conservation, as well as the life cycle assessment of the materials.

The report O1-A1.2 includes Spanish and European legislation regarding new technologies in the built environment.

This report and all the information about the project are available in the following url:

- RecoverIND project web: https://recoverind.eu/en/project/

## 1. Background

It is recognized that the construction sector causes a high environmental impact, being responsible for 36% of the world's final energy consumption and almost 40% of total direct and indirect CO2 emissions. For this reason, it is vital to use the Life Cycle Analysis (LCA) for the rehabilitation of existing buildings, both for energy efficiency and for material and resource efficiency, to know the life cycle of the products and processes from the cradle to the grave helps decision-making to improve sustainability, select the best available technology and minimize the environmental impact of buildings by seeing if they contribute to increasing or reducing emissions from buildings.

When it comes to rehabilitating a heritage building, the energy study is often complicated because the plans of the industrial building are not available or due to the changes that can occur during the construction process, which makes it difficult to have enough information about the building. Although there are many factors that count to determine the energy efficiency of buildings such as the efficiency and evaluation of the facilities, one of the most important parameters is the composition and structure of the envelope, since the energy load depends mainly on the bridges. thermal, infiltrations and the state of the insulation material and as well as the consumption of the facilities, also linked to the envelope.

Currently, the regulations are directing the construction sector towards the use of electronic systems (modeling of construction information) in the procedures for the procurement of works, service and supply (D_2014/24/UE). Therefore, the level of knowledge of BIM (Building Information Modeling) among designers and engineers has improved, and the transfer of data between models has become more reliable. The use of laser scanners, thermal imaging cameras and drones correlated with the BIM methodology, will help to reliably digitize the embedded data of heritage industrial buildings and facilities and to rapidly acquire data for large areas of the built environment and guarantee a focus of implementation life cycle that prioritizes accurate information transfer through project phases and between project team members.

## 2. New technologies in the construction sector

We are currently immersed in what experts have classified as the 4th industrial revolution, precisely because of the revolutionary change that new technologies are causing in the way of facing personal, work and business life. Construction is one of the driving sectors of the economy of our country, however, the economic crisis is causing digitization to be rather slow, there is still a long way to go in terms of digital innovation in this sector. Accelerating this digital transformation is an important challenge today,

starting with promoting the use of some of the digital trends that are being applied in the construction sector:

1. Virtual modeling with BIM technology: information modeling for construction is what is known as BIM technology, capable of integrating all the information created by all the agents involved in the project, thus reducing possible failures and delays. This technology is very useful for speeding up projects, as well as better collaboration between all the participants of the same project.

2. Drones: in the construction sector, drones are being used as tools to collect data in surveying work, as well as in monitoring the different phases of a construction. The proper use of drones has a very positive impact, there are data that show that the use of drones can reduce the production costs of a civil work by 25% and the deadlines by 10% (data from the Andalusian Technological Centre).

3. Big Data: allows the intelligent analysis of all the data that is produced at high speed, it allows the sector to better manage all this information, for it to be applied correctly. In this way, productivity in construction improves considerably, reducing economic costs, as well as delivery times. It is very useful for analysing information from drones and anticipating where a building may have a problem.

4. 3D printing: thanks to it, parts of buildings can be manufactured, thus reducing the cost of materials and logistics, and even allows the printing of complete buildings. This technology has already been used in Spain. For example, in Alcobendas there is the world's first pedestrian bridge created with a 3D printer.

Despite the advances, more momentum is needed in the sector to carry out the implementation of these technological trends, the main barrier is that many companies in the sector due to the crisis continue to work in a more traditional way, to survive, but these technological innovations can help to make the leap they need in the construction sector.

## 2.1. Regulatory framework for application to BIM technology

**Europe**

The first introduction of BIM in the legislation takes place in the European Directive 2014/24 / EU on Public Procurement. This directive promotes the modernization and improvement of public procurement processes through technological advances, while introducing the economic and environmental cost of the building or infrastructure as a possible award criterion.

