

P6.4  
Technical, economic,  
and environmental  
information to be  
included in official  
recognized tools for  
policy  
implementation.



## PROJECT CONTEXT

<b>Project acronym</b>	IMIP
<b>Project title</b>	Innovative Eco-Construction System Based on Interlocking Modular Insulation Wood & Cork-Based Panels
<b>Project code</b>	SOE3/P3/E0963
<b>Coordinator</b>	Universitat Politècnica de València (UPV), Instituto ITACA
<b>Duration</b>	1 May 2020 – 30 April 2023 (36 months)
<b>Working Package (WP)</b>	WP.6 Dissemination and transfer of knowledge
<b>Product</b>	P6.4 Technical, economic, and environmental information to be included in official recognized tools for policy implementation
<b>Summary</b>	The deliverable explains the implementation of the IMIP panels in National Recognised Official tools developed by IVE <sup>1</sup> .
<b>Delivery date</b>	03/2023
<b>WP Leader</b>	UPV
<b>Activity coordinator</b>	IVE
<b>Main authors</b>	Villanova Civera, I. <sup>1</sup>
<b>Contributing authors</b>	Lázaro Moreno C. <sup>1</sup> ; Romero Clausell, J. <sup>1</sup> , Pla Alabau F. <sup>1</sup> ; Navarro Escudero M. <sup>1</sup> , Valero Escribano V. <sup>1</sup>
<b>Document ID</b>	IMIP_P6.4_Official tools

<sup>1</sup> Valencian Institute of Building, IVE.

## PARTNERS



Universitat Politècnica de València  
 Instituto Universitario de las Tecnologías de la Información y Comunicaciones  
 Information and Communications Technologies versus Climate Change



Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, Centro Nacional – Instituto de Ciencias Forestales - Departamento de Productos Forestales (ICIFOR-INIA, CSIC)



Institut Technologique Forêt Cellulose Bois-construction Ameublement (FCBA)



Universitat Politècnica de Catalunya, Barcelona Tech



Asociación de Investigación Técnica de las Industrias de la Madera (AITIM)



Agencia Andaluza de la Energía (AAE)



Instituto Valenciano de la Edificación  
 Fundación de la Comunitat Valenciana (IVE)



Instituto Superior de Agronomía (ISA)



Pôle de Compétitivité XYLOFUTUR XYLOFUTUR  
 PROD MAT FORETS CULTIVEES (Xylofutur)

## ASSOCIATED PARTNERS



ESPADAN CORKS SLU (EC)



Comité de Développement Forêt Bois Aquitaine  
(CODEFA)



Observatòri de la Sostenibilitat d'Andorra (OSA)

# CONTENT

---

<i>PROJECT CONTEXT</i> .....	<i>I</i>
<i>PARTNERS</i> .....	<i>II</i>
<i>ASSOCIATED PARTNERS</i> .....	<i>III</i>
<b>CONTENT</b> .....	<b>I</b>
<b>INTRODUCTION</b> .....	<b>1</b>
<b>OBJECTIVES</b> .....	<b>2</b>
<b>NATIONAL RECOGNISED TOOLS</b> .....	<b>3</b>
CONSTRUCTION PRICE BANK (BDC) .....	3
CATALOGUE OF CONSTRUCTION ELEMENTS (CEC).....	4
<b>IMPLEMENTATION IN THE CONSTRUCTION PRICE BANK (BDC)</b> .....	<b>5</b>
IMIP PANEL COMBINATIONS .....	5
JOB ITEMS .....	8
<i>Type A (Roof)</i> .....	8
<i>Type B (Sandwich)</i> .....	10
<i>Type C (Slab / Floor)</i> .....	11
<i>Type D (Wall / Façade)</i> .....	12
SUMMARY .....	13
<b>IMPLEMENTATION IN THE CATALOGUE OF CONSTRUCTION ELEMENTS (CEC)</b> .....	<b>14</b>
USER-DEFINED EXAMPLES .....	15
<i>Type B (Sandwich)</i> .....	15
<i>Type D (Wall / Façade)</i> .....	17
SUMMARY .....	19

---

## INTRODUCTION

---

Information on IMIP products should be included in officially recognized tools and documents for policy implementation in order to facilitate their introduction in the market.

