LIGHT-WEIGHT GALVANIZED STEEL CONCRETE COMPOZITE BUILDING SYSTEM

CATALOG

GETAS

HIGH – TECH CONSTRUCTION

GETAS HIGH-TECH

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OWERWIEW

GETAS HIGH-TECH market has developed rapidly due to optimum manufacturing speed and efficiency. Getas High-Tech enables the construction of buildings in the quality and price level demanded.
In addition, the values of this system on fire resistance, sound penetration, heat thermal transmittance and earthquake endurance are indisputably higher than the values of ordinary constructed buildings.

Construction production with single shift in the plant is about 500 m2 daily. It is possible to double the amount by increasing shifts and/or installing new production lines. However, production on the construction field and/or provision manufacturing lines on the construction field result in savings from transportation in a project with high volumes such as 100.000 m2. Our structure is appropriate for this kind of task Installation of a structure of 150 m2 (carcass/skeleton) is possible in a weak with a team of five persons.
Wall coatings and concrete fillings are performed in a week, and floor concrete and roof construction are completed in the following week

Turn-key solution period is eight or nine weeks with a good organization.
Four week period is an ideal time to complete construction and installation and put fixed furniture in their places.
The system is four times lighter than classical system and provides extra safety in addition to the earthquake safety which is very high already, with decrease of momentum of inertial.
Owing to very little construction time, the earlier the use of building starts the earlier the payback of the finance expended for the building commences. (Such as avoiding extra rental costs by starting use the building earlier or obtaining income by hiring the building).
Margin of error is almost 0 (Zero) because it is half-fabricated production

GENERAL INFORMATION

- Galvanized Steel Composit Housing System is a system like the armoured concete system with a difference of usage of steel profiles instead of the reinforcing irons.
- Any quality of concrete according to the needs can be used in the wall areas.
- Concrete can be poured to the spaces between the floors.
- As explained below, this system can be used in any kind of climate all around the world. from coldest to the hottest temperatures,
- Due to the fact that this system is low in permeability, it provides extra energy savings
- Steinberg Galvanised Steel Composite System:
  The steel profiles are produced in Steinberg factory in Gebze /Istanbul.
- All the installation holes and the appropriate screws are created in house.
- They are all packaged together and sent to the construction sites.
- On top of the ready foundation, Steinberg system can be assembled within a week.
- The assembly can be realized on top of any type of foundation.
  It is recommended to choose raft foundation with a height between 0,40m and 0,50m.

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CONSTRUCTION

•Architectural, Electrical and Fitting Application Projects are prepared according to the current design agreed;
•Static project is prepared by performing static calculation (bearing system) of the plan to be applied is performed (Steel thickness and interval calculation of the posts are determined and interval distances are calculated);
•Basic manufacturing is performed for concrete foundation, and concrete structure level is completed up to basement floor entrance height);
•Wall panels manufactured previously as steel frames in panel wall forms are encased/restrained into concrete foundation according to their places in the projects;
•Steel system installation elements are applied for upper floor; magnesium oxide wall coating elements are coated on the single surface of the basement wall;
•Electric and Sanitary Installation Teams prepare electrical wiring guides or water pipes;
•Magnesium Oxide Panels are coated on the open side after installation of electrical and sanitary pipes. Walls are prepared as empty walls inside;
•Foam concrete is flowed from upper side into the walls coated with magnesium oxide panels from both sides; and the wall is filled;
•Ceiling structure steel of the basement floor is installed vertically according to the ceiling structure project for the floor coating application of the first floor;
•Magnesium oxide panels are put horizontally on the girders;
•Foam concrete is flowed on the oxide panels for floor concrete of the first floor;
•Same operation is followed for the roof application;
•Material demanded for the floor coating (marble, granite, wooden pieces, ceramic, etc.) is coated on the foam concrete.

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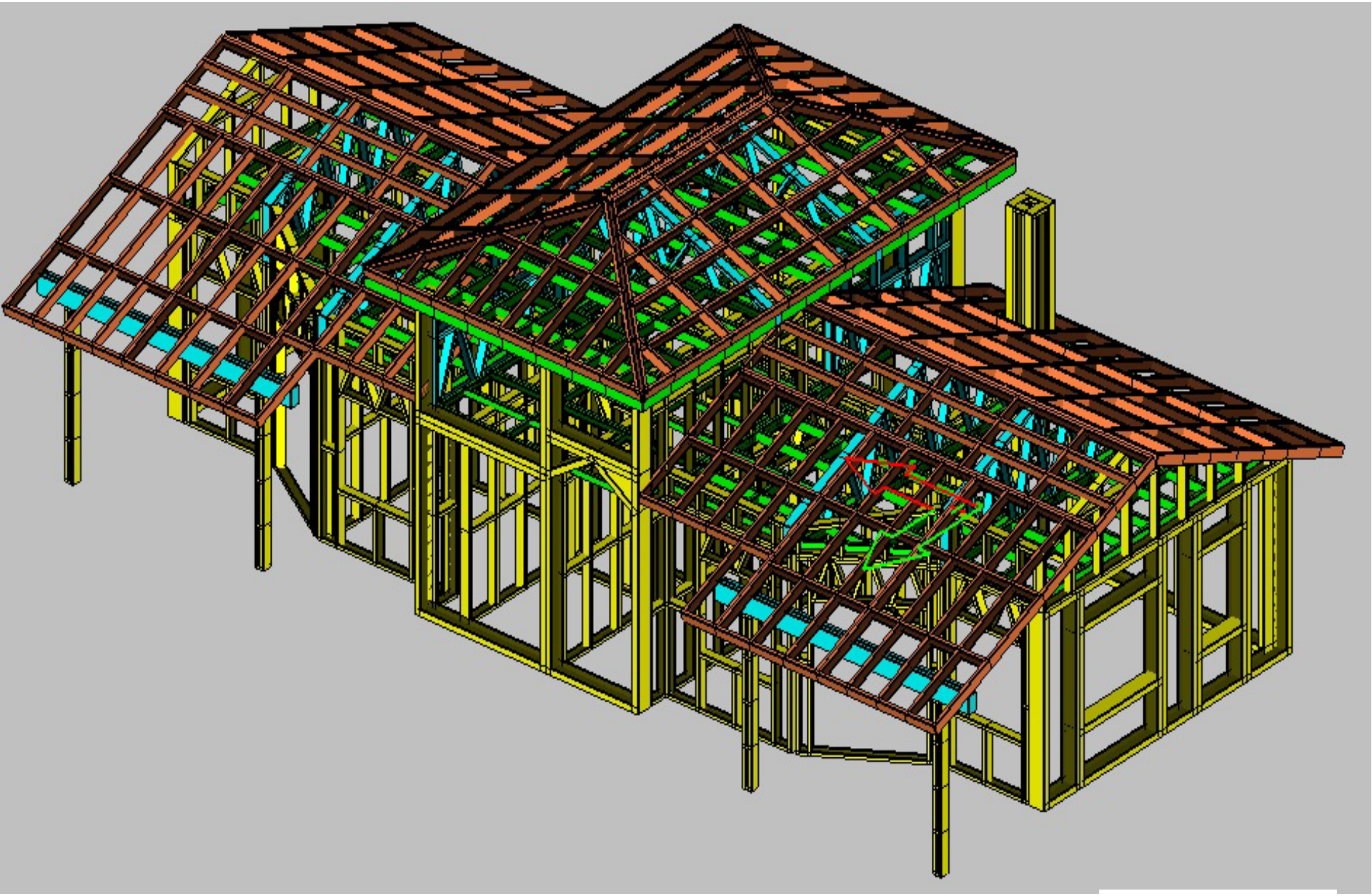
GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL



STEEL FRAME

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STEEL FRAME

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BUILDING

The technique involves applying steel shields around concrete walls (shear walls) instead of applying concrete shields around iron bars (columns and concrete shear) in the traditional/ordinary method. Therefore, it is reverse of traditional/ordinary method of concrete construction.

FOUNDATION

It is the same as the ordinary method. However it is not necessary to leave iron bars stemming out of concrete floor. Structure of the building is installed on the foundation (base slab/mat foundation or perennial foundation) in a very short time like a week.

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WALLS

Wall surfaces are coated with Magnesium Oxide Panels which are wonderful works of art in our age. (There is no necessity for plaster coating on the surfaces of the walls.) The wall surfaces are very smooth

GAS BETON BLOCK APLICATION

Ready gas beton blocks can be masoned inside of sTructure, And Magnesium Oxide Panels are covered on the walls as a plaster.

MAGNESIUM OXIDE PANEL

They are special smooth plates obtained from space research, which are fireproof and sound and humidity resistant. Even a double surface coated wall with nothing between the coats
(10 mm + gap + 10 mm) provides 54 DB sound isolation (they are ideal for hospitals).
They are manufactured as fitted with magnesium oxide + perlite + fiber. They do not contain asbestos. They are certified in A1 Class for fire safety.

The technique involves applying steel shields around concrete walls (shear walls) instead of applying concrete shields around iron bars (columns and concrete shear) in the traditional/ordinary method. Therefore, it is reverse of traditional/ordinary method of concrete construction.

Wall surfaces are coated with Magnesium Oxide Panels which are wonderful works of art in our age. (There is no necessity for plaster coating on the surfaces of the walls.) The wall surfaces are very smooth. Foamed concrete in demanded quality is injected into the gaps between the walls which are coated on the surface. Concrete weight is applied as 400 kg/m3 in normal application for maximum sound and heat resistance and fire safety. This application provides a compact texture allowing all gaps to be filled. It is possible to paint or apply decorative coating on the wall surfaces. Any kind of front application is possible.

COMPARISON	GETAS HIGH - TECH		CLASICCAL CONCRETE		DIFFERENCE	
WEIGHT	22.0	Ton/100 m2	130.0	Ton/100 m2	108.0	Ton/100 m2
CONSTRUCTION PERIOD	2,5	Month/100 m2	8.0	Month/100 m2	5,5	Month/100 m2
HEAT ISOLATION	U =	0,32	U =	0,76	U =	0,44
SOUND ISOLATION	68.0	dB	21.0	dB	47.0	dB
NON FLAMMABILITY	A1	F/120	A2	F/60		
BREATHING		VERY HIGH		MEDIUM		
HUMIDITY		NON		MEDIUM		
BUILDING STABILITY LIFE	100.0	YEAR	50	YEAR	50	YEAR

UNIT WEIGHT COMPARISON TABLE
BETWEEN FOAM CONCRETE AND CLASSIC CONCRETE

CLASSIC CONCRETE UNIT WEIGHT : 2300.000 KG/M3

THICKNESS	QUANTITY (1 m3/m2)	CLASICAL CONCRETE WEIGHT (1 M2)	FOAM CONCRETE WEIGHT (300)	FOAM CONCRETE WEIGHT (400)	FOAM CONCRETE WEIGHT (500)	FOAM CONCRETE WEIGHT (600)
5 cm	20 m2	115 kg/m2	15 kg/m2	20 kg/m2	25 kg/m2	30 kg/m2
6 cm	16 m2	144 kg/m2	19 kg/m2	25 kg/m2	31 kg/m2	38 kg/m2
7 cm	14 m2	164 kg/m2	21 kg/m2	29 kg/m2	36 kg/m2	43 kg/m2
8 cm	12 m2	192 kg/m2	25 kg/m2	33 kg/m2	42 kg/m2	50 kg/m2
9 cm	11 m2	209 kg/m2	27 kg/m2	36 kg/m2	45 kg/m2	55 kg/m2
10 cm	10 m2	230 kg/m2	30 kg/m2	40 kg/m2	50 kg/m2	60 kg/m2

FOR ONE BUILDING COMPARISON CHART (10 FLATS)

NORMAL CONCRETE (600 kg)	WITH FOAM CONCRETE	DIFFERENCE (kg/m2)	FLAT AREA (m2)	NUMBER OF FLAT	PROVIDED LIGHTWEIGHT (TON)
5 cm - 115 kg / m2	30 kg /m2	80 kg/m2	120.00 m2	10	**96.000**
6 cm – 144 kg/m2	38 kg/m2	106 kg/m2	120.00 m2	10	**127,200**
7 cm – 164 kg/m2	43 kg/m2	121 kg/m2	120.00 m2	10	**145,200**
8 cm – 192 kg/m2	50 kg/m2	142 kg/m2	120.00 m2	10	**170,400**
9 cm – 209 kg/m2	55 kg/m2	154 kg/m2	120.00 m2	10	**184,800**
10 cm – 230 kg/m2	60 kg/m2	170 kg/m2	120.00 m2	10	**204.000**

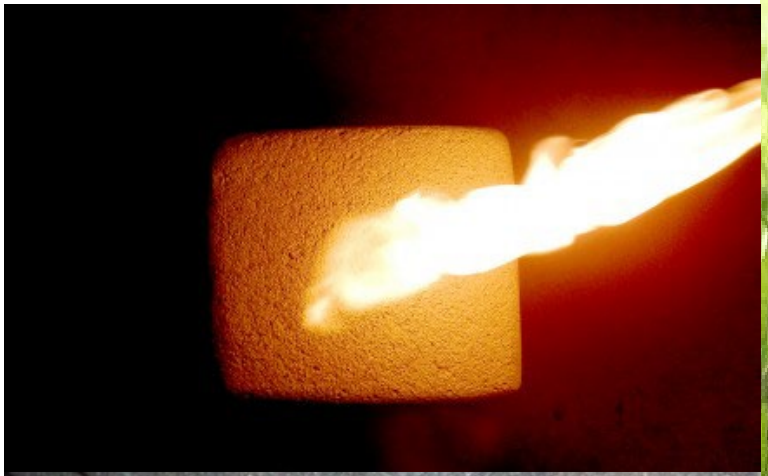
STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

After the plug procedures, the mono block gas concrete wall is created

Sound isolation : max levels.

Temperature isolation : max levels.

Fireproof : max levels



GETAS

Ideally, it is applied as 400 kg/m3 on walls, 500 kg/m3 on floors and 600 kg/m3 in cement finishes. “Lambda” coefficient = 0.09; “U” calculation for an exterior wall of 26 cm: d/lambda>>0.26/0.09=2.88=R, 1/R=0.32W/mk=U.

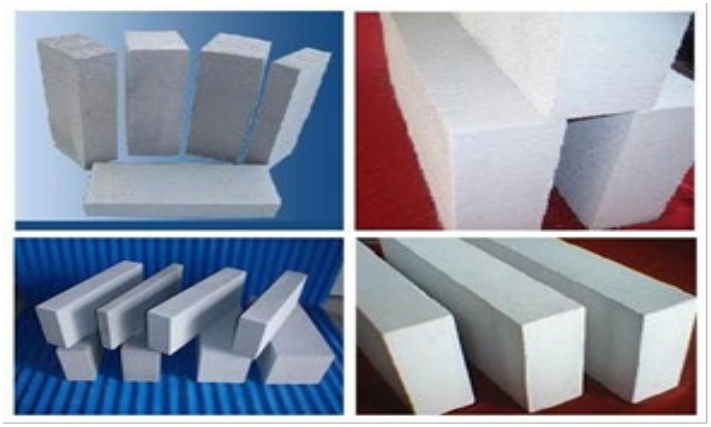
The coefficient is U=0.40 in the Eastern Anatolian Region of Turkey and U=0.30 in the Siberia (High Heat Isolation).

