



**Alex-panel**  
Alexandria steel forming Co.

# Cold Storage Insulated Panels



[www.alexgroup.com.eg](http://www.alexgroup.com.eg)



# About Alex Panel

The new member of ALEX GROUP, ALEX PANEL, powered by **ALEX FORM**, introduces a new high quality production of metal and insulating panels, promoting a sustainable building industry, by helping in the process of quick construction and ease of installation, while providing the building with the best innovative energy efficient solutions and thermal insulation.



Aiming to keep satisfying our customers' needs and meeting the different architectural projects' requirements, we use **HENNECKE**, One of the top German manufacturers of polyurethane processing machinery, which allows our sandwich panels to be of excellent quality, different facings, thicknesses, and profiles.

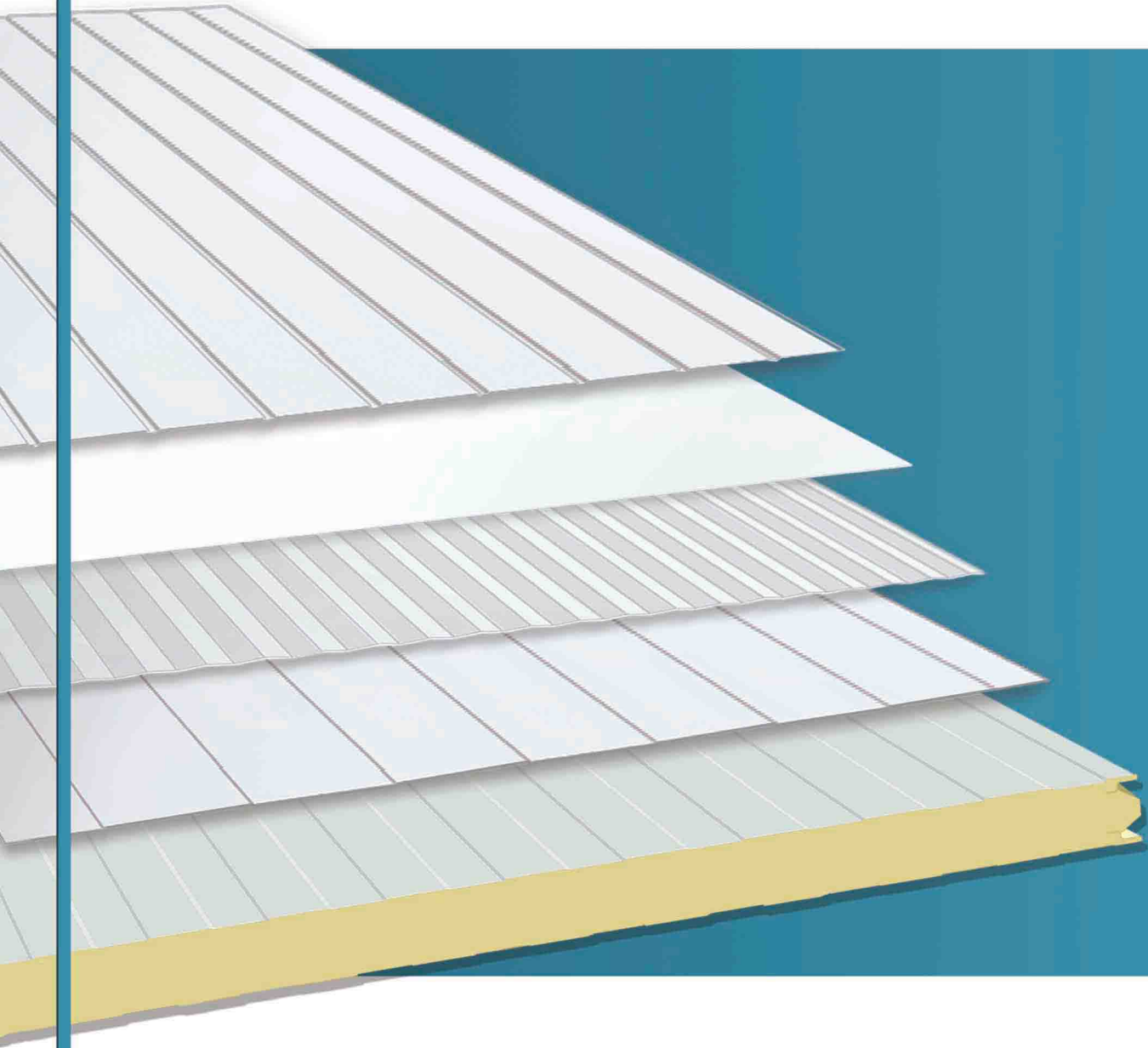
Our Cold store panel consists of an Insulation material (PUR and PIR) that is covered by metal sheets ( Steel or Aluminum sheets or flexible faces) which is environmentally friendly following the international standards and specifications.

- **Alex Panel** offers ideal construction methods that completely take advantage of opportunities offered by industrialization.
- Thanks to our fully automated sizable production line system, we guarantee high- quality products as well as quick order processing.
- We have experts monitoring each step of the production process starting from the design stage to the delivery. Hence, Our end product made from pre-painted steel to aluminum and membrane panels, always meet expectations.
- In addition to our new cooling system which is necessary to cool the latent heat of produced sandwich panels standing horizontally.

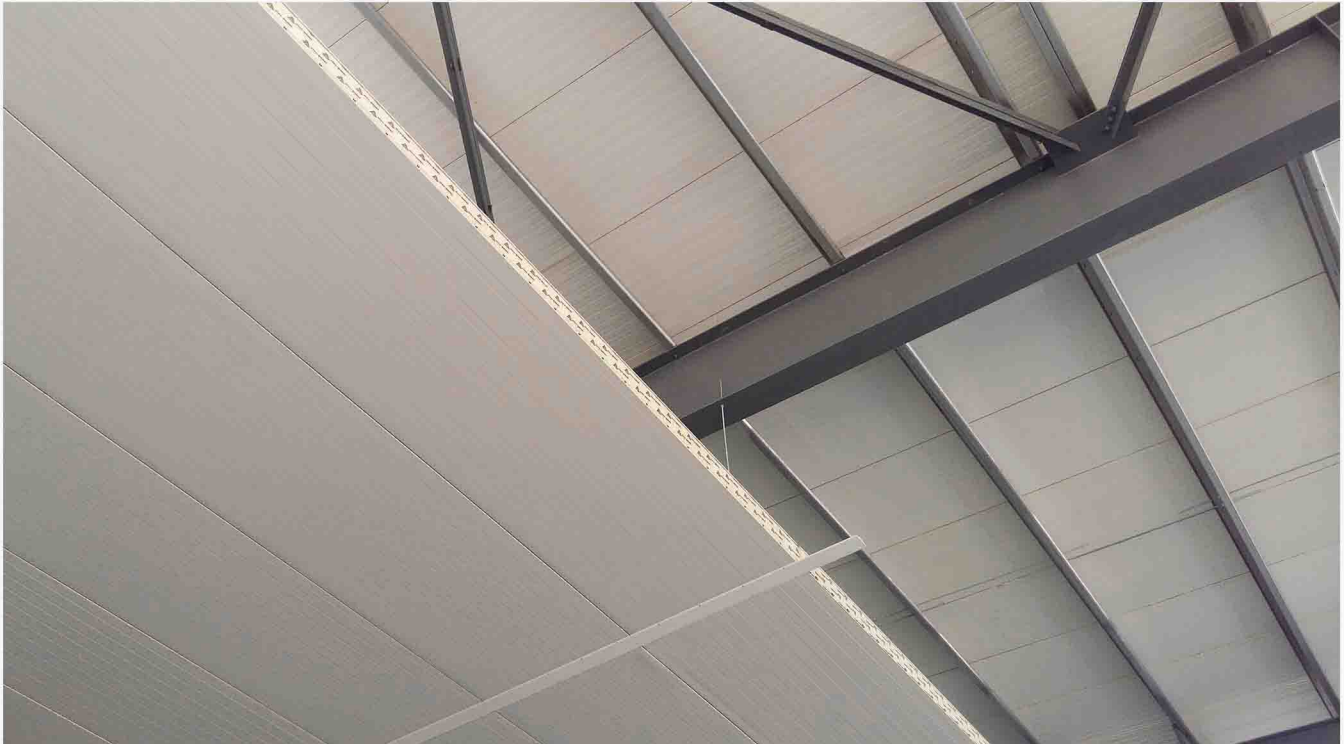


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**“We do not only build our customer’s needs,  
as we also build a lifetime bond & trust  
always hoping for a better future”**



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## Cold store

**panels** are suitable for use within temperature controlled hygienic environments where performance is critical.

**Cold Store** can be used for constructing a wide range of room types including these applications:

- Usual Construction.
- Cool Room.
- Chill Room.
- Cold Room.
- Frozen Rooms.
- Chock Room.



