

FR HCOM
LYCORCLAD® **LCP**
Aluminium Composite Panel



PREMIUM CLADDING SOLUTIONS



**LCP LYCORCLAD® Series
(FR CORE/FR HCOM/FR PRO)**

are ideal options for building envelopes due to their superior fire resistance performance, aesthetics, design flexibility and ease of installation.

With excellent processing, performance and aesthetic features, it meets the majority of the fire regulations for both external & internal cladding. Providing superior surface flatness with high quality coating system for façade cladding and selective roofing for architects, interior designers and developers for their commercial, residential, industrial and institutional projects.

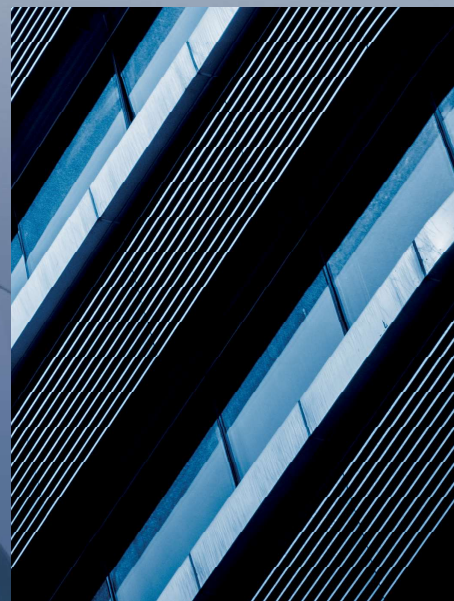
**Manufactured in Singapore
with 100% Full Automation**

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1 INTRODUCTION



LCP LYCORCLAD[®] FR HCOM

Manufactured from aluminium coil and non-combustible core material tested to BS EN 13501-1:2018 in natural hexagonal honeycomb structure, **LCP LYCORCLAD[®] FR HCOM** not only has excellent sturdy shape and resilient properties but is also 100% recyclable. The honeycomb structure enhances its ability to withstand extreme stress and provides greater structural strength when it comes to projects with high demands on material stiffness.

Fire Safety Performance:
BS EN 13501-1: 2018 Class B

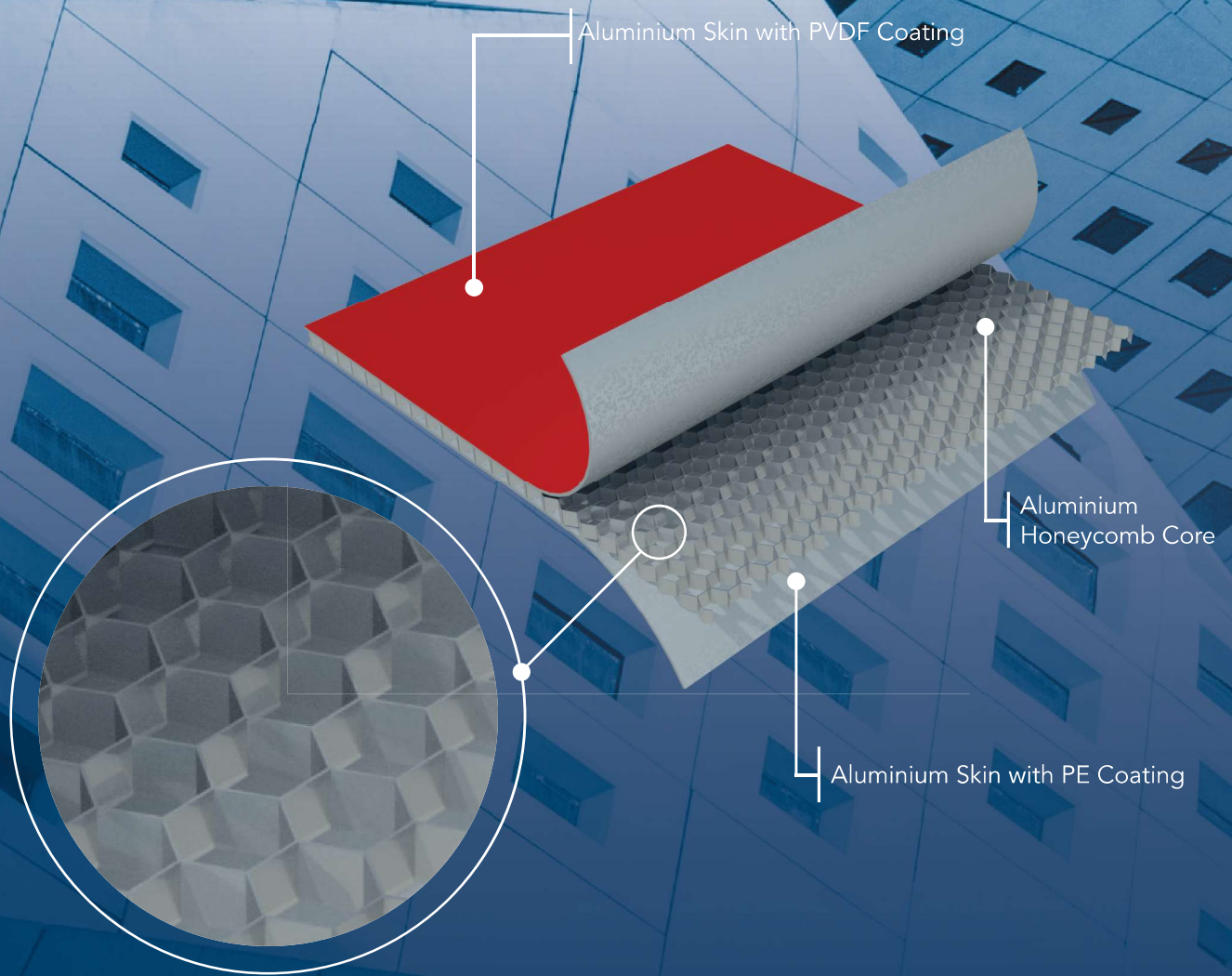
Complied with SCDF
Certificate of Conformity
(Roof Covering Material)
Scheme 2

Complied with Toxicity Test
BS EN 45545-2:2020

- Lightweight and low density
- Recyclable, energy saving and environmentally friendly
- High strength and good rigidity
- Resistant and strong compression strength
- Non-combustible and moisture resistance
- Good formability and optional thickness
- Beautiful appearance and easy to clean

PRODUCT INFORMATION





Standard Width	1220mm, 1500mm
Panel Thickness	6mm ~ 50mm
Skin Thickness	0.7mm ~ 2.0mm

Tolerance

Panel Thickness	Skin Thickness	Width	Length
±0.2mm	±0.2mm	±0.2mm	±0.2mm

Note: Products can be customized (other than the thickness and sizes above) to suit project requirements, subject to minimum order quantity.

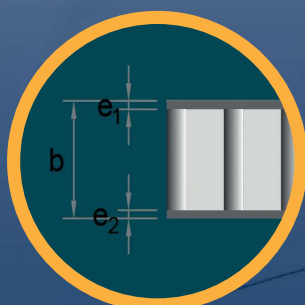
Aluminium Alloy	Colors	Coating Finishes
A 3004 (Different Grade Available)	Refer to LCP Aluminium Color Chart for more options.	PE, PVDF, NANO, FEVE

Note: Special finishes such as granite, marble, wood or other metal options such as stainless steel, copper, zinc and titanium are also available in creative design options upon request.

