



Healthier Life with Eco-innovative Components for Housing Constructions

Inside [H]-house

Living comfort in modern airtight buildings

Roswag Architekten

18.02.2016



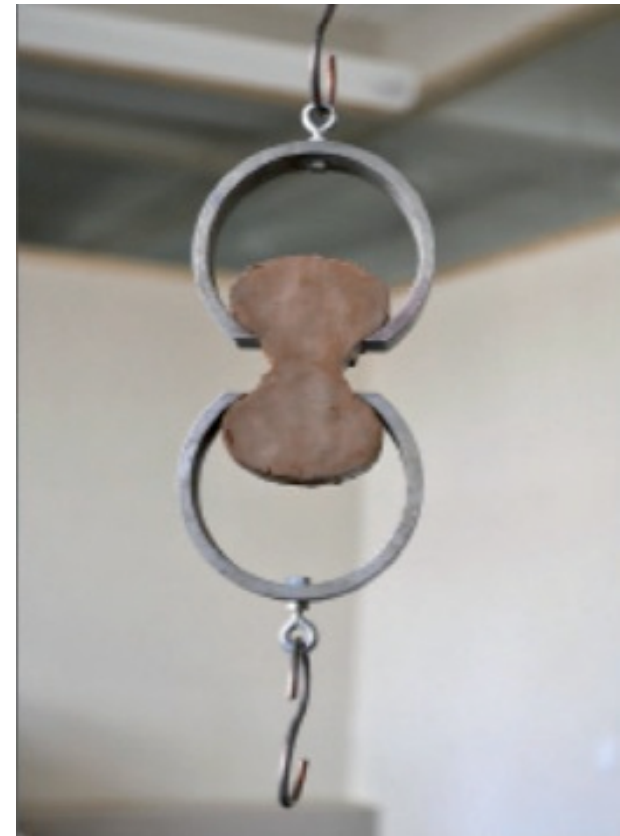
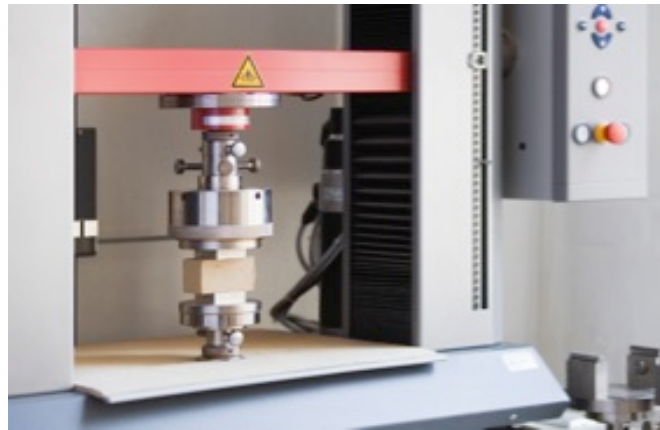
Roswag Architekten Office Presentation

