

IMIP - WP3 PROTOTYPE TESTING

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6 AAE

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Interreg SUDOE IMIP
(SOE3/P3/E0963)

Date 18/04/2023

IMIP WP3 PROTOTYPE TESTING

objectives

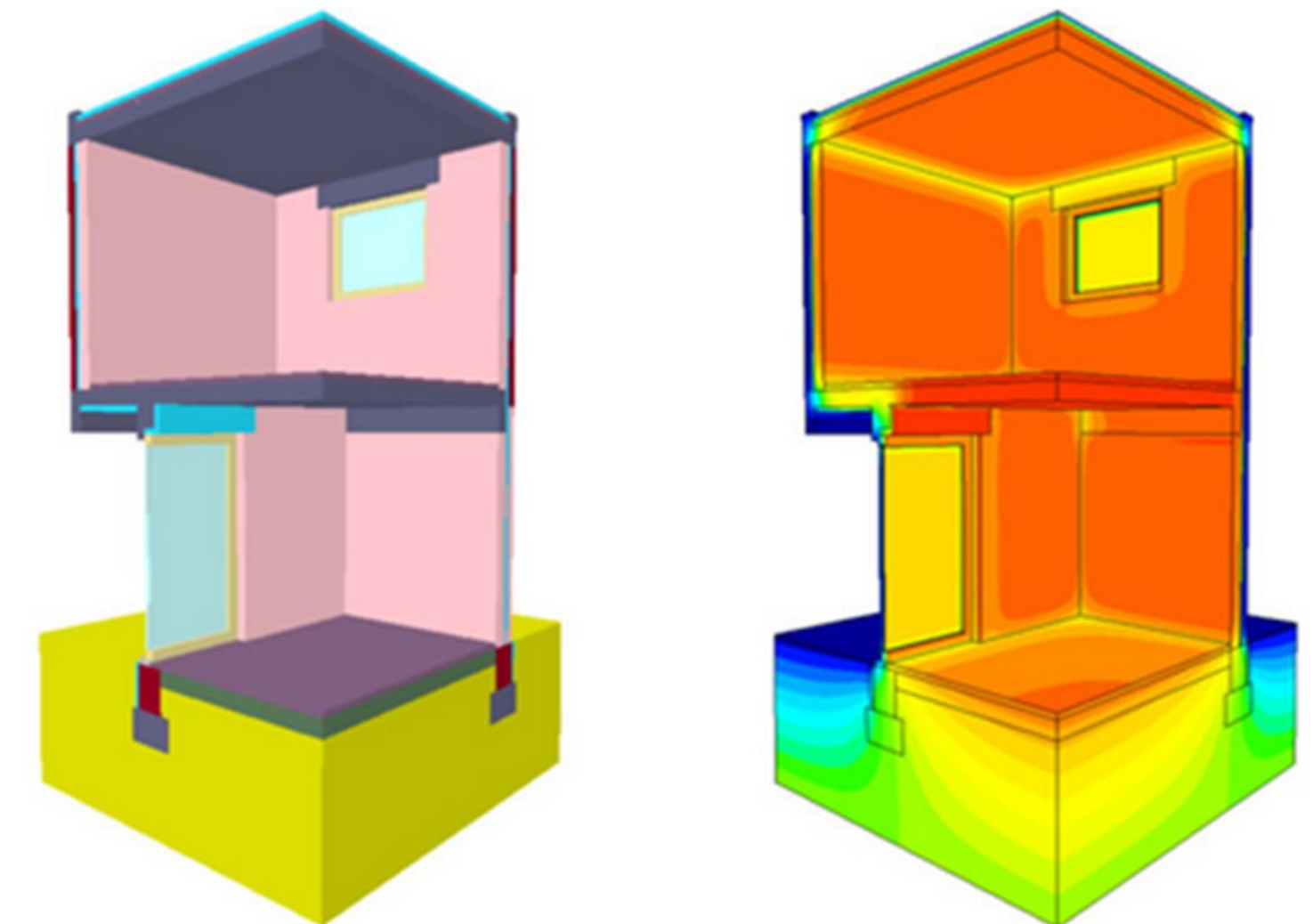


Determine performances according to standards for :

- materials
 - Timber for CLT, CORK, OSB Panel, glue
- Systems
 - wall, roof, floor
- building scale
 - holistic performances for example energy consumption, link with environmental performances

Tests stages (boundary)

- Validation tests after manufacturing all systems (WP2)
- Additional request in WP5 for each demonstration pilots
- Modelling as well if unable tests
 - Thermal and acoustic



IMIP WP3 PROTOTYPE TESTING

Methodology and Output



Physical properties of the modules and the mounting and dismounting properties are evaluated using prototypes in certified laboratories belonging to the participating partners.

Prototype testing schedule

- Structural analysis : INIA
- Sound insulation analysis : FCBA
- Thermal insulation analysis : FCBA
- Combustion analysis : UPV, FCBA
- Durability and dimensional stability analysis for exterior uses : AITIM and UPV

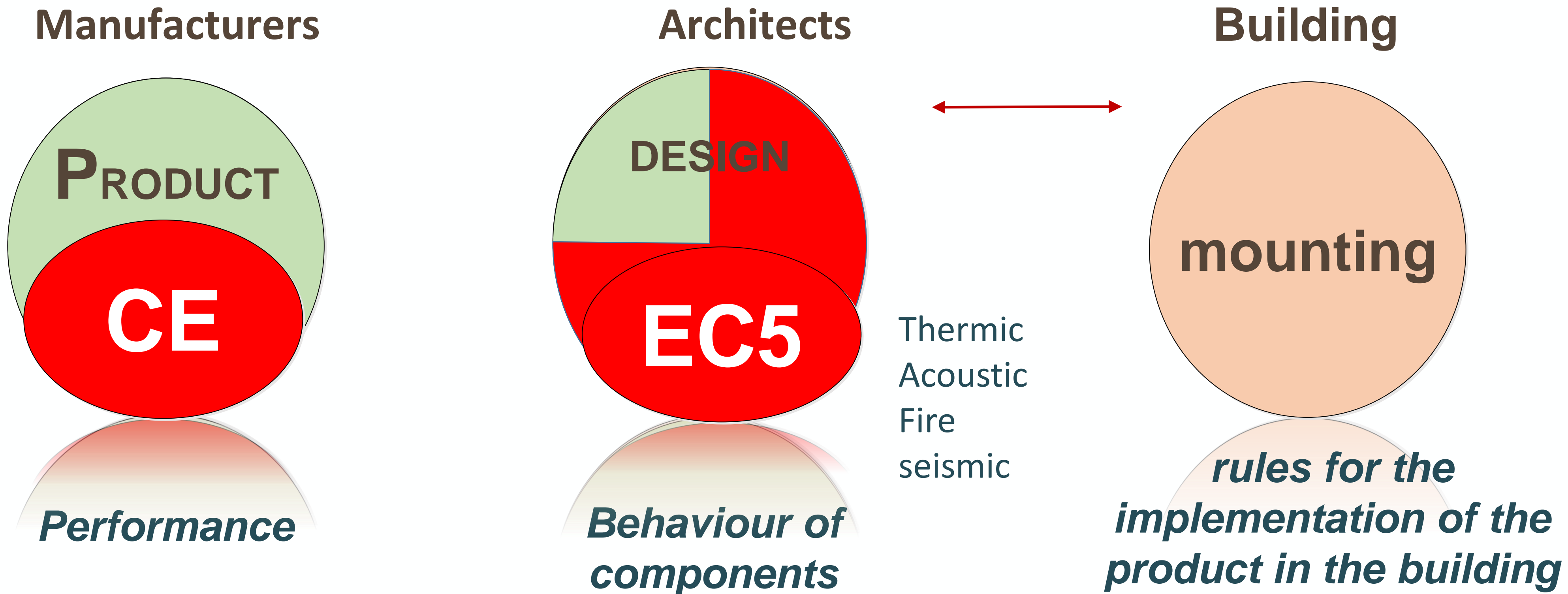
→ Give recommendations on level requirements