This is, for example, the case of the construction price bank developed by IVE. Many professionals use this type of construction prices database to select technical, economic, and environmental information on building systems to be implemented in their construction projects. Therefore, it is essential to generate this information and include it in these recognized tools and documents so that specifiers can include these products in their projects.

## OBJECTIVES

---

IMIP products will be implemented in official tools and documents recognised by public administrations developed by the Valencian Institute of Building (IVE) to facilitate:

- Knowledge transfer
- Introduction into the market
- Use of IMIP products for prescribers
- Implementation of energy efficiency policies

## NATIONAL RECOGNISED TOOLS

---

There are two tools developed in the IVE that fit into the achievement of the above-mentioned objectives:

### Construction Price Bank (BDC)

Construction professionals use price banks to select technical, economic, and environmental information on building systems to be implemented in their projects. It is therefore essential to generate this information and include it in the bills of quantities so that prescribers can include these products.

The bills of quantities are made in construction management programs. To facilitate the communication between different programs, bills of quantities and price banks, in Spain has been developed a standard exchange format, created by the association FIEBDC-3, being the file extension of the format the BC3. The Construction Price Bank developed in IVE (BDC by its Spanish acronym) follows this standard format.

The BDC can be installed in local computers or used in its online version, in both cases for its use together with standard compatible construction management programs. This price bank is an officially recognised one and it is also widely used in projects of public contracts for making bills of quantities.

The BDC online is free for consultation and can be accessed through this link:

<https://bdc.f-ive.es/>





## Catalogue of Construction Elements (CEC)

Construction professionals need to know how to choose from different constructive solutions for a better fitting in the needs of their projects. The Catalogue of Construction Elements (CEC by its Spanish acronym) gives the professionals an easy way to look for the constructive solution they need, design user-defined elements that do not come preloaded in the catalogue, automatically calculate their physical properties and the possibility of export the desired solution into IFC format for implementing all the information in a BIM project.

The CEC is an online tool, free for consultation and use and can be accessed through this link:

<https://cec.f-ive.es/>



## IMPLEMENTATION IN THE CONSTRUCTION PRICE BANK (BDC)

---

First, all the IMIP panel combinations need to be defined.

### IMIP panel combinations

This chart shows all the types of IMIP panels.

Type	Product	Number of combinations	Type Board 1	Thickness Board 1 (mm)	Type Inner	Thickness inner (mm)	Type Board 2	Thickness Board 2 (mm)
A	Roof	6	CLT-OSB	46	Cork	100	CLT-OSB	46
			CLT-OSB	46	Cork + ribs	200	OSB	18
			CLT	60	Cork + ribs	200	OSB	18
			CLT	100	Cork + ribs	200	OSB	18
			CLT	120	Cork + ribs	200	OSB	18
			CLT	140	Cork + ribs	200	OSB	18
B	Sandwich (partition / small span roof)	1	CLT-OSB	46	Cork	100	CLT-OSB	46
C	Slab / Floor	25	CLT-OSB	46	Cork + ribs	200	CLT-OSB	46
			CLT	60	Cork + ribs	200	CLT	60
			CLT	100	Cork + ribs	200	CLT	100
			CLT	120	Cork + ribs	200	CLT	120
			CLT	140	Cork + ribs	200	CLT	140
D	Wall / Façade	25	CLT-OSB	46	Cork	60	---	---
			CLT	60	Cork	80	---	---
			CLT	100	Cork	100	---	---
			CLT	120	Cork	120	---	---
			CLT	140	Cork	140	---	---

The Type A has 6 different combinations, so it can be a parametric job item in the price bank. The Type B has only one combination, thus it cannot be a parametric job item. The Type C and Type D have combinations between more than one variable; thus, they must be parametric job items.

A parametric job item has the advantage of condensing in a simple way many job items, facilitating the work of the prescribers.