Building with renewable resources in Germany & internationally



Roswag Architekten Office Presentation

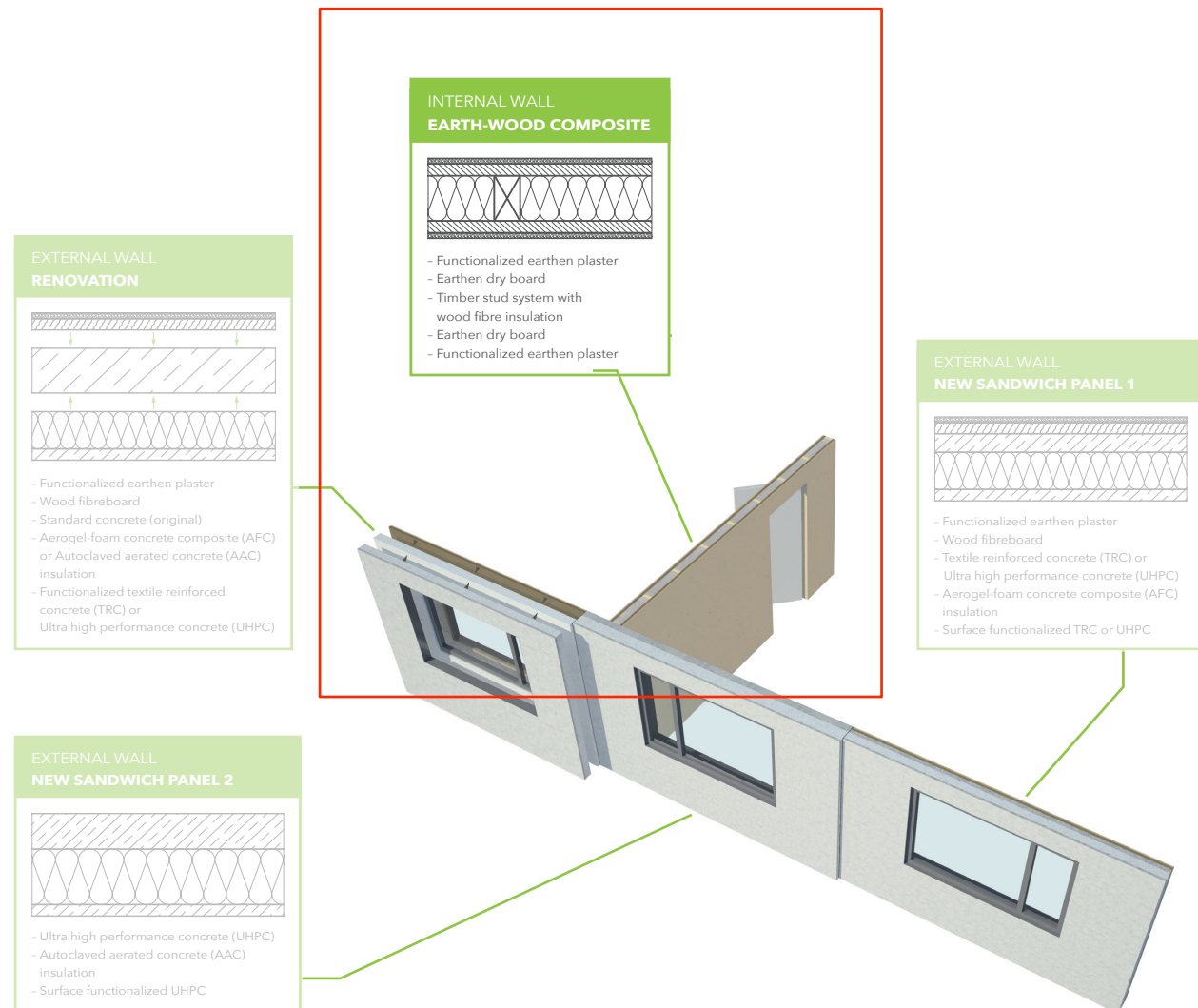
Office lab for material testing and development for construction