LIGHTWEIGHT FOAM CONCRETE

Foamed concrete in demanded quality is injected into the gaps between the walls which are coated on the surface. Concrete weight is applied as 400 kg/m3 in normal application for maximum sound and heat resistance and fire safety. This application provides a compact texture allowing all gaps to be filled. It is possible to paint or apply decorative coating on the wall surfaces. Any kind of front application is possible.

Foamed concrete application has been applied in North European Countries, Russia, United States and Canada for a long time. In Turkey, it is used for heat isolation in floor covering works and wall construction by manufacturing brands such as Ytong and Cimtas abiding to recent changes in specifications. However, manufacturing the blocks in the plants and transporting them to construction field result in extra cost.

Foamed concrete application provides ideal uses for between 250 kg/m3 and 1000 kg/m3. It is applied with specific machines in the construction field. Ideally, it is applied as 400 kg/m3 on walls, 500 kg/m3 on floors and 600 kg/m3 in cement finishes.



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1/R=0.32W/mk = U.
The coefficient is U=0.40 in the Eastern Anatolian Region of Turkey and U=0.30 in the Siberia (High Heat Isolation).

FLOOR COVERING

Application for floors is the same as for wall system. We can define that it is a horizontal application of wall system. Light steel galvanic “C” profiles are put vertically in single way (in girder form) with specific intervals (usually 50 cm) on the exterior and interior walls.

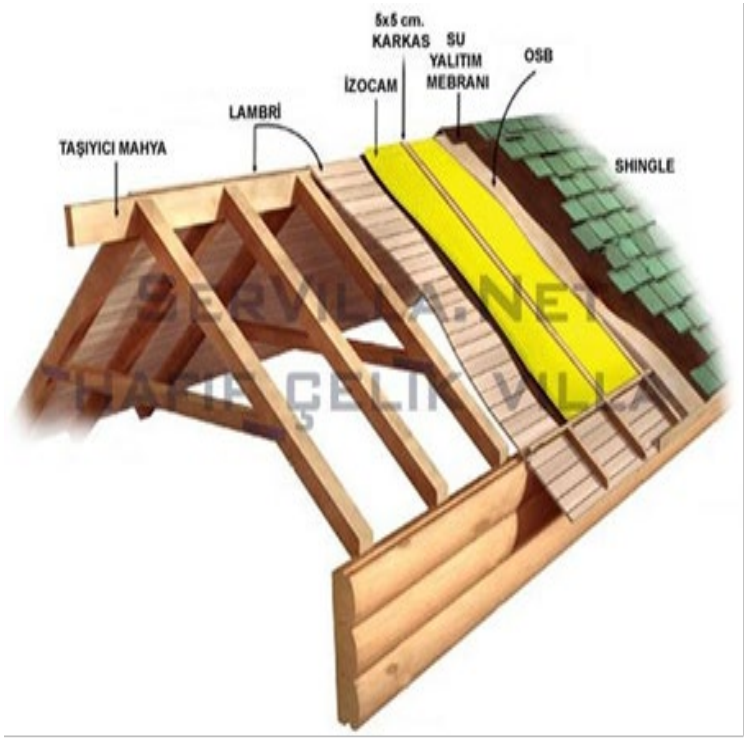
Magnesium Oxide Panels are put horizontally on the “C” profiles installed. Foam is applied on them in 5-6 thickness. There is no necessity to put iron inside concrete. However it is possible to put single line of welded wire fabric. Any floor coating can be applied on the foam concrete such as ceramic, marble, wooden floor pieces, etc.

ROOF

Magnesium Oxide Panels are used for roof coating on the roof screen structures made up of light galvanic steel in standard method. Membrane is coated on it for waterproofing.

Any kind of product demanded can easily be used as roof coating. Metal roof tile coating, concrete roof tile coating, Ondulin (corrugated) coat.

CLASICAL



GETAS HIGH-TECH

STEEL STRUCTURES

The quality of steel construction components are always under control. They are produced in factory conditions according to the standards in proper sizes and proportions.

As it is a homogeneous and isotropic material it reacts as expected . In static calculations the margin of errors are very low.

The use of small sections of steel profiles avoids big columns. By this way this systemm increases the building areas and provides large spaces. Very lightweight structures can be built.

Any type of design can be realized at low costs.

This system can be built fast under any kind of weather conditions lowering labor costs.

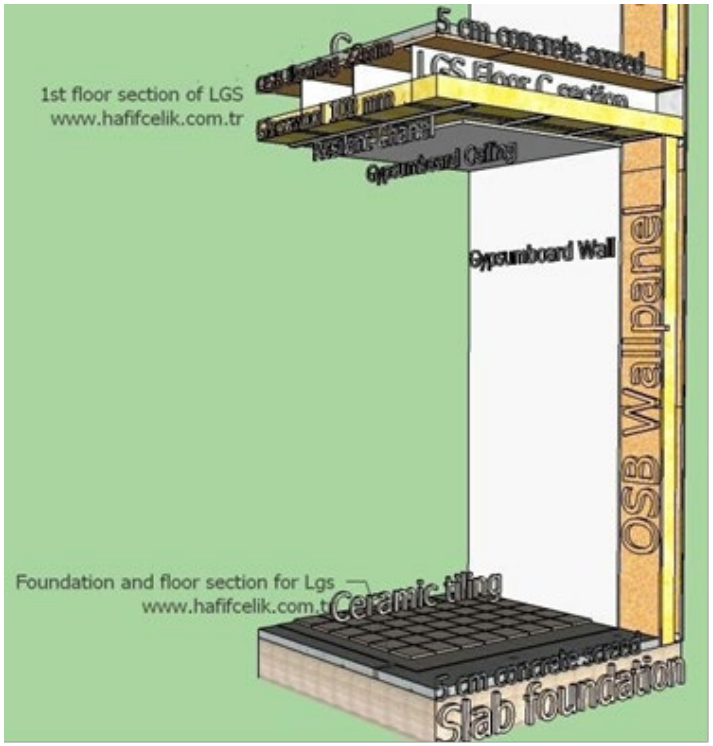
Skilled work required. This minimizes the implementation defaults.

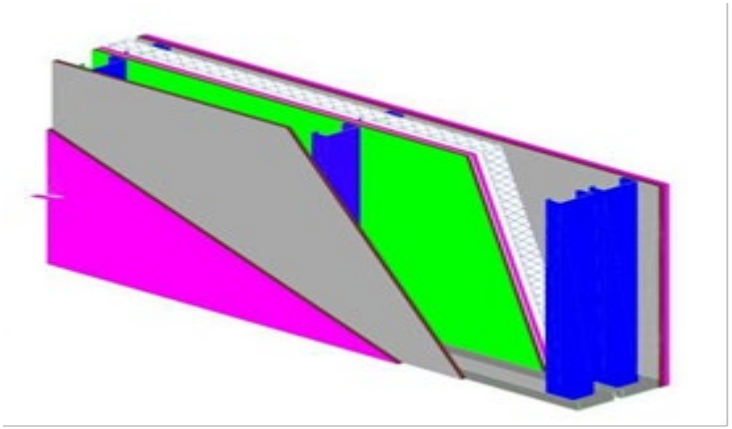
The system also provides significant advantage against the major earthquake loads . For any reason whatsoever damaged structural steel elements by can easily be replaced. This process is fast, easy and with low cost.

This system allows for dismantling and reinstalling.

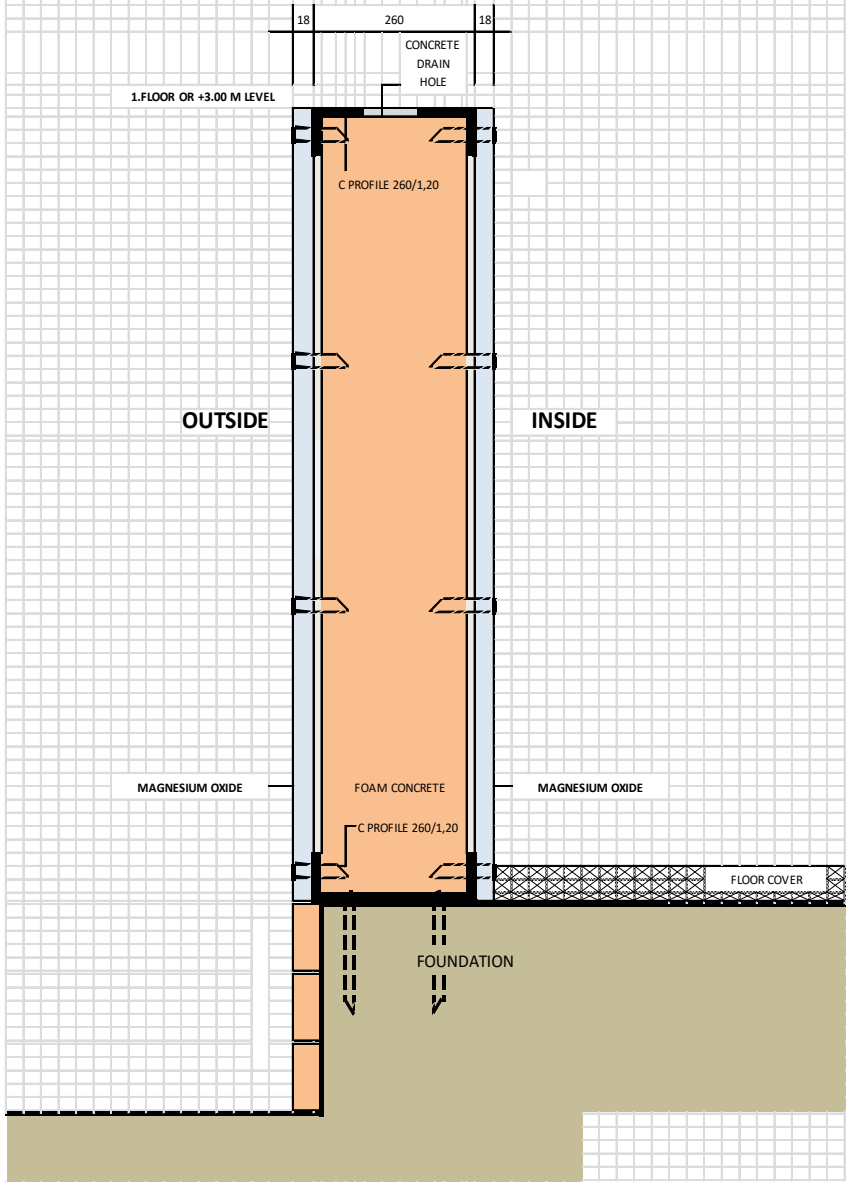
When the construction is completed , the steel construction components carry full loaded capacity.

The products can be controlled at every stage.