Combinable variable parameters are marked in blue in the chart. And the Type B Sandwich can be used as a partition or as a small span roof.

The price bank is programmed in the FIEBDC-3 standard; thus, the file extension in which it will be distributed is BC3. This is the appearance of the IMIP panels price bank imported in a compatible construction management program:

Item	Código	UM	Resumen	Precio	Medida	Disponibilidad	Info
EEFM10\$	m2	Forjado panel prefabricado madera y corcho					
EEFM11\$	m2	Cubierta panel prefabricado madera y corcho					
EEMM.0\$	m2	Cerramiento panel prefabricado madera y corcho					
EPPM.4a	m2	Partición panel sándwich prefabricado CLT-OSB 46 + corcho 100 + CLT-OSB 46 mm	219,00				

All the 57 IMIP panels have been condensed in just 3 parametric job items and a non-parametric one.

In the price bank, this is the information provided for each job item from the previous chart:

- Summary
- Description
- Units of measure
- Unit price
- Break down
  - Unit concepts (labour, material, ancillary direct costs)
  - Quantities

This information is the required for the bills of quantities according to the regulations of construction projects.

The price bank will be included in the next BDC edition (BDC23), and each job item will have a unique URL with all its information.

**IVE** INSTITUTO IBERO-AMERICANO DE INVESTIGACIÓN Y FORMACIÓN EN LA EDIFICACIÓN Base de datos de construcción

Iniciar sesión ?

**BDC IVE 2022** BDC IVE 2009 BDC IVE 2010 BDC IVE 2011 BDC IVE 2012 BDC IVE 2013 BDC IVE 2014 BDC IVE 2015 BDC IVE 2016 BDC IVE 2017 BDC IVE 2018 BDC IVE 2019 BDC IVE 2020 BDC IVE 2021 BDC IVE 2022

Jul. 2022 EE - Estructuras | EEF - Forjados y losas | EEFM - Madera

Alicante

Buscar

Código	Unidad	Resumen	Precio unitario
EEFM.1\$	m2	Forjado vigueta madera	
EEFM.2\$	m2	Entablado de forjado	
EEFM.3\$	m2	Entablado panel sandwich forjado	
EEFM.4\$	m2	Forjado panelado estructural (CLT)	
EEFM.5\$	m2	Entramado vigueta madera	
EEFM.6\$	m2	Tablero aglomerado partículas en forjado	
EEFM.7\$	m2	Tablero OSB en forjado	
EEFM.8\$	m2	Tablero fibras en forjado	
EEFM.9\$	m2	Tablero contrachapado en forjado	

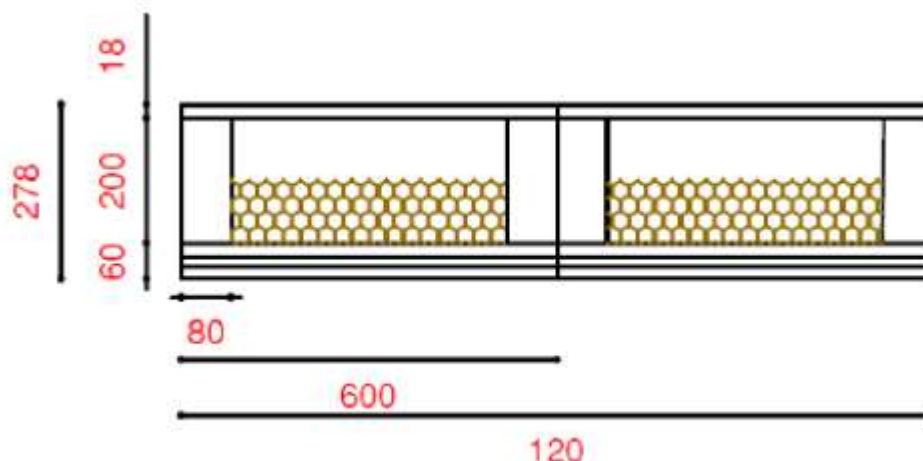
## Job items

Each job item is being described in the following sections.

