Contents

ADVANTAGES

LIFOPANEL consist of a core of polyethylene or mineral filled core sandwiched between two 0.5mm thick aluminium skins. The aluminium coil is coated with superior quality KYNAR500® PVDF coating system.

Weather Durability with up to 20 years warranty on coating

KYNAR500® PVDF coating system provides outstanding colour uniformity, UV fade resistance, gloss retention and corrosion resistance coming complete with up to 20 years warranty.

Lightweight and Rigid

LIFOPANEL with its impressive strength to weight ratio is exceptionally light-weight. Its rigidity and high strength make it the most suitable material for exterior wall cladding.

Superior Evenness

Its superior evenness makes LIFOPANEL the ideal material for creating smooth monolithic surfaces that eliminate distortion, buckling and deflection.

Excellent Formability

It can be easily formed into small radius curves, angles, rounded edges, bull noses and the like. Other fabrication techniques include routing, drilling, bending, folding and hot-air welding.

Environmentally Friendly

LIFOPANEL is a fully recyclable material in that the core material and the aluminium sheets are recyclable and the process in no way does any environmental harm to the planet.

Easy Maintenance

LIFOPANEL can be easily cleaned using water and a sponge or a soft bristled brush and a mild detergent solution. This is sufficient to restore the panel to its original appearance and gleam.

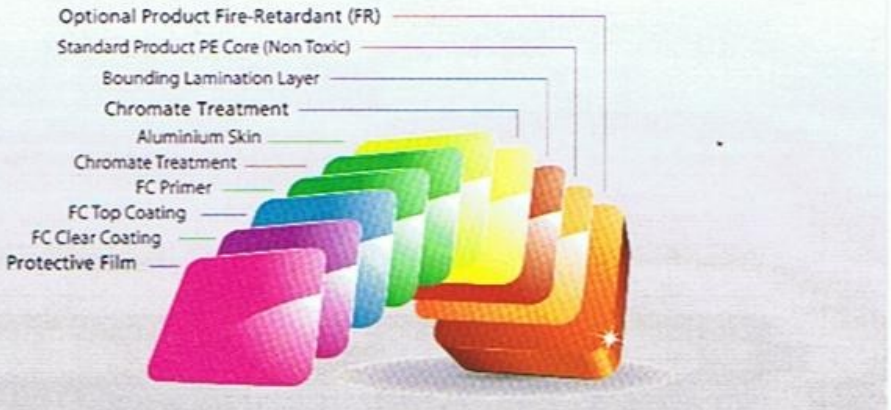
Superior Cost Effectiveness

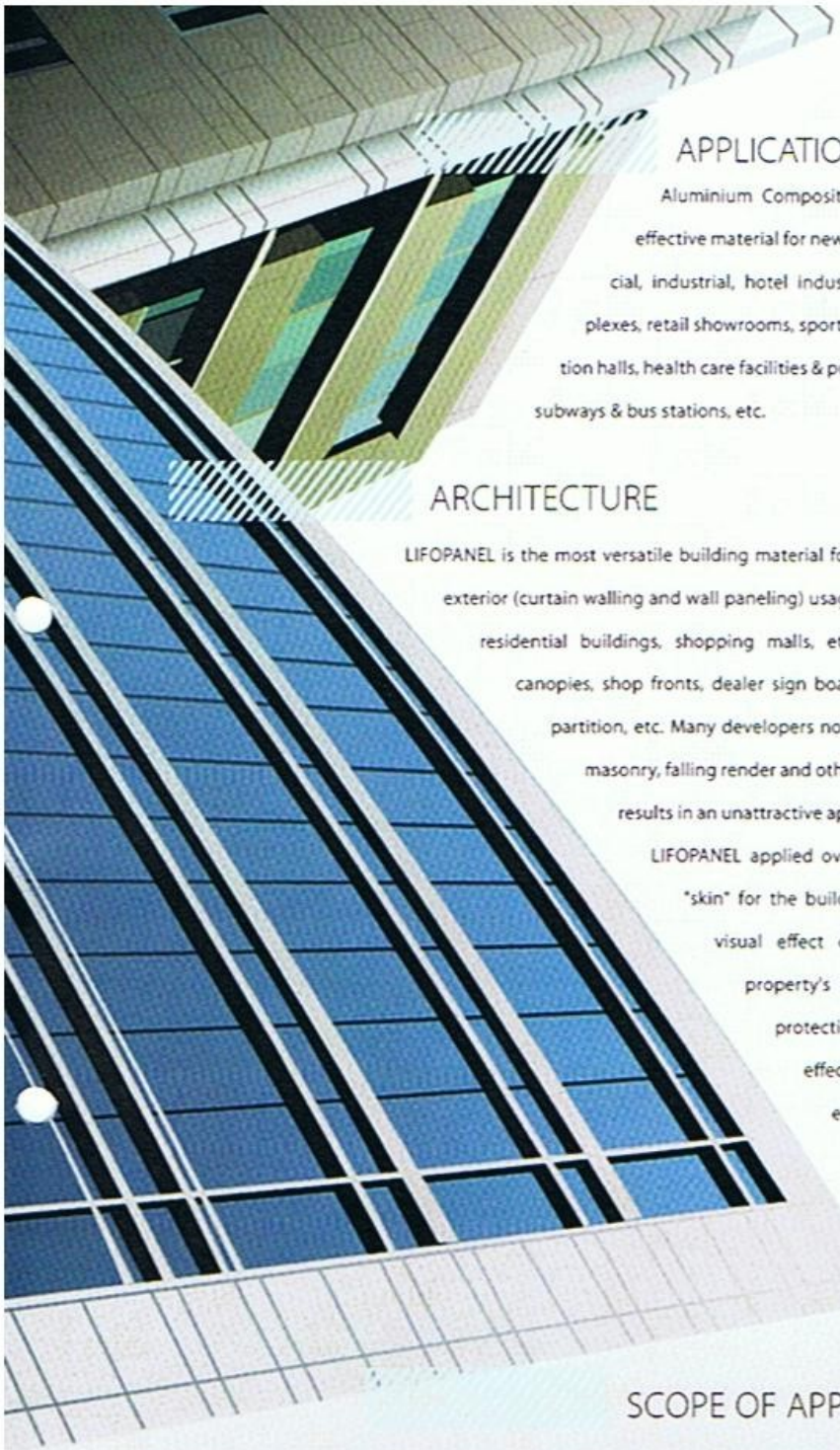
Being a local manufacturer, stock is hence convenient to acquire and comes undoubtedly at an affordable price, as opposed to all factors concerned, in dealing with imported stock.

Fire Retardant

LIFOPANEL is classified as Index "0" BS476 Part 6 for fire propagation and Class "One" BS476 Part 7 test for surface spread of flame.