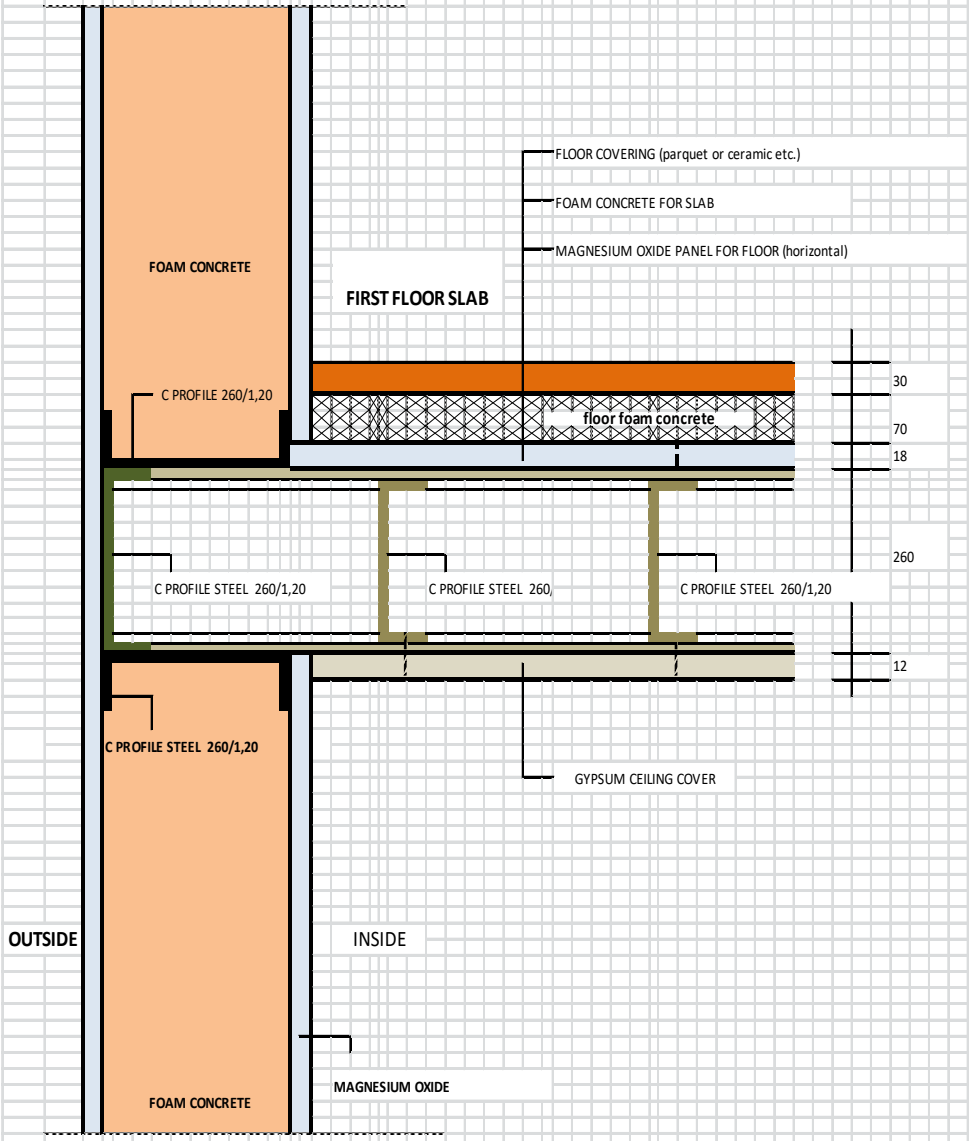




FLOOR CORNER DETAIL



FIRST FLOORING DETAIL



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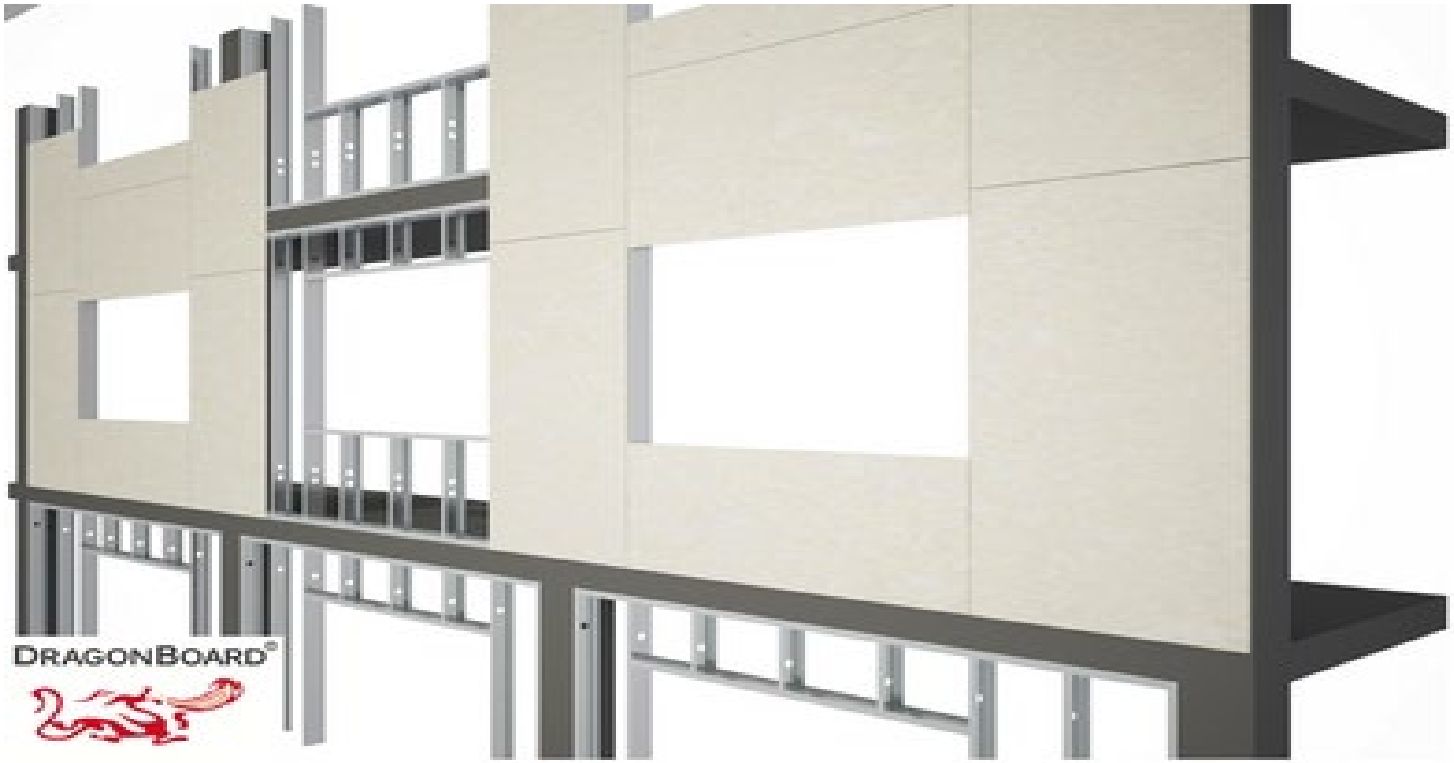
The walls are covered with Magnesium Oxide panels (the thickness of the board varies due to the temperature)

Magnesium Oxide Panels provides isolation of heat and sound. It is also fireproof. (It has all certificates officialy)



The system lets you to put any kinds of decorations on the facades where as you can also leave them by just painting

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TIME PERIOD FOR ERECTION

İÇ ve DIŞ BOYA

5 KİŞİ / 3 GÜN

All Painting
5labour/3days

ALÇIPAN + MASTİK BOYA

5 KİŞİ / 3 GÜN

Gypsum Board
5labour/3days

Steel Assembly
5labour/3days

ÇELİK MONTAJI

5 KİŞİ / 3 GÜN

Board Covering
5labour/3days

OSB KOMPLE KAPLAMA

5 KİŞİ / 3 GÜN

Roof
5labour/3days

ÇATI YAPIMI

5 KİŞİ / 3 GÜN

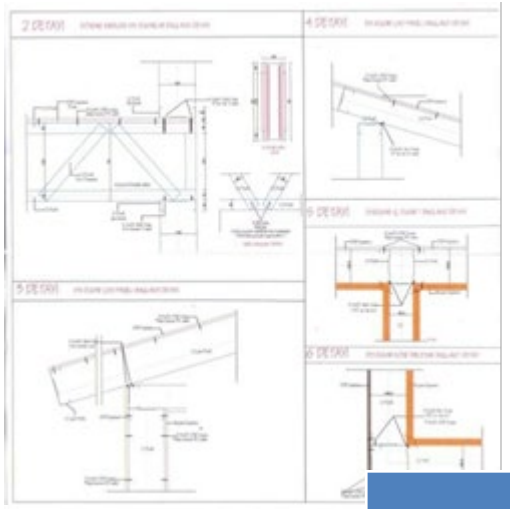
External Coating
5labour/3days

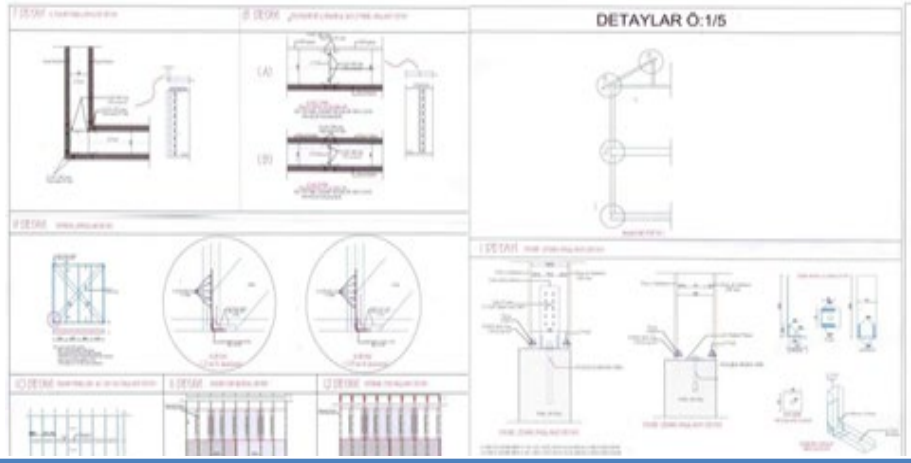
DIŞ KAPLAMA + MANTOLAMA

5 KİŞİ / 3 GÜN

ERECTION : In 36 Days for 12 Villa needs; 30 Labours, 1 Formen and 1 Engineer on site.

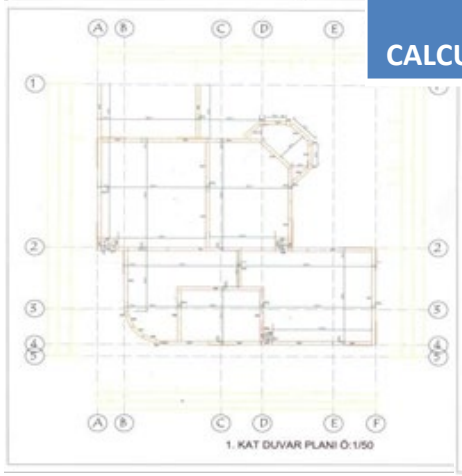
ÜRETİM SÜRECİ BİLDİRİMİ: 30 İŞÇİ - 2 MÜHENDİS İLE 12 ADET VİLLANIN BİTİRİLMESİ 36 GÜN .

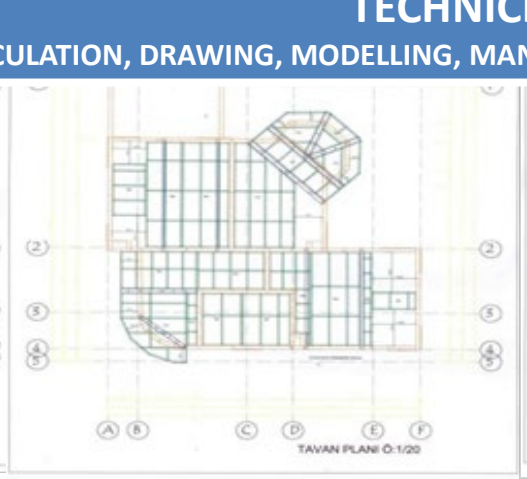


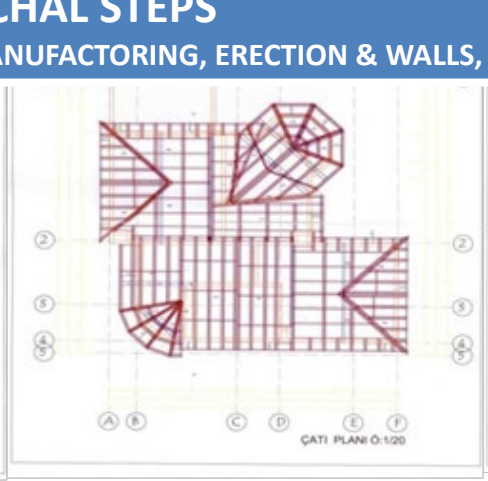


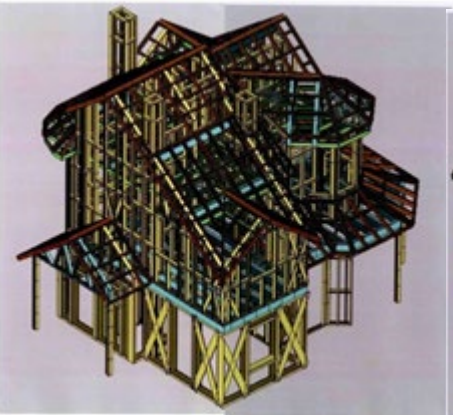
TECHNICHAL STEPS

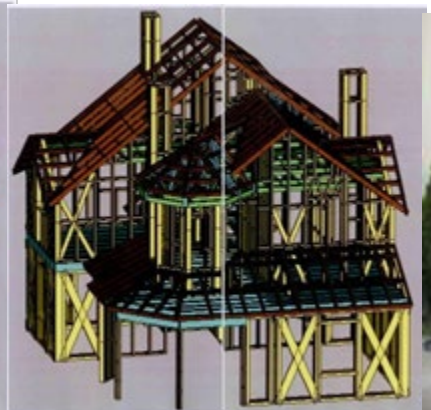
CALCULATION, DRAWING, MODELLING, MANUFACTORING, ERECTION & WALLS, FINISHING











FOAM CONCRETE

Foam concrete is also known as foam cement, bubble concrete, etc; Foam concrete is a type of spumyconcrete materials with a great number of tiny, closed and uniform pores; These pores in interior of the materials have a great deal of air, which, of the best thermal inertia than any other material, degrades largely the thermal conductivity of foam concrete materials; The pores in the materials are closed and disconnected to each other so that convective circulation cannot be formed. Meanwhile, the concrete is separated inside by pores, which, of spherical shape, are encompassed by cement paste film so that the interface increases the resistance to thermal penetration. Thus the material is featured by light weight, high strength, heat preservation, heat insulation, sound insulation and water resistance and shock absorption; Generally, foam concrete is mainly used to reduce structure weight or insulate sound and heat

PERFORMANCE FEATURES OF FOAM CONCRETE:

1. Compressive strength and ageing resistance: Traditional chemical heat Insulting materials cannot have its compressive strength and ageing Resistance satisfied all the time though attain the effect of heat insulation. However, light foam concrete, as the substitute product for the traditional One, can completely solve this problem;
2. Light weight: With a density between 200 kg/m3 and 1200kg/m3, it can Effectively reduce the burden of buildings;
3. Good sound insulation: Light foam concrete has better sound insulation As much as 5-8 times than ordinary cement, fully solving the problem of Sound insulation in respect of dwelling space
4.Excellent high thermal resistance: Foam concrete is applicable to a Temperature as high as over 400 degree
5. Improving steadiness and life-span of insulating layer: The insulating Layer of foam cement has high steadiness and ageing resistance, which Effectively ensures the flooring of flattening without cracks. Its life-span is 5-10 times the polystyrene board, and above 5 times the perlite Particles;
6. Good environmental performance: Addition agent used in foam cement is plant protein fiber and animal protein, both of which are free of hazards. While the chemical heat insulating materials such as organic heat Insulating material and perlite particles will emit toxic gases when heated to a high temperature;

7. Good heat-insulating property: Coefficient of heat conductivity is 0.06 -
0.20w/m. K, 20-30 times of general concrete.
8. Excellent compression strength: When density is 350kg/m3, Compressive strength during the period of 7 days is 6kg/cm2 and 9kg/cm2 During 28 days.
9. Simple construction: Foam concrete is fluid conveyed by Machines in high pressure, which economizes manpower and Materials. The surface is luster and flattening after setting.
10. Good moisture resistance: There will not present condensation of moisture around warm water pipes when supplying heat and no scission between each layer;
11. Excellent associativity: The material for foam concrete is Concrete, so that it integrates very well with upper and lower Layers, and will not form hollow or caving on the ground
12.High speed of construction: Each machine can operate 1000-3000 m2 for every shift, shortening the construction period;
13. Good integrity: The pouring at one time has not gaps, and can Unite with the cast-in-place floors and mortar layers so as to be a Whole;

Mature applied technique of foam cement:

1. Indoor bedding of foam concrete
2. Walling unit of foam concrete
3. Roof insulation of foam concrete(Roof insulation is the earliest and also most mature technique in China in respect of foam concrete project)

Foam concrete is a new heat insulating materials of recycle waste, environmental protection and low cost. It has special air-entrapping structure, excellent heat-insulating property and promising application prospect

German standard DIN 7726 defines ‘foams’ as a mass made up of open or closed cells whose raw density is lower than the raw density of its matrix (DIN, 1982). The matrix of the foam may consist of organic polymers (plastic foams) or inorganic materials (foamed concrete, foam glass).

Foam concrete is a very fluid, lightweight cellular concrete fill material, produced by blending a cement paste (the slurry or mortar) with a separately manufactured, pre-formed foam

Foam concrete made of consists Cement, Sand, Fly ash, water, Protein based Foam Agent and some Fillers. In multi story fyed construction, Partition walls, cast-in- situ, pre-cast, floor screeds and other non load Bearing building elements are to be made in foam concrete, there by substantially reducing. The dead load of the structure.

Raw material required are Foam agent, metal mould lubricant, cement, sand with clay, water

Foam Concrete Plant mainly consists of a mixer of suitable capacity , foam generator cum pump .The foam mixer consists of screw type vanes, would be powered with a Geared Motor

Foam concrete can be used for a wide range of applications as infill and insulation as well as lightweight foundations. Foam concrete applications include Secure old mine-workings, shafts, tunnels and other underground voids, Fill redundant sewers, pipelines fuel-tanks, culverts and many others.

