



LCP CAPLOCK®

Metal Roof & Wall Cladding System



Integrity In **Partnership**



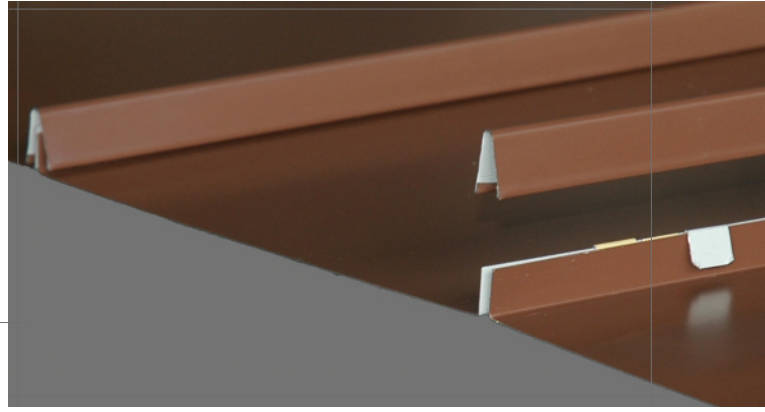
CERT NO. FM 59595
BS EN ISO 9001 : 2008



LCP CAPLOCK®

FEATURE

LCP CAPLOCK® is an aesthetically pleasing architectural metal roofing profile with slim looking battens and flat pans running along the lengths of the roofing sheets. **LCP CAPLOCK®** is ideally suited for both roof and cladding applications. No fixing clips are visible and the installation is simple.



AESTHETICALLY PLEASING & COST EFFECTIVE

- ▶ 300mm or 500mm nominal cover width – ideal flat pan width
- ▶ Batten height of 27mm – provides slick looking narrow ribs.
- ▶ Design flexibility – allowing curves.
- ▶ Quick to install and easy handling – economical choice.
- ▶ Easy fixing – using specially designed concealed clips
- ▶ A variety of Clean COLORBOND® pre-painted steel offers excellent gloss and long lasting beauty.

GOOD STRUCTURAL CAPACITY

- ▶ Lightweight and high strength steel substrate.
- ▶ 5 degrees minimum roof pitch (see Minimum Roof Slope Table inside) – minimal support structures.
- ▶ Design flexibility – long lengths possible.

GOOD THERMAL & ACOUSTIC PROPERTIES

- ▶ The improved clean COLORBOND® pre-painted steel and use of suitable insulation materials provide energy efficient roofing systems.
- ▶ When a steel roof is designed with an effective acoustic system, it provides good sound insulation for the building.

MATERIALS

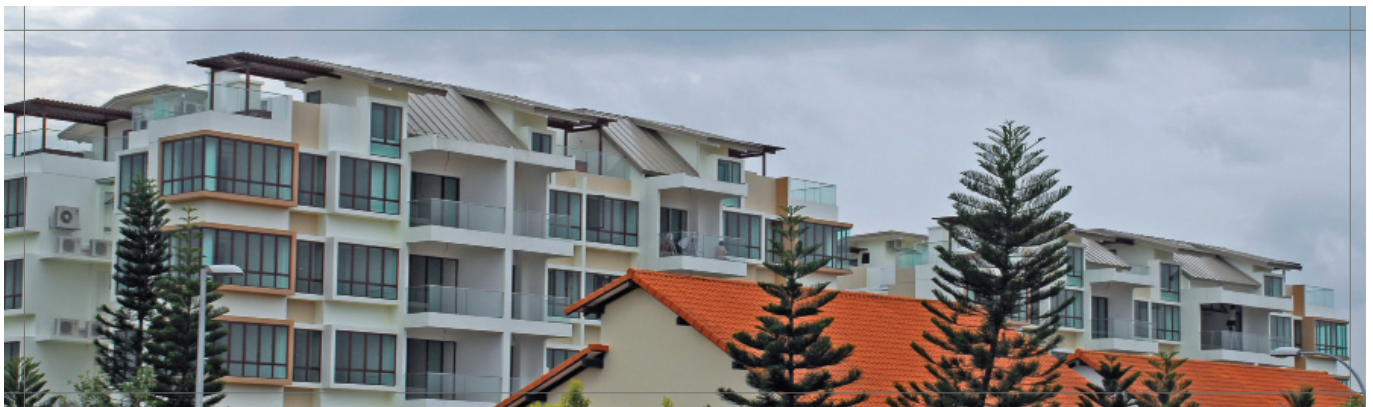
The strength and formability of steel makes it an ideal material for roof and wall panels. **LCP CAPLOCK®** is a cold roll formed roof and wall cladding manufactured from high strength steel of G300 base material (300MPa minimum yield stress), with ZINCALUME® steel (Zinc & Aluminium alloy) coating, in accordance with AS 1397 and COLORBOND® pre-painted steel in accordance with AS 2728.