1.0 [H]-house Goals

Aims and Objectives

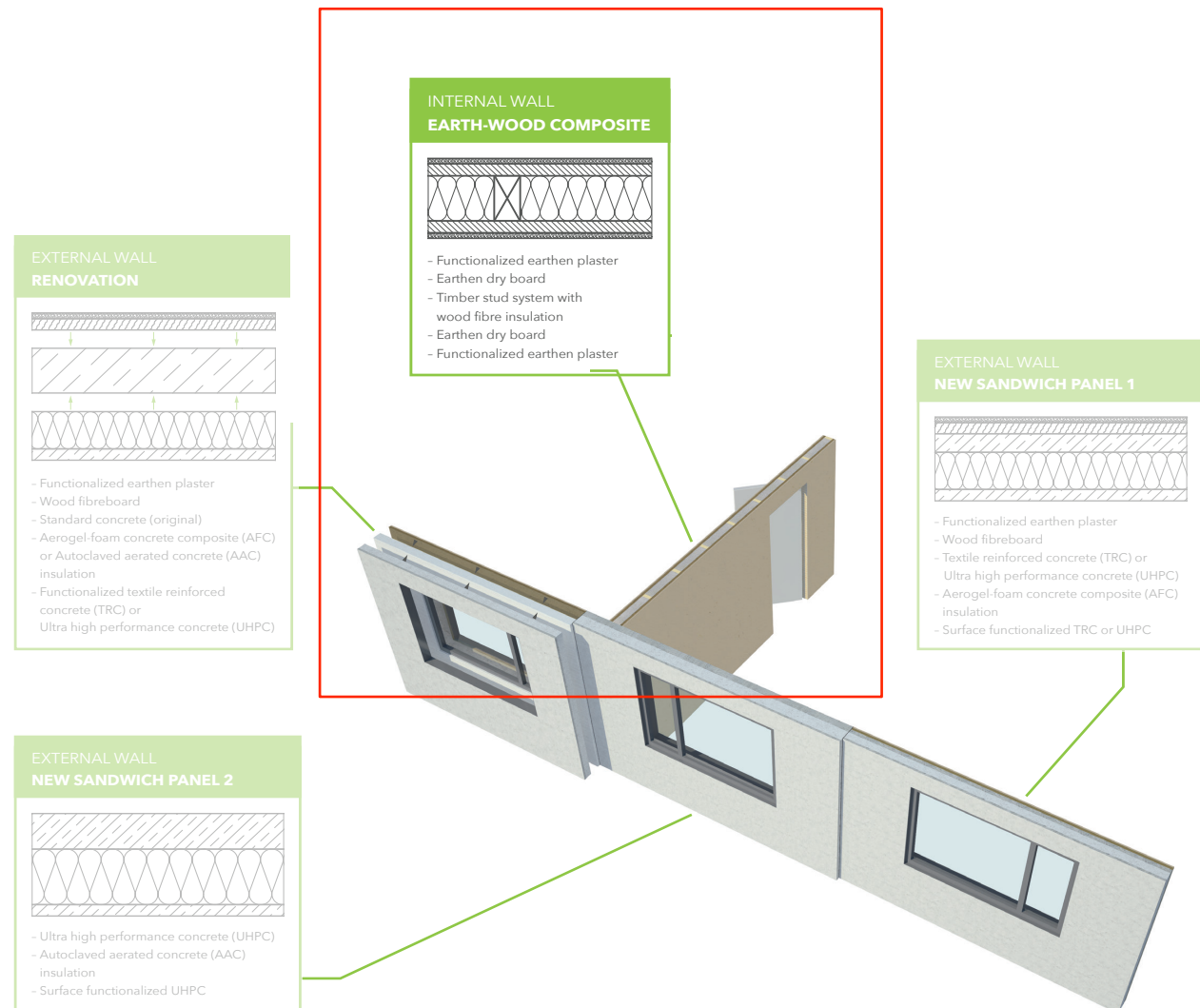
- Sustainable construction
- IEQ
 - Water vapour adsorption
 - Prevention against overheating in summer
 - Low emissions
 - Adsorption of air pollutants
- LCA / LCC
- Affordability



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1.0 [H]-house Goals

Improved Indoor Environment Quality - IEQ

- Address shortcomings associated with modern airtight buildings
 - > increased relative humidity levels indoors
 - > higher concentration of air pollutants



Mould growth



Materials emissions



Evaporations

1.0 [H]-house Goals

Improved Indoor Environment Quality - IEQ

- Develop robust solutions that are able to react to reduced air exchange rates and address associated problems
 - > damp problems and condensation, resulting in mould growth > disorders and allergic reactions (worst case)
- In combination with natural ventilation



Importance of material selection



Increased moisture buffer through natural building materials



2.0 Material Development - IEQ

Aerogel modified Earth Plasters

- Aerogel are highly porous solid objects on the basis of silicates
- Bulk density between 40-150 kg/m³
- Surface area 750 m² / g
- 3 different types of Aerogel (ND / CMS / E9)
- Very cost efficient material production