GETAS

GALVANIZED STEEL COIL

GALVANİZED STEEL COİL

JISG 3302,SGCC,Z50-275,Thickness:0.14-4.5mm,Width:20-1500mm,S250-550 - Galvanized Steel Coil

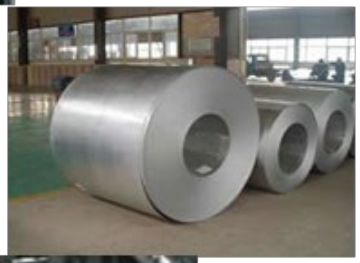
1) Thickness:0.14-4.5mm
2) Width:20-1500mm
3) Zinc coating:50-275g/mm2
4) Tensile strength:270-500n/mm2
5) Quality standard of galvanized steel coil: JIS G3002 GB/T251B
6) Grade of galvanized steel coil: SGCC (DX51D+Z), SGCD (DX52D+Z)
7) Surface finish of galvanized steel coil: Normal spangle, large spangle, small spangle, matt surface
8) Thickness of galvanized steel coil: Of galvanized steel coil 0.18-1.20mm

Note of the Galvanized Steel Sheet: the small order can be negotiated.

9) Elongation: 16-33%
10) Applications: Galvanized tube/pipe, ceiling channel
11) COIL WEIGHT:3-8MT, According to Clients' requests.
12) Applications buildings material, galvanized wire steel tape
13) Standard: JIS G3312 or EN 101402, commercial quality of the Steel base.
14) 14) Packing: Standard Export
15) Applications of galvanized steel coil: Widely used for roofs, outer walls, ovens, explosive-proof steel, electrically controlled cabinets

WHY STEEL HOME OVNER

No structural termite damage ever
Non flammable
Not affected by Moisture content
Easy to add onto as it will remain straight and true
Will not sag over time under loads
Lower Insurance premiums

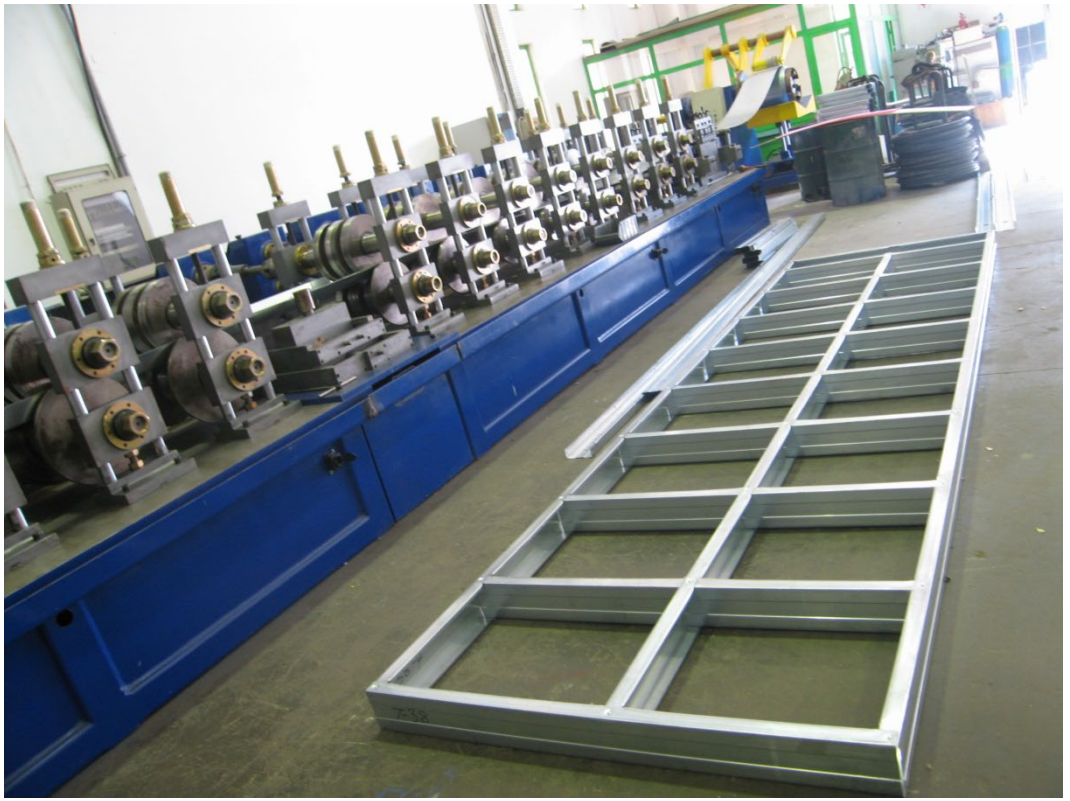


GALVANIZED STEEL are mainly applies in some professions, such as constructions. For the constructions, it mainly used as roofs of some industrial, residential constructions to preventing from corrosion. For the light industry, it used to produce outer cover of electrical appliances, chimney, kitchen utensil and corrosion-proved

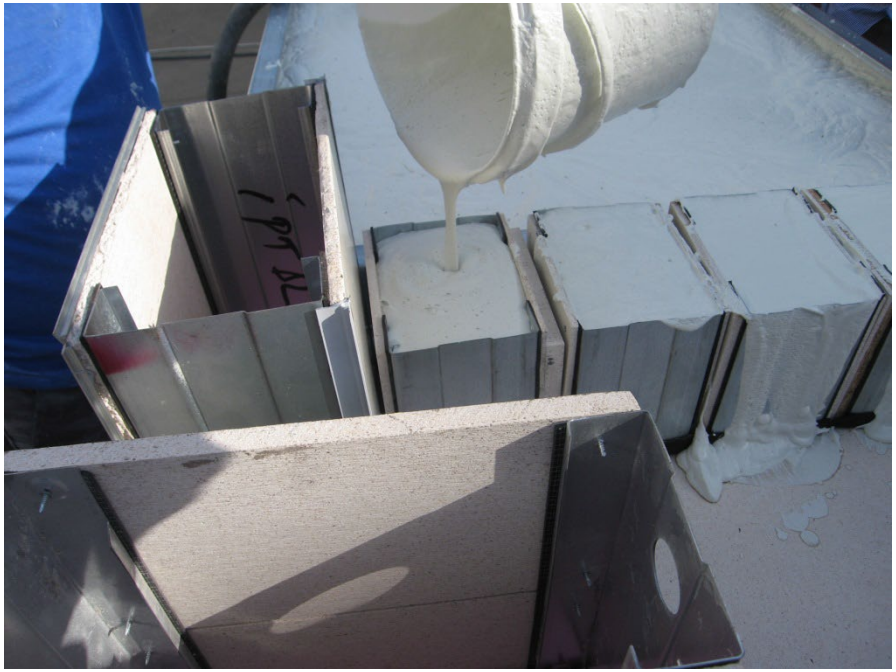
GALVANIZED STEEL İS ABLE TO PREVENT SURFACE OF STEEL PLATE FROM SUFFERİNG THE CORROSİON, LENGTHENS İTS AVAİLABLE TİME

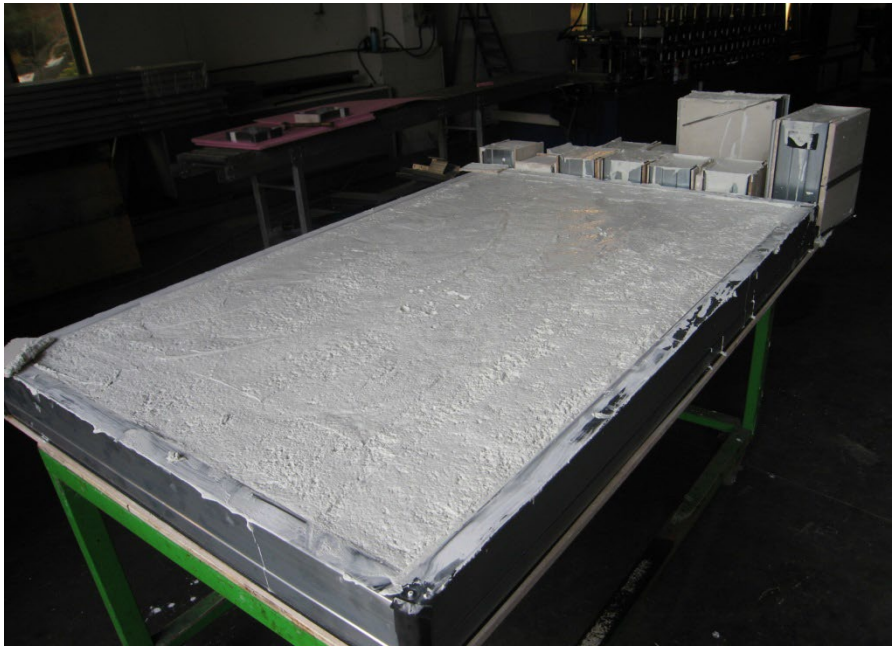
BUILDER

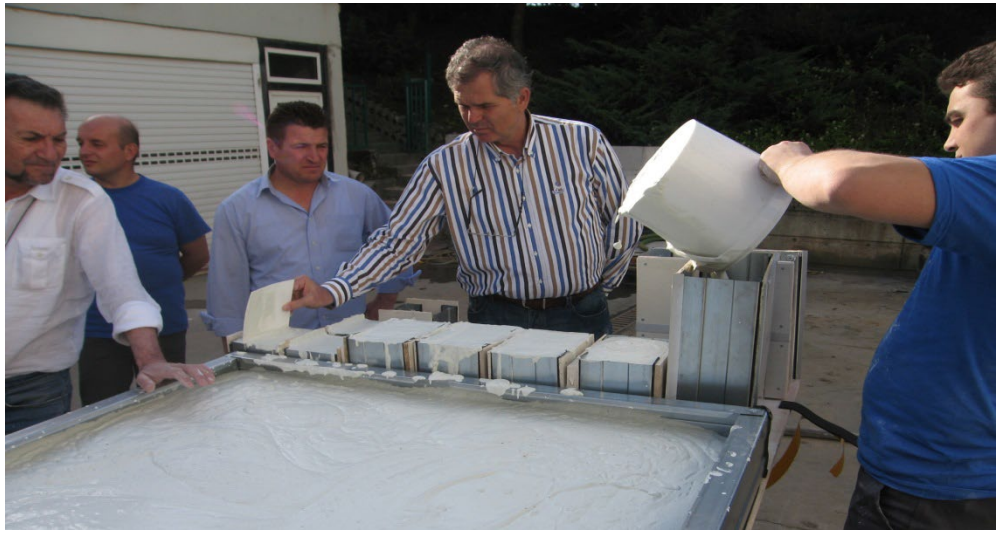
Design and Construct –
One of the problems we have is that we see the plans too late to suggest better ways of constructing we can usually save customer significant amounts in this area
Dimple system allows for adjustment on site if floor is not completely level
Product can stand in weather for prolonged period without ill effect – several
Owner builders have bought frames and then for various reasons have taken up to 3 years before commencing construction
Equivalent to a good quality timber frame
Lightweight reduces fatigue on workers
Less follow up maintenance for ceiling cracks etc. as steel has similar coefficient of thermall expansion to gyp rock



VARIOUS WIEWS FROM PLANT / ISTANBUL



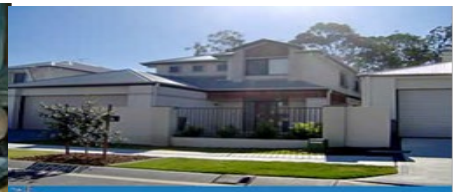




VARIOUS WIEWS FROM PLANT / ISTANBUL

ARCHITECT

Eco friendly
Flexibility in design
Economical construction for sloping sites
Preferred truss options with product such as Hebel blocks because of less movement from steel
Design and Construct – we always strive to meet the concept you envisage but also ensure that what we produce is structurally sound
Independent Engineer – Highly recognized in the industry engineering several different systems



LIGHT GAUGE STEEL FRAMING

Light gauge steel framing uses advanced sign and engineering software, computer controlled manufacture, and high quality materials to deliver a rapid, economical, sustainable, and reliable construction system.
Steel framing boasts many benefits such as consistent quality, code compliance, light weight, resistant to termites, pests, mold and mildew, is non-combustible, environmentally friendly, and durable.
The idea behind steel framed housing is to use light, strong, cold-formed steel sections to make up the structural frame similar to traditional timber construction.
Finished cold-formed steel homes will be indistinguishable from other homes because the framing material doesn't affect the architectural style. The greater span capability of steel allows designs to incorporate larger interior open spaces and dramatic architectural features.
Light weight Steel Framing is also a good option for low to medium rise structures such as schools, shopping malls, hotels, of fice buildings, assisted care facilities, and low income housing.
Lightweight steel is used in the wall, floor and roof assemblies in buildings from one to six stories. Lightweight steel alone can provide all necessary structural elements or it can be used in combination with other material for greater building diversity and scope.

MAGNEZIUM OXIDE PANEL

The USA patented panels produced under with nano technology is a construction panel made of natural raw materials magnesium oxide and magnesium chloride and reinforced with fiber glass

The aim of the construction panels is; to increase area of use per m² in construction sites, to increase construction speed, to reduce costs and to reduce load of the building thanks to its lightness.

Standard sizes are 1220 x 2440 mm and; Dimensions up to 3300 mm. can be custom made. Magnezıum Oxıde Panel is a material that can be applied easily with standard panel application methods.

The plates up to 10 mm can be cut even with a box cutter and can easily be cut with standard hand saw.

It is produced with thicknesses 3 mm, 4mm, 6 mm, 8 mm, 10 mm, 12 mm, 14 mm, 16 mm, 18 mm, 20 mm, 22 mm, 24 mm and 25 mm.

While providing such advantages, the panels should have some properties. They should:

- be fire-proof
- Not be effected by water and moist
- Provide heat and sound insulation
- not include materials harmful for human health or environment
- not release toxic gases
- not allow bacteria formation

It bears all these properties, first and the only USA patented construction panel and it has proven these superior properties with test reports and certificates in USA, England, Japan, China and Turkey.

It is an American patented, 100%natural, environment friendly high quality construction, insulation and decoration panel obtained by combination of magnesium oxide and magnesium chloride reinforced with glass fiber.

It can be used in interior and exterior surfaces, in roofs as a siding element, in covering floors and mezzanine floors; in suspended ceilings, interior partition walls for decoration; in protection of load bearing systems of buildings, in prefabricated buildings, in places such as chimneys, where there is fire risk and all other places where fire, heat, sound and water insulation is required. It is also the only composite panel that can be used against effects of fire and sea water in shipping and yacht building sectors.

A space of 2-3 mm is left when applying Panels and the space is filled with polyurethane mastic. The special joint tape is applied over it and only joint tape surface is coated with acrylic based putty.

Panel surfaces are ready for mesh and putty paints. Satin plaster application is not required. When smoothing required in Panels surfaces, acrylic based putty should be preferred instead of satin plaster.