COLORBOND® pre-painted steel shall achieve CLASS '0' in accordance to BS 476 PART 6 & 7. The core material ZINCALUME® shall be non-combustible in accordance to BS 476 PART 4.

Also available in other materials and various finishes. For further information, please contact **LCP Building Products Pte. Ltd.**

ADVERSE CONDITIONS

If **LCP Building Products Pte. Ltd.** range of roofing, walling or rainwater products are to be used within 1km of salt marine or industrial and unusually corrosive environments, please contact our Technical Department for advice.



ARCHITECTURAL SPECIFICATION

The roofing and/or wall cladding metal sheets shall be 0.55mm BMT. **LCP CAPLOCK®** produced by **LCP Building Products Pte. Ltd.**, with rib height of 21mm at 27mm batten height spaced at nominal 300mm or 500mm cover width. The sheets shall be installed using concealed fixing clips in accordance to manufacturer's recommendations. The fasteners used to secure the fixing clips to the supports shall conform to Australian Standard AS 3566 and be compatible with the roofing material used. The clips shall be concealed and no fasteners are to penetrate the cladding. The **LCP CAPLOCK®** ribs must be mechanically seamed to complete the installation of the roof.

The sheeting material shall comply to Australian Standard AS 1397 with a minimum yield stress of 300MPa (Grade G300), metallic hot-dip coated with aluminium/ zinc alloy comprising 55% aluminium, 43.5% zinc and 1.5% silicon. The minimum coating mass for the aluminium/ zinc alloy coated steel shall be AZ 200 (200g/m² minimum coating mass) as determined by Australia Standard AS 1397.

Wherever applicable, the installation of the metal sheets shall be in accordance to the "Installation code for metal roofing and wall cladding; Standard Australia SAA HB39-1997".

A minimum of 50mm shall be provided for projection into gutters. Flashings shall be supplied in compatible materials, as specified. Minimum cover of flashing shall be 150mm.

All sheeting shall be fixed in a workman like manner, leaving the job clean and weather-tight. All debris (nuts, screws, cuttings, filings etc.) shall be cleaned off daily.

COLOUR COATING OPTIONS

Clean COLORBOND® pre-painted steel is resistant to dirt pick up and staining. The various categories of Clean COLORBOND® pre-painted steel finishes offer excellent gloss and long lasting life span to the roof and wall cladding.

The following Clean COLORBOND® pre-painted steel finishes are available:

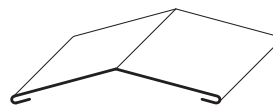
1. **Clean COLORBOND® Ultra Steel** (Used for severe applications that require durability.)
2. **Clean COLORBOND® XPD Steel** (Used for moderate / severe applications that require premium durability.)
3. **Clean COLORBOND® XPD Pearlescent Steel** (Used for moderate / severe applications that require premium durability and a decorative alternative.)