**Spain**

In the case of Spain, in 2015, the Ministry of Development created the esBIM commission, made up of different agents and organizations belonging to both the public and private sectors (ministries, public companies, professional associations, business associations, etc.), with the objective of progressively implementing the requirements of DE_2014 / 24 / EU. The transposition of this directive in Spain is carried out through the Public Sector Contract Law 9/2017 (LCSP_9/2017), which regulates the administrative procedure through which a public body develops a contracting process, such as the works, project competitions or related services (Construction Management, Health and Safety coordination, Quality Control, etc.). This Law indicates that "the contracting bodies may require the use of specific electronic tools, such as Digital Modeling of Construction Information (BIM) tools or similar tools". Therefore, the Public Sector Contract Law 9/2017 allows, but does not oblige public bodies to require the use of the BIM methodology in public tenders by including it in the specifications, either as a requirement within technical solvency, requirement of valuation of the offer or extraordinary additional benefit.

All this has led to the creation of an Interministerial Commission according to Royal Decree 1515/2018 dated December 28, 2018, so that the implementation of information modeling for construction (BIM Methodology) in public procurement allows effective and safe action in the General State Administration and the entities that make up its institutional public sector that must apply this regulation (RD_1515/2018).

With this new legislation, it is established that public procurement must comply with current legislation, which may be state, regional and / or local.

**Catalonia**

The Generalitat de Catalunya, in 2016, created the Interdepartmental Commission for the Implementation of BIM in public works, almost three years later, it became the first region in Spain in which BIM is mandatory for projects and works of a certain size. This obligation is determined by the Decree of the Government of Catalonia of December 11, 2018, which aims to improve and increase the quality in the construction process and, ultimately, in the buildings and public works promoted by the Administration of the Generalitat of Catalonia and its public sector, improving efficiency in the use of resources. The Generalitat grants a moratorium for the entry into force of the decree, being BIM mandatory from June 11, 2019 for those contracts with a minimum budget of 5.5 million euros, for works and public works concessions, and 221,000 euros for supply and service contracts.

**Andalusia**

The Governing Council of the Junta de Andalucía, in November 2019, approves a report from the Ministry of Development which sets out the progress and the commitment to implement the BIM Methodology in new infrastructure projects, especially in works of the Andalusian subway. The uses of BIM models are required in public tenders, such as: centralized information, modeling of existing conditions, engineering analysis, 3D coordination, 4D planning, 5D measurement and cost traceability, 6D environmental footprint, generation of virtual views (VR), augmented reality (AR) and 7D asset management, among others.

To achieve the integration of the BIM Methodology, the Public Works Agency of the Junta de Andalucía (AOPJA) has incorporated two key documents on the BIM requirements and a standard template for technical specifications that are made available on this AOPJA website (AOPJA, 2019).

Even though BIM is not mandatory in Spain (except for Catalonia), more and more public bodies of any scope (national, regional or local) have decided to require the use of BIM in their projects and works, either as a requirement or as a valuable element in the offer. Among these organizations, it is worth highlighting those that have also started an internal BIM implementation process, such as ADIF, AENA, Renfe, Correos, Puertos del Estado or Ferrocarrils de la Generalitat Valenciana.

This is reflected in the growing increase in public tenders with BIM requirements, reaching the figure of 351 at the end of 2019, which represents a growth of more than 70% compared to the previous year, according to data provided by buildingSMART Spain and the Observatory of Public Tenders of esBIM.

**Standardization in BIM**

The use of standards for the application of the BIM methodology is essential, to regulate and clarify the application of BIM depending on the type of project. Needs will be marked by the type of action and specialty, building or infrastructure, and the best alignment between the objectives pursued must be established, as well as the potential for using the methodology. The standards provide a framework by which to operate through the methodology.

Regarding standards and how they influence projects, on the one hand, we have the ISO regulations as a current reference and that to a greater or lesser extent seek to standardize the use of BIM. Broadly speaking, we can cite the most important ones such as ISO_16739: 2013 where the IFC is established as a format for data transmission in the construction industry. ISO 12006-2 that defines the framework

for the development of classification systems for the construction sector. Under this framework, the British on the one hand developed the Uniclass (2015) and on the other hand the Americans developed the OmniClass® (2020). Point out that, in the cultural context and the way of understanding projects in Spain, the use of both Anglo-Saxon classification systems does not quite fit. For this reason, in Spain the GuBIMClass (2020) is being used as a reference, this being a system devised by the Gubimcat - group of BIM Users of Catalonia, with the aim of meeting the needs of the construction industry in Spain.

