Formed with ColorLume® Galvalume®

Locally produced & custom-cut using modern machinery

Supply and fix service

FPC & ISO 9001-2015 Certified

We are aware of the importance of having shelter over our heads.
We also understand overheads.
Talk to us about our competitive pricing and services.
We are standing by to receive your call.

M METAL PTE LTD
9 Tuas Avenue 2 Singapore 639449
T : +65 6898 9637 • F : +65 6558 7294
E : sales@mmetal.com.sg • W : www.mmetal.com.sg

You Inspire, **We Deliver.**

M-CLIPP 430

SINGAPORE GREEN BUILDING PRODUCT SGBC LEADER

SGBP 2018-1363

M Metal - a game changer

M Metal is a Singapore-based manufacturer of high quality steel and non-steel roofing and walling products.

We started the company in 2007 in response to what we saw was a growing industry need for a responsible supplier, which believes in the value of forging partnerships with stakeholders in order to deliver innovative, reliable and customized solutions. It is our breadth and depth of specialized knowledge, combined with our stakeholders' awareness of their client needs, which results in a win-win collaboration.

Our sense of responsibility extends to workplace safety. We strongly believe that good safety equates good business. Through regular training sessions, we make sure that our workers, and also those of our contractors, are able to do a good job safely.

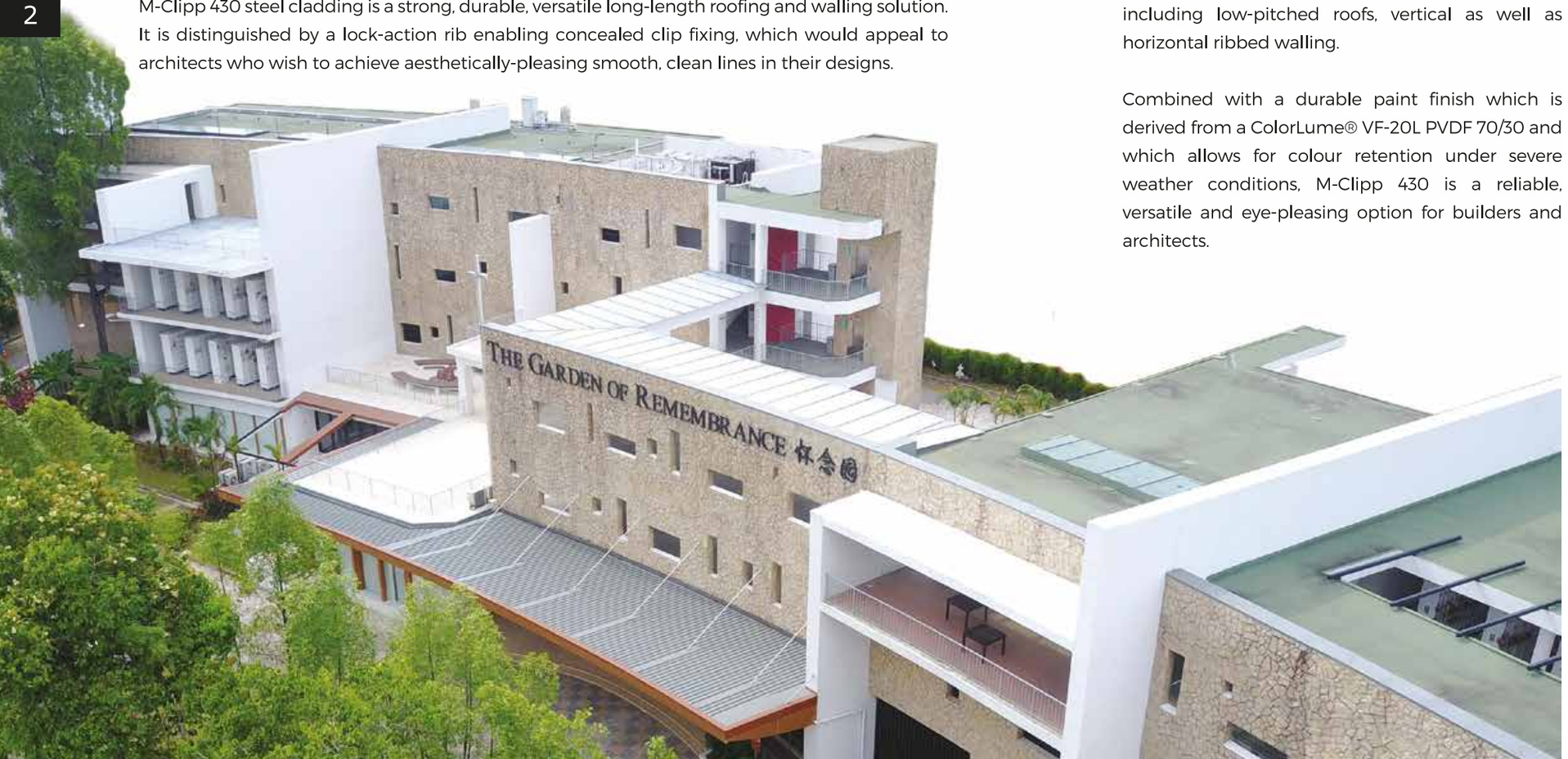
Staffed by experienced professionals with an in-depth knowledge of the industry and who are motivated by the company's vision - to be the industry's preferred building solutions provider from concept to completion - we aim to be a game-changer in Singapore's building industry.