LIFOPANEL COMPOSITE PANEL





APPLICATIONS

Aluminium Composite Panels is the current ideal and cost effective material for new constructions or renovation in commercial, industrial, hotel industry, entertainment industry like multiplexes, retail showrooms, sports stadiums, convention centers & exhibition halls, health care facilities & public places like airports, railway stations, subways & bus stations, etc.

ARCHITECTURE

LIFOPANEL is the most versatile building material for exterior and interior use: examples of exterior (curtain walling and wall paneling) usage is for high-rise commercial, industrial, residential buildings, shopping malls, etc. Specific applications are for store canopies, shop fronts, dealer sign boards, display units, innovative furniture, partition, etc. Many developers now suffer from stained concrete, cracked masonry, falling render and other time related problems. Inevitably, this results in an unattractive appearance and a fall in commercial value. LIFOPANEL applied over cladding system will provide a new "skin" for the building and will dramatically improve the visual effect of an old building and restore the property's value. LIFOPANEL offers outstanding protection from weather and will withstand the effects of industrial pollution and will save energy. It is lightweight, quick to install and easy to maintain. LIFOPANEL is available in a range of colours and sizes.

SCOPE OF APPLICATIONS

- Curtain walling and wall cladding (exterior and interior)
- Fascia, soffit and facade finishes
- Spandrel and canopy panels
- Column covers and beam wraps
- Showroom finishes
- Stairwells, elevators and kiosks
- Partition and ceiling panels
- Body parts of automobile
- Highway, tunnels and subway interiors
- Signage and billboards

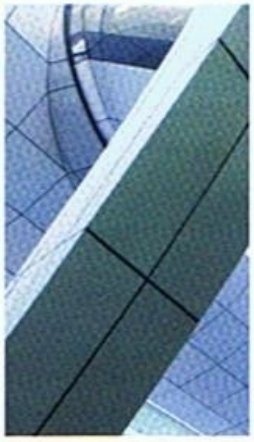
EXTERIOR

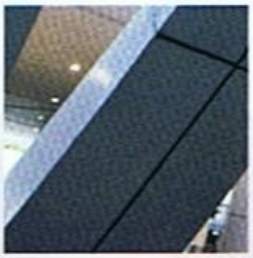
To secure and expand their market share, modern shopping centres, established corporations, banks, supermarkets, petrol pumps, car showrooms require good infrastructure, which also makes an identifiable and memorable architectural statement. This can be achieved with LIFOPANEL. There are tangible images which successfully catch the customer's eye as well as its long term attention. LIFOPANEL offers a tailor made solution for every image, be it with exclusive colours or innovative surface contours.

Aluminium composite panels when used in such outstanding design structures, provide the architect with great versatility for his design concepts and overall cost effectiveness.

INSPIRATIONAL INTERIORS

Modern shopping centres, famous corporations, banks, supermarkets, car showrooms require good infrastructure, which also makes an identifiable and architectural branding statement. This can be achieved with the use of aluminium composite panels. Aluminium composite panels offer a tailor made solution for every image, be it with exclusive colours or innovative surface contours.





BILLBOARDS AND SIGNAGES

With its outstanding features such as easy and light assembly as well as durable weathering resistance, the use of LIFOPANEL gives the crucial advantage in the preferred specifications of billboard and signage design and construction. LIFOPANEL characteristics have no creative limits. Superior evenness and its smooth surface ensures accurate alignment in small and/or large format allowing for high resolution half tone screen printing without pre-treatment. LIFOPANEL allows ink coverage, adhesion, and a reliable application of vinyl with the added advantage of ensuring that replacements do not leave any surface marks.

DISPLAYS

Even with mobile and rotating displays LIFOPANEL keeps its shape thanks to its outstanding rigidity. A multiplicity of three dimensional forms can be achieved by means of folding and bending the material. This gives LIFOPANEL its flexibility whilst adding extra structural strength. Be it system stand panels, cover elements, picture backing or 3D product presenters the dimensional stability, durability and easy processing of LIFOPANEL make it a must for displays and exhibitions. Excellent flatness and flawless surface finish facilitate problem free lamination with adhesive foil or sprayed adhesives.

TRANSPORT VEHICLES

These products are ideal for all types of transport cladding application because of their following outstanding features: lightweight, strength and rigidity, sound and vibration dampening characteristics, capacity to remain flat in adverse climatic conditions, smooth pre-finished surface and easiness to fabricate.

BUSES

Manufacturers use these products for exterior cladding, sidewalls, roof panels and air conditioning ducts.

TRUCKS

Bodybuilding applications include sideboards, floors, swing boards, doors and advertising sign panels.

RAIL

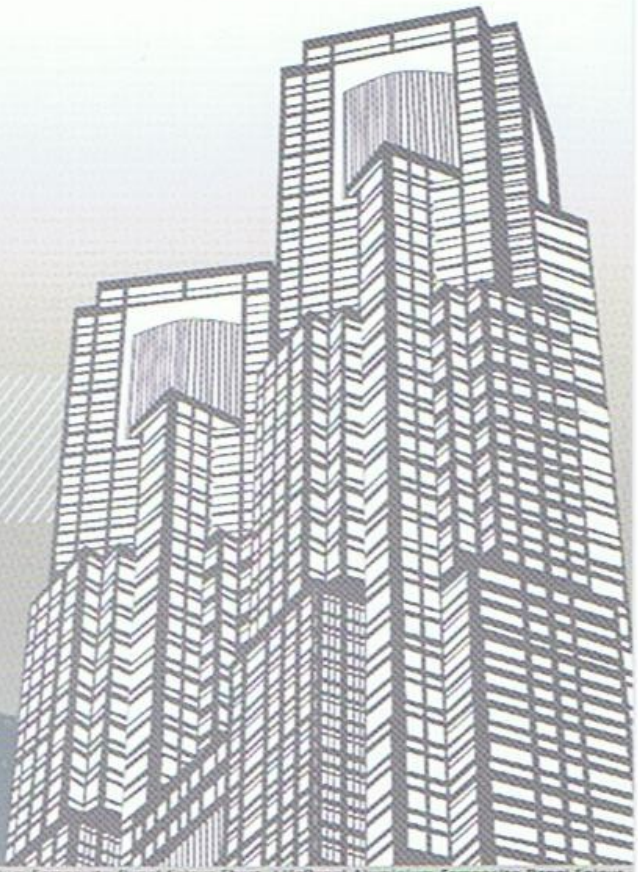
Locomotive and rolling stock manufacturers take advantage of all the features of these products for ceiling panels, interior linings, floors and bulkheads.

SHIPS

Shipbuilders utilize the fire rating characteristics of aluminium composite panels for all types of interior cladding such as walls, doors, ceilings, bulkheads and floors.