Our construction elements are equipped with a highly effective insulating core of rigid PIR foam. These elements feature superior seal tightness based on the labyrinth construction of our double tongue-and-groove joints. Available in eight economical insulation thicknesses, depending on the desired operating temperature.

## Quality Control laboratory

We ensure to maintaining our high-quality standards by performing various quality control tests that enable us to discover any kind of minor errors or the slightest deviations from our high set value.

Accordingly, our high-value standard is reflected by the quality of our raw materials.

- One of the main tests we perform is the mechanical test, which includes many forms of testing; bending, shear, tensile and compressive stress tests, in addition to density, visual and dimensional inspections.

Regarding the fire resistance tests, it is for high index PIR sandwich panel to determine the resistance in terms of stability, flame resistance, and thermal insulation. Also, assess the reaction class based on the development of smoke and drips. That what qualifies Alex panel to a great number of certificates.

## PIR (polyisocyanurate) Core

Products with PIR (polyisocyanurate) nomination correspond with a polyurethane family in which the structure of isocyanate polymer is modified. These structures are consequence of the reaction of molecules of isocyanate with an excess of themselves, giving the final structure a remarkable stability in case of thermal aggression like a fire.

PIR components present an excellent insulation performance, they are highly effective and lightweight. They offer an excellent thermal conductivity, high resistance to weight, combined with versatility of production.

## Ignition Temperature Test



Surface Impingement Test Specimen  
Before Test



Surface Impingement Test Specimen  
After Test



Edge Impingement Test Specimen  
Before Test



Surface Impingement Test Specimen  
After Test

## Fire Resistance

Polyisocyanurate (PIR) insulation core provides superior fire-resistance and the special joint (double tongue & groove joint) further protects the core from flame ingress and enables the panel to maintain its structural integrity when exposed to fire.

Panels are classified as fire-resistant when they satisfy certain performance criteria during a real fire situation. Fire resistant panels do not spread fire, contribute to it, spit out burning droplets or emit excessive smoke. Fire resistant panels preserve their integrity and heat insulation properties for a certain period of time. By successfully meeting these criteria during a fire, fire-resistant panels will provide sufficient time for occupants to safely evacuate the building and implement fire-fighting measures.



# Alex Cold store panels Applications

Alex Cold store panels are used in different applications such as:

Industrial cold storages



Agricultural Sectors  
(Fruit and Vegetables)



Distribution Centers



Meat Processing Plants



Dairy Plant



Fish Processing



Flower Industry



Poultry



Sandwich Panels offer unique features which includes:

## Excellent Insulation Properties:

When it comes to cold storage panels, It is important to make sure that the insulation properties are up to the job. PIR cold storage panels are made from a fully formed cell structure that allows for superb thermal performance with the thinnest possible available solutions.



### Fire Resistant

PIR-HI index provide good fire resistance which secure enough time to control fire and save properties.



### Cold & Heat Resistance

The Thermal properties provided by panel allows to control the temperature with much less energy .



### Sound Insulation has good

Panel has good properties in sound reduction in addition to its excellent behavior against acoustics.



### Easy Installation

Easy to assemble, without any complicated details, construction guide provided.



### Fast Installation

Erection time is fast comparing with other construction material.



### Low Cost

Cheaper than traditional materials higher performances.



### Light weight

Sandwich panel is light weight element which provide huage advantages in reducing the dead loads on the structure.



### Moisture Resistant

Panel could be provided with special sheet painting to hold against humidity and corresponding corrosion effects.



### Impact Resistant

Better bonding capability and good impact resistance with less facing delamination.



### Recyclable

Sandwich panel is fabricated from recycled material in addition the panel itself could be recycled.



### Chemical Resistant

Panel could be provided with special sheet painting to hold against chemical effects.



### Environmentally Friendly

Panel is CFC free which matching the recent environmental requirements.





# Our Projects



MAFA - MAGRABI AGRICULTURE



MAFA - MAGRABI AGRICULTURE



MAFA - MAGRABI AGRICULTURE



ROYAL TEST PROJECT



ROYAL TEST PROJECT



ABDELWAHAB SONS COMPANY



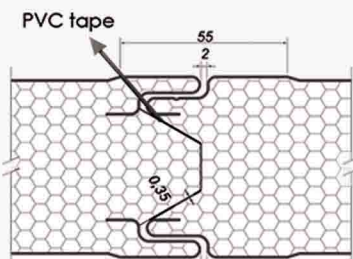
EGOT FOR AGRICULTURAL PRODUCTS



COLD STORE UNITED NATIONS CAMP

## Alex Cold Store panels : AP-ISO

Suitable for Wall, Ceiling, Partition and roof applications.



### Surface Lining Options:

- Smooth surface.
- Super lambri surface.
- Midi lambri surface.
- Micro lambri surface.

### Panel Thicknesses:

40, 50, 60, 80, 100, 120, 150 and 200mm

### PUR/PIR - LOW INDEX

$\lambda=0.023$

Panel thickness (mm) - X	40	50	60	80	100	120	150	200
Fire Resistance Class (PUR) (EN-13501-1) (PIR)	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>	B - S2, d <sub>0</sub> B - S1 - d <sub>0</sub>
U - Value W / (m2.k)	0.643	0.517	0.420	0.311	0.248	0.208	0.167	0.126
R - Value m2.k/W	1.555	1.934	2.382	3.217	4.027	4.813	5.976	7.944
R value (h.ft2.*f)/BTU	8.83	10.98	13.53	18.27	22.87	27.33	33.93	45.11
Sound Reduction (dB)	10 - 14	12 - 16	15 - 18	24 - 30	27 - 35	30 - 38	42 - 48	48 - 60
Used Width ( mm)	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000
Available Max Length (mm)	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000
Weight Kg / m <sup>2</sup>	9.95	10.35	10.75	11.55	12.35	13.15	14.35	16.35

### PIR - HI INDEX

$\lambda=0.024$

Panel thickness (mm) - X	40	50	60	80	100	120	150	200
Fire Resistance Class (EN-13501-1) (PIR)	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>	B - S1 - d <sub>0</sub>
U - Value W / (m2.k)	0.671	0.541	0.440	0.327	0.261	0.219	0.176	0.133
R - Value m2.k/W	1.490	1.850	2.273	3.062	3.829	4.574	5.678	7.543
R value (h.ft2.*f)/BTU	8.46	10.50	12.91	17.39	21.74	25.98	32.24	45.11
Sound Reduction (dB)	10 - 14	12 - 16	15 - 18	24 - 30	27 - 35	30 - 38	42 - 48	48 - 60
Used Width ( mm)	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000	1100 1000
Available Max Length (mm)	16.000	16.000	16.000	16.000	16.000	16.000	16.000	16.000
Weight Kg / m <sup>2</sup>	9.95	10.35	10.75	11.55	12.35	13.15	14.35	16.35