Within the ISO standards, even already adapted to the context of Spanish standardization, is the current UNE-EN_ISO_19650-1:2019, which establishes the regulations to organize and digitize information in building and civil engineering works that use BIM. The standard contemplates the definition of the generation, verification, and exchange of information processes between the agents that are part of the projects.

## 2.2. Regulatory framework of application to the use of drones

The use of the technology offered by drones to improve the building processes and control of the works is expected to be very favourable for the agents involved in the construction sector, however, any use of this type of technology collides with the current one legislation because since 2014 drones are not allowed to fly in urban areas and over crowds of people. The State Agency for Aviation Safety (Aesa), dependent on the Ministry of Development, has been working on the regulatory change, to allow the flight of drones of less than 10 kilos overpopulated areas, at a maximum of 100 meters from distance from the pilot and at a maximum height of 120 meters.

The use of drones is increasingly present in all labour sectors and the construction sector is not far behind and is committed to this technology to improve building processes and control of works. The sector defends the use of this technology to maximize the maintenance and rehabilitation of buildings, improving the work of technicians to assess The use of drones is growing at a spectacular rate, which is why every year there is a greater need to regulate their use, currently the drone industry in Spain and in Europe is governed by new European regulations (RD_2019/945) that legislates its use providing much more clarity than any previous regulation. Although, it has been in force since its publication in 2019, it is not until this year 2021 when its progressive application begins. And, although the first changes were initially planned for July 1, the situation caused by the health crisis of COVID-19, has forced to delay the times. The new Implementing Regulation 2020/746 (RE_2020/746), which modifies the dates indicated in RE 2019/947 (RE_2019/947), sets new deadlines adapted to the current situation, where it is indicated that the new regulations will be of application from January 1, 2021.

This new drone law establishes, among its new requirements, the obligation to check the geographical areas defined by AESA, where a drone can be flown and under what conditions. In addition to requiring an operational authorization, which implies carrying out a safety study with its consequent risk mitigation and that AESA validates it to approve the operation, specific training will also be needed.

## 3. Conservation of industrial heritage in Spain

In Spain, industrial heritage and its traces on the territory have become new cultural assets and an active resource to promote sustainable development programs at local and regional level. These assets are inserted into a specific landscape, and it is increasingly necessary to interpret heritage not as an isolated element, but in its territorial context. The heritage of industrialization, with fragile and vulnerable elements, must be considered as a new cultural asset represented and interpreted through an updated, integrated and scientific reading.

The value of industrial heritage does not reside so much in its economic or aesthetic values, but in that it is history, society and technique. In industrial landscapes remains the trace of the testimonies and the processes originated by societies that have already disappeared, each industrial installation has a character that it is necessary to keep alive in the interventions that are undertaken, avoiding the loss of identity, considering that not all rehabilitated historical buildings can be adapted to any new functionality. Industrial heritage has been the protagonist of important changes and needs careful intervention to ensure its historical identity.

Since the first Base Document was drafted in 2000, the National Industrial Heritage Plan (PNPI, 2015) has evolved, based on its own experience and in response to the needs that have been detected.

### 3.1. Regulatory framework of the National Plan for Industrial Heritage

The legal basis for the existence of National Plans is found in Law 16/1985 on Spanish Historical Heritage (Ley_16/1985), which states in section 2 of its second article that “the State Administration will adopt the necessary measures to facilitate collaboration with the other public powers and between them, as well as to collect and provide as much information as necessary ”. Section 2 of its third article also states that "the communication and exchange of action programs and information related to Spanish Historical Heritage will be facilitated by the Heritage Council".

However, the instrument of the National Conservation Plan is not defined in the law. In its article thirty-five, the Historical Heritage Law declares that “for the protection of the assets that make up the Spanish Historical Heritage and in order to facilitate citizens'

access to them, promote communication between the different services and promote the information necessary for the development of scientific and technical research, National Information Plans on the Spanish Historical Heritage will be formulated periodically ", and attributes to the Spanish Historical Heritage Council the competence to prepare and approve said plans.