For appropriate coating option or other materials, please contact **LCP Building Products Pte. Ltd.**

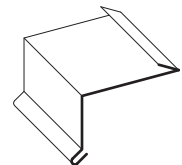


FLASHING DETAIL

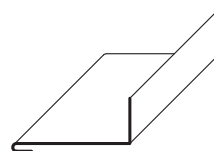
The profile of the **LCP CAPLOCK®** sheet needs to be taken into account when detailing the flashing.



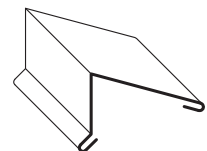
Ridge Capping



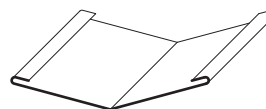
Eaves Flashing



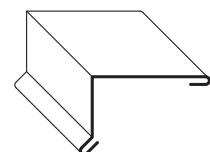
Apron Flashing



High End Flashing



Valley Gutter



Gable End Flashing

Typical common flashings used. Full range of flashing is available.



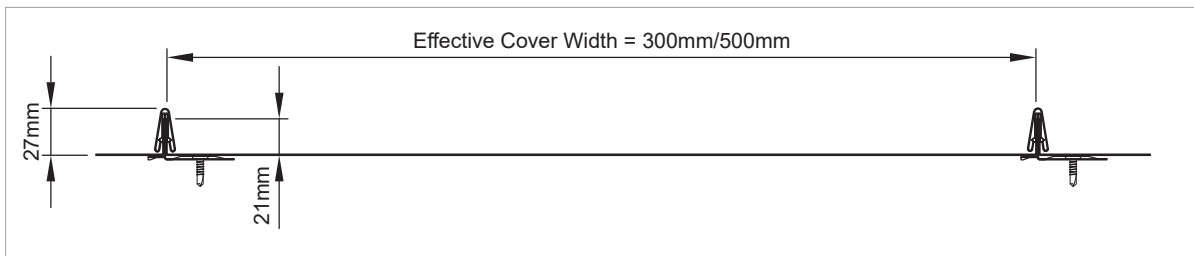
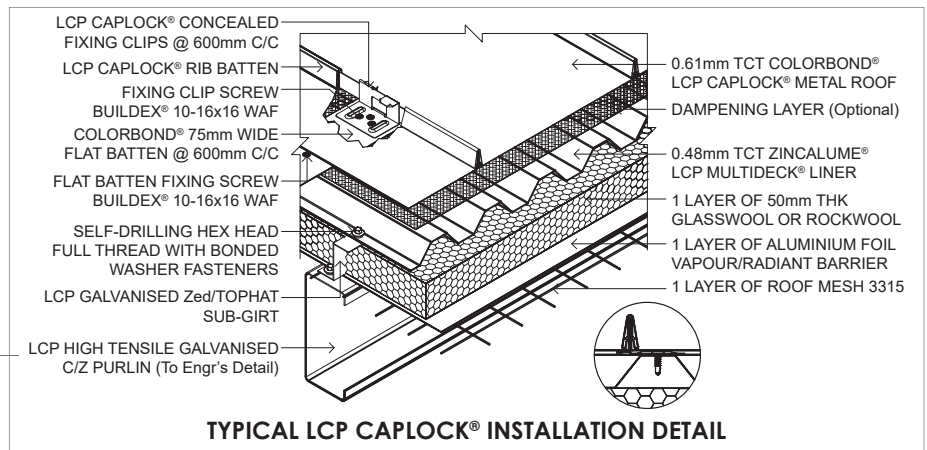
LCP CAPLOCK®

TYPICAL ROOF

Note:

For other types of roof build-up, please contact **LCP Building Products Pte. Ltd.**, Technical Department.

Applications requiring acoustic performance are also available upon request.



LCP CAPLOCK® for ROOF and WALL

The external roof system is available in 21mm rib height with a 27mm high batten. The standard cover widths will either be 300mm or 500mm wide depending on application. Please contact **LCP Building Products Pte. Ltd.** for non-standard cover widths availability.