TECHNICAL DATA

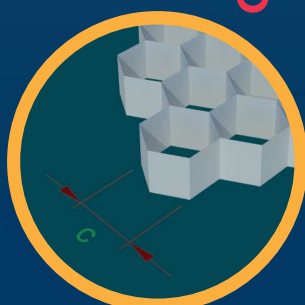


TECHNICAL DATA



Description	Unit	Specifications
Overall Thickness "b"	mm	6 10 15 20 25
Aluminium Sheet Thickness "e ₁ "	mm	0.7 1 1 1 1
Aluminium Sheet Thickness "e ₂ "	mm	0.7 0.7 0.7 0.7 0.7
Panel Weight	kg/m ²	4.9 5.8 6.3 6.5 6.8
Aluminium Alloy	EN1396	A3004 (Different Grade Available)
Tensile Strength	MPa (min)	≥ 185
0.2% Proof Stress	MPa (min)	≥ 130
Elongation A ₅₀	% (min)	≥ 3
Modulus Of Elasticity	MPa	70000
Standard Width	Mm	1220 & 1500
Min./Max. Length	mm	1000/12000

CORE FEATURES



Cell size "c"		1/4"	3/8"	1/2"	3/4"	1"
Aluminium Alloy	mm	Series 3000 / 5000				
Foil Thickness	µm	50 - 70				
Core Density	kg/m ³	56-80	40-54	29-40	20-27	10-17
Compression Strength	MPa	3.50-4.30	1.95-2.60	0.95-1.50	0.60-0.85	0.39-0.59
Crush	MPa	0.90-1.65	0.50-0.85	0.30-0.50	0.15-0.25	0.09-0.15



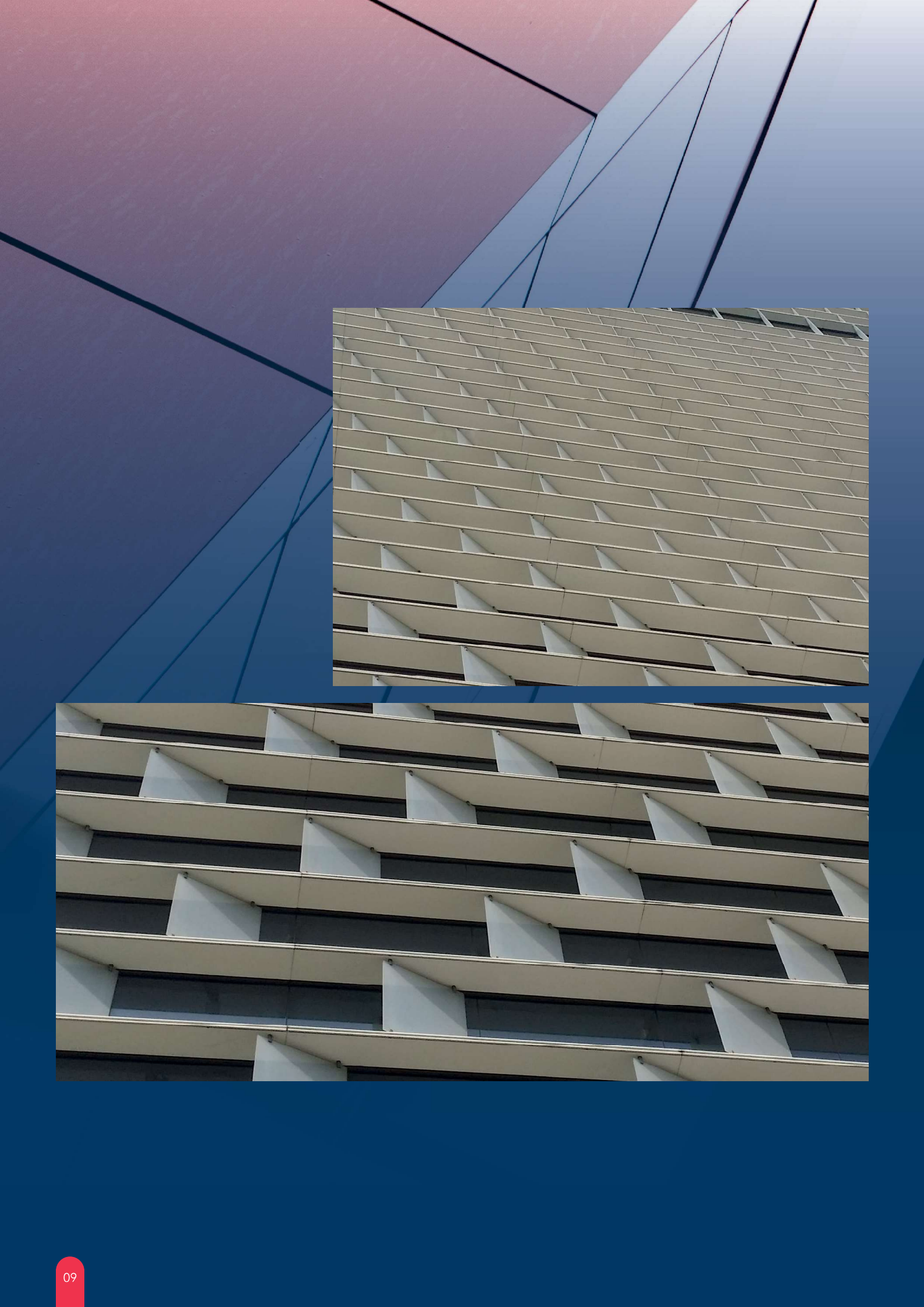


4 PAINT PERFORMANCE

Pretreatment	Corrosion resistant proprietary conversion coating.
Primer Coat	Universal corrosion inhibitive primer. Normal dry film thickness 5µm each side.
Finish Coat	Custom formulated 70% PVDF paint system with high performance pigments. Nominal dry film thickness 20µm on the top or weather side.
Colour	Refer to LCP Aluminium Color Chart for more options. LCP could match colour as per customer sample or RAL CODE to suit project requirements, subject to minimum order quantity.



Polyvinylidene fluoride that is also known as PVDF in short is a type of fluorocarbon polymer resin used in architectural coating. PVDF coating is one of the preferred architectural coatings due to its excellent weathering characteristic of fluorinated materials.



LCP LYCORCLAD® FR HCOM is using the aluminium PVDF 2 coatings as its weather side layer that is available in a wide range of consistent, stable, inorganically pigmented colours and are extremely inert, providing long term durability as well as resistance to chemical attack and surface damage caused by acid rain, salt spray, and humidity encountered under normal environmental conditions.

