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PRODUCTS  
AND SYSTEMS

 **TECHNOGIPS**<sup>JSC</sup>  
gypsum manufacturing

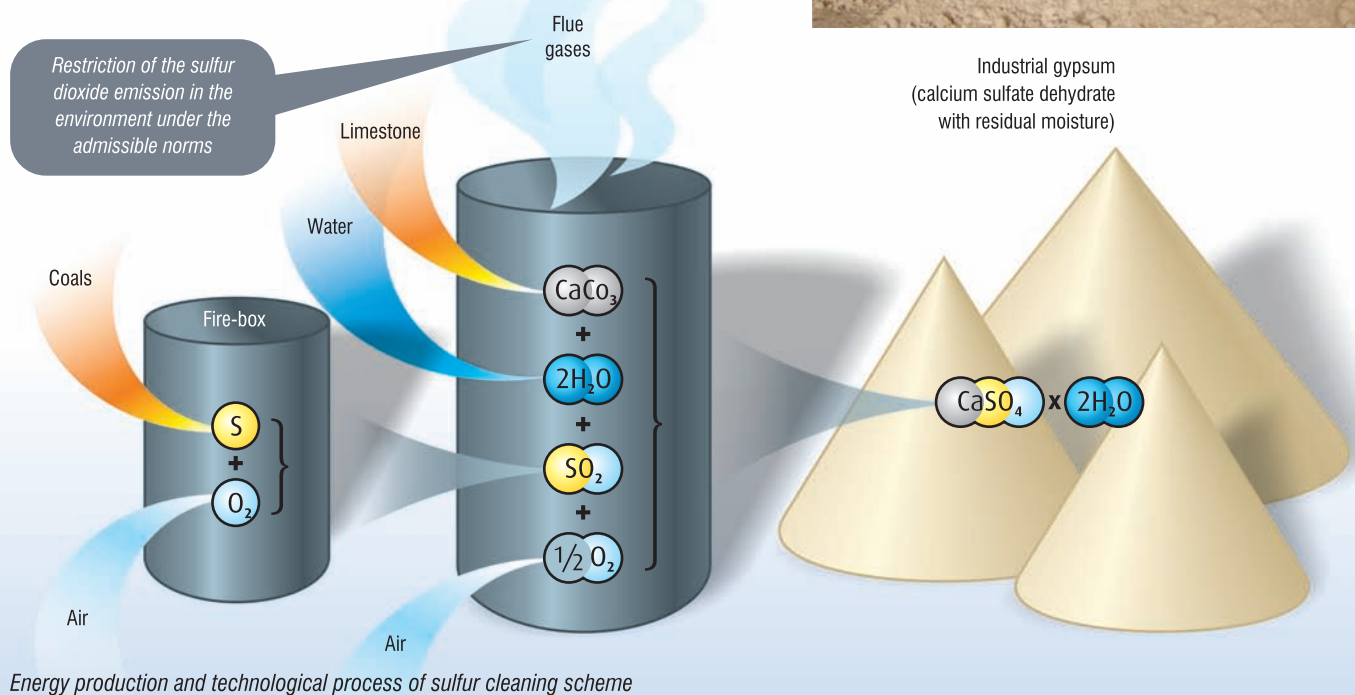




## RAW MATERIAL, TECHNOLOGY, PRODUCTS – ECOLOGY GUARANTEE

**TECHNOGIPS JSC** processes **industrial gypsum**. Its use in the region is new and probably provokes many questions. This gypsum is also known as REA or FGD-gypsum and is obtained at the production of electricity in TPP Maritza Iztok 2 in the special flue gases desulfurization installations. It is a result of an elementary process of irreversible binding of calcium carbonate, released by limestone mass, with sulfur dioxide, air oxygen and water. The industrial gypsum has the same formula like the natural one and the only difference is the manifold shorter time of production.

➤ **Industrial and natural gypsum are fully identical in formula and composition**



It can be underlined expressly that the natural gypsum property to be a regulator of the climate is also valid for the industrial gypsum. When used for gypsum plasterboards or dry mixtures for plasters it absorbs and releases moisture in the rooms. Both kinds of gypsum have the same behavior at high temperatures, which provides for a high durability and resistance of materials.

