



For green world

# Product manual



## Henan Panels Industry Co.,Ltd

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*Sandwich Panel Professional Manufacturer*

# Industrial Building Insulation Sandwich Panel

Build For Stronger  
Build For More Perfect  
Make The World More Environmentally

# PNS



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## Company Profile:

Henan Panels Industry Co.,Ltd headquartered in Zhengzhou,China. Currently has total assets of 300 million RMB, more than 200 employees, and annual production capacity of 1.2 million square meters of sandwich panels. The products are sold in more than 20 provinces and cities nationwide and exported to more than 60 countries, including Russia, Australia, New Zealand, United Kingdom, France, Cambodia, Peru, Brazil and other countries.

The company introduced international advanced level composite panels (including polyurethane and rock wool) automatic continuous production line from Bradbury Group Italy PUMA , with a production capacity of up to 10m/min. Mainly produce all kinds of new types of sandwich panels, for example, PIR/PU( polyurethane) sandwich panels, rock wool/glass wool sandwich panels. Including R&D, production, sales, technical guidance, and import and export business,with the growth of more than 15 years, the company has taken the lead in obtaining ISO9001 quality certification,ISO14001 environmental management system certification, OHSAS18001 occupational health system certification and CE certification.

## How to Ensure Product Quality?

- **Advanced Production Equipment** : At present, the second set fully imported automatic continuous production line we have invested has started production,it is globally advanced six-component continuous foaming technology .
- **Extra Long Double Crawler Machine**: 32m long double crawler machine to make the polyurethane foam thermalization more fully, panels looks beautiful and flat.
- **Well-known Supplier**: Shanghai Baosteel,Taiwan Yehui, Bayer AG, BASF AG,Yantai Wanhua, America Huntsman, other high-end supplier to ensure product more insulation and durability.
- **15 Professional Designers and Technicians** to ensure 100% timeliness and effectiveness.
- **Export Business Team with 10 Years of Experience**: efficient communication, fast shipment arrangements, and 24-hour online overseas after-sales service.



Automatic decoiler equipment



Forming machine



Forming machine



Double crawler curing



Automatic cutting machine



Sucker automatic palletizing system



Drying equipment



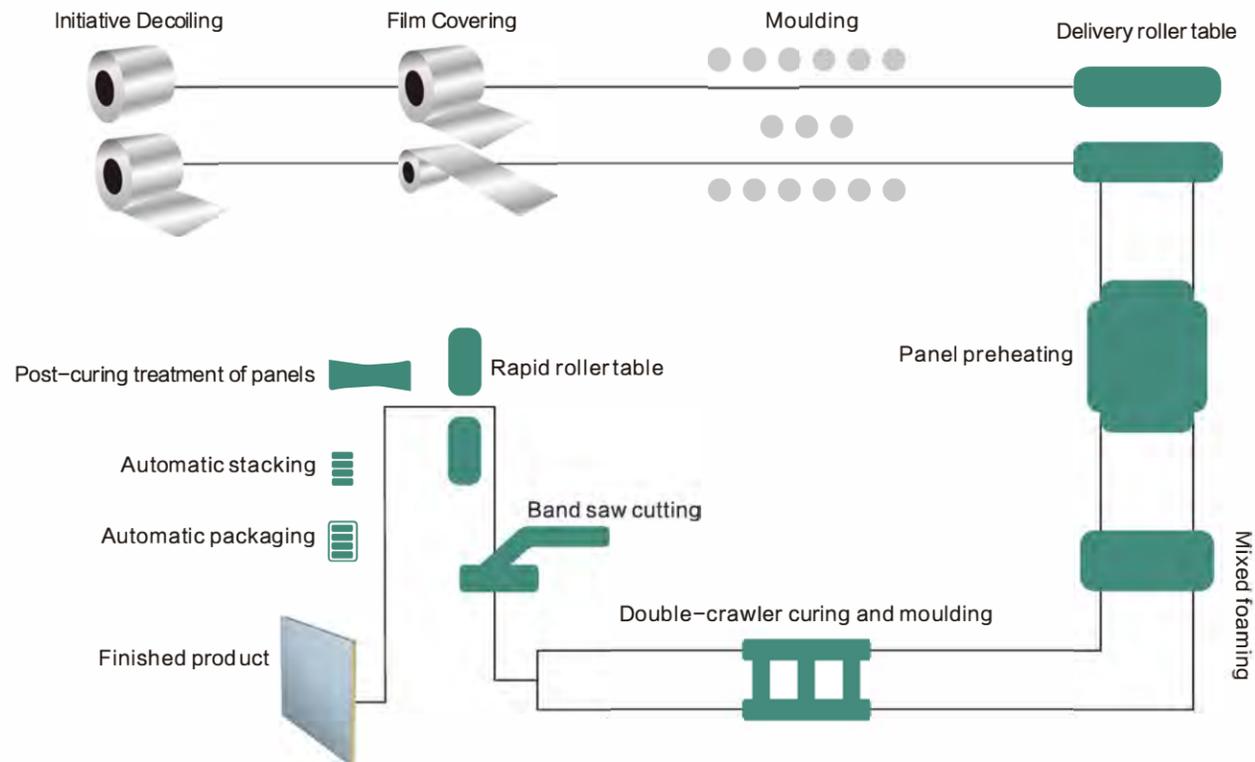
Fully automatic packing system



Six-component foaming system



### Process Flow



## Our commitment:

Never obtain customers with low prices, low added value, ONLY win long-term cooperation with customers base on reasonable price and high-quality products and services.

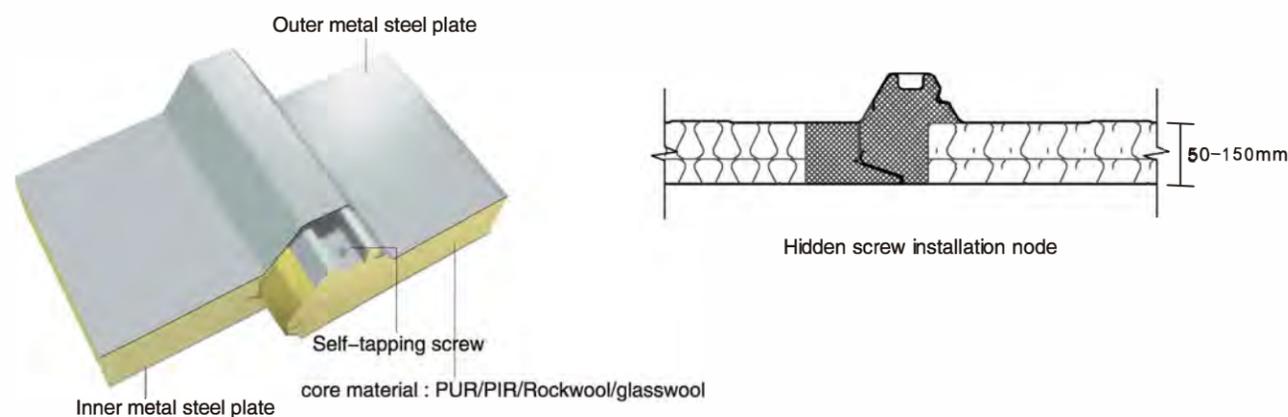
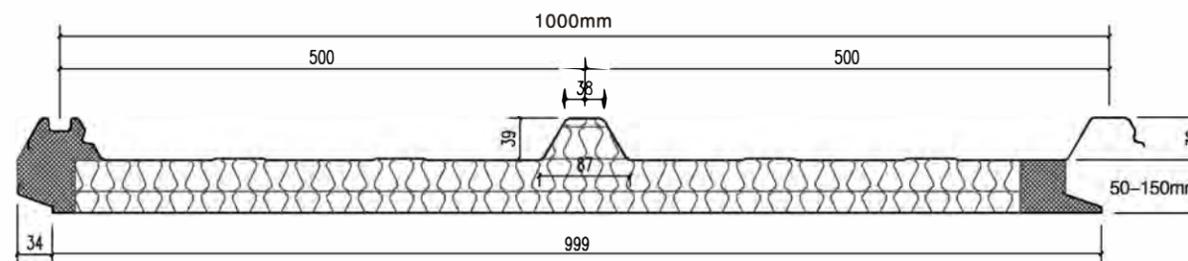
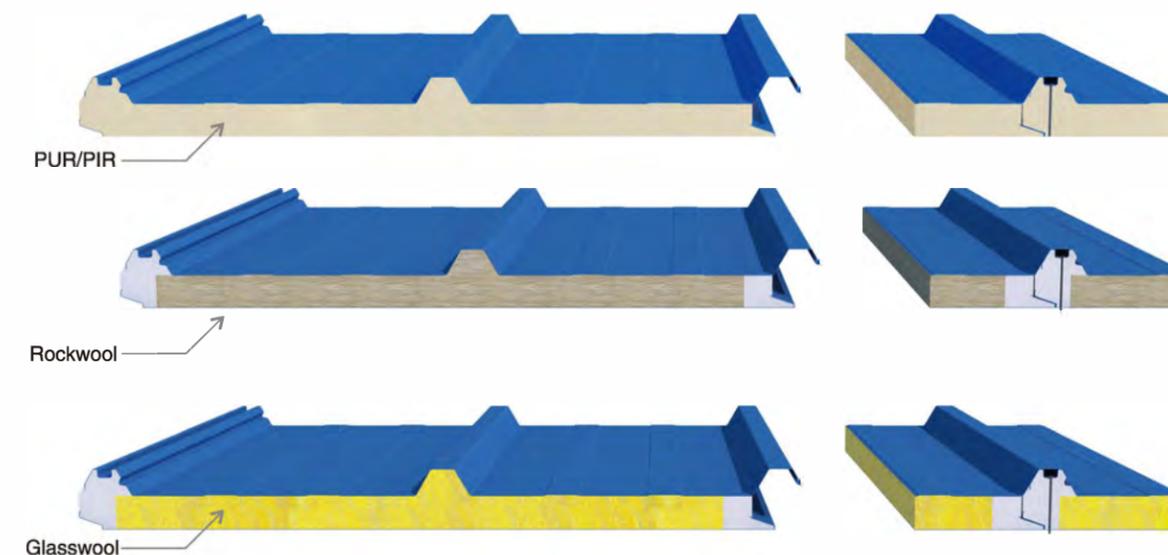
### Main parameters of new industrial Building insulation sandwich panels