M-CLIPP 430
The Widest Concealed Fix Cladding

M-Clipp 430 steel cladding is a strong, durable, versatile long-length roofing and walling solution. It is distinguished by a lock-action rib enabling concealed clip fixing, which would appeal to architects who wish to achieve aesthetically-pleasing smooth, clean lines in their designs.

The lock-action rib design, together with smart fluted pans and concealed fastening, means that M-Clipp 430 can be used in a variety of applications including low-pitched roofs, vertical as well as horizontal ribbed walling.

Combined with a durable paint finish which is derived from a ColorLume® VF-20L PVDF 70/30 and which allows for colour retention under severe weather conditions, M-Clipp 430 is a reliable, versatile and eye-pleasing option for builders and architects.



Benefits of M-Clipp 430

- It has a smooth, clean appearance. Because of special fixing clips which secure M-Clipp 430 to steel or timber supports without the need for punctures, fastening screws are invisible.
- It provides a very effective waterproof cladding system - its wide fluted pans and high ribbed design quickly disperse water to the perimeter of the roof - and is hence particularly well-suited for areas which are prone to heavy rainfall.
- It is extremely strong in terms of wind resistance. Its first-class resistance against corrosion, discolouration and tropical dirt staining, which requires minimal or no maintenance, makes it the best all-weather performer.
- It is simple and cheap to install. Long, straight lengths of M-Clipp 430 can be laid in place and easily aligned. The process of fixing the special clips is straight forward, simple and fast. The smaller number of clips for any given area also means greater economy. Furthermore, M-Clipp 430 is available in long lengths, meaning that it is likely you will only require one sheet from ridge to gutter without end laps.
- ✔✔✔✔ **Leader** Green mark certified by Singapore Green Building Council (SGBC).

Material Specification

Thickness & Weight

	Standard	Non-Standard
Base Metal Thickness	0.48mm	0.60mm
Total Coated Thickness	0.54mm	0.66mm
Weight	5.71 Kg/m^2	7.0 Kg/m^2

The base material of M-Clipp 430 is a protected steel sheet with a minimum yield stress of 550MPa (Grade G550) finished with high color and gloss retention ColorLume* paint system. The substrate is coated with metallic hot-dipped zinc/aluminium alloy comprising 55% Aluminium, 43.5% Zinc and 1.5% Silicon for long-term performance against corrosion.

The minimum total coating mass for the zinc/aluminium alloy is 200 g/m^2 or AZ 200* coating class as determined by Australia Standard AS1397-2011.

* AZ 200 is widely known as Galvalume®, a registered trademark of BIEC International Inc (USA) licensed to YP Enterprise Co., Ltd.

Finishes

M-Clipp 430 is finished with ColorLume® PVDF (70/30) and ColorLume® SMP finished paint systems.

The detailed coating composition is as follows:

Finish Coat*

- **ColorLume® PVDF** : High performance Polyvinylidene Fluoride (abbreviated PVDF or called Fluorocarbon) with full strength 70% of KYNAR® 500 or HYLAR® 5000 premium resin is used. 20µm nominal dry film thickness.
- **ColorLume® SMP** : Custom formulated Silicon Modified Polyester (SMP) paint system. 20µm nominal dry film thickness.