➤ **Good performance qualities of the used gypsum**

The use of industrial gypsum is the investment of great quantities in materials, which are realized in construction thanks to our partners and clients, where:

- nature is not polluted with landfill site
- nature is not deprived of natural gypsum
- The basic energy source for the production is natural gas, the result of which is the least effect on the environment.
- No gases or other wastes are released during the technological cycle. Only vapors are emitted in the atmosphere.

### TECHNOGIPS PRODUCTS – PRIORITIES

- **modernized technology** – optimized cost energy
- **lightweight building components**, reduced load, respectively optimized cost of structural materials
- **location of industry** – low transport costs to consumers
- **Gypsum** – utilized a byproduct, replaces natural
- **Cardboard** – 100% recycled paper
- **Plasterboards** – 100% recyclable








# TECHNOGIPS GYPSUM PLASTERBOARDS – HIGH END PRODUCT

## PLASTERBOARD TYPES

The new naming of the plasterboard types is also valid with the introduction of the standard EN 520. They correspond to the ones, established in the branch, and to the ones, popular in many countries from the German standard DIN:

TECHNOGIPS	EN 520	DIN 18 180
Standard plasterboards type A	Type A	GKB
Moisture resistant plasterboards type H	Type H	GKI
Fire resistant plasterboards type F	Type F	GKF

### TECHNOGIPS

 Standard plasterboards type A	 Moisture resistant plasterboards type H2	 Fire resistant plasterboards type F
Thickness (mm)		
9,5	–	–
12,5	12,5	12,5
15,0	15,0	15,0
18,0	–	18,0
Width (m)		
1,20	1,20	1,20
Length (m)		
2,00	2,00	2,00
2,50	2,50	2,50
2,60	2,60	2,60
3,00	3,00	3,00

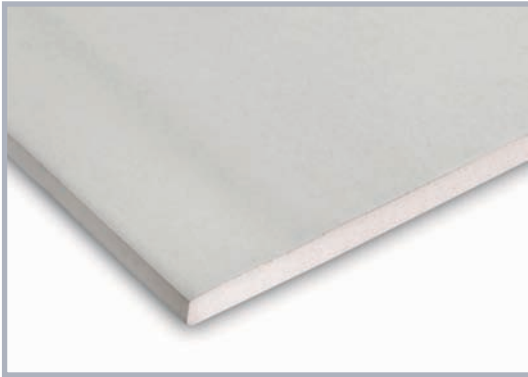
### TECHNOGIPS

#### standard gypsum plasterboards type A



TECHNOGIPS standard gypsum plasterboards create a surface, suitable for painting, papering and gypsum plaster. They are used in partition systems, wall linings and suspended ceilings.

The construction elements, built by type A boards can be situated in interior rooms with normal humidity.



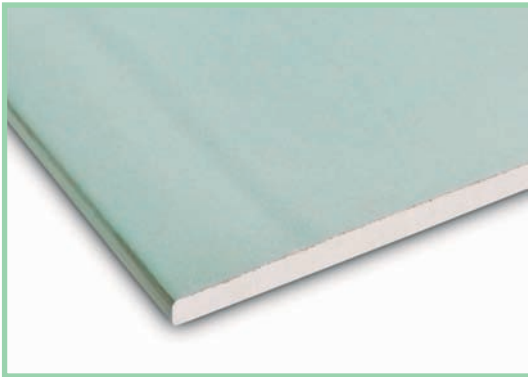
### TECHNOGIPS

#### moisture resistant plasterboards type H2



TECHNOGIPS moisture-resistant boards type H2 are boards of reduced water absorption. Special impregnated board is used in the production process and additives to the gypsum core, whose purpose is to increase the resistance at high humidity conditions. TECHNOGIPS moisture-resistant boards type H2 are classified in the second group of common water absorption with an index between 5% - 10%.

They are used for partition walls, wall linings and suspended ceilings the surfaces being suitable for lining or decoration – paints, wallpapers, etc.



### TECHNOGIPS

#### fire resistant plasterboards type F



TECHNOGIPS fire resistant plasterboards type F are resistant to high temperatures, because the gypsum core is reinforced with additives and glass fibers. Due to this they are system elements with which different levels of fire protection with partitions and shaft walls, suspended ceilings and fire protection cladding of steel elements is obtained. The finishing works on the surfaces are the standard - plastering or painting, papering, lining, etc.