Metal sheet (0.4-0.8mm)	1) color Prepainted galvanized steel sheet 2) Aluminium zinc sheet 3) stainless steel sheet 4) A luminum Magnesium Manganese sheet
surface pattern/External steel textures of panels	Flat/mirror, small ripple, concave, square wave, emboss/Relief effect
Insulation core material	Polyurethane(PU)/PIR ,Rockwool, Glasswool
Surface coating	PVDF, HDP,SMP, nano self-cleaningPE, MicroBan antibacterial type
Coating thickness	Outer panel ≥ 18 μm, Inner panel ≥ 8 μm
Color	Gray,red,white,silver,etc
Effect width	500-1120mm(1000mm Regular)
Length	≤ 11.8m
Thickness	50mm/75mm/80mm/100mm/120mm/150mm/200mm
Color	White gray, silver gray,sea-blue,crimsonor as per Ral
connection	hidden nail connection(seamless and gap 15/25/40mm)
fireproof rate	B2 / B1 / A grade

Note: non-standardsize and color can be customized

## PNS Brand Sandwich Roof Panel Series

HENAN PANELS' PUR/PIR/Rockwool/glasswool sandwich roof use hidden screw connection,which increase the roof closed and leak-proof,offset caused by expansion and contraction,thereby reduce the damage to the roof,excellent waterproof performance and waveform appearance,economical and reasonable cost .





## Advantage:

- ▶ Hidden screw connection, the panels lap tightly
- ▶ The unique capillary groove design effectively avoids rainwater seepage and cold bridge phenomenon.
- ▶ The major rib of 39mm height improves the panel's bearing capacities greatly. The heat preservation effects of buildings are ensured and the building costs of customers are significantly decreased as well, The minimum roof pitch may be 3%.

Product Name	PUR sandwich roof panel	PIR sandwich roof panel	Rockwool sandwich roof panel	Glasswool sandwich roof panel
Model	RF1000/PU	RF1000/PIR	RF1000/RW	RF1000/GW
Thickness	50/60/70/75/80/100mm/120/150			
Metal sheet	0.4-0.8mm 1) color prepainted galvanized steel sheet 2) Aluminium zinc sheet 3) stainless steel sheet 4) Aluminum Magnesium Manganese sheet			
Core material	PU/PUR (Polyurethane)	PIR (polyisocyanurate)	Rockwool +PU sealing side	Glasswool+PU sealing side
Height of major rib	39mm			
Effective width	500-1000mm(1000mm Regular)			
Length of panel	≤ 11.8 meters			
Density of core material	38-40 KG/M <sup>3</sup>	40-42 KG/M <sup>3</sup>	80-120 KG/M <sup>3</sup>	64 KG/M <sup>3</sup>
Fireproof grade	B2	B1	A (Incombustible material)	A (Incombustible material)
Temperature resistance range	-185℃ ~ 110℃	-196℃ ~ 205℃	>1000℃	>1000℃
Thermal conductivity	≤0.028 w/(m. k)	≤0.026 w/(m. k)	0.037-0.043w/(m. k)	0.035-0.041 w/(m. k)
Color of steel plate	White grey, silver gray, sea-blue, crimson and so on			
Exterior / Interior surface profile	Square wave, flat, embossment, small wave, wide ribbed			
Joint type	tongue and groove with hidden screw Joint		PU edge tongue and groove with hidden screw Joint	

Note : Upon request of customers , flame retardant sponge may be arranged on the sides of roof plates, And other aspects may also be customized .

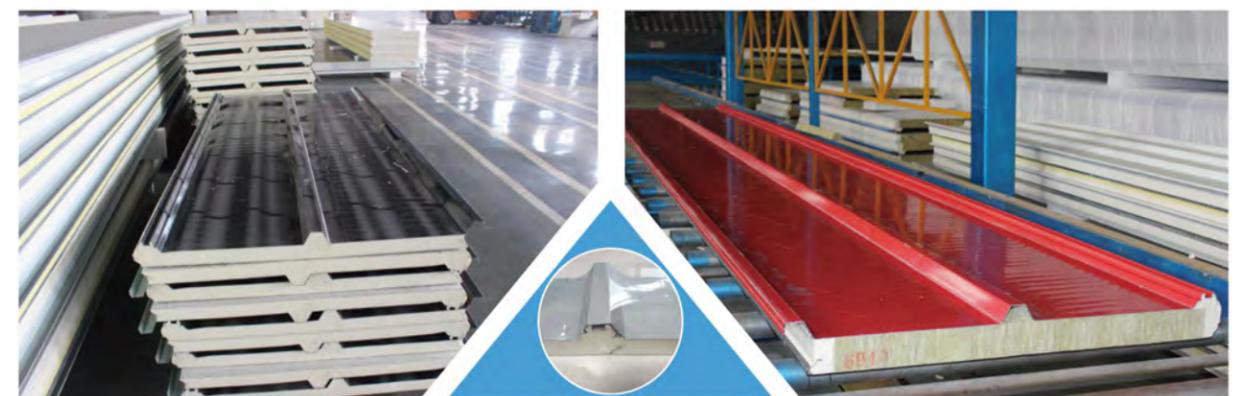
Allowable vertical load and heat transfer coefficient of PNS' Polyurethane sandwich roof panel (allowable deformation  $f \leq L/240$ )

Thickness of panel	Heat Conductivity	Weight (Kg/m <sup>2</sup> )		Load capacity					
		0.5/0.4mm	0.6/0.6mm		0.60	0.80	1.0	1.20	1.50
mm	W/m <sup>2</sup> K	KG/M <sup>2</sup>	KG/M <sup>2</sup>	P=KN/M <sup>2</sup>					
50	0.31	9.94	12.50	L(m)	3.59	3.17	2.85	2.61	2.33
75	0.21	10.99	13.70		4.64	4.07	3.66	3.34	2.96
100	0.19	11.69	14.50		5.57	4.88	4.38	3.99	3.53
120	0.16	12.39	15.30		6.28	5.49	4.92	4.48	3.97

Allowable vertical load and heat transfer coefficient of PNS' Rockwool sandwich roof panel (allowable deformation  $f \leq L/240$ )

Thickness of panel	Heat Conductivity	Weight (0.6/0.5mm)	Load capacity					
				0.60	0.80	1.00	1.20	1.50
mm	W/M <sup>2</sup> K	KG/M <sup>2</sup>	P=KN/M <sup>2</sup>					
50	0.75	15.75	L(m)	3.78	3.31	2.98	2.71	2.41
75	0.53	18.68		4.83	4.21	3.76	3.42	3.01
100	0.41	21.62		5.77	5.02	4.47	4.04	3.55
150	0.31	27.51		7.53	6.54	5.82	5.26	4.61

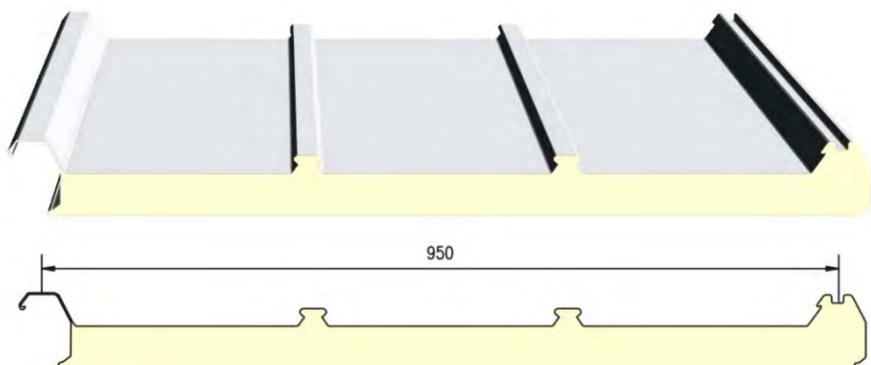
Above table is calculated on the basis of rockwool bulk weight of 120kg/m<sup>3</sup>, 0.6mm outer steel sheet and 0.5mm inner steel sheet .