### Type A (Roof)

In the price bank, the summary of this job item is “Prefabricated wood and cork panels for roofs” and its code is EEFM11\$. The dollar sign represents that the job item is parametric. That means that after selecting from the corresponding parameters all the information regarding the selection is given.

For example, in a IMIP roof panel with this composition:



The parametric options for that composition are: CLT60 mm + Cork+ribs 200mm + OSB 18mm. After selecting in the parametric job item these parameters, a unique code and all its related information is shown at the tool:

**EEFM1** 20

Paramétrico **Combinaciones Validas** Derivados Destacados

	TABLERO INFERIOR (mm): CLT 60	INTERIOR (mm): corcho con costillas 200	TABLERO SUPERIOR (mm): OSB 18
a	<input type="radio"/> CLT-OSB 46	<input type="radio"/> corcho 100	<input checked="" type="radio"/> OSB 18
b	<input checked="" type="radio"/> CLT 60	<input checked="" type="radio"/> corcho con costillas 200	<input type="radio"/> CLT-OSB 46
c	<input type="radio"/> CLT 100		
d	<input type="radio"/> CLT 120		
e	<input type="radio"/> CLT 140		

**EEFM11bba · m2 · Cubierta de panel prefabricado CLT 60 + corcho con costillas 200 + OSB 1...** 218,35 Utilidades

Cubierta de panel prefabricado de dimensiones 1200 x 6000 mm, compuesto por tablero inferior CLT de 60 mm de espesor, capa interior de corcho con costillas de madera de 200 mm de espesor y tablero superior OSB de 18 mm de espesor, incluido suministro y montaje.

Descomposición **Otros Textos** Programa

Tipo	Código	Ud.	Resumen	Precio	Cantid...	Importe
	PFPM.3bbfb	m2	Panel prefabricado cubierta CLT 60 + corcho con costillas 200 + OSB 18 mm	182,29	1,000	182,29
	MOOC.8a	h	Oficial 1ª carpintería	24,44	0,500	12,22
	MOOC10a	h	Ayudante carpintería	19,18	0,500	9,59
	PBUT31a	cu	Pequeños elementos fijación madera	38,87	0,060	2,33
	PFTZ21a	u	Herrajes estructura madera	21,83	0,350	7,64
	%		Costes directos complementarios	214,07	0,020	4,28

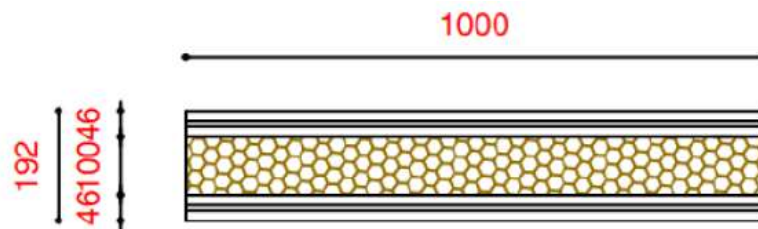
In the BDC online, the direct link to that job item would be:

[https://bdc.f-ive.es/BDC23/1/EEFM11\\$/bba](https://bdc.f-ive.es/BDC23/1/EEFM11$/bba)

## Type B (Sandwich)

In the price bank, the summary of this job item is “Sandwich for partitions or small spans roofs” and its code is EFPM.4a. Since it does not have a dollar sign that job item is non-parametric. That means that all the information is given just by consulting its data.

