

TECHNICAL DESCRIPTION

PLASTERING & DRYWALL SYSTEMS



worldskills
international

© WorldSkills International
TD21 v4.0 – WSC2013

WorldSkills International, by a resolution of the Technical Committee and in accordance with the Constitution, the Standing Orders and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

1.	INTRODUCTION	2
2.	COMPETENCY AND SCOPE OF WORK	2
3.	THE TEST PROJECT	5
4.	SKILL MANAGEMENT AND COMMUNICATION.....	7
5.	ASSESSMENT	8
6.	SKILL-SPECIFIC SAFETY REQUIREMENTS	11
7.	MATERIALS & EQUIPMENT	11
8.	MARKETING THE SKILL TO VISITORS AND MEDIA.....	13

Effective 11.10.11



John Shiel
Chair Technical Committee



Stefan Praschl
Vice Chair Technical Committee

© WorldSkills International (WSI) reserves all rights in documents developed for or on behalf of WSI, including translation and electronic distribution. This material may be reproduced for non-commercial vocational and educational purposes provided that the WorldSkills International logo and copyright notice are left in place.

1. **INTRODUCTION**

1.1 **Name and description of skill**

1.1.1 The name of the skill is

[Plastering and Drywall Systems](#)

1.1.2 Description of skill

The plastering skill includes:

- The development and the decoration of buildings by the processing of elements and materials essentially containing plaster. That includes in particular:
 - The realisation of works in plasterboard (gypsum plasterboard), including metal framing
 - The processing of mouldered decorations with prefabricated elements containing plaster
 - Interior coatings stained or not, smooth or with texture.

1.2 **Scope of application**

1.2.1 Every Expert and Competitor must know this Technical Description.

1.2.2 In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 **Associated documents**

1.3.1 As this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI - Competition Rules
- WSI - Online resources as indicated in this document
- Host Country - Health and Safety regulations

2. **COMPETENCY AND SCOPE OF WORK**

The Competition is a demonstration and assessment of the competencies associated with this skill. The Test Project consists of practical work only.

2.1 **Competency specification**

[Working environment – hygiene, safety and the law](#)

Competitors shall have the following knowledge and understanding of hygiene, safety and related plastering and drywall systems laws:

- Describe (in simple terms) the standards and laws relating to safety, security and hygiene in plastering and drywall systems.
- Describe the different personal protective equipment (PPE).
- Describe the precautions for the safe use of power tools.

Competitors shall be able to:

- Create and maintain a safe and hygienic working environment
- Install his work area to avoid back pain.
- Apply standards and laws relating to security, safety and hygiene in plastering and drywall systems.
- Identify and use the appropriate personal protective equipment (PPE).
- Use power tools in a safe manner.

Study (reading plans and drawings / material and tools)

Knowledge and understanding of building study:

- Understand the work and customers demands.
- Identify the quality and standards required.

Competitors shall be able to:

- Read and interpret documentation from a variety of sources.
- Read and interpret drawings and specifications.
- Calculate the materials in accordance with plans and specifications.
- Describe in writing the process of installation.

Construction (partitions and ceilings)

Competitors shall have the following knowledge and understanding of construction, framing of partition walls and ceilings in plasterboards:

- Describe (in simple terms) the standards and laws relating to construction of partitions and ceilings in plasterboard.
- Identify and describe the framing systems used in the construction of walls and ceilings.
- Identify and describe the screws and fastenings used in the construction of walls and ceilings.
- Identify and compare different types of plasterboards and fibre cement boards.

Competitors shall be able to:

- Store plasterboards and related products.
- Set out the different elements of walls and ceilings.
- Cut metal frames.
- Erect the framing (square, plumb and levelled)
- Cut and fix (with adhesives or screws) plasterboard sheets.
- Cut and fix (with adhesives or screws) fibre cement boards.

Insulation (thermal, acoustic, and fire)

Competitors shall have the following knowledge and understanding of insulation:

- Describe (in simple terms) the standards and laws relating to thermal insulation in buildings.
- Describe (in simple terms) the standards and laws relating to acoustic insulation in buildings.
- Describe (in simple terms) the standards and laws relating to spread of fire.
- Identify and describe the materials used in thermal insulation.
- Identify and describe the materials used in acoustic insulation.
- Identify and describe the materials used to prevent the spread of fire.

Competitors shall be able to:

- Install and fix acoustic products.
- Install and fix thermal products.
- Install and fix fire proof material and other materials to prevent the spread of fire.
- Use resilient material.