# PNS Brand Photovoltaic (PV) Sandwich Roof Panel

PV energy-saving polyurethane sandwich roof panel (Hidden connection)



Model : PV-PU 950R

PV fireproof rockwool sandwich roof panel with PUR/PIR sealing side (Hidden connection)

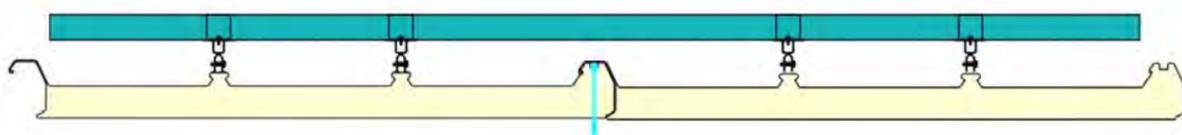


Model : PV-RW 950R

PV fireproof glasswool sandwich roof panel with PUR/PIR sealing side (Hidden connection)



Model : PV-GW 950R



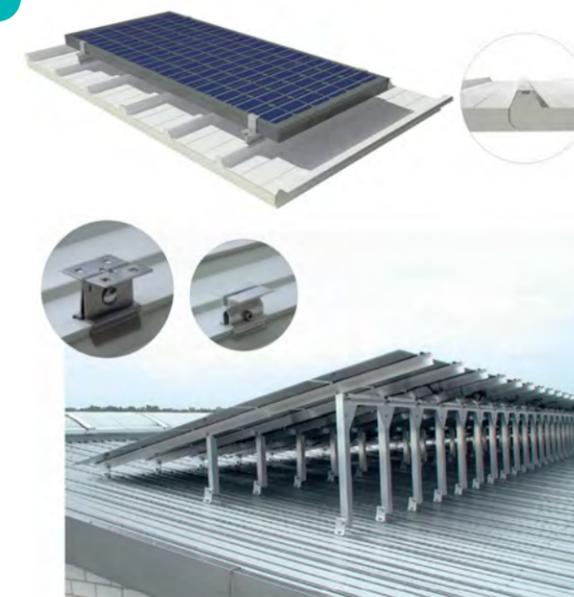
Product Name	PV polyurethane sandwich roof panel	PV Rockwool sandwich roof panel	PV Glasswool sandwich roof panel
Model	PV-PU950R	PV-RW950R	PV-GW950R
Effective width	950mm		
Thickness	50/75/100/120/150mm		
Specification	Corrugated height 40mm; Peak spacing 316mm		
Surface material	Galvanized sheet; Color coated steel sheet; Aluminum plate (0.4/0.5/0.6/0.7mm)		

## Advantage:

- This roof panel is connected by hidden nails, and the board surface is tightly overlapped;
- Polyurethane's excellent energy-saving and thermal insulation performance, combined with the use of solar clean energy, create a pure green and environmentally friendly roof;
- 3.40mm peak height and multi-peak design greatly improve the bearing capacity of the roof and meet the load-bearing needs of photovoltaic maintenance;
- The snap-on wave crest design, equipped with special fixtures, can realize the rapid installation of the modules of the photovoltaic roof system.

### Hold up the future of roof photovoltaic energy

This panel type is a special design of PNS for photovoltaic roofs. The roof crest can be directly connected with the buckle, no need to penetrate the roof structure. The roof panel is made of high-quality color-coated panels. After continuous cold bending, the middle is injected with high flame-retardant thermal insulation polyurethane liquid, processed by high pressure, heating, foaming, curing and other processes, and then compounded with the surface material. The product has stable quality and can be cut at any size.





# PNS Brand PUR/PIR Insulation Exterior Wall Sandwich Panel

## Product Introduction:

PUR/PIR sandwich panels produced by Henan Panels Industry Co.,Ltd. It own beautiful appearance and good overall effect. It integrates load-bearing, heat preservation, fireproof and waterproof integration, and does not require secondary decoration. It is quick and convenient to install, has short construction period and good comprehensive benefits, good cost performance advantage . It is a kind of high-efficiency energy-saving building envelope material with wide application and great potential. The PUR( polyurethane) /PIR(polyisocyanurate) is an energy-saving insulation material, it is a combination of polyether (white material), curing agent, foaming agent, flame retardant, catalyst and isocyanate (black material) in a certain proportion, through high pressure or low pressure foaming machine. Instantly mix and then uniformly cast between the upper and lower layers, a polymer material that is laminated and foamed to have properties such as heat insulation, fire prevention and heat preservation.

## Comparison of the same insulation coefficient:

Polyurethane has a low thermal conductivity of between 0.018 and 0.023 W/mk, and other insulation materials are incomparable. The addition of a rigid metal exterior decorative surface provides long-term thermal insulation without damage to the outer casing. Its thermal insulation performance can be maintained for about 50 years.

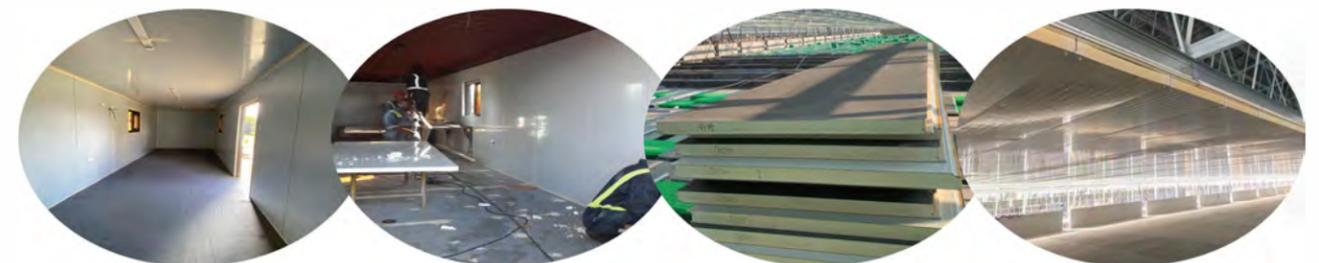


Excellent insulation core material – PIR/PUR( polyurethane)

# PU/PIR sandwich panel with single-sided steel plate

## Product Introduction:

Single-sided steel plate sandwich panel, one side is steel plate, the other side is aluminum foil or cement mortar paper, used for wall and ceiling, the core material is polyurethane/PIR, which is more lower cost than double-sided steel sheet PU/PIR sandwich panel.



Product name	PU/PIR sandwich panel with single-sided steel plate
Thickness	40/50/75/100/150mm
Effective width	500-1000mm
Length	Customized
Surface material	Aluminum foil / Cement mortar paper + Color Coated Galvanized steel sheet
Core material	Polyurethane rigid foam
Density	38-40 kg/m <sup>3</sup>
Color	white gray,silver gray,sea-blue,crimson or Customized RAL color
Advantage	Good heat preservation / Fireproof
Use	For Wall or Ceiling
Application	Container house, warehouses, gymnasiums, supermarkets, purification workshops

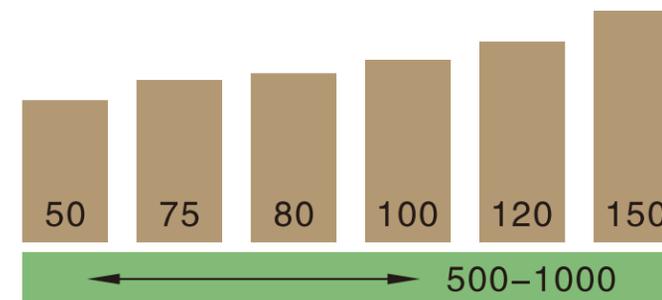
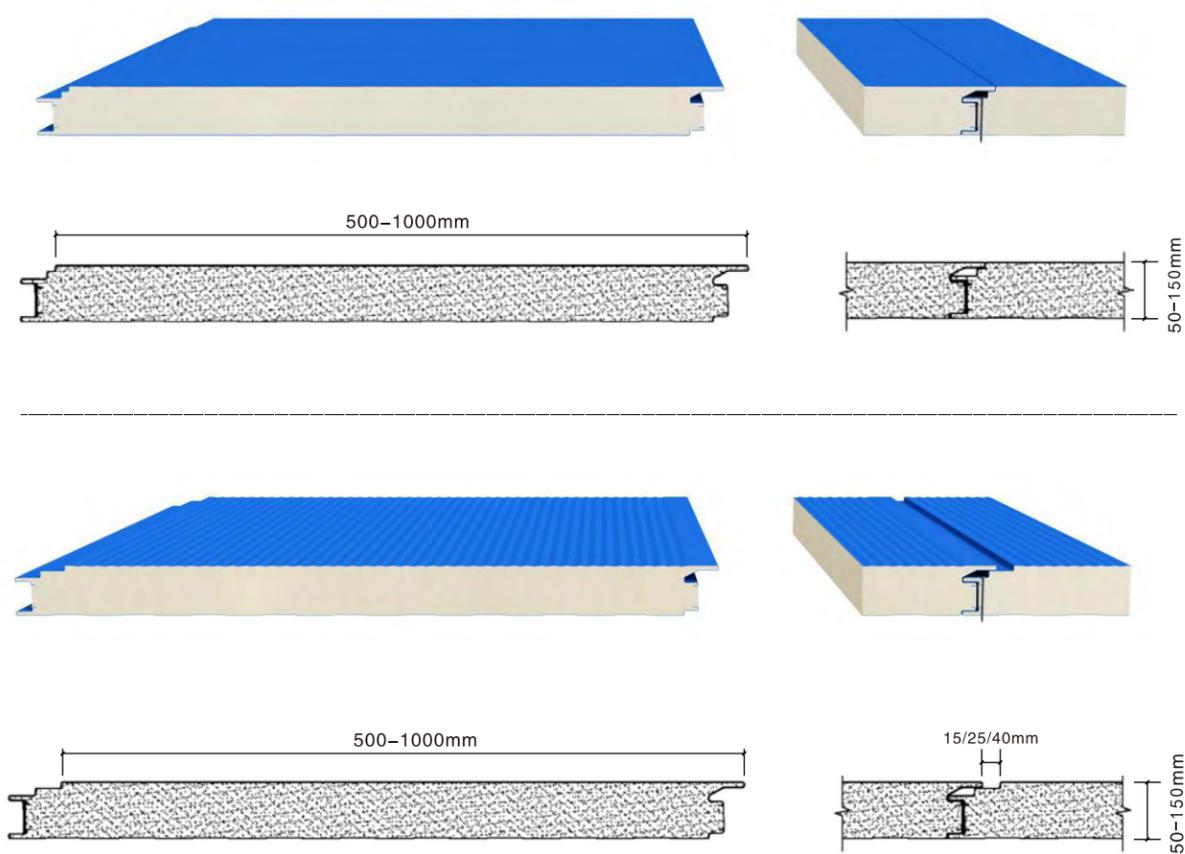
# PUR/PIR Exterior Wall Sandwich Panel