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regulations



A product or component is recognized (traditional) if the 3 major components of the act of building, in France, are subject to a collective reference system called “The rules of the art”

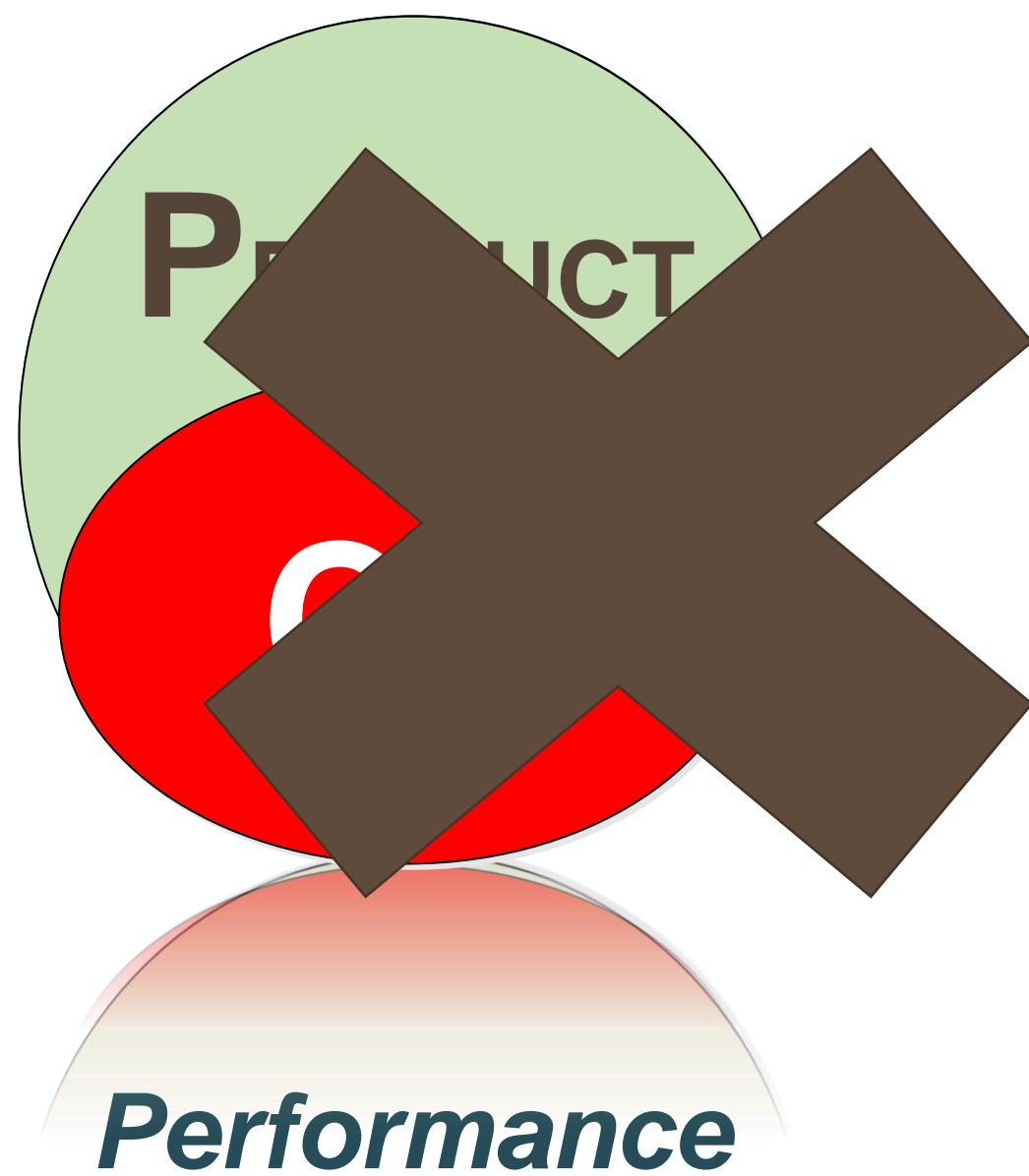


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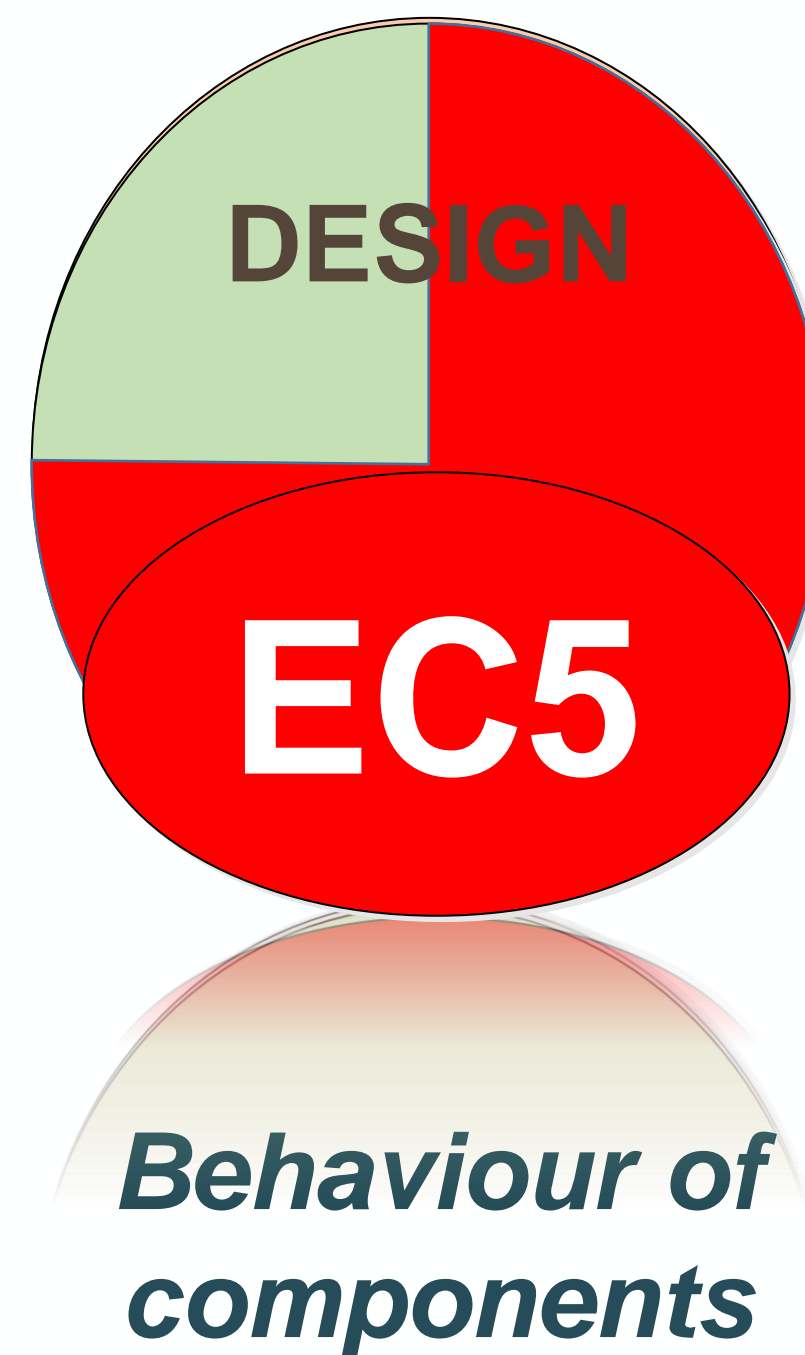
regulations



