Gypsum Plaster Board

Gypsum Plaster Board:- they are made for two sheet of thin mill boards with gypsum plaster in between sometimes the plaster in a created which reduces weight and have more advantages. The two great advantages of plaster board over wood board.

What is Gypsum Board?

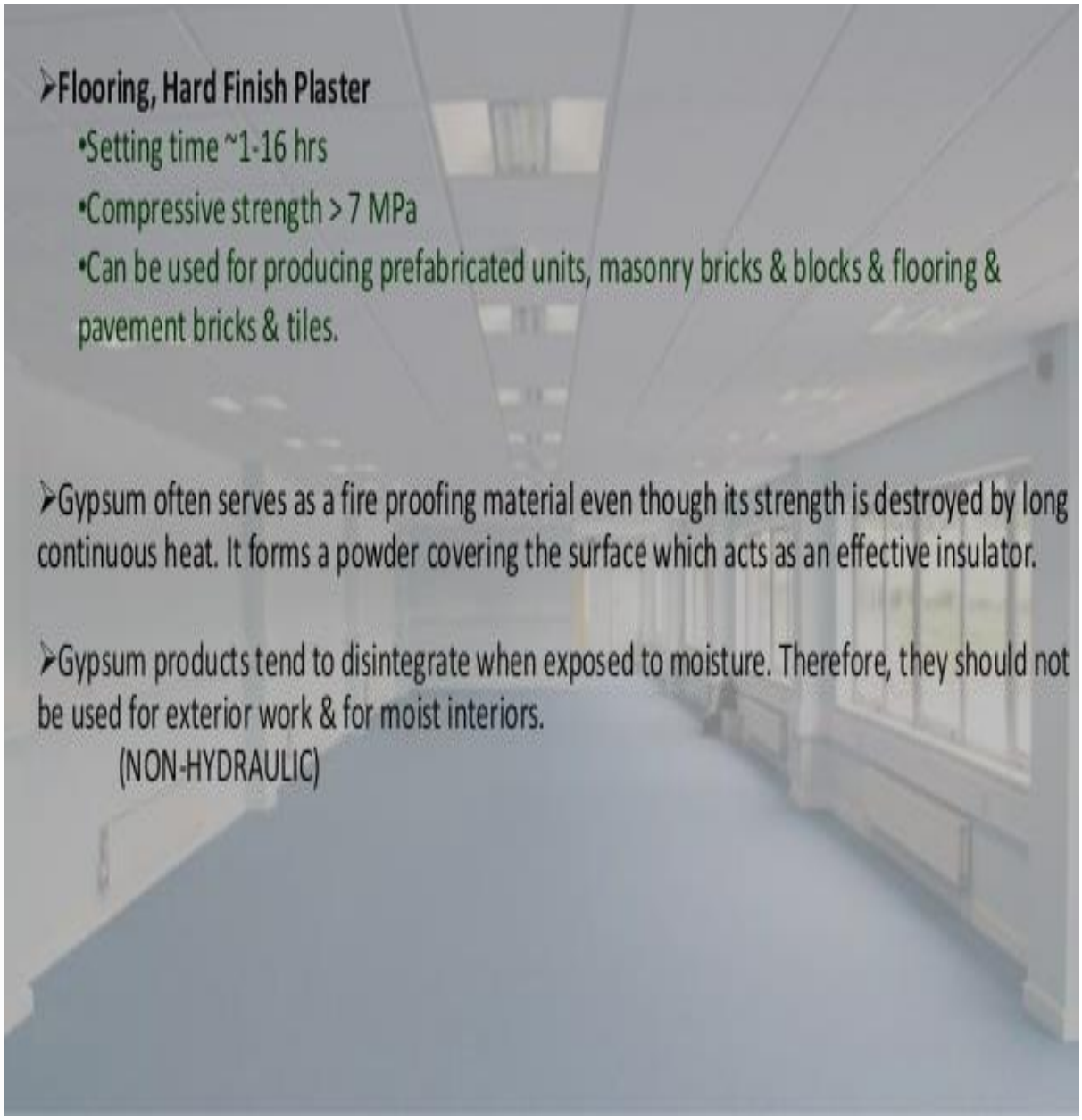
Gypsum board, commonly known as **drywall,** is the technical product name used by manufacturers for a specific board with a gypsum core and a paper facing.