## Product Introduction

PNS brand PUR/PIR building exterior wall sandwich panels include 2 kinds : 1) with decorative gaps; 2) without decorative gaps.

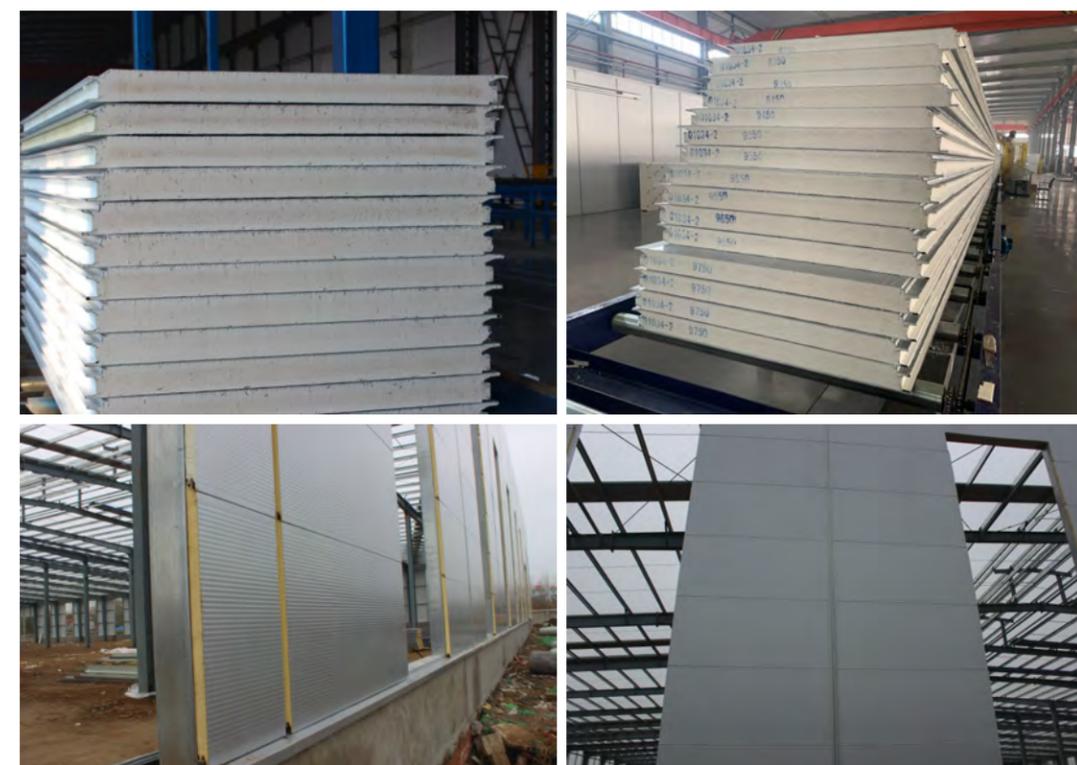
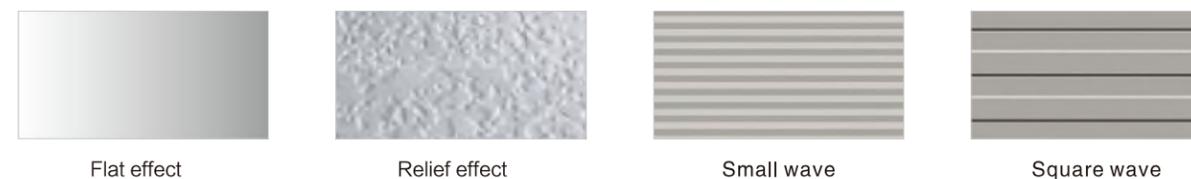
The outer wall sandwich panel with seam is mainly suitable for horizontal installation of the outer wall, and the panel' seam can be adjusted. The seamless building exterior wall panel is suitable for vertical or horizontal exterior walls. The scientific node design can effectively prevent the rainwater leakage of the vertical panel.

The wall panel is connected to the purlin by self-tapping screws, and is plug-in connected.



Optional sandwich panel' thickness and effective width

## Panel appearance





Product Name	PUR Exterior Wall Sandwich Panel	PIR Exterior Wall Sandwich Panel
Model	WL500-1000/PUR	WL500-1000/PIR
Metal sheet (0.4-0.8mm)	1) color pre-painted galvanized steel sheet 2) Aluminium zinc sheet 3) stainless steel sheet 4) Aluminum Magnesium Manganese sheet	
Thickness	50/75/80/100/120/150mm	
Effective width	500-1000mm (Regular 1000mm)	
Length of panel	≤ 11.8 meters	
Core material	PU/PUR (Polyurethane)	PIR ( polyisocyanurate )
Density	38~40 KG/M <sup>3</sup>	40~42 KG/M <sup>3</sup>
Thermal conductivity (25°C)	≤0.028/(m.k)	≤0.026w/(m.k)
Heat-resistance range	-185°C ~ 110°C ( PUR foam)	-196°C ~ 205°C(PIR foam)
	Long-term continuous use below 85°C(PUR sandwich panel)	Long-term continuous use below 150°C(PIR sandwich panel)
Closed cell rate	≥ 97%	≥ 97%
Moisture Permeance factor	6.5 ng/(Pa.m-s )	6.2 ng/(Pa.m-s )
Water absorption rate	2.5-3%	up to 0.9%
Fireproof grade	B2	B1
Combustion performance	≥D	≥ B
Color of steel plate	White grey,silver gray,sea-blue,crimson or as per RAL	
Exterior / Interior surface profile	Flat,Relief,Small wave, Square wave	
Painting	Polyester PE/SMP/HDP/PVDF coating etc.	
Installation method	1. horizontal	2. vertical
Joint type	Plug in type hidden screw mounted	



Horizontal installation of exterior wall panels



vertical installation of exterior wall panels



Horizontal installation without decorative seam



Horizontal installation with decorative seam

**Allowable span and heat transfer coefficient of PNS' polyurethane sandwich wall panel (allowable deflection  $f \leq L/200$ )**

Thickness of pane	Heat Conductivity	Weight	Load capacity					
				0.60	0.80	1.00	1.20	1.50
mm	W/M <sup>2</sup> K	kg/m <sup>2</sup>	P=KN/m <sup>2</sup>					
50	0.31	10.06	L(m)	3.52	3.04	2.69	2.42	2.11
75	0.21	11.06	L(m)	4.71	4.09	3.64	3.29	2.89
100	0.19	12.05	L(m)	5.76	5.02	4.47	4.05	3.56
120	0.16	12.84	L(m)	6.53	5.68	5.07	4.6	4.04
150	0.11	14.04	L(m)	7.56	6.58	5.87	5.32	4.68

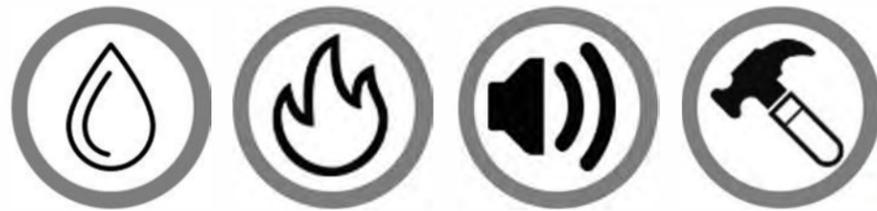




# Polyurethane Foam insulation board

## Product Introduction:

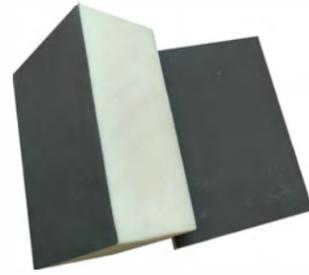
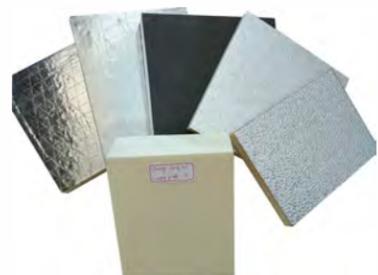
PNS brand polyurethane foam board : Using high-functional polyether polyol and polymethyl polyphenyl isocyanate as the main raw materials, it is foamed by chemical reaction under the action of catalyst, blowing agent, surfactant, etc. Aluminum foil or mortar paper can be used for the upper and lower sides.



