



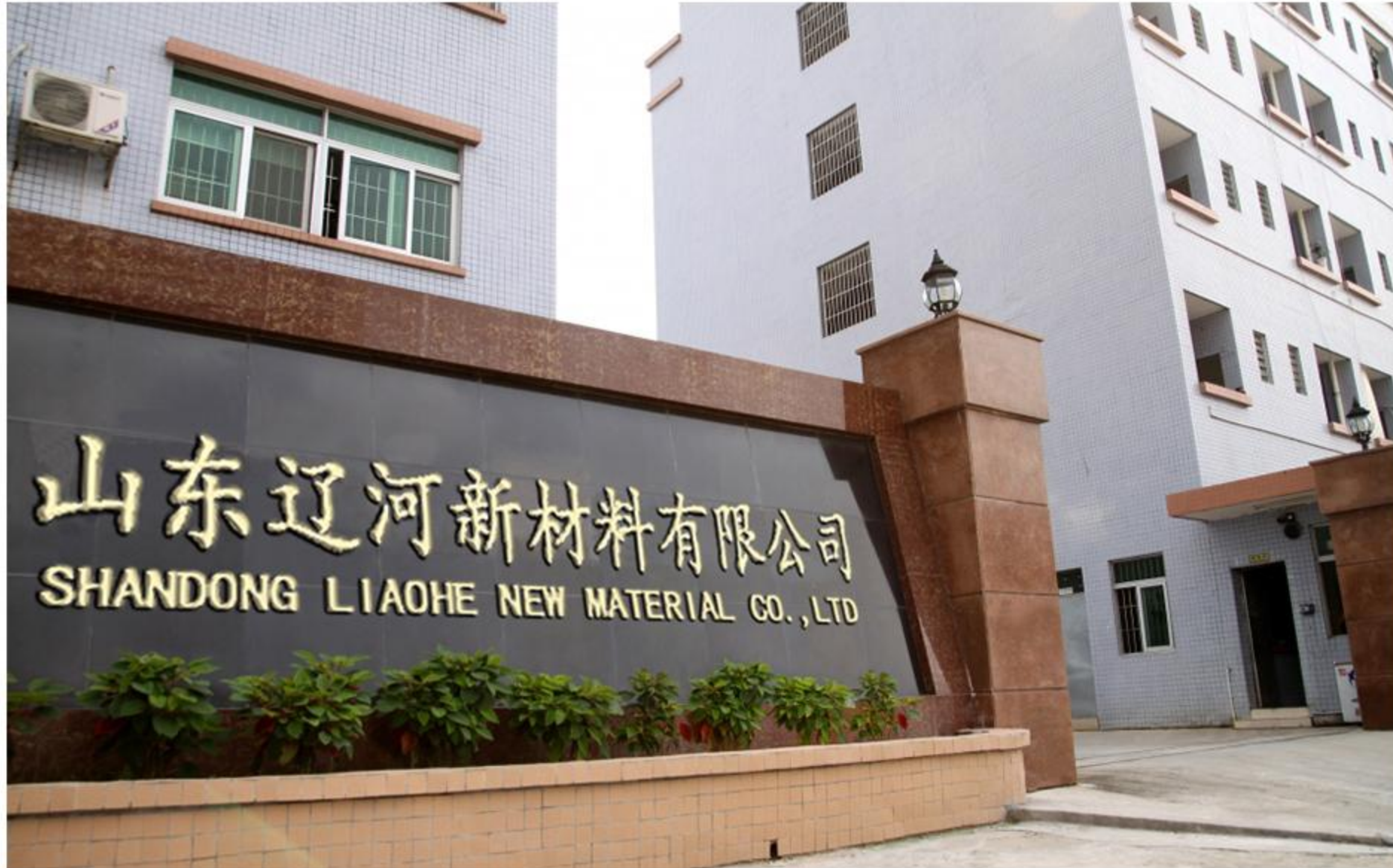
**山东辽河新型材料有限公司**  
Shandong Liaohe New Material Co., Ltd



# **Sandwich Panel Catalog**

Polyurethane sandwich panel / EPS sandwich panel / Rock wool sandwich panel / Metal carved board / Corrugated metal sheet / C-shaped steel / Z-shaped steel

## Factory Introduction



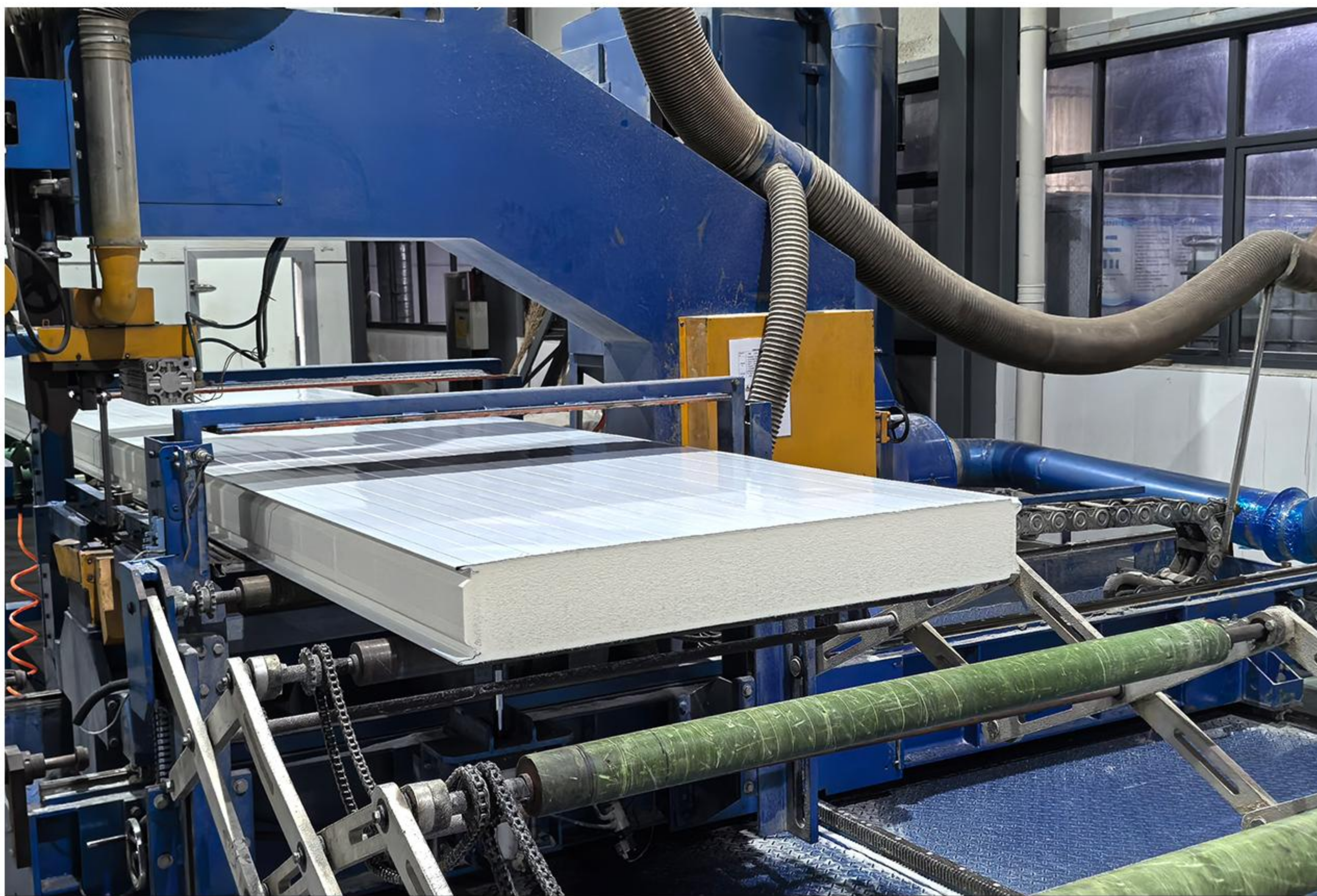
*Shandong Liaohe New Material Co., Ltd., is mainly engaged in the production and trade circulation of high-end brand color coated steel plates, production and manufacturing of building steel products, design and manufacturing of prefabricated building and other businesses. Shandong Liaohe is a national high-tech enterprise cultivation enterprise. The company's headquarters is located in Liaocheng, Shandong, China, covering an area of over 400 acres. The production lines for polyurethane energy-saving panels, galvanized coils, and color coated panels that have been completed and put into operation adopt industry-leading equipment, technology, and production management. The product series includes: Sandwich panels, painted metal roof panels, and steel structures such as C-beams and Z-beams.*

*Shandong Liaohe is committed to becoming a comprehensive service provider of diversified solutions in the global industrial construction field. It has now developed into an internationally leading production line with 3 aluminum zinc plate production lines, 3 high-quality color coated plate production lines, 3 clean plate production lines, and 1 Italian imported 7-component foaming polyurethane energy-saving board production line with an annual output of 4 million meters. For many years, Liaohe in Shandong has gained a reputation both domestically and internationally. Its construction steel products are widely used in industrial manufacturing, logistics and warehousing, modern agriculture, public buildings, and other fields, contributing unique value to the development of various industries. The products are exported to 47 countries and regions in North America, the Middle East, Ukraine, Türkiye, etc., and are used in well-known buildings at home and abroad, such as the Indonesian presidential palace, airports, hospitals, etc. Liaohe people will continue to adhere to the business philosophy of "doing better than customer needs", contribute to the development of the industry with exquisite skills and sincere attitude, and win the respect and praise of customers, peers, and all sectors of society.*

## Production line

### Energy saving panel production line

We have a complete set of imported Italian Puma production lines, using advanced European polyurethane core production technology and seven component on-site foaming technology to ensure product performance stability. The ultra long double track ensures the flatness of the product surface.



### Cold storage panel production line

The cold storage panel production line has introduced advanced equipment and technology from OMS in Italy. The double track has a length of 36 meters, and the extra long double track provides sufficient curing reaction time for polyurethane foam, greatly improving the adhesion and molding performance of the panels. The equipment can produce 250mm ultra thick cold storage panels to meet customers' special needs for low-temperature environments. The advanced polyurethane pentane foaming process eliminates the original F11 and 14B foaming agents, resulting in better foaming quality and achieving zero fluoride emissions in the production process.