SUPPORT BATTENS

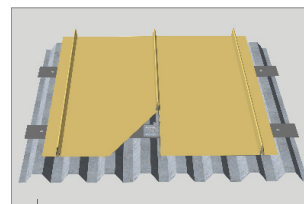
The battens are used as support for fastening the concealed clips. These support battens can either be a flat, Z-shape, or top hat section depending on the depth of the roof and application of the internal liner.

PANEL FIXING CLIPS

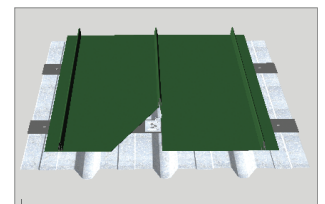
The **LCP CAPLOCK®** uses specially designed concealed fixing clips to securely fasten the flat pan metal roof to the substrate below. The strength of the clip attachment method and spacing are therefore coordinated with the panel size and structural characteristics to provide the necessary wind uplift resistance.

INTERNAL LINER STEEL DECK

The internal liner steel deck is the structural component that provides support and mounting surface for roof building materials. The deck will normally be a galvanised, ZINCALUME® steel (Zinc & Aluminium alloy) or Clean COLORBOND® pre-painted trapezoidal profile available at **LCP Building Products Pte. Ltd.** The internal liner can also be a perforated product, which is used for sound absorption.

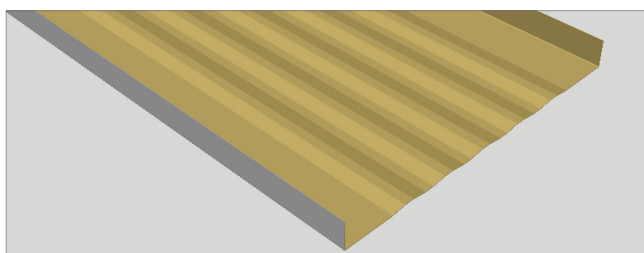


LCP MULTIDECK® Liner

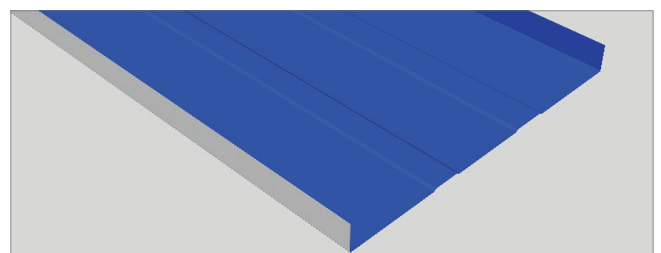


LCP LYCORRIB® 762 Liner

OPTIONS



Striations



Pan Flute

INSTALLATION PROCEDURE

Depending on the thickness and density of insulation, there are 2 common system proposals.

If the insulation is not too dense, the Fibreglass insulation shall be sandwiched in between purlins and supported by either wire mesh and reinforced vapour barrier. LCP MULTIDECK® liner will be installed directly onto purlins, with the flat batten strips fastened to the top of the LCP MULTIDECK® liner. The dampening membrane is placed on top of the LCP MULTIDECK® liner before the concealed clips. Final roof sheets is secure to the system via the concealed clips.

When Mineral Wools of higher density is required, LCP MULTIDECK® is used as a supporting decking for the roofing system. Top Hat / Zed Sub-Girt must be installed to serve as an insulation spacer before placing the required insulation, radiant barrier/Aluminium foil and dampening membrane. The concealed clips are then installed on Top Hat / Zed Sub-Girt directly before securing the final roof sheets.

FIXING REQUIREMENT

In a completed installation, there are loads that will act on the panel parallel with any plane. This has the effect of pulling the panel down the slope of the roof. If the panel is not adequately fixed to the structure to prevent such drag loads, it will creep down the plane of the roof. Establishing the point of fixity depends on the roof type, clip type and amount of movement. Please contact **LCP Building Products Pte. Ltd.**, Technical Department for more details.