Gypsum board is the **premier building material for wall, ceiling, and partition systems in residential, institutional, and commercial structures** and is designed **to provide a monolithic surface** when joints and fastener heads are covered with a joint treatment system.

Making Gypsum Board

- To produce gypsum board, calcined gypsum is mixed with water and additives to form a slurry which is fed between continuous layers of paper on a board machine.
- As the board moves down a conveyer line, the calcium sulfate recrystallizes or rehydrates, reverting to its original rock state.
- The paper becomes chemically and mechanically bonded to the core.
- The board is then cut to length and conveyed through dryers to remove any free moisture.
- Gypsum manufacturers also rely increasingly on "synthetic" gypsum as an effective alternative to natural gypsum ore.


PROPERTIES AND USES OF
GYPSUM PLASTERS
Plaster of Paris
•Setting time ~5-20 min.
•Used for sculpturing, ornamental work, small repair works.
Hard Wall Plaster
•Setting time ~1 hr
•Compressive strength ~7 MPa
•Admixtures result in increased plasticity & setting time & reduced shrinkage
•Can be used for plastering walls
•Production of prefabricated structural units
•Masonry bricks & blocks



➢**Flooring, Hard Finish Plaster**

- Setting time ~1-16 hrs
- Compressive strength > 7 MPa
- Can be used for producing prefabricated units, masonry bricks & blocks & flooring & pavement bricks & tiles.

➢Gypsum often serves as a fire proofing material even though its strength is destroyed by long continuous heat. It forms a powder covering the surface which acts as an effective insulator.

➢Gypsum products tend to disintegrate when exposed to moisture. Therefore, they should not be used for exterior work & for moist interiors.

(NON-HYDRAULIC)

OTHER USES OF GYPSUM

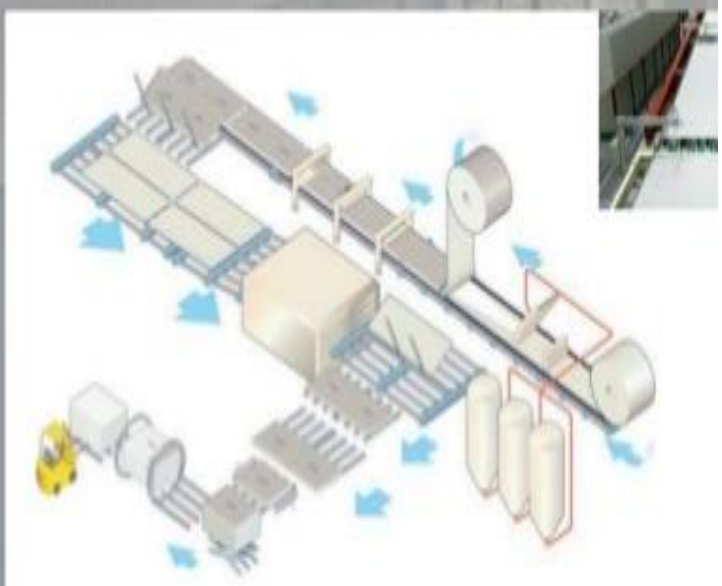
Gypsum can indeed also:

- Be added to some bread and dough mixes as a Calcium source and baking aid.
- Be used as a filler and fire retardant in plastic products.
- Be used in Portland cement and special cement products for set and expansion control.
- Be a source of Calcium and Sulphate Sulphur for plant growth.
- Be used as a modelling material for tooth restorations.
- Be an ingredient in many patching compounds.
- Be used with glass to fabricate large, lightweight architectural decorations.
- Be used as a mould material to fabricate custom body parts for trucks and automobiles.
- Be an aid in juice extraction of some fruits and vegetables

The Modern Use of Gypsum in Construction: Plasterboard

- The modern use of Gypsum as a building material was discovered in 1888 when the American Augustine Sackett invented a machine for producing plasterboards (also known as wallboards and dry walls) composed of several layers of paper with Gypsum in-between.