Fabrication



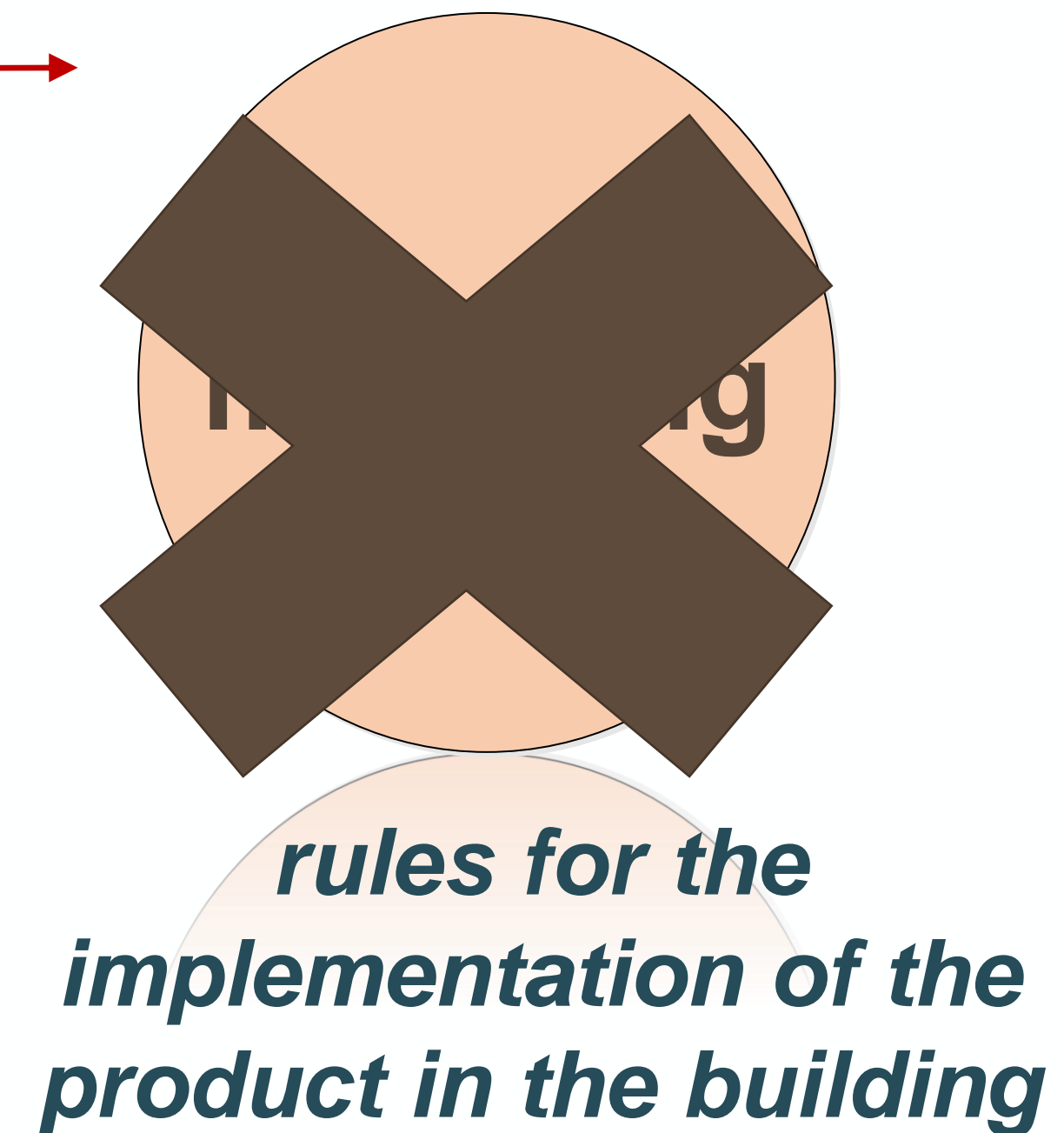
Architects



Building



Thermic
life
seismic



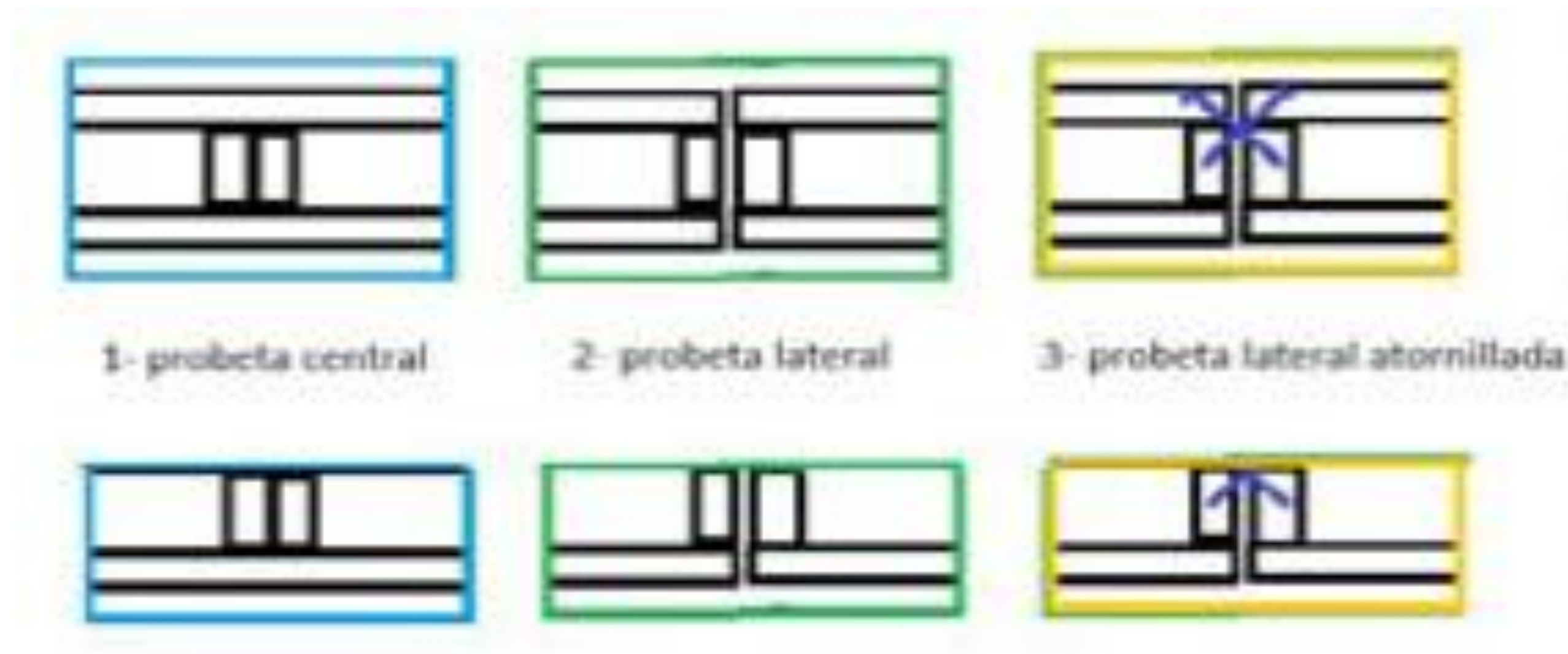
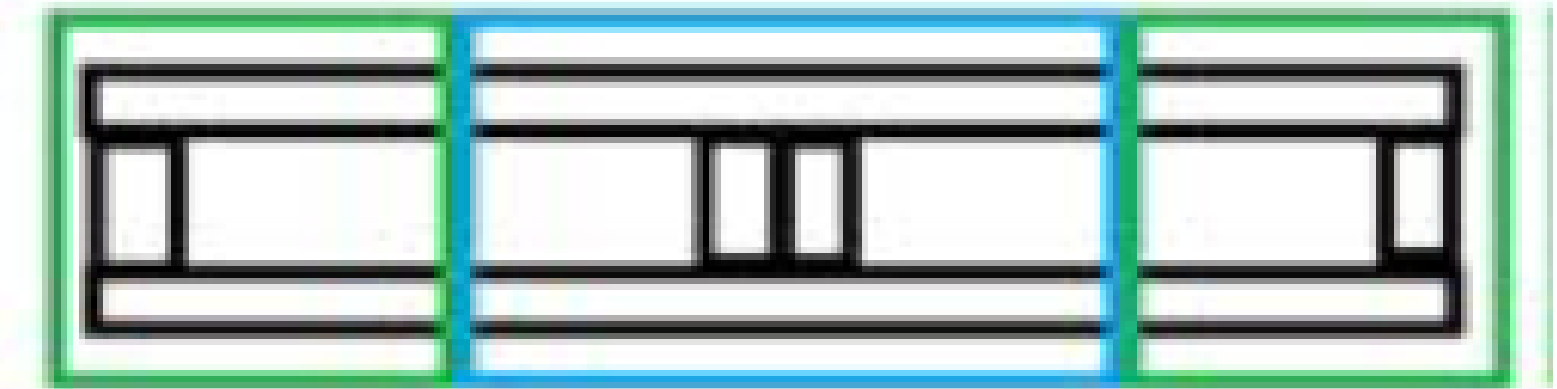
IMIP WP3 PROTOTYPE TESTING

Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Structural analysis : INIA
 - Bending tests (EN 408)
 - PANELS C & A
 - INIA according 4 configurations