COATING SPECIFICATIONS

	Aluminium Substrata	G90 HDG/Galvalume/Galfan Substrata
Dry Film Thickness (nominal) ASTM D1400	5µm Primer, 20µm Topcoat	5µm Primer, 20µm Topcoat
Gloss ASTM D523@60°	23-35	25-35
Pencil Hardness ASTM D3363	HB-H	HB-H
Flexibility T-Bend, ASTM D4145	1T-Bend; No pick-off ¹	1T-Bend; No pick-off ¹
Solvent Resistance ASTM D5402	100+ MEK double rubs	100+ MEK double rubs
Adhesion ASTM D3359 Reverse Impact 1/16" Crosshatch	No Adhesion Loss	No Adhesion Loss
Reverse Impact ASTM D2794	5.0J (0.6mm), No pick off	13.6J (0.6mm), No pick off
Acid Resistance ASTM D1308 10% Muriatic Acid—24 Hours 20% Sulfuric Acid—18 Hours	No effect No effect	No effect No effect
Acid Rain Test Kesternech SO ₂ DIN 50018	10 Cycles Min. No objectionable colour change	10 Cycles Min. No objectionable colour change
Alkali Resistance ASTM D1308 10%, 25% NaOH, 1hr	No effect	No effect
Salt SprayResistance ASTM B117 5% salt fog @ 95°F	Passes 4000 hrs 1.6mm (1/16") average scribe creep None or few #8 blisters.	Passes 1000 hrs 3.2mm (1/8") average scribe creep None or few #8 blisters.
Humidity Resistance ASTM D714 ASTM D2247, 1000hrs 100% relative humidity @ 95°F/34.5°C	Passes 4000 hrs. None or few #8 face blisters	Passes 1500 hrs. None or few #8 face blisters
Exterior Exposure 10 years @ 45°, South Florida ASTM D2244 - Colour ASTM D4214 - Chalk	Max 5 Fade Max 8 chalk	Max 5 Fade Max 8 chalk

5 ADHESIVE FILM PERFORMANCE

HIGH POLYMER ADHESIVE FILMS

Adhesive film, the core factor of bonding the aluminium coil and non-combustible core material.

LCP LYCORCLAD® FR HCOM used high polymer adhesive films, a modified polyolefin hot-melt adhesive film which is solvent-free, hygienic and environmentally friendly.

TYPICAL PHYSICAL PROPERTIES

Description	ASTM Test Method	Unit	Specification
Density	ASTM D-792	g/cm ³	0.92
Melt Flow Rate	ASTM D-1238, 190°C/2.16kg	g/10min	19.5
Elongation as Break	ASTM D-638	%	450
Tensile Strength	ASTM D-638	MPa	15.7
Melting point	ASTM D-2117	°C	125
Vicat Softening Point	ASTM D-1525	°C	74



APPLICATION

6



Shopping/Leisure mall



School/Academic Hub



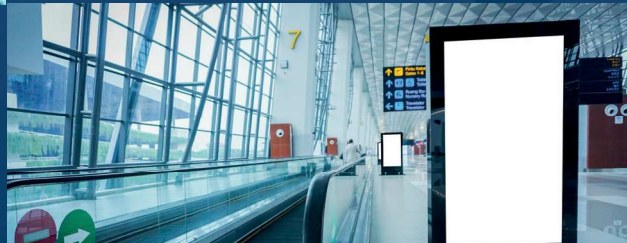
Stadium/Sports Hub



Commercial Building



Condominium / HDB / Residential House



Airport



Bus stop/Linkway/Interchange



Hospital/Medical Centre



Factory/Warehouse



JOINTING & FIXING METHOD

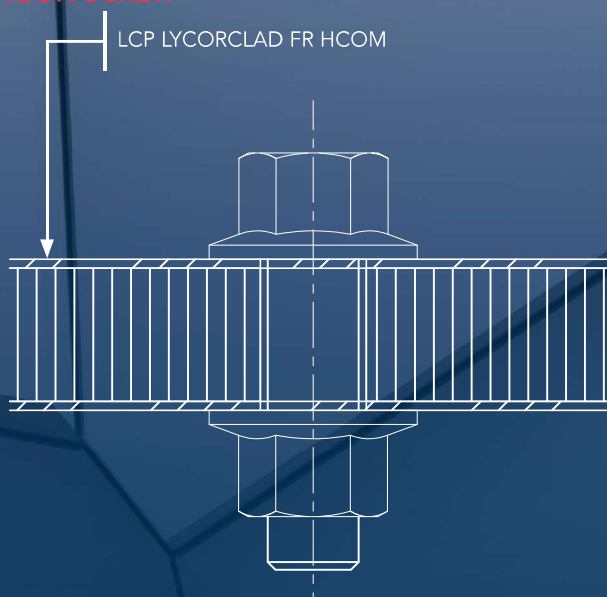
Threaded Fasteners – Outdoor Use

For outdoor application, thermal expansion of the panel must be taken into consideration. The diameter of the hole in the panel must allow for expansion to avoid jamming. The screws must be suitable for the corresponding substructure, and should be tightened with a torque wrench or screwdriver so that the sealing washer is placed on the panel for sealing the bore hole without exerting pressure to the panel. Multi-step drills or sleeves with corresponding diameters are used for centrally drilling holes into the panel and the substructure, and for centrally fitting the rivet.

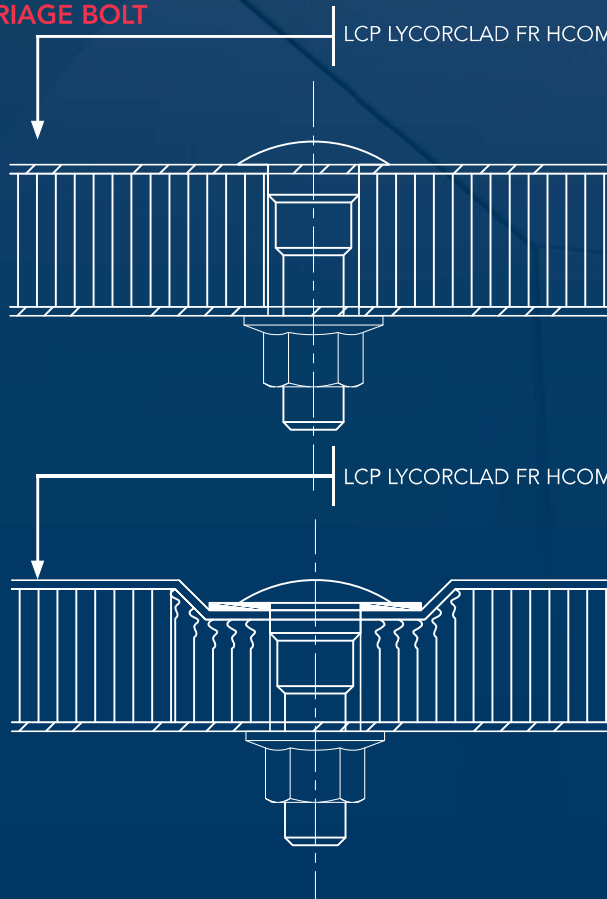
Note: ALWAYS remove the protective film from the screwing area prior to screwing.