2.0 Material Development - IEQ

Moisture adsorption of earth plasters & aerogels

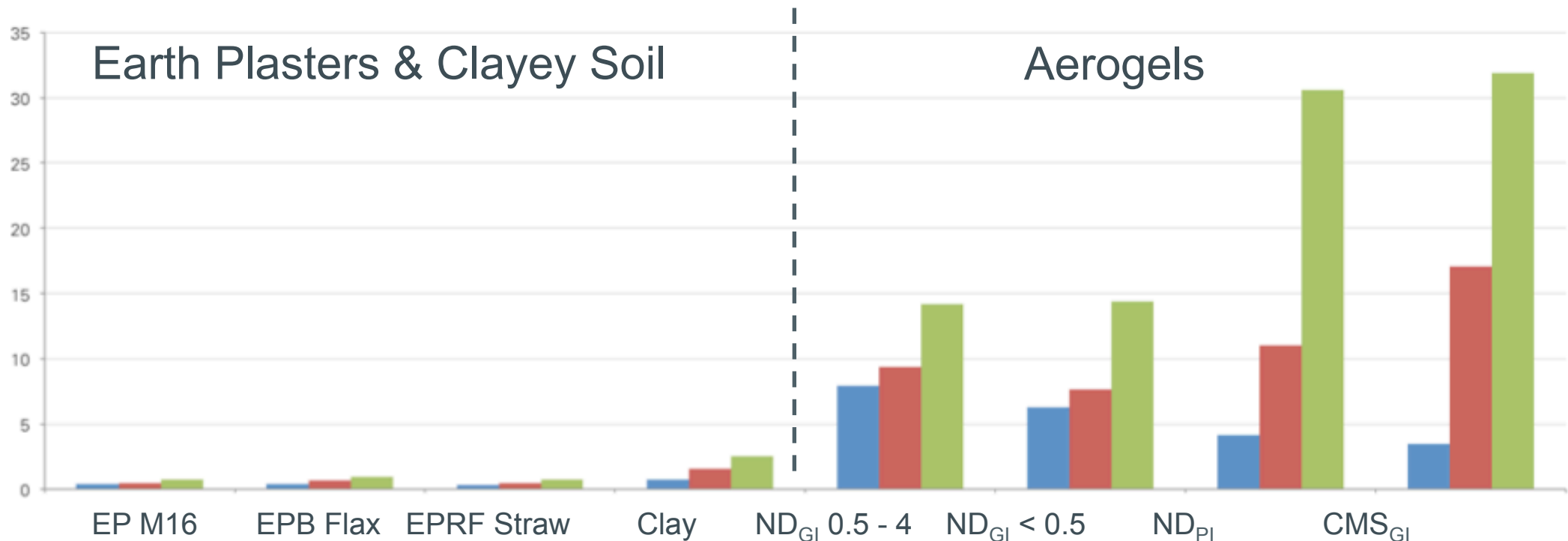
Moisture
content m [%]