LifoPanel®

Aluminium Composite Panel



Colour Chart

LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel Aluminium Composite Panel Colour Chart LifoPanel

General Properties

Thickness	0.4mm / 0.5mm
Alloy	5005A
Tensile Strength	Rm ≥ 130 (N/mm²)
Elongation	≥ 5%

Aluminium Composite Panel Size

Panel Thickness	Aluminium Skin Thickness	Width (W)	Length (L)
3mm, 4mm	0.05mm, 0.1mm, 0.2mm	1220mm	2440mm 3660mm
4mm, 5mm, 6mm	0.3mm, 0.4mm, 0.5mm	1250mm 1550mm	2440mm 3050mm 3660mm 4100mm
Weight: 3mm : 3.4kg/m²	4mm : 5.5kg/m²	6mm : 7.2kg/m²	
Tolerance: width ±2.0mm	length ±4.0mm	thickness ±0.2mm for 4mm	

LFP 1301 (Pure White)

LFP 1302 (Matte White)

LFP 1303 (Ivory White)

LFP 1304 (Matte Ivory White)

LFP 1305 (Champagne)

LFP 1306 (White Silver Grey)

LFP 1307 (Champagne Gold)

LFP 1308 (Bright Silver)

LFP 1309 (Finland Green)

LFP 1312 (Light Blue)

LFP 1320 (Gold)

LFP 1324 (Bright Brownish Bronze)

Colour Chart

Durable & Distinctive Colour Coating Protection with a Statement

LFP 1325 (Bright Jade Green)

LFP 1326 (Dark Grey)

LFP 1328 (Pure Dark)

LFP 1312 (Light Green)

LFP 1314 (Midnight Blue)

LFP 1315 (Dark Green)

LFP 1316 (Dark Blue)

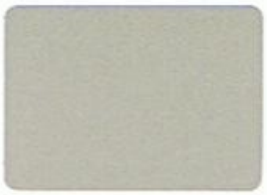
LFP 1319 (Lemon)

LFP 1321 (Orange Red)

LFP 1322 (Purple)

LFP 1323 (Dark Red)

LFP 1327 (Coffee)



LFP 1330 (Khaki)

LFP 1331 (Orchid)

LFP 1332 (Rose Red)

NOTE: ORDER BASED ON SEALED SAMPLE

*The colours in this chart are just for reference and only for polyester. A slight colour variation may occur between different products such as PVDF coating and polyester coating. For exact colour matching, please request an actual colour sample.

Colour variations may occur between panels originating from different production batches. To ensure colour consistency, the total project should be placed in one order.

Coating Performance

Test Item	Specification	Result
Gloss	ECCA T2	15-35 units Gardner 60°
Pencil Hardness	ECCA T4	≥F
Impact Resistance	ECCA T5	>5J aluminium substrate
Bending	ASTM D4145	≤2T
Solvent Resistance	ASTM D5402	≥100 double rub with MEK
Adhesion	ASTM D3359	5B
Salt Spray	ASTM B117	passed 2000h
QUV-A	ECCA T10	passed 4000h
Gloss retention		not less than 80%
Colour retention		ΔE<5 CIEL ab units
Chalking retention		rating of 8 units
Florida Exposure		passed after 2 years
Gloss retention		not less than 80%
Colour retention		ΔE<2 CIEL ab units
Chalking retention		rating of 8 units
Chemical Resistance		
Muriatic acid	(AAMA 2605-987.7.1)	No blister and visual change
Mortar	(AAMA 2605-987.7.2)	No attack
Nitric acid	(AAMA 2605-987.7.3)	Delta E < 0.5
Detergent	(AAMA 2605-987.7.4)	No attack

Lifomax Woodbuild Sdn. Bhd. (557684-M)
23-1A, Jalan Bandar 12, Pusat Bandar Puchong, 47100 Puchong, Selangor Darul Ehsan, Malaysia
+6 03 5882 2211 +6 03 5882 9938 lfp@lifomax.com www.lifomax.com

COATING PERFORMANCE

LIFOPANEL is coated with polyvinylidene fluoride (PVDF) which is a high performance fluoropolymer architectural coil coating system from Becker Industrial Coatings. With a history of more than 140 years, Becker Industrial Coatings originating from Sweden, is currently Europe's leading coil coating paint manufacturer for industrial and architectural markets.

Becker's PVDF coating comprises a minimum of 70% KYNAR500® resin. KYNAR500® based finishes meet or exceed the physical test performance criteria of the American Architectural Manufacturers Association (AAMA Specification 605.2) for high performance coatings on aluminium panels.

The carbon fluoride bond in the PVDF resin polymer structure, which is the strongest chemical bond known, provides the thermal, chemical and ultra violet resistance. The binder also enables the coating system to resist environmental degradation and dirt retention.

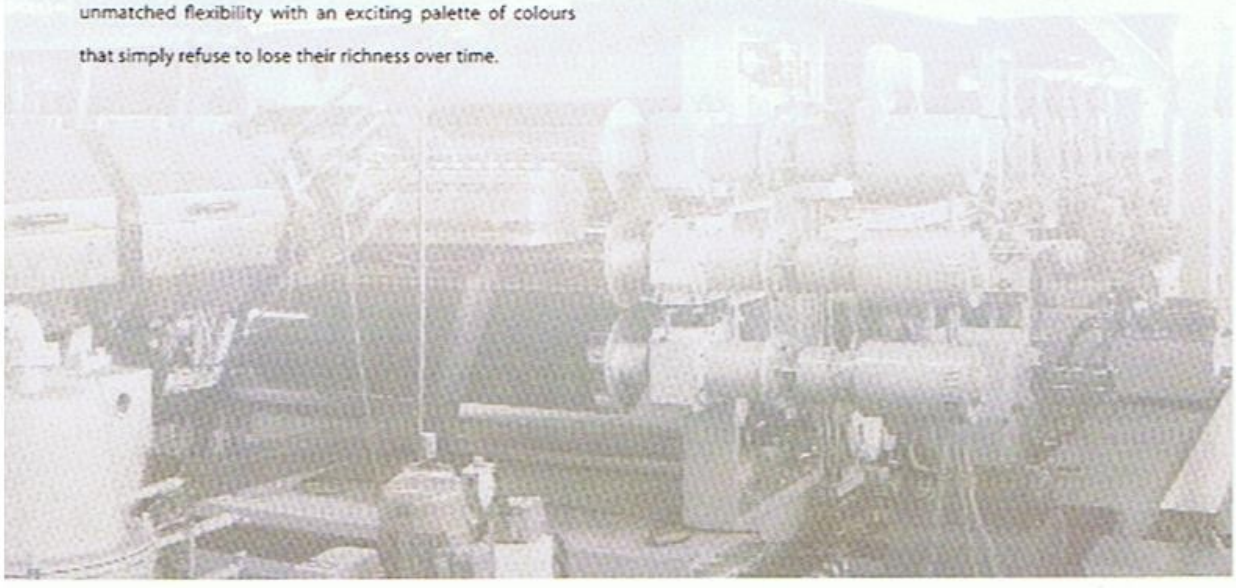
KYNAR500® based finishes which were introduced over a quarter of a century ago, are a designer's dream. They offer unmatched flexibility with an exciting palette of colours that simply refuse to lose their richness over time.