EXAMPLE OF THREADED FASTENAR

A HEXAGON SCREW

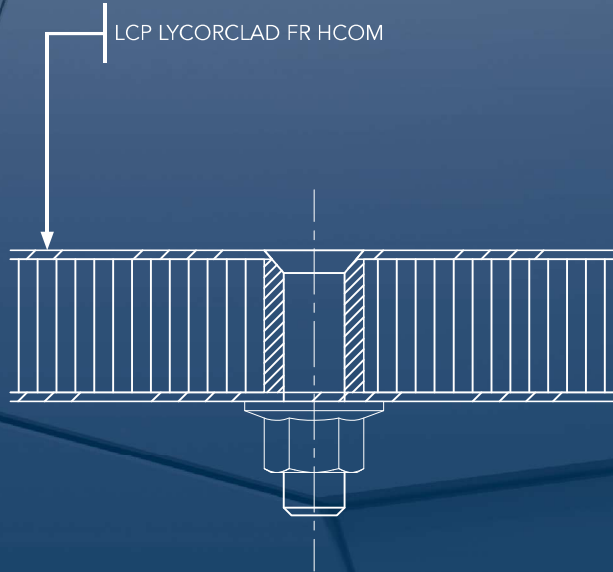


B CARRIAGE BOLT

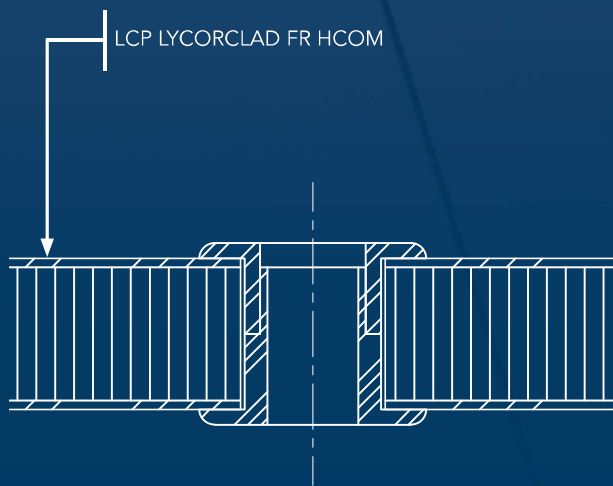


EXAMPLE OF THREADED FASTENAR

C COUNTERSUNK SCREW WITH DISTANCE SLEAVE



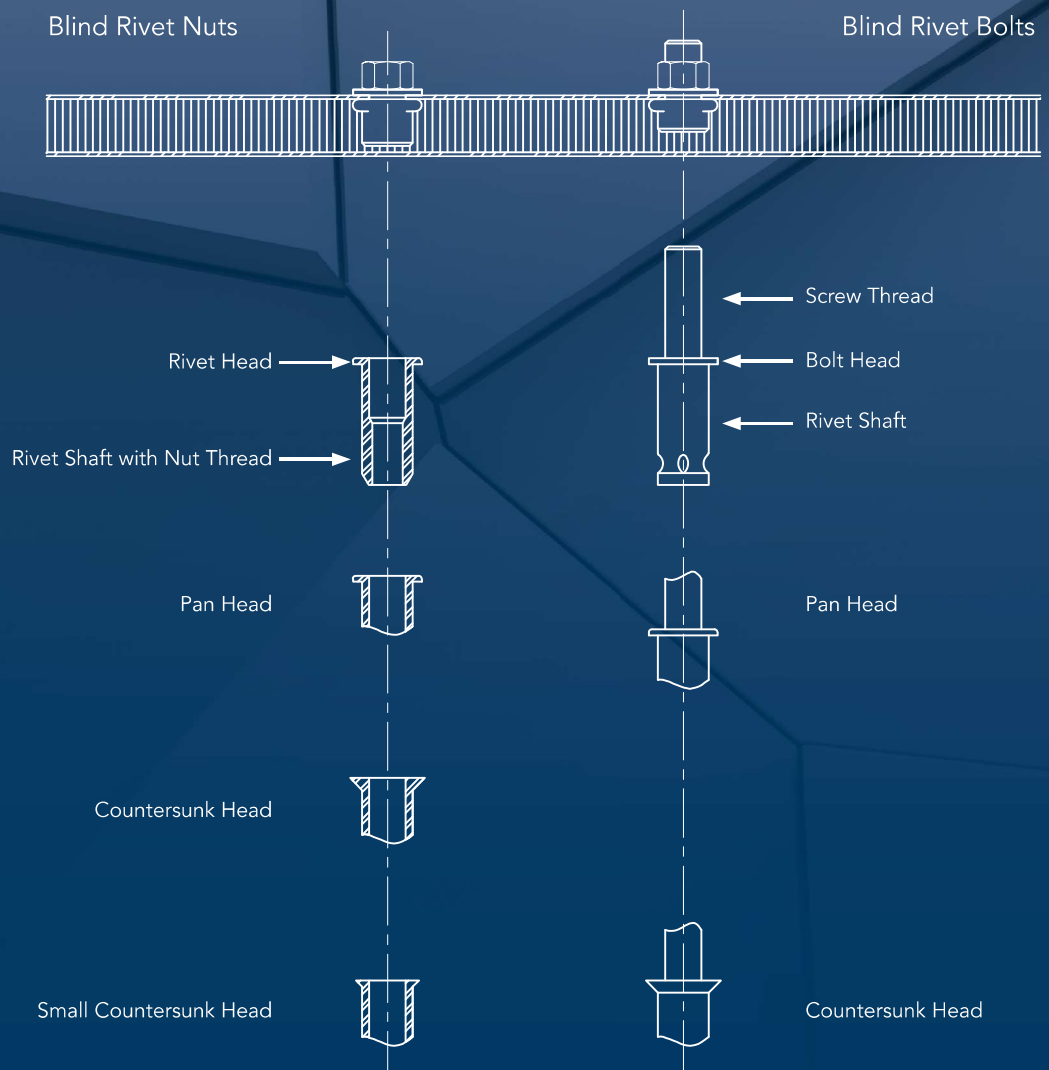
D HOLD EDGES STRENGTHENED BY INSERTS



Blind Rivet Nuts and Bolt

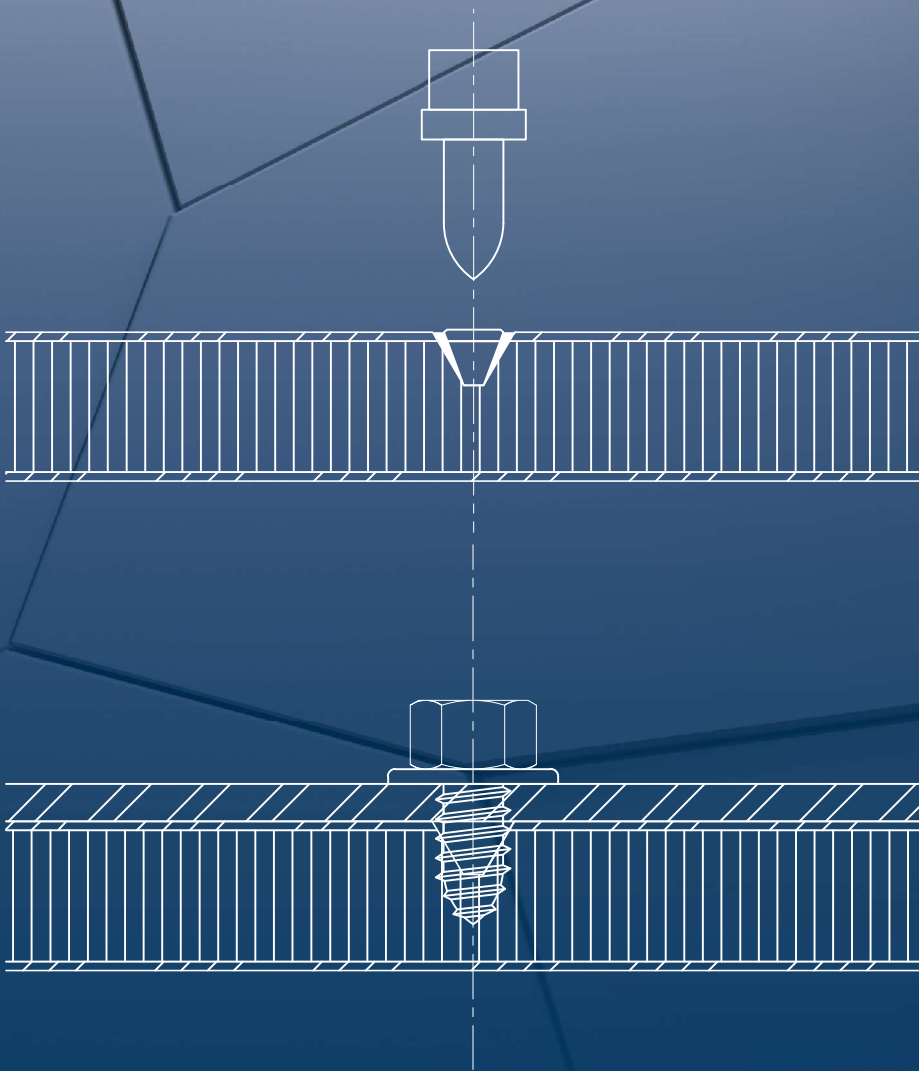
A rivet nut, also known as a blind rivet nut is a one-piece internally threaded and counter bored tubular rivet that can be anchored entirely from one side. Since the nut head is not visible on the panels, this makes it perfect for projects that call for hidden fasteners. For outdoor use and for use in areas of high humidity, make sure to use aluminium blind rivets with stainless steel mandrels to prevent unpleasant corrosive edges. When using aluminium blind rivets with steel mandrels, the mandrel should drop out after riveting (detachable version). Countersunk rivets are suitable for indoor use only.