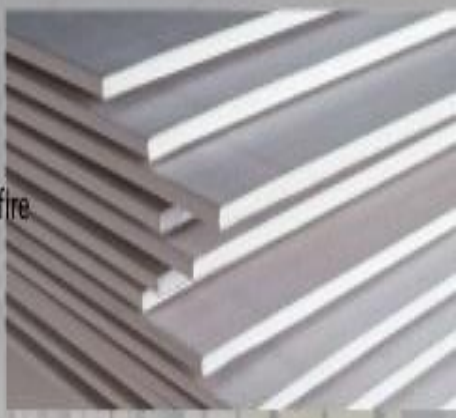
- In Eastern and Western Europe, there are currently more than 200 factories producing plasterboards.



Uses of Gypsum Products in Home Interiors

➢ **Plasterboards**

• Plasterboard is used for partitions and the lining of walls, ceilings, roofs and floors. The properties of plasterboard can be modified to meet specific requirements, such as fire resistance, humidity resistance, impact resistance, etc.



➢ **Decorative Plaster**

• Plaster powder, mixed with water, manually or through the use of silo-supplied spray systems, is used to create an effective and aesthetically-pleasing lining for brick and block walls, and for ceilings.

• Gypsum's adaptability in application lends itself to moulding and shaping. Since time immemorial, Gypsum has been used by skilled craftsmen to create decorative plaster mouldings.

➢ **Building plaster**

• Gypsum plaster is used for walls and ceilings.

➢ **Plaster blocks**

• Gypsum blocks are used for partitions and Gypsum tiles for ceilings.

➢ **Gypsum based self levelling screeds**

• Anhydrite or Alpha- Hemihydrates are used in the production of self levelling floor screeds.

➢**Gypsum Fibreboards**

•Gypsum fibreboard is used for partitions and lining of walls, ceilings, roofs and floors. Gypsum Fibreboard offers good performance when it comes to impact resistance, sound insulation and humidity resistance.

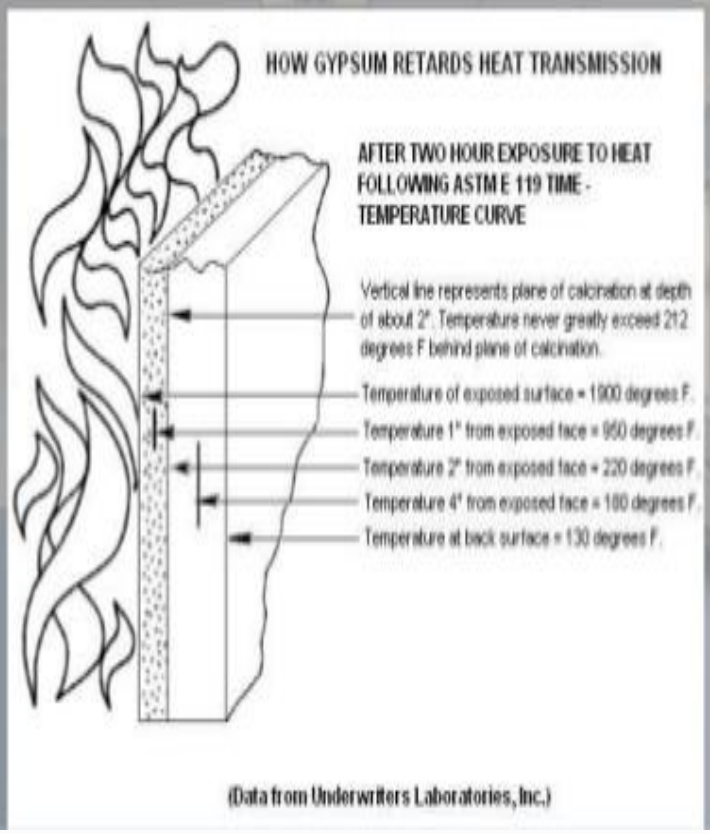
Gypsum Products Unique Properties

1) FIRE PROPERTIES

- **Due to the natural composition** of Gypsum, gypsum plasterboards are inherently fire resistant.
- The chemical formulation of Gypsum is **$CaSO_4.2H_2O$ - Calcium Sulphate Dihydrate.**
- In nature, Gypsum occurs in the **form of crystals.**
- The presence of water in Gypsum (H_2O), **one square meter of plasterboard of 15 mm thickness contains around 3 litres crystal water.**
- Through the action of fire, **the crystal water evaporates and a protective layer of Gypsum is formed.**
- Behind this layer, the material under fire attack, remains at constant temperature around 100oC as long as water is released from the Gypsum.