Finishing of plasterboards (taping and coating)

Competitors shall have the following knowledge and understanding of finishing:

- Understand different methods of finishing plasterboards.

Competitors shall be able to:

- Prepare the plasterboards to receive the finish.
- Cut the beads and trims.
- Mix plastering compounds.
- Finish plasterboards joins manually.
- Manually sand the finished joints.
- Finish plasterboard using a skim coat of Gypsum plaster.

Plastering (mouldings and plaster coatings)

Competitors shall have the following knowledge and understanding of decoration with plaster:

- Describe of the use of decorative mouldings.
- Understand cutting both internal and external mitred corners.
- Describe the use of plaster coatings.

Competitors shall be able to:

- Measure and cut components accurately.
- Cut and fix paper-faced cornices
- Match, mitre and install cast ornamental cornices and panel mouldings.
- Prepare surfaces for plastering
- Apply floating and render coats to straight and curved surfaces
- Apply textured trowel coat finishes
- Apply smooth coat finishes

Creation and decoration

Competitors shall have the following knowledge and understanding of creation and decoration with plaster:

- Hear the opinion of the customer
- Understand the proposed theme
- Work to the Competitor's professional limit in given time

Competitors shall be able to:

- Apply decorative coatings in a professional manner.
- Show the talents and skills of a plasterer and drywall professional to the fullest.

2.2 Theoretical knowledge

2.2.1 Theoretical knowledge is required but not tested explicitly.

2.2.2 Knowledge of rules and regulations is not examined.

2.3 Practical work

The Test Project will include:

- Constructions in plasterboard including frames structures, thermal or acoustic insulation, finishing, angles and edges.
- A decorative section can be realised:
 - with some prefabricated units containing plaster
 - Interior coatings stained or not, smooth or with texture.

The following materials could be used:

- Metal frame
- Plasterboard (gypsum plasterboard; thickness from 6 to 15 mm)
- Accessories of installations and finishing
- Insulating materials (glass wool, rock wool, polystyrene, etc.)
- Decorating prefabricated units containing plaster
- Decorating renders including accessories of finishing, additives and colourings
- Any other complementary products to these materials.

3. THE TEST PROJECT

3.1 Format / structure of the Test Project

The format of the Test Project is modular with 4 modules. The complete Test Project has a building time between 15 and 18 hours.

One module will be freestyle with a maximum of 4 hours. This module will be done and assessed the last day of the Competition. The competitors can prepare their work before the competition (templates, drawings, etc.)

The compulsory Test Project consists of 4 separate modules which will be assessed each day (1 module per day):

- Module 1: Internal arrangement
- Module 2: Thermal or acoustic solution
- Module 3: Decoration and ornamentation includes a speed test for approximately 1 hour of work
- Module 4: Freestyle

3.2 Test Project design requirements

The Competitors have to carry out, independently the following tasks without any outside help:

- Set out the walls, ceilings and decorative elements.
- Build the walls and ceilings using a metal frame and clad them with plasterboard.
- Tape, joint and finish the plasterboards.
- Measure, cut and fix the prefabricated decorative sections formed from plaster.
- Use a decorative plastering technique to create a plaster effect which can be applied to the required module. This can be moulding sections run by the competitor, decorative coatings, Venetian plaster, sgraffito or lighting effects. The Competitor has a free choice of technique.
- The materials for this exercise can be brought to the Competition by the Competitor if they are not on the infrastructure list but they must contain plaster. Templates and specialist tools can be brought and used by the Competitor as well as special accessories such as spot lights. The Competitors must consider the space implications regarding the workshop floor space as the Competitor will not be allowed to encroach past their allotted space.

Module 1 – Internal arrangements

- This module cannot exceed 2.1 metres in height.
- This module must contain a 2 sq.m. straight and plumb surface which will be used for application of module 4.
- This module must contain at least 1 angle and 2 edges.
- The wall can be curved and can contain a door or window opening.

Module 2 – Thermal or acoustic solution

- This module can be independent or fixed to module 1.
- It must contain some insulating material to improve thermal or acoustic performance.

Module 3 – Decoration and ornamentation

- Three months prior to the start of the Competition the Chief Expert must choose a combination of 3 of the following element: cornice, plinths, coatings and mouldings. All Experts must decide on the combination on the discussion forum. The combination with the most votes will be chosen.
- All Experts will bring a proposal for this module using the chosen combination to the competition.
- Experts will vote to decide the preferred proposal at the competition. Voting will be as per the Competition Rules.
- An easy square part of this module can be used as a speed test.