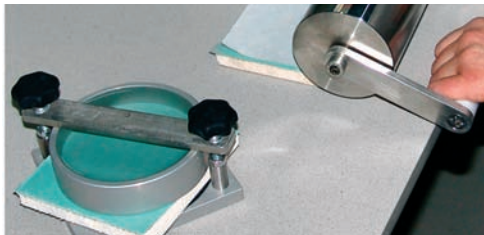






#### Resistance at high temperatures (gypsum core cohesion)

The plasterboards type F are tested in the TECHNOGIPS laboratory according to the product standard for the higher durability at heating.



#### Resistance at high humidity (water absorption)

The plasterboards type H2 are evaluated through two additional tests. The first one is for the water quantity, which is absorbed only by the face of the plasterboard and only by its back – surface water absorption. The second one is for the quantity of water, absorbed by the whole plasterboard – total water absorption.

### PRODUCTION CONTROL FOR DRY MIXTURES

The parameters of the gypsum machine plaster TEHNOSPRINT are tested for compliance with product standards for compressive strength, tensile strength, adhesion to the substrate. They have further examined adhesion to various substrates such as brick, concrete with and without primer, hardness. Indicators of plaster are subject to continuous monitoring, the values always exceed those specified in the product standard EN 13279. In practice, high values indicate:

- Easy workability
- Stability and firmness in executable form
- The composition of gypsum is a prerequisite for slower wear of machine parts

The parameters of the adhesive for plasterboards - TEHNOFIKS are tested for compliance with product standards for adhesion to the substrate. They have further examined the adhesion of gypsum boards and other substrates such as concrete. Subject to continuous monitoring are as well as strength of grip and the compressive strength and tensile strength. For sale are available only products whose performance exceeds specified in the product standard EN 14496.



Test for compressive strength of gypsum adhesive TEHNOFIKS



Flexural strength test of gypsum adhesive TEHNOFIKS

## TECHNOGIPS GYPSUM PLASTERBOARD CHARACTERISTICS CONTROL

Over 10 plasterboard characteristics are a subject of control in the production process. It is exercised continuously at key points from the beginning to the end of the technological line. The ready production is tested daily according to the parameters given by the product standard EN 520 and completed according to the requirements of the good building practice.

#### ➤ Adhesion of the gypsum core with the board

This is a characteristic which influences the final result of the assembly and the surface finishing and is a subject of a continuous control.

#### ➤ Strength

At the execution of construction elements with gypsum plasterboard a certain bearing capacity is required. The strength is measured in the TECHNOGIPS Jsc laboratory with the help of equipment of the highest world level.

At the product initial type tests in a notified laboratory of the Research Institute of Construction in Sofia were carried out. The result values are much higher than the "flexural strength and bending" parameter limits.

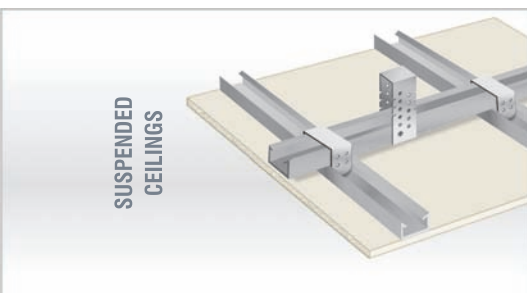
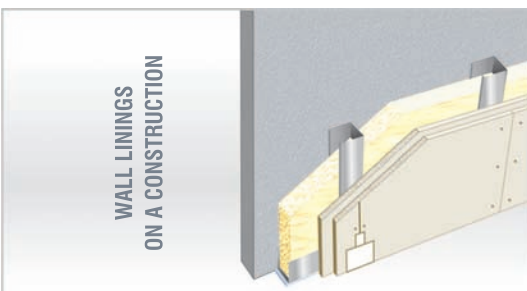
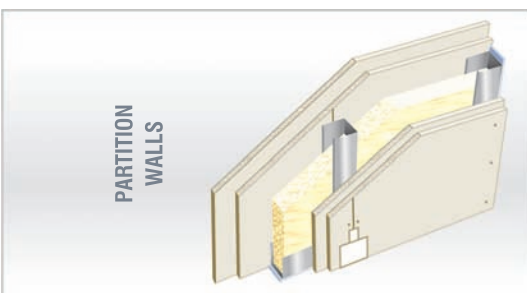
Control in TECHNOGIPS laboratory – flexural strength at bending