Today the world's leading architectural firm specify KYNAR500® based finishes to protect and beautify commercial, industrial and residential buildings in the most inhospitable climates.

LIFOPANEL which is coated with KYNAR500® PVDF has the ability to meet or exceed the highest performance requirements of architectural coatings for:

- Long term exterior durability
- Exceptional gloss and colour retention
- Excellent chemical and corrosion resistance
- Excellent fungus and dirt resistance
- Low maintenance
- Excellent formability

All LIFOPANEL panels coated with KYNAR500® PVDF comes complete with a back to back performance warranty of up to 20 years.



TEST ON LIFOPANEL COMPOSITE

Test	Result
1) ASTM E90: 1990 Laboratory Measurement of Airborne Transmission Loss of Building Partition	STC 26
2) ISO 8990:1994-Thermal Insulation - Resistance of Heat Transmission (R-value) - Thermal Transmittance (K-value) - Thermal Conductivity (K-value)	 0.21 m^2k/w 4.88 w/m^2k 0.06 w/mk
3) ASTM B117-1997 Salt Spray Test (500 hours)	No rust or any visual defect was observed on the samples.
4) ASTM D2794-92 Rapid Deformation (IMPACT) Test	No cracks was observed at the impact area at 1200mm height.
5) ASTM D792-91 - Specific Gravity and Density Test i) Specific Gravity ii) Density	 1.38 (kg/m^2) 1379 (kg/m^3)
6) ASTM C393-62-Flexural Stiffness Test	4.56 (N/mm^2)
7) ASTM D790-92-Flexural Modulus Test	2.12 (N/mm^2)
8) ASTM D903-98-Peel / Stripping Strength Test	598 (N)

LIFOPANEL COMPOSITE FIRE RESISTANT CAPABILITIES

SINGAPORE (TUV SUD PSB CORPORATION)

Fire Propagation of the Product	BS476 Part 6	Index "0"
Test for Surface Spread of Flame	BS476 Part 7	Class "One"

MALAYSIA (SIRIM QAS INTERNATIONAL SDN. BHD.)

Fire Propagation of the Product	BS476 Part 6	Index "0"
Test for Surface Spread of Flame	BS476 Part 7	Class "One"

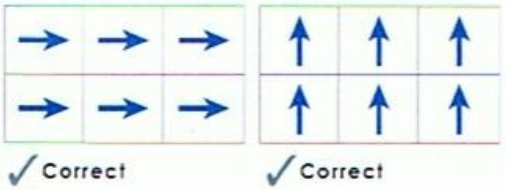
IMPORTANT INFORMATION

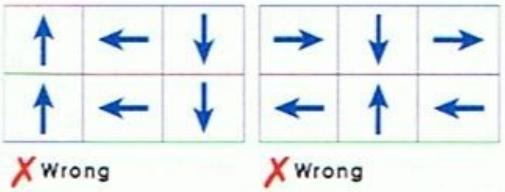
Installation

• To avoid possible reflection differences (for metallic colours only) it is recommended that panels be installed in the same direction as the markings shown on the protective foil of the individual panels running parallel to each other.

• The panels must not be continuously exposed to temperatures of 70 degree Celsius or above.

• If the aluminium materials come in contact with a dissimilar material, such surfaces shall be insulated with a layer of PVC or polyethylene tape.





Removal of protective foil

It is recommended that the removal of the protective foil be done as soon as possible after installation. This is to prevent the residual glue from sticking to the surface of the panels which invariably happen under hot weather conditions.

Storage

Adequate measures should be taken to protect pallets during storage against rain, moisture and condensation. Store the pallets stacked one on top of the other. Stacks must not contain more than six pallets of identical size. Avoid storage for a period of more than six months.

Cleaning and maintenance

Cleaning operations should be carried out in stages from the top and working downwards. Lifopanel can be easily cleaned with water and a sponge or with a soft bristled brush and a mild detergent solution. Avoid strong alkaline or acid products and abrasive solutions. The cleaning should be followed with a thorough rinsing with clean water to ensure the removal of all remnants of the cleaning agent used earlier. It is recommended that cleaning be done once or twice a year. However the cleaning frequency will depend on the location and environmental conditions.

EXAMPLE OF SPECIFICATION

Item	Description	Unit	Quantity	Rate	Amount
	Bill No. Element - Wall Cladding System				
A	Allow for mock-up and testing as described	Item			
B	To design, fabricate, deliver and install 4mm thick "LIFOPANEL", aluminium composite panels with Polyethylene Core in KYNAR500® PVDF Fluorocarbon of selected colour complete with sub-frame, fasteners, fixing brackets, approved sealant and all necessary fittings and accessories as described.	m^2			
C	Ditto to sides fascia	m^2			
D	Curve fascia	m^2			
	Available from: - Lifomax Woodbuild Sdn. Bhd. 23-1A, Jalan Bandar 12, Pusat Bandar Puchong, 47100 Puchong, Selangor Darul Ehsan, Malaysia Tel : +6 03 5882 2211 Fax : +6 03 5882 9938				
	(Carried To Final Summary)				

SPECIFICATIONS

ALUMINIUM COMPOSITE PANEL SIZE

Panel Thickness	Aluminium Skin Thickness	Width (W)	Length (L)
3mm, 4mm	0.05mm, 0.1mm, 0.2mm	1220mm	2440mm
			3660mm
4mm, 5mm, 6mm	0.3mm, 0.4mm, 0.5mm	1250mm	2440mm
		1550mm	3050mm
			3660mm
			4100mm
Weight: 3mm : 3.4kg/m²	4mm : 5.5kg/m²	6mm : 7.2kg/m²	
Tolerance: width ±2.0mm	length ±4.0mm	thickness ±0.2mm for 4mm	