Water Resistant    Fireproof    Sound Absorption    Durability



Thermal Insulation    Light Weight    Easy to Install



Main performance indexes of PUR/PIR foam composite board:

Item	Specification	Unit
Board composition	Both side with Mortar pape or Aluminum foil	
	Core material : PU/PIR foam	
Standard panel size	1200*600; 1200*1200; 1200*1000; 1000*500	mm
Thickness of board	20-200mm	mm
Fireproof	B1,B2	grade
Alu. foil thickness	0.08mm/0.2mm	micron
Foam density	35/40	kg/m <sup>3</sup>
Thermal conductivity	0.028-0.026	w/m.k
Moisture Permeance factor	6.5/6.2	ng/(Pa.m-s )
Bending strength	2	Mpa
Water absorption	≤0.1	%
Dimension change	0.3	%
Working temperature	-150to +120	℃
Maximum allowable wind velocity	≤12	m/s
Continuous running maximum temperature	≤70	℃

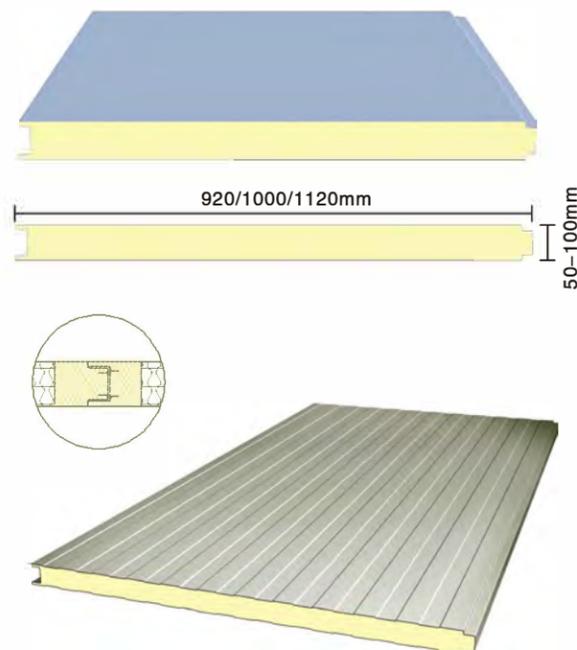
## Application areas of rigid polyurethane / PU foam board

Polyurethane hard foam composite insulation Board has become an indispensable material for thermal insulation, waterproofing, leak-proofing, and sealing in industrial sectors such as construction, transportation, petroleum, chemical industry, electric power, and cold storage.

# PNS Brand Cold Storage Sandwich Wall / Ceiling Panels

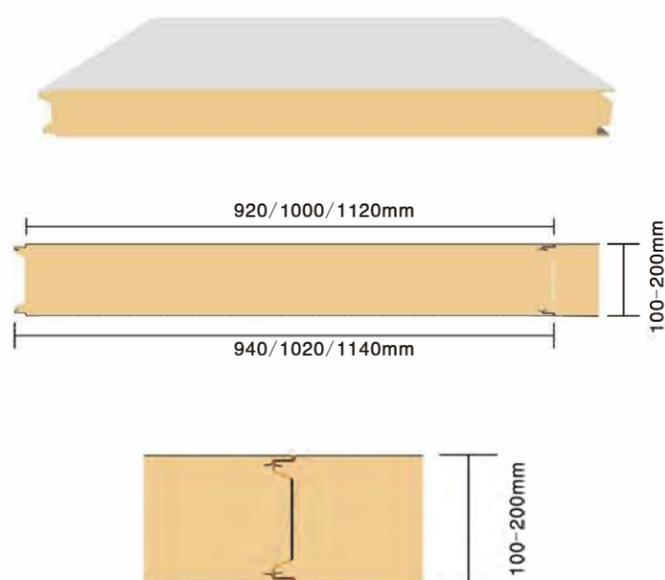
## CS50-100/PUR/PIR series

- ▶ The concave and convex groove structure improves the airtightness of the joint of the panel, and has excellent heat insulation and waterproof performance;
- ▶ It has excellent heat insulation effect, eliminates "cold steam bridge", greatly improves the airtight performance, and is more suitable for air-conditioned cold storage.
- ▶ It can be connected by nails, which improves the connection structure of the cold storage body. The docking position of adjacent boards is accurate, and the facade effect of the storage body is neat and uniform.



## CS100-200/PUR/PIR series

- ▶ Through prestaging the special airtight rubber in wedge-shaped structure between internal and external layer of cold storage panel, so that the adjacent panel of the inner and outer layers of cold steel as one organic, greatly overcome the thermal expansion and contraction phenomenon of cold storage panel, make the whole air tightness performance is equivalent to the effect of seamless steel plate welding.
- ▶ Light weight and beautiful appearance, the assembly board can be disassembled and reinstalled in another place is easy and fast;



Product Name	Cold Storage Sandwich Wall / Ceiling Panels	
Model	CS50-100/PUR CS100-200/PUR	CS50-100/PIR CS100-200/PIR
Metal sheet 0.4-0.8mm	1) color pre-painted galvanized steel sheet 2) Aluminium zinc sheet 3) stainless steel sheet 4) Aluminum Magnesium Manganese sheet	
Thickness	50 / 75 / 100 / 120 / 150 / 175 / 200mm	
Effective width	920mm, 1000mm, 1120mm (Regular 1000mm)	
Length of panel	≤ 11.8 meters	
Core material	PU/PUR (Polyurethane)	PIR ( polyisocyanurate )
Density	38-40 KG/M³	40-42 KG/M³
Thermal conductivity (25℃)	≤ 0.028w/(m.k)	≤ 0.026w/(m.k)
Heat-resistance range	-185℃ ~ 110℃ ( PUR foam)	-196℃ ~ 205℃(PIR foam)
	Long-term continuous use below 85℃(PUR sandwich panel)	Long-term continuous use below 150℃(PIR sandwich panel)
Closed cell rate	≥ 97%	≥ 97%
Moisture Permeance factor	6.5 ng/(Pa.m-s )	6.2 ng/(Pa.m-s )
Water absorption rate	2.5-3%	up to 0.9%
Fireproof grade	B2	B1
Combustion performance	≥ D	≥ B
Color of steel plate	White gray, silver gray or as per RAL	
Exterior / Interior surface profile	Square wave, flat, embossment, small wave, wide ribbed	
Painting	Self-cleaning coating PE, PVDF SMP, HDP	
Installation method	1. horizontal	2. vertical

Reference table of temperature and cold storage panels' thickness

Thickness of panels	Temperature difference between indoor and outdoor of cold storage	length of panels	Temperature of keeping in cold storage														
			25	20	15	10	5	0	-2	-8	-15	-20	-25	-30	-35	-40	-45
mm	℃	m															
50	30	2-8															
75	40	2-8															
100	50	2-12															
120	60	2-12															
125	60	2-12															
150	70	2-12															
180	80	2-12															
200	90	2-12															



Allowable vertical load, span and heat transfer coefficient of PNS' cold storage panels (allowable deformation  $\leq L/200$ )

Thickness of panels	Heat transfer coefficient U-Value, W/(M <sup>2</sup> K)	Weight of panel (kg/m <sup>2</sup> )		 P.P. +30		
		PPGI :0.5+0.5	PPGI : 0.6+0.6	P=kg/m <sup>2</sup>	PPGI :0.5+0.5	PPGI : 0.6+0.6
100mm	0.21	12.48	14.17	L=M	6.20	6.55
120mm	0.18	13.42	15.12	L=M	7.10	7.50
150mm	0.14	14.38	16.06	L=M	8.40	8.80
175mm	0.12	15.28	17.02	L=M	9.50	10.00
200mm	0.11	16.18	17.98	L=M	10.20	10.80