Primer Coat
Anti-corrosion inhibitive polyurethane primer. 5µm nominal dry film thickness on both sides.

Pre-treatment
With proprietary conversion film to achieve excellent adhesion between the steel surface and paint finish on both sides.

Substrate
AZ 200 alloy coated steel. AZ comprises 55% Aluminium, 43.5% Zinc and 1.5% Silicon (by weight) in accordance to ASTM A792M. Minimum coating mass. 200 g/m^2 on both sides.

Backing Coat
Custom formulated polyester coating. Light Grey for PVDF and Egret White for SMP. 10µm nominal dry film thickness.

Gloss
Nominal gloss level of 25 GU at 60° reflection angle.

* For colour selection, please refer to our color chart or the actual color plate sample. Maximum specular gloss allowed is 30 G.U. (Gloss Unit) as measured at 60° reflection angle in accordance to ASTM D 523 : 2008 / SS 5 Part E1 : 2003 / BS EN 13523-2 Performance Standards).

Recommended Roof Pitch

Sheet length without end lap	2° (approx 1 in 30)
Sheet length with end lap	3° (approx 1 in 20)

Material Performance Test

Typical Properties	Test Standard (Method)	Correspond to Singapore Standard SS631:2017*
T-Bend Test	ASTM D 4145-10	AS/NZS 2728
Pencil Hardness	ASTM D 3363-05 (2011)	ASTM D 3363
Colour	ASTM D 2244-16	SS Part E3
Specular Gloss	ASTM D 523-14	SS 5 Part E1
Dry Film Thickness	ASTM D 7091-13	SS 5 Part B1
Impact Resistance	JIS K5600-5-3	ISO 6272
Humidity Resistance	JIS K5600-7-2 : 1999	SS 5 Part G6
Cross Cut Adhesion	JIS K5600-5-6 : 1999	ISO 2409

Corrosion and Weathering	Test Standard (Method)	Correspond to Singapore Standard SS631:2017*
Salt Spray Test	ASTM B 117-16	SS 5 Part G10
Weathering Test	ASTM G 154-16	SS 5 Part G9
Acid Resistance (10%v/v HCL)	JIS K5600-6-1 : 2016	ISO 2812

* Material performance for the manufacture of profiled roof and wall cladding conforms to Singapore Standard 631 : 2017 Specification for Metal Roofing.
* Fire Classification A1 in accordance to EN 13501-1 and Class 0 in BS 476 Part 6 & 7.

Design Performance

M-Clipp 430 Limit State Wind Pressure Capacity – kPa

Base Material Thickness (BMT) = 0.48mm, Total Coated Thickness (TCT) = 0.54mm

Type of Span	Limit State	Span - mm									
		900	1200	1500	1800	2100	2400	2700	3000	3300	3600
Single	Serviceability	2.40	2.20	1.90	1.60	1.40	1.10	0.80	0.60	-	-
	Strength*	4.60	4.10	3.70	3.40	3.00	2.50	1.90	1.40	-	-
End	Serviceability	2.20	2.00	1.80	1.60	1.50	1.30	1.20	1.10	0.90	0.80
	Strength*	3.30	3.10	3.00	2.80	2.50	2.10	1.80	1.50	1.30	1.20
Internal	Serviceability	2.60	2.50	2.40	2.30	2.10	1.90	1.60	1.50	1.40	1.20
	Strength*	3.70	3.20	2.80	2.40	2.10	1.90	1.60	1.50	1.40	1.20

Base Material Thickness (BMT) = 0.60mm, Total Coated Thickness (TCT) = 0.66mm

Type of Span	Limit State	Span - mm									
		900	1200	1500	1800	2100	2400	2700	3000	3300	3600
Single	Serviceability	4.40	3.70	3.20	2.60	2.10	1.70	1.20	0.80	-	-
	Strength*	8.00	6.90	6.00	5.10	4.30	3.60	3.00	2.40	-	-
End	Serviceability	4.20	3.90	3.60	3.20	2.70	2.40	2.00	1.60	1.30	1.20
	Strength*	5.90	4.70	3.70	3.20	2.80	2.40	2.20	1.90	1.70	1.50
Internal	Serviceability	4.60	4.30	4.00	3.60	3.30	3.00	2.60	2.20	1.90	1.50
	Strength*	6.70	5.80	5.00	4.30	3.80	3.30	2.80	2.60	2.10	1.70

* Reduction factor of 0.90 has been applied. These capacities are based on tests carried out by the Cyclone Testing Station of James Cook University and in accordance with the requirements of Australian Standard AS 1562.1, and AS 4040.2-1992 Resistance to Wind Pressure for Non-Cyclonic Regions.