You can easily apply ceramic and etc. products on both sides of the panels. Better results are obtained in heavy stone coverings, if the rough surface of the panels are used as the adherence surface.

Magnesium Oxıde panels are construction, insulation and decoration panels that can be used in every detail of interior and exterior surfaces of all buildings. It is possible to construct partition walls and sandwich panels which ensure high thermal, sound and fire insulation.
Magnesium Oxıde panels can be shaped in any size or with joints.
Magnesium Oxıde panels can form construction elements for various purposes with miscellaneous insulation materials (rock-wool or glass-wool etc.).

- It can be used as interior and exterior facing in all kinds of construction,
- In heat insulation as an exterior side coating,
- In partition wall systems in interior locations (6, 8, 10, 12 mm)
- Where fire insulation is required (for any thickness)
- For places where water and moist resistance is required (for any thickness)
- For places where high level of sound insulation is required (for thickness of 8mm and above)
- In construction of suspended ceilings (6, 8, 10 mm)
- Raised floor construction (for thickness of 14 mm and above)
- It is completely compatible with new fire regulations
- Used as roof sheathing panels (12, 14, 16 mm)
- In construction of interior and exterior walls, floor and ceiling of light steel prefabricated buildings
- Fire protection of heavy steel buildings
- In construction of schools, hospitals, hotels, residences, military structures and earthquake and war shelters
- In construction of interior and exterior walls, floor and ceiling of building site offices, hangars, mess, sleeping quarter s and such
- In cold storages
- In furniture manufacturing (fire proof door, counter, cupboard, etc)
- As supporting element under flooring,

over ground concrete.(Screed application is not required)

GETAS

The magnesium Oxide Panels can be use under the roof bricks.
Also it works as a isolator to keep cold or hot temperature outside.

GETAS

The system is set ready for the concrete to be poured after laying the plumbing pipes betwen the walls and after creating the spaces for the electrical arrangements

GETAS

Generally gas concrete blocks, bricks or concrete bricks can be placed in betwen the walls. However in Steınberg system ready light weight concrete is placed between the walls. (the weight per meter cube varies from 250kg to 1600kg). Also for second option the walls can be padded with pyoliuretain foam.

The Light Weight concrete is composed of cement, aggregate and chemical foam maker compounds. The chemical mix is created by special machines. The mix is brought to the construction sites. The time for it to freeze is equal to the time for the concrete to freeze.

GETAS

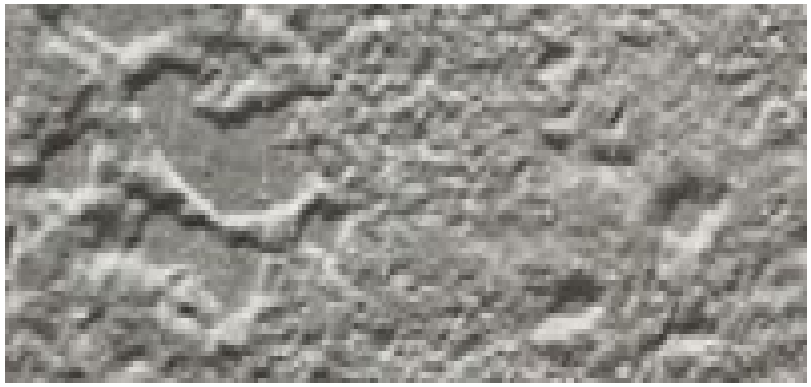
The Concrete can be mix by own special equpment.
Foam can be pump on job place.
Due to the fluditie of the mix, it does not leave any spaces

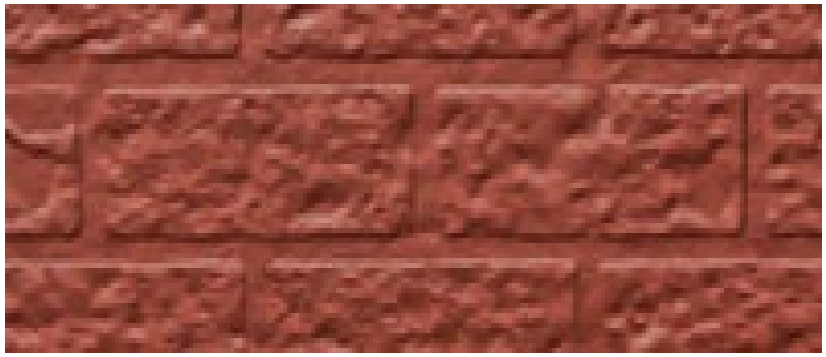
The usage of foam concrete in floor separations provides better sound isolation concrete does. It is also ideal for roof temperature isolations.

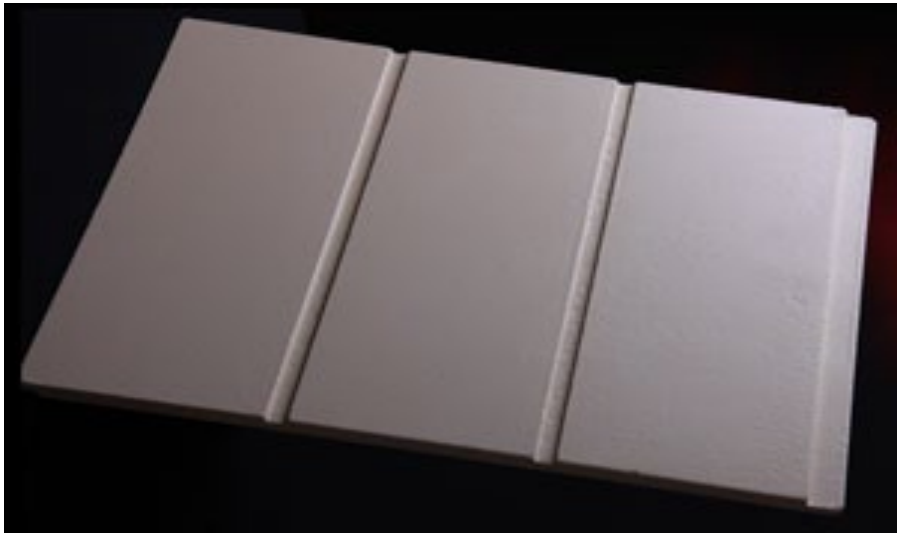
Facades can be covered with any facad material .

GETAS

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

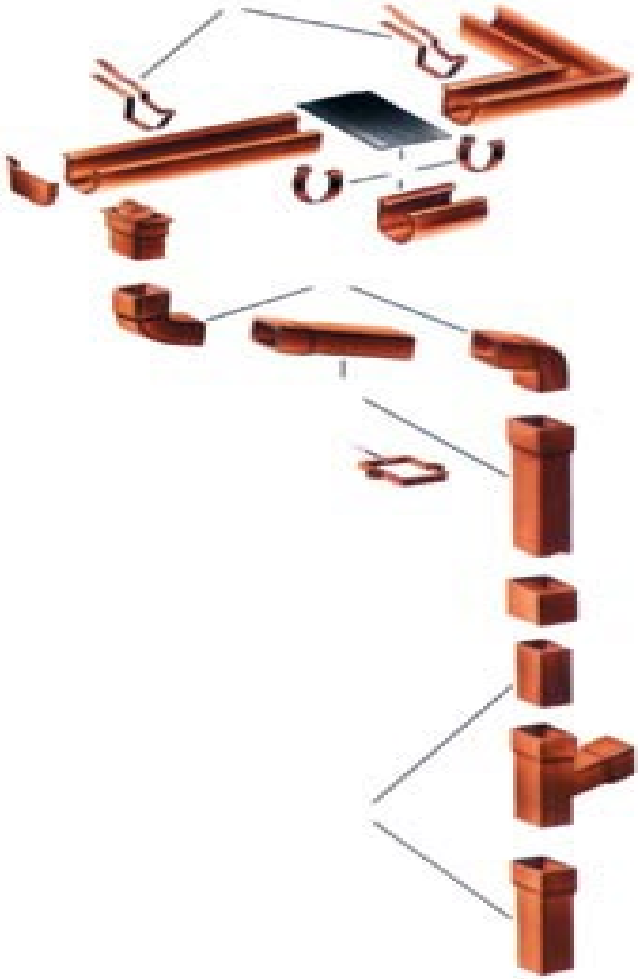






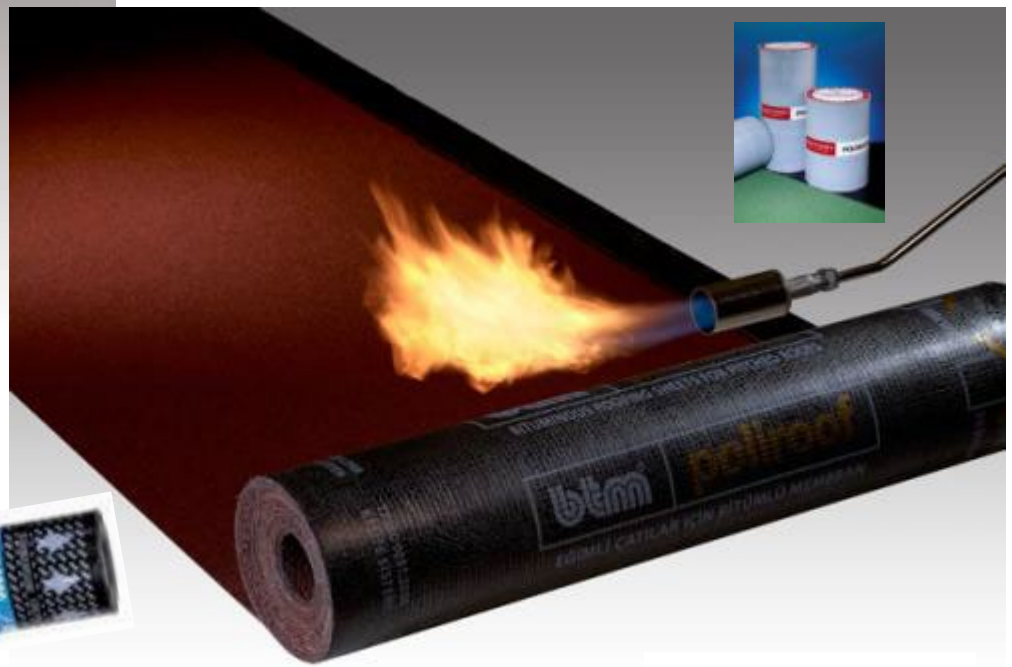
GETAS

The steel ridges of the roofs are covered with Magnesium Oxide Panel. The rain spouts are placed and the water isolation material is placed. After that the roof cover is created with the chosen material. (shingle, metal bricks or bricks)



GETAS

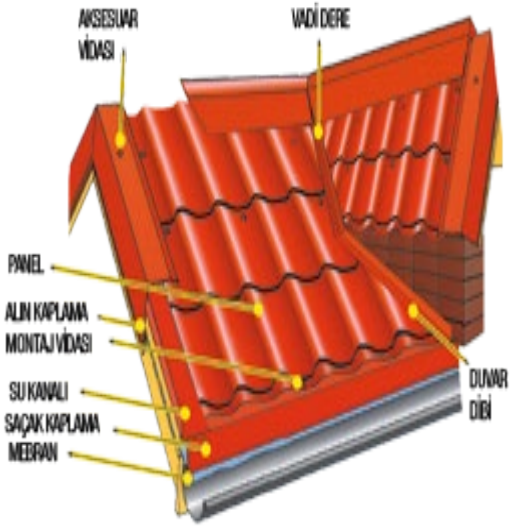
STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL



GETAS

WATER INSULATION

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM TECHNICAL



Width	: 118 cm
Height	: 255 - 220 - 150 - 80 - 45 cm
Thickness	: 0,50 mm
Weight	: 4,2 kg
Step	: 20 mm

These dimensions and colors, sizes and colors made to produce the desired standard and special orders

GETAS

ROOF

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

Corrubit Mahya Elemanı

Corrubit Kenar Kapama Elemanı

Corrubit Montaj Çivileri

yeşil

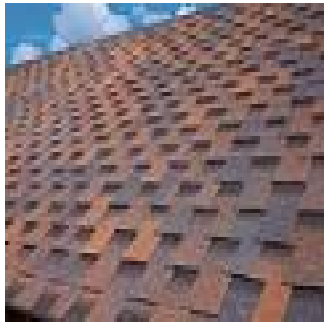
kırmızı

kahverengi

GETAS

ROOF

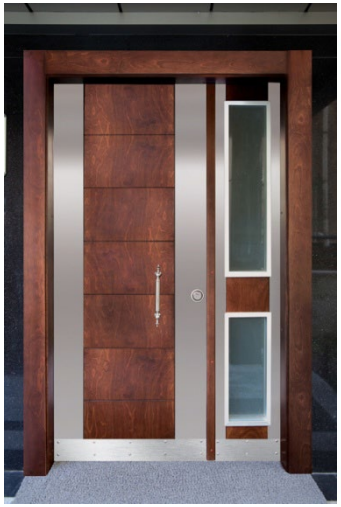
STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

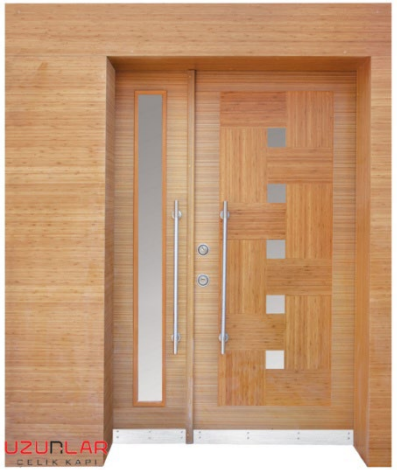


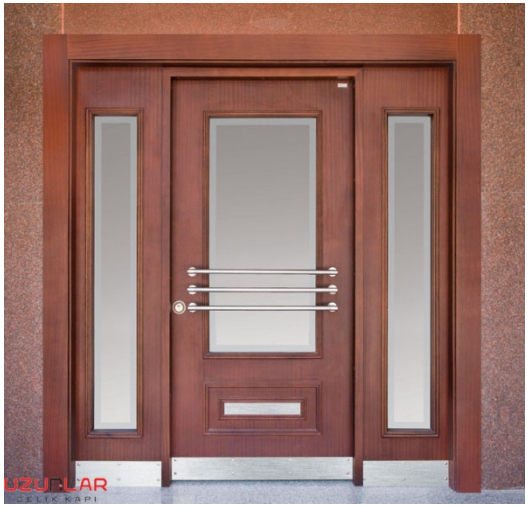
ROOFS

GETAS

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM TECHNICAL







GETAS

OUT DOORS

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

IN DOORS

GETAS

GETAS ISTANBUL-STEINBERG TECNOLOGY

TECHNICAL SPECIFICATIONS OF STEEL COMPOSITE HOUSING SYSTEM BUILDINGS

• GENERAL DESCRIPTION OF THE SYSTEM :

MANUFACTURING TECHNOLOGY: DIN EN 10326 standards S320GD+Z,+AZ Erdemir quality no:1332, S350GD+Z,+AZ Erdemir quality no:1335 and/or Erdemir quality no: 1322 steel materials are used in load bearing system. Galvanized steel C ve U Profiles made by Cad-Cam controlled, fully continue roll-form automatic machines are used in manufacturing. There is no welding in manufacturing.