### Clean panel production line

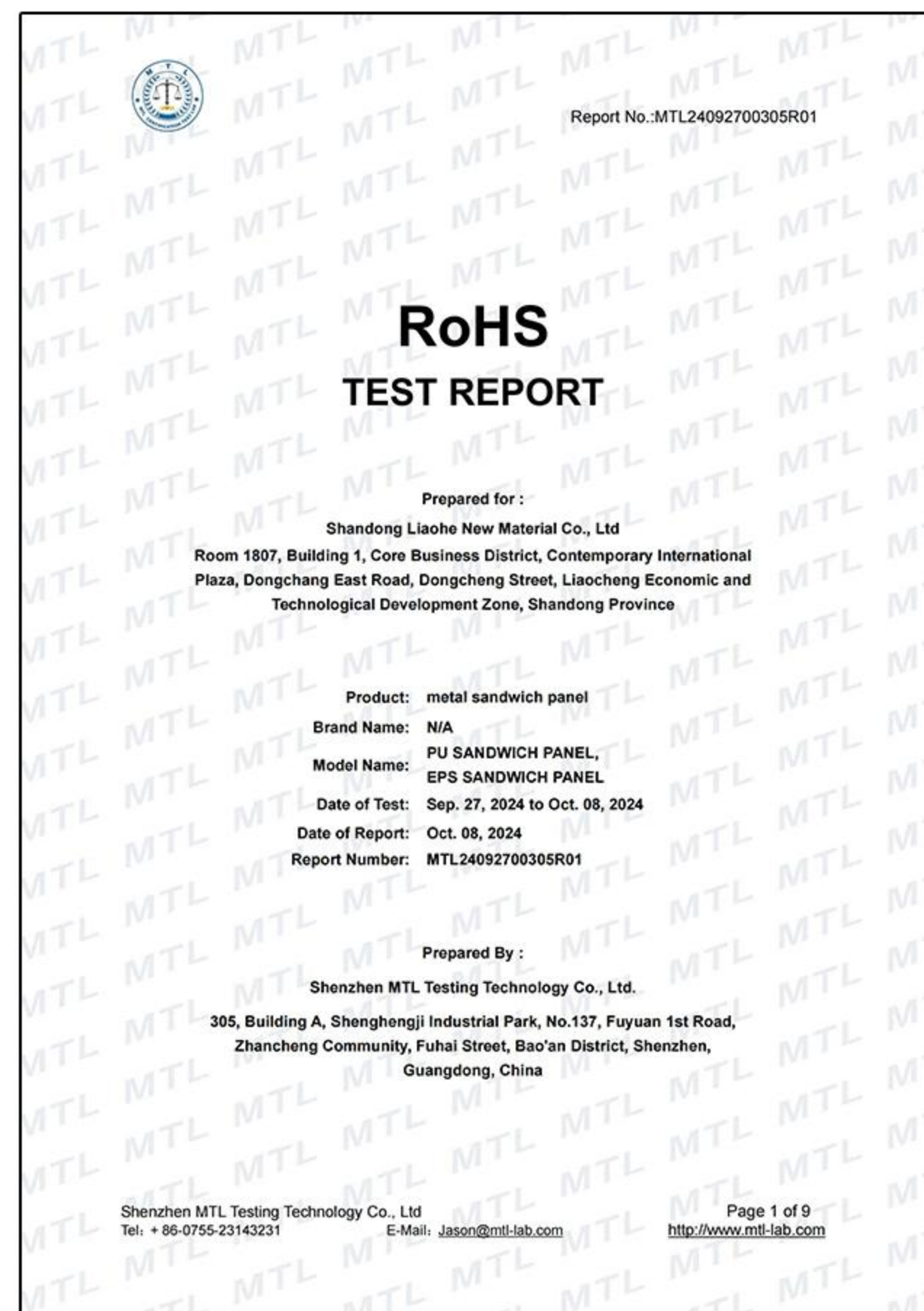
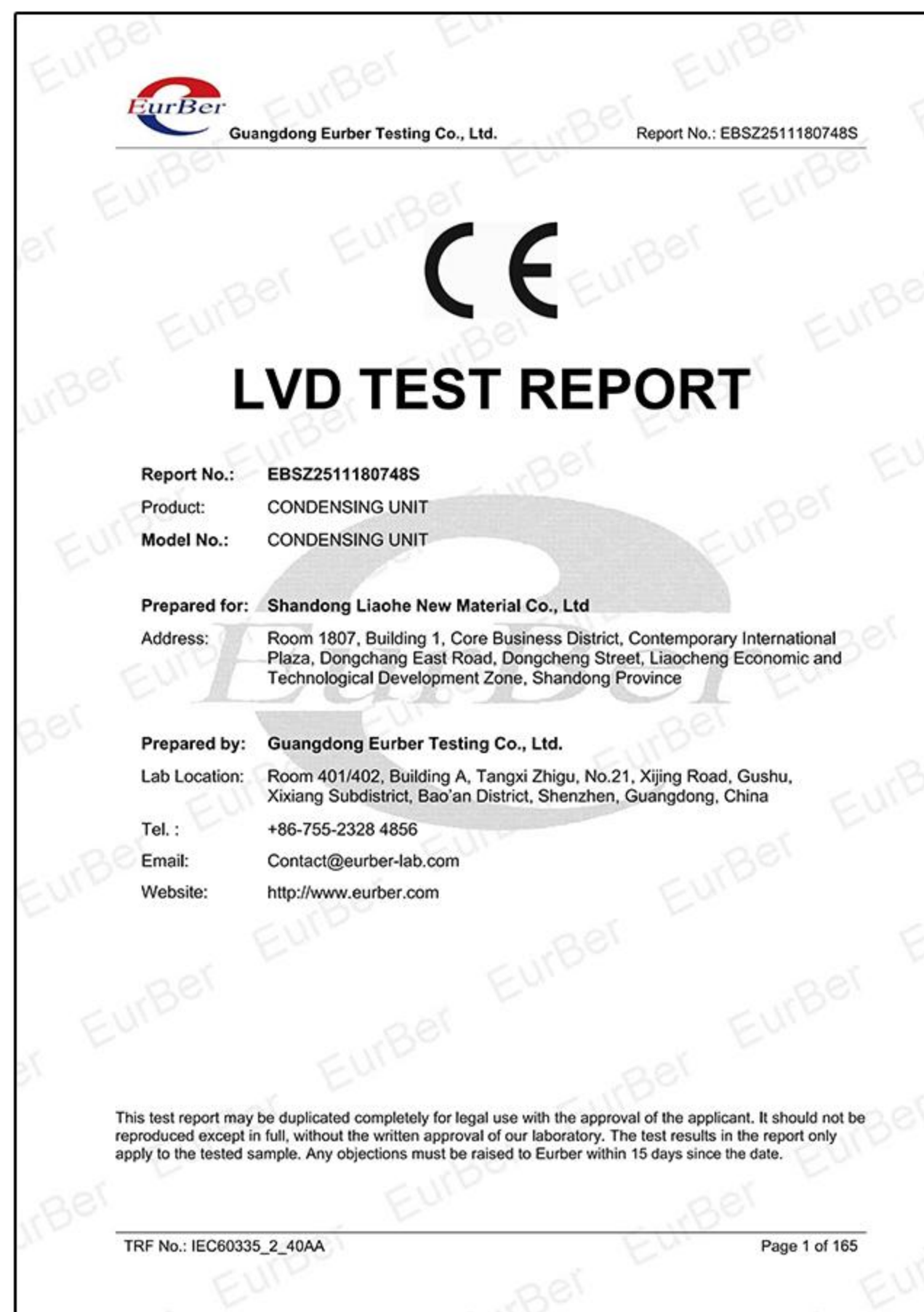
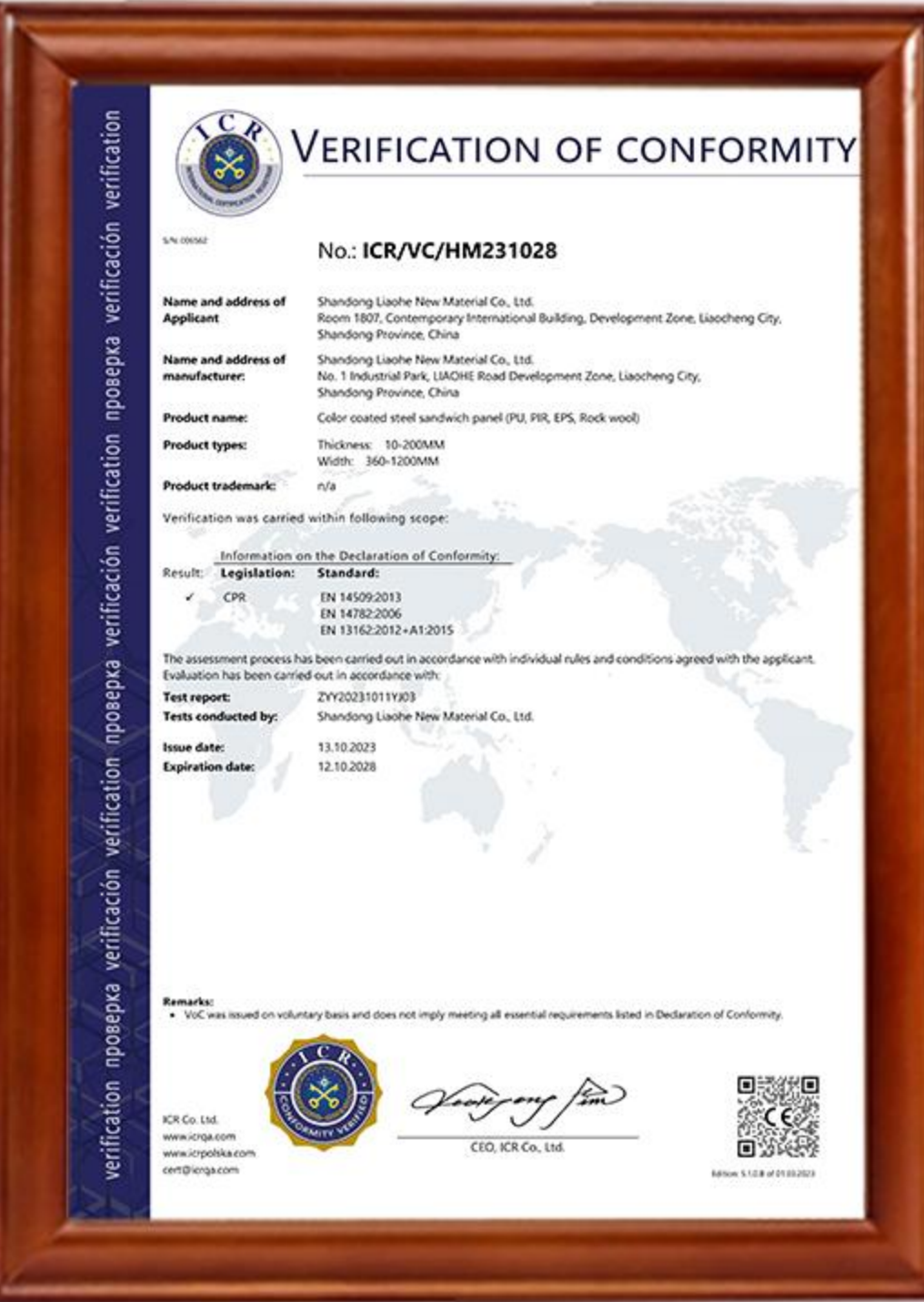
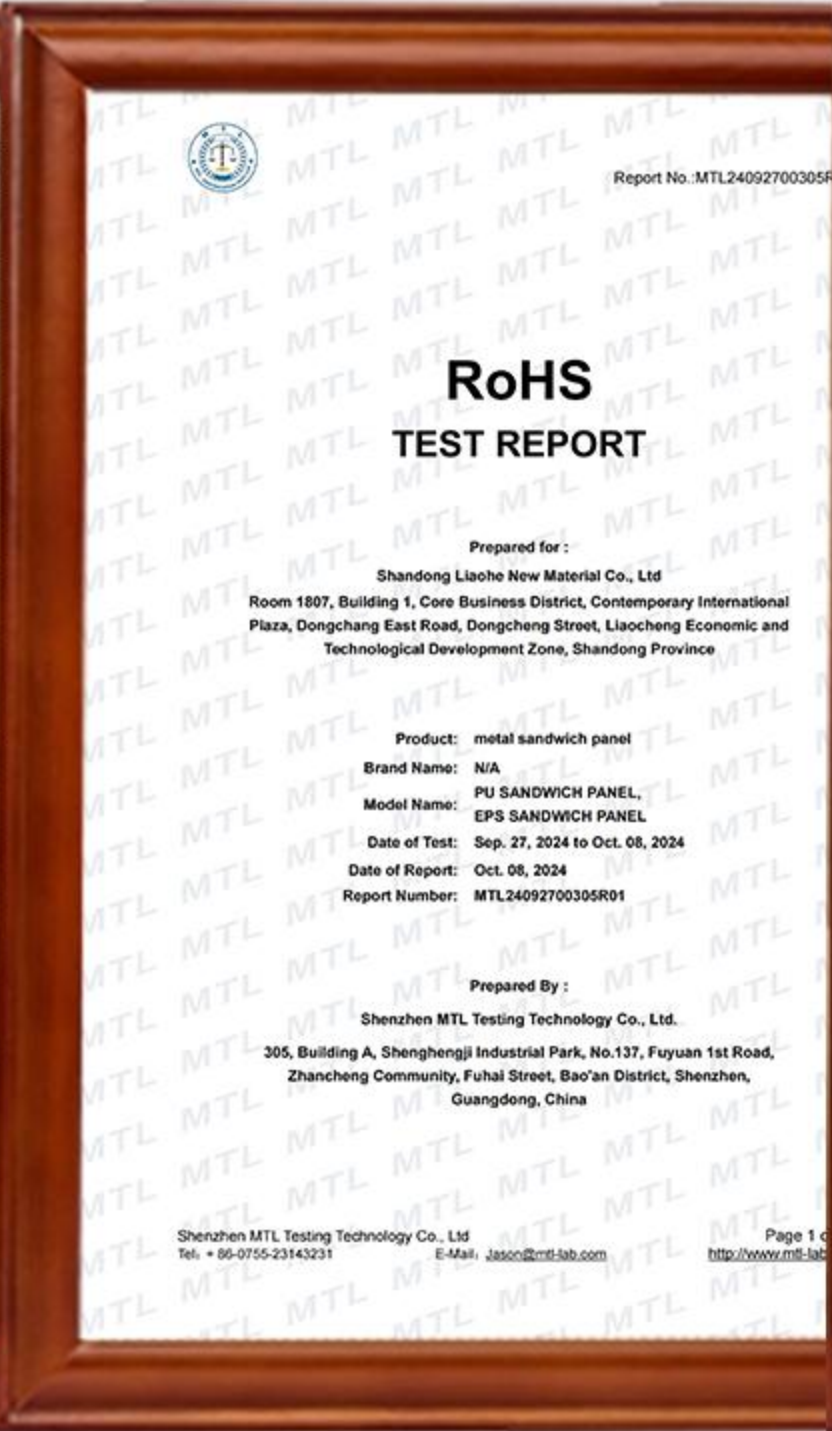
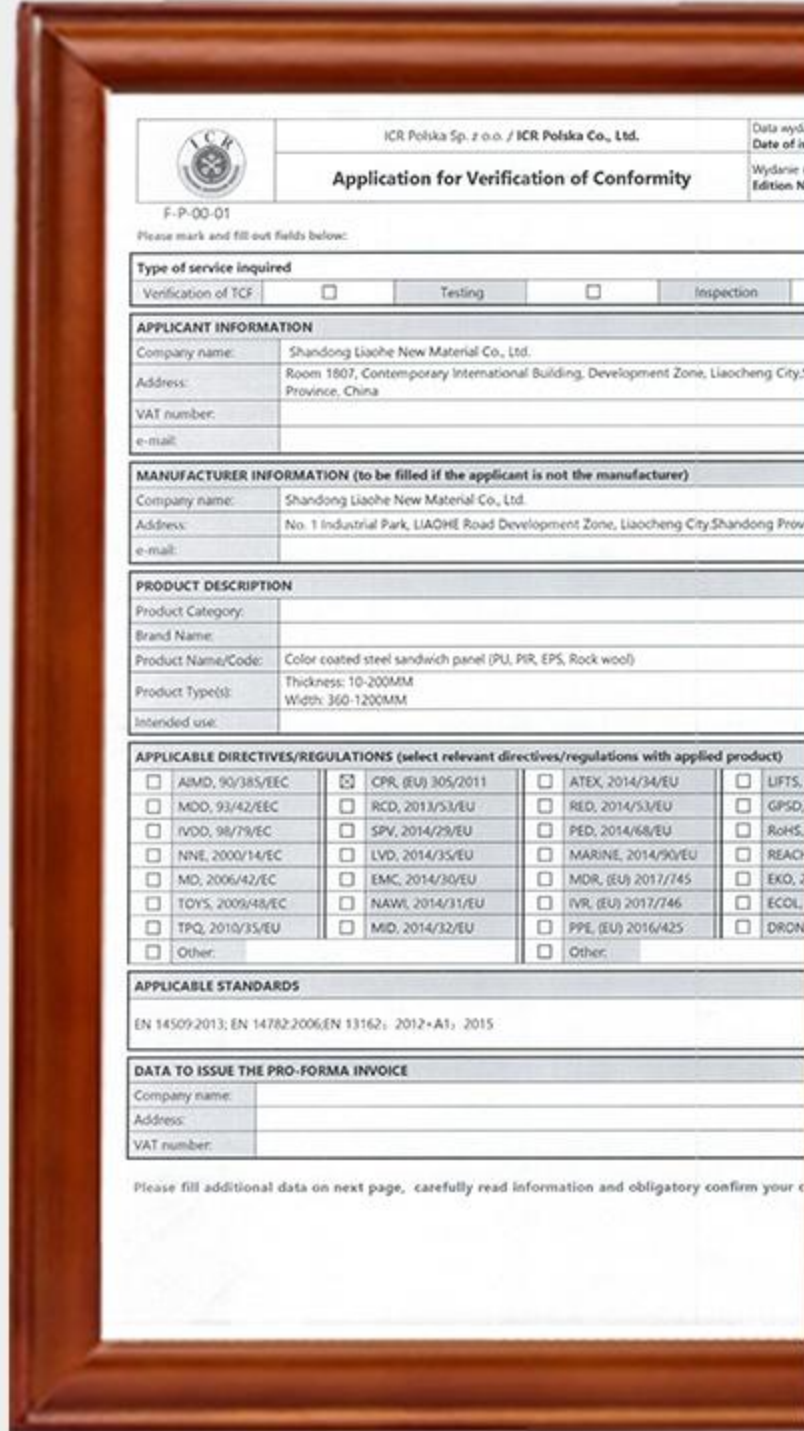
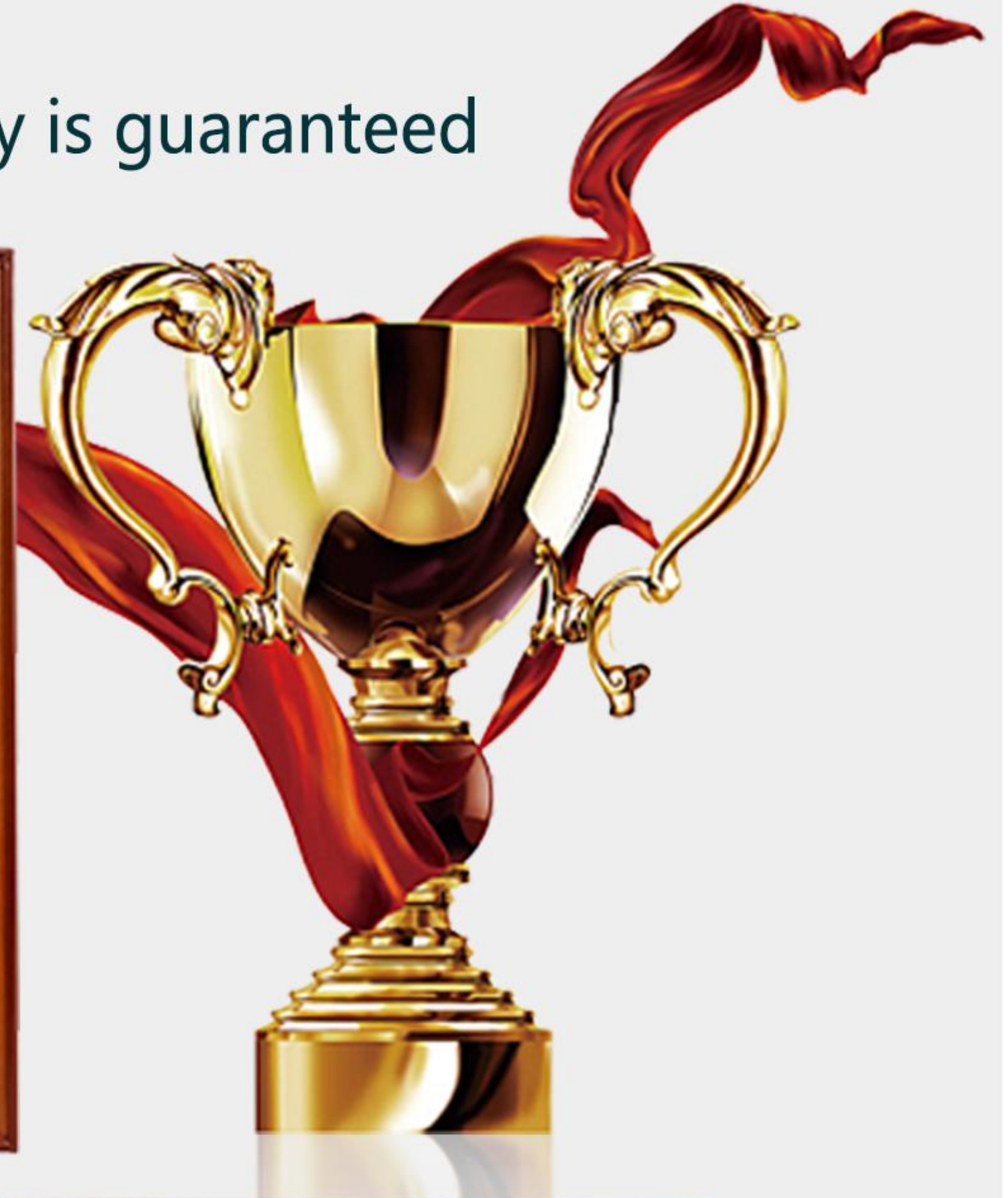
The clean board continuous production system has industry-leading level, including roll forming system, automatic cotton feeding system, automatic glue spraying system, double track shaping and temperature control system, robot palletizing system, control system, etc.

The system has a high degree of automation, fast processing efficiency, and stable product quality, with a maximum production capacity of 2 million square meters per year. It can produce a variety of core material clean boards, and the production efficiency is 6-8 times that of traditional handmade boards.



# Certifications

Obtain many kinds of certificates and patents, quality is guaranteed

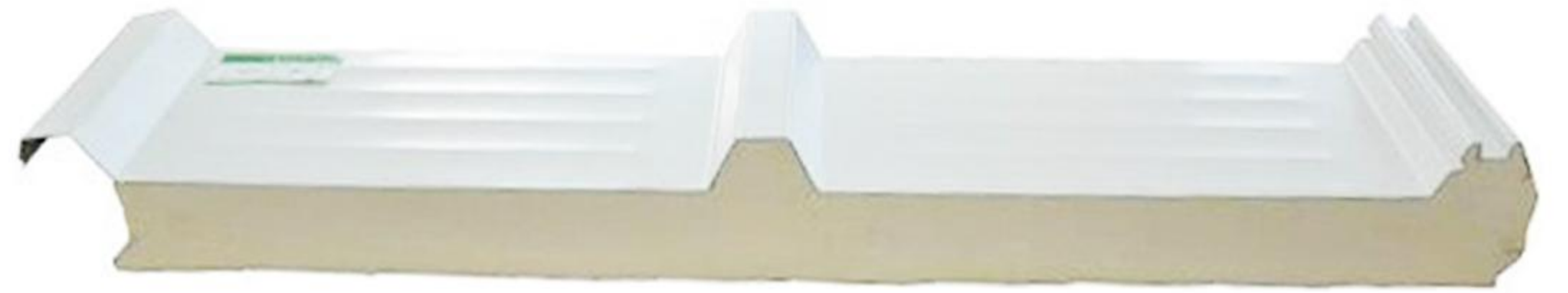


*Sandwich panel*

*PU & Pir sandwich panel*



*Wall panel*



*Roof panel*

*Rock wool sandwich panel*

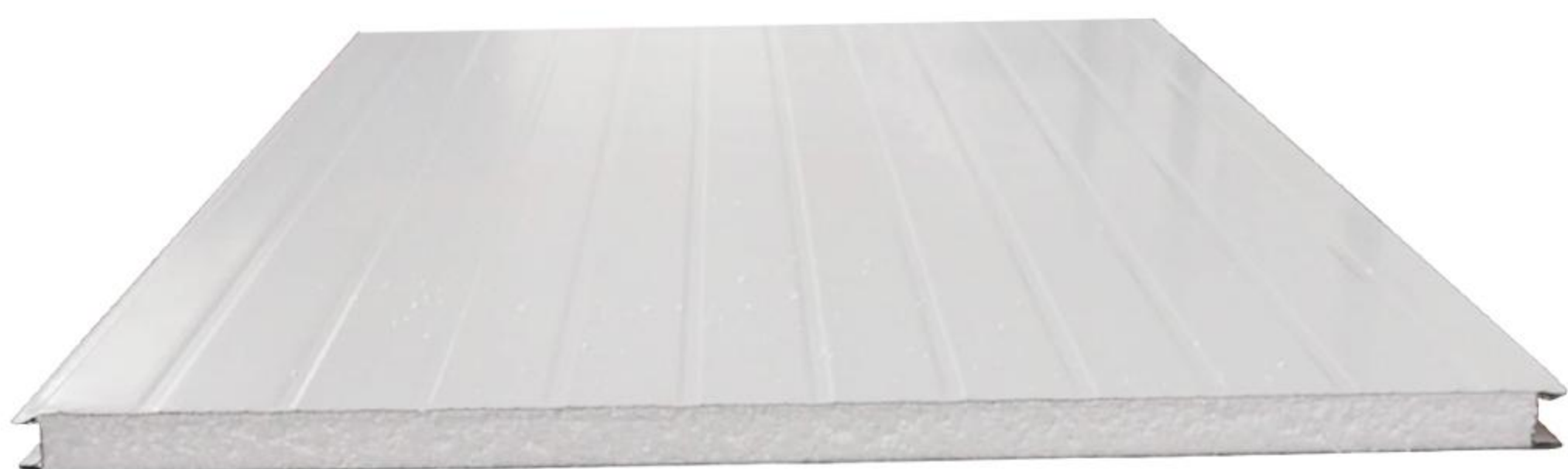


*Wall panel*



*Roof panel*

*EPS sandwich panel*



*Wall panel*



*Roof panel*

*Polyurethane edge sealing rock wool sandwich panel*

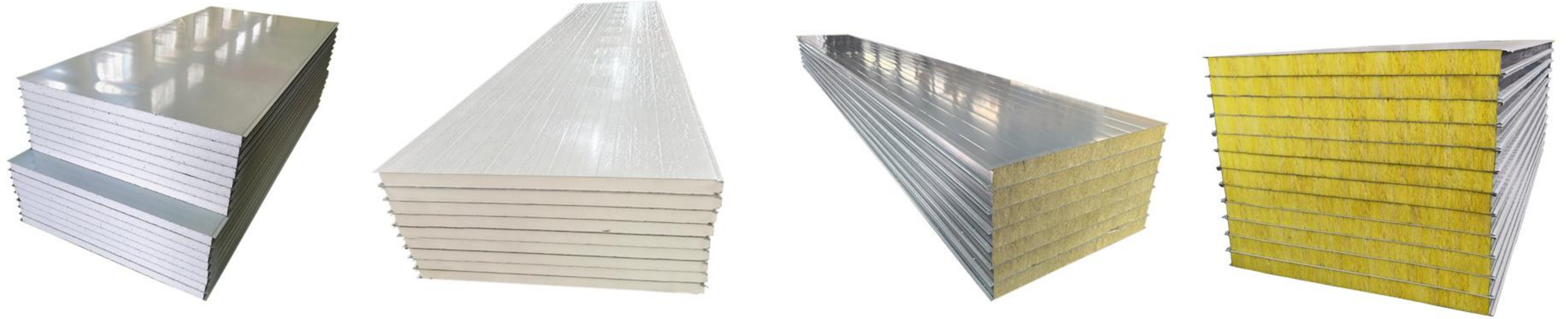


*Wall panel*



*Roof panel*

## Performance comparison

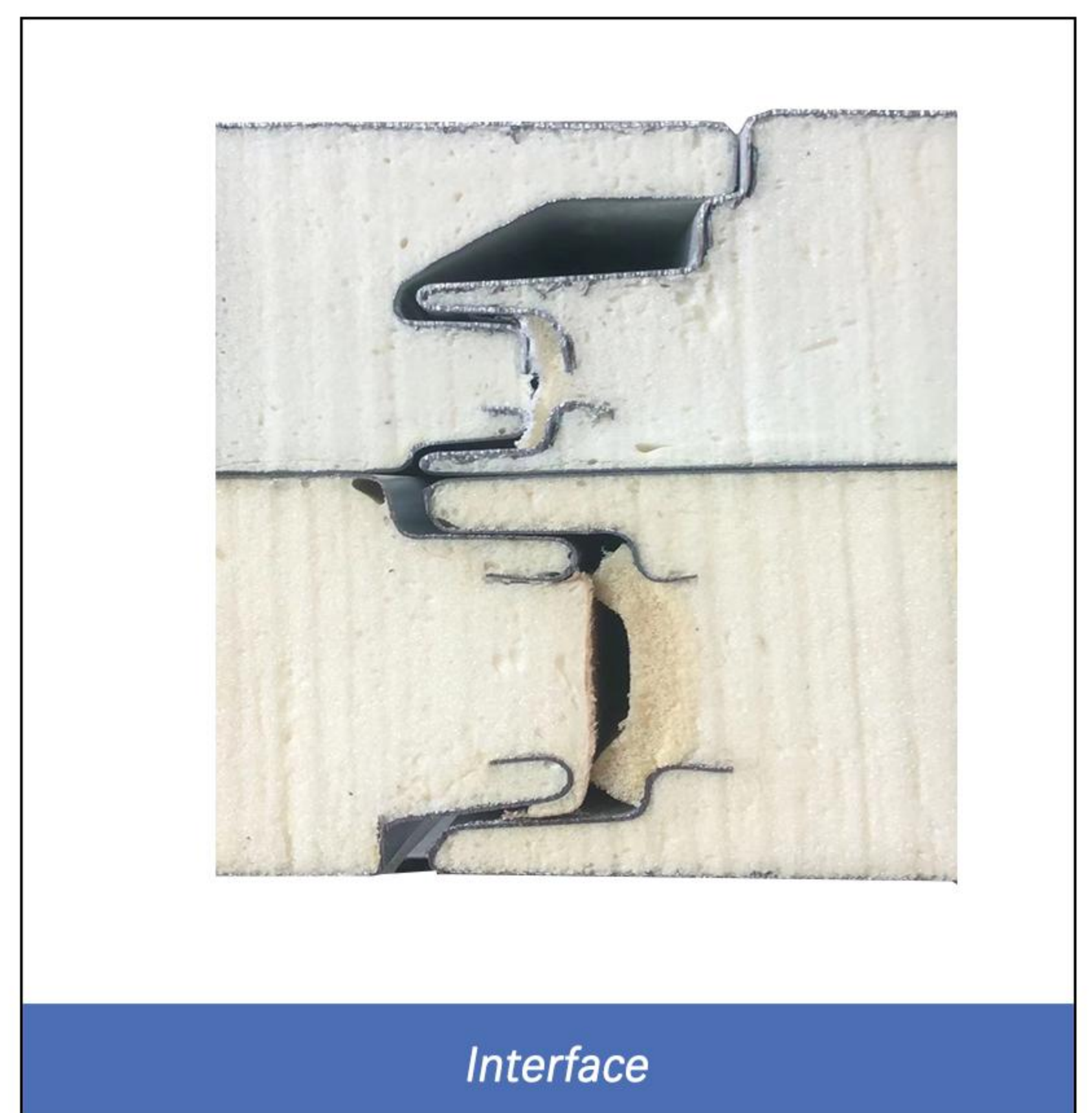


LTEM	EPS Sandwich Panel	PU Sandwich Panel	Rock Wool Sandwich Panel	Fiber Glass Sandwich Panel
Water Proof	★★★★★	★★★★★	★★★	★★★
Fire Proof	★★ Inflaming retarding	★★★★★	★★★★★	★★★★★
Heat Insulation	★★★	★★★★★	★★★★	★★★★
Sound Insulation	★★★★★	★★★★★	★★★★★	★★★★★
Price Comparison	★★	★★★★★	★★★★	★★★
Density Range	10-14kg/m <sup>3</sup>	35-40kg/m <sup>3</sup>	60-80kg/m <sup>3</sup>	30-50kg/m <sup>3</sup>