On the other hand, Royal Decree 565 of April 24, 1985, which created the Institute for the Conservation and Restoration of Cultural Assets, includes among its purposes "the elaboration of plans for the conservation and restoration of the Spanish Historical Heritage" (RD_565/1985). In the successive decrees of functional reorganization of the Ministry of Culture, this function has always been maintained.

The National Conservation Plans are a synthesis of these two figures: The National Information Plans provided for in the Historical Heritage Law, competence of the Heritage Council, and the Conservation and Restoration Plans provided for in the Decree of creation of the Institute of Conservation and Restoration of Cultural Assets (ICRBC), today the Institute of Cultural Heritage of Spain.

### 3.2. National Plan for Industrial Heritage

Industrial heritage is understood to be the set of movable, immovable property and systems related to the culture of work that have been generated by the extraction, transformation, transportation, distribution and management activities generated by the economic system that emerged from the "industrial revolution". These assets must be understood as an integral whole composed of the landscape in which they are inserted, the industrial relations in which they are structured, the architectures that characterize them, the techniques used in their procedures, the files generated during their activity and their practices of symbolic character.

Industrial heritage has its own interdisciplinary methodology called Industrial Archaeology. This scientific discipline studies and values the material and immaterial vestiges as historical testimonies of the production processes. Its study brings us closer to a better understanding of the structures and processes that have generated the development of technical-industrial societies, their energy sources, their places and workspaces, their productive organization and their way of responding to an economy based on in the mechanization of production processes.

Industrial heritage is an integral heritage, a faithful reflection of the concept and objectives of Industrial Archaeology, we must admit as an object of this heritage: the industrial landscape (whether in an urban or rural context), the monument or real estate, the artifact or the machine, the document and the testimonies in the ways of seeing and understanding life in industrial activities. Five fields of work that are

fundamental in the analysis and valuation of an industrial asset; In which many disciplines of a scientific, historical and artistic nature influence, disciplines that rely on methods and sources, old and new, and through them we must approach these heritage objects. Interdisciplinarity and therefore, global interpretations and applications of the object of study.

The Industrial Heritage Plan will include all the architectural or technological manifestations of the extraction, production, transformation, management, transport, distribution or consumption activities, together with the necessary equipment for the performance of these functions (housing, warehouses and healthcare facilities or educational ...) as well as documentary sources (written, graphic and oral), but always within the context and historical process of which they are part.

The justification for arbitrating a National Plan for Industrial Heritage lies in the need to protect and preserve a heritage that, due to its own specificity, is rapidly deteriorating and is liable to disappear. The first industrial heritage plan (2001) had as its main objective to detect the main industrial heritage assets of the Autonomous Communities susceptible of an investment for their preservation or reuse, integrating them into the inventory of real estate of the historical heritage of Spain (Inventario, 2021). In this second phase, it is necessary to reflect on the real state of the industrial heritage by compiling the information available in the different autonomous communities to then implement the actions to be followed.

The National Plan for Industrial Heritage constitutes an action strategy endowed with a common methodological framework under which the coordinated action of any public administration, private entities and society in general is proposed. This necessarily requires a high degree of coordination so that the participation of any of them occurs in an appropriate way, with the knowledge of all the agents, and consistent with the best conservation of the assets.

**4. Life cycle of materials**

The new European directive on energy efficiency of buildings, hardens its objectives in search of the elimination of the use of fossil fuels, for this, the directive raises some innovative proposals towards the digitization of energy systems as an opportunity to save energy during use (Directiva_2018/844/UE). The latest data from the European Commission on circular economy establishes that avoiding the production of waste, promoting ecological design as well as the reuse of waste, will provide EU companies with savings of around 8% of annual turnover and an annual reduction in greenhouse gas emissions of between 2 and 4% (European Commission, 2019). In this sense, LCA (Life Cycle Analysis) assesses environmental loads throughout the life cycle of a product, service or work. The International Standards Organization (ISO) creates subcommittee