CHARACTERISTICS AND PROPERTIES

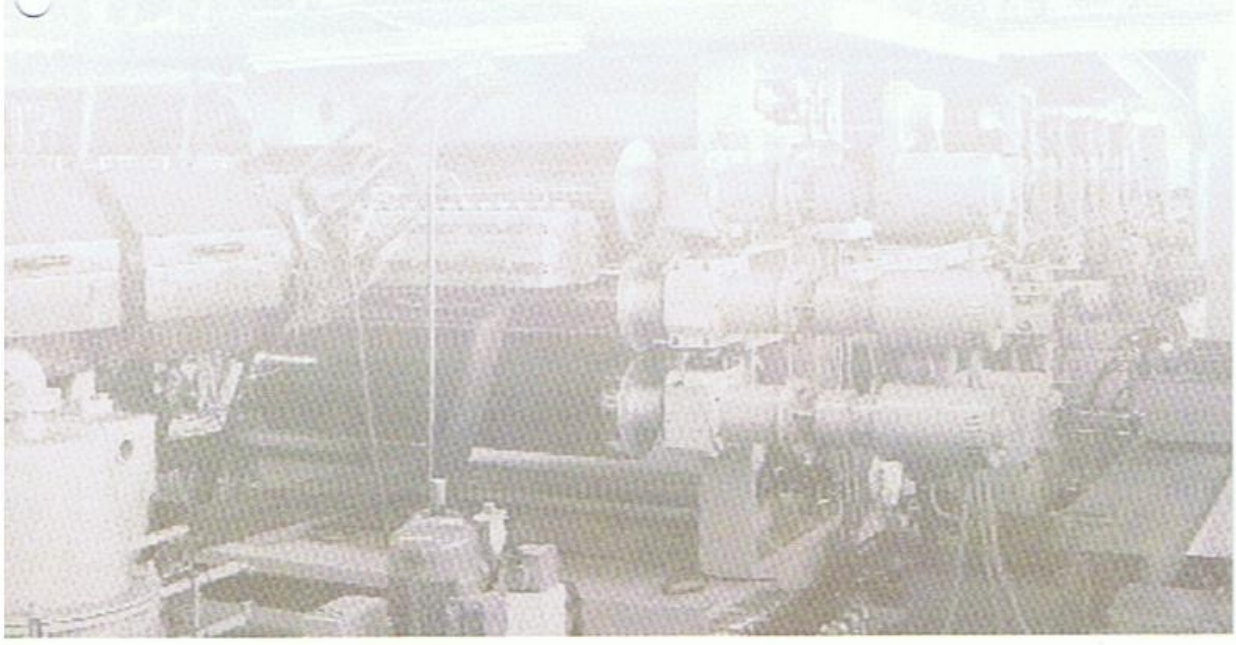
GENERAL PROPERTIES

LIFOPANEL Composite's Aluminium

Thickness	0.5mm
Alloy	3003/H16
Technical standard	YS/T 432-3000
Tensile strength	178 (Mpa)
Elongation	2.98%

LIFOPANEL Composite's Thermal LDPE Core

Melt index	ASTM D1238	0.33g/10min
Density	ASTM D1505	0.922g/cm^3
Vicat softening point	ASTM D1525	97°C
Dart drop impact	ASTM D1709	4g/μm
Tensile strength	ASTM D882	220/200kg/cm^2
Ultimate elongation	ASTM D882	490/620%



Coating Performance

Test Item	Specification	Result
Gloss	ECCA T2	15-35 units Gardner 60°C
Pencil Hardness	ECCA T4	> F
Impact Resistance	ECCA T5	> 5J aluminium substrate
Bending	ASTM D4145	< 2T
Solvent Resistance	ASTM D5402	> 100 double rub with MEK
Adhesion	ASTM D3359	5B
Salt Spray	ASTM B117	passed 2000h
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Colour retention		ΔE<5 CIEL ab units
Chalking retention		rating of 8 units
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Mortar	(AAMA 2605-987.7.2)	No attack
Nitric acid	(AAMA 2605-987.7.3)	Delta E<0.5
Detergent	(AAMA 2605-987.7.4)	No attack

Beckers

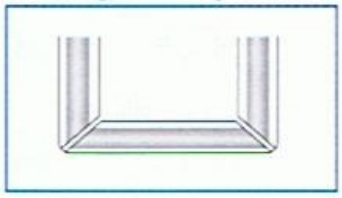
LIFOPANEL Composite Fire Resistant Capabilities

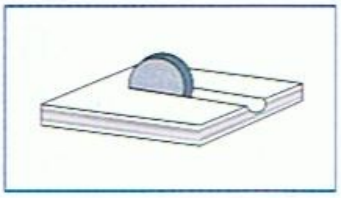
MALAYSIA (SIRIM tested)

Fire Propagation of the Product	BS476 Part6	Index "0"
Test for Surface Spread of Flame	BS476 Part7	Class "One"

PROCESSING TECHNIQUES

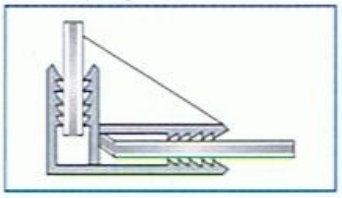
• Routing / Folding





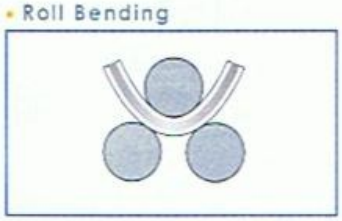
▪ LIFOPANEL Composite panels can be shaped cold by a very simple technique by hand or panel saws, then folding to produce various shapes and sizes. Rout a groove along the folding edge using a disk or end-milling cutter. 0.3mm of core material should remain at the base of the groove. The panel can then be folded by hand.

• Clamping



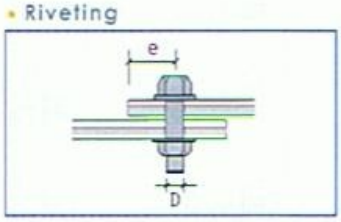
▪ With serrated corner joint or butt-joint sections between aluminium extrusions.

• Roll Bending



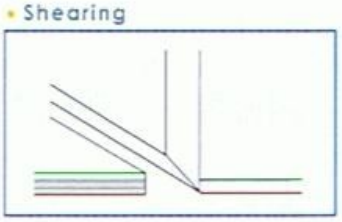
▪ LIFOPANEL Composite panels can be bent with a roll-bending machine. Please use ground rolls in perfect condition only.

• Riveting



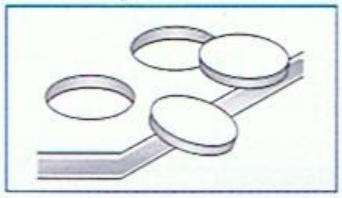
▪ Riveting is possible with the usual equipment such as rivets or blind rivets. For outdoor use allow for thermal expansion.

• Shearing



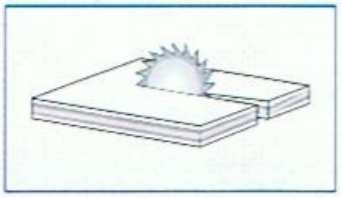
▪ Shearing can be done with a guillotine. Please make sure the blanking tools are padded! Shearing causes an indentation of the panel cover sheet.