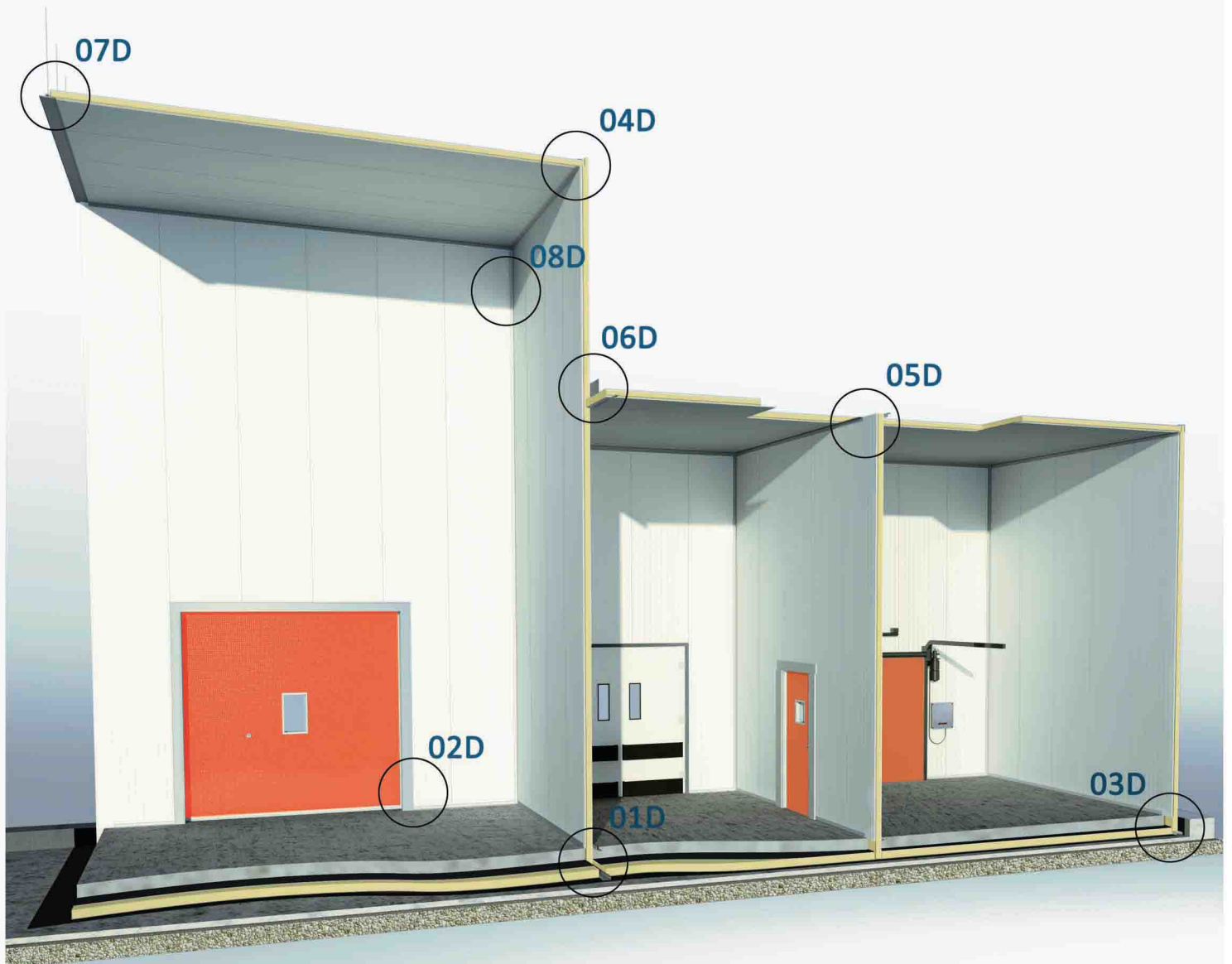
# Ceiling Span guide



Uniformly Distributed load (Kg/m <sup>2</sup> ) - Live Loads based on Max. Deflection							
Panel Thickness	Span (m)						
	3	4	5	6	7	8	9
40	100	51	29	-	-	-	-
50	141	73	42	26	-	-	-
60	184	98	57	36	24	-	-
80	279	154	92	59	39	27	-
100	382	217	133	86	58	41	30
120	489	285	178	116	80	57	41
150	-	395	252	168	116	83	62
200	-	-	389	266	188	137	102
Steel Sheets 0.5/0.5 mm - Simple Support 120 mm							

## Cold Store Building Section

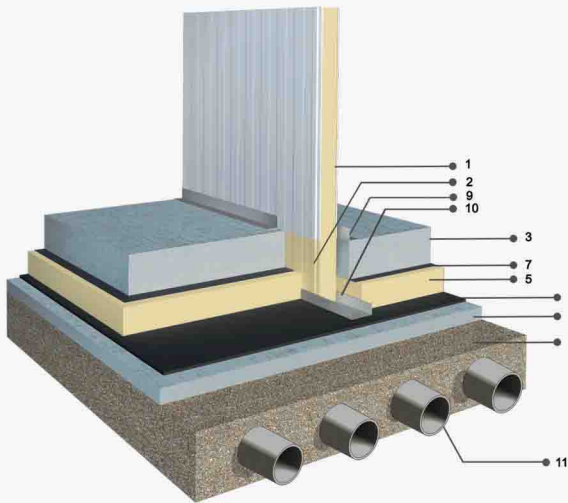
- 01D Partition Wall Floor Detail.
- 02D Opening Detail.
- 03D Wall - Floor Detail.
- 04D Wall - Ceiling Detail 1.
- 05D Partition Wall Ceiling Detail.
- 06D Wall - Ceiling Detail 2.
- 07D Ceiling suspension Detail.
- 08D Wall - Wall Corner Detail.





# Typical Installation Details

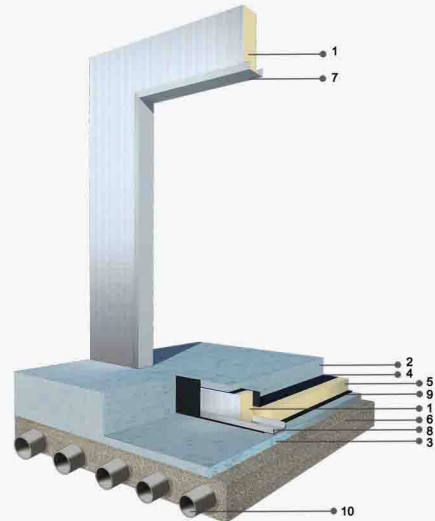
01D Partition Wall - Floor Detail



- 1 Cold Store wall panel.
- 2 Remove panel skin.
- 3 Concrete slab on grade.
- 4 Concrete slab.
- 5 Foam panel.
- 6 Hand fill & Sand.
- 7 DPC.

- 8 (DPC) damp proof course. Run up & taped to wall to protect panel during wear slab installation.
- 9 Inner Corner profile.
- 10 Floor (U) profile.
- 11 Ventilation pipes

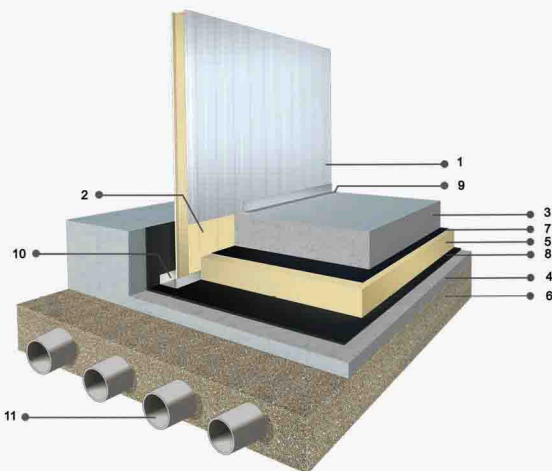
02D Opening Detail



- 1 Cold Store wall panel.
- 2 Concrete slab on grade.
- 3 Concrete slab.
- 4 (DPC) damp proof course. Run up & taped to wall to protect panel during wear slab installation.