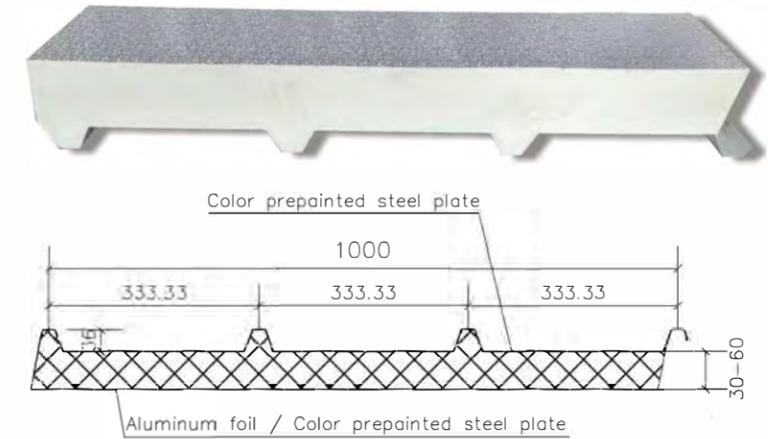
Above core material :PU (40-42KG/M<sup>3</sup>)



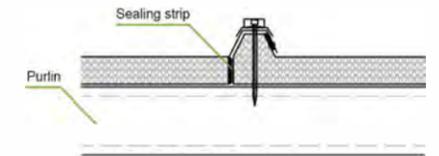
# PNS Brand Aluminum foil Sandwich Roof Panel

## Product Introduction:

- ❖ The inner surface can choose ordinary color steel plate or aluminum foil. Aluminum foil has corrosion resistance, moisture resistance, acid and alkali resistance, and the outer surface adopts color steel plate to ensure the overall structural strength of roof maintenance. With aluminum foil veneer, it is suitable for various corrosive environments that do not react with aluminum.



- ❖ Exposed nails joint for convenient construction and installation.



Product name	Aluminum Foil Sandwich Roof Panel	
Model	RF-1000A/PUR	RF-1000A/PIR
Core material	PU/PUR (Polyurethane)	PIR ( Polyisocyanurate )
Density	38-40kg/m <sup>3</sup>	40-42 kg/m <sup>3</sup> ( PIR)
Thickness of panel	30-150mm	
Upper plate	Color steel plate (0.4-0.8mm)	
Inner steel plate	Color steel plate 0.4-0.7mm / Aluminum foil (0.06mm)	
Effective width	1000mm	
Length of panel	Max.11.8m	
Regular color	White gray, silver, sea blue or as per need	



Application industries: slaughter plants and breeding farms, such as pig farms, cattle farms, chicken farms and other industries with corrosive gases.



## PNS Brand Rockwool /Glasswool Sandwich Wall Panel Series

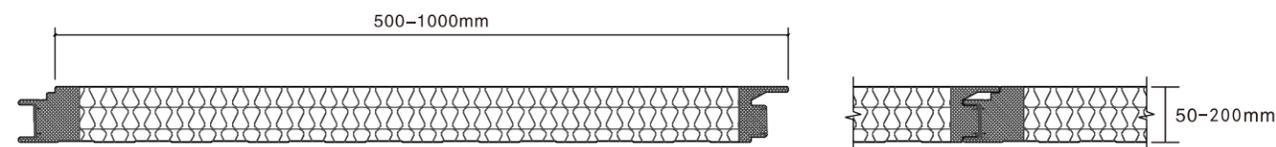
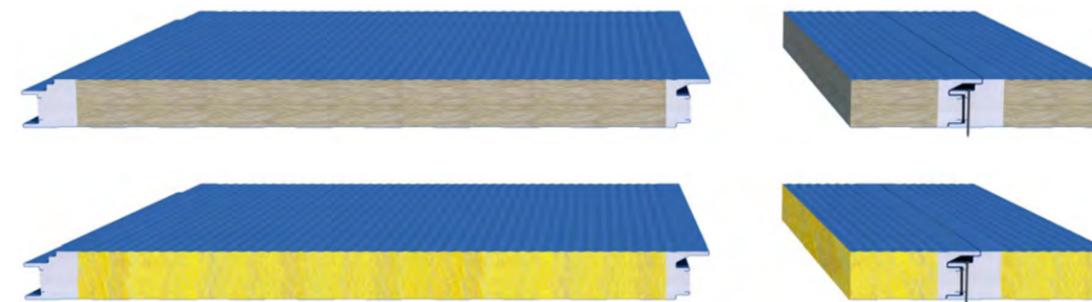
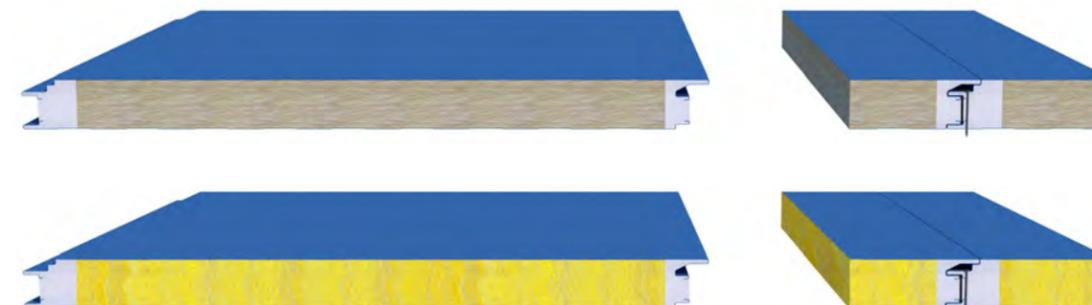
### Product Introduction:

PNS select high-quality color coated galvanized (or other metal materials) or aluminum or stainless steel as the panel metal sheet. After the roll forming, cut the rockwool /glasswool into strips and then turn 90 degree (make the fiber perpendicular to the metal surface), then bond with the metal plate together by the high-strength, high bond strength, high fireproof binder. at the last, seal the high-density rigid polyurethane(PU) or PIR foam in the two edges, and the nice smooth tough panel is complete.

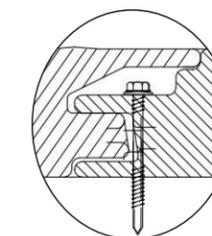
### Production Procedure:



## Rockwool /Glasswool Exterior Wall Sandwich Panel (seamless)

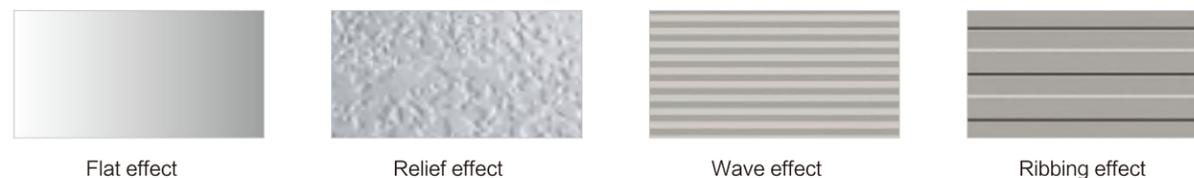


The wall panel is connected to the purlin by self-tapping screws, it is plug-in connected.

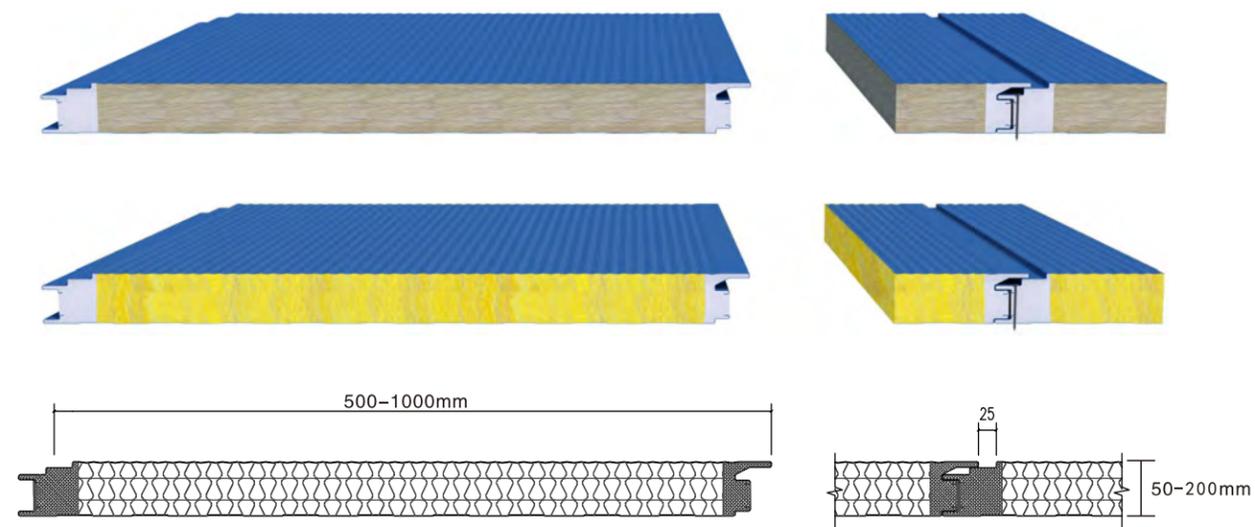
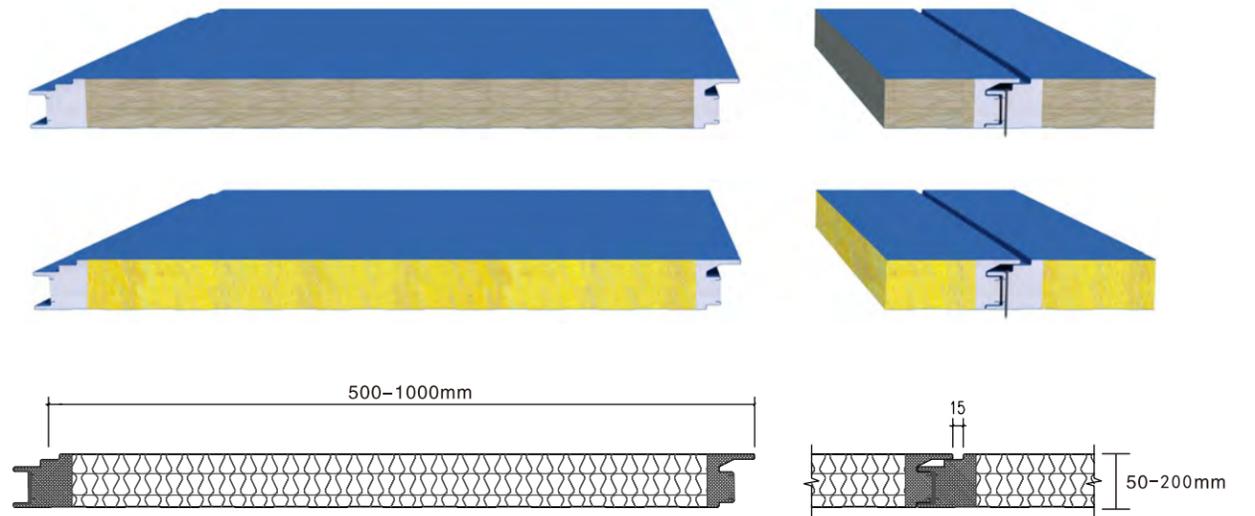