PU sandwich wall panel

Color steel thickness	0.3mm~0.8mm
Core thickness	30mm~200mm
Effective width	1000mm/1120mm

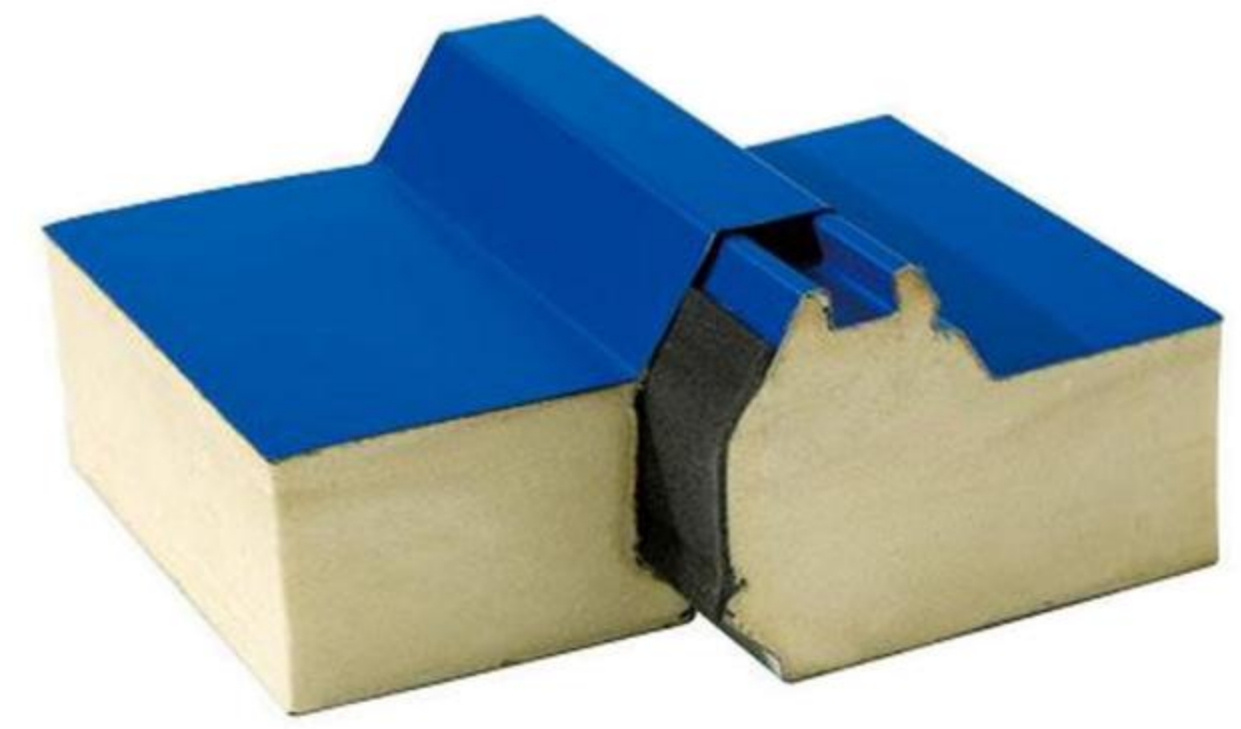


Interface

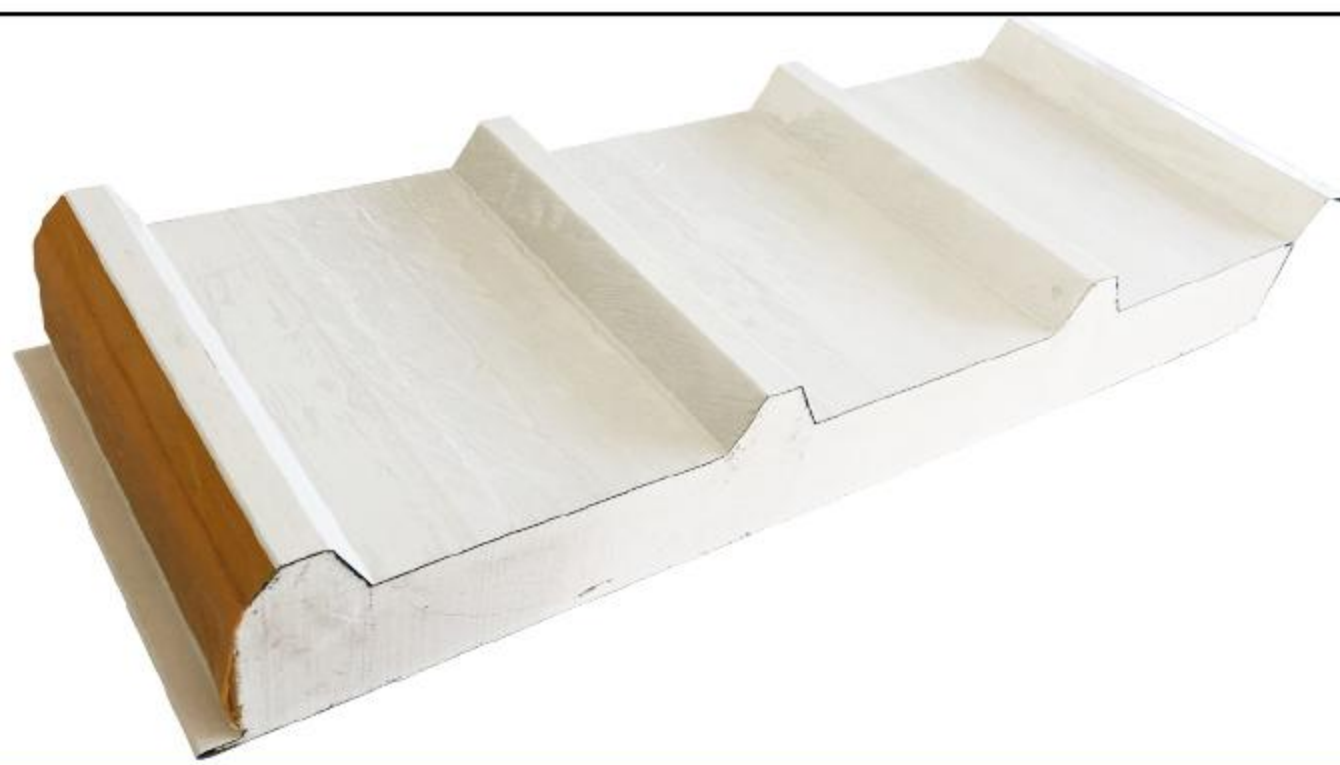


Three wave PU sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	30mm~200mm
Effective width	1000mm



Interface



Four wave PU sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	20mm~200mm
Effective width	1000mm



Interface

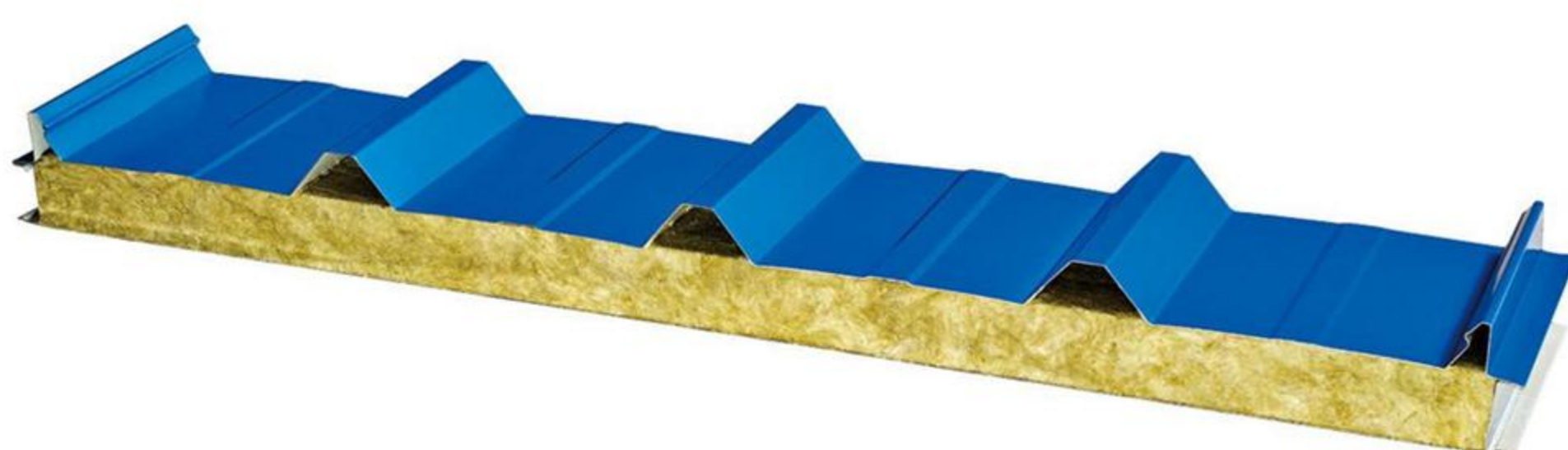


Rock wool sandwich wall panel

Color steel thickness	0.3mm~0.8mm
Core thickness	50mm~200mm
Effective width	950mm/1150mm

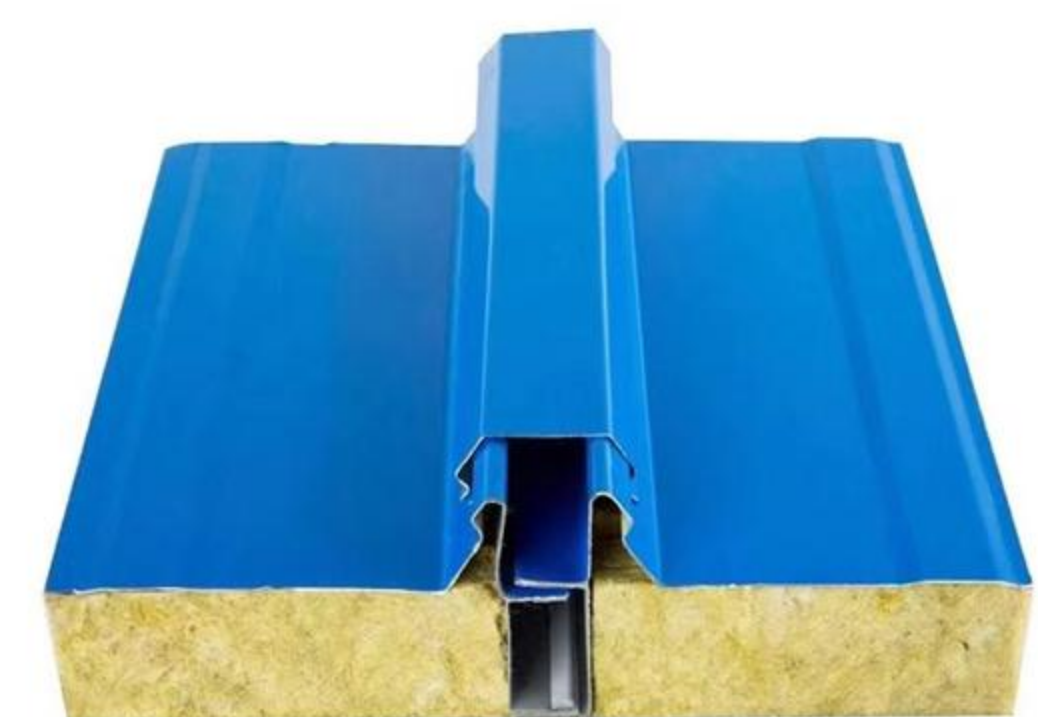


Interface



Five wave rock wool sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	50mm~200mm
Effective width	950mm



Interface



EPS sandwich wall panel

Color steel thickness	0.3mm~0.8mm
Core thickness	30mm~200mm
Effective width	950mm/1150mm

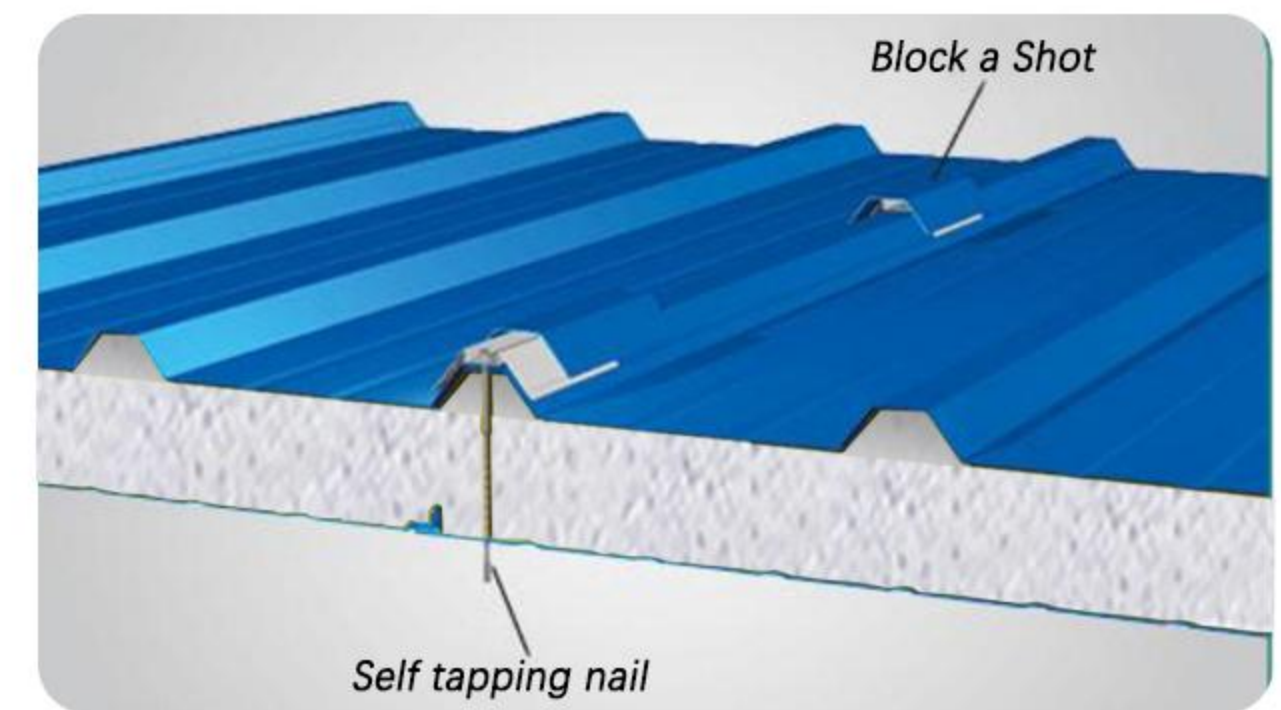


Interface



Five wave EPS sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	30mm~200mm
Effective width	960mm



Interface



Polyurethane edge sealing rock wool sandwich wall panel

Color steel thickness	0.3mm~0.8mm
Core thickness	50mm~200mm
Effective width	1000mm

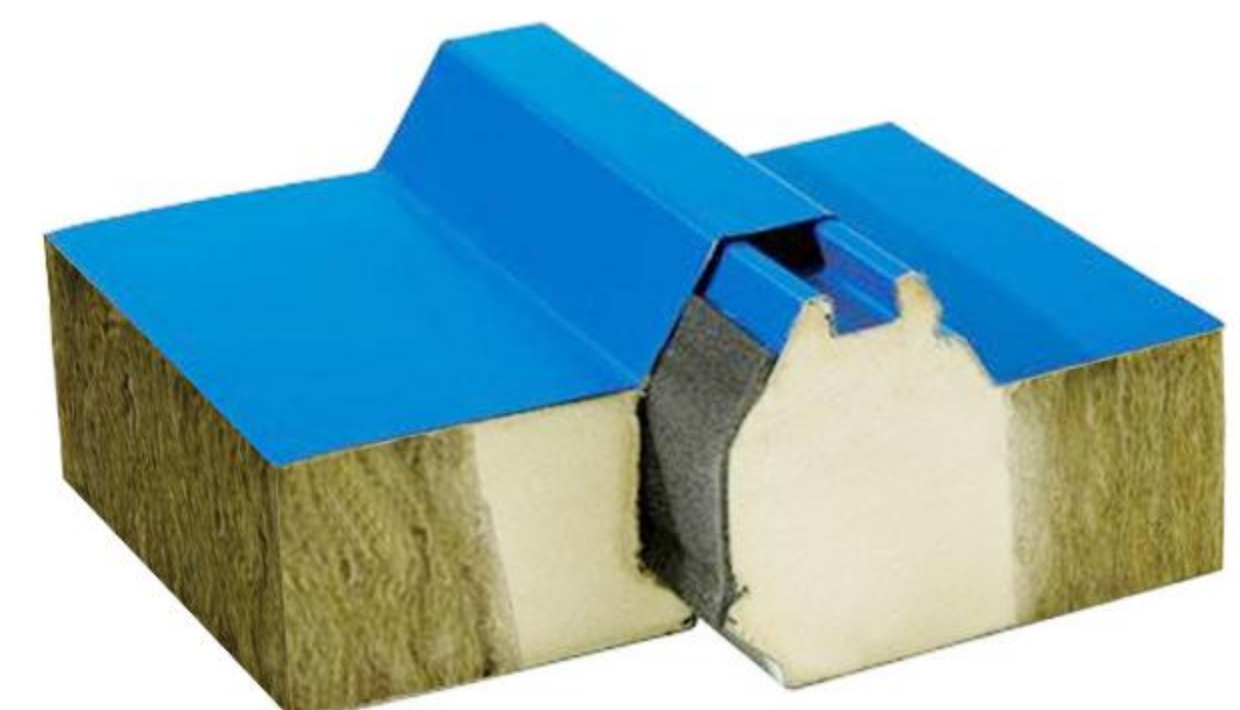


Interface

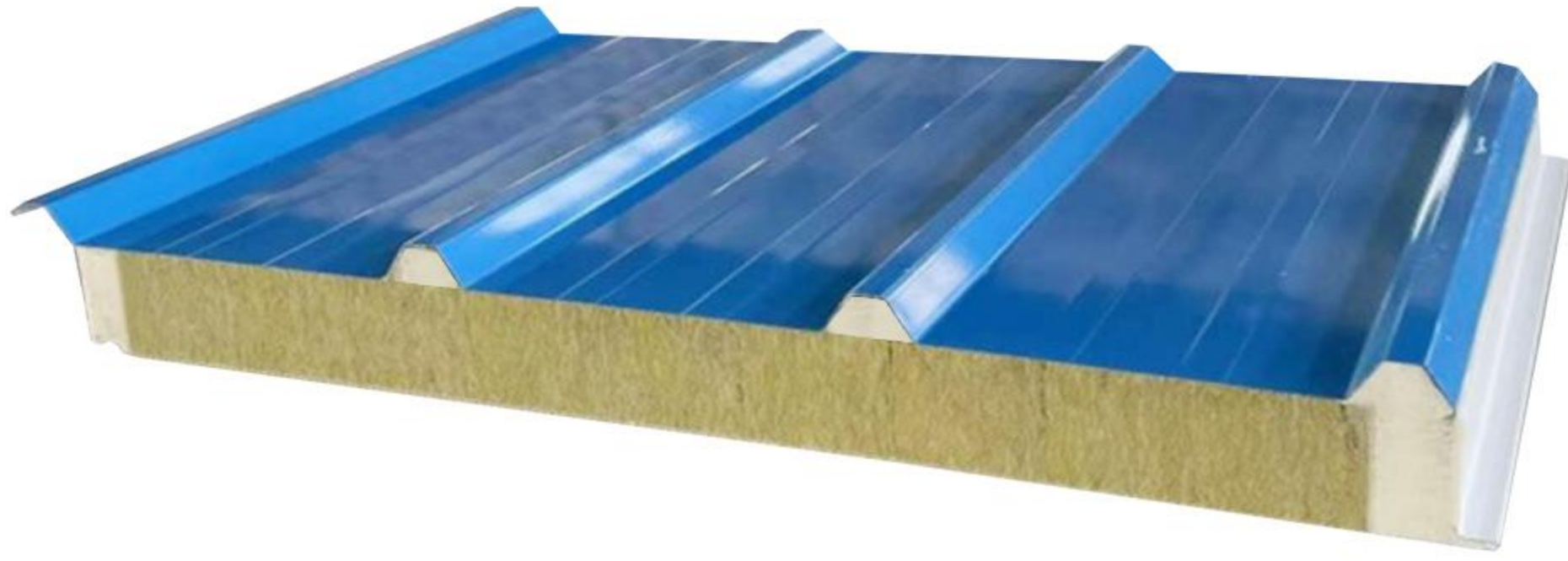


Three wave polyurethane edge sealing rock wool sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	50mm~200mm
Effective width	1000mm