DESIGN EXAMPLE

For a maximum 20° pitched roof, place at least 2 nos. of Gauge 12 fasteners equally spaced in each pan at the high-end ridge to take the drag force developed from a maximum 14.80m length roof with 0.75 kPa live load. These fixings need to be placed behind the ridge flashing. Please consult **LCP Building Products Pte. Ltd.**, Technical Department for other roof pitch, lengths and load configurations.

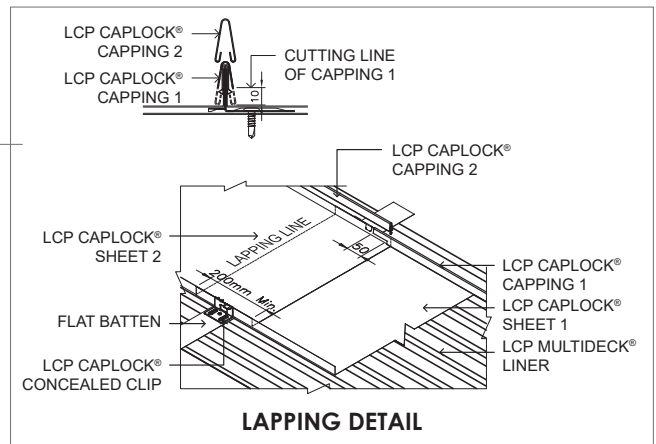
Note: For some curve roof applications such as barrel roofs, a special fixing may be required. Please consult **LCP Building Products Pte. Ltd.**, Technical Department, for further assistance.

FOOT TRAFFIC

When walking on **LCP CAPLOCK®**, always wear clean, non-marking and flat rubber soled shoes. Avoid unnecessary foot traffic and walk on the flat of the panel at or near the supporting roof structural members as much as possible. Do not use the roof panel as a working platform.

LAPPING OF SHEET

The minimum end lap should be 250mm. It is recommended that the laps be laid in a staggered fashion on adjacent roof sheets so as to enhance aesthetics. For other types of lapping, please contact **LCP Building Products Pte. Ltd.** Technical Department.



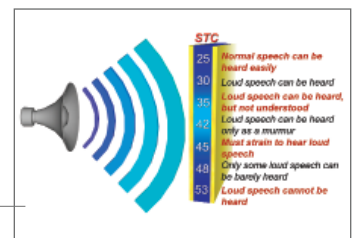
COMPATIBILITY

Lead flashings should not be used in conjunction with ZINCALUME® steel or Clean COLORBOND® pre-painted steel sheeting. Drainage from ZINCALUME® or Clean COLORBOND® pre-painted steel roofing (inert materials) should not be allowed to discharge onto galvanised rainwater components. Drainage from copper roofing should not be allowed to discharge onto ZINCALUME® steel, galvanised, Clean COLORBOND® pre-painted steel or aluminium rainwater components. Each of these combinations may lead to premature corrosion.

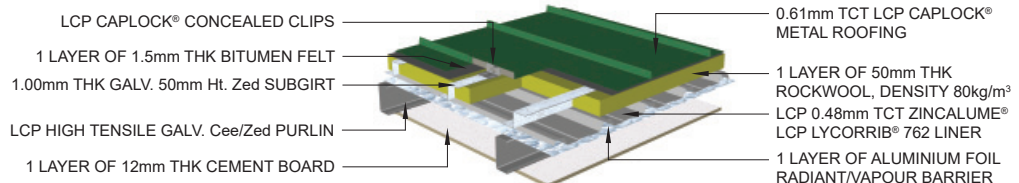
LCP CAPLOCK® THERMAL and ACOUSTIC SYSTEM

ACOUSTIC and THERMAL REQUIREMENTS

LCP Building Products Pte. Ltd. can provide standard details for various Sound Transmission Class (STC) and Impact Isolation Class (IIC), if required. The thermal resistance will vary depending on the roof design and would have to be calculated by the designer, if required. Please consult **LCP Building Products Pte. Ltd.**, Technical Department, for assistance with your roof design.