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Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Structural analysis : INIA
 - FCBA bending test EN 408



- FCBA creep on panel A
 - 40 days at 9,6 tonnes



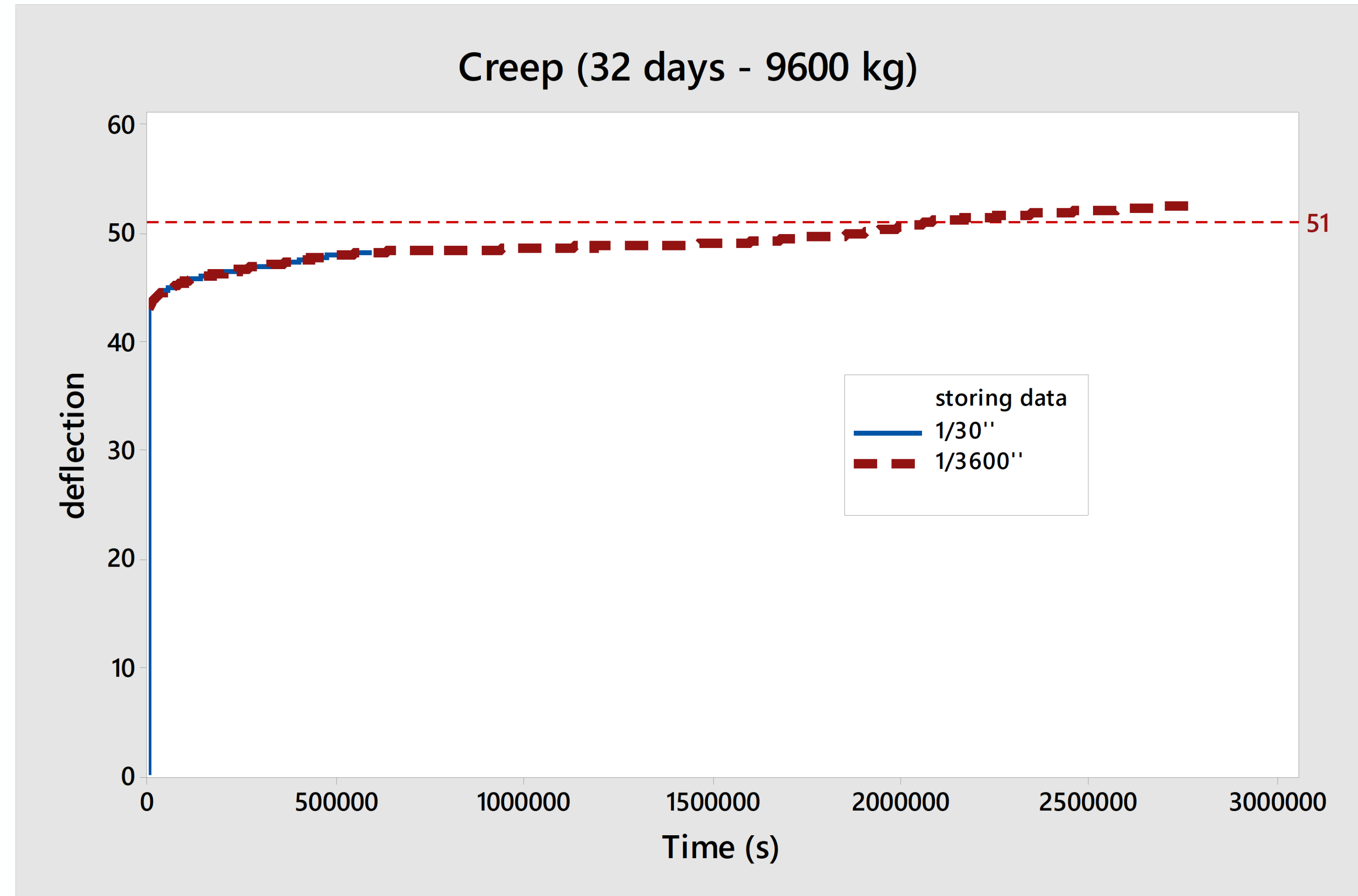
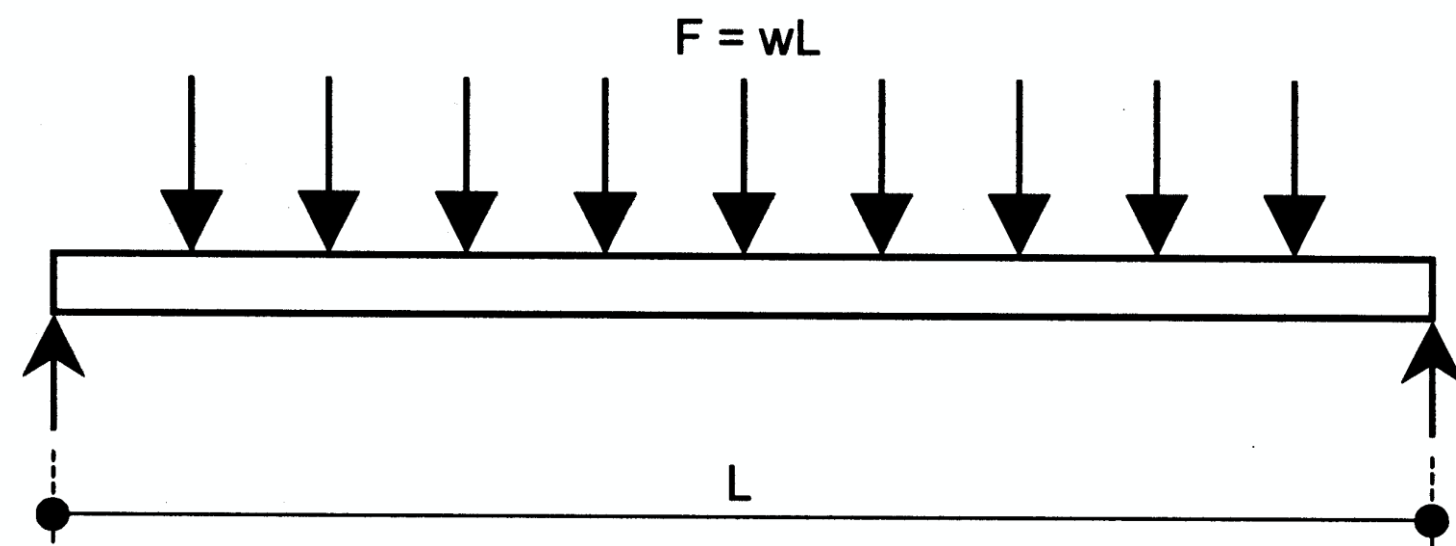
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Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Structural analysis : INIA
 - FCBA creep
 - 40 days at 9,6 tonnes