This IMIP panel has this composition:



All its related information is shown at the tool:

Código	Ud	Resumen	Precio	Reserva...	Importe	%	Info
MOOC.8a	h	Oficial 1ª carpintería	24,44	0,280	6,84	3.1 %	
MOOC10a	h	Ayudante carpintería	19,18	0,320	6,14	2.8 %	
PBUT31a	cu	Pequeños elementos fijación madera	38,87	0,060	2,33	1.1 %	
PFFPM.3dacc	m2	Panel prefabricado sándwich partición CLT-OSB 46 + corcho 100 + CLT-OSB 46 mm	191,76	1,000	191,76	87.0 %	
PFTZ21a	u	Herrajes estructura madera	21,83	0,350	7,64	3.5 %	
%		Costes directos complementarios		0,020	4,29	2.0 %	
			<b>214,71</b>	<b>0,020</b>	<b>4,29</b>	<b>2.0 %</b>	

menf2 - Ventana de textos

**EFPM.4a · Partición panel sándwich prefabricado CLT-OSB 46 + corcho 100 + CLT-OSB 46 mm** 237

Descripción larga

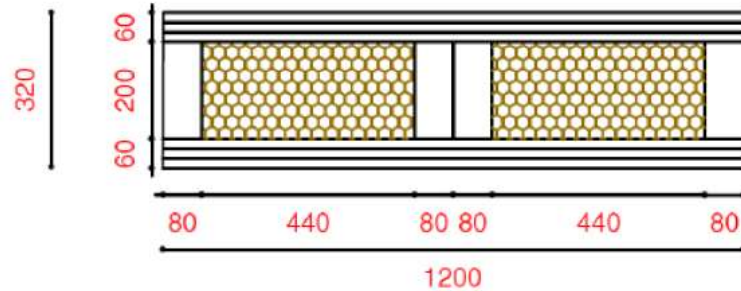
Partición de panel sándwich prefabricado de dimensiones 1000 x 2000 mm, compuesto por tablero CLT-OSB de 46 mm de espesor, capa interior de corcho de 100 mm de espesor y tablero CLT-OSB de 46 mm de espesor, incluido suministro y montaje.

In the BDC online, the direct link to that job item would be:

<https://bdc.f-ive.es/BDC23/1/EFPM.4a>

## Type C (Slab / Floor)

In the price bank, the summary of this job item is “Prefabricated wood and cork panels for slabs” and its code is EEFM10\$, a parametric job item. For example:



The parametric options for that composition are: CLT60 mm + Cork+ribs 200mm + OSB 18mm. After selecting, its unique code and all its related information is shown at the tool:

**EEFM10\$ · m2 · Forjado panel prefabricado madera y corcho** 25 / 25

**Paramétrico** | Combinaciones Validas | Derivados Destacados

	TABLERO INFERIOR (mm): CLT 60	TABLERO SUPERIOR (mm): CLT 60
a	<input type="radio"/> CLT-OSB 46	<input type="radio"/> CLT-OSB 46
b	<input checked="" type="radio"/> <b>CLT 60</b>	<input checked="" type="radio"/> <b>CLT 60</b>
c	<input type="radio"/> CLT 100	<input type="radio"/> CLT 100
d	<input type="radio"/> CLT 120	<input type="radio"/> CLT 120
e	<input type="radio"/> CLT 140	<input type="radio"/> CLT140

**EEFM10bb · m2 · Forjado de panel prefabricado CLT 60 + corcho 200 con costillas + CLT 60...** 304,08 Utilidades

Forjado de panel prefabricado de dimensiones 1200 x 6000 mm, compuesto por tablero inferior CLT de 60 mm de espesor, capa interior de corcho y costillas de madera de 200 mm de espesor y tablero superior CLT de 60 mm de espesor, incluido suministro y montaje.

**Descomposición** | Otros Textos | Programa

Tipo	Código	Ud.	Resumen	Precio	Cantidad	Importe
	PFFM.3abfd	m2	Panel prefabricado forjado CLT 60 + corcho con costillas 200 + CL...	266,34	1,000	266,34
	MOOC.8a	h	Oficial 1ª carpintería	24,44	0,500	12,22
	MOOC10a	h	Ayudante carpintería	19,18	0,500	9,59
	PBUT31a	cu	Pequeños elementos fijación madera	38,87	0,060	2,33
	PFTZ21a	u	Herrajes estructura madera	21,83	0,350	7,64
%	%		Costes directos complementarios	298,12	0,020	5,96

In the BDC online, the direct link to that job item would be:

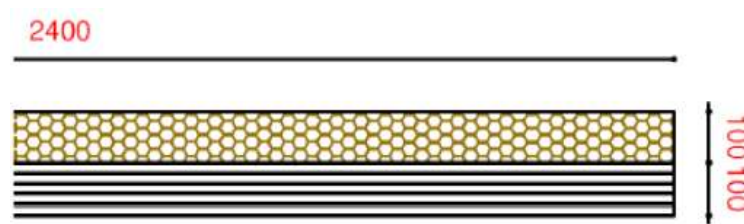
[https://bdc.f-ive.es/BDC23/1/EEFM10\\$/bb](https://bdc.f-ive.es/BDC23/1/EEFM10$/bb)



## Type D (Wall / Façade)

In the price bank, the summary of this job item is “Prefabricated wood and cork panels for slabs” and its code is EEFM.8\$, a parametric job item.

For example, in a IMIP wall panel with this composition:



The parametric options for that composition are: CLT 100mm + Cork 100mm. After selecting, its unique code and all its related information is shown at the tool:

**EEMM.:** 0 25 / 25

Paramétrico | Combinaciones Validas | Derivados Destacados

	TABLERO EXTERIOR (mm): CLT 100	INTERIOR (mm): corcho 100
a	<input type="radio"/> CLT-OSB 46	<input type="radio"/> corcho 60
b	<input type="radio"/> CLT 60	<input type="radio"/> corcho 80
c	<input checked="" type="radio"/> <b>CLT 100</b>	<input checked="" type="radio"/> <b>corcho 100</b>
d	<input type="radio"/> CLT 120	<input type="radio"/> corcho 120
e	<input type="radio"/> CLT 140	<input type="radio"/> corcho 140

**EEMM.8cc · m2 · Cerramiento de panel prefabricado CLT 100 + corcho 100 mm** 198,51 Utilidades

Cerramiento de panel prefabricado de dimensiones 2400 x 5500 mm, compuesto por tablero exterior CLT de 100 mm de espesor y capa interior de corcho de 100 mm de espesor, incluido suministro y montaje.

Descomposición | Otros Textos | Programa

Tipo	Código	Ud.	Resumen	Precio	Cantid...	Importe
	PFFM.3ccca	m2	Panel prefabricado cerramiento CLT 100 + corcho 100 mm	162,84	1,000	162,84
	MOOC.8a	h	Oficial 1ª carpintería	24,44	0,500	12,22
	MOOC10a	h	Ayudante carpintería	19,18	0,500	9,59
	PBUT31a	cu	Pequeños elementos fijación madera	38,87	0,060	2,33
	PFTZ21a	u	Herrajes estructura madera	21,83	0,350	7,64
	%	%	Costes directos complementarios	194,62	0,020	3,89

In the BDC online, the direct link to that job item would be:

[https://bdc.f-ive.es/BDC23/1/EEMM.8\\$/cc](https://bdc.f-ive.es/BDC23/1/EEMM.8$/cc)

## Summary

All the 57 IMIP panels have been condensed in just 3 parametric job items and a non-parametric one.

Type	Product	Number of combinations	BDC code
A	Roof	6	EEFM11\$
B	Sandwich	1	EFPM.4a
C	Slab / Floor	25	EEFM10&
D	Wall / Façade	25	EFMM.8\$

Each of the job items will have its own URL and will be compatible with all the construction management programs from the FIEBDC-3 association. The price bank containing the IMIP panels will be distributed in BC3 file extension.



IMIP panels will be included in the next BDC edition and will have their own unique URL.

## IMPLEMENTATION IN THE CATALOGUE OF CONSTRUCTION ELEMENTS (CEC)

The Catalogue of Construction Elements is an online tool that has preloaded constructive solutions. It also allows to create user-defined constructive solutions if the user does not find the one he needs in the preloaded ones.

For each solution the tool calculates its physical properties and allows to export the element with its properties to IFC.