- 5 Foam panel.
- 6 Hand fill & Sand.
- 7 Framed opening flashing.
- 8 Floor (U) profile.
- 9 DPC.
- 10 Ventilation pipes

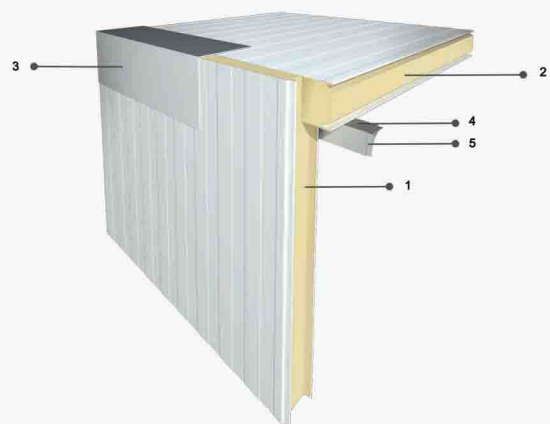
03D Wall - Floor Detail



- 1 Cold Store wall panel.
- 2 Remove panel skin.
- 3 Concrete slab on grade.
- 4 Concrete slab.
- 5 Foam panel.
- 6 Hand fill & Sand.
- 7 DPC.

- 8 (DPC) damp proof course. Run up & taped to wall to protect panel during wear slab installation.
- 9 Inner Corner profile.
- 10 Floor (U) profile.
- 11 Ventilation pipes.

04D Wall - Ceiling Detail 1



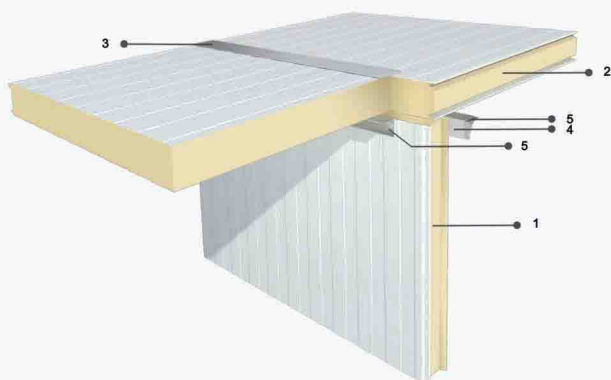
- 1 Cold Store wall panel.
- 2 Cold Store ceiling panel.
- 3 Outer Corner flashing.

- 4 Inner Corner profile.
- 5 PVC Corner profile.

# Typical Installation Details

05D

Partition Wall - Ceiling Detail

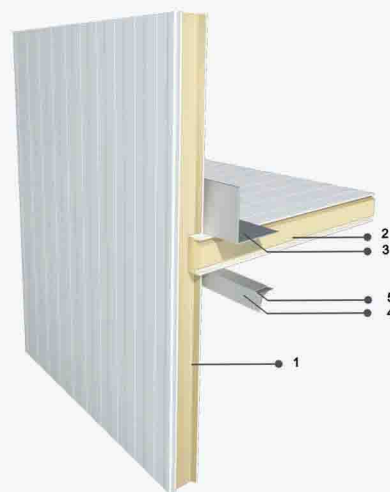


- 1 Cold Store wall panel.
- 2 Cold Store ceiling panel.
- 3 Flat flashing.

- 4 Inner Corner profile.
- 5 PVC Corner profile.

06D

Wall - Ceiling Detail 2

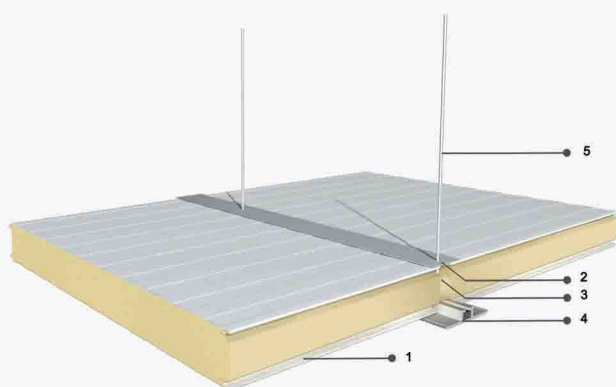


- 1 Cold Store wall panel.
- 2 Cold Store ceiling panel.
- 3 Outer Corner flashing.

- 4 Inner Corner profile.
- 5 PVC Corner profile.

07D

Ceiling Suspension Detail

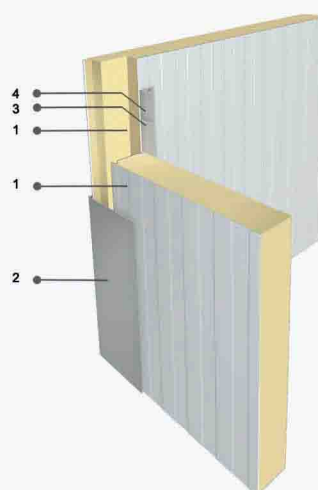


- 1 Cold Store ceiling panel.
- 2 Top Cover profile.
- 3 Spray Foam.

- 4 Suspension profile (Aluminum).
- 5 Threaded Rod.

08D

Wall - Wall Corner Detail



- 1 Cold Store Wall panel.
- 2 Outer corner flashing.

- 3 Inner corner profile.
- 4 PVC corner profile.



# Material Specifications

## External Faced Sheets

### - Steel Sheets:

Steel sheets undergo an intensive high voltage discharge prior to profiling (Corona-Pretreatment device) which guarantees a high quality long lasting panel.

The panels facing material is always under control as it is galvanized, skin passed, pre-painted and top coated, the top coat colors will be according to customer Preferred directions and usual international panel satisfactions.

The standard panel facing is a steel plate coated with Ral 9002 polyester paint suitable for food process purposes.

#### The optional top coating for interior & exterior applications:

**PVDF:** For inside and outside use where there is a high risk of corrosion.

**PVC :** High elasticity and very good corrosion – prevention properties, suitable especially for internal use.

### - Aluminum Sheets:

It is available to use also aluminum sheets instead of steel for the panel production , All aluminum rolls used in the Alex panel's production are produced completely according to EN & ASTM & ISO norms.

#### Aluminum surface properties:

- Corrosion resistance
- Convenient processing property
- Decorative appearance

#### Physical features of aluminum panel surface:

- Yield Strength - 150 Mpa
- Tensile Strength - 175 Mpa
- Elongation - 3 % (min)
- Surface Stucco Embossed or painted
- Temper - H16 \_ H26..... EN 485-2
- Alloy - AW 3000 series..... EN 485-2
- Thickness tolerance is ( +/-0.03 mm) ..... EN 10145

## Paint & Colors

Alex panel's top coating colors are always possible for all available RAL colors, Production metal paints can be arranged according to customer preferred directions and usual international panel specifications.

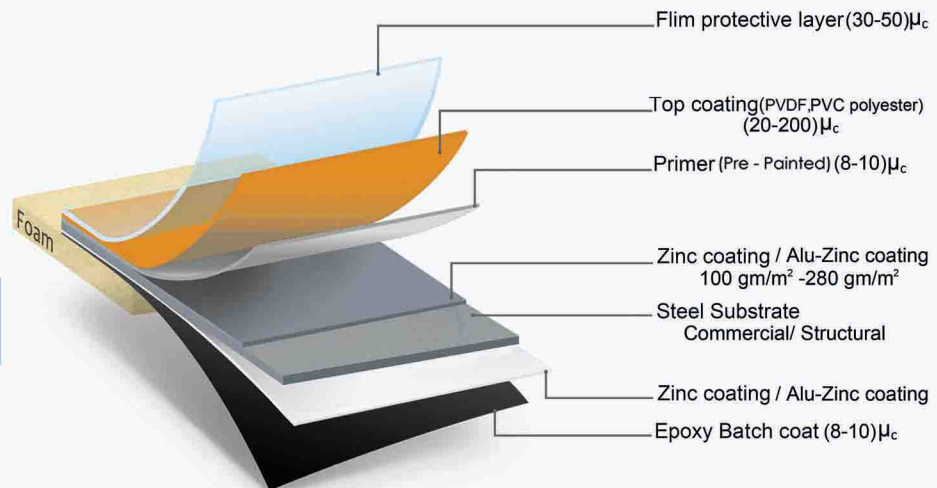
Coil coating is the continuous and highly automated industrial process for efficiently coating coils of metal due to the metal treating before cutting & forming, Cleaning and treating the entire surface and providing tightly – bonded finishes.