Interface



Four wave polyurethane edge sealing rock wool sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	50mm~200mm
Effective width	1000mm



Interface



Pir sandwich wall panel

Color steel thickness	0.3mm~0.8mm
Core thickness	30mm~250mm
Effective width	1000mm/1120mm

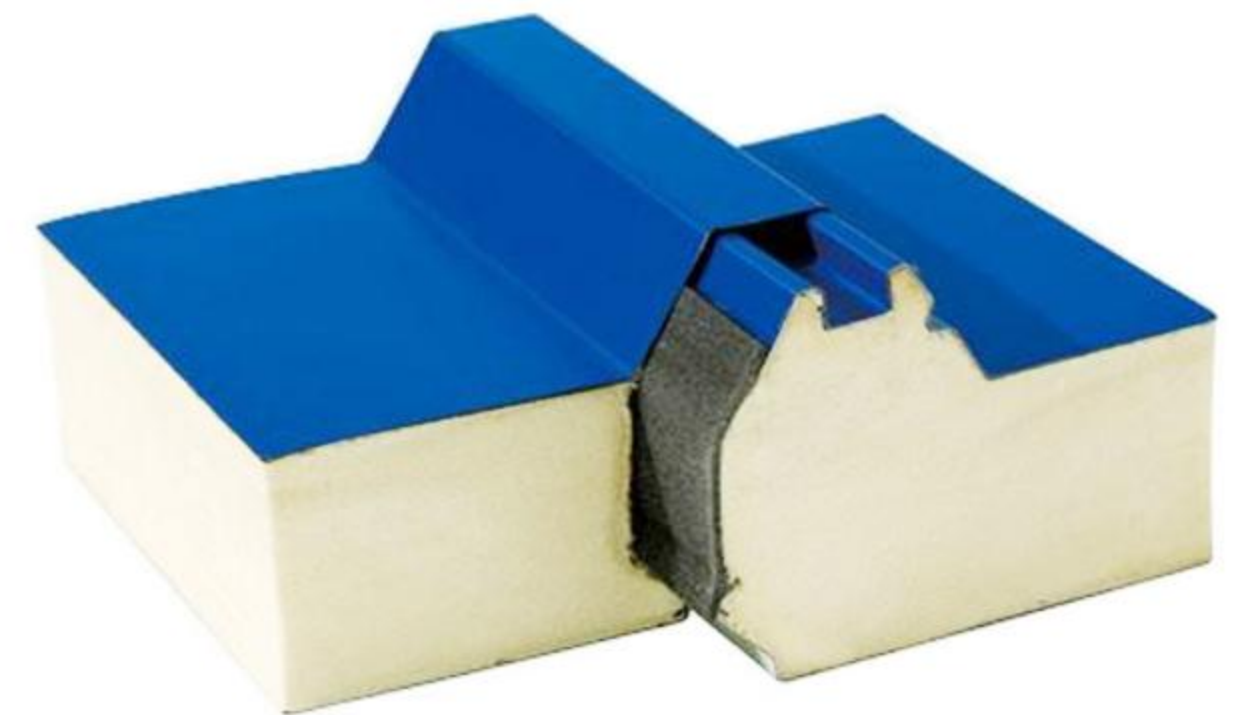


Interface

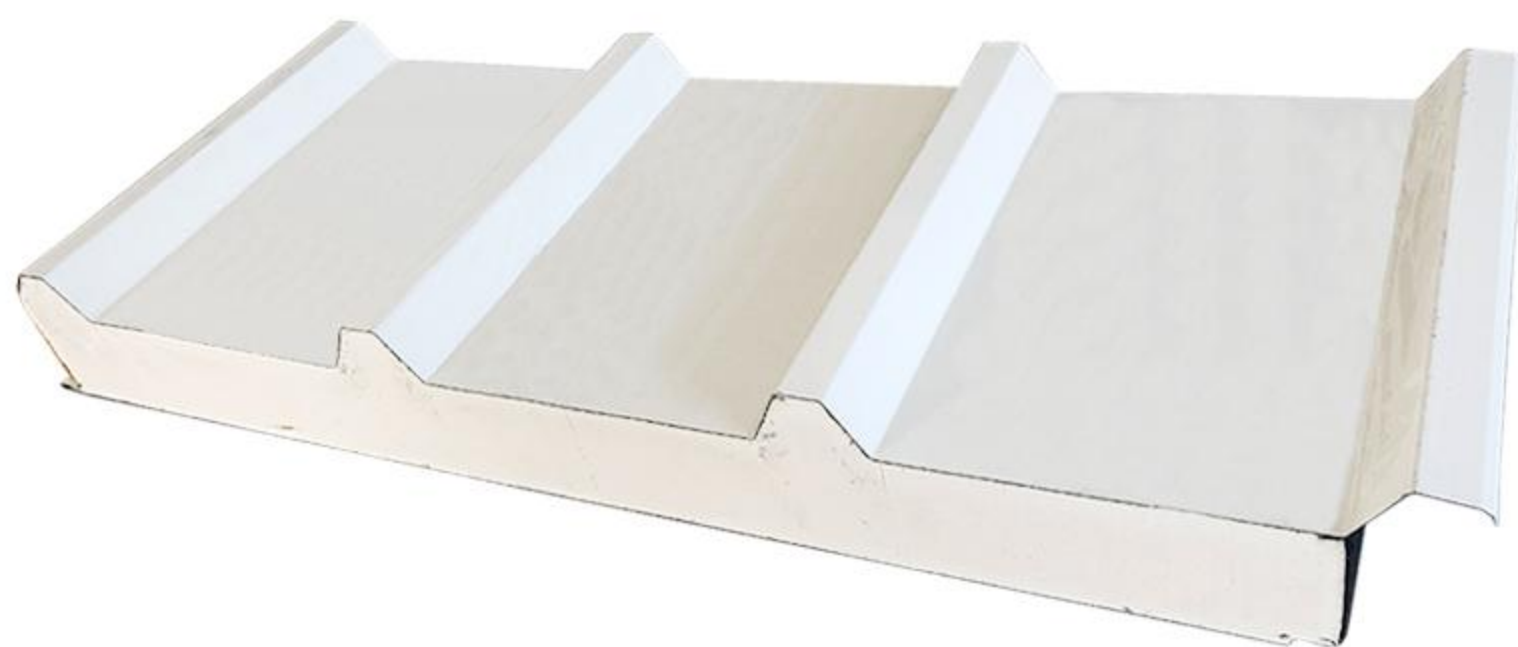


Three wave pir sandwich roof panel

Color steel thickness	0.3mm~0.8mm
Core thickness	30mm~200mm
Effective width	1000mm

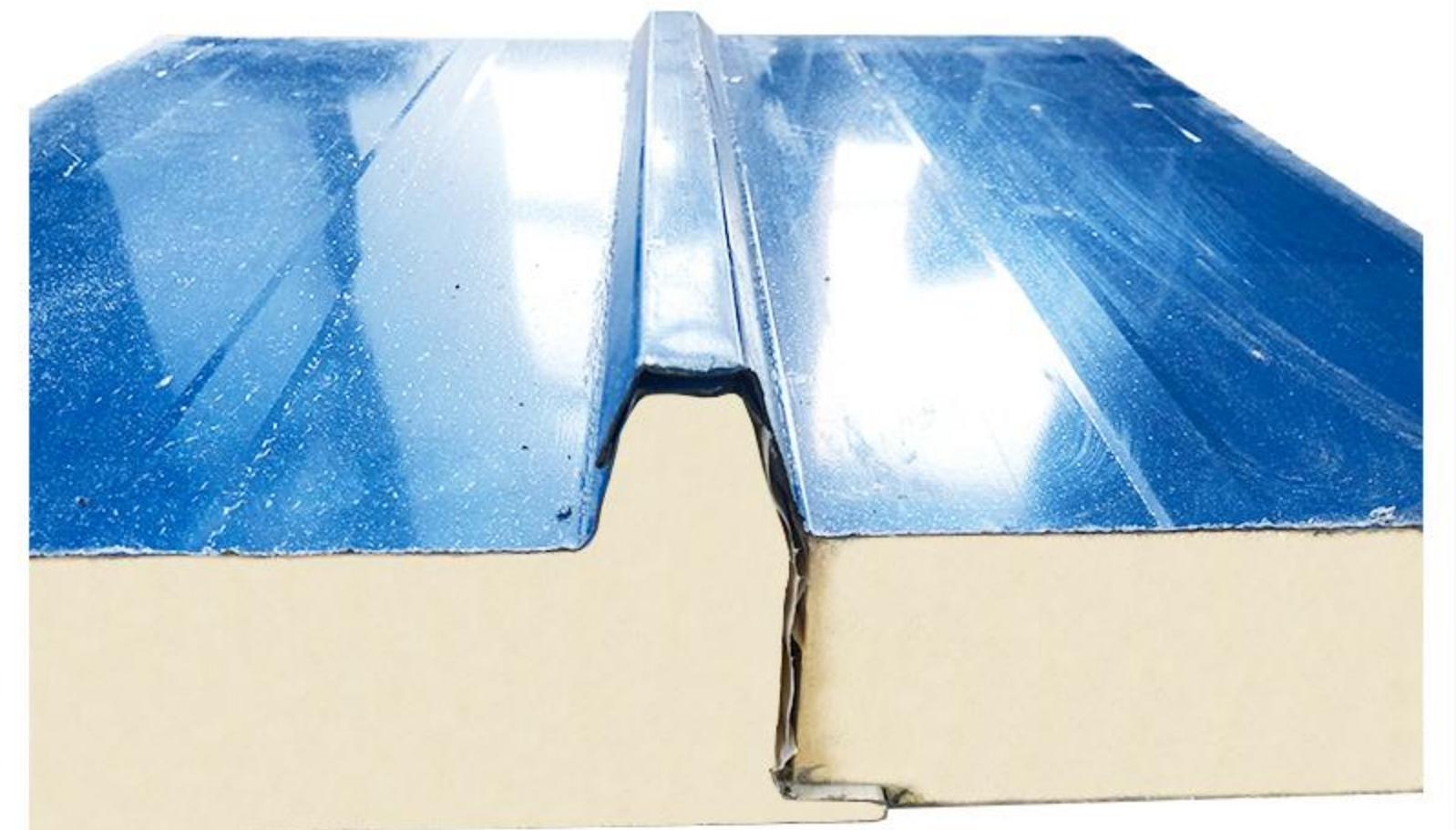


Interface







Four wave pir sandwich roof panel


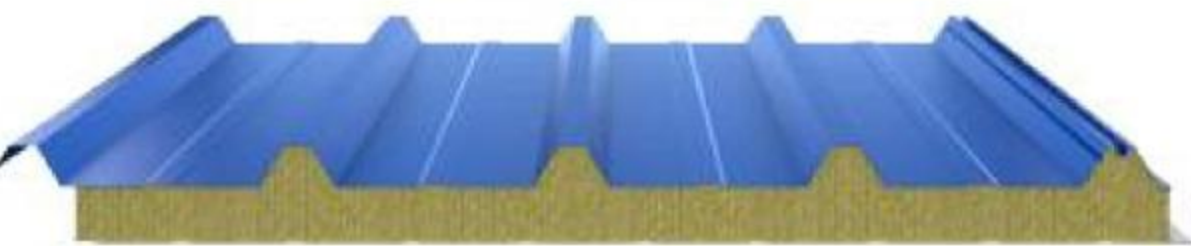
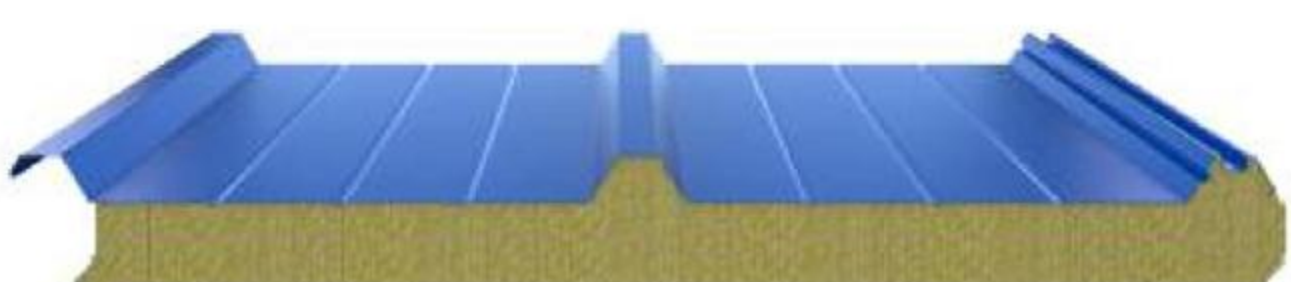
Color steel thickness	0.3mm~0.8mm
Core thickness	20mm~200mm
Effective width	1000mm



Interface

## Product information

Product Model	Product legend	Application Features
LH-FD-R-LapSv40		Self tapping nail with visible nail fixation, good structural safety, and fast construction
LH-FD-R-LapSv36		Self tapping nail with visible nail fixation, good structural safety, and fast construction
LH-FD-R-LapSoft		Self tapping nail with visible nail fixation, good structural safety, and fast construction
LH-FD-R-CapHT		Hidden nail fixation reduces the risk of corrosion and water leakage

Product Model	Product legend	Application Features
Cap type 950 metal roof panel		1.Fireproof and flame retardant, with excellent insulation effect 2.Vibrant colors, no need for surface decoration 3.Flexible and fast installation, greatly reducing the construction period
Overlapping 950/980 type metal roof panel		
Australian style roof panels/ Australian style corrugated roof panels		



### Wind resistant exposure

The combination of roof panels adopts a dual fixing method, and the roof panels themselves have strong resistance to positive and negative wind pressure, effectively solving the instability caused by sliding due to thermal expansion and contraction of the roof as a whole

### Quick construction

Roof energy-saving panels are produced in a highly controlled and constant temperature environment in the factory, ensuring quality and shortening the construction period

### Beautiful economy

Diverse surface forms and rich colors; Reduce material loss, save construction time and project cost

### Photovoltaic roof is green and environmentally friendly

Free from formaldehyde, resistant to microbial invasion, recyclable, and fully utilizing the characteristics of the roof with photovoltaic technology

### Air tight and soundproof

Good water absorption, it has a significant reduction effect on the sound caused by heavy rain, hail and other impacts

## LH-FD-R-360HN II



### Rapid roof construction

Energy saving roof panels are produced in the factory with stable quality assurance, and can be installed directly on site. The process is simple and reliable

### Easy to maintain security

Subtracting the aluminum frame eliminates dust accumulation and is easy to maintain. The surface has strong load-bearing capacity and can be stepped on, allowing for manual operation and maintenance

### Quick and easy installation

After the roof panel is completed and the surface is cleaned, photovoltaic panels can be directly installed.

### The overall weight of the roof is light

Eliminating the need for fixed aluminum frames for roof conversion support frames and photovoltaic panels greatly reduces costs.

### Low hidden dangers at the overlap

The roof overlap is almost covered by photovoltaic cells for protection, and the hidden dangers will be almost eliminated in the future

### Strong wind resistance

Two dedicated adhesive stickers for fixation and two roof fixtures for double fixation, ensuring double safety

### Thermal insulation and fire prevention

Receiving direct sunlight over the widest possible area is the most efficient way to resist heat transfer

### Efficient power generation capacity

It is the largest use of solar panels covering the roof, with the highest power generation efficiency

## LH-FD-W-UH



(S-0mm)



(S-10mm)



(S-20mm)

### Fire resistance performance

The energy-saving board is made of Class A and B fire-resistant materials, which can effectively protect buildings and reduce fire losses.

### Good sound insulation/water tightness/air tightness

Good sound insulation, limited reduction of external noise interference by 30db. The energy-saving board material is hydrophobic, and all joints between the boards are designed with air tightness guidance

### Beautiful facade

Screw hidden node design, high flatness of the board surface, diverse seam sizes, rich paint coating colors, and long-lasting color consistency

### Thermal insulation performance

Polyurethane with a thermal conductivity between 0.019-0.023 w/m · k is an excellent insulation material. Node design with multiple functional requirements to ensure sealing performance and insulation effect

### Sturdy and durable

The bulk density is about 42kg/m<sup>3</sup>, 120kg/m<sup>3</sup>, and 64kg/m<sup>3</sup>. The three core materials have high strength and long-lasting stability

### LH-FD-W-UHV8



#### Fire resistance performance

The energy-saving board is made of Class A and B fire-resistant materials, which can effectively protect buildings and reduce fire losses.