IMIP WP3 PROTOTYPE TESTING

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Prototype testing (planned for April 2021 but really started in December 2022)

- Structural analysis : INIA
 - Bending tests (EN 408)
 - PANEL B (INIA)



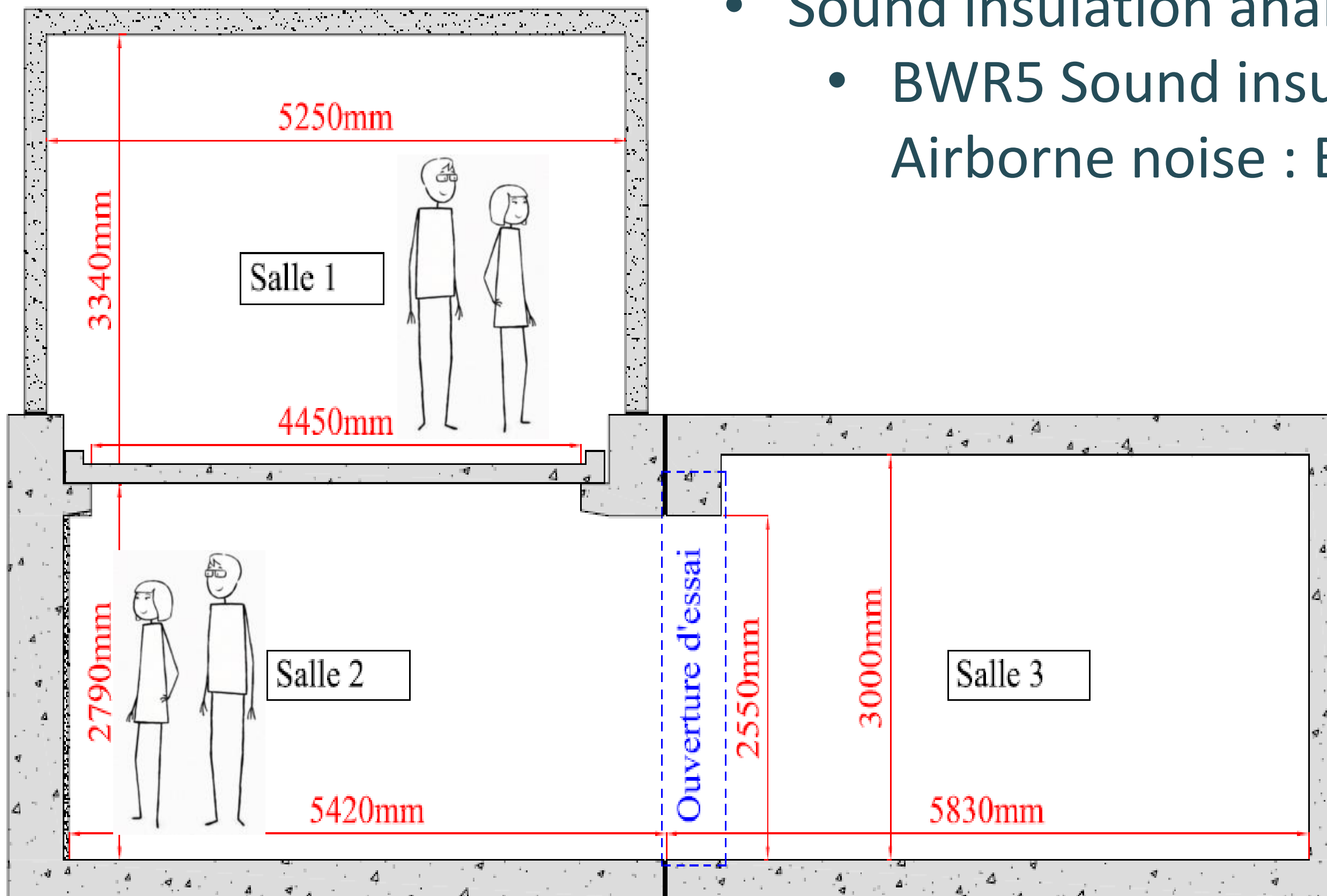
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Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Sound insulation analysis : FCBA
 - BWR5 Sound insulation : EN ISO 10140-1 to 5
 - Airborne noise : EN ISO 717-1