ASSEMBLY: The assembly of all panels, trusses (Frame work supporting roof), purlins and frame work between floors are joined together by bolts and nuts without the need of welding. This enables us to assembly and disassembly of system many times.

STATISTIC CALCULATIONS: Meets the requirements of Turkish and/or International standards stated at item2; Sap2000, CFS, STA4CAD, BRICSCAD, HAYESCAD programs are used to make seismic and static calculations depending on the purpose of the building and where the building is located.

ENDURANCE : Outer and inner sides covering are done by certified (resistant to fire, water and sound) Magnesium oxide board, Light weight concrete filled in accordingly how strong ıt wants.

•STANDARDS OF SITE BUILDINGS

TS 11372: Steel Buildings – Made by light and cold formed profiles –Calculation rules
TS 648: Calculation and building rules of steel buildings
TS 498: Calculation values for dimensioning of the member of the buildings
TS ENV 1993-1-2: (Euro code 3) Design of steel building Section 1-2: General rules- Design criteria against fire
TS 4561: Calculation rules for Steel buildings according to plastic theory
TS ENV 1090-1: Steel Building regulations –Part 1: General rules
TS ENV 1090-3: Steel Building regulations – Part 3: Additional rules for soft steel
TS ENV1998-1: Euro code 8: Design of buildings that have high earthquake
resistant - Part 1: General rules, seismic causes and rules for buildings
TS EN 10326: Hot dip galvanized steel plates and band -technical drawing rules
TS EN 10327: Hot dip galvanized and cold formed steel plates and band –technical drawing rules
TS EN 10162: Steel profiles-Cold rolled- Size and cross sectional tolerances
TS EN 20898: Mechanical specifications of fastening devices
TS 3611EN 20898 - 2: Mechanical specifications of fastening devices – Section 2: load standard screw

THE OTHER STANDARTS:

TS6793, TS7046, TS825, TS13162, EN12088, DIN4109, TS2381-2 EN ISO 717-1, TS2381-2 EN ISO 717-2, EN29052-1, TS 7316 EN1 3163, TS EN 13500, DIN 4102, TS1263, DIN1365-2, TS EN 13501-1, TS EN520, TS1475, TS EN 12369-1 TS EN 300, TS EN 12369-1

•EXTERIOR WALL Height: 250, 280 or 300cm

Exterior wall thickness: 280 mm
Exterior wall-Outer board: 12mm or, 15mm or 18 mm thickness magnesium oxide board (certificated) (local Codations)
Heat and sound insulation for Exterior walls: Filling it with light weight concrete (excellent sound, fire,heat protection)
Fire resistance: “ falame-proof, fire proof” “A” class.
Joining system for wall Panels: Specially designed galvanized profile. Fastenings are made by bolts and nuts. There is no welding on any kind of fastening.
Exterior wall- board paint: Water based Acrylic exterior paint (Two coats)

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM TECHNICAL

• INTERNAL WALL Height: 250, 280 OR 300cm

Interior wall thickness: 100 mm, 120mm, or 140mm.
Interior wall-Outer board: 10mm, or 12mm, or 15mm thickness magnesium Oxide Panel Board (certificated)
Heat and sound insulation for Interior walls: 400kg/m3 light weigt concrete fill in, or Polyuretaın foam fill in
Fire resistance: “flame -proof, fire proof” “A” class.
Joining system for wall Panels: Specially designed galvanized profile. Fastenings are made by bolts and nuts. There is no welding on any kind of fastening.
Interior wall-board paint: Plastic Paint (Two coats)

•CEILLINGS: 12 mm gypsıum board

•CANADIAN ROOFS

Roof covering: 0.50mm colored Metal sheet tile or Shingle
Under Tile roof covering: Waterproof cowering
Under Water proof covering: Magnesium Oxide Panel Board.
Purlin: Specially shaped galvanized profile
Roof bearing system : Specially designed galvanized profile. Fastenings are made by bolts and nuts. There is no welding on any kind of fastening.

•FLAT ROOFS

Roof covering: Ceramic Tile or, Terrazo tile or, Crashed rock
Under Tile roof covering: Screeding light weight concrete
Under screeding light weight concrete: Water proof covering.
Under Water proof covering: Magnesium Oxide Panel Board.
Under Magnesium Oxide Panel Board: 400kg/m3 Light weight concrete for heat prıoofing.
Under 400kg/m3 Light weight concrete for heat proofing: Magnesium Oxide Panel Board

•GROUND FLOORS

Any type of floor covering.
Light weight conctrete screeding.

•SUBFLOOR (Frame work for the floor of first floor)

Framework: Specially formed C and U shape galvanised profile
Floor covering: Magnesium Floor coverinc (Please see Floor sheets)

•DOORS

EXTERIOR DOOR:

Single door: 860mm * 2000mm 0.70 mm thickness galvanized steel sheet insulated
Double door: 160mm * 1960 mm Aluminum Double door
Door frame: 1,5 mm galvanized sheet (Oil based paint)
Lock / handle : Cylindrical type lock / Grey color metal door handle

INNER DOOR:

Size: 840*1960 mm
Door: MDF lam pressed panel (thickness 40 mm)
Door Frame: 0,7 mm galvanized sheet (Oil based paint applied)
Lock /handle: Cylindrical type lock / Grey color metal door handle

GETAS

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

•WINDOWS

Normal window: 100 x120 cm in dimension, made of PVC
Small window: 50 x 120 cm in dimension, made of PVC
Bathroom, WC: 50 x50 cm in dimention. Made ofPVC

•GLAZING

Normal window :4+8+4mm double glazing
Small window :4 mm thickness iced glass

•PAINT

Outer walls: Water based Acrylic paint (AKCALI or ecuall brand)
Inner walls: Plastic paint, colors will be decided by buyer.
Ceiling: Plastic paint

•ELECTRICAL INSTALLATION (OVER THE SURFACE)

Cable 250 V- 50 H, Outlets, Switches VIKO brand, Outlet cables NYM ve NYA 3x2,5 mm2 (Ozguven – Oznur), Lighting cables NYM ve NYA 2x1,5 mm2 (Ozguven – Oznur), Lighting fixtures Normal rooms 2x40 FLORASANT tubes, WC-bathroom Round Globe – Baklaya, Over Exterior door Outer globe – Baklaya, Fuse, Fuse boxes Federal – Cetsan – Baklaya – Siemens., Electrical Box Buyer's responsibility, Telephone Installation Buyer's responsibility, Mains Buyer's responsibility

NOT: If any electrical stove, Air Condition, Electrical radiator is used this should be shown on plan. For every device individual fuse line is applied.

•SANITARY INSTALLATION (OVER THE SURFACE)

Pipes (clean water) PPRC pipe (Fırat brand), Pipes (foul water) PVC pipe (Fırat brand), Vitrify, taps and shower heads: Sink counter 28x45cm wall type (Duravit), Sink tap Fixed to wall. (ĐNCĐ-ECE - SAN), Toilet Plastic reservoir tank (Duravit), Shower 80*80 Mermerit, Shower head Mix shower head, Toilet tap Fixed to wall (TSE), Kitchen installation Hot and cold water installations are made, There will be no cabinets and cupboards. Main connections clean and foul water connections are buyer's responsibility.

• PACKING FOR EXPORT (Optional):

Please contact to our Logistic department for packing. There are different types of packaging depending on Land , Sea, Air transportation.

•OTHERS

Please see reference sheets for alternative walls, floors or roofs.

•CONTACTS

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Mob. : +90 (532) 312 72 82
E-mail : aykuterdogan@getasgroup.com

GETAS

TSE DENEY LABORATUVARI MERKEZİ BAŞKANLIĞI
Elektroteknik ve Makine Laboratuvar Grup Başkanlığı (Gebze)
EX Laboratuvarı Müdürlüğü (İzmir)

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16.10.06
43464
03-09

MUAYENE VE DENEY RAPORU
TEST REPORT

Deneyi Talep Eden *(Adı,Adresi,Şehir vb.) Customer (Name, Adress, City etc.)*	:	KAREKS POLİMER VE PETRO KİMYA DIŞ TİC.LTD.ŞTİ. SAKIP SABANCI CAD. PARK APT. NO67/1 EMİRGAN Sariyer-İSTANBUL)
Deney Talep Tarihi/No *Order Date / No*	:	13.02.2009 / 19852
Numunenin Tanımı (Cins, Marka, Tip, Tür, Model vb.) *Sample Description(Type,Mark,Model etc.)*	:	MAGNEZYM OXID ESASLI YAPI PANELİ . . . - . - 1.00 adet
Numunenin Alındığı Tarih *Sample Receipt Date*	:	12.02.2009 Numune,müşteri tarafından alınmıştır
Deneylerin Yapıldığı Tarih *Date of Test*	:	16.02.2009 - 12.03.2009
Uygulanan Standard / Metod *Applied Standard/Method*	:	TS 1913 EN ISO 1716: 2005-01"YAPI ÜRÜNLERİNİN YANGINA TEPKİ DENEYLERİ – YANMA ISISININ TAYİNİ"
Raporun Sayfa Sayısı *Number of pages of the report*	:	4
Açıklamalar *Remarks*	:	

Yukarıda tanımlanan numune için laboratuvarımızda yapılan muayene ve deneylerden OLUMLU sonuç alınmış olup ,ölçüm sonuçları müteakip sayfalarda verilmiştir.
The sample described above Passed the applied tests. The test results are given on the following pages.

Bu rapor ilgili firmanın özel deney talebine istinaden düzenlenmiş olup, Standardlara Uygunluk Belgesi niteliğinde değildir,ayrıca ilan ve reklam için de kullanılamaz.
This report was prepared referring to the private demand of the related firm , can not be used as a Conformity For Standards Document and can not be used for announcement and advertisement .

Mühür / Tarih *Seal / Date*	Deney Sorumlusu *Person in charge of tests*	Kontrol Eden *Reviewer*	Laboratuvar Müdürü *Head of Laboratory*
23.03.09	Önder Volkan BALCI Tekniker	Ebru BALI Mühendis	Tacettin AKGÜN

IFC Group — **INTERNATIONAL FIRE CONSULTANTS LTD**

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FIELD OF APPLICATION REPORT IFCA/06179
REVISION B

Field of Application of the fire resistance of minimum 50mm thick laminated timber cored FD60 door leaves hung in timber frames

Prepared on behalf of: Kamet Fire Engineering & Consultancy
Room 2706
Kam Ning House
Kam Fung Court
Ma On Shan
Shatin
Hong Kong

NOTE: This report should not be manipulated, abridged or otherwise presented without the written consent of International Fire Consultants Ltd

Original Issue – July 2006
Revision A – August 2006
Revision B – August 2006

Ref: X/Assess/2006/06179B/#7678

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TUTUŞMAZLIK TEST RAPORU

TSE DENEY LABORATUVARI MERKEZİ BAŞKANLIĞI
Elektroteknik ve Makine Laboratuvar Grup Başkanlığı (Gebze)
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Email:ex@izmir.tse.org.tr Web:www.tse.org.tr

16.10.06
43452
03-09

MUAYENE VE DENEY RAPORU
TEST REPORT

Deneyi Talep Eden (Adı,Adresi,Şehir vb.) *Customer (Name,Adress,City etc.)*	:	KAREKS POLİMER VE PETRO KİMYA DIŞ TİC.LTD.ŞTİ. SAKIP SABANCI CAD. PARK APT. NO67/1 EMİRGAN Sarıyer-İSTANBUL)
Deney Talep Tarihi/No *Order Date / No*	:	13.02.2009 / 19852
Numunenin Tanımı (Cins, Marka, Tip, Tür, Model vb.) *Sample Description(Type,Mark,Model etc.)*	:	MAGNEZYUM OXİD ESASLI YAPI PANELİ, , , -, -, , 1.00 adet
Numunenin Alındığı Tarih *Sample Receipt Date*	:	12.02.2009 Numune,müşteri tarafından alınmıştır
Deneylerin Yapıldığı Tarih *Date of Test*	:	16.02.2009 - 12.03.2009
Uygulanan Standard / Metod *Applied Standard/Method*	:	TS EN ISO 1182: 2007-12"YAPI MAMULLERİNİN YANGIN DENEYLERİNE TEPKİSİ – TUTUŞMAZLIK DENEYİ"
Raporun Sayfa Sayısı *Number of pages of the report*	:	4
Açıklamalar *Remarks*	:	

Yukarıda tanımlanan numune için laboratuvarımızda yapılan muayene ve deneylerden OLUMLU sonuç alınmış olup ,ölçüm sonuçları müteakip sayfalarda verilmiştir.
The sample described above Passed the applied tests. The test results are given on the following pages.

Bu rapor ilgili firmanın özel deney talebine istinaden düzenlenmiş olup, Standardlara Uygunluk Belgesi niteliğinde değildir,ayrıca ilan ve reklam için de kullanılamaz.
This report was prepared referring to the private demand of the related firm , can not be used as a Conformity For Standards Document and can not be used for announcement and advertisement .

Mühür / Seal	Tarih / Date	Deney Sorumlusu / Person in charge of tests	Kontrol Eden / Reviewer	Laboratuvar Müdürü / Head of Laboratory
	13.03.09	Önder Volkan BALCI Tekniker	Ebru BALI Mühendis	Tacettin AKGÜN

TSE DENEY LABORATUVARI MERKEZİ BAŞKANLIĞI
Yapı Malzemeleri ve Kimya Laboratuvar Grup Başkanlığı (Gebze)
Yapı Malzemeleri Laboratuvarı Müdürlüğü (Turgutlu)

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16.20.05
43016
03-09

MUAYENE VE DENEY RAPORU
TEST REPORT

Deneyi Talep Eden (Adı,Adresi,Şehir vb.) *Customer (Name,Adress,City etc.)*	:	KAREKS POLİMER VE PETRO KİMYA DIŞ TİC.LTD.ŞTİ. SAKIP SABANCI CAD. PARK APT. NO67/1 EMİRGAN Sarıyer-İSTANBUL)
Deney Talep Tarihi/No *Order Date / No*	:	26.02.2009 / 20494
Numunenin Tanımı (Cins, Marka, Tip, Tür, Model vb.) *Sample Description(Type,Mark,Model etc.)*	:	Magnezyum Oxid Esaslı Yapı Paneli, , , -, -, , 3.00 metrekare
Numunenin Alındığı Tarih *Sample Receipt Date*	:	Numune müşteri tarafından alınmıştır
Deneylerin Yapıldığı Tarih *Date of Test*	:	02.03.2009 - 06.03.2009
Uygulanan Standard / Metod *Applied Standard/Method*	:	TS EN ISO 8990: 2002-01"Isı yalıtımı - Kararlı durum ısı iletim özelliklerinin tayini - Kalibre edilmiş ve mahfazalı sıcak kutu"
Raporun Sayfa Sayısı *Number of pages of the report*	:	2 (3 sayfa ek)
Açıklamalar *Remarks*	:	

Yukarıda tanımlanan numune için laboratuvarımızda yapılan muayene ve deneylerden elde edilen sonuçlar müteakip sayfalarda verilmiştir.
The testing and /or measurement results are given on the following pages which are part of this report.