Joint type

### Panel appearance



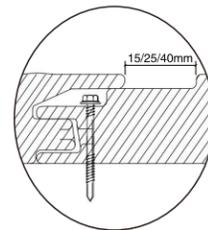
## Rockwool /Glasswool Exterior Wall Sandwich Panel (with seam)



### Panel appearance

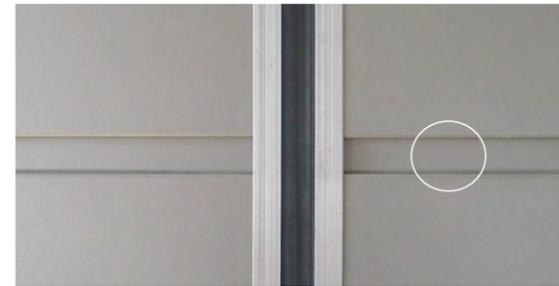


The wall panel is connected to the purlin by self-tapping screws, it is plug-in connected.

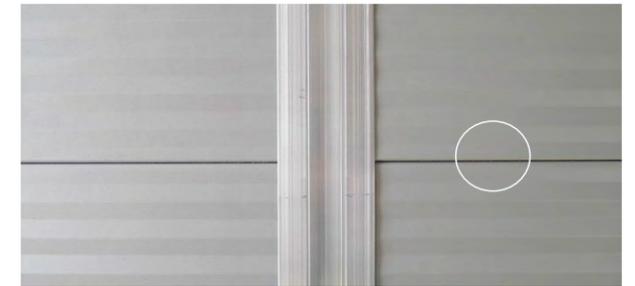


Joint type

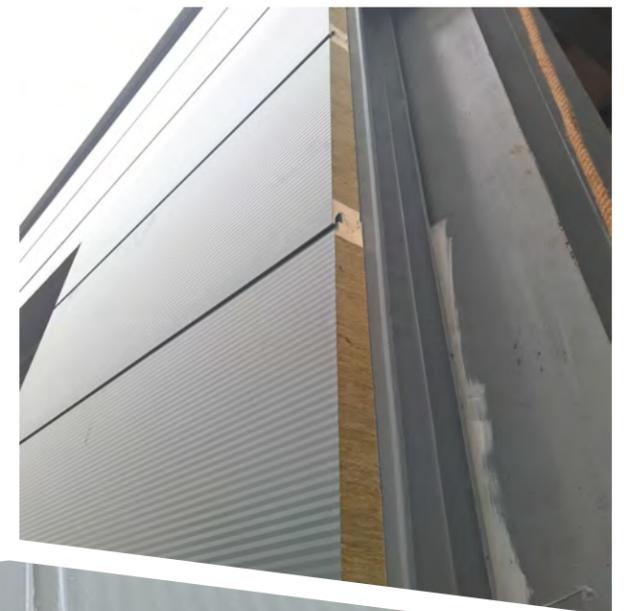
### Panel joint's type



Joint with gap for horizontal application



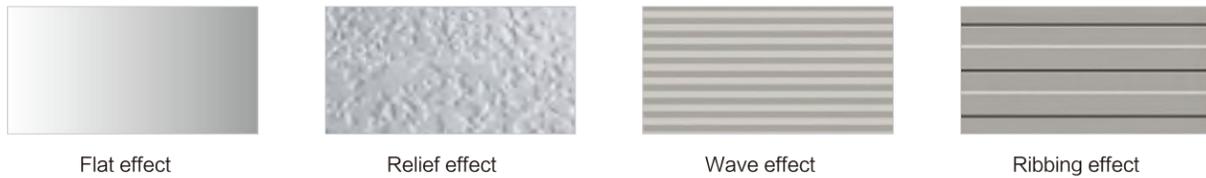
Joint without gap for horizontal application



Joint type



### Panel appearance



Exterior / Interior surface profile of all wall panels for choose : Flat,Relief,Small wave, Square wave.

### Surface –plentiful colors



Note : In the process of printing,the colors mentioned above may have a little difference from the real colors, the actual product shall prevail.

### Installation Method

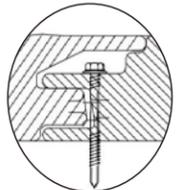


Horizontal installation

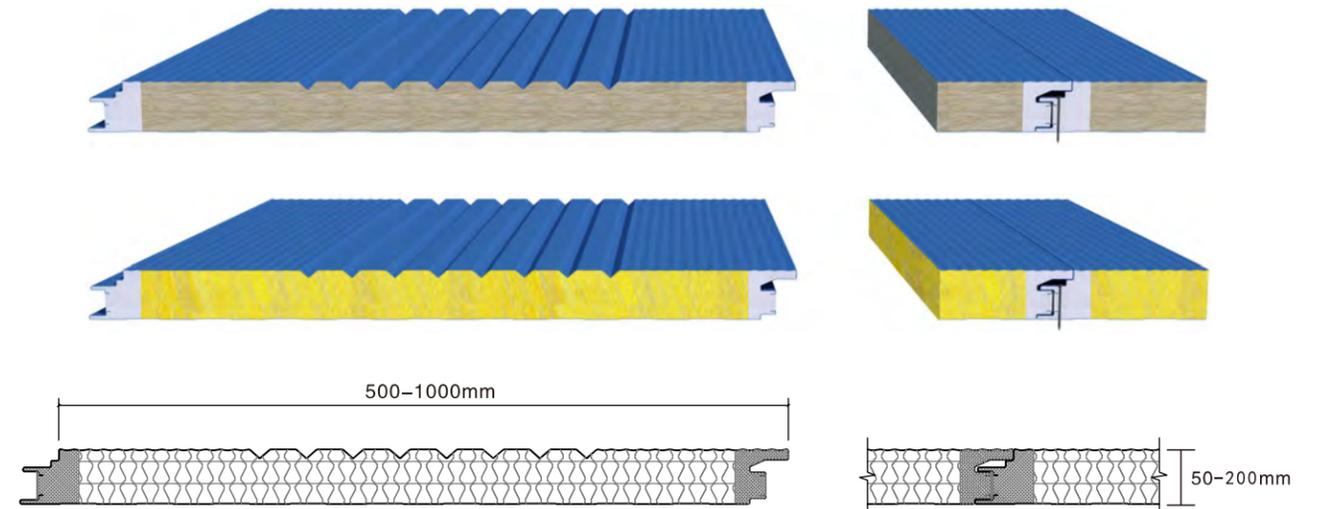


Vertical installation

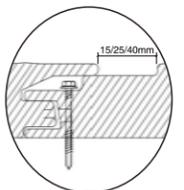
### V Series Rockwool/Glasswool Exterior Wall Panel (seamless)