BUILD-UP FOR STC (SOUND TRANSMISSION CLASS) 56, TESTED IN ACCORDANCE WITH ASTM E90 - 97



TECHNICAL SPECIFICATION

PROPERTIES

LCP CAPLOCK® - Effective Cover Width Table

Effective Cover Width (mm)	300	500
Mass Per Unit Area (kg/m ²)	6.15	5.53

The allowable tolerance shall be ± 4 mm. For other cover widths availability, please contact **LCP Building Products Pte. Ltd.**, Technical Department.

PERFORMANCE

LCP CAPLOCK® Permissible Wind Load Table

Effective Cover Width	Rib Height	Clip Spacing	Permissible Wind Load
500mm	27mm	600mm	2.5KPa
300mm	27mm	600mm	3.5KPa

Note: The **LCP MULTIDECK®** or **LCP LYCORRIB® 762** will be used as liner beneath the **LCP CAPLOCK®**. The purlin spacing is to be in accordance with the loading allowable in the **LCP Building Products Pte. Ltd.** Product Catalogue for either **LCP MULTIDECK®** or **LCP LYCORRIB® 762** profiles.

For maximum purlin spacing, contact **LCP Building Products Pte. Ltd.**, Technical Department.

THERMAL MOVEMENT

LCP CAPLOCK® Thermal Movement (For COLORBOND® Steel)

Rib Height	Temperature Differential (Degree Celsius)	Thermal Movement for Every Metre Length of Roof
27mm	30	0.3mm
	50	0.5mm
	70	0.8mm

Please contact **LCP Building Products Pte. Ltd.**, Technical Department for additional information on Thermal Movement of other materials.

CURVED PANEL

Roof Pitch & Curving Characteristics

Rib Height	Minimum Pitch (Degrees)	Minimum Radius (Convex Sprung Curve)	Minimum Radius (Convex Pre-Curve)	
			Steel/Stainless	Non-Ferrous Metal
27mm	5	10m	1500mm	300mm

The water carrying capacity of **LCP CAPLOCK®** roofing allows for a minimum slope of 5 degrees, subject to specific design factors. It is imperative that this minimum slope is adhered to all points of the roof to prevent ponding from occurring. If the roof slope is 7 to 5 degrees, a sealant to be installed over the male rib of the **LCP CAPLOCK®**. For more information, please contact **LCP Building Products Pte. Ltd.**, Technical Department.

LCP CAPLOCK® can be pre-curved in the factory prior to delivery to site or sprung curved on site during installation.

TAPERED SHEET: For concave sprung and pre-curve sheet requirements, please consult **LCP Building Products Pte. Ltd.**, Technical Department.

PROJECT REFERENCES



Residence at Toh Crescent, Singapore



Red Swastika School, Singapore



Tampines Market, Singapore



Glentrees Condominium, Singapore



Woodlands Primary School, Singapore



Changi North, Singapore



Marsiling Secondary School, Singapore

MANUFACTURING and CONSTRUCTION

ORDERING

When ordering, please have the following information available to ensure a speedy processing of your requirements:

- ▶ Customer/Company name, address, phone number & fax number.
- ▶ Contact person name & phone number.
- ▶ Name of Product (e.g. **LCP CAPLOCK®**) and material (e.g. G300 steel). Thickness of product (e.g. 0.61mm TCT).
- ▶ Coating or Colour (e.g. Clean COLORBOND®: Enduring White colour).
- ▶ Number/quantity and sheet length (e.g. 10 pieces of 5 metres length per piece).
- ▶ Flashing – style, quantity and colour.
- ▶ Delivery address (e.g. No. 10 Telok Kurau Lane, Singapore).
- ▶ Delivery date & preferred time.
- ▶ Site access (please specify whether current access to delivery location would permit entry by standard 12 metres length flat-bed trailers).
- ▶ Cranage requirement (please specify whether craning will be required at site).