• Punching



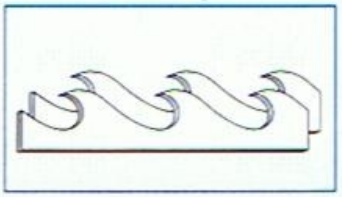
▪ LIFOPANEL Composite panels of any thickness can be punched with conventional sheet punching machines. For clean cuts please use evenly ground tools and the narrowest possible cutting gap. Punching causes an indentation of the panel cover sheet.

• Cutting



▪ LIFOPANEL Composite panels can be cut with a zig saw, circular band or a vertical panel saw.

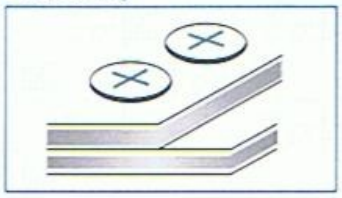
• Contour Cutting



▪ LIFOPANEL Composite panels can be cut to size with water jets, profile milling machines, contour saws and jigsaws.

PROCESSING TECHNIQUES

Screwing

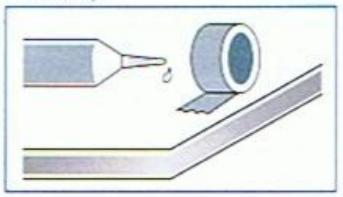


• Can be applied on conventional wood, sheet metal or machine screws made of stainless steel. For outdoor use make allowances for thermal expansion.

Bending

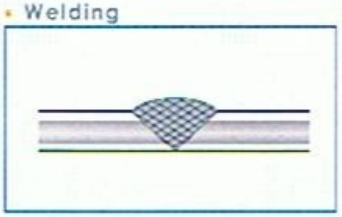
• Bending is possible with a folding table or brake press. The inside bending radius is roughly 10 times of LIFOPANEL Composite panels thickness. Please use protective foils. The spring-back effect is higher than with solid sheet. For production series a prototype should be made.

Gluing



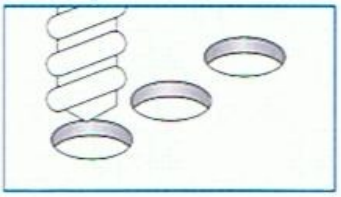
• This is done with the usual metal adhesives. There is no adhesion to the plastic core. Alternatively double sided tape may be used.

Welding



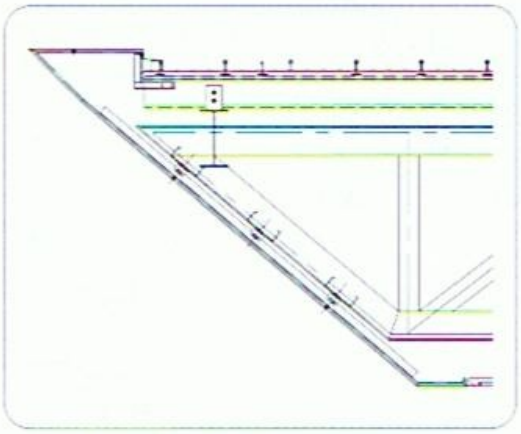
• Hot air welding has been proven suitable for joining Lifopanel Composite panels. The plastic core and plastic welding rod are heated and welded with electric hot air welding sets.

Drilling

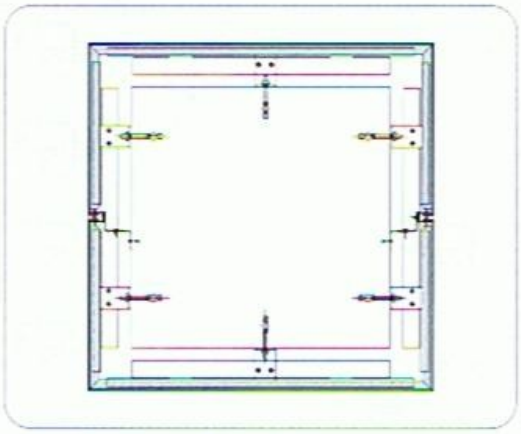


• LIFOPANEL Composite panels can be drilled with twist drills normally used for aluminium and plastics on machines common for metals.