#### Good sound insulation/water tightness/air tightness

Good sound insulation, limited reduction of external noise interference by 30db. The energy-saving board material is hydrophobic, and all joints between the boards are designed with air tightness guidance

#### Beautiful facade


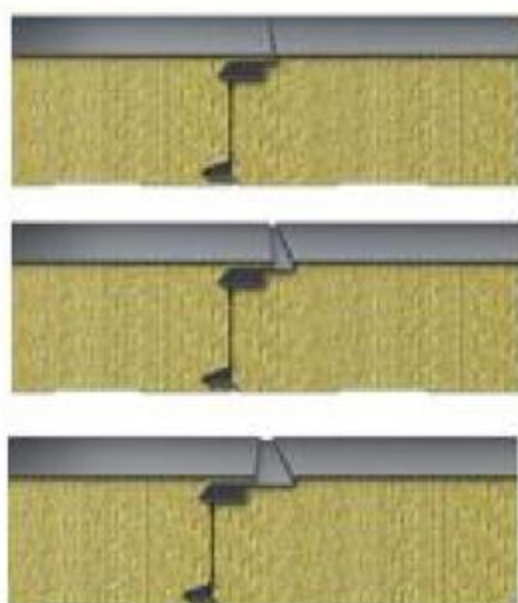


Screw hidden node design, high flatness of the board surface, diverse seam sizes, rich paint coating colors, and long-lasting color consistency

#### Thermal insulation performance

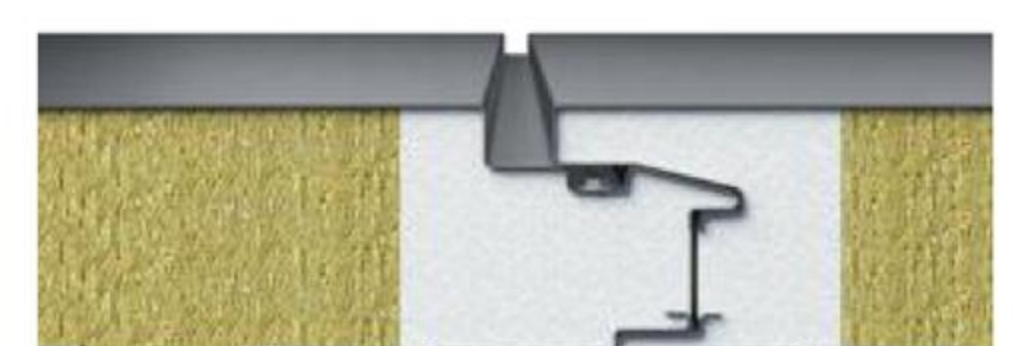
Polyurethane with a thermal conductivity between 0.019-0.023 w/m · k is an excellent insulation material. Node design with multiple functional requirements to ensure sealing performance and insulation effect

#### Sturdy and durable

The bulk density is about 42kg/m<sup>3</sup>, 120kg/m<sup>3</sup>, and 64kg/m<sup>3</sup>. The three core materials have high strength and long-lasting stability

Product Model	Product legend	Application Features
LH-FD-W-SHR	 	Industrial building exterior wall Horizontal division line of facade Hidden nail installation Pure rock wool core material
LH-FD-W-SH15	 	Industrial building exterior wall Facade horizontal/vertical Hidden nail installation 15X15 decorative seam

### LH-FD-W-LHEB



#### Thermal insulation and fire resistance performance

Used for building exterior walls, with superior thermal insulation and fire resistance performance. Color patterned steel plates, aluminum plates, or stainless steel plates can be selected according to environmental requirements

#### Beautiful facade

The width dimensions of the exterior wall facade with a flat, smooth, elegant, and strong metallic texture can provide designers with different arrangement and segmentation effects

#### Easy construction

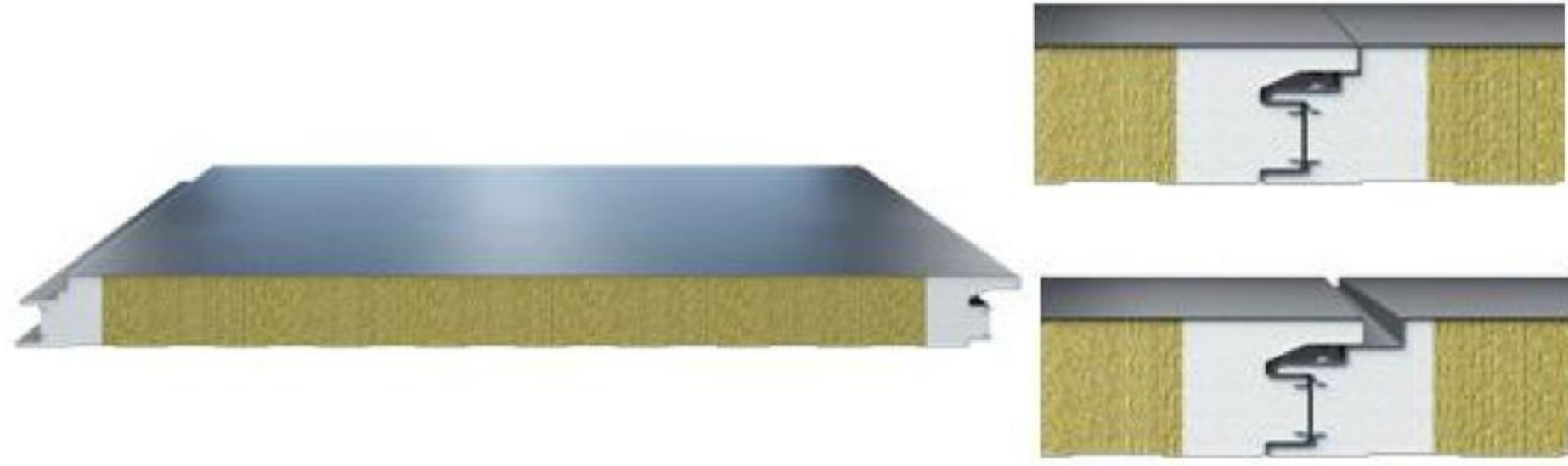
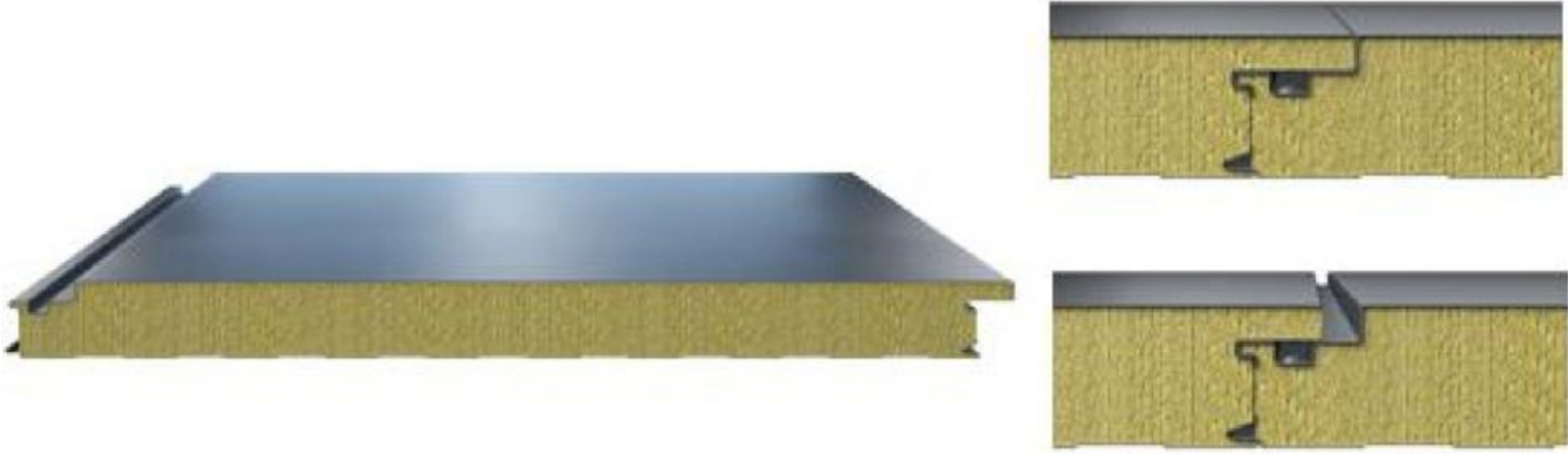
The construction process is simple, on-site installation is not prone to errors, and the construction efficiency is high

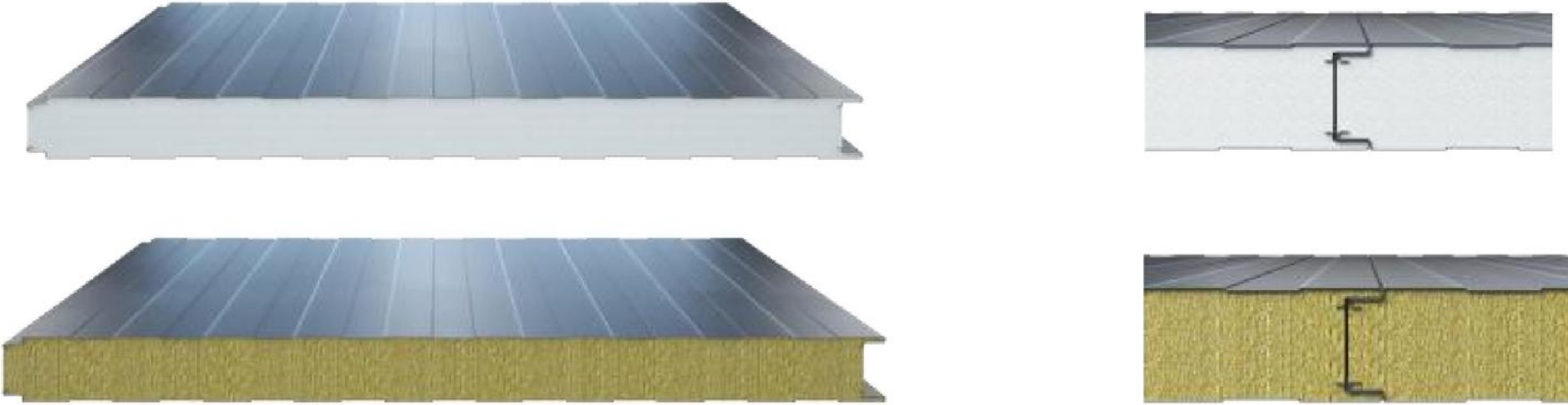
#### Interface connection

Tongue shaped bite groove connection; Non silicone resin joint connection on both sides

#### Beautiful and environmentally friendly

According to the functional requirements of the building, the selection of core materials can be matched to meet the needs of functionality, aesthetics, environmental protection, and economy

Product Model	Product legend	Application Features
LH-FD-W-UHEB		<ol style="list-style-type: none"> <li>1. Building energy-saving exterior wall</li> <li>2. Horizontal/Vertical Installation</li> <li>3. Adjustment of segmentation seam size</li> </ol>
LH-FD-W-SHEB		<ol style="list-style-type: none"> <li>1. Hidden nail installation</li> <li>2. Dry seal with EPDM rubber strip in the middle seam</li> <li>3. End fold sealing</li> </ol>

Product Model	Product legend
LH-ID-CW-US	

**Good self-supporting performance**

Can be used for interior walls and ceilings in buildings, as well as for walls in mobile container houses

**Good airtightness**

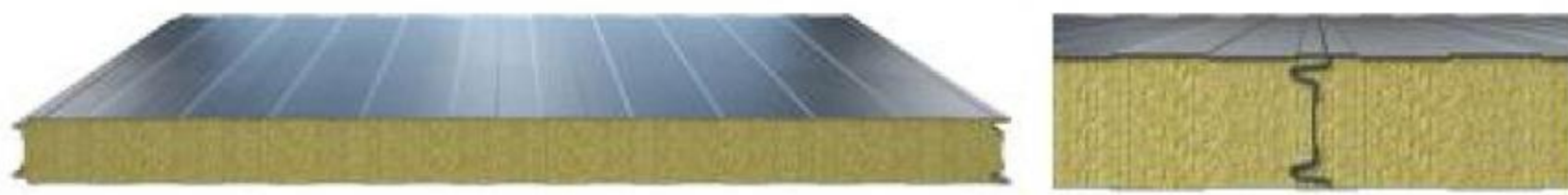



The requirement for airtightness can be met by sealing the docking interface.

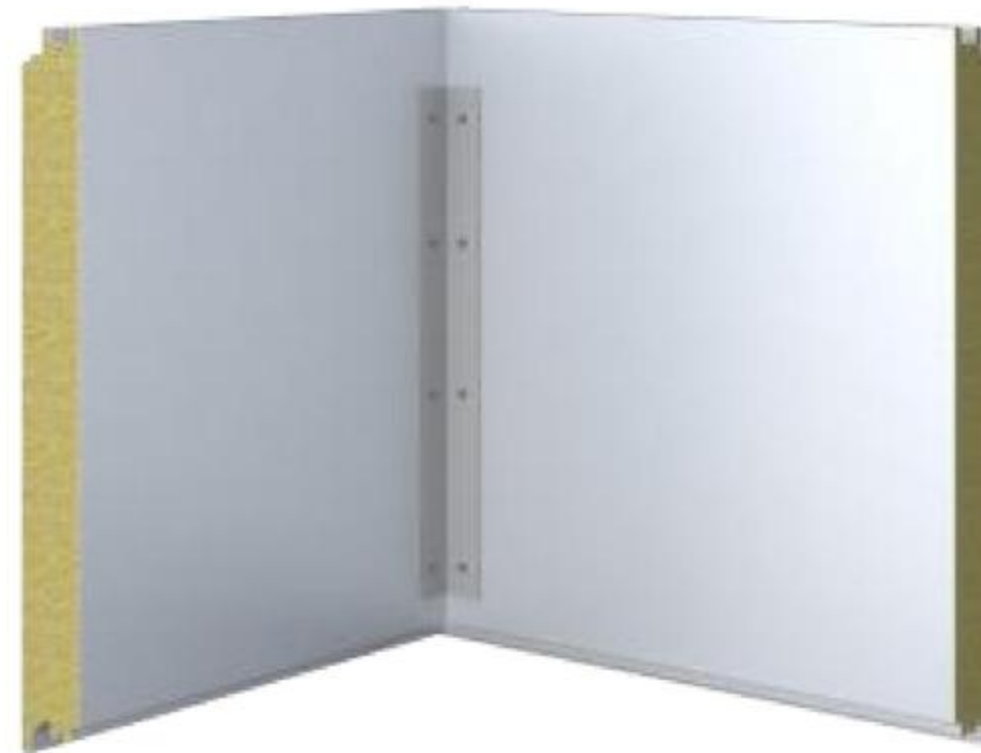
**Broken Cold Bridge**

Pure polyurethane or pure rock wool can cover and bond the core material well at the interface.

**Surface layer selection**

Based on customer preferences and functional selection, it can fully meet the needs

Product Model	Product legend	Application Features
LH-ID-CW-MS		<p>In terms of energy-saving and fire prevention applications for interior and exterior walls, it fully meets the functional and economic needs</p>
Australian style socket composite panel/ Australian style Z-shaped locking wall panel		
Flat socket composite panel/ flat mouth 1000/1200 type metal wall panel		
LH-ID-CW-USS		



### Application Features

Acoustic panel: Acoustic panels have the advantages of sound absorption, environmental protection, flame retardancy, thermal insulation, moisture resistance, mold resistance, easy dust removal, easy cutting, easy construction, good stability, good impact resistance, good independence, high cost-effectiveness, etc. There are a variety of colors to choose from, which can meet the needs of different styles and levels of acoustic decoration, with a thickness of 50-100 millimeters. In order to maintain the overall shape of the building and reduce the treatment of edge joints, Liaohe provides solutions for overall corners and circular scoop corners. The L corner does not exceed the transportation height limit on one side, and can be processed in sizes of 200-12000 per strand. The U-shaped corner is used to retract window nodes, and the single wing edge size considers transportation limitations of 200-12000. The radius of the arc corner is greater than 1000, and the details of the community will be customized according to the actual project.

LH-CS-CW-U



LH-CS-CW-M



#### Superior insulation performance

Adopting high-pressure continuous foaming technology, the foam is evenly and densely foamed, with extremely low water absorption rate, which can effectively hinder the penetration of water vapor and thus exert its excellent thermal insulation performance

#### Leading Pentane Technology

Using fluorine free raw materials for one-time high-pressure foaming, without producing fluorocarbons, with zero greenhouse effect and no pollution to the environment

#### Easy and fast installation

Prefabrication and molding of sheet metal in the factory, mature installation system design, meeting all-weather construction requirements, shortening installation cycle, reducing labor costs and material losses

#### Good fire resistance performance

Polyurethane rigid foam has excellent fire resistance when combined with metal surface materials, which can further improve its flame retardant performance

#### Exclusive airtightness/energy saving, consumption reducing and environmental protection

Eliminate the "cold steam bridge", greatly improve the airtightness performance, make it more suitable for controlled atmosphere storage, strictly follow national and industry environmental standards, make the cold storage body organic, and reduce consumption

## Production system

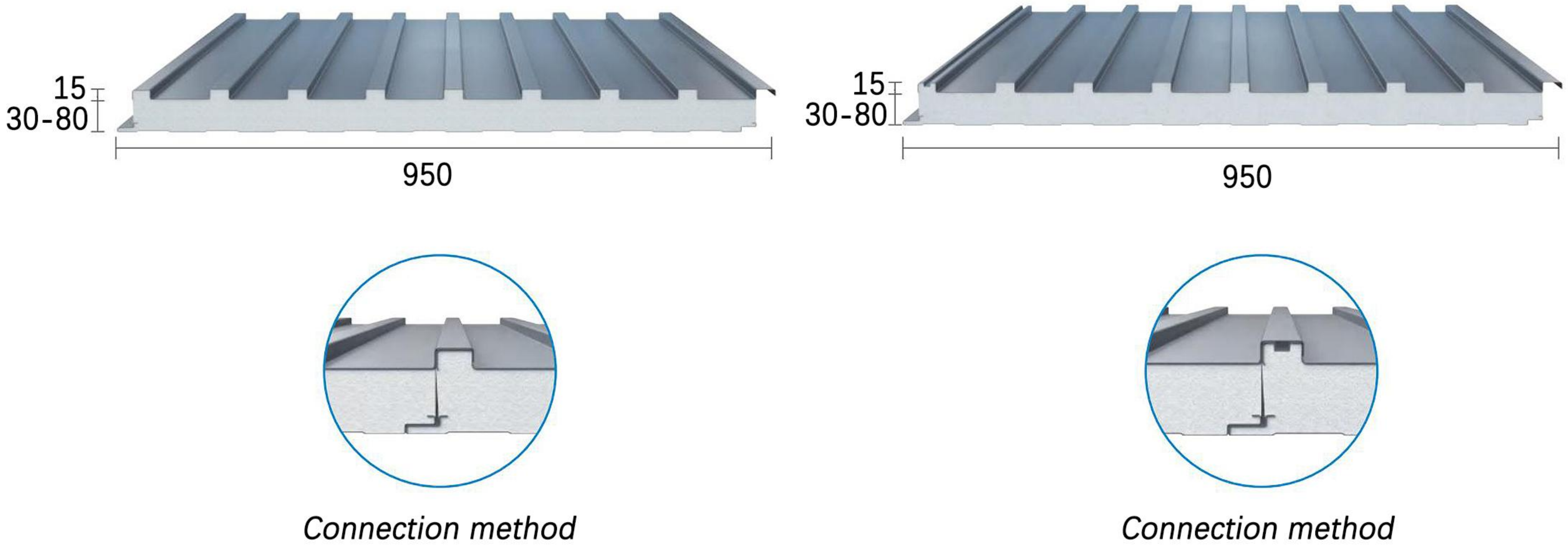
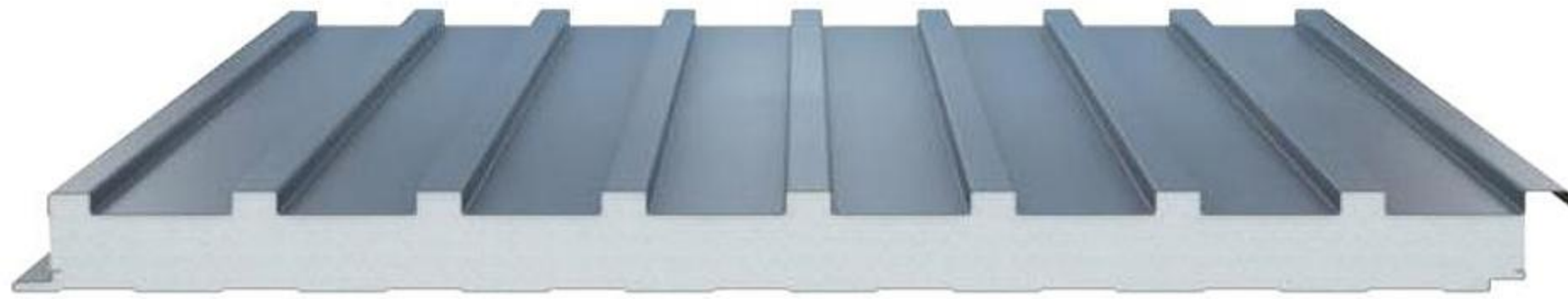


Table of unsupported span and thermal performance selection for Liaohe roof Great Wall slab

Plate thickness	Square weight	Shear modulus G	Supporting conditions	Heat transfer coefficient
mm	kg/m <sup>2</sup>	Mpa	Span condition	W/m <sup>2</sup> ·k
30-80	5	1.91	Double	0.69
Load (KN/m <sup>2</sup> )/allowable purlin distance (mm)				
0.5	0.7	1.0	1.2	1.5
2200	1900	1600	1400	1200

Note: The data in the table is calculated based on a core material of polyurethane 40kg/m<sup>3</sup>, with an outer plate of 0.6mm thick aluminum plate and an inner plate of 0.5mm thick aluminum plate

## Product parameters

Type and model	LH-FD-R-LapGW				Application scenarios	
Roof Great Wall Board					Roof Great Wall Board (Sunshine Room)	
Substrate thickness (steel)	Outer layer	0.3-0.8mm	Inner layer	0.3-0.8mm		
Substrate thickness (aluminum)	Outer layer	0.3-1.0mm	Inner layer	0.3-1.0mm		
Surface profiling	Outer layer	Profiling	Inner layer	Flat		
Core material	Polyurethane					
Supply price	Width	950mm	Thickness	30-80mm	Length	Customizable
Seam width	Lapped joint					
Thermal conductivity	0.024					
Fire rating	Class B1 GB8624-2012					
Raw material brand	Polyurethane: BASF, Huntsman, Wanhua Steel coils: Baosteel, Bosige, Yehui, Guanzhou Aluminum coils: medium aluminum, southwest aluminum					