Bu rapor ilgili firmanın özel deney talebine istinaden düzenlenmiş olup, Standardlara Uygunluk Belgesi niteliğinde değildir,ayrıca ilan ve reklam için de kullanılamaz.
This report was prepared referring to the private demand of the related firm , can not be used as a Conformity For Standards Document and can not be used for announcement and advertisement .

Mühür / Seal	Tarih / Date	Deney Sorumlusu / Person in charge of tests	Kontrol Eden / Reviewer	Laboratuvar Müdürü / Head of Laboratory
	06.03.2009	Akide Seleen HERGÜN Tekniker	Akide Seleen HERGÜN Tekniker	Şahap Cürler PAŞA

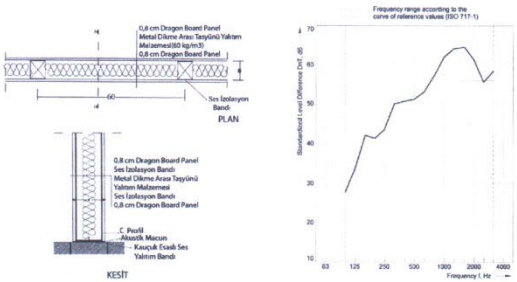
DRAGONBOARD PANEL
SES AZALTIM İNDEKSİ
ÖLÇÜM RAPORU

HAZIRLAYAN : Y.DOÇ. DR. NURGÜN TAMER BAYAZIT

İTÜ MİMARLIK FAKÜLTESİ

YAPI BİLGİSİ ABD

TAŞKIŞLA – TAKSİM-34437 –İST



MART, 2009

NGC Testing Services

Acoustical Testing Laboratory

NVLAP

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 200291

TEST REPORT

for

Dragon Board US LLC
8-01 26th Avenue
Astoria, NY 11102
Sam Borgia / 570 840-4000

Sound Transmission Loss Test
ASTM E 90 – 04 / E 413 - 04
On

2 Hour Fire-Rated Wall Partition Assembly with Dragon Board Sheathing on Steel Super Studs

Page 1 of 4

Report Number: NGC 2006015

Assignment Number: G-308

Test Date: 05/22/2006

Report Date: 07/06/2006

Submitted by: Craig G. Cooper
Test Engineer

Reviewed by: Robert A. Menchetti
Director

The results reported above apply to specific samples submitted for measurement.
No responsibility is assumed for performance of any other specimen.
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The laboratory's accreditation or any of it's test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

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TSE DENEY LABORATUVARI MERKEZİ BAŞKANLIĞI

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16.20.05
43017
03-09

MUAYENE VE DENEY RAPORU
TEST REPORT

Deneyi Talep Eden (Adı,Adresi,Şehir vb.) *Customer (Name,Adress,City etc.)*	:	KAREKS POLIMER VE PETRO KİMYA DIŞ TİC.LTD.ŞTİ. SAKIP SABANCI CAD. PARK APT. NO67/1 EMİRGAN Sarıyer-İSTANBUL)
Deney Talep Tarihi/No *Order Date / No*	:	26.02.2009 / 20636
Numunenin Tanımı (Cins, Marka, Tip, Tür, Model vb.) *Sample Description(Type,Mark,Model etc.)*	:	Magnezyum Oxid Esaslı Yapı Paneli, , , -, -, 2.00 metrekare
Numunenin Alındığı Tarih *Sample Receipt Date*	:	Numune,müşteri tarafından alınmıştır
Deneylerin Yapıldığı Tarih *Date of Test*	:	02.03.2009 - 06.03.2009
Uygulanan Standard / Metod *Applied Standard/Method*	:	TS EN 520: 2006-11"ALÇI LEVHALAR-TARİFLER,GEREKLER VE DENEY METODLARI"
Raporun Sayfa Sayısı *Number of pages of the report*	:	2
Açıklamalar *Remarks*	:	

Yukarıda tanımlanan numune için laboratuvarımızda yapılan muayene ve deneylerden elde edilen sonuçlar müteakip sayfalarda verilmiştir.
The testing and /or measurement results are given on the following pages which are part of this report.

Bu rapor ilgili firmanın özel deney talebine istinaden düzenlenmiş olup, Standardlara Uygunluk Belgesi niteliğinde değildir,ayrıca ilan ve reklam için de kullanılamaz.
This report was prepared referring to the private demand of the related firm , can not be used as a Conformity For Standards Document and can not be used for announcement and advertisement .

Mühür *Seal*	Tarih *Date*	Deney Sorumlusu *Person in charge of tests*	Kontrol Eden *Reviewer*	Laboratuvar Müdürü *Head of Laboratory*
	06.03.2009	Akide Selcen HERGÜN Tekniker	Akide Selcen HERGÜN Tekniker	Şahap Garler PAŞA

16.00.00 F 045 / 25.11.2008-2 1 / 2

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Registro Imprese di Rimini n. 00 549 540 409
Organismo Europeo notificato n. 0407
Accreditamenti: SINCERT (057A e 0828) - SIT (20)

RICONOSCIMENTI UFFICIALI MINISTERI ITALIANI:

ENTI TERZI:

PARTECIPAZIONI ASSOCIATIVE:

CLAUSOLE:

RAPPORTO DI PROVA N. 245705

Luogo e data di emissione: Bellaria-Igea Marina - Italia, 24/09/2008

Committente: LASTON ITALIANA S.p.A. - Via Dell'Economia, 47 - 36100 VICENZA - Italia

Data della richiesta della prova: 28/08/2008

Numero e data della commessa: 42371, 29/08/2008

Data del ricevimento del campione: 03/09/2008

Data dell'esecuzione della prova: 15/09/2008

Oggetto della prova: Compressione di cemento cellulare secondo la norma UNI EN 12390-3:2003

Luogo della prova: Istituto Giordano S.p.A. - Blocco 8 - Via del Lavoro, 1 - 47814 Bellaria-Igea Marina (RN) - Italia

Provenienza del campione: campionato e fornito dal Committente

Cantiere: Materiale proveniente dallo stabilimento del Committente sito in Via Dell'Economia, 47 a Vicenza - Italia

Identificazione del campione in accettazione: n. 2008/1927

Descrizione del campione*.

Il campione sottoposto a prova è costituito da n. 4 provini di calcestruzzo cellulare leggero "FOAMCEM" densità 400 kg/m^3.

Risultati della prova.

Provino [n.]	Dimensioni [mm]	Area [mm²]	Peso [g]	Massa volumica [Kg/m³]	Resistenza totale [kN]	Resistenza unitaria [MPa]	Tipo di rottura (1)	Rettifica (2)
01	149,6×150,4×148,4	22499,8	1409,6	422,2	24,49	1,09	E	Si
02	149,3×150,3×148,0	22439,8	1392,7	419,4	30,74	1,37	E	Si
03	150,0×149,7×148,1	22455,0	1404,3	422,3	26,47	1,18	E	Si
04	150,8×149,2×143,0	22499,4	1337,7	415,8	25,81	1,15	E	Si

(1) Legenda: A=Bipiramidale, B=Piramidale, C=Obliqua, D=D'angolo, E=Altro.
(2) In caso negativo il campione risulta già conforme alla norma di riferimento.

(*) secondo le dichiarazioni del Committente.

Il Responsabile Tecnico di Prova	Il Responsabile del Laboratorio di Scienza delle Costruzioni	Il Presidente o l'Amministratore Delegato
(Sig. Gianmatteo Zanzini)	(Dott. Ing. Genti Nallbati)	Dott. Ing. Vincenzo Iommi

Comp. PM Revis.	Il presente rapporto di prova è composto da n. 1 foglio.	Foglio n. 1 di 1

STEINBERG GALVANIZED STEEL COMPOSITE HOUSING SYSTEM
TECHNICAL

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Organismo Europeo notificato n. 0407
Accreditamenti: SINCERT (057A e 082B) - SIT (20)

RAPPORTO DI PROVA N. 245705

Luogo e data di emissione: Bellaria-Igea Marina - Italia, 24/09/2008

Committente: LASTON ITALIANA S.p.A. - Via Dell'Economia, 47 - 36100 VICENZA - Italia

Data della richiesta della prova: 28/08/2008

Numero e data della commessa: 42371, 29/08/2008

Data del ricevimento del campione: 03/09/2008

Data dell'esecuzione della prova: 15/09/2008

Oggetto della prova: Compressione di cemento cellulare secondo la norma UNI EN 12390-3:2003

Luogo della prova: Istituto Giordano S.p.A. - Blocco 8 - Via del Lavoro, 1 - 47814 Bellaria-Igea Marina (RN) - Italia

Provenienza del campione: campionato e fornito dal Committente

Cantiere: Materiale proveniente dallo stabilimento del Committente sito in Via Dell'Economia, 47 a Vicenza - Italia

Identificazione del campione in accettazione: n. 2008/1927

Descrizione del campione*.

Il campione sottoposto a prova è costituito da n. 4 provini di calcestruzzo cellulare leggero "FOAMCEM" densità 400 kg/m³.

Risultati della prova.

Provino [n.]	Dimensioni [mm]	Area [mm²]	Peso [g]	Massa volumica [Kg/m³]	Resistenza totale [kN]	Resistenza unitaria [MPa]	Tipo di rottura (1)	Rettifica (2)
01	149,6×150,4×148,4	22499,8	1409,6	422,2	24,49	1,09	E	Si
02	149,3×150,3×148,0	22439,8	1392,7	419,4	30,74	1,37	E	Si
03	150,0×149,7×148,1	22455,0	1404,3	422,3	26,47	1,18	E	Si
04	150,8×149,2×143,0	22499,4	1337,7	415,8	25,81	1,15	E	Si

(1) Legenda: A=Bipiramidale, B=Piramidale, C=Obliqua, D=D'angolo, E=Altro.
(2) In caso negativo il campione risulta già conforme alla norma di riferimento.

(*) secondo le dichiarazioni del Committente.

Il Responsabile Tecnico di Prova (Sig. Gianmatteo Zanzini) — Il Responsabile del Laboratorio di Scienza delle Costruzioni (Dott. Ing. Genti Nallbati) — Il Presidente o l'Amministratore Delegato Dott. Ing. Vincenzo Iommi

Comp. PM Revis. | Il presente rapporto di prova è composto da n. 1 foglio. | Foglio n. 1 di 1

CLAUSOLE:
Il presente documento si riferisce solamente al campione o materiale sottoposto a prova.
Il presente documento non può essere riprodotto parzialmente, salvo approvazione scritta del laboratorio.

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Organismo Europeo notificato n. 0407
Accreditamenti: SINCERT (057A e 082B) - SIT (20)

RAPPORTO DI PROVA N. 248978

Luogo e data di emissione: Bellaria-Igea Marina - Italia, 04/12/2008

Committente: LASTON ITALIANA S.p.A. - Via dell'Economia, 47 - 36100 VICENZA (VI) - Italia

Data della richiesta della prova: 28/08/2008

Numero e data della commessa: 42371, 29/08/2008

Data del ricevimento del campione: 03/09/2008

Data dell'esecuzione della prova: dal 03/10/2008 al 02/12/2008

Oggetto della prova: Determinazione della conduttività termica con il metodo della piastra calda con anello di guardia secondo la norma UNI EN 12664:2002

Luogo della prova: Istituto Giordano S.p.A. - Blocco 1 - Via Rossini, 2 - 47814 Bellaria-Igea Marina (RN) - Italia

Provenienza del campione: campionato e fornito dal Committente

Identificazione del campione in accettazione: n. 2008/1927-2

Denominazione del campione*.

Il campione sottoposto a prova è denominato "CEMENTO CELLULARE FOAMCEM (massa volumica 400 kg/m³)".

(*) secondo le dichiarazioni del Committente.

ilac-MRA SINAL n° 0021

Comp. Revis. | Il presente rapporto di prova è composto da n. 7 fogli. | Foglio n. 1 di 7

Il presente Rapporto di Prova è rilasciato in base all'Accreditamento n. 0021 concesso dal SINAL.
I risultati del presente Rapporto di Prova si riferiscono solamente al campione sottoposto a prova.
Il presente Rapporto di Prova non può essere riprodotto parzialmente, salvo approvazione scritta del laboratorio.

(Rapporto di prova n. 248978 del 04/12/2008) — segue - foglio n. 7 di 7

ISTITUTO GIORDANO — ilac-MRA SINAL n° 0021

Risultati della prova.

Conduttanza termica "Λ" = 1/R e relativa incertezza estesa	0,99 $^{+0,02}_{-0,01}$ W/(m²·K)
Resistenza termica "R" = $\frac{2 \cdot A \cdot (T_1 - T_2)}{\Phi}$ e relativa incertezza estesa	1,01 $^{+0,01}_{-0,02}$ m²·K/W
Conduttività termica "λ" = $\frac{\Phi \cdot d}{2 \cdot A \cdot (T_1 - T_2)}$ e relativa incertezza estesa	**0,098 $^{+0,002}_{-0,001}$ W/(m·K)**
Livello di fiducia "p" dell'incertezza estesa	95 %
Fattore di copertura "k_p" dell'incertezza estesa	2

I risultati di prova sono stati determinati nelle seguenti condizioni:

Condizioni termoigrometriche delle provette	Condizioni "Ia"*: temperatura di riferimento 10 °C e basso contenuto di umidità ottenuto mediante essiccamento del materiale
Massa volumica delle provette essiccate "ρ_0"	378 kg/m³

(*) Secondo la Table 1 "Determination of declared thermal values" della norma UNI EN ISO 10456:2008 del 22/05/2008 "Materiali e prodotti per edilizia. Proprietà igrotermiche. Valori tabulati di progetto e procedimenti per la determinazione dei valori termici dichiarati e di progetto".