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Material and methods

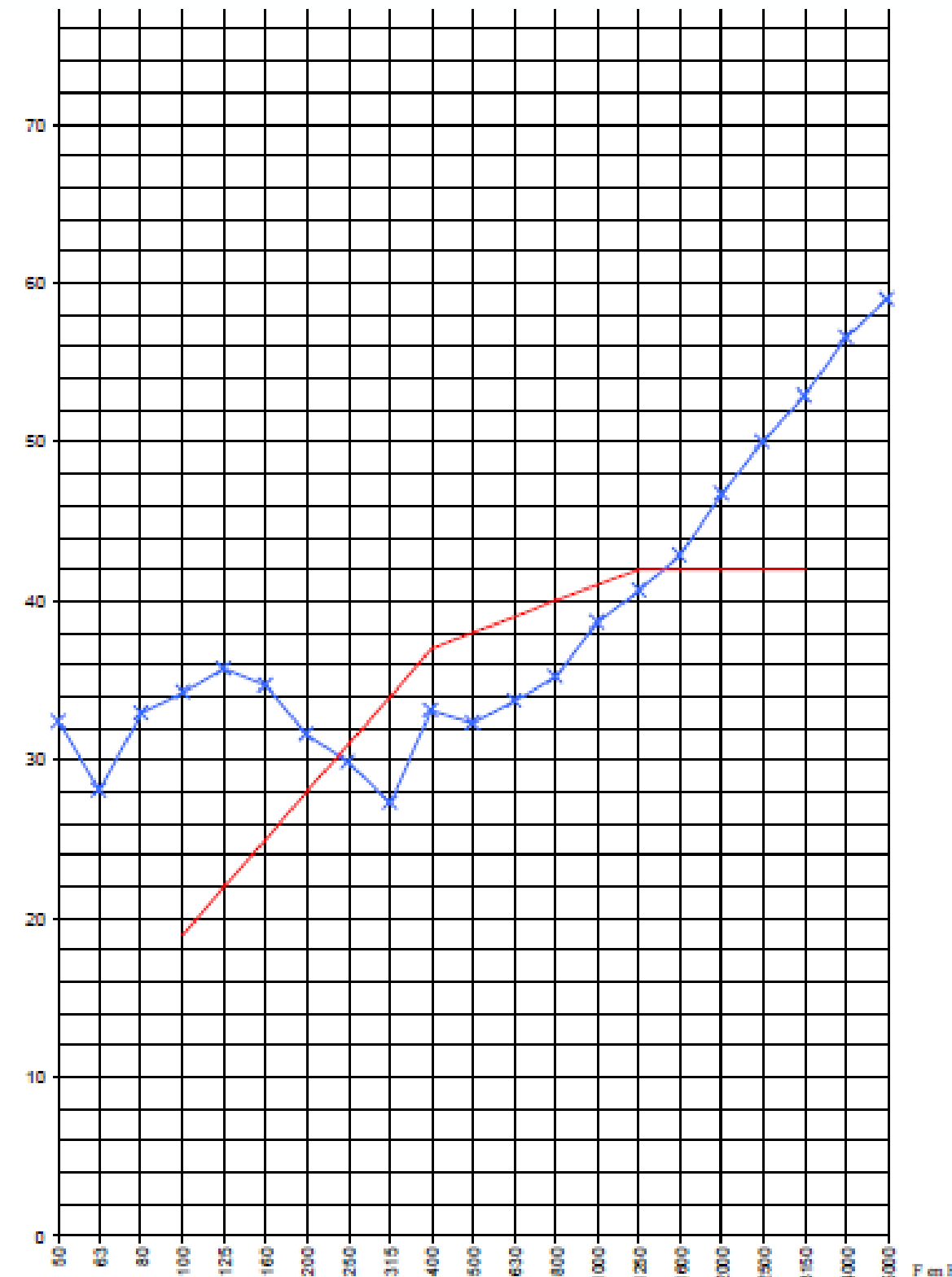


Prototype testing (planned for April 2021 but really started in December 2022)

- Sound insulation analysis : FCBA
 - BWR5 Sound insulation : EN ISO 10140-1 to 5

Date de l'essai :	07/02/23	
Volume salle émission :	68 m³	
Volume salle réception :	56 m³	
Surface éprouvette :	15 m²	
Conditions d'essai	Eni	Récep.
T ± 0,2 en °C	16,0	15,8
H ± 2,5 en %	37,5	37,3
P ± 5 en hPa	1028,2	1028,0

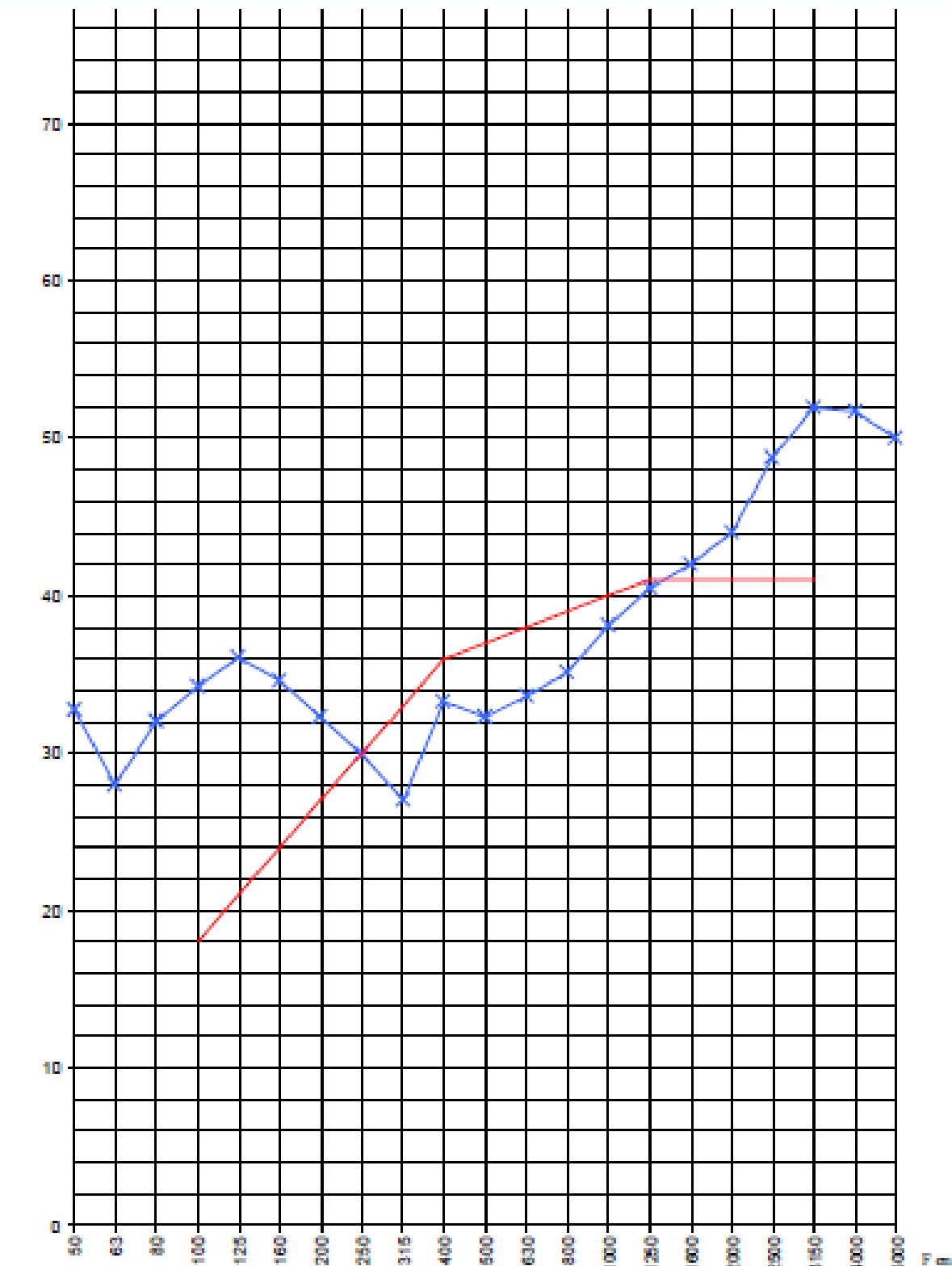
Fréquence en Hz	R en dB
50	≥ 32,4 * (44,5)
63	≥ 28,1 * (42,8)
80	≥ 32,9 * (44)
100	≥ 34,2 * (48,6)
125	35,7
160	34,7
200	31,6
250	29,8
315	27,3
400	33,1
500	32,3
630	33,7
800	35,2
1000	38,6
1250	40,7
1600	42,9
2000	46,7
2500	50,0
3150	52,9
4000	56,6
5000	59,0
Classification ISO 717-1 ⁺	
R _w (C ; C _w)	≥ 38 (-1 ; -3) dB
R _A = R _w + C	≥ 37 dB
R _{A,Tr} = R _w + C _{tr}	≥ 35 dB