Key

■ w delivered

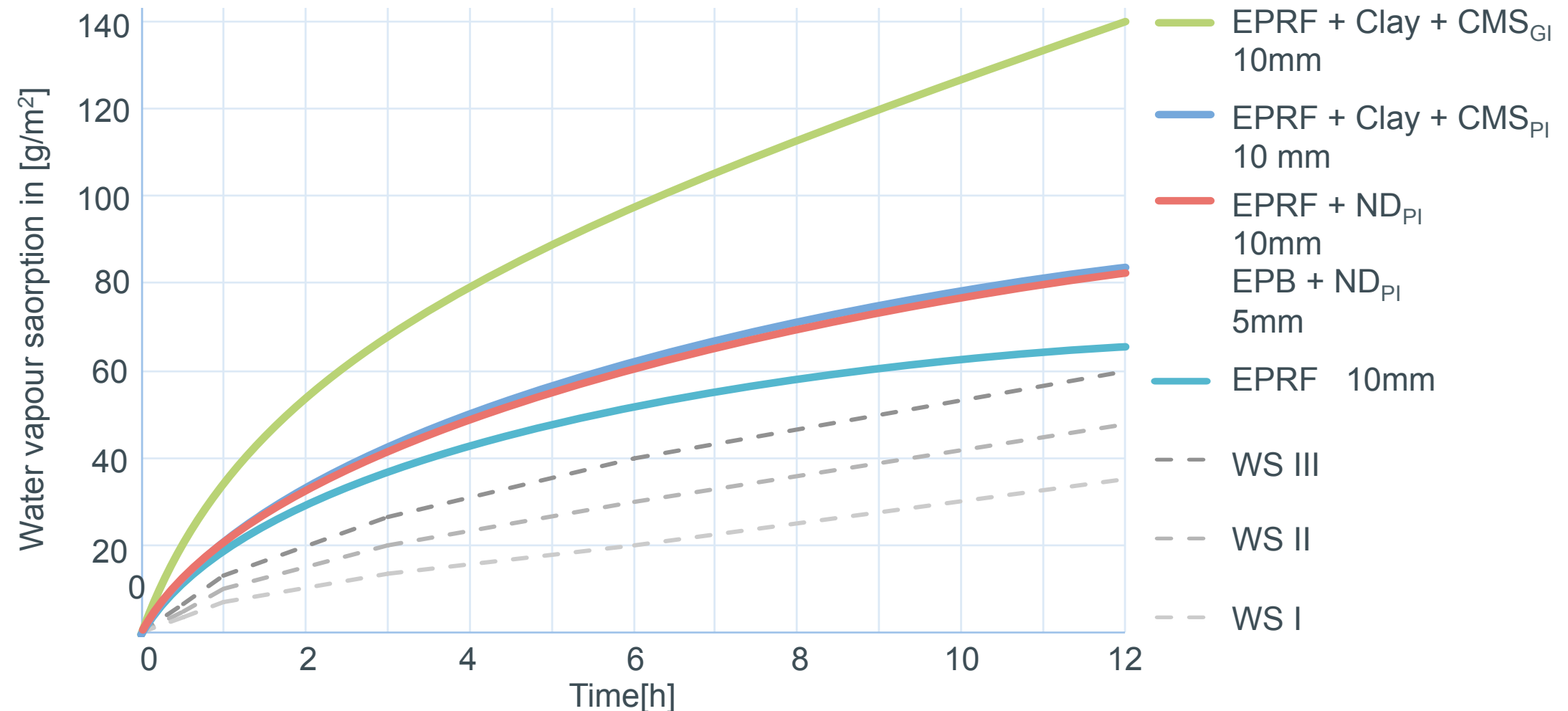
■ w 23°C / 50% RH

■ w 23°C / 80% RH



2.0 Material Development - IEQ

Water Vapour Adsorption Tests (DIN 18947)