Pre-painted coils are often considered more durable and more corrosion - resistant than most post painted coils.

The various coating that is available include polyesters, polyurethane, plastisol, PVDF, epoxies, primers, backing coats and laminated films. For each product the coating is built up in a number of layers. Backing coats are applying to the underside of the strip with or without a primer, generally not exposed to corrosive environments and not visible in the end application, The coating generally is not thick as the finish coating used for the exterior applications.

Outer Face	Primer- Epoxy 5- 7 $\mu$
	Finish Polyester 18 $\mu$
	Total DFT 23- 25 $\mu$
Inner Face	Primer- Epoxy 5-7 $\mu$

### Steel Facer Detail



### Alex-Panel Standard RAL:

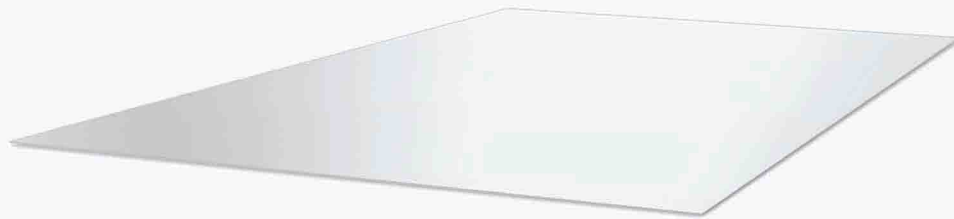
ITEM	ALEX-PANEL STANDARD RAL	
Paint (RAL)	RAL 9002	
	RAL 9010	



# Material Specifications

## Surface Lining Options

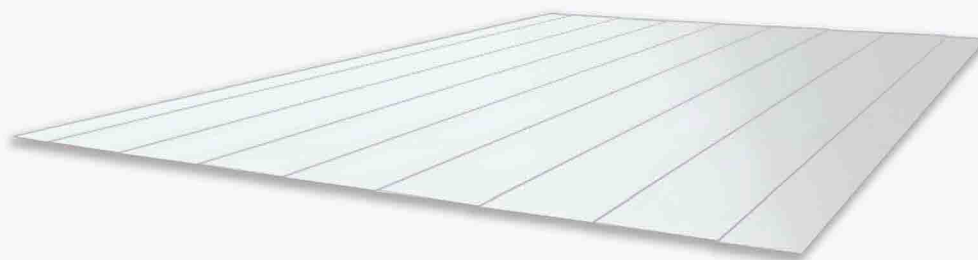
Sheet thickness = 0.35 to 0.75 mm



a) \_\_\_\_\_  
For external / Internal

Smooth surface

For hygienic



b) \_\_\_\_\_  
For external / Internal

Super Lambri  
surface

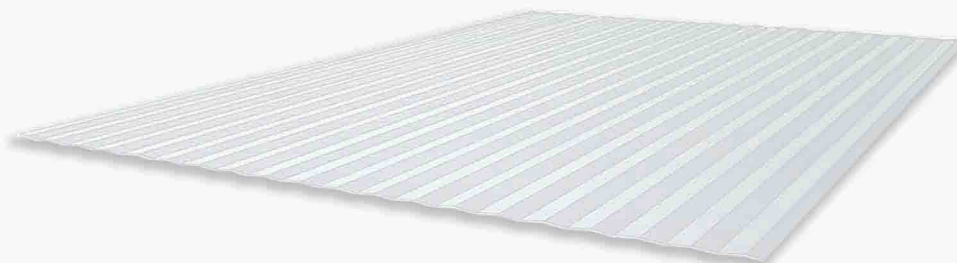
For good tensile



c) \_\_\_\_\_  
For external / Internal

Midi Lambri  
surface

For Extra tensile



d) \_\_\_\_\_  
For external only

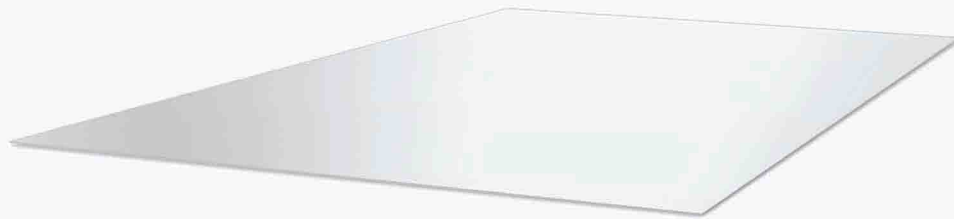
Micro Lambri  
surface

For Decoration  
For Reflection

# Material Specifications

## Surface Lining Options

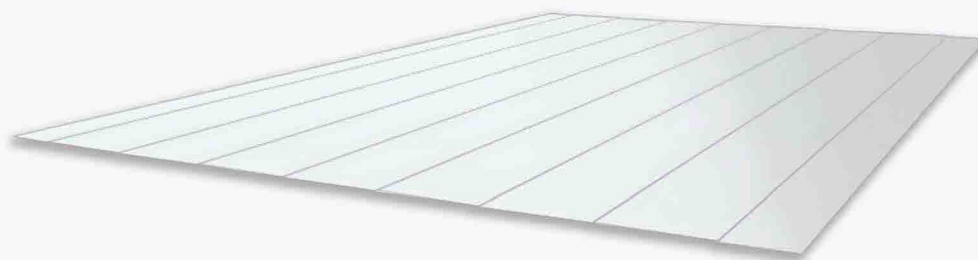
Sheet thickness = 0.35 to 0.75 mm



a) \_\_\_\_\_  
For external / Internal

Smooth surface

For hygienic



b) \_\_\_\_\_  
For external / Internal

Super Lambri  
surface

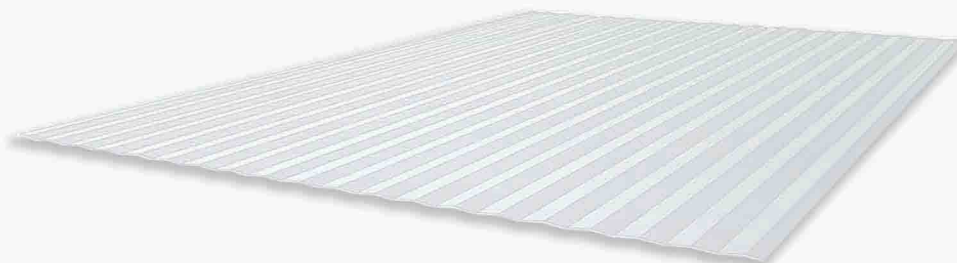
For good tensile



c) \_\_\_\_\_  
For external / Internal

Midi Lambri  
surface

For Extra tensile



d) \_\_\_\_\_  
For external only

Micro Lambri  
surface

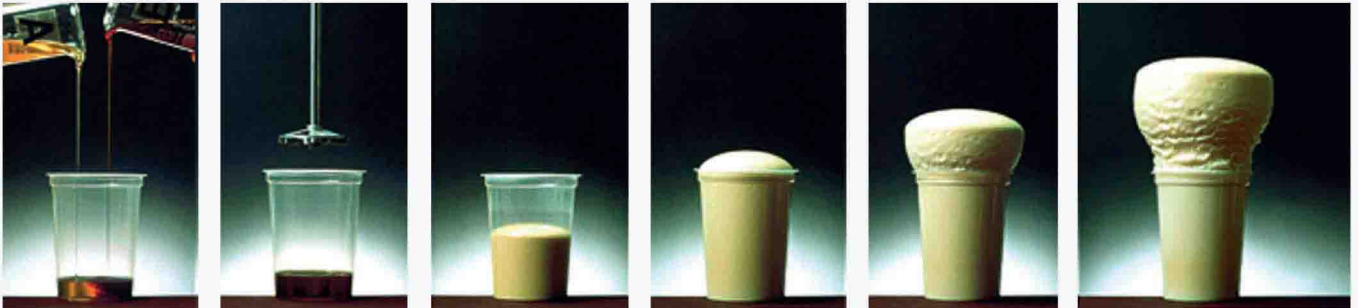
For Decoration  
For Reflection



## Insulation Core

Polyurethane

Alex panel offers environment friendly Polyurethane Foam that follow the International Standards. The Polyurethane Foam include PUR and PIR which provide a wide range of Fire Resistance and combining low thermal conductivity ratio and good fire resistance.