• The **inclusion of glass fibres** in Gypsum boards enhances their **fire protection performance** by maintaining the integrity of the board in a fire.

•Gypsum is a **powerful fire retardant element** in the construction sector due to its **non-combustibility** and **ability to delay for up to 4 hours** - according to the number of plasterboards in the corresponding system - the progression of fire.



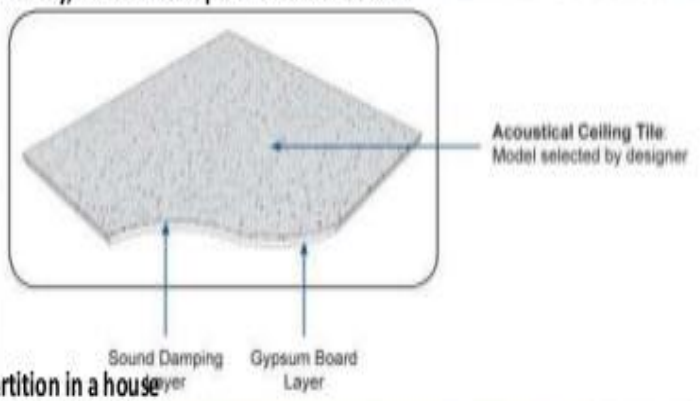
2) ACOUSTIC PROPERTIES

•The Gypsum Industry has a beneficial impact on **noise reduction** as it produces **special acoustic grade plasterboard which offers greater sound extinction** which can be applied where a particularly high performance is required.

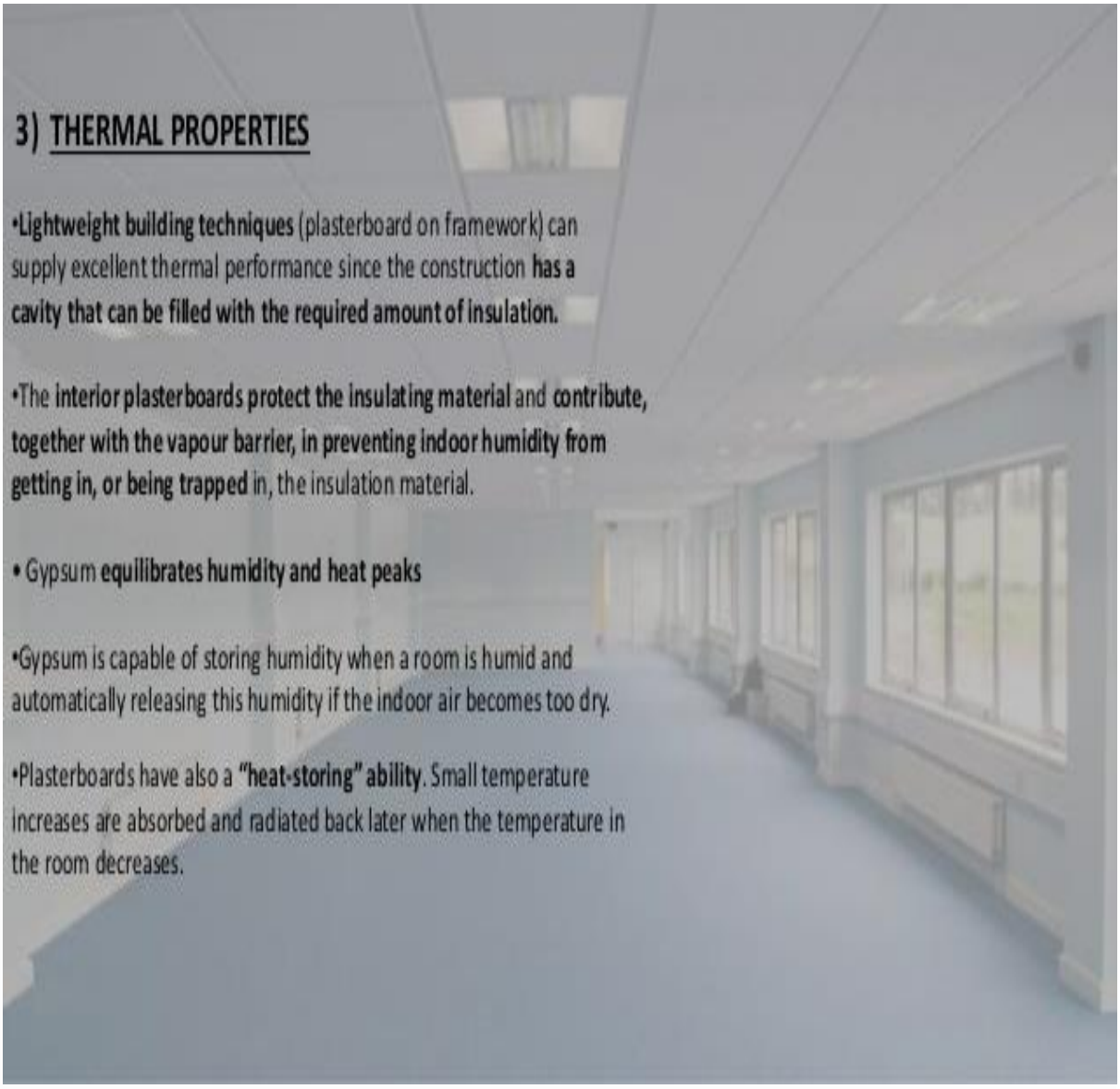
•**Drywall systems** provide effective sound insulation because they are designed **to provide a physical barrier to sound, incorporate a sound break and minimise reverberation.**