Maximum Support Spacing

Type of Application	Type of Span	TCT (mm) 0.54	TCT (mm) 0.66
Roof	Single	1600	1900
	End	1900	2200
	Internal	2200	2500
	Unstiffened Overhang	150	250

Type of Application	Type of Span	TCT (mm) 0.54	TCT (mm) 0.66
Wall	Single	2200	2400
	End	2300	2900
	Internal	2300	2900
	Overhang	150	300

These numbers represent the maximum spans that can be achieved for foot traffic and have no relationship with capacity to withstand resistance to wind uplift

Site Rolling

One of the most valuable services M Metal offers is site rolling, whereby cladding – in particular, long-length cladding can be roll-formed on site itself with a roll-former.

Benefits:

- Greater convenience for projects where roof length is over transportable limits
- Better watertightness, as there is no need to compromise by resorting to having several end-laps over the whole roof length
- Versatility, as the roll former can be placed at the ground level or roof level, whichever suits the site conditions
- Time savings, as the roll former can be quickly re-positioned to where the cladding is required
- Self-sufficient production reduces on-site labour and packing requirements

M Metal can manufacture all its roof and wall cladding profiles, including M-Clipp 430 on-site.

Fixing

Fasteners

It is important that the correct fasteners are used so that it is compatible with the cladding material selected and matches with the cladding's life expectancy.

The fasteners used for installation of M-Clipp 430 sheeting to the purlin/structural support should conform to AS3566:2002 – Class 3 or Class 4, self-drilling with a wafer head.

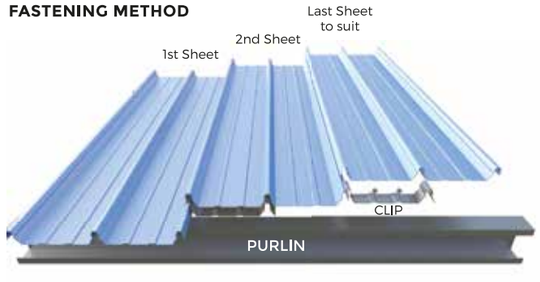
STEEL SUPPORT

Thickness	Up to 4.5mm	Exceeds 4.5mm
Directly to support	No. 10 - 24 x 16mm wafer-head self drilling and tapping screw	Teks 5 No. 12 - 24 x 32mm wafer-head self drilling and tapping screw
Over insulation blanket	Increase to 22mm long screw if required	Same as above

TIMBER SUPPORT

Grade	Hardwood	Softwood
Directly to support	No. 10 - 12 x 25mm wafer-head type 17 self drilling wood screw; 3.75mm x 50mm flat-head spiral threaded nail (on special orders).	No. 10 - 12 x 46mm wafer-head type 17 self drilling wood screw
Over insulation blanket	Increase to 22mm long screw if required 3.75mm x 50mm flat-head spiral threaded nail (on special orders).	Same as above