Alex panel system automatically inject the foam material to inside of double metal facing before pressing,

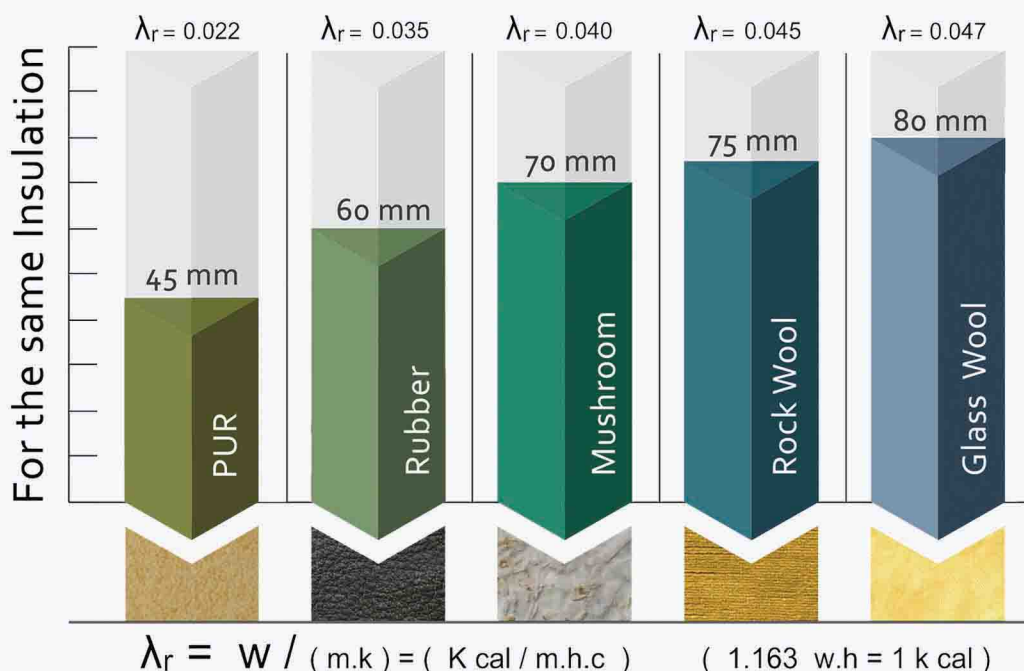
This foam material are specially chosen from high quality chemical companies.

(DOW - BAYER - BASF ) Using foam materials include special catalysts, additives and n-pentane gas for high quality foam.

One of the many benefits of PIR / PUR insulation board is its ability to be cut or shaped and to hold the required form; probably one of the best-known applications (PIR / PUR ) right insulation boards can be used for walls, terraces, roofs and floors behind rain screens or under soffits specially floor insulation of cold stores.

## Thermal conductivity

Thermal conductivity ( $\lambda$ ) is the amount of heat perpendicularly crossing unit ( $m^2$ ) in 1 hour when thermal difference between the two parallel surfaces of a material thickness is 1 (K) kelvin. Thermal conductivity is considered when the thickness of the filler for the sandwich panels is determined.



# Material Specifications

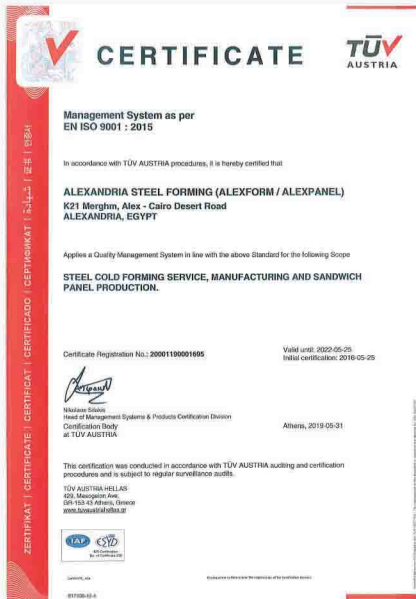
## Heat Transmission Table

The chart below show that the polyurethane provides the maximum thermal insulation with the minimum thickness So that the polyurethane is the most appropriate material can be used for insulation.

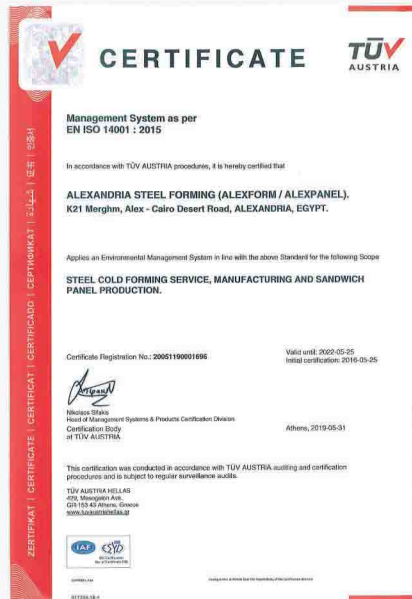
Panel Thickness (mm)	60	80	100	120	150	200
Thermal Energy Transmission (W/m²K)	0.41	0.28	0.23	0.19	0.15	0.11
Temperature Differential (TD)						
10°C	4.181	2.875	2.300	1.916	1.533	1.150
15°C	6.271	4.312	3.450	2.874	2.299	1.725
20°C	8.362	5.750	4.600	3.832	3.066	2.300
25°C	10.452	7.187	5.750	4.790	3.832	2.875
30°C	12.543	8.625	6.900	5.748	4.599	3.450
35°C	14.633	10.062	8.050	6.706	5.365	4.025
40°C	16.724	11.500	9.200	7.664	6.132	4.600
45°C	18.814	12.937	10.350	8.622	6.898	5.175
50°C	20.905	14.375	11.500	9.580	7.665	5.750
55°C	22.995	15.812	12.650	10.538	8.431	6.325
60°C	25.086	17.250	13.800	11.496	9.198	6.900
65°C	27.176	18.687	14.950	12.454	9.964	7.475
70°C	29.267	20.125	16.100	13.412	10.731	8.050
75°C	31.357	21.562	17.250	14.370	11.497	8.625
80°C	33.448	23.000	18.400	15.328	12.264	9.200

*Heat transmission value depends on the thickness of metal, the number of pitches and the joint type*

**TÜV AUSTRIA**  
EN ISO 9001 : 2015 ISO 9001



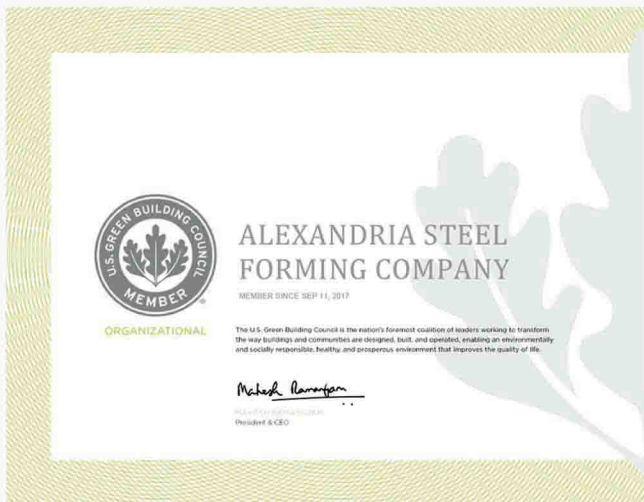
**TÜV AUSTRIA**  
EN ISO 14001 : 2015 ISO 14001



**TÜV AUSTRIA**  
EN ISO 45001 : 2018 ISO 45001



LEED Certificate



FM Approved Certificate





Egyptian Quality Seal





## Air leakage, Water penetration, Uniform load deflection and Structural performance of Sandwich panel





**Test Results for**  
Air Leakage, Water Penetration, Uniform Load Deflection and Structural Performance of  
Sandwich Panel, Alexandria steel forming Co. (Alex- Panel).