3.0 Material Investigation - IEQ

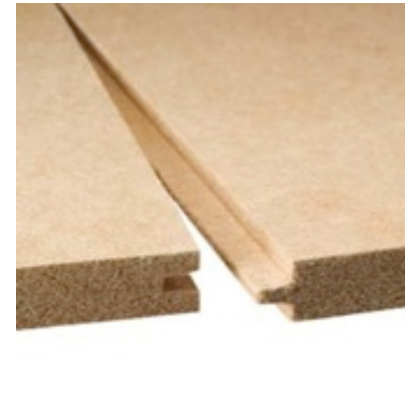
Material Selection



Earth plaster



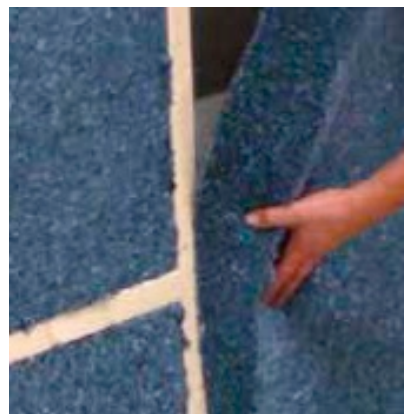
Earth dry, earth cellulose board



Wood fibre, wood fibre sandwich board



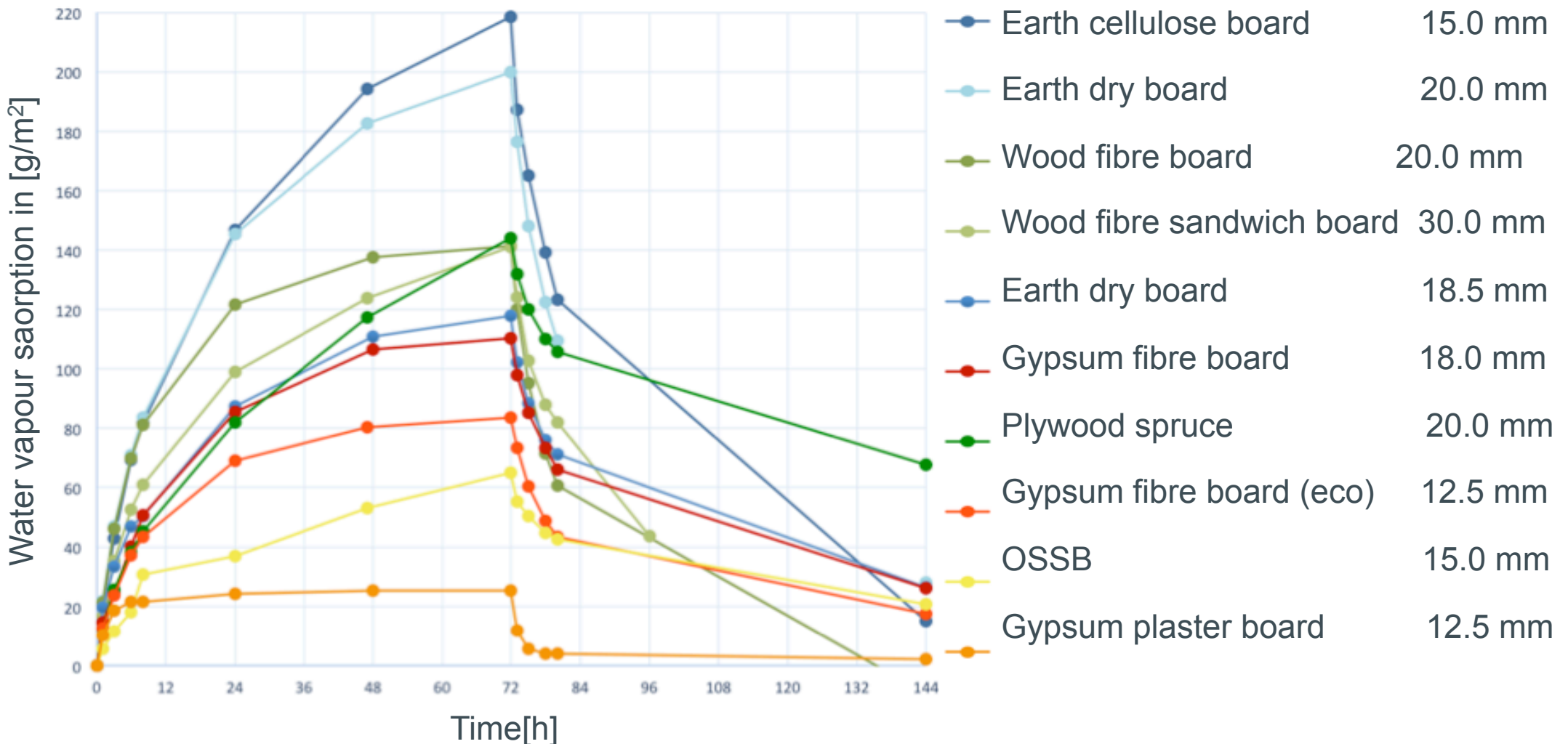
Wood fibre, hemp and clothes insulation



Wood fibre flax board or strawboard

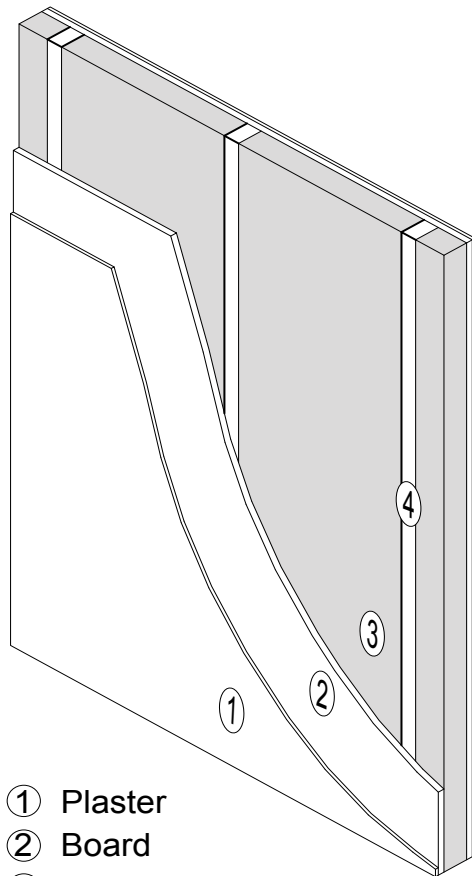
3.0 Material Investigation - IEQ