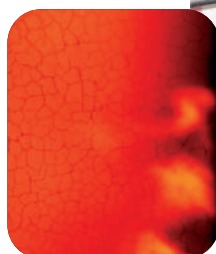
Moisture control on-site



## TECHNOGIPS SYSTEM SOLUTIONS FOR DRYWALL – SOUND BASIS FOR DESIGN AND PERFORMANCE



TECHNOGIPS  
partition wall test  
at 95-th minute on the  
non-heated side



*TECHNOGIPS partition wall test at 95-th minute on the heated side*

Construction	
<i>type of profile – bearing</i>	CD60
<i>type of profile – mounting</i>	CD60
Hanger 0.4 kN	
<i>direct or vernier hanger</i>	
Axial distance between	
<i>hangers (mm)</i>	800
<i>bearing profiles (mm)</i>	800
<i>mounting profiles (mm)</i>	400
Cladding	
<i>thickness (mm)</i>	2 x 15
<i>TECHNOGIPS plasterboard – type</i>	F
FIRE RESISTANCE OF SUSPENDED CEILING	
<i>El (min)</i>	60
<i>protocol</i>	N2 / 16.02.2011

The notion "system" has become popular in the field of theory and practice. This is the set of elements which should be assembled without wet processes. We can use the term system when the construction-physical parameters, which are achieved, are known. Their use rests on a more than 40 year experience in Europe and a lot of researches and tests of construction science. They have formed gradually the basic principles of system formation, the requirements to them, the interaction with all kinds of construction elements, made of other materials and other functions in the buildings is checked. This experience finds place in established norms like DIN 18181 and 18183, ONORM 3415. In Europe a process for the accepting of unitary norms for drywall is going on at the moment. Only EN 13964 "Suspended ceilings" is approved up to the present moment. In it the notion "construction set" is introduced. It is used together with the notion "system".

On the other hand the quality and reliability criteria of the individual products for drywall are determined. In Europe the individual product standards apply:

- EN 520 – Gypsum plasterboards
- EN 14195 – Metal framing components for gypsum plasterboard systems
- EN 14496 – Gypsum based adhesives for thermal/acoustic insulation composite panels and plasterboards
- EN 13963 – Jointing materials for gypsum plasterboards
- EN 14566 – Mechanical fasteners for gypsum plasterboard systems
- EN 13162 – Thermal insulation products for buildings. Factory made mineral wool products

A good construction practice is realized today through construction sets of elements, whose conformity to the product standards is proved.

TECHNOGIPS tests and gives information about the main construction parameters like sound and thermal insulation and fire protection of systems with TECHNOGIPS plasterboards, construction, fastening and jointing materials, conforming to the respective product standards.

Plasterboard type selection depending on the humidity level in the room: ONORM recommendations in 3415:2009

## FIRE RESISTANCE OF TECHNOGIPS PARTITION WALLS

Construction  Type of profile	Thickness of the wall	Cladding		Insulating material		Fire resistance	
		<i>thickness</i>	<i>TECHNOGIPS plasterboard</i>	<i>thickness</i>	<i>density</i>	<i>EI</i>	<i>protocol*</i>
	<i>mm</i>	<i>mm</i>	<i>type</i>	<i>mm</i>	<i>kg/m³</i>	<i>min</i>	

### Walls with a single layer cladding with wool

CW/UW 50	75	1 x 12,5	F	50	40	EI 90	№ 56/ 11.10.2010
CW/UW 75	100	1 x 12,5	F	50	40		
CW/UW 100	125	1 x 12,5	F	50	40		

### Walls with a double layer cladding with wool

CW/UW 50	100	2 x 12,5	A	50	40	EI 90	№ 57/ 11.10.2010
CW/UW 75	125	2 x 12,5	A	50	40		
CW/UW 100	150	2 x 12,5	A	50	40		

### Walls with a double layer cladding without wool

CW/UW 50	100	2 x 12,5	F	—	—	EI 120	№ 8/ 09.02.2010
CW/UW 75	125	2 x 12,5	F	—	—		
CW/UW 100	150	2 x 12,5	F	—	—		

\* Classification protocols in accordance to EN 13501-2



## TECHNOMIX – hand-applied gypsum plaster

A universal gypsum-based dry mixture with additives for the regulation of the setting time and adhesion. It is used for internal plastering on standard building foundations in rooms with normal humidity. It enables the achievement of a smooth surface, ready to be painted. Factory homogenized, improved gypsum mixture. Secure packing, convenient to operate. Suitable for application on all standard bases with normal load bearing.