Test	Test Name	Applied Pressure (Pa)	Results		State
			Maximum Allowable	Calculated Results	
1	Air Leakage	500	≤1.5 (L/s.m²)	0.57 (L/s.m²)	Pass
2	Water Penetration	500	500 Pa	no water leakage.	Pass
3	Uniform Load Deflection	900	12.0 mm	2.6 mm	Pass
4	Structural Performance	900	8.4 mm	0.76 mm	Pass

**Notes:**  
 - These tests were conducted at indoor air temperature 31 °C & 55% R.H.  
 - The laboratory tests meet the American Architectural Manufacturers Association (AAMA 101) and the applicable standard requirements with respect to: ASTM E 283, for air leakage test, ASTM E 331, for water penetration test and ASTM E 330 for structural performance test.  
 - These results are only valid for the test panel delivered to the wind tunnel lab.  
 - This report is valid for only one year.

Tech. Engineer

*A. Adel*  
A. Adel

*M. Mahmoud*  
M. Mahmoud

Head of Tech. group

*Prof. Dr. M.A. Hassan*  
Prof. Dr. M.A. Hassan

*Dr. M. Morsy*  
Dr. M. Morsy

Tech. Manager

*Prof. Dr. N.M. Guirguis*  
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*S.S. Shebl*  
Head of Institute

Report No. 2


2/ 12

Gedah 26/09/2016

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## Fire classification: B-S1,d0



THOMAS BELL-WRIGHT  
INTERNATIONAL CONSULTANTS

Classification Report Reference No.: SD142-3

### 6. CLASSIFICATION & FIELD OF APPLICATION

**6.1. Reference of classification**  
This classification has been carried out in accordance with Clause 8 of EN 13501-1:2007+A1:2009.

**6.2. Classification**  
The product 100mm thick Cold Store Polyisocyanurate (PIR) Sandwich Panel with vertical joints relation to its reaction to fire behavior are classified:

Fire behavior	Smoke production	Flaming droplets
B	s	d0

**Reaction to fire classification: B- s1, d0**


**Remark:** The classes with their corresponding fire performance are given in Annex A.

**6.3. Field of application**  
This classification is valid for the following end use applications:

**i. Construction applications**  
This classification is also valid for the following product parameters:

Product Thickness	No variation allowed
Product Density	No variation allowed
Product Composition	No variation allowed
Product Construction	No variation allowed

## The Ignitability Test



THOMAS BELL-WRIGHT  
INTERNATIONAL CONSULTANTS

Test Reference No.: SD142-1

### 11. APPENDIX 1- PICTURES




Photo 1: Surface Impingement Test Specimen  
Before Test




Photo 2: Surface Impingement Test Specimen  
After Test




Photo 3: Edge Impingement Test Specimen  
Before Test






Photo 4: Surface Impingement Test Specimen  
After Test

—End of Test Report—

## Fire Test (61 minutes)



Fire Laboratory  
Building Physics Institute (BPI)  
Housing & Building National Research Center (HBRC)



### SUMMARY

The test was carried out in Fire Lab. - BPI - HBRC on 01 November 2016. The ambient temperature at the start of the test was about 27 °C and the mean unexposed face temperature was 29°C. The client representatives were allowed to attend and observe the test for witness.

A Fire classification of the tested sample was conducted in accordance with EN 13501-2. A Fire resistance test was conducted in accordance with NFPA 251 (standard methods of tests of fire resistance of building construction and materials) and EN 1364-1 (Fire resistance tests for non-Lead bearing elements Part 1: Walls). The sample was installed as a nonbearing wall nominally 270cm wide × 300cm height × 15cm thickness. It was a prefabricated polyurethane sandwich panel coded as [API/ISO - Sp-150 (150 mm Cold Store Panel)] which is composed of three pieces that was installed vertically. Each piece composed of polyurethane foam as core material covered on both sides with a steel sheet as claddings. A special sealant (high temperature resistance) was used on the panel-panel and the panel - frame joining sealant areas. As informed by the client, the panels were manufactured in accordance with BS EN 14509. The full responsibility for tested sample construction and installation was to the client under the supervision of the fire lab technologist. The test specimen was tested as described in details hereinafter.

It has succeeded to meet the condition of acceptance as outlined in NFPA 251 and EN 1364-1 for an actual duration of fire test of 61 minutes. The tested specimen remained in its original position in the test frame opening during the fire test, no cracks or openings developed in the specimen during the test period, a dense smoke was appeared from the upper edges and no flaming occurred on the unexposed surface of the tested specimen. The fire endurance test for the polyurethane sandwich panel assembly was stopped after 61 minutes as requested by the customer.

**Tested and report by**  
*M. Mokhtar*  
M. Mokhtar  
Fire Technologist

**Reviewed and approved by**  
*Prof. Dr. S.S. Shebl*  
Prof. Dr. S.S. Shebl  
Head of Fire Dept.

Date: 15/11/2016

Report No. 3 - Issue No. 1

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Gedah 09/11/2016

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For project design, bid preparation or component manufacturing, our sales representatives, engineers, technicians and draftsmen are at your service. Our team can suggest efficient and economical solutions.

## Project development support

Having developers and designers on board in the early phases, allows us to suggest reliable data and solutions for the scheduling, planning and estimating cost, either for buildings that require a new design or existent ones. Moreover, we provide efficient materials that assure the highest sustainability results.



## Technical design support

Our designers are widely experienced in the various types of building designs. Their input of drawings, details and technical documentation has allowed us to keep our entire projects budget friendly while succeeding in reducing the construction time and achieving the required goal from client. Meanwhile, our technical services' teams are specialized in providing construction stage technical support and Thermal/Load table calculations in addition to expert detailing covering all related element the project.

Our specialists on board are committed to a high level of professionalism, applying the International Codes and Standards by using the latest software systems, enabling us to deliver an efficient service, with top quality structural components, which are custom-designed to the client's specific requirements.

## Field service

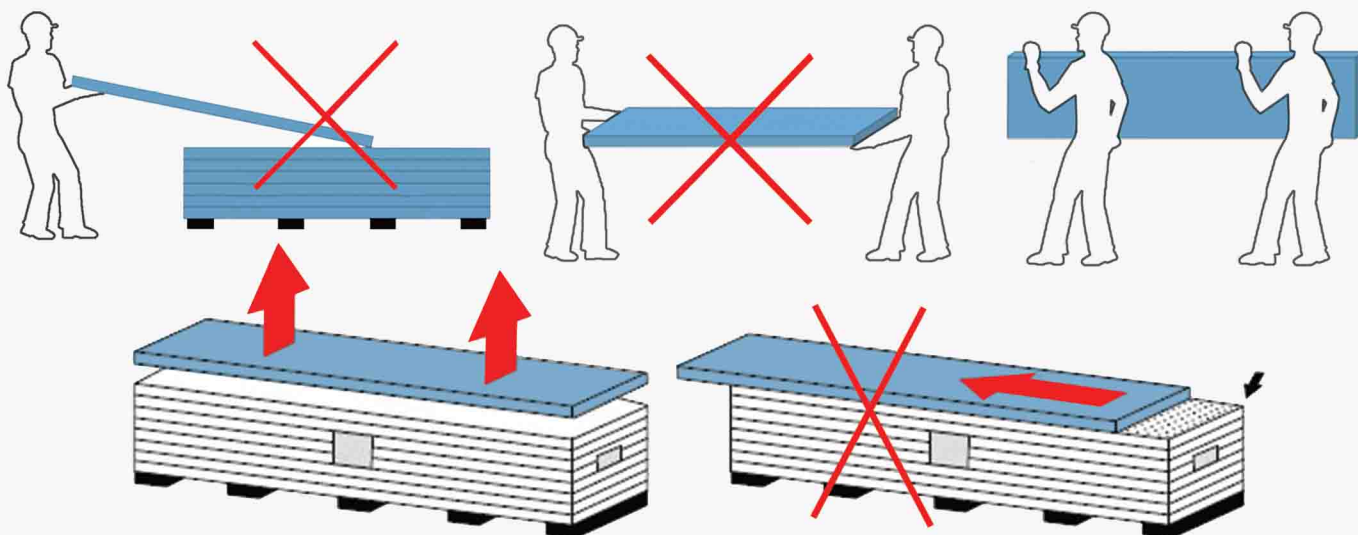
Not only does our field services teams have the expertise to supervise the erection, installation, and maintenance process, but also able to provide a complete demonstration of the installation procedure of the product starting with the safe unloading and manual handling.