Module 4 - Freestyle

- The Experts decide some compulsory measurements in respect of this module based on the 2 sq.m. wall.
- The theme of the freestyle module could be the decision of the Competition Organiser.

3.3 Test Project development

The Test Project MUST be submitted using the templates provided by WorldSkills International (<http://www.worldskills.org/competitionpreparation>). Use the Word template for text documents and DWG template for drawings.

3.3.1 Who develops the Test Project / modules
The Test Project / modules are developed by:

Some Experts and the material supplier.

The Test Project modules can be drawn by a CAD professional.

3.3.2 How and where is the Test Project / modules developed

The Test Project modules are developed jointly on the Discussion Forum.

3.3.3 When is the Test Project developed
The Test Project is developed according to the following timeline:

Time	Activity
3 months before the Competition	The Test Project is developed, selected by vote of the Experts and circulated on the WSI website. Module 3 – The CE decides on the combination of elements to be included in the module. A vote of the Experts is conducted on the forum for agreement.
At the Competition	The Experts present proposed projects for Module 3. This module will be selected by vote of the Experts. Module 3 constitutes the 30% change.

Note: The material catalogue available in the Host Member's country/region is required to develop the Test Project modules.

3.4 Test Project marking scheme

Each Test Project must be accompanied by a marking scheme proposal based on the assessment criteria defined in Section 5.

3.4.1 The marking scheme proposal is developed by the person(s) developing the Test Project. The detailed and final marking scheme is developed and agreed by the majority of Experts on the Discussion Forum prior to the Competition.

3.4.2 Marking schemes should be entered into the CIS prior to the Competition.

3.5 Test Project validation

When the Test Project modules have been designed it must be agreed by all Experts that the Test Project modules can be completed within the material, equipment, knowledge and time constraints of the Competitors.

3.6 Test Project selection

The Test Project is selected as follows:

The Test Project modules 1, 2 and 4 are developed by all Experts on the Discussion Forum. Together the Experts will discuss and develop the final Test Project modules and the Marking Scheme with the Chief Expert facilitating the process. At the end of the Test Project development, the majority of Experts (50% +1) must agree on the design.

At the current Competition, each Expert must bring a Test Project module 3, which can recover module 1 and/or module 2. Experts will vote on the module for this Competition. Voting will be as per the Competition Rules.

3.7 Test Project circulation

The Test Project is circulated via WorldSkills International website as follows:

The Test Project modules 1, 2 and 4 are circulated via the WorldSkills International website 3 months before the current Competition.

3.8 Test Project coordination (preparation for Competition)

Coordination of the Test Project will be undertaken by:

Coordination of the Test Project will be undertaken by the Skill Management Team and the Supplier(s).

3.9 Test Project change at the Competition

Module 3, which is 30% of the Test Project, is not circulated. That means that each competitor discovers this module at the Competition.

3.10 Material or manufacturer specifications

If Host Member's norms and manufacturer specifications are required to allow the Competitor to complete the Test Project, the manufacturer / supplier must provide by 3 months before the Competition the necessary documents at least in English:

- Host Member's norms
- Technical specifications
- Installation guide

4. SKILL MANAGEMENT AND COMMUNICATION

4.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration and decision making regarding the skill must take place on the skill-specific Discussion Forum (<http://www.worldskills.org/forums>). All skill-related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be moderator for this forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

4.2 Competitor information

All information for registered Competitors is available from the Competitor Centre (<http://www.worldskills.org/competitorcentre>).

This information includes:

- Competition Rules
- Technical Descriptions
- Test Projects
- Other Competition-related information

4.3 Test Projects

Circulated Test Projects will be available from [worldskills.org](http://www.worldskills.org) (<http://www.worldskills.org/testprojects>) and the Competitor Centre (<http://www.worldskills.org/competitorcentre>).

4.4 Day-to-day management

The day-to-day management is defined in the Skill Management Plan that is created by the Skill Management Team led by the Chief Expert. The Skill Management Team comprises the Jury President, Chief Expert and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalised at the Competition by agreement of the Experts. The Skill Management Plan can be viewed in the Expert Centre (<http://www.worldskills.org/expertcentre>).

5. ASSESSMENT

This section describes how the Experts will assess the Test Project / modules. It also specifies the assessment specifications and procedures and requirements for marking.

5.1 Assessment criteria

This section defines the assessment criteria and the number of marks (subjective and objective) awarded. The total number of marks for all assessment criteria must be 100.