(44) : Classification basée sur les résultats de mesure en Laboratoire

Date de l'essai :	07/02/23	
Volume salle émission :	68 m³	
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Fréquence en Hz	R en dB
50	≥ 32,7 * (44,5)
63	≥ 28,0 * (42,8)
80	≥ 32,0 * (44)
100	≥ 34,2 * (48,6)
125	36,1
160	34,6
200	32,3
250	29,9
315	27,0
400	33,3
500	32,3
630	33,6
800	35,1
1000	38,1
1250	40,5
1600	42,0
2000	44,0
2500	48,8
3150	51,9
4000	51,7
5000	50,0
Classification ISO 717-1 ⁺	
R _w (C ; C _w)	≥ 37 (0 ; -2) dB
R _A = R _w + C	≥ 37 dB
R _{A,Tr} = R _w + C _{tr}	≥ 35 dB



(44) : Classification basée sur les résultats de mesure en Laboratoire

IMIP WP3 PROTOTYPE TESTING

Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Thermal insulation analysis : FCBA
 - Shear strength f_v and G (EN 12090)
 - Load 1,340 kN
 - $\tau = 107 \text{ KPa}$



IMIP WP3 PROTOTYPE TESTING

Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Thermal insulation analysis : FCBA
 - Compressive strength (EN 1605)
 - determine deformation occurring under specified conditions of compressive load, temperature and time



Table 1 — Test conditions

Set of conditions	Stress, in kPa	Step A		Step B	
		Temperature, in °C	Time, in h	Temperature, in °C	Time, in h
1	20	(23 ± 5)	(48 ± 1)	(80 ± 1)	(48 ± 1)

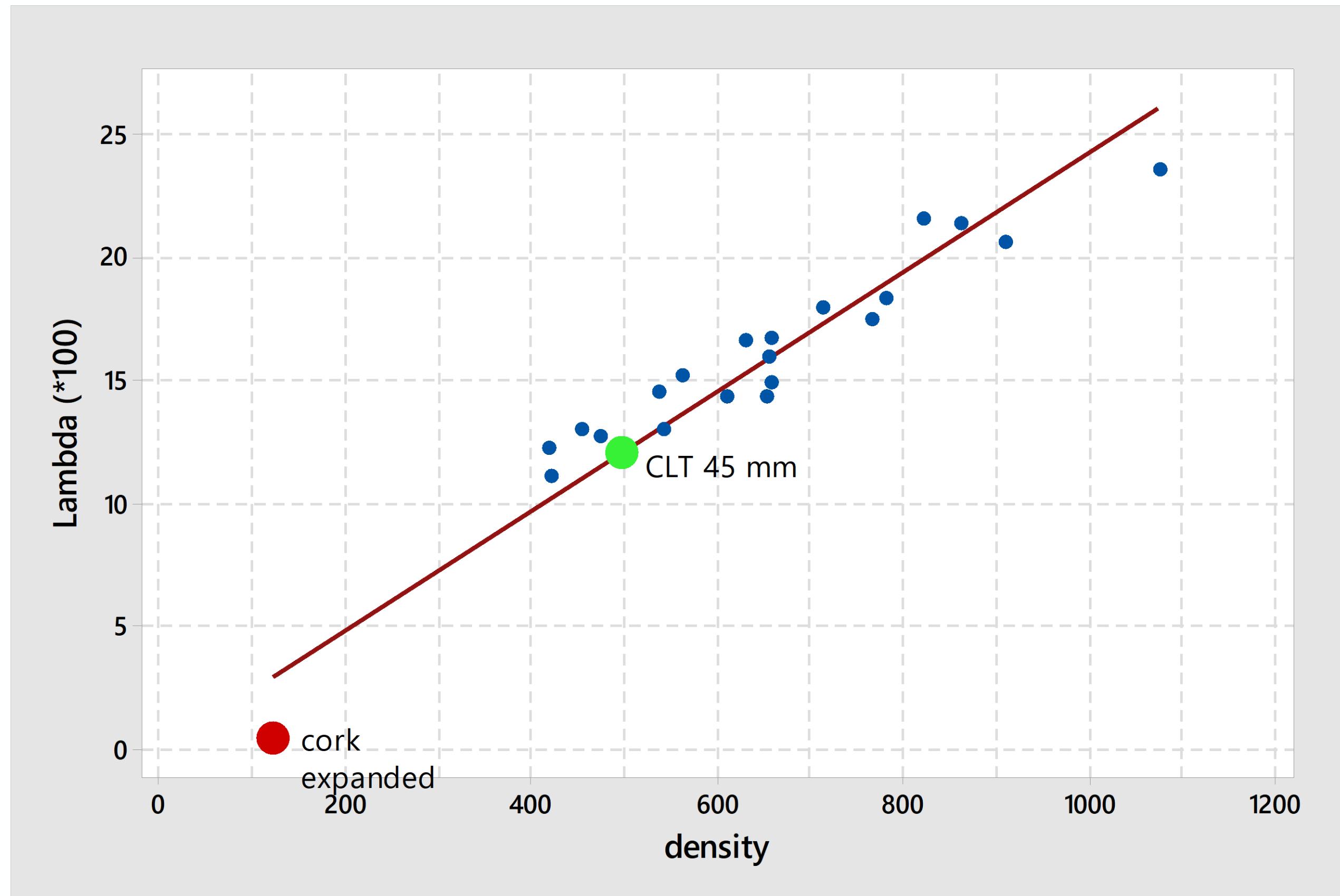
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Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Thermal insulation analysis : FCBA
 - Thermal conductivity λ (EN 12667)



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Material and methods

Prototype testing (planned for April 2021 but really started in December 2022)

- Combustion analysis : UPV, FCBA
 - SBI test is intended for the Euroclass classification of construction products and floor coverings used in walls or ceilings (PANEL B)
 - This test determines the classification corresponding to both the energy contribution and the smoke contribution.