The screenshot shows the 'CATÁLOGO DE ELEMENTOS CONSTRUCTIVOS' interface. It features a sidebar with navigation options like 'Proyecto', 'Criterios', 'Fichas', 'Partidas', and 'Historial'. The main area displays a table with columns for 'Tipo', 'Subtipo', 'Soluciones de Catálogo', and 'Soluciones de usuario'. The table lists two elements:

Tipo	Subtipo	Soluciones de Catálogo	Soluciones de usuario
W	W	W	W
W	W	W	W

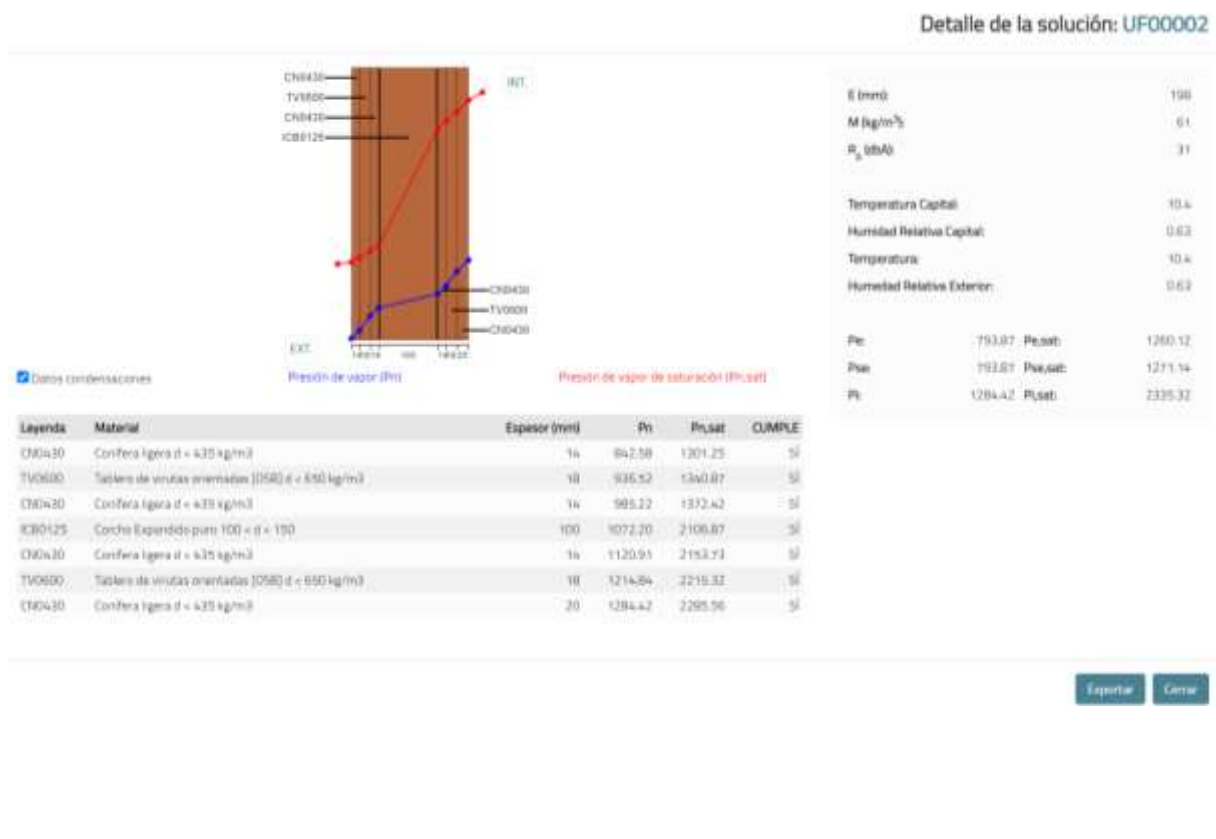
The current version of the CEC only allows the creation of IMIP panels Type B (Sandwich) and D (Wall / Façade) as user defined constructive solutions, which are given as examples.