## Roof panel construction diagrams



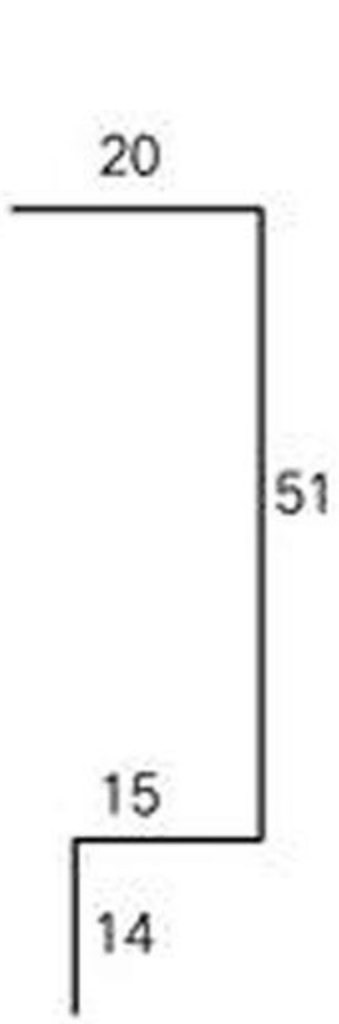
Outer spine I



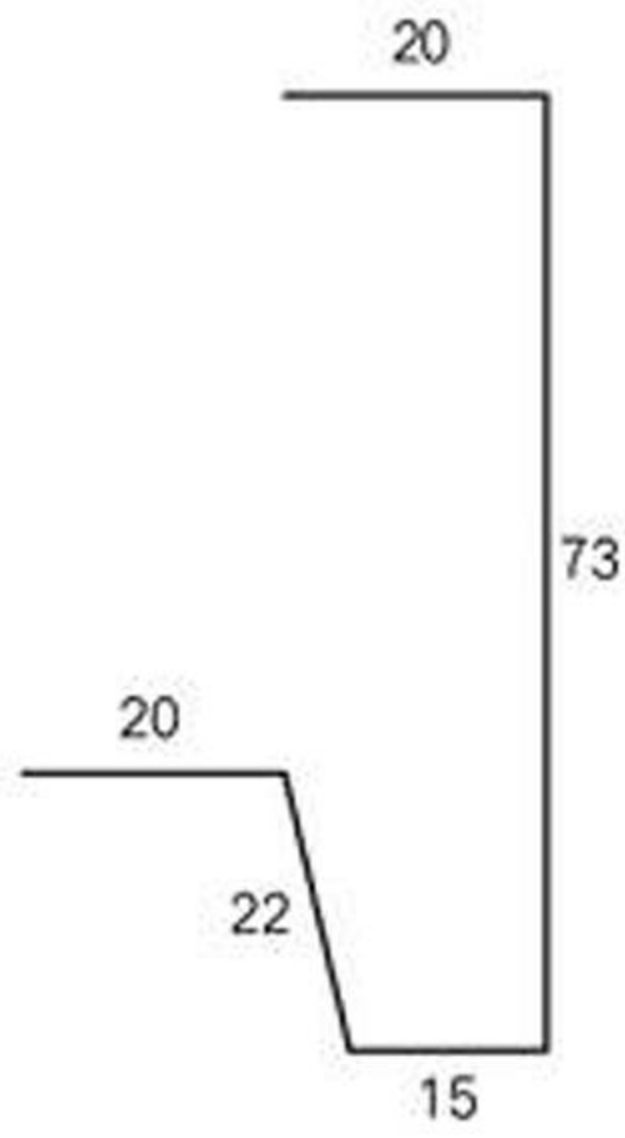
Outer spine II



Inner ridge



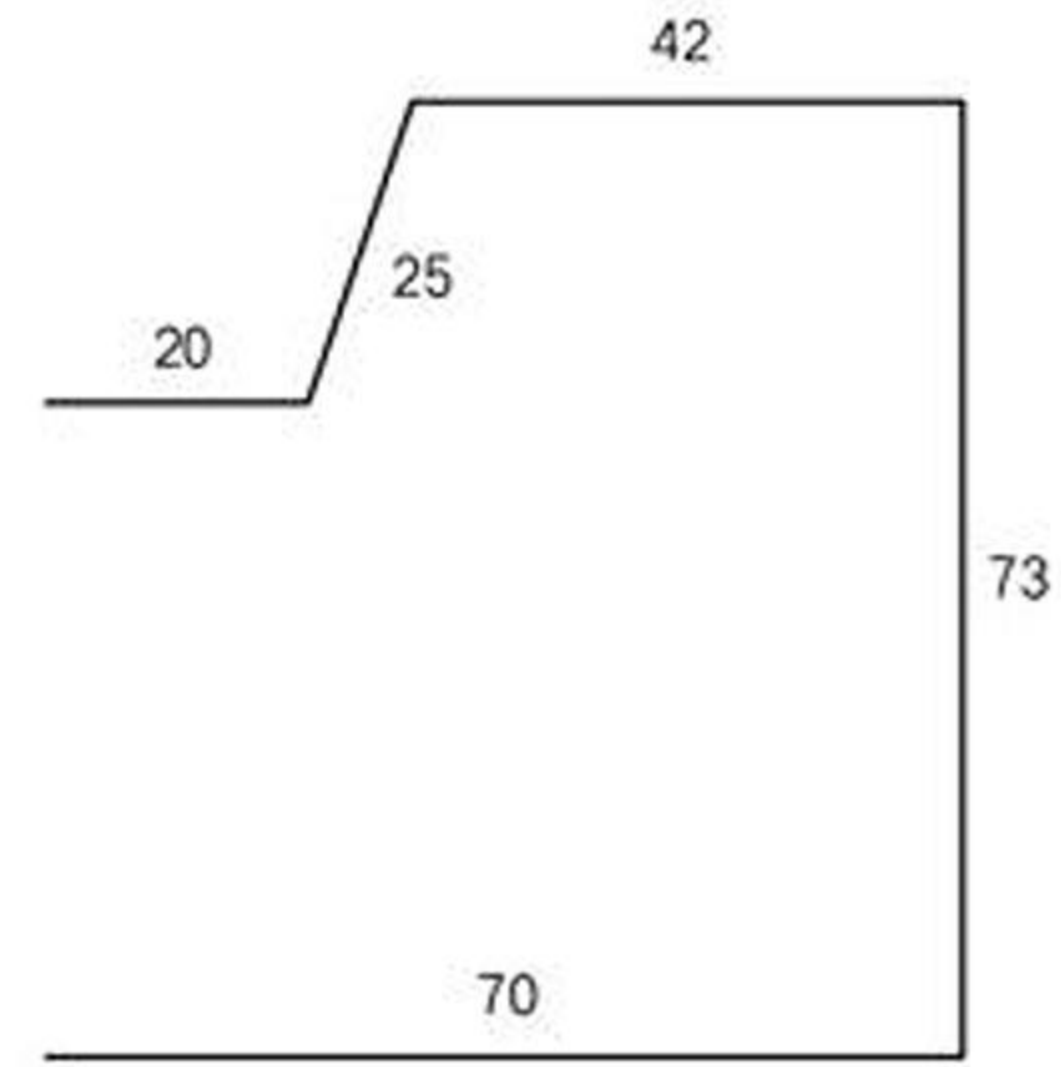
Drip line I



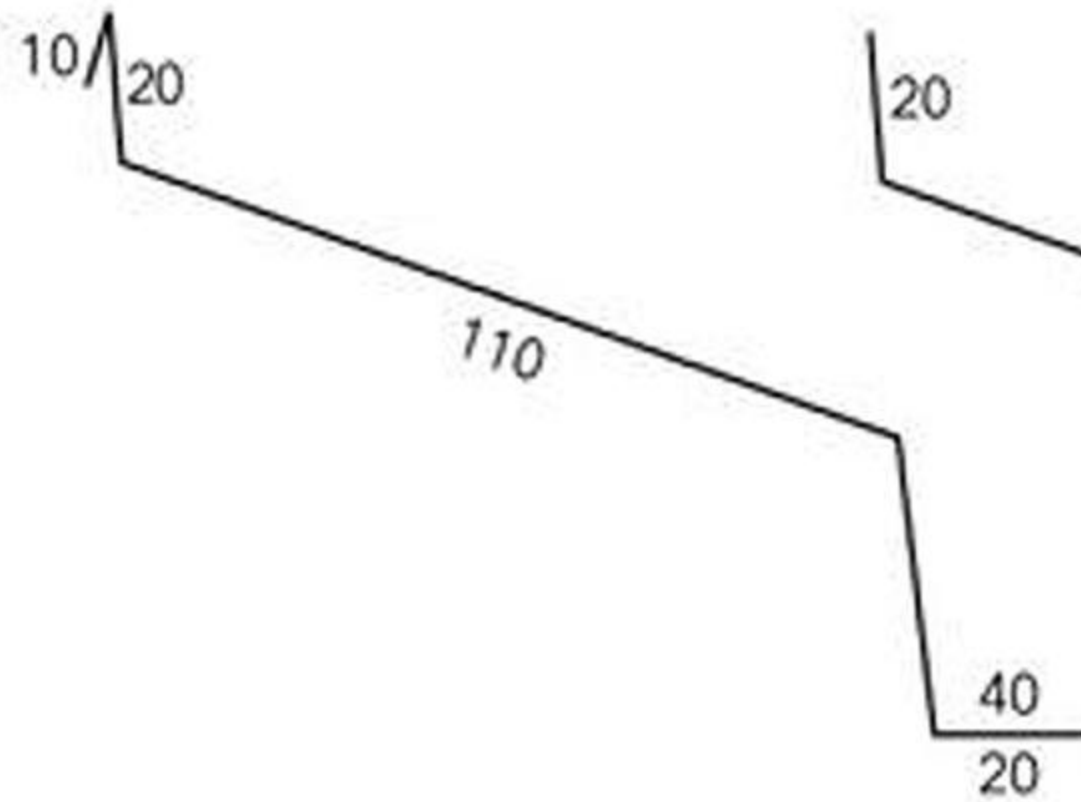
Drip line II



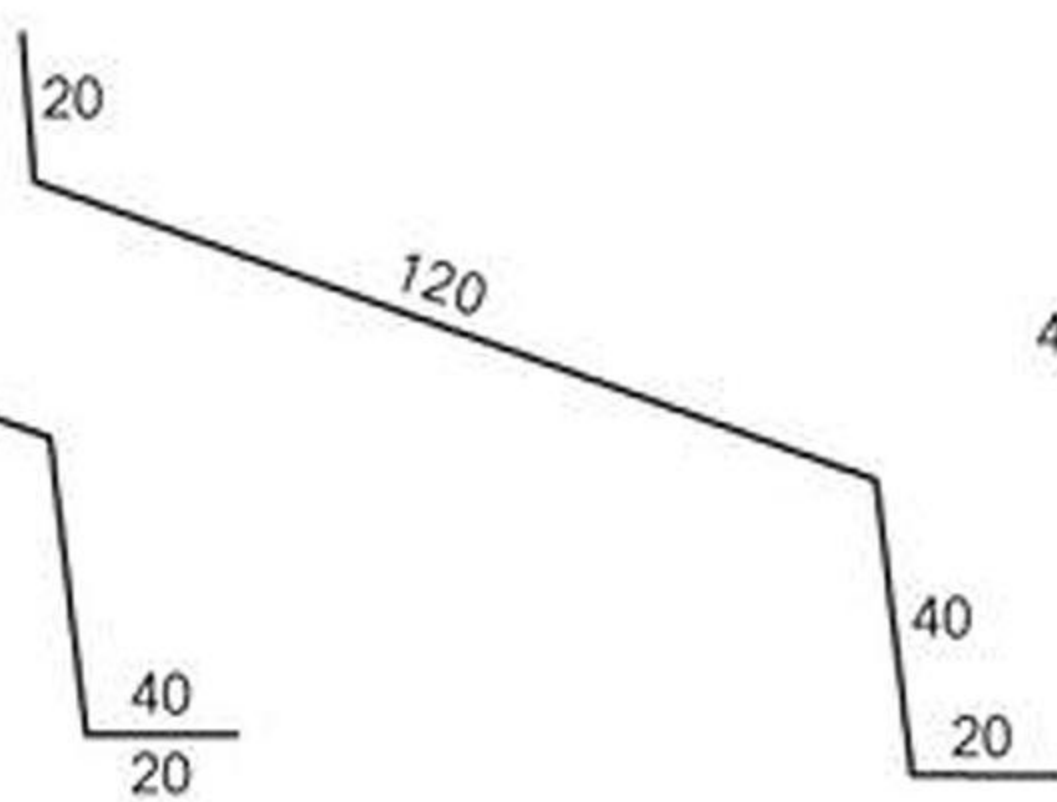
Sealing groove I



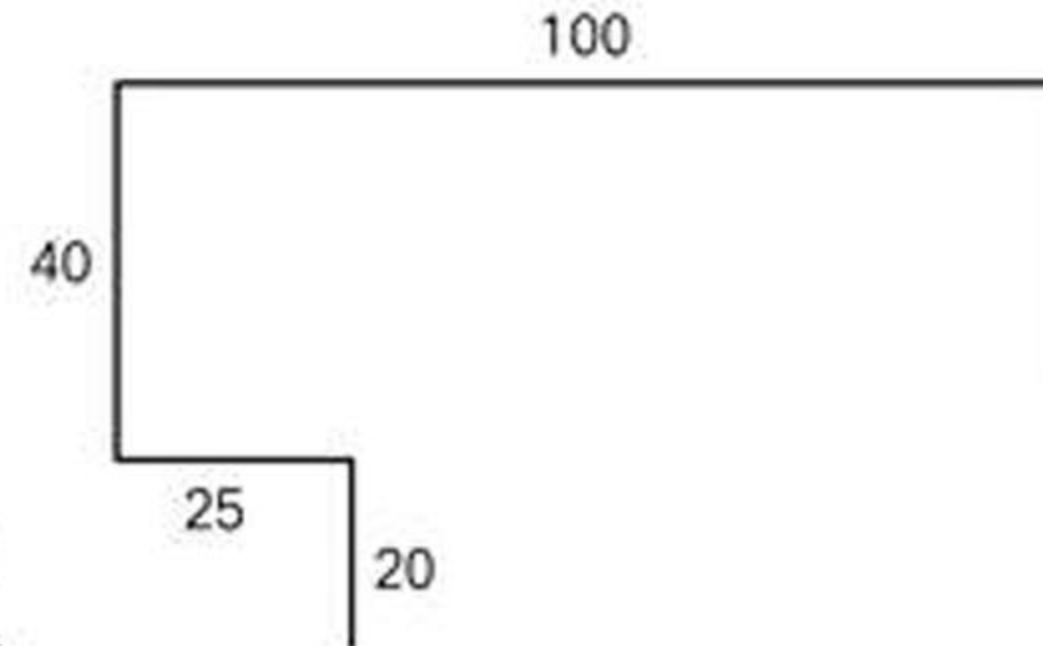
Sealing groove II



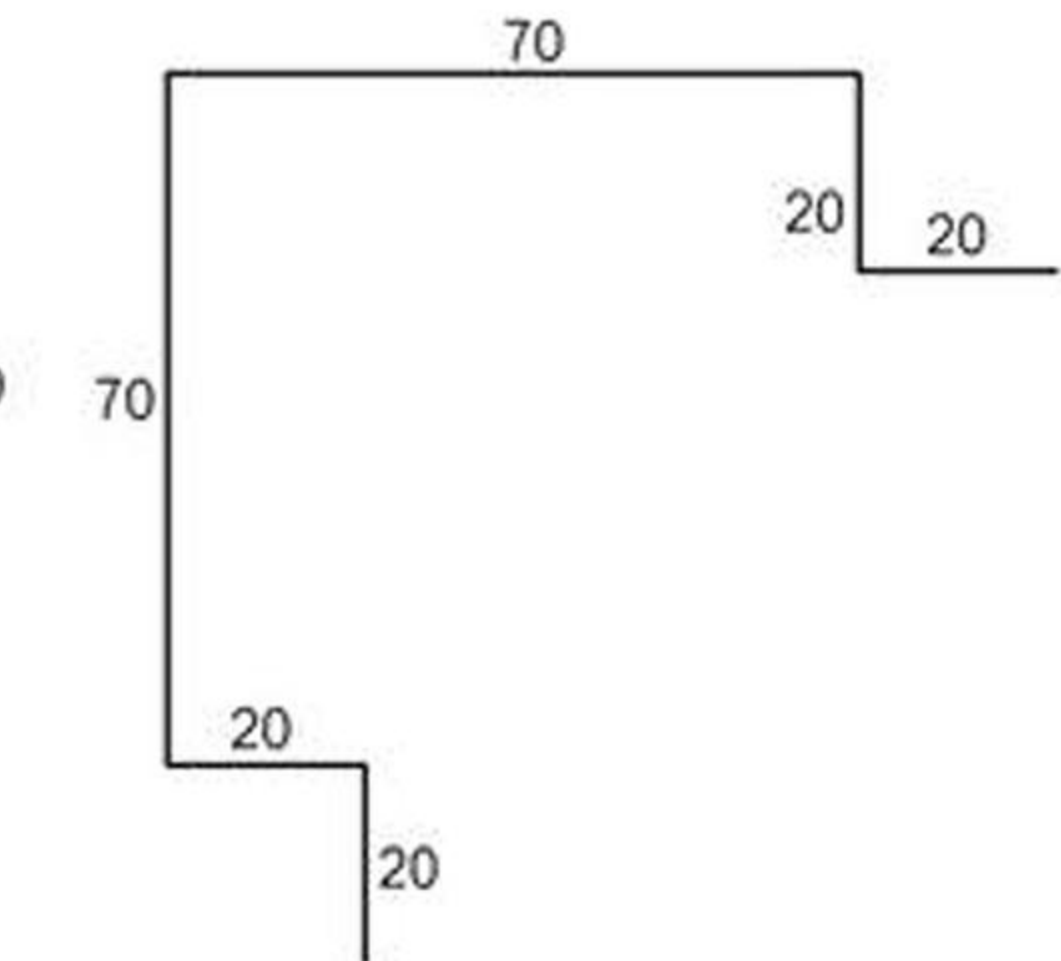
Flashing I



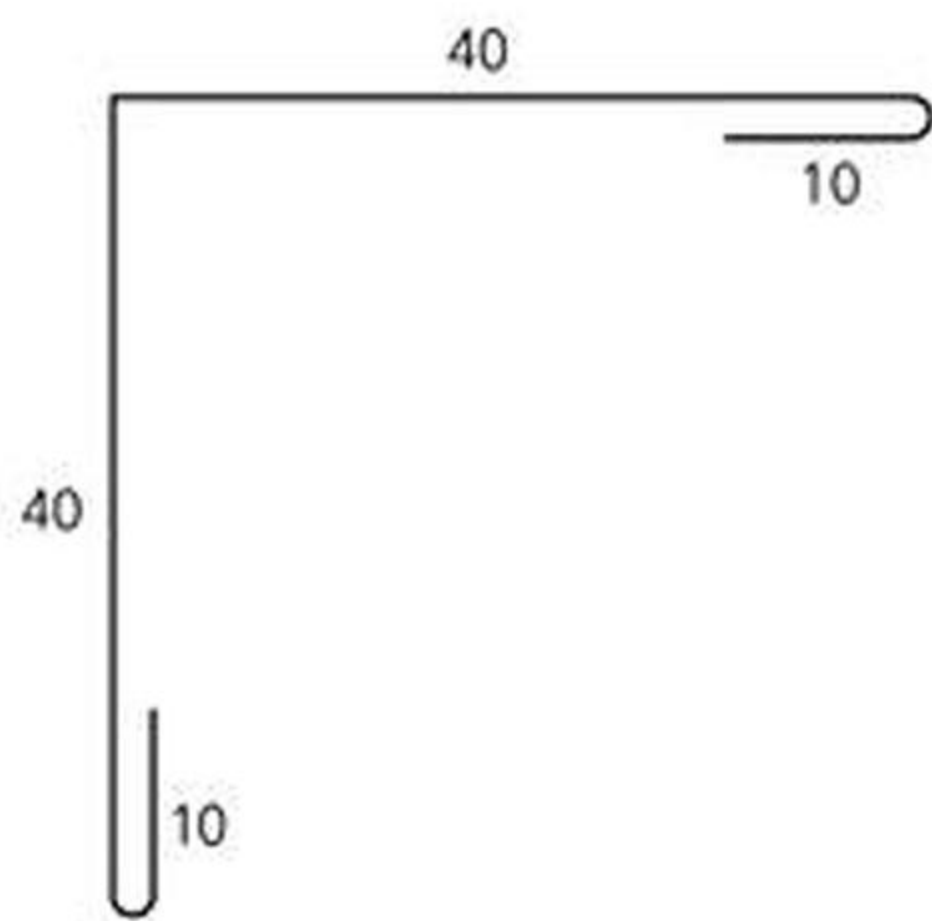
Flashing II



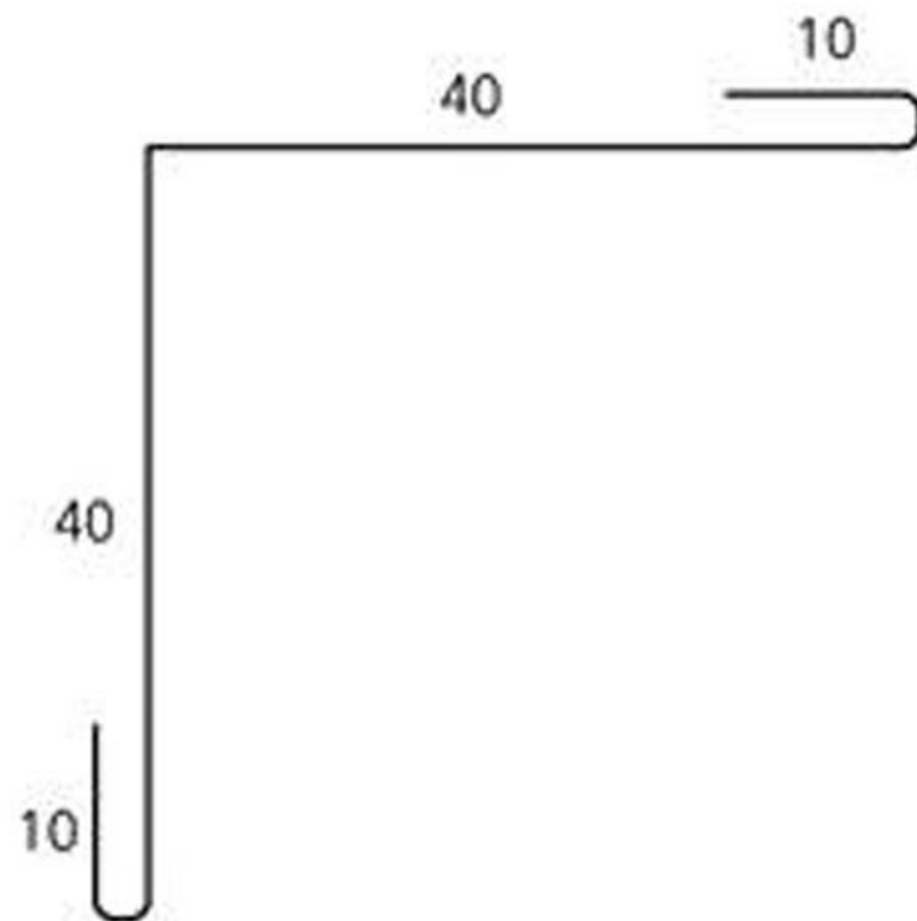
75 window line



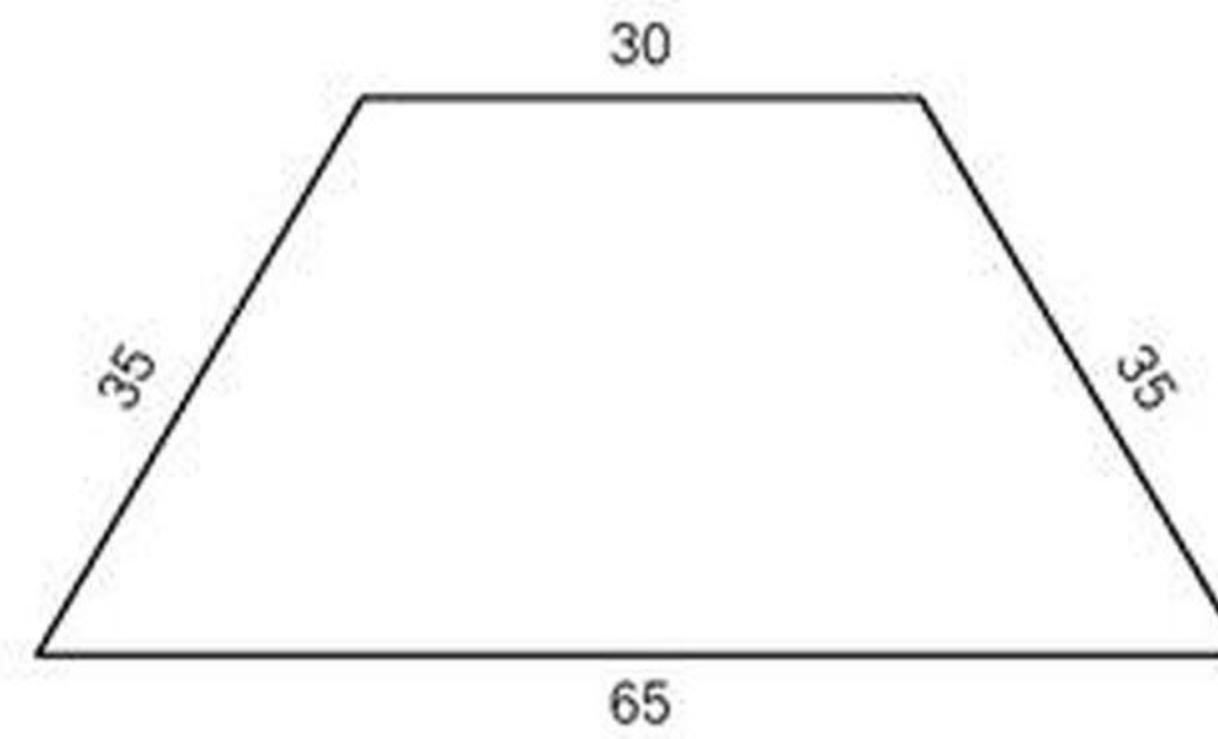
50 sealing corners



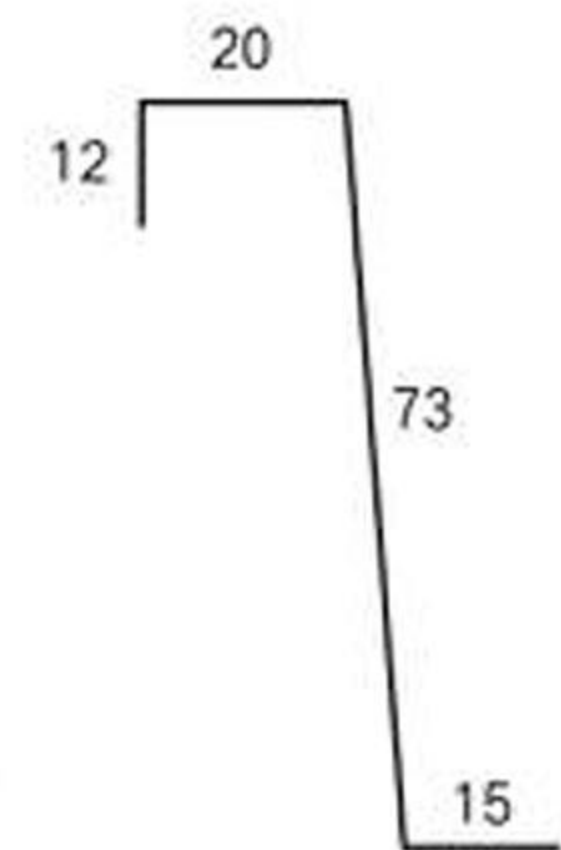
40\*40 External angle



40\*40 Interior angle



Box



50 galvanized buckle

## Corrugated metal sheets

Unit:mm

430 type vertical locking edge roof tiles

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
No	0.15-0.8	2	1	65	430	600

Unit:mm

470 type concealed buckle colored steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
No	0.15-0.8	2	1	66	470	600

Unit:mm

750 type trapezoidal color steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width
3	0.15-0.8	7	1	35	750

Unit:mm

760 type angle Chi color steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	3	1	76	760	1000

Unit:mm

820 type angle Chi color steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	3	3	54	820	1000

Unit:mm

840 type color steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	5	1	25	840	1000