SC 5 with the purpose of developing international standards to regulate the methodology for calculating universal indicators on the environment. The study of the complete cycle includes the stages of extraction and processing of raw materials, production, transport and distribution, use, reuse and maintenance, recycling and final disposal. LCA studies comply with the following standards: UNE-ISO 14040 Environmental management. Life cycle analysis. Principles and reference framework (ISO_14040:, 2006) and UNE-ISO 14044Environmental management. Life cycle analysis. Requirements and guidelines (ISO_14044:, 2006). Through this standardization of the LCA calculation and considering the current boom in BIM technology, which allows all project information to be centralized in a digital information model, they make it the ideal tool to implement the analysis. of life cycle and thus lay the foundations of a model that allows the ideals of circular economy to take root in the construction sector.

4.1. Regulatory framework

The methodology to establish the Environmental Product Declaration (EDP) assumes the UNE-EN_ISO_14025 (Labelling Type III: Environmental Product Declarations). In Spain, later appears the UNE-EN_15804 that establishes Product Category Rules (PCR), and allows for defining the common rules to perform a specific DAP for product families. In 2018, the UNE-CEN ISO/TS 14027:2018 standard was approved for the development of these PCRs.

**Europe**

European initiative of Single Market for Green Products.
Resolution 2014/2208 (INI) about the efficient use of resources: move towards the circular economy: “The European Parliament, (…) urges the Commission to propose, by the end of 2015, a main indicator and a set of sub-indicators about efficient use of resources, also in ecosystem services; it noted that the use of these harmonised indicators must be legally binding form 2018 and these must measure the consumption of resources, including the imports and exports a EU level, Member States and the industry, and consider all the life cycle of products and services, and has to be based on the ecological footprint methodology and measure of, at least, the land, water, materials and carbon use”.
Environmental procurement. Handbook on Green Public Procurement.
Regulation 305/2011 of Construction Products. For the evaluation of the sustainable use of the resources and environmental impact of construction work must use the environmental product declaration, when available.

**Spain**

Royal Decree 187/2011 establishing the requirements of ecological design including coverage of all energy-related product – Article 10 "Presumption of conformity and harmonised standards": "(…) Likewise the Environmental Product Declarations (EPD) will be recognised by bodies which administer programs of these ecological labels Type III according to the standard «UNE-EN ISO 14025» provided that such Environmental Product Declaration are in compliance with the requirements of ecological design of applicable implementing measures"

**Catalonia**

Decree 21/2006 – Paragraph 6.2: At least one family of products used in the construction of the building, understanding as a family the set of products destined to the same use, will have to have a Distinctive of guarantee of environmental quality of the Government of Catalonia, Ecological Label of the European Union, AENOR Environmental label, or any other type I of ecological label, according to the UNE-EN ISO 14024/2001 or type III, in accordance with the UNE 150025/2005 IN standard.