# Instructions for Packing, handling and storage

## Packing

Sandwich panels are being delivered on stacks. To ensure protection of the edges of the panel in loading and unloading activities carried out by crane with lifting belts.

Certain destinations may require special packing. We can create reinforced packing using extra wrappings, timber elements or crates upon request.



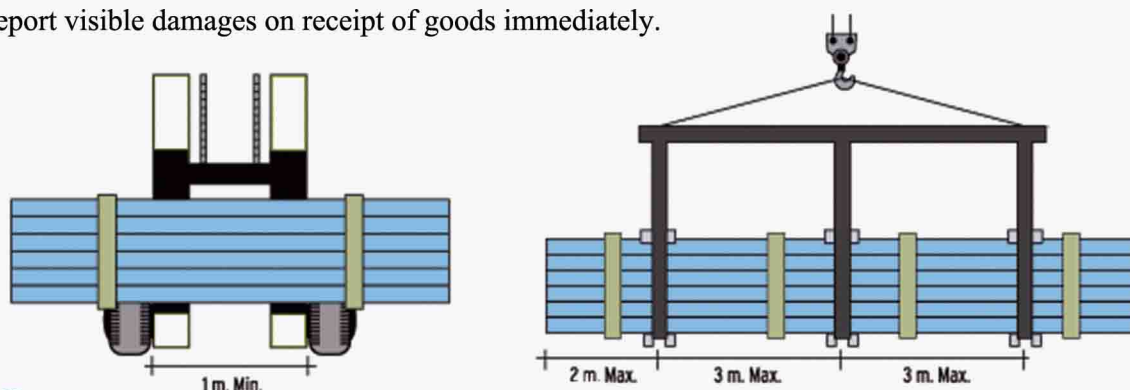
## Handling

Panel stacks are carefully loaded and strapped at factory to ensure clients receive their goods in optimum condition. In order to maintain the panel quality in top condition, it is critical to pay special attention to correctly handling the panels while unloading/moving.

Individual panels should never be moved in a flat position as excessive flexing may result. Excessive flexing ruptures a panel's core, permanently distorts the facings and may lead to thermal blistering.

When moving a panel, it must be turned on its edge first, then supported at each end with as many men as necessary to safely handle.

When receiving goods at the site, clients are requested to carefully inspect the panel stacks prior to unloading and to report visible damages on receipt of goods immediately.



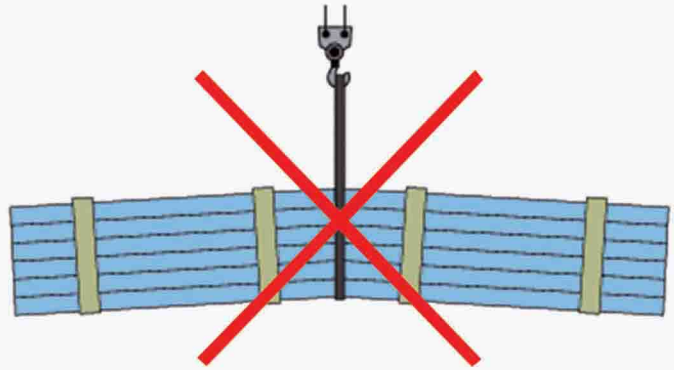
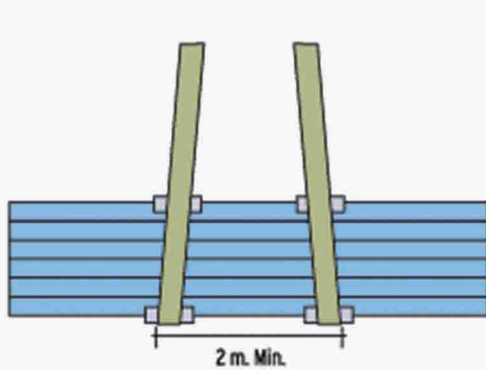
## Unloading

Before starting to unload sandwich panels, check the package condition, Each panel package supplied on wooden pallets.

Stacks up to 6m can be raised and forklifts. Packets with length of 6m to 13,5 m should be lifted by crane or with forklift for long panels. To ensure protection of the edges of the panel in loading and unloading activities carried out by crane with lifting belts, stacks need to be reinforced at the bottom and at the top with protective angular elements that accompany the panels in each expedition.



# Instructions for Packing, handling and storage



## Protective Films

The protective film can protect the pre-painted steel sheet to be polluted, corroded and scratched during the process of producing & transporting and storing. It is cover easily; peel easily, no vestige, no inner pollution.

### Specifications:

Thickness: 0.03 – 0.05 mm.

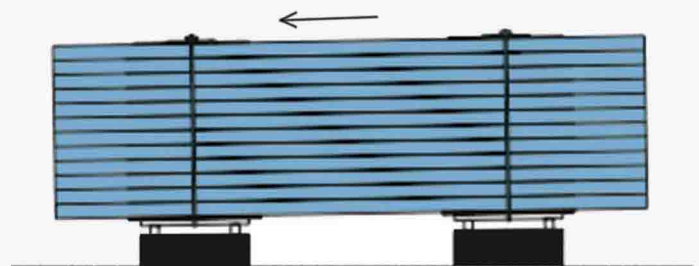
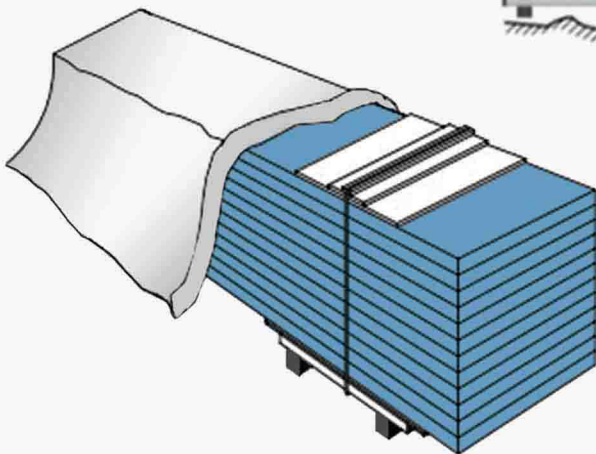
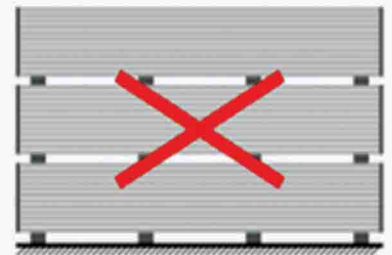
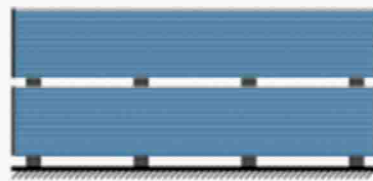
Width: According to panel width.

Color: Transparent.

Backing: Polyurethane film.

Adhesive strength:

According to kind of paint.



## STORAGE

Do not keep the package of panels at a job site or warehouse more than 3 months. To protect the package from the collected water at the base put wooden or polystyrene block trough the long side with minimum height 100 mm. Stacking yard must be open to air circulation.

- If the package of panels at a jobsite cannot be stored inside, be sure to wrap the packages with polyethylene covering.
- The covering needs to be applied in a manner that does not allow water to accumulate in the package. Put the packages with 5% slope, in order to prevent the water collection between the panels.
- Do not store more than three packages one on top of another and place spacers or board between them.

## Our Clients





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