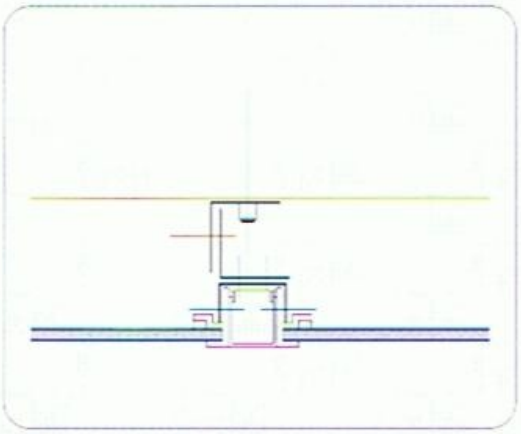
INSTALLATION METHOD



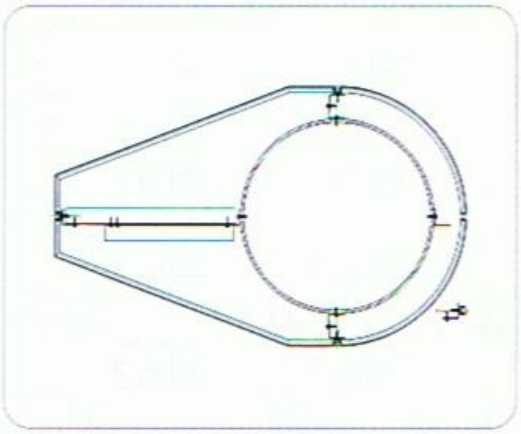
Square Shape Soffit Cladding



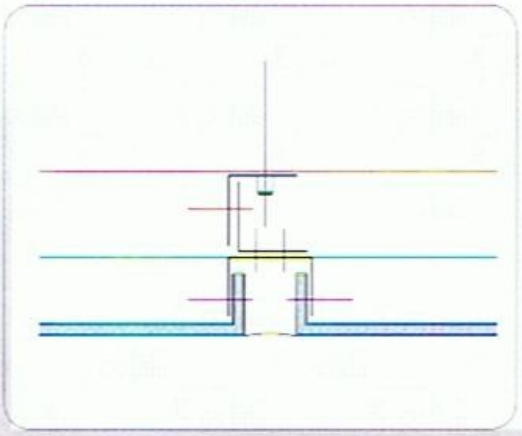
Square Column Special Design



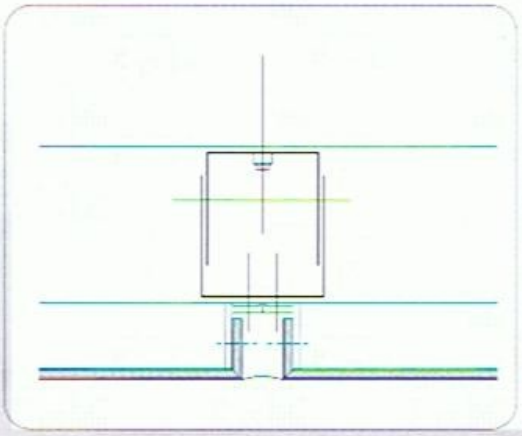
Clip Bracket With Silicone



Oval Column Special Design

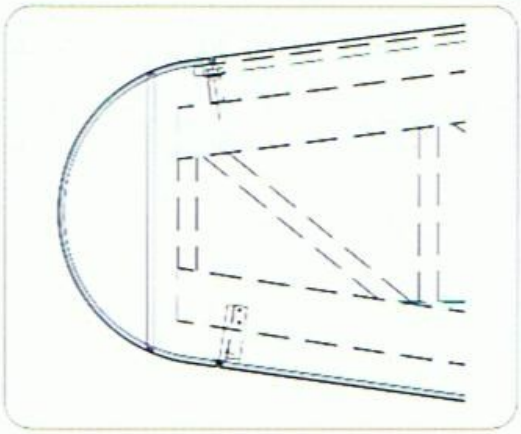


Screw Fixed With Gasket

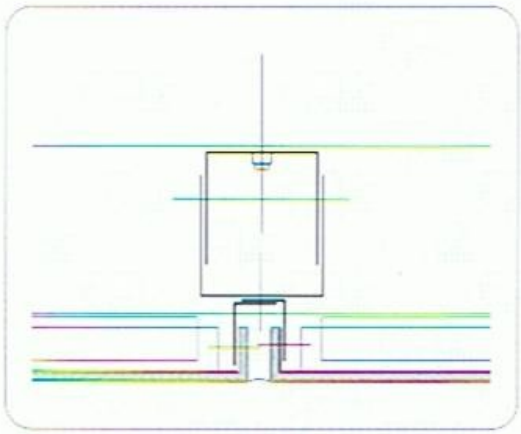


Screw Fixed With Silicone

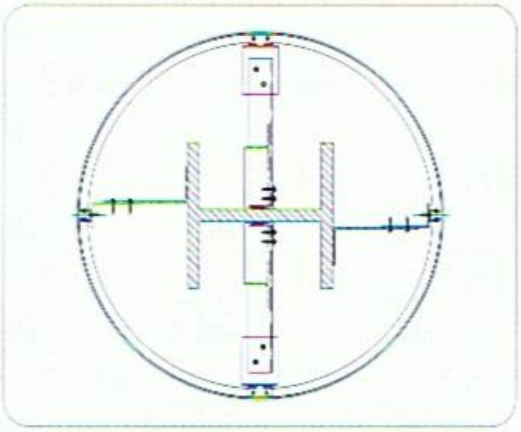
INSTALLATION METHOD



Round Shape Soffit Cladding



Tray Panel System - Suspended On Pins



Round Column Special Design

System Open Joint With Suspended Bracket

PRODUCTION FLOW

METHOD STATEMENT, OPERATION & MAINTENANCE MANUAL OF THE FAÇADE CLADDING *("LIFOPANEL"* ALUMINIUM COMPOSITE PANELS)

1.0 Introduction

The purpose of this document is to define the method and control employed to ensure that the aluminium composite panels is carried out in a controlled and systematic manner and is in all respect conformed to the specifications, manufacturer's instructions and drawings.

2.0 Scope of Work

The scope of this document shall cater for all aspect of the site installation of the aluminium composite panels for aluminium composite cladding.

3.0 Materials

a) "Lifopanel" 4.0mm thick aluminium composite panels c/w 0.4mm aluminium skin.
b) Aluminium angle extrusions
c) Black sealant

4.0 Execution

Overview summary.

Item	Description	Remarks
1	Gridline marks and reduced level datum to be marked and provided on level 1	To set out the works
2	Area of work to be handed over and standing scaffold to be ready	To commence the works
3	Setting out and plumbing	Inspection (where applicable)
4	Taking site measurement	
5	Off-site fabrication works	Factory inspection (where applicable)
6	Deliver fabricated components	Pre-installation inspection
7	Install façade cladding	
8	Dismantle protection tape	
9	Inspection and handover	

- ***4.1 Setting out and plumbing***

Setting out and plumbing the x and y axis shall be done according to the gridline marks and reduced level datum marked on level 1 by the building surveyor. The least to be provided by the building surveyor shall be the building control lines on both axis and one reduced level datum.

It is only practical and advisable that the setting out and plumbing of the façade shall be done in full height or one plane. Handover must be the full height of the façade but can be limited to certain length of the façade.

Site inspection on the setting out shall be conducted where applicable.

Site measurements shall be taken and recorded in the shopdrawing for verification. Any discrepancies or deviation shall be submitted together with Request for Information form (RFI) before further activities commence.

- ***4.2 Off-site fabrication process***

All aluminium composite panels shall be fabricated in the factory.

PVDF aluminium composite panels shall be protected with plastic sheet prior to fabrication works. The protective sheet shall be left for as long as necessary.

All fabricated components shall be codified and inspected before delivering to site for installation.

All fabricated components shall be delivered to site in a loose form and unloaded from the lorry manually.

- *4.3 Façade installation process*

Brackets and aluminium angles for the aluminium composite panel shall be installed with electrical drill.

The fabricated aluminium composite panel shall be hoisted manually and put in place with battery operated drill.

The open end between the aluminium composite panels shall be sealed with approved black sealant.

- *4.4 Precautionary measure*

Other activities related to the façade, the works contractors shall ensure to take extra precautionary measures to avoid damage to the completely installed façade cladding, especially the plasterer and painter.

When the aluminium composite panel is ready for inspection, the protective plastic tape shall be removed.

5.0 Cleaning and Maintenance

Clearing operations should be carried out in stages from the top and working downwards. Aluminium composite panels can be easily cleared with water and a sponge or with a soft bristled brush and a mild detergent solution. Avoid strong alkaline or acid products and abrasive solutions. The clearing should be followed with a thorough rinsing with clean water to ensure the removal of all remnants of the cleaning agent used earlier. It is recommended that cleaning be done once or twice a year. However the cleaning frequency will depend on the location and environmental conditions.