# SPANISH REGULATIONS REGARDING NEW TECHNOLOGIES IN THE BUILT ENVIRONMENT

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| **Tecnología BIM** | **BIM technology** |
| Directiva 2014/24/UE del Parlamento Europeo y del Consejo, de 26 de febrero de 2014, sobre contratación pública y por la que se deroga la Directiva 2004/18/CE. Available online: https://www.boe.es/buscar/doc.php?id=DOUE-L-2014-80598 | Directiva 2014/24/UE del Parlamento Europeo y del Consejo, de 26 de febrero de 2014, sobre contratación pública y por la que se deroga la Directiva 2004/18/CE. Available online: https://www.boe.es/buscar/doc.php?id=DOUE-L-2014-80598 |
| Ley 9/2017 del 8 de noviembre, de Contratos del Sector Público, por la que se transponen al ordenamiento jurídico español las Directivas del Parlamento Europeo y del Consejo 2014/23/UE y 2014/24/UE, de 26 de febrero de 2014. | Law 9/2017 of November 8, on Public Sector Contracts, by which the Directives of the European Parliament and of the Council 2014/23 / EU and 2014/24 / EU, of February 26, 2014 are transposed into the Spanish legal system. |
| RD_1515/2018. Real Decreto 1515/2018, de 28 de diciembre, por el que se crea la Comisión Interministerial para la incorporación de la metodología BIM en la contratación pública. Available online: https://www.boe.es/buscar/doc.php?id=BOE-A-2019-1368 | RD_1515 / 2018. Real Decreto 1515/2018, de 28 de diciembre, por el que se crea la Comisión Interministerial para la incorporación de la metodología BIM en la contratación pública. Disponible en línea: https://www. boe. es/buscar/doc. php?id=BOE-A-2019-1368 |
| Requerimientos BIM (EIR), tipos exigidos para pliegos de licitación de redacción de proyectos y ejecución de obras (anexo 1 del PTP). Cons. Fomento, Infraestructuras y Ord. del Territ. Available online: https://www.aopandalucia.es/principal.asp?alias=bim | BIM Requirements (EIR), types required for bidding documents for the drafting of projects and execution of works (Annex 1 of the PTP). Ministry of Development, Infrastructures and Spatial Planning. Available online: https://www.aopandalucia.es/principal.asp?alias=bim |
| Plantilla del plan de ejecución BIM, tipo exigido para pliegos de licitación de redacción de proyectos y ejecución de obras (anexo 2 del PTP). Cons. Fomento, Infraestructuras y Ord. del Territ. Available online: https://www.aopandalucia.es/principal.asp?alias=bim | Template of the BIM execution plan, type required for bidding documents for the drafting of projects and execution of works (Annex 2 of the PTP). Ministry of Development, Infrastructures and Spatial Planning. Available online: https://www.aopandalucia.es/principal.asp?alias=bim |

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| Modelo de informe de supervisión del plan de ejecución BIM (peb) de proyectos y obras. Consejería de Fomento, Infraestructuras y Ordenación del Territorio. Available online: https://www.aopandalucia.es/principal.asp?alias=bim | Supervision report model for the BIM execution plan (peb) of projects and works. Ministry of Development, Infrastructures and Spatial Planning. Available online: https://www.aopandalucia.es/principal.asp?alias=bim |
| ISO_16739: 2013 Industry Foundation Classes (IFC) para el intercambio de datos en las industrias de construcción y gestión de instalaciones Available online: https://www.iso.org/standard/51622.html | ISO_16739: 2013 Industry Foundation Classes (IFC) para el intercambio de datos en las industrias de construcción y gestión de instalaciones Available online: https://www.iso.org/standard/51622.html |
| ISO 12006-2 Building construction -- Organization of information about construction works -- Part 2: Framework for classification; 2015 | ISO 12006-2 Building construction -- Organization of information about construction works -- Part 2: Framework for classification; 2015 |
| Uniclass Classification structure for all disciplines in the construction industry. Available online: https://www.thenbs.com/our-tools/uniclass-2015 | Uniclass Classification structure for all disciplines in the construction industry. Available online: https://www.thenbs.com/our-tools/uniclass-2015 |
| OmniClass® Classification system for the construction industry Available online: https://www.csiresources.org/standards/omniclass | OmniClass® Classification system for the construction industry Available online: https://www.csiresources.org/standards/omniclass |
| GuBIMClass Sistema de clasificación de elementos BIM Available online: https://gubimclass.org/es/ | GuBIMClass Classification system for BIM elements Available online: https://gubimclass.org/es/ |
| UNE-EN_ISO_19650-1:2019 Organización y digitalización de la información en obras de edificación e ingeniería civil que utilizan BIM (Building Information Modelling). Gestión de la información al utilizar BIM (Building Information Modelling). Parte 1: Conceptos y principios. Available online: https://www.une.org/encuentra-tu-norma/busca-tu-norma/norma?c=N0062137 | UNE-EN_ISO_19650-1:2019 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 1: Concepts and principles. Available online: https://www.une.org/encuentra-tu-norma/busca-tu-norma/norma?c=N0062137 |
| **Uso de drones** | **Use of drones** |
| RD_2019/945 Reglamento delegado (UE) 2019/ 945 de la comisión de 12 de marzo de 2019 - sobre los sistemas de aeronaves no tripuladas y los operadores de terceros países de sistemas de aeronaves no tripuladas; Comisión Europea | RD_2019 / 945 Commission Delegated Regulation (EU) 2019/945 of March 12, 2019 - on unmanned aircraft systems and third country operators of unmanned aircraft systems; European Comission. |