•Between the two sides of the partition there is an **air cavity, which interrupts the flow of sound.**

•Because the two sides of the partition are separate it is harder for impact sound to pass through.



•These characteristics mean that **a typical drywall partition in a house can be only 75mm thick. A comparable masonry wall would need to be 110mm thick to achieve the same sound performance.**



3) THERMAL PROPERTIES

•**Lightweight building techniques** (plasterboard on framework) can supply excellent thermal performance since the construction **has a cavity that can be filled with the required amount of insulation.**

•The **interior plasterboards protect the insulating material** and **contribute, together with the vapour barrier, in preventing indoor humidity from getting in, or being trapped** in, the insulation material.

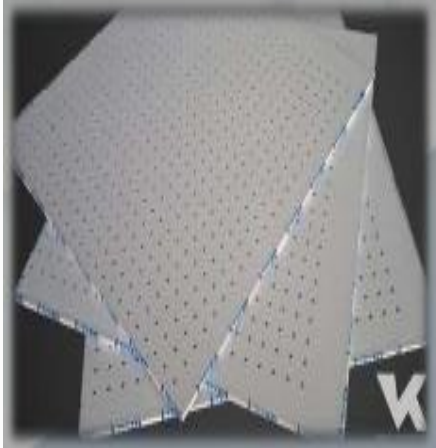
• Gypsum **equilibrates humidity and heat peaks**

•Gypsum is capable of storing humidity when a room is humid and automatically releasing this humidity if the indoor air becomes too dry.

•Plasterboards have also a **"heat-storing" ability**. Small temperature increases are absorbed and radiated back later when the temperature in the room decreases.

4) AESTHETICS AND DESIGN

•A richness of forms can be created in plasterboard or stucco.
•For architects, building with gypsum products allows them to unleash their creativity thus allowing them to answer, even more dramatically, to the demands of their customer while remaining within an **affordable budget.**
•In short, Gypsum allows the creation of stunning interiors in any and all styles, from the Classical to the Modern.



5) EASE OF ISTALLATION

•One of the principal reasons for this rapidly growing popularity is ease of installation.

•To construct an internal wall, for example, a frame is erected, plasterboard is fitted to it, joints are filled, and the wall is created.

•The operation is clean, dry and uncomplicated.

•A gypsum finish can also be applied to the surface of the plasterboard in order to achieve a superior finished appearance.