Section	Criterion	Marks		
		Subjective (if applicable)	Objective	Total
A	General aspects	5	5	10
B	Measurements	0	20	20
C	Squareness / Plumbness / Level	0	20	20
D	Mouldings and plaster / Taping and coatings	3	17	20
E	Technical conformity and the level of construction	0	10	10
F	Module 3 - Speed competition	0	4	4
G	Module 4 - Freestyle	3	5	8
H	Health, Safety and cleanliness	0	8	8
Total =		11	89	100

5.2 Subjective marking

Scores are awarded on a scale of 1 to 10

10 = Perfect

9 = Very good

8 = Good

7 = Fairly good

6 = Sufficient

5 = Average

4 = Poor

3 = Unsatisfactory

2 = Very bad

1 = Unacceptable

5.3 Skill assessment specification

Criteria A: General Aspects

This will be assessed using the following sub criteria. For Module 1, 2 and Module 3

Subjective marks (5)

- The optical cleanliness of the finish of modules 1, 2 and 3
- The overall look from the Test Project
- The precession of the cutting of the plasterboards.

Objective marks (5)

- Is the task total finish as drawn on the plan Module 1, 2 and 3
- Is the task finis as in Test Project Description defined Module 1, 2 and 3

Criteria B: Measurements

This will be assessed using the following criteria. For Module 1, 2 and Module 3

Objective marks

- The accuracy of the measurement of the given dimensions in High before the coating. On module 1,2 and 3
- The accuracy of the measurement of the given dimensions in wide and before the coating. On module 1,2 and 3

Criteria C: Squareness / Plumbness / Level

This will be assessed using the following sub criteria for modules 1, 2 and 3.

- The plumbness of the construction in module 1, 2 before coating and beds
- The squareness of the construction in module 1, 2 before coating and beds
- The levels of the construction in module 1, 2 before coating and beds
- The straightness of the construction in module 1,2 before coating and beds
- The plumbness of the construction in module 1, 2 after coating and beds
- The squareness of the construction in module 1, 2 after coating and beds
- The Levels of the construction in module 1, 2 after coating and beds
- The plumbness of the mouldings in module 3
- The squareness of the components mouldings in module 3
- The straightness of the components mouldings in module 3
- The levels of the components mouldings in module 3

Criteria D: Mouldings and plaster / Taping and coating

This will be assessed using the following criteria for modules 1, 2 and 3:

- The straightness of the tapes and beads.
- The smoothness of the tapes and beads.
- The straightness of the coatings.
- The smoothness of the coatings.
- The cleanness of the coatings.

- The straightness of the components mouldings in module 3
- The smoothness of the mouldings
- The cleanness of the mouldings
- The precision of the cutting and filling of the internal and external mitres on the components mouldings in module 3
- The straightness of the internal and external mitres of the mouldings in module 3
- The smoothness of the internal and external mitres of the mouldings in module 3
- The cleanness of the internal and external mitres of the mouldings in module 3

Criteria E: Technical conformity and the level on the construction

This will be assessed using the following criteria. For Module 1, 2 and 3

- The precision of the cutting of the plasterboards.
- The correct fixation of plasterboard.
- The correct fixation of metal construction
- The correct use of specific materials used in the technical construction.
- The technical conformity.
- The correct use of tapes and beads.
- The correct bedding in of the beads and tapes.
- The correct use of insulation.

Criteria F: Module 3 - Speed Competition

This will be assessed using the following criteria:

- The accuracy of the measurement of the given dimensions of the task.
- The completion of the task.
- The general aspect of the speed contest
- Time used for finish the work by fastest and lowest time

Criteria G: Module 4 - Freestyle module

This will be assessed using the following criteria:

- The accuracy of the measurement of the given dimensions in the drawing supplied to the competition judges on day 2.
- The completion of the model.
- The general aspect of the model.

Criteria H: Health and safety and general cleanliness

This will be assessed throughout the Competition.

- Correct use of glasses, gloves and mask each day
- Correct use of safety boots each day
- Correct handling with tools each day
- Now running in work area each day
- Working place clean at each day by lunchtime
- Working place clean each day after Competition
- Working area clean during daytime at work each morning
- Working area clean during daytime at work each afternoon

Tolerances for structure and plasterboard: +-1mm for the dimensions lower than 300mm +-2mm for the dimensions between 300mm and 1200mm, +- 3mm for the dimensions higher than 1200mm.

Tolerances in straightness for coatings and finishing: +-1mm for the dimensions lower than 500mm +-2mm for the dimensions between 500mm and 1500mm +-3 mm for the dimensions higher than 1500mm.