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| RE_2020/746 Reglamento de ejecución (UE) 2020/746 de la comisión de 4 de junio de 2020 por el que se modifica el Reglamento de Ejecución (UE) 2019/947 en lo que respecta al aplazamiento de las fechas de aplicación de determinadas medidas en el contexto de la pandemia de COVID-19. Available online: https://www.boe.es/doue/2020/176/L00013-00014.pdf | RE_2020 / 746 Implementing Regulation (EU) 2020/746 of the commission of June 4, 2020 amending Implementing Regulation (EU) 2019/947 with regard to the postponement of the dates of application of certain measures in the context of the COVID-19 pandemic. Available online: https://www.boe.es/doue/2020/176/L00013-00014.pdf |
| RE_2019/947 Reglamento de ejecución (UE) 2019/947 de la comisión de 24 de mayo de 2019 relativo a las normas y los procedimientos aplicables a la utilización de aeronaves no tripuladas Available online: https://www.boe.es/doue/2019/152/L00045-00071.pdf | RE_2019 / 947 Implementing Regulation (EU) 2019/947 of the commission of May 24, 2019 on the rules and procedures applicable to the use of unmanned aircraft. Available online: https://www.boe.es/doue /2019/152/L00045-00071.pdf |
| **Conservación del patrimonio industrial** | **Conservation of industrial heritage** |
| Plan Nacional de Patrimonio Industrial. Ministerio de Educación, Cultura y Deporte. Edita la secretería general técnica, Subdirección General de Documentación y Publicaciones. NIPO: 030-16-423-2; 2015 | National Plan for Industrial Heritage. Ministry of Education, Culture and Sports. It publishes the general technical secretariat, Subdirectorate General for Documentation and Publications. NIPO: 030-16-423-2; 2015 |
| Ley 16/1985, de 25 de junio, del Patrimonio Histórico Español. Jefatura del Estado 1985. | Law 16/1985, of June 25, on the Spanish Historical Heritage. Head of State 1985 |
| Real Decreto 565/1985, de 24 de abril, por el que se establece la estructura orgánica básica del Ministerio de Cultura y de sus Organismos autónomos. Presidencia del Gobierno, 1985. | Royal Decree 565/1985, of April 24, which establishes the basic organic structure of the Ministry of Culture and its autonomous bodies. Presidency of the Government, 1985. |
| **Ciclo de vida de los materiales de construcción** | **Life cycle of building materials** |
| UNE-EN ISO 14025:2010. Etiquetas y declaraciones ambientales. Declaraciones ambientales tipo III. Principios y procedimientos. | UNE-EN ISO 14025:2010. Environmental labels and declarations. Type III environmental declarations. Principles and procedures. |
| UNE- EN ISO 14020:2002 Etiquetas ecológicas y declaraciones ambientales. Principios generales. | UNE-EN ISO 14020:2002 Environmental labels and declarations. General principles. |
| UNE-EN 15804:2012+A1:2014. Sostenibilidad en construcción. Declaraciones Ambientales de producto. Reglas básicas de categorías de productos de construcción. | UNE-EN 15804:2012+A1:2014. Sustainability in construction. Environmental Declarations of product. Core rules for the product category of construction products. |

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| UNE-CEN/TR 16970:2016 (Ratificada). Sostenibilidad en la construcción. Directrices para la implementación de la norma EN 15804 (Ratificada por la Asociación Española de Normalización en enero de 2017.) | UNE-CEN/TR 16970:2016. Sustainability of construction works - Guidance for the implementation of EN 15804 (Endorsed by Asociación Española de Normalización in January of 2017.) |
| UNE-CEN ISO/TS 14027:2018. Etiquetas y declaraciones ambientales. Desarrollo de reglas de categoría de producto. | UNE-CEN ISO/TS 14027:2018. Environmental labels and declarations - Development of product category rules. |
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