## User-defined examples

### Type B (Sandwich)

The user can create the element layer by layer, defining the material of each layer and its thickness. Once the element is saved, the tool calculates its physical properties like:

- Density
- Thermal transmittance
- Acoustic insulation
- Vapour pressure
- Saturation vapour pressure

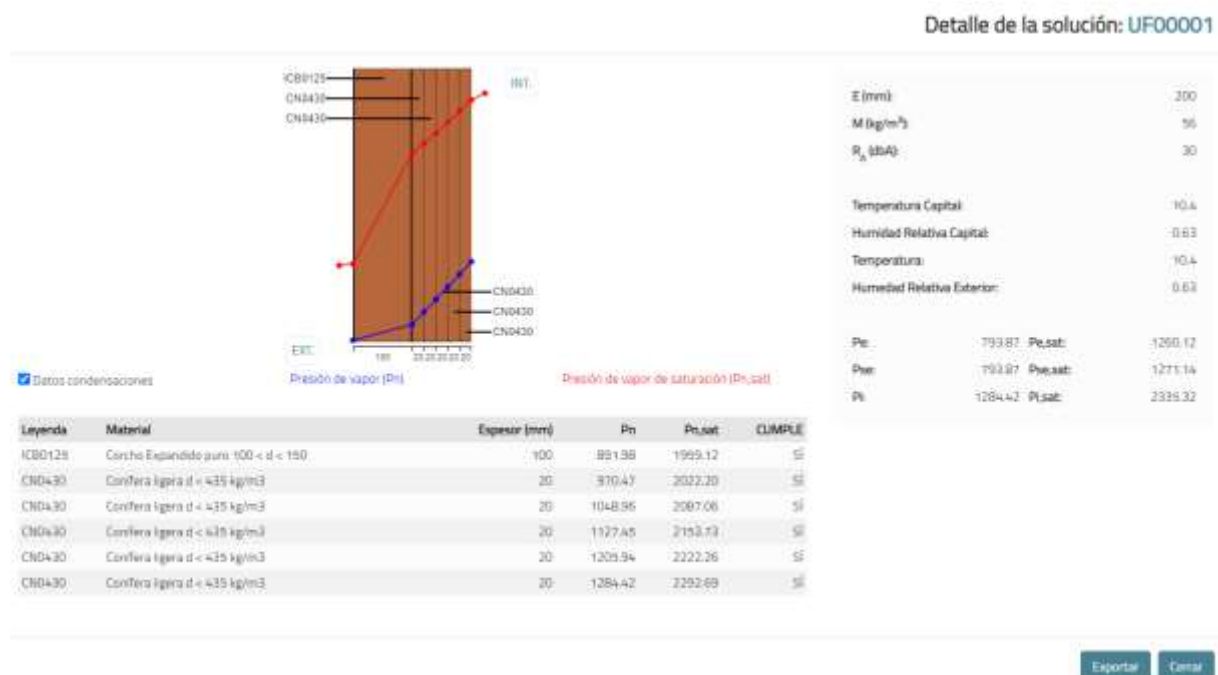




## Type D (Wall / Façade)

In the same way, the user can create this element layer by layer, defining the material of each layer and its thickness. Once the element is saved, the tool calculates its physical properties like:



- Density
- Thermal transmittance
- Acoustic insulation
- Vapour pressure
- Saturation vapour pressure





## Summary

IMIP panels can be created in the tool layer by layer as user-defined constructive solutions and the tool calculates their physical properties.

Código	Sección	E (mm)	M kg/m <sup>2</sup>	DB-HR		U (W/m <sup>2</sup> K)	DB-HE	
				R <sub>s</sub> dBA	R <sub>s,t</sub> dBA		Condensaciones Superficiales	Condensaciones Intersticiales
UFD0001		200	56	30	25	0.34	CUMPLE 0.92 > 0.52	CUMPLE
UFD0002		198	61	31	26	0.34	CUMPLE 0.92 > 0.52	CUMPLE

The user can export the constructive solutions and their properties to IFC format.



The CEC in its next version will be updated with:

- Allow user-defined constructive solutions for types A (Roof) and C (Slab / Floor).
- IMIP panels as preloaded constructive solutions.