## Corrugated metal sheets

Unit:mm

840 type color steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	5	1	25	840	1000

Unit:mm

470 type concealed buckle colored steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	5	1	25	840	1000

Unit:mm

840 type antique colored steel glazed tiles

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	6	1	28	840	1000

Unit:mm

900T color steel tile

Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
2	0.15-0.8	5	1	15	900	1000

Unit:mm

850 arc-shaped color steel tiles

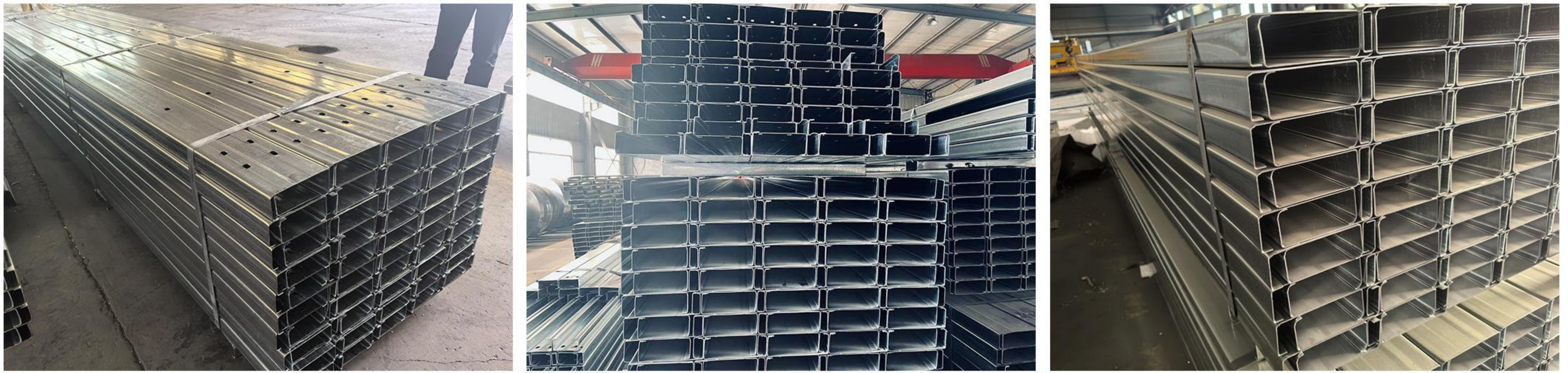
Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
No	0.15-0.8	14	1	14	850	1000

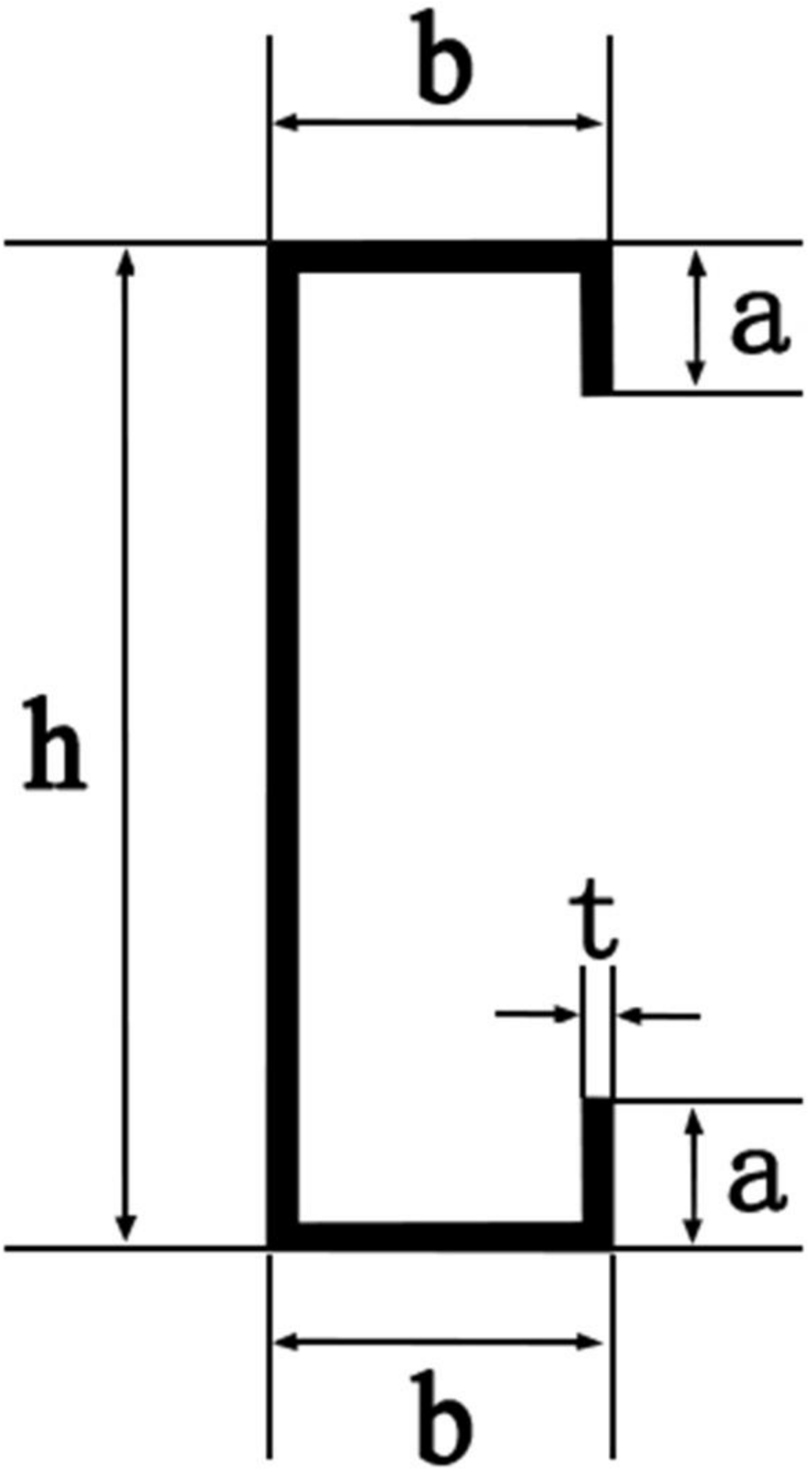
Unit:mm

950 type wall color steel tiles

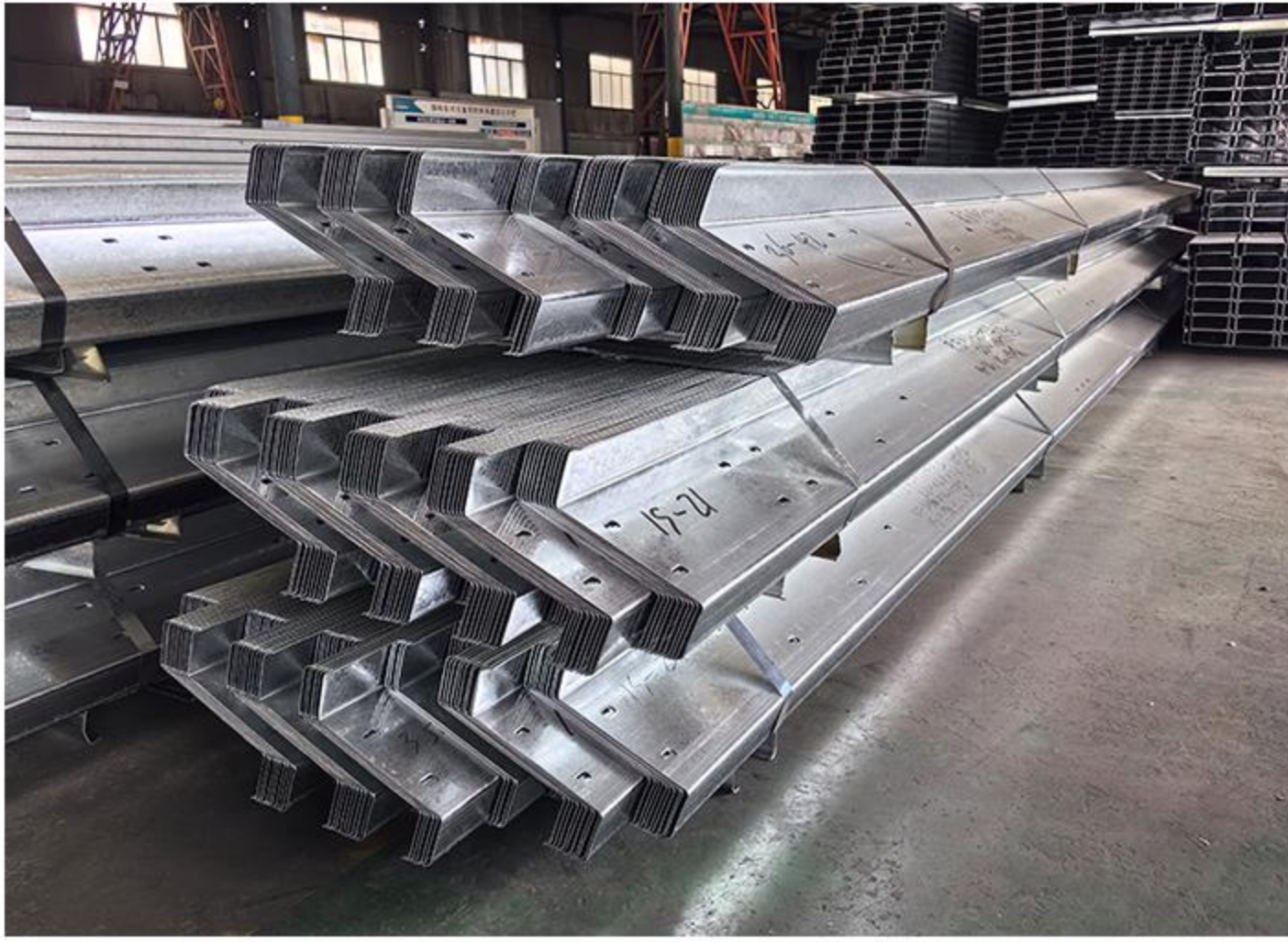
Ribs	Thickness	Wave No.	Layers	Wave height	Effective width	Total width
1	0.15-0.8	5	1	35	950	1200

## C-shaped steel

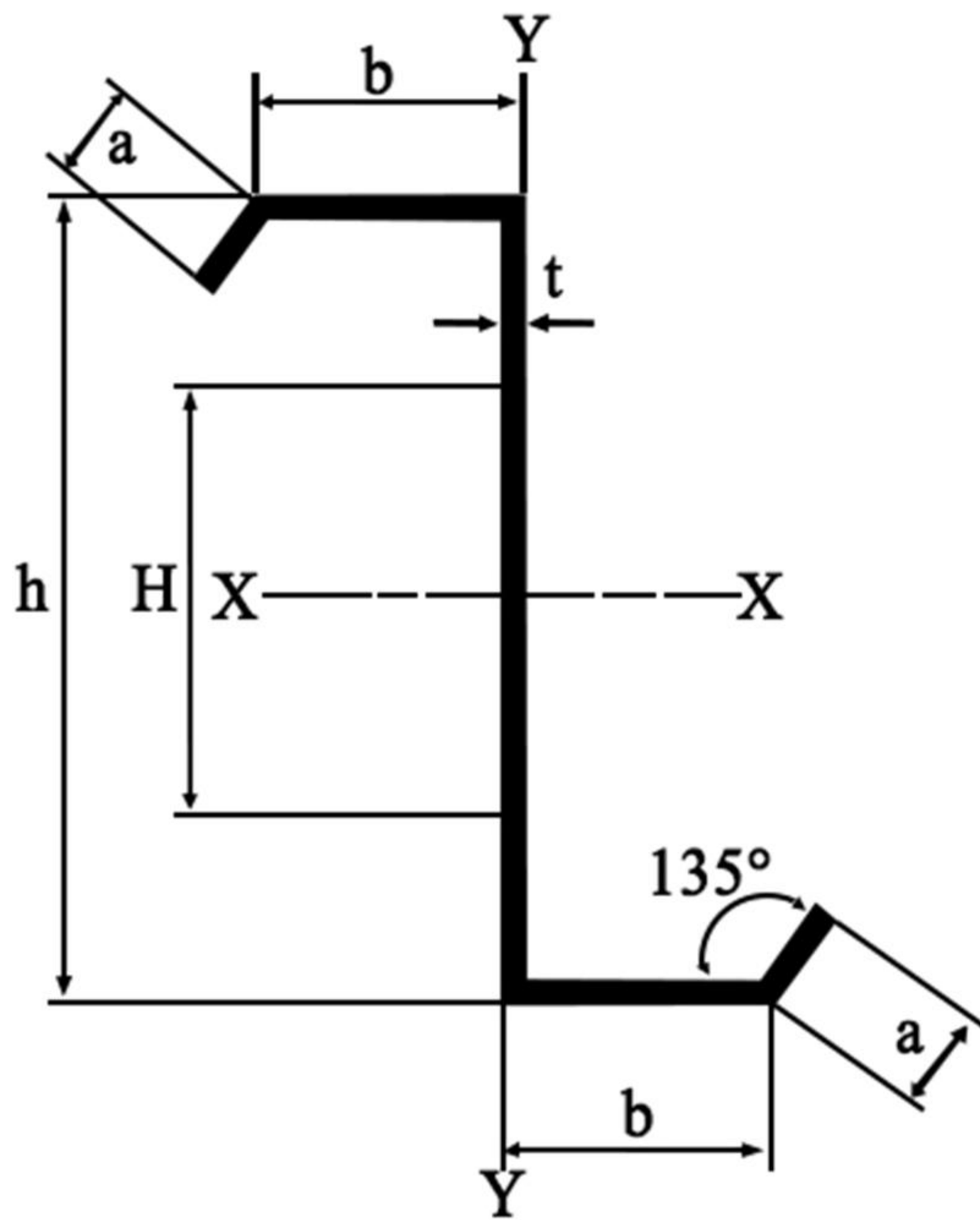


C Type Steel	Model	Specifications			
		h (mm)	b (mm)	a (mm)	s (mm)
	C80	80	40	20	1.6~3.2
	C100	100	40	20	1.6~3.2
	C120	120	40/50/60	20	1.6~3.2
	C140	140	50/60	20	1.6~3.2
	C150	150	60	20	1.6~3.2
	C160	160	50/60	20	1.6~3.2
	C180	180	60/75	20	1.6~3.2
	C200	200	60/70	20	1.6~3.2
	C220	220	60/70	20	1.6~3.2
	C240	240	70/75	20	1.6~3.2
	C250	250	75	20	1.6~3.2
	C260	260	75	20	1.6~3.2
	C280	280	80	20	1.6~3.2
	C300	300	100	20	1.6~3.2
	C320	320	100	20	1.6~3.2
	C340	340	110	20	1.6~3.2
C350	350	120	20	1.6~3.2	