Tolerances for mouldings and ornamentation: +-1mm for the dimensions lower than 300mm +-2mm for the dimensions higher than 300mm.

Special local (host country) technical specification can be used to assess. In this case, those specifications/norms must be given by 3 months before the Competition.

5.4 Skill assessment procedures

The Chief Expert and Deputy Chief Expert discuss and divide the Experts into marking teams. This is assessed by the WorldSkills Competition experience, culture and language of the Experts.

The Expert marking teams mark the same aspects on every project.

6. **SKILL-SPECIFIC SAFETY REQUIREMENTS**

Refer to Host Country Health & Safety documentation for Host Country regulations.

- All Competitors must bring and use safety glasses when using any hand, power or machine tools or equipment likely to cause or create chips or fragments that may injure the eyes.
- All Competitors must bring and use:
 - protective clothes
 - Safety shoes.
- Competitors must keep their workspace clear of obstacles and the floor space clean permanently.
- Failure by the Competitor to comply with safety directions or instructions may incur loss of marks for the marking point: security.
- Judges will wear the appropriate personal safety equipment when inspecting, checking or otherwise working with a Competitor's Test Project.

7. **MATERIALS & EQUIPMENT**

7.1 Infrastructure List

The Infrastructure List details all equipment, materials and facilities provided by the Competition Organiser.

The Infrastructure List is online (<http://www.worldskills.org/infrastructure/>).

The Infrastructure List specifies the items & quantities requested by the Experts for the next Competition. The Competition Organiser will progressively update the Infrastructure List specifying the actual quantity, type, brand/model of the items. Items supplied by the Competition Organiser are shown in a separate column.

At each Competition, the Experts must review and update the Infrastructure List in preparation for the next Competition. Experts must advise the Technical Director of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

7.2 Materials, equipment and tools supplied by Competitors in their toolbox

No toolbox can exceed 1 cubic meter and 160kg in weight. Toolbox numbers are not limited but the total weight and volume cannot exceed the specified values.

The following is a list of tools a Competitor may choose to bring:

- meter or measuring tape (2m)
- ruler (1m)
- square
- mitre box
- feather edge ruler
- trowels, different types
- plastering knives and plastering spatulas
- plasterer's float, different types
- joint rules/ mitre tools
- hammer
- wood and metal saws
- special saws for plasterboard
- abrasive paper
- rubber breakers
- brushes
- metal stud guillotine
- pencils
- felt board/ felt sponge
- Japanese spatulas
- chalk lines
- jig saw
- screw gun (single screw or collated)
- grignoteuse
- reglets
- gouges
- sponges
- surform plane
- tin snips

This list is not restrictive.

7.3 Materials, equipment and tools supplied by Experts

Not applicable

7.4 Materials & equipment prohibited in the skill area

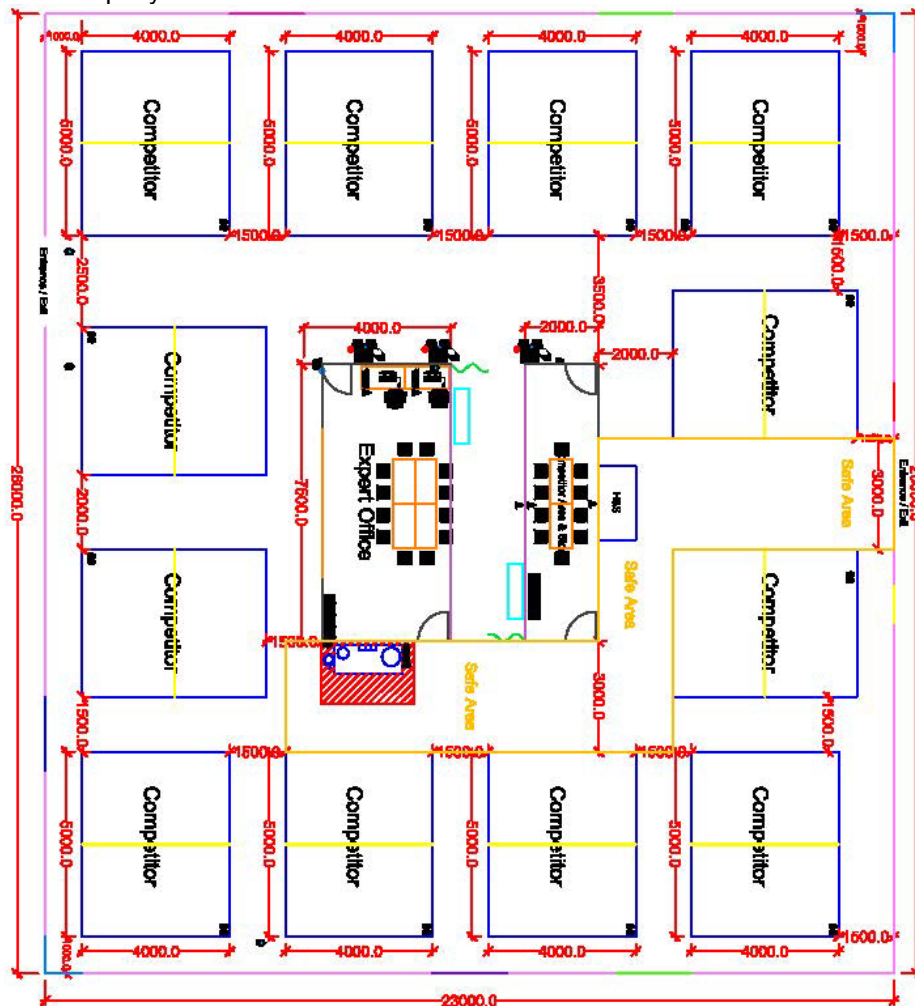
All metal sections are to be cut by a drywall guillotine or tin snips and as a result electrical chop saws are prohibited in the Competition.