Note: ALWAYS remove the protective film from the screwing area before riveting.



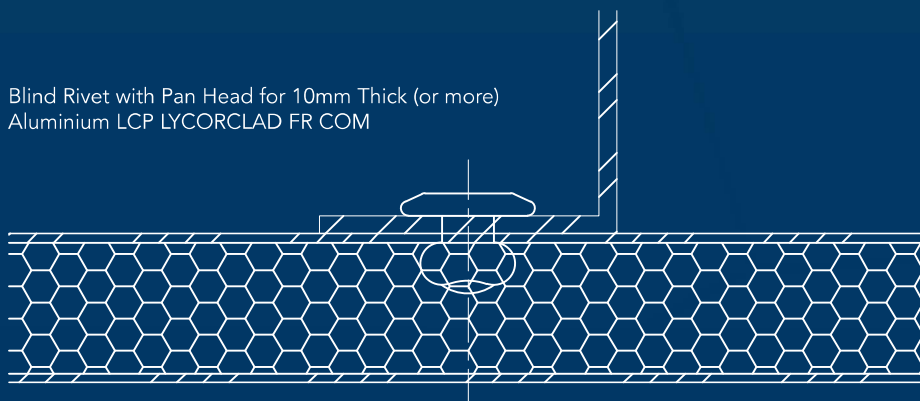
Flowdrill Process

A Flowdrill is a solid carbide drilling tool that is capable of locally displacing material in order to form increased material thickness, which, in turn, allows for a stronger fastening connection by tapping and brazing. The “flat/short” Flowdrill type is suitable for **LCP LYCORCLAD®FR HCOM** panel, they are able to remove protruding material from the panel surface at the same time.

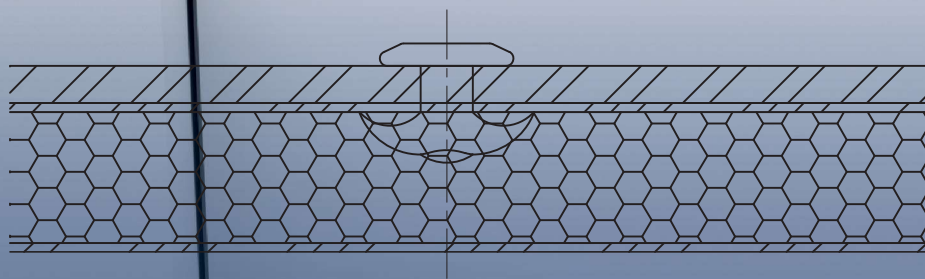


Rivets – Not Penetrating the Panel

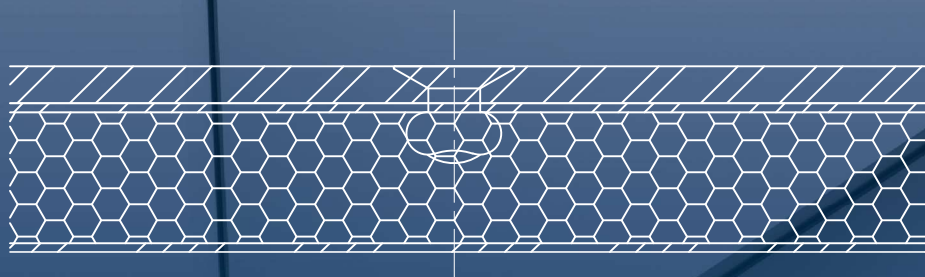
Rivets generally must be anchored in the non-exposed aluminium skin of **LCP LYCORCLAD®FR HCOM** panel. Channels or Sections can be attached to **FR HCOM** panel with commercially available rivets for aluminium constructions. The rivets can be anchored in the cover sheet after drilling a blind hole of the same diameter as the rivet shank. As a rule, use rivets with stainless steel mandrel.