LENGTH

The sheets are manufactured at **LCP Building Products Pte. Ltd.** factory or on construction site. The length of the sheet is a function of design requirements, geometry of the roof (i.e. curving or other factors), site conditions and workability, height of the rib and transportation constraints.

Lengths specified must be actual site measurements and not plan dimensions. The length should be measured accurately, and allowance should be made for clearance at the ridge (unless the sheet is continuous over the ridge) of normally around 50mm. At the eaves, allowed overhang into the gutter is not more than 50mm. Where a “step down” or expansion joint is incorporated into the roof, an allowance of not less than 300mm should be added. The tolerance of the length of product supplied is +0, -15mm.

FLASHING

Standard flashings are readily available for use with **LCP CAPLOCK®** roofing. **LCP Building Products Pte. Ltd.** will give design advice for flashing details and manufacture the required flashing.

DELIVERY

Delivery can normally be made within 2 or 3 days, subject to the delivery location and material availability, or can be at a pre-arranged date and time. Please assist us to provide undamaged product by ensuring that suitable arrangements have been made for truck unloading. When lifting sheeting by crane, care should be taken to ensure that the load is spread to prevent sheeting damage. Where a crane is not available, sufficient labour must be supplied to assist in manual unloading.

HANDLING

LCP CAPLOCK® (especially Clean COLORBOND®) should be handled with care at all times to preserve the quality of the finish. Packs should always be kept dry and stored above ground level whilst on site. If however the sheets have become wet then they should be separated, wiped and placed in the open to aid in drying.

FASTENERS

All fasteners should conform to AS 3566 and be compatible with the roofing material used. The fastener of the roof clip to support the standing seam is Buildex 10-16 × 16 WAF. The flat shape of the screw head is very important, as a high head will puncture the flat pan of the roof sheet.

CUTTING

Sheeting can be cut, where necessary, by means of metal snips or electric nibbler. The use of cutting discs should be avoided but if it is used, the Clean COLORBOND® pre-painted steel sheeting should be placed downwards, or carefully shielded, to minimize the risk of hot filings embedding in the painted surface.

CLEAN UP

Ensure that all debris, nails, rivets, screws, rags, and especially filings & particles from cutting or drilling, are carefully cleared from the surface after each day's work or premature corrosion could occur.

OIL CANNING

As in all flat pan-roofing profiles, the flat surfaces of the metal sheets may exhibit some degree of undulation known as “oil canning”. The extent and degree of oil canning will generally depend on factors such as width of the flat pan, the radius of the curved roof, variations in level of the purlins or batten supports, etc. Please note the oil canning is regarded as an inherent characteristic, not a defect of flat pan roofing profiles. As such, oil canning of **LCP CAPLOCK®**, if present, shall not form the basis of product rejection by the end-user.

PAN FLUTE

The flat pan of the **LCP CAPLOCK®** can be strengthened by the addition of either 1 or 2 flutes in the pan. The flute will help reduce the oil canning, strengthen the pan if it is trafficked, and provide a linear feature in the panel. The positions can be varied. By placing the flutes at the 1/3 point across the pan you can get the best results. The minimum centre to centre of the two flutes is 175mm and the minimum distance from each rib is 52mm. The width of the flute is 25mm and the height is 1mm. For further information, please contact the **LCP Building Products Pte. Ltd.**, Technical Department.

IMPORTANT NOTE: The information published in this brochure is as far as possible accurate at the date of publication, however, prior to application in a particular situation, **LCP Building Products Pte. Ltd.** recommends that you obtain qualified expert advice confirming the suitability of product(s) in question for the application proposed. While **LCP Building Products Pte. Ltd.** accepts its legal obligations, be aware however that to the extent permitted by law, **LCP Building Products Pte. Ltd.** disclaims all liability (including liability for negligence) for all losses and damages resulting from the use of the information provided in this brochure.



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