All mitres to cornice and panel moulds must be cut by hand and as a result electrical mitre saws are prohibited in the Competition.

7.5 Proposed workshop and workstation layouts

Workshop layouts from London are available at:
http://www.worldskills.org/index.php?option=com_halls&Itemid=540

Workshop layout:



8. MARKETING THE SKILL TO VISITORS AND MEDIA

8.1 Maximising visitor and media engagement

- Try a trade
- Speed test in module 3 (decoration and ornamentation)
- Display screens (architectural works in plaster and plasterboard)
- Test Project descriptions
- Career opportunities
- Daily reporting of competition status

8.2 Sustainability

- Who of us does not live surrounded by gypsum? What home does not have plaster on the walls or plasterboards for its ceilings and interior lining? Who has not been impressed by offices, hotels and public institutions whose interiors are shaped into intricate arches and curves, which are made possible by the use of plaster and plasterboards to create an aesthetically pleasing environment?

- Gypsum has been used by man in construction or decoration in the form of plaster and alabaster since 9000 B.C. During the time of the pharaohs, gypsum was used as mortar in the construction of Cheops Pyramid (3000 B.C.). In the Middle Ages and Renaissance, decorations and artistic creations were made of plaster. Since then, the range of construction-related uses has continued to expand.
- The process to obtain plaster is simple: the mineral is extracted from the earth's crust (open or underground quarries), it is then exposed to certain thermal processes whereby it is partially dehydrated and after grinding becomes a fine white powder – commonly known as Plaster of Paris – which hardens when moistened and allowed to dry. There isn't any VOC (Volatile Organic Compound) inside.
- Gypsum is furthermore a raw material which can be eternally recycled to manufacture gypsum based products (closed-loop recycling). We could say that gypsum is in that case close to being a "totally renewable natural resource".
- Incomparable Features:
 - Gypsum is fire protective. Gypsum is non-combustible and able to delay a fire's spread up to 4 hours. Gypsum acts, in this case, as a fire barrier and thus reduces home or business fire damage
 - Gypsum regulates sound and solutions. Gypsum walls, ceilings and floors together with insulation materials create quiet zones in the house or business environment. They are designed to provide a physical barrier to sound, incorporate a sound break and minimize reverberation. These solutions are virtually indispensable for the interiors of homes and offices and indeed all types of buildings where people congregate such as schools, shops, cinemas, airports, etc.
 - Gypsum acts as a thermal insulator when combined with insulation materials. Thanks to its low thermal conductivity, gypsum plasterboards contribute together with the insulating material to the insulation of external walls and linings.
 - 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. Plaster and Plasterboards have also a "heat-storing" ability. Small temperature increases are absorbed and radiated back later when the temperature in the room decreases.
 - Gypsum is impact resistant. The gypsum industry provides plasterboards, plaster blocks and plaster with a degree of hardness equivalent to a thick wall heavy masonry construction.
 - Gypsum is multifaceted, multipurpose, supple and aesthetic. A richness of forms can be created in plasterboard, plaster or stucco. For architects, building with gypsum products allows 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.