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Fax no. : 03-55445855

MS ISO/IEC 17025
TESTING
SAMM 085

TEST REPORT

REPORT NO : 2010CB3708	PAGE : 1 OF 4

Applicant	:	LIFOMAX WOODBUILD SDN. BHD. No. 23-1A, Jalan Bandar 12, Pusat Bandar Puchong, 47100 Puchong, Selangor Darul Ehsan.
Manufacturer	:	- Nil -
Product	:	Aluminium Composite Panel
Reference Standard/ Method of test	:	ASTM B 117 - 1997 : Standard Method of Salt Spray (FOG) Testing - Salt Spray (Fog) Test
Description of sample	:	One sample of Aluminium Composite Panel was received for testing. Brand : Lifopanel Model : 4mm x 0.4mm x 0.4mm (FR)
Date received	:	01st June 2010
Job no./Ref. no.	:	J20105043708 / SQAS/CCST/T.REC/ MSL/07
Issued date	:	23 AUG 2010

Approved Signatories

(SERI BANUN SUJANGI)
Senior Technical Executive

SIRIM QAS INTERNATIONAL SDN. BHD. Civil & Construction Section

(YM RAJA NOR SIHA RAJA ANDUL HANAN)
Group Leader
Civil & Construction Section
Testing Services Department

TEST REPORT

REPORT NO : 2010CB3708	PAGE : 2 OF 4

TEST RESULTS : NEUTRAL SALT SPRAY

Specification	: ASTM B 117 - 1997 Standard Method of Salt Spray (FOG) Testing
Test	: Salt Spray Test
Duration of Test	: 500 hours
Operating Temperature	: $35 \pm 1.1\ ^{0}C$
Operating pressure	: 20 ± 2 psi (1.4 ± 0.1 kgf/cm^2)
Salt Solution	: 5 gm of Sodium Chloride (NaC1) dissolved in 995 gm of distilled water.
pH of Salt Solution	: 6.5 – 7.2
Cleaning of Sample	: **Before Test** The sample was cleaned thoroughly with Magnesium Oxide and then rinsed with clean tap water.
	: **After Test** The sample was cleaned and rinsed with clean tap water to removed salt deposits. The sample was then allowed to dry.
Date of Start Test	: 09th June 2010

SIRIM QAS INTERNATIONAL SDN. BHD. Civil & Construction Section

23 AUG 2010

TEST REPORT

REPORT NO : 2010CB3708	PAGE : 3 OF 4

TEST RESULT : SALT SPRAY TEST

SAMPLE REFERENCE	OBSERVATION BEFORE TEST AT 0 HOUR
Aluminium Composite Panel	The sample was clean and free from any stain and rust. (see photo 1.0)

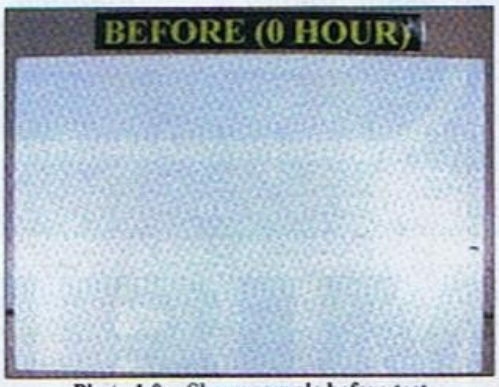

Photo 1.0 : Shows sample before test

SIRIM QAS INTERNATIONAL SDN. BHD. Civil & Construction Section

23 AUG 2010

TEST REPORT

REPORT NO : 2010CB3708	PAGE : 4 OF 4

TEST RESULT : SALT SPRAY TEST

SAMPLE REFERENCE	OBSERVATION AFTER TEST AT 500 HOURS
Aluminium Composite Panel	No rust was detected on both surfaces of sample. Stain was detected on back surface of sample(See photo 2.0) however, the front surface was free from any stain or rust (See photo 3.0).

Photo 2.0 : Shows back side of sample after test

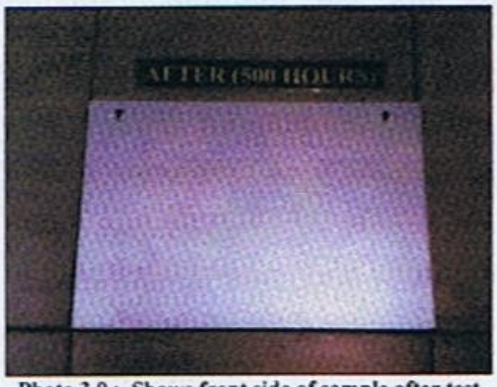

Photo 3.0 : Shows front side of sample after test

23 AUG 2010

SIRIM QAS INTERNATIONAL SDN. BHD. Civil & Construction Section

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TEST REPORT

REPORT NO: 2010CB3707	PAGE : 1 OF 2

Applicant	:	LIFOMAX WOODBUILD SDN. BHD. No. 23-1A, Jalan Bandar 12, Pusat Bandar Puchong, 47100 Puchong, Selangor Darul Ehsan.
Manufacturer	:	- Nil -
Product	:	Aluminium Composite Panel
Reference Standard/ Method of test	:	1) BS EN 10002 – 1 : 2001 – Metallic Materials – Tensile Testing Part 1 : Method of Test at Ambient Temperature 2) JIS H 0401 : 1999 – Methods of Test for Hot Dip Galvanized Coatings.
Description of Sample	:	One sample of Aluminium Composite Panel was received for testing. Brand : Lifo Panel Model : 4.0mm x 0.4mm x 0.4mm (FR)
Date received	:	01st June 2010
Job no./Ref. no.	:	J20105043707/ SQAS/CCST/T.REC/MSL/01
Issued date	:	22 JUN 2010

Approved Signatories

(SERI BANUN SUJANGI)
Senior Technical Executive

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Group Leader
Civil & Construction Section
Testing Services Department

TEST REPORT

REPORT NO: 2010CB3707	PAGE : 2 OF 2

TEST RESULTS: TENSILE TEST

SAMPLE REFERENCE	ALUMINIUM COMPOSITE PANEL
THICKNESS , a (mm)	3.98
WIDTH , b (mm)	25.08
AREA, So (mm^2)	99.82
YIELD LOAD (kN)	3.48
UPPER YIELD STRENGTH (N/mm^2)	35
MAXIMUM FORCE, Fm (kN)	4.37
TENSILE STRENGTH, Rm (N/mm^2)	44
ELONGATION, A (%)	5.0

TEST RESULTS : COATING MASS *

SAMPLE REFERENCE	RESULT (µm)
ALUMINIUM COMPOSITE PANEL	0.32

* Note : Testing was conducted by Chemical and Consumer Testing Section, Building 16.

SIRIM QAS INTERNATIONAL SDN. BHD. Civil & Construction Section

22 JUN 2010