Water Vapour Adsorption Wall Lining Boards

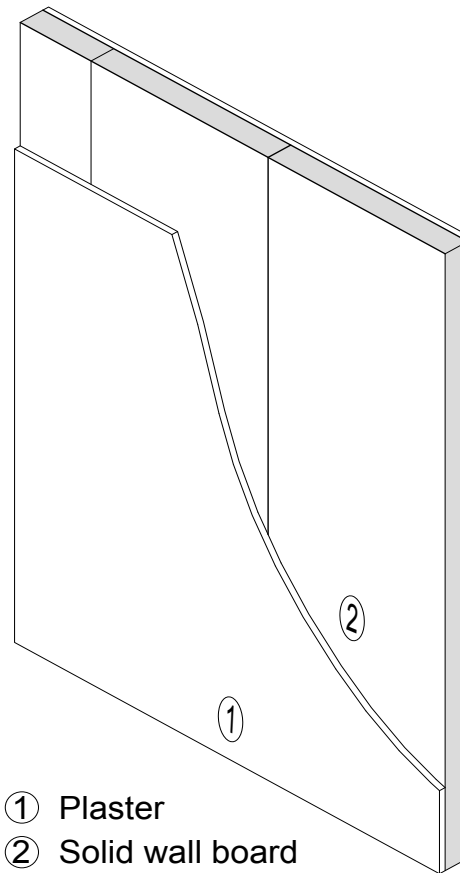


4.0 Design Development

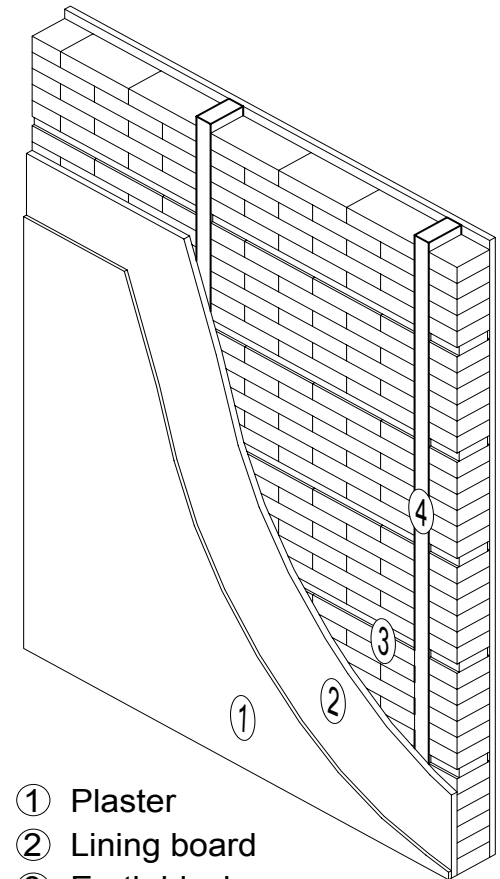
Dry Wall Typologies



- ① Plaster
- ② Board
- ③ Insulation
- ④ Stud



- ① Plaster
- ② Solid wall board



- ① Plaster
- ② Lining board
- ③ Earth block
- ④ Timer stud



www.h-house-project.eu

Thanks for your attention.

Project partners

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