According to the product standard EN 13279

**Cost:** about 10 kg / 10 mm / m<sup>2</sup>

### Advantages:

- ✓ Allows single coating with 40 mm thickness
- ✓ Optimum consumption rate of material
- ✓ Speed of the working process and avoiding further plastering of the surface
- ✓ Good steam-diffusion ability

## TECHNOSPRINT – machine-applied gypsum plaster

Dry gypsum mixture for internal plastering of all kinds of standard building foundations in rooms with standard humidity. It is suitable for all plaster spray machines with a conveying capacity of 22 l/min.

Factory homogenized, improved gypsum mixture. Secure packing, convenient to operate. Suitable for application on all standard bases with normal load bearing.

According to the product standard EN 13279

**Cost:** about 10 kg / 10 mm / m<sup>2</sup>

### Advantages:

- ✓ Saves manual labor
- ✓ Wide-open application time
- ✓ Perfectly smooth finish surface
- ✓ You do not need antialiased with fine putty

## TECHNOSATEN – hand-applied gypsum fine plaster

Fine gypsum mixture with additives for the regulation of the setting time and adhesion, allowing an extremely thin plastering on all kinds of standard lime-cement and gypsum lining plasters, and on plasterboards and gypsum-phaser boards in rooms with normal humidity. It is used for a perfectly smooth surface before painting. It allows thin fillings.

Factory homogenized, improved gypsum mixture. Secure packing, convenient to operate. Suitable for application on all standard bases with normal load bearing.

According to the product standard EN 13279

**Cost:** about 1 kg / 1 mm / m<sup>2</sup>

### Advantages:

- ✓ It achieves perfect smoothness
- ✓ Wide-open application time
- ✓ Allows coat of zero thickness

## TECHNOFUGA – joint-filler

Fine gypsum mixture with additives for achieving equal strength bond between the plasterboards. The material is used both for manual joint-filling and second and third coating.

Suitable for manual joint-filling with joint-reinforcing tape on all types of plasterboards in rooms with normal humidity.

**Allows to:** filling minor damage from transport, installation of plasterboards or full-surface coating.

Factory homogenized, improved gypsum mixture. Secure packing, convenient to operate.

According to the product standard EN 13963

**Cost:** about 300 g / m<sup>2</sup> by mounting of mono-layer plasterboards with thickness of 12,5 mm

## TECHNOFIX – gypsum adhesive for gluing gypsum plasterboards on the internal wall surfaces in rooms with normal humidity.

Factory homogenized, improved gypsum mixture. Secure packing, convenient to operate. Suitable for application on all standard bases with normal load bearing.

TECHNOFIX apply to the enforcement of the so-called "dry coat" with plasterboards. Depending on the unevenness of the main wall, the following main methods:

- bumps up to  $\pm 10$  mm - balls of gypsum adhesive
- bumps over  $\pm 10$  mm - balls of gypsum adhesive and plasterboard stripes

Do not gluing plasterboards in rooms with high humidity such as bathrooms, pools, etc.

According to the product standard EN 14496

**Cost:** about 4.5 kg / m<sup>2</sup>











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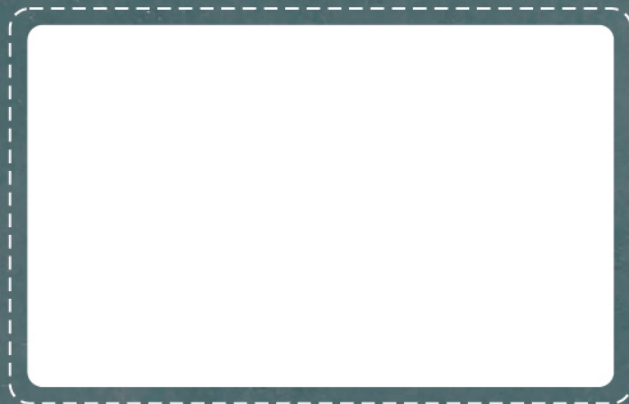
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