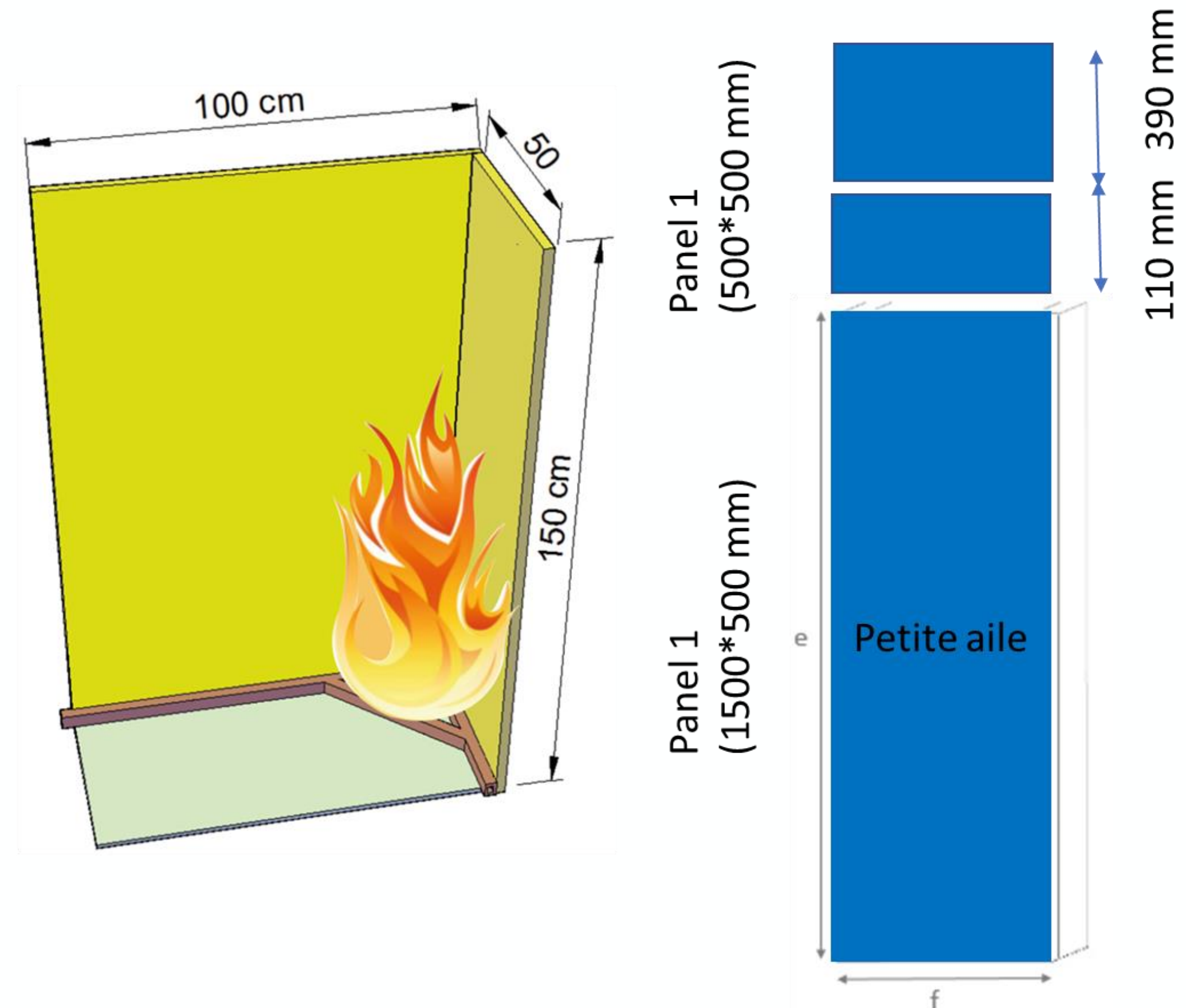
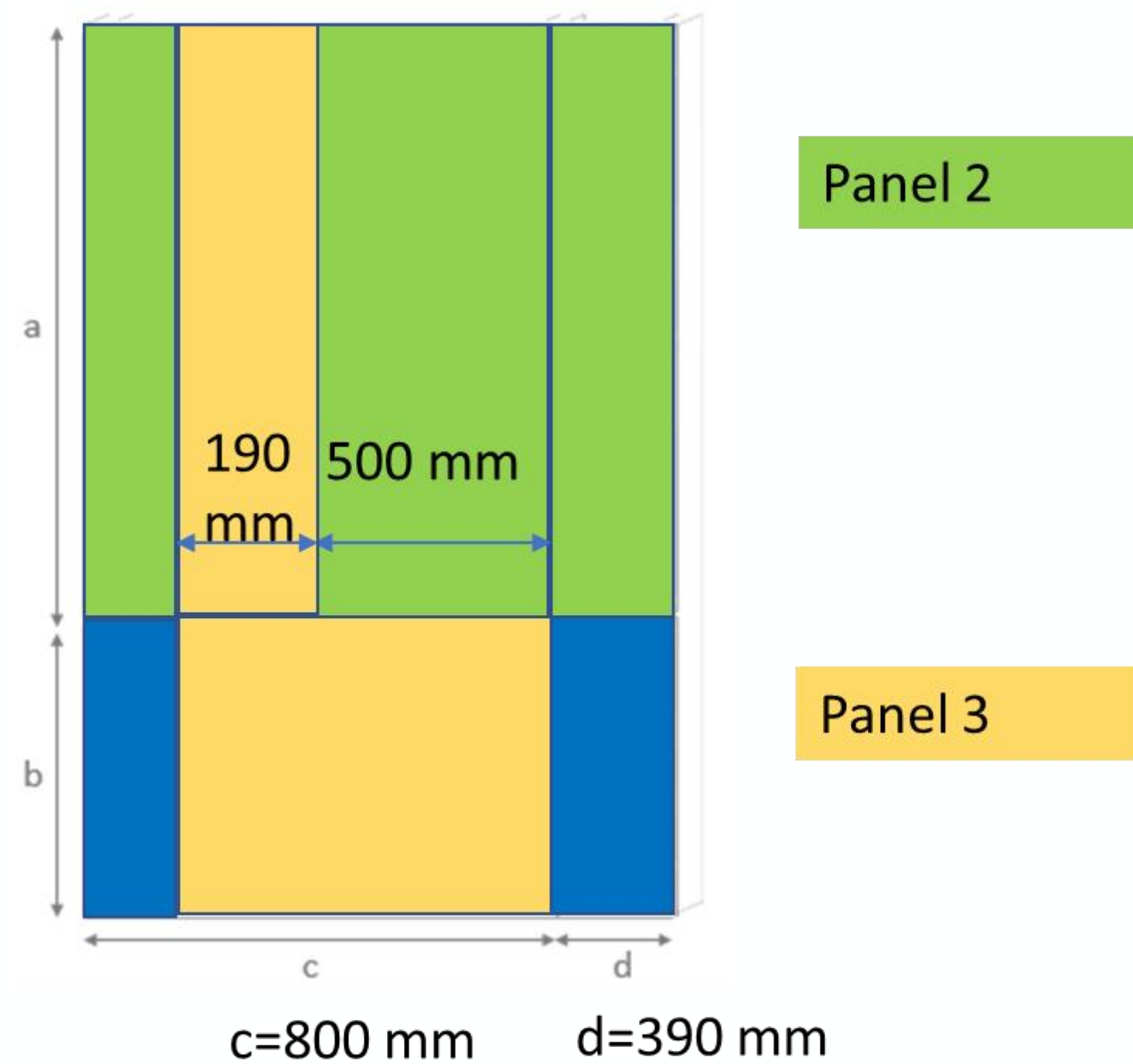
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Material and methods

Prototype testing (planned for April 2021 but really started in December 2022)

- Combustion analysis : UPV, FCBA
 - 3 tests (for valid fire grade)



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Material and methods



Prototype testing (planned for April 2021 but really started in December 2022)

- Durability and dimensional stability analysis for exterior uses : ALTIM and UPV
 - Ongoing work

IMIP WP3 PROTOTYPE TESTING

references for labelling IMIP products



ETAG standard

- ETAG 16
- ETAG 19

European Technical Assessment (ETA)

- <https://www.eota.eu/>

- Harmonised standards
- Test standards