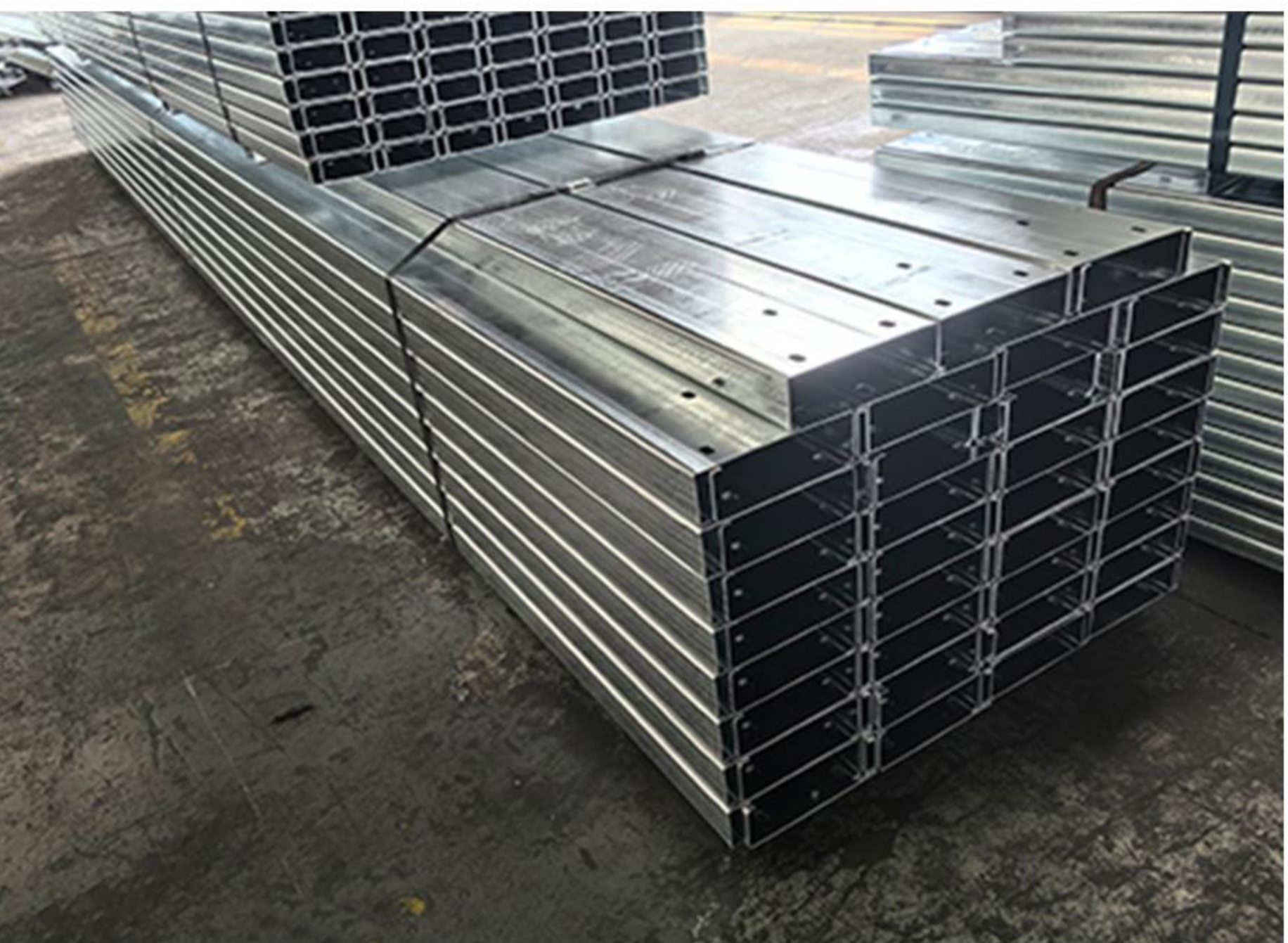
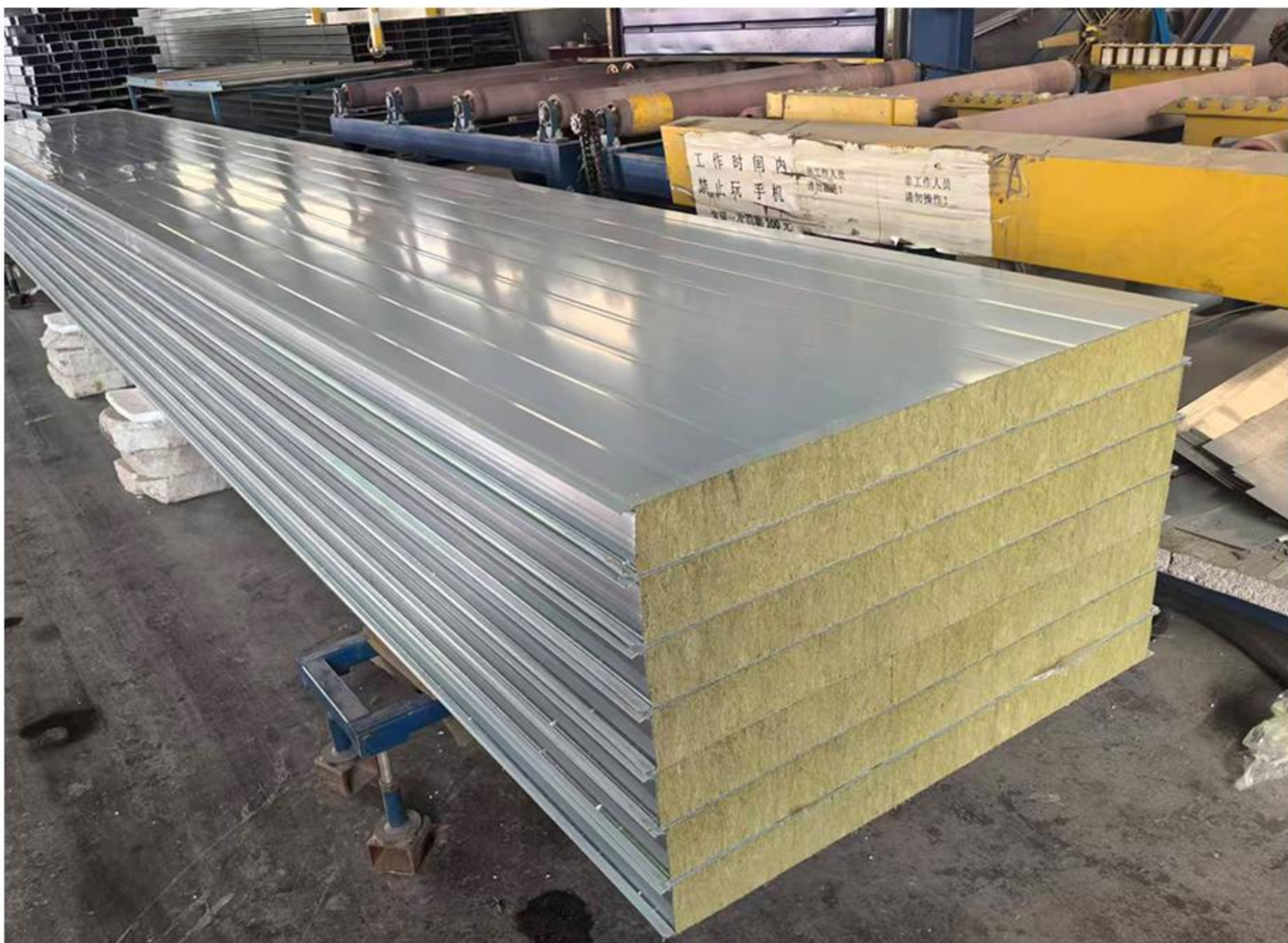
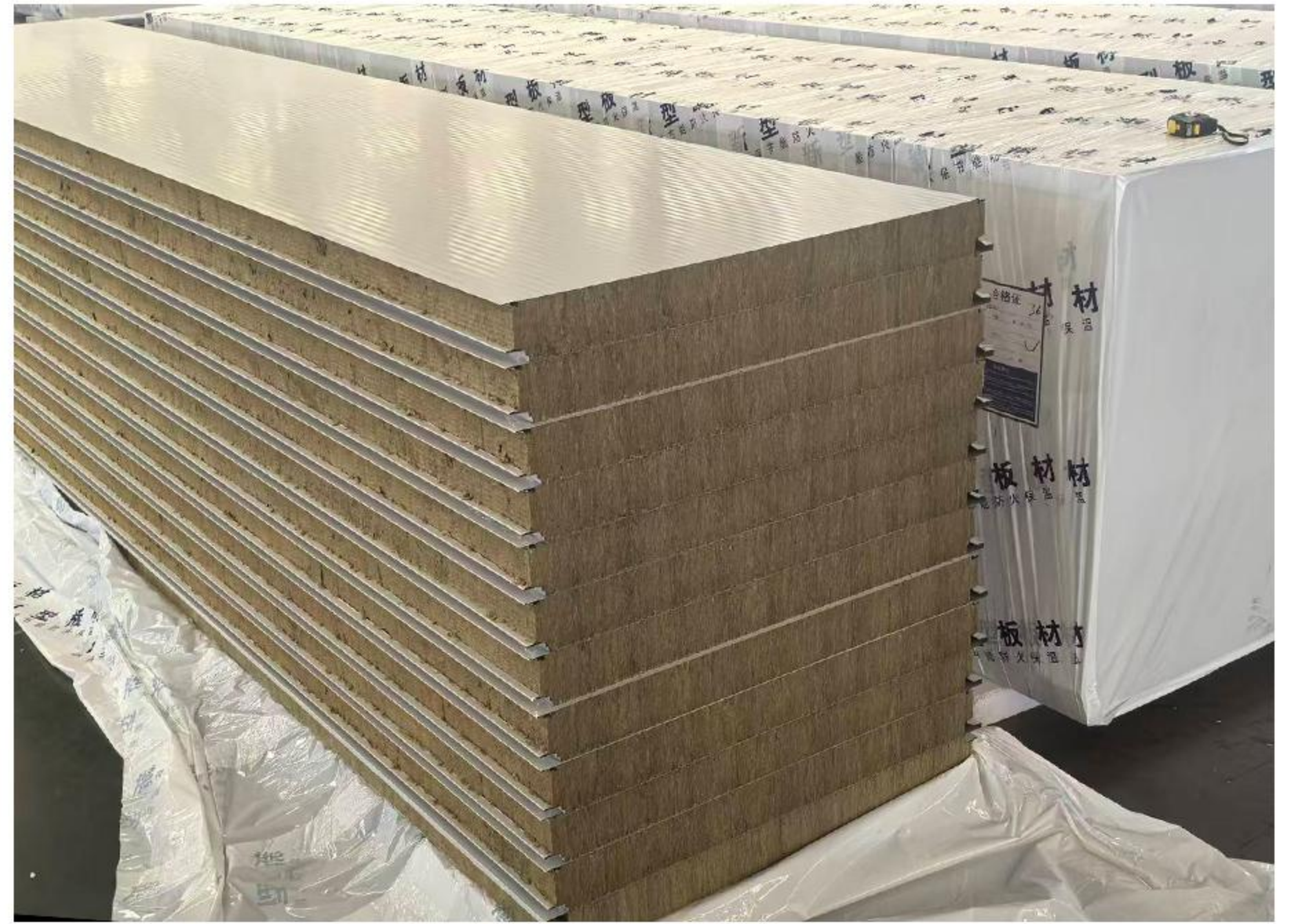
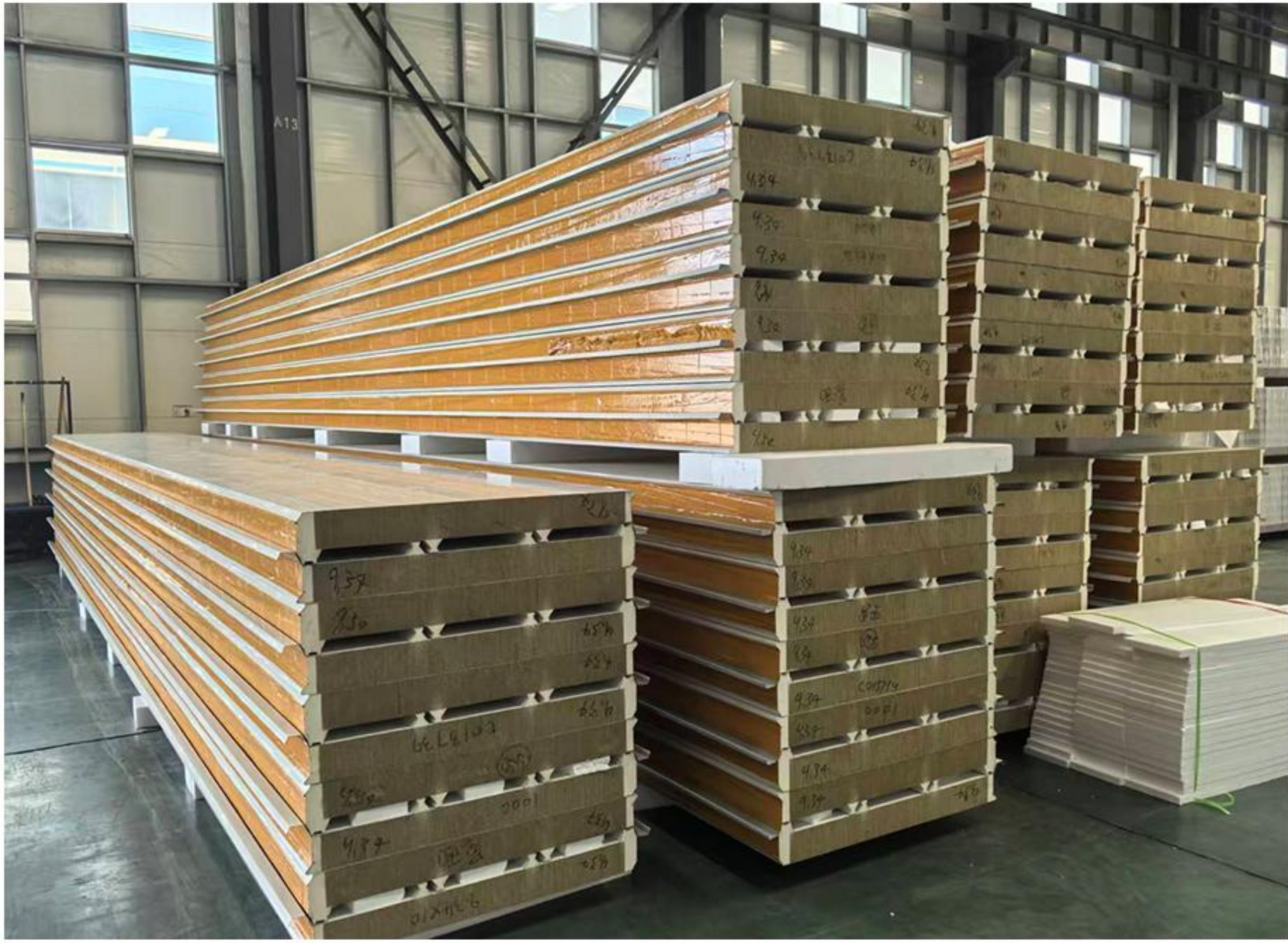
## Z-shaped steel



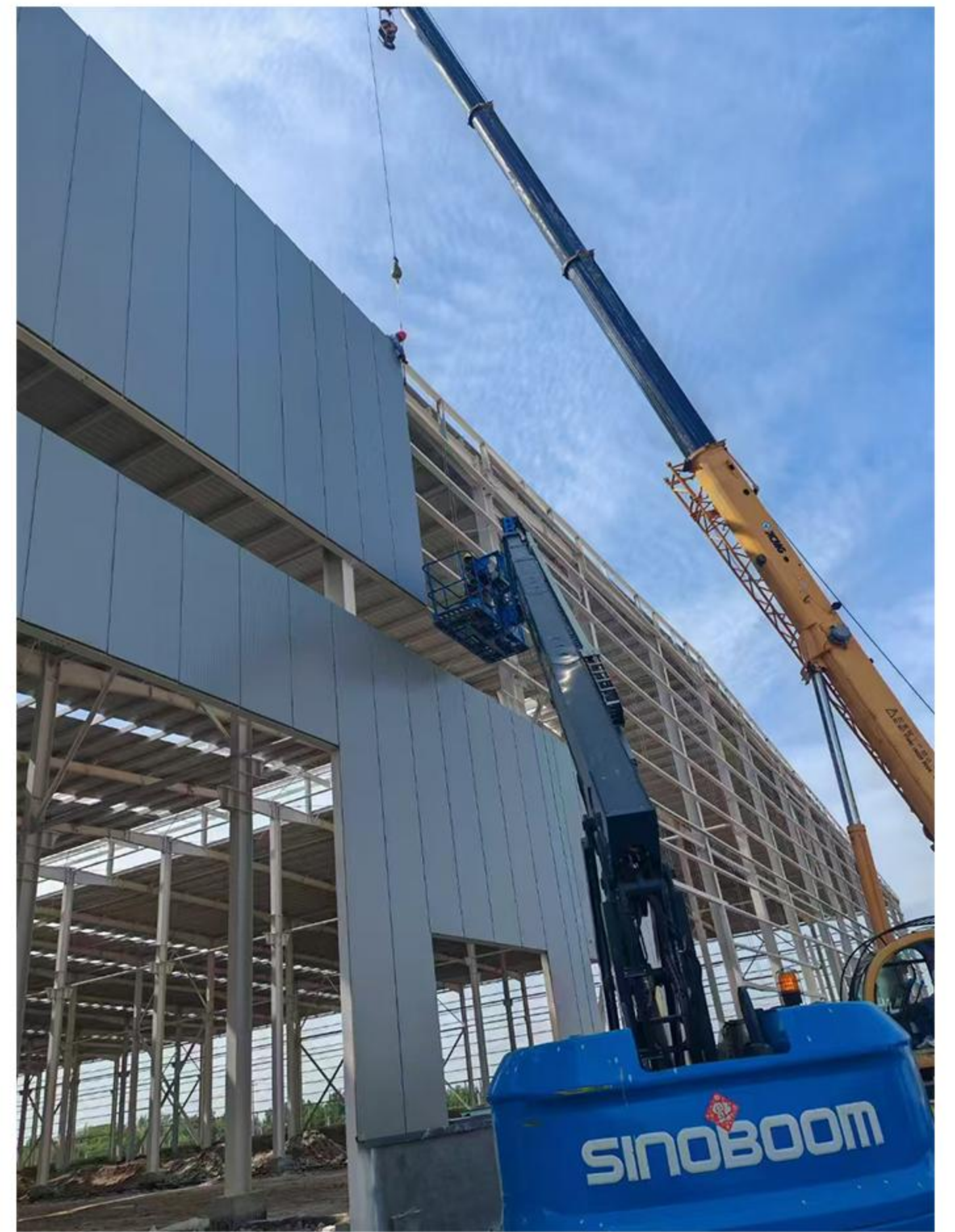
Z Type Steel	Model	Specifications			
		h (mm)	b (mm)	a (mm)	s (mm)
	Z100	100	40	20	1.6~3.2
	Z120	120	50	20	1.6~3.2
	Z120	120	60	20	1.6~3.2
	Z140	140	50	20	1.6~3.2
	Z150	150	60	20	1.6~3.2
	Z160	160	60	20	1.6~3.2
	Z160	160	70	20	1.6~3.2
	Z180	180	60	20	1.6~3.2
	Z180	180	70	20	1.6~3.2
	Z200	200	60	20	1.6~3.2
	Z200	200	70	20	1.6~3.2
	Z220	220	60	20	1.6~3.2
	Z220	220	70	20	1.6~3.2
	Z240	240	60	20	1.6~3.2
	Z240	240	75	20	1.6~3.2
	Z250	250	75	20	1.6~3.2
	Z300	300	100	20	1.6~3.2
	Z350	350	120	20	1.6~3.2



## Packaging and Transportation



Project presentation





山东辽河

SHANDONG LIAOHE