FASTENING METHOD



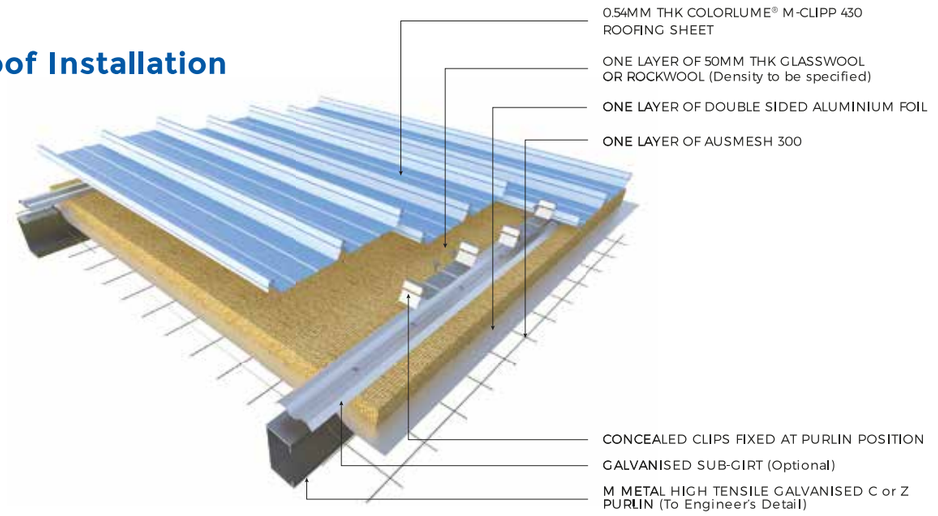
FEATURES OF FASTENER

- Forged drill point
- Strip out resistant
- Higher pullout load
- Zinc alloy proven corrosion protection

ML 70 FIXING CLIP

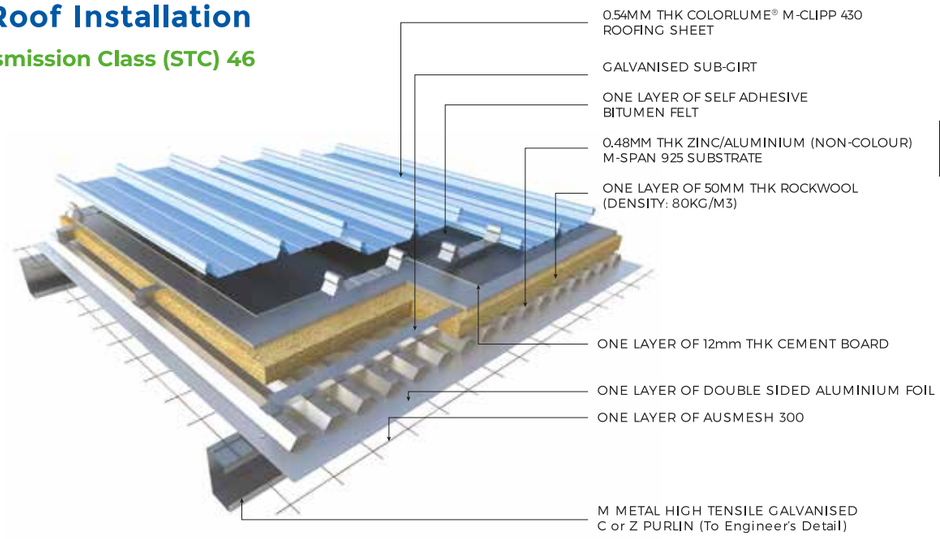
Roof System

Typical Roof Installation



Acoustic Roof Installation

- Sound Transmission Class (STC) 46



* Ausmesh 300 safety mesh is designed to support insulation and to help prevent construction roof workers from falling.

Please contact M Metal Pte Ltd, Technical Department for all technical matters and assistance with your roof design

Compatibility

All products should be checked for compatibility with adjacent materials before installation. It is important to check the implications of direct contact between materials, and water runs from one material to another.

Galvalume®/ColorLume® SMP/ColorLume® VF-20L (70/30) PVDF coated steel sheets should not be placed in direct contact with copper, lead, green or treated timber, stainless steel, mortar or concrete.

Length

M-Clipp 430 roof and wall claddings are supplied cut-to-length. Regulatory limits for transporting long products by the local transport authority should be verified. The manufacturing tolerance on the length of product supplied is ±0-15mm.

Delivery / Unloading

M Metal provides a shorter lead-time than other manufacturers because its manufacturing facility is located in Singapore. Delivery can be made within 3 working days subject to the delivery location, quantity and material availability.

Please ensure that suitable arrangements have been made for truck unloading. When lifting M-Clipp 430, care should be taken to ensure that the load is spread evenly to prevent damage.

Handling / Storage

M-Clipp 430 should be handled with care at all times to preserve the quality of its finish and product capabilities. M-Clipp 430 packs should be stored above ground level while on-site and kept dry.