Blind Rivet with Pan Head for 10mm Thick (or more)
Aluminium LCP LYCORCLAD FR COM



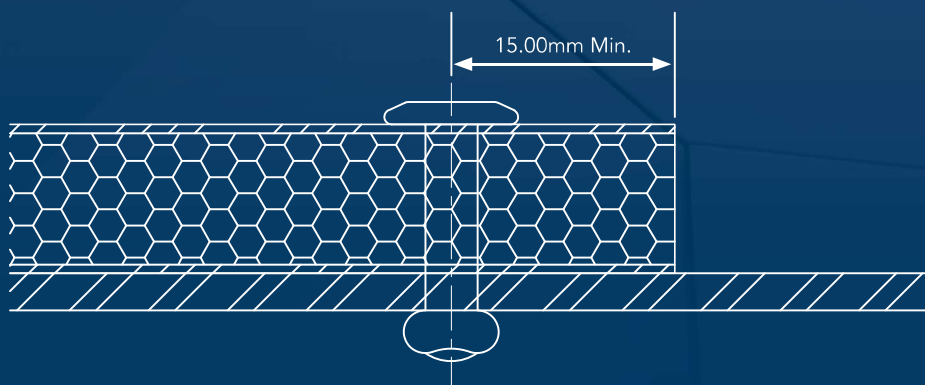
Expansion Blind Rivet for 10mm Thick (or more)
Aluminium LCP LYCORCLAD FR COM



Blind Rivet with Countersunk Head

Rivets – Penetrating the Panel

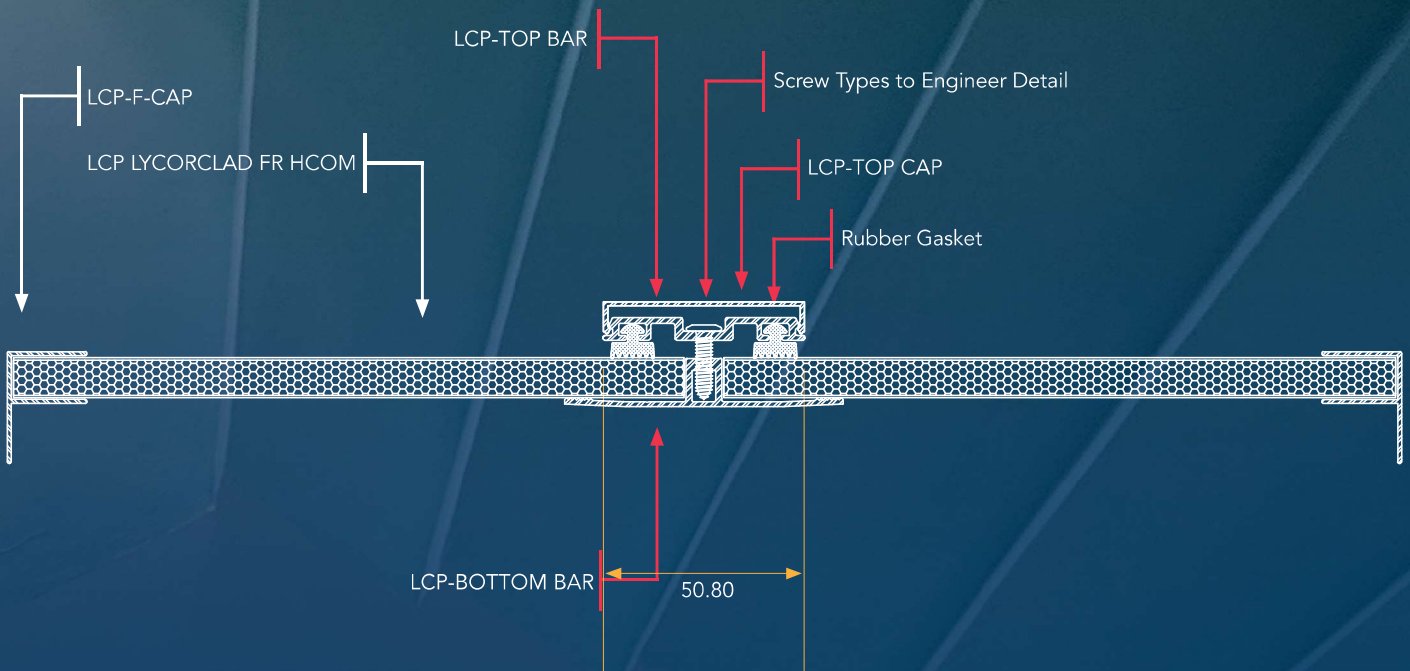
LCP LYCORCLAD® FR HCOM panel can be joined or fastened to other materials using rivet types commercial available for aluminium constructions. Aluminium blind rivets with stainless steel mandrels are normally used to prevent ugly corrosive edges for outdoor use and for use in areas of high humidity. When using aluminium blind rivets with steel mandrels, the mandrel should drop out after riveting.