Il Responsabile Tecnico di Prova (Dott. Ing. Paolo Ricci) — Il Responsabile del Laboratorio di Fisica Tecnica (Dott. Ing. Vincenzo Iommi) — Il Presidente o l'Amministratore Delegato Dott. Ing. Vincenzo Iommi

---

LASTON cellular — Nomi e marchi depositati — Fomith — foam cem cellular

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Cod. Fisc. e Reg. Imprese: 00686470246
R.E.A. VI 146563
http: www.laston-spa.com

TECHNICAL ANALYSIS REPORT

FOAMCEM foaming agent for light weight cellular concrete

physical state	=	brown liquid		
pH	=	6.8		
specific weight (15 °C)	=	1.13	g/ml	
viscosity (20 °C)	=	17 ± 5	cst	
freezing point	=	– 15	°C	
solubility in water	=	infinite		
dry matter	=	30.5	%	
ashes	=	31	%	on dry matter
calcium	=	1.5	% p/p	" " "
iron	=	0.5	% p/p	" " "
nitrogen	=	8.4	% p/p	" " "
organic carbon	=	32	% p/p	" " "
sodium	=	7.6	% p/p	" " "
chlorides	=	13.8	% p/p	" " "
sulphates	=	0.9	% p/p	" " "
protein content (Keratin)	=	29-30%		on total matter

LASTON ITALIANA SPA

LASTON cellular — Nomi e marchi depositati — Fomith — foam cem

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C.C.I.A.A. 146563 - Vicenza
M/VI 013800

MATERIAL SAFETY DATA SHEET

1) PRODUCT IDENTIFICATION

- Product name: FOAMCEM
- Manufacturer : LASTON ITALIANA SPA as letter heading

2) COMPOSITION/INFORMATION ON INGREDIENTS

Isobutanole: 1-2% — R-Phrases 36
Calcium cloride 1-3% — S-Phrases 23-24/25-51
Mineral extender 8-10%
Amino-acid 19-21%

3) HAZARDOUS INDICATIONS

-The exposition to the compound don't cause particular risks to the health
-The long exposition could cause eye and skin irritation, headache and sick feeling moderately.

4) FIRST AID PROCEDURES

-Inhalation: take the person in a room with pure air
-Skin contact: remove the contamined clothing. Flush with plenty of water for at least 15'. In case get medical attention.
-Eye contact: flush with plenty of water for at least 15'. In case get medical attention.
-Ingestion: make drink a lot of water. In case get medical attention.

5) FIRE-FIGHTING MEASURES

-The product is not flammable
-Product combustion: smoke with low presence of carbonium and nitrogen oxide

6) PROCEDURES IN CASE OF BREAKAGE OR LEAKAGE

-Individual precautions: use protective clothing and use breathing equipment if the area is narrow and closed.
-Environmetal precautions: keep the product away from superficial and underground water.
-Cleaning procedures: soak up with inert material in accordance with law regulations. Wash with water.

7) HANDLING AND STORING

-Handling: use the normal care. Keep far from foodstuffs.
-Storing: store in well ventilated area in closed container.

Foamcem pag.1

LASTON cellular — Nomi e marchi depositati — Fomith — foam cem

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C.C.I.A.A. 146563 - Vicenza
M/VI 013800

MATERIAL SAFETY DATA SHEET: FOAMCEM

8) PERSONAL PROTECTION INFORMATION

-Respiratory protection: work in well ventilated area or use a face protection.
-Hand protection: use appropriate gloves.
-Eye protection: use chemical goggles to avois spray.
-Skin protection: use protective clothing.

9) CHEMICAL/PHISICAL PROPERTIES

-Phisical state: dark viscous liquid
-Odour: characteristic
-PH: 6.5-7.5
-Boiling point: over 100 °C
-Flash point: over 70 °C
-Vapour pressure: N.D.
-Relative density: 1.13 Kg/lt
-Viscosity: 17 cst about
-Solubility in water: water solution.

10) STABILITY AND REACTIVITY DATA

-Precautions: do not expose at high temperature
-Materials to avoid: acid, strong oxidizers
-Hazardous decomposition products: in case of fire: carbon and nitrogen monoxide.

11) TOXICOLOGICAL INFORMATIONS

-Inhalation: breathe difficulties, headache, sick feeling
-Ingestion: mouth and throat irritation, sick feeling
-Skin contact: skin irritation
-Eye contact: eye irritation.

12) ECOLOGY DATA

-Use the normal care, do not disperse on the ground.

13) DISPOSAL

-See point 15

14) TRANSPORT INFORMATIONS

ONU N° Not applicable

Foamcem pag.2

GETAS

LIGHT WEIGHT CONCRETE CERTIFICATES

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MATERIAL SAFETY DATA SHEET: FOAMCEM

15) REGULATORY INFORMATION

D.M. 18 January 1992
S Phrases: 23-24/25-51
-The waste of the compound are classified like special no toxic and no injurious

16) OTHER INFORMATION

- N.D.

The information herein is given in good faith and to the best of our knowledge, but no warranty, express or implied, is made.

Since the use of this information and the conditions of use of the product are not within our control, it's the user's obligation to determine the condition of safe use of the product.

Vicenza, december 2008

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RAPPORTO DI PROVA

N. 32932-01 **costituito di n. 5 pagine** **rilasciato in data** 3 novembre 1999

a Laston Italiana S.p.A. Via dell'Economia, 47 - 36100 Vicenza

conforme alla richiesta n.5737/1999 **in data** 5 luglio 1999

Tipo di prova : misura in laboratorio del livello di rumore di calpestio normalizzato

Campione in prova : massetto in calcestruzzo leggero accoppiato con membrana acustica

Data di ricevimento in Istituto : 8 settembre 1999

Data di esecuzione della prova : 22 ottobre 1999

I risultati riportati nel presente documento si riferiscono esclusivamente agli esemplari descritti e alle condizioni di misura specificate. Ogni estensione dei risultati ad altri esemplari e ad altre condizioni di misura esula dallo scopo del documento.

Le misure delle grandezze di cui al presente documento sono espresse, in accordo con quanto disposto dal D.P.R. 12 agosto 1982, n. 802, mediante le unità del Sistema Internazionale delle unità di misura (SI), definito ed approvato dalla Conferenza Generale dei Pesi e delle Misure (CGPM). In accordo con quanto stabilito dalla legge 11 agosto 1991, n. 273, la riferibilità alle unità SI è assicurata dai campioni nazionali realizzati e conservati dagli Istituti metrologici primari (Istituto di Metrologia Gustavo Colonnetti, Istituto Elettrotecnico Nazionale Galileo Ferraris ed ENEA). Le incertezze di misura dichiarate in questo documento sono valutate al livello di due volte lo scarto tipo (corrispondente, nel caso di distribuzione normale, a un livello di confidenza del 95%).

Gli Sperimentatori

Il Responsabile del
Settore Acustica
(Renato Spagnolo)

PROCEDIMENTO DI PROVA

Le misure sono state eseguite in conformità alla Norma Internazionale ISO 140-6:1998, UNI EN ISO 140-8:1997; i risultati sono stati valutati in conformità alla Norma Internazionale UNI EN ISO 717-2:1997.

AMBIENTE DI PROVA

I requisiti del Laboratorio e le condizioni di prova concordano con le specifiche della Norma UNI EN ISO 140-1:1997. Il campione in esame viene posato sull'intera superficie di una soletta in cemento armato di spessore 14 cm e dimensioni 3,35 m x 2,95 m, che separa due camere semiriverberanti.

STRUMENTI DI MISURA IMPIEGATI

- 1 generatore di rumore di calpestio normalizzato Brüel & Kjær, tipo 3204;
- 1 microfono a condensatore da 1/2" Brüel & Kjær, tipo 4166;
- 1 preamplificatore microfonico Brüel & Kjær, tipo 2619;
- 1 asta rotante Brüel & Kjær, tipo 3923;
- calibratore di livello sonoro Brüel & Kjær, tipo 4231;
- analizzatore di frequenza digitale in tempo reale a 1/3 di ottava a 2 canali Brüel & Kjær, tipo 2133;
- equalizzatore digitale Yamaha, tipo DEQ 5;
- amplificatore di potenza Amcron Crown, tipo MICRO-TECH 1200;
- 1 diffusore acustico omnidirezionale cubico contenente 6 woofer e 6 tweeter.

MODALITÀ DI MISURA

Sulla struttura in prova viene posto in funzione il generatore di rumore di calpestio normalizzato, mentre nella camera ricevente è collocata una postazione microfonica rotante.

La misura ha inizio, dopo l'accensione del generatore di calpestio, quando il livello di pressione sonora nella camera ricevente si è stabilizzato.

La misura viene effettuata rilevando, nell'ambiente ricevente, per ogni banda di frequenza di 1/3 di ottava, il livello medio di pressione sonora (L_i). Analoga procedura viene eseguita ponendo in funzione la macchina di calpestio sulla soletta nuda senza il campione in prova.

La catena di misura viene calibrata all'inizio e alla fine delle prove mediante un calibratore di livello sonoro Brüel & Kjær tipo 4231, con incertezza pari a ± 0,2 dB, a sua volta tarato mediante i campioni primari del laboratorio di Acustica dell'IEN.

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I livelli medi di pressione sonora sono definiti dalla relazione:

$$L = 10\ \lg \frac{\frac{1}{T_m}\int_0^{T_m} p^2(t)\ dt}{p_0^2} \quad \text{[dB]}$$

dove:
- p è la pressione sonora, in pascal;
- p_0 è la pressione sonora di riferimento, uguale a 20 μPa;
- T_m è l'intervallo d'integrazione, in secondi.

L'analisi in frequenza è realizzata mediante un analizzatore digitale a due canali a 1/3 di ottava, effettuando un'integrazione spazio-temporale su 64 secondi, corrispondenti a due giri completi del microfono. La misura viene ripetuta per quattro diverse posizioni della sorgente di calpestio; lo spettro di pressione sonora complessivo relativo alla soletta nuda nella camera ricevente viene ottenuto come media energetica sulle quattro misure.

Si procede, quindi, alla misura del tempo di riverberazione T, per bande di 1/3 d'ottava, nella camera ricevente. Mediante la catena descritta in precedenza si genera un segnale sonoro caratterizzato da uno spettro d'ampiezza costante nella banda 63 ÷ 5000 Hz, con tolleranza ± 5dB. Il tempo di riverberazione viene misurato effettuando una media su tre posizioni del microfono.

Il livello di rumore di calpestio normalizzato relativo all'ambiente ricevente viene determinato mediante la relazione:

$$L_n = L_i + 10\ \lg \frac{A}{A_0} \quad \text{[dB]}$$

dove:
- A è l'area equivalente di assorbimento acustico, in metri quadrati, dell'ambiente ricevente,
- A_0 è l'area equivalente di assorbimento di riferimento, pari a 10 m^2.

L'area equivalente di assorbimento acustico A è espressa dalla formula:

$$A = \frac{0{,}163 \cdot V}{T} \quad [m^2]$$

dove:
- V è il volume della camera ricevente, pari a 50 m^3;
- T è il tempo di riverberazione, in secondi.

RISULTATI DI MISURA

I risultati della prova sono riportati nella tabella e nel grafico di pagina 4.
La descrizione del campione in prova è riportata nel disegno di pagina 5.

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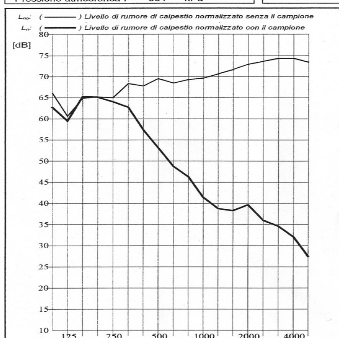
Condizioni ambientali della camera di ricezione:
Temperatura dell'aria t = 19,4 °C
Umidità U = 58 %
Pressione atmosferica P = 984 hPa

Osservazione:
la messa in opera del campione in prova è stata effettuata a cura del Richiedente.



Frequenza [Hz]	L_{no} [dB]	L_n [dB]
100	66,1	62,7
125	60,6	59,4
160	64,8	65,2
200	65,1	65,1
250	65,0	64,0
315	68,3	62,7
400	67,7	57,4
500	69,5	53,1
630	68,4	48,7
800	69,3	46,3
1000	69,6	41,4
1250	70,6	38,7
1600	71,6	38,2
2000	72,9	39,6
2500	73,6	36,0
3150	74,3	34,6
4000	74,3	32,1
5000	73,4	27,4

Indice di valutazione dell'isolamento del rumore di calpestio:	$L_{n,w}$ = 55,9 dB
Indice di valutazione dell'attenuazione del livello di pressione sonoro di calpestio :	ΔL_w = 18,9 dB
Termine di adattamento allo spettro:	C_I = 6 dB

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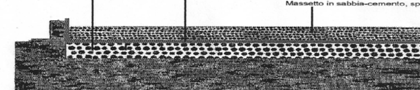
Struttura del pavimento in prova



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MODULARIO INTERNO 1352 — Mod. 839

Ministero dell'Interno

CENTRO STUDI ED ESPERIENZE ANTINCENDI

ROMA - CAPANNELLE

Prat.n°3303/138/78

LABORATORIO DI CHIMICA

PROVA SU CALCESTRUZZO CELLULARE LEGGERO

R A P P O R T DI P R O V A

La Società FOAMCEM ITALIANA con sede in VICENZA Via dell'Economia, 66 richiedeva a questo Centro Studi ed Esperienze di effettuare l'esecuzione delle prove di Laboratorio su campioni di calcestruzzo cellulare leggero, invoato dalla Società stessa.

Sui campioni presentati è stata eseguita la prova di non combustibilità ISO/DIS 1182.2.-

DATI DICHIARATI DALLA SOCIETA'

Materiale	: Calcestruzzo cellulare leggero
Denominazione commerciale	: C C L F
Caratteristiche merceologiche	: Boiacca di cemento + schiuma
Impiego	: Massetti di sottofondo per pavimentazione.

PROVA DI NON COMBUSTIBILITA' ISO/DIS 1182.2

La prova ha lo scopo di evidenziare la tendenza del materiale in esame ad emettere, nella condizione di prova, una quantità di calore superiore ad un predeterminato livello e/o emettere fiamma. Essa consiste nella misura dei valori della temperatura indicata da tre termocoppie applicate rispettivamente in corrispondenza della superficie interna del forno della superficie e del centro del provino introdotto nel forno a temperatura stabilizzata, nonchè

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nella registrazione di eventuale apparizione e durata di fiamma continua e nella determinazione dell'eventuale perdita di peso di ciascuna provetta.

Nei grafici allegati viene riportato l'andamento della temperatura registrata dalle tre termocoppie.

I risultati della prova utili alla valutazione sono riportati dalla presente Tabella:

N°	Tf	Ts	Tp	$\frac{Ap}{p} \cdot 100$
1	870	845	755	18
2	880	825	755	22
3	875	840	760	23
4	870	845	755	19
5	880	835	760	20
Medie	875	838	757	20

Tf = Temperatura max forno
Ts = Temperatura max sup. provetta
Tp = Temperatura max interno provetta
Ap = Perdita di peso

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C O N C L U S I O N I

Il campione di calcestruzzo cellulare leggero denominato " C C L F " presentato dalla Soc. FOAMCEM Via dell'Economia, 66 VICENZA, ha superato la prova ISO/DIS 1182.2 e pertanto è classificato NON COMBUSTIBILE.

Roma-Capannelle 17/7/1979

LO SPERIMENTATORE
DIRETTORE DEL LAB.DI CHIMICA
(Dott.Ing.Aldo IRACE)

V I S T O:
IL DIRETTORE
DEL CENTRO STUDI ED ESPERIENZE
(Dott.Ing.Mario ARRIGO)

A IR/dgv

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