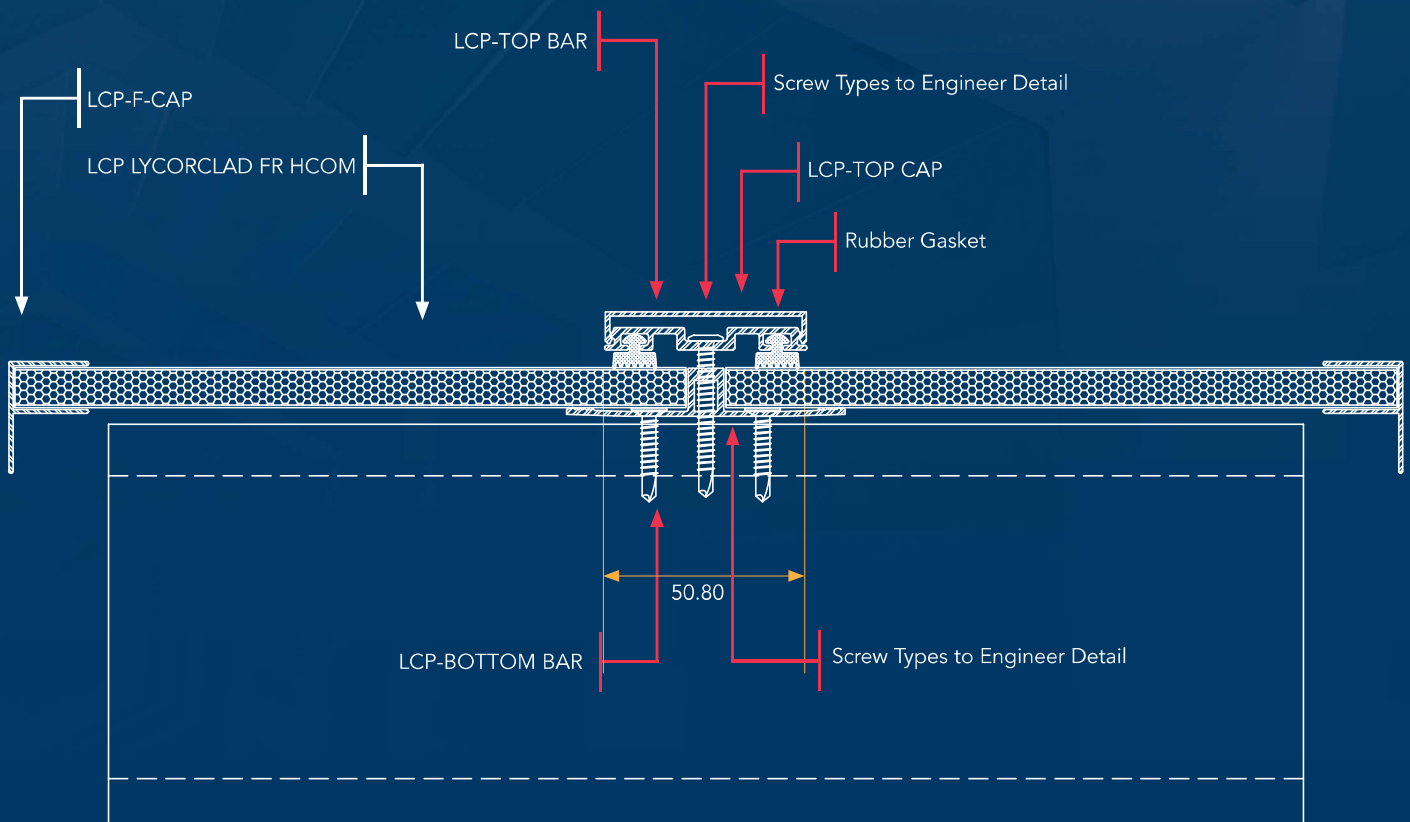


ROOF **8** & CLADDING CONNECTION

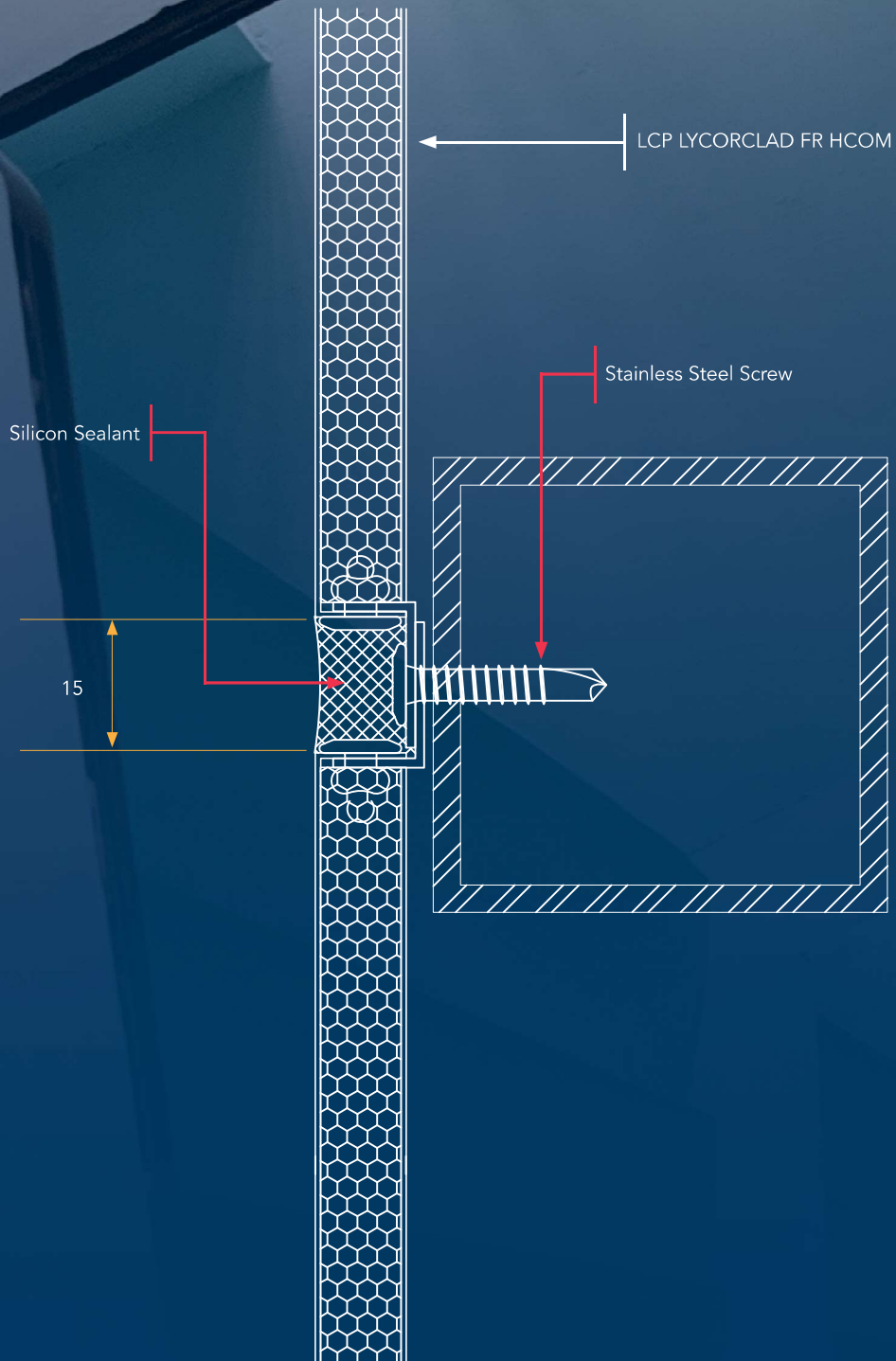
Intermediate without Purlin Support



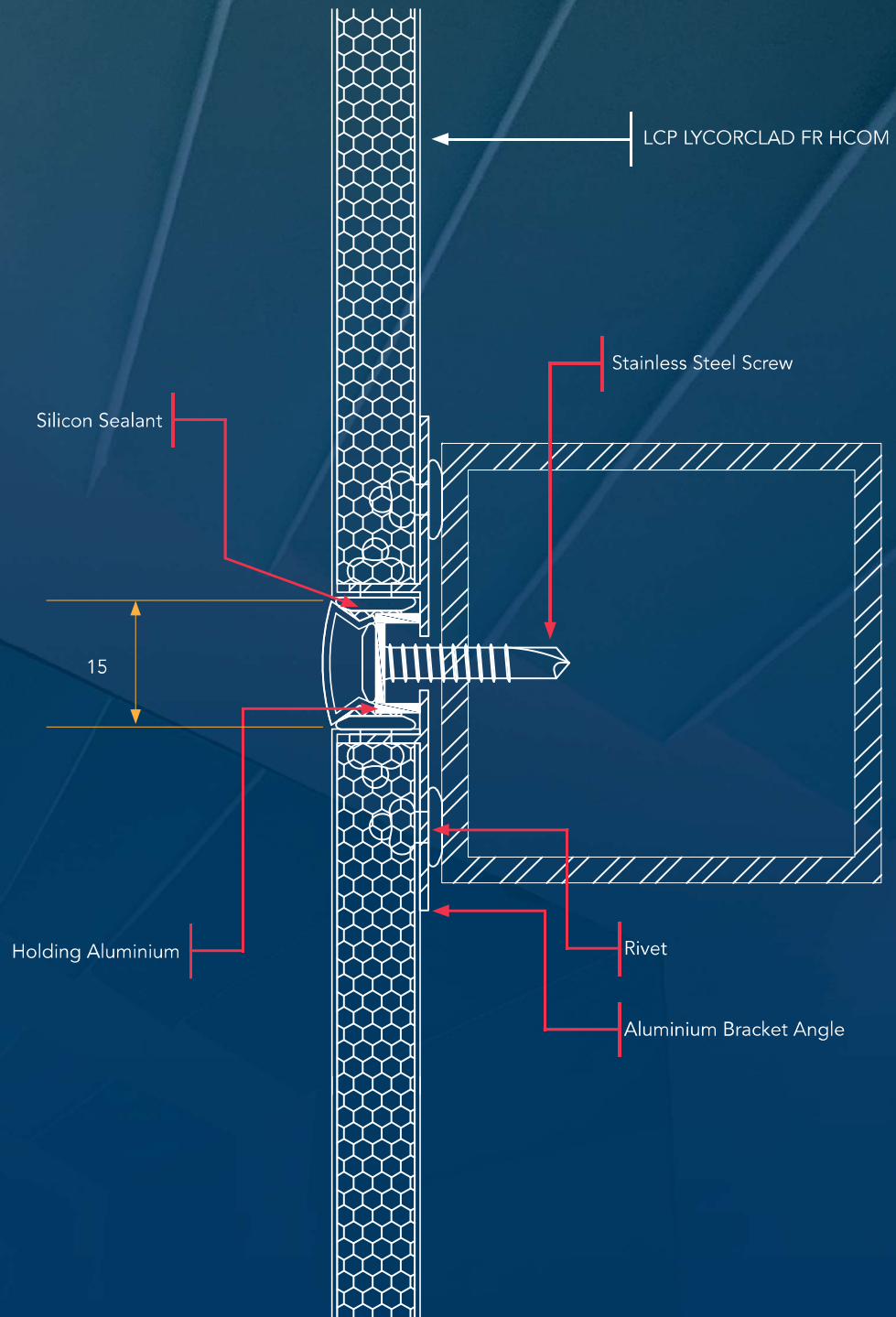
Section View with Purlin Support



Conventional Sealed Joint System Detail

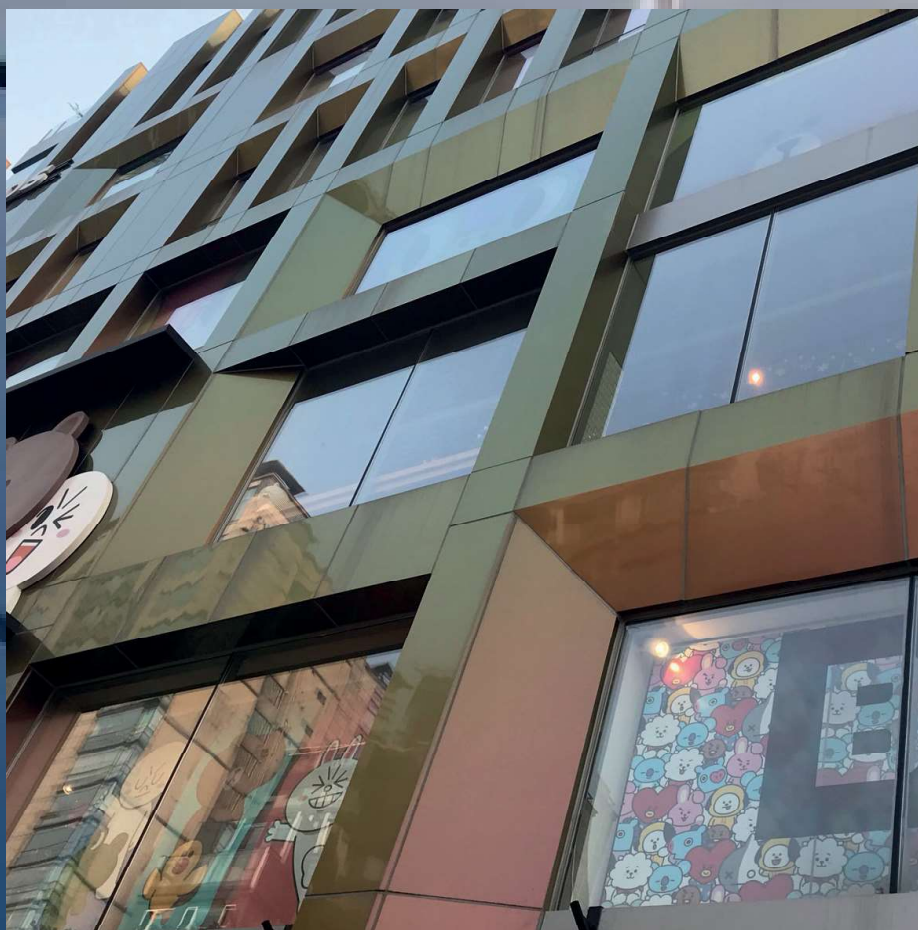


GROOVE CAP SEALING PROFILE





**MAINTENANCE/
9 STORAGE/
HANDLING
GUIDELINE**



When Installing The Panels, The Following Should Be Noted

It is recommended that the panels be installed with their protection film facing the same direction, to avoid possible reflection differences. Colour variations may occur between panels originating from different production batches. It is best to place an entire project's worth of panels in one order to ensure colour consistency.

To ensure perfect functioning of the **LCP LYCORCLAD® FR HCOM** protective film, the following information should be observed:

- Storage exceeding 6 months should be avoided, and severe temperature fluctuations and exposure to direct sunlight should be avoided.
- Additionally, do not mark the protective films or panel surfaces with ink (marker), adhesive tapes, or stickers because solvents or plasticizers in these materials can damage the coating surfaces.
- If any part of the protective film comes off during processing or after assembly, dirtied edges may occur over time which can be difficult to remove.
- Remove the protective film as soon as possible after assembly so that it does not remain on panels for an extended period of time during exterior exposure; prolonged exposure may make removal difficult and cause residual glue to stick to the surface of panels due to UV radiation.



Transportation/Storage

To protect **LCP LYCORCLAD® FR HCOM** panels against mechanical damage and the harmful effects of weather conditions and moisture, the following information must be observed:

- When handling pallets, be careful not to scrape the surface. Do not handle open pallets.
- Upon delivery, examine the pallet for any damage due to transportation and moisture (**LCP LYCORCLAD® FR HCOM** panels that have become wet must be dried to avoid any spots or corrosion forming). Any damage must be reported immediately and confirmed by the forwarding agent.
- Store pallets so that they are protected against any liquid penetrating due to rain and spray water.
- When storing **LCP LYCORCLAD® FR HCOM** panels, stack them one on top of the other. Do not stack the panels vertically and never put anything between the panels during storage to avoid staining.
- When lifting off a panel from its pallet, two people should hold all four corners of the panel and carry it vertically. Always wear gloves while handling these panels to avoid staining.



Cleaning and Maintenance

General Cleaning

Annual cleaning is recommended. To clean the surface, wipe down with a damp soft cloth or a high-pressure cleaner (max. 50 bar) with clean water. If stubborn stains are present, use a gentle, mild soap (such as mild dish detergent) and a clean, damp cloth to remove. Do not use abrasive cleaning agents such as bleach or abrasive sponges or brushes that may scratch the surface.

Do not use cleaning products containing petroleum distillates such as kerosene, turpentine, or paint thinner. These may leave residues that will spoil the look of the finish. Cleaning should take place from top to bottom. Rinse with clean water after cleaning to remove any cleaning agent residue.

Do not clean surfaces heated by the sun ($> 40\text{ }^{\circ}\text{C}$) – the quick drying process may cause blemishes.

PRODUCT WARRANTY

LCP LYCORCLAD® FR HCOM panels come with warranty.

Our products are free from manufacturing defects for the duration of 15 years (PVDF 3 coats) and 10 years (PVDF 2 coats).

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