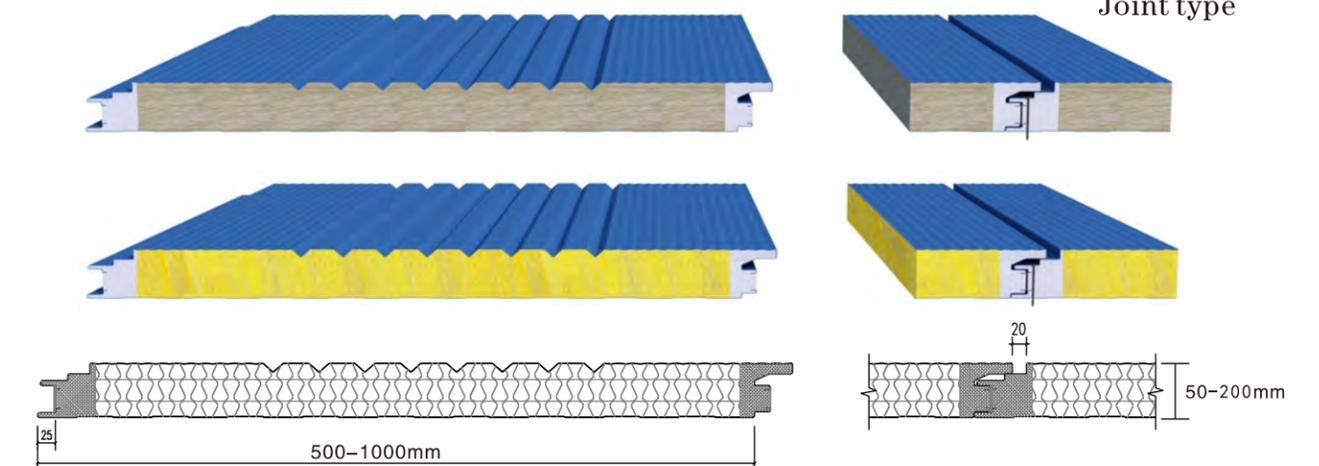
Joint type



### V Series Rockwool/Glasswool Exterior Wall Panel (with seam)



Joint type





Product Name	Rockwool Sandwich Wall Panel with PUR/PIR double sealing	
Model	WL500-1000/RW	WL500-1000/GW
Thickness of panels	50/75/80/100/150/200mm	
R-Value	1.32/ 1.97 / 2.11/ 2.63/3.95/5.26 M <sup>2</sup> .K/w	
Thermal conductivity of Rockwool	$\lambda \leq 0.038$ w/(m. k)	
Metal sheet(0.4-0.8mm)	1) color prepainted galvanized steel sheet 2) Aluminium zinc sheet 3) stainless steel sheet 4)Aluminum Magnesium Manganese sheet	
Core material	Rockwool, Glasswool	
Hydrophobic rate	98%	
Glue connection	Bonding strength $\geq 0.06$ MPa	
Gluing method	Automatic glue spraying	
Density : core material	Rockwool: 80kg/m <sup>3</sup> -120kg/m <sup>3</sup> Glasswool: 64kg/m <sup>3</sup>	
density: sealing side	PU:38-40kg/m <sup>3</sup> PIR : 40-42kg/m <sup>3</sup>	
Fireproof grade	A grade	
Color of steel plate	White grey,silver gray,sea-blue,crimson or as per Ral	
Exterior / Interior surface profile	Square wave,flat,embossment, small wave, wide ribbed	
Effective width	500-1000 mm (Regular 1000mm)	
Length of panel	Max.11.8 meters	
Installation method	1. horizontal 2. vertical	
Connection	PU edge tongue and groove with hidden screw	



Allowable vertical load and heat transfer coefficient of PNS Rockwool sandwich wall panel (allowable deformation  $f \leq L/240$ ).

Thickness of pane	Heat Conductivity	Weight	Load capacity	Diagram of load distribution				
				P	L	P	L	P
MM	W/M <sup>2</sup> K	KG/M <sup>2</sup>	P=KN/m <sup>2</sup>	0.6	0.8	1.0	1.2	1.5
50	0.75	15.53	L(m)	3.66	3.13	2.75	2.46	2.12
75	0.53	18.37	L(m)	4.9	4.22	3.73	3.35	2.91
100	0.41	21.21	L(m)	5.99	5.17	4.58	4.12	3.59
150	0.31	26.88	L(m)	7.82	6.75	5.98	5.37	4.68

Corresponding table between fire resistance limit and thickness when the Rockwool sandwich wall panels install horizontally (the maximum span of the panel does not exceed 4 m).

Density of core material (Rockwool)	Thickness of panel	Duration of fire resistance
kg/m <sup>3</sup>	mm	min.
$\geq 120$	75	90
	100	120
	150	180
	200	240





Allowable vertical load and heat transfer coefficient of PNS' Glasswool sandwich wall panel (allowable deformation  $f \leq L/240$ ).

Thickness of pane	Heat Conductivity	Weight	Load capacity	Diagram of load distribution				
				0.6	0.8	1.0	1.2	1.5
MM	W/M <sup>2</sup> K	KG/M <sup>2</sup>	P=KN/m <sup>2</sup>					
50	0.69	12.95	L(m)	3.74	3.23	2.86	2.57	2.23
75	0.47	14.50	L(m)	5.01	4.34	3.86	3.48	3.05
100	0.36	16.04	L(m)	6.12	5.32	4.73	4.28	3.75
150	0.33	19.14	L(m)	8.00	6.94	6.18	5.58	4.89



Index of core material(rockwool)of PNS' sandwich panel

Properties	Unit	Density $\geq 100\text{kg/m}^3$	Density $\geq 120\text{kg/m}^3$	Standard
Compressive strength	kpa	85	105	EN826
Shear strength	kpa	60	80	EN12090
Tensile strength	kpa	170	220	EN1607
Slag ball content	%	<5( size of coarse slag ball >0.25mm)		ASTM C1335
		<30(Size of fine slag ball >63 $\mu\text{m}$ )		ASTM C1335
Thermal conductivity of rockwool panel (average temperature 20 $^{\circ}\text{C}$ )	w/mk	0.036		GB/T 10295 ASTM C518
Thermal conductivity of rockwool core material (average temperature 20 $^{\circ}\text{C}$ )	w/mk	0.043		EN12667
Fireproof rating	-	Noninflammable material/A reaction to fire		EN ISO 1182 GB/T 5464-1999
	-			EN1350-1GB/T 8624-2006
Fire-resistant limit (FRL)		According to the structure and thickness of sandwich panel, FRL is between 30mins and 240mins.		
Hydroscopicity (weight ratio)	%	<1		ASTM C1104 GB/T 5480.7
Hydrophobicity (specific to hydrophobic products)	%	98		GB 10299
Ageing and expansion rate	%	5 (thickness change rate after 24 hour under the state of 65 $^{\circ}\text{C}$ )		prEN14509
Delting temperature	$^{\circ}\text{C}$	>1000		-
Fiber diameter	$\mu\text{m}$	7		

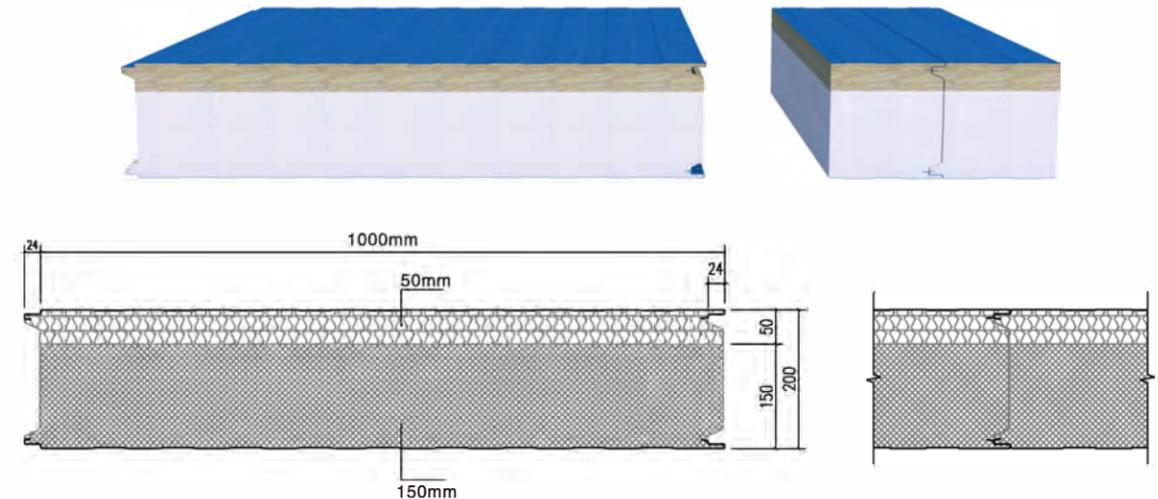


Index of core material(glasswool)of PNS' sandwich panel

Properties	Test standard	Test results
Fiber diameter(μm)	GB/T5480.4	5.0-7.0
Slag ball content (%)	GB/T5480.4	0
Combustibility rating	GB5464	Grade A (incombustible material)
Moisture content(%)	GB/T13350	0.4
Thermal conductivity(w/m.K)(The average test temperature as 25°C)	GB/T10295	0.031-0.036
Noise reduction coefficient(NRC)	JC/T469	0.7
Sound reduction index (Rw)	GBJ75-84	≤ 34

# PNS Brand

## 1+1 Rockwool & PIR(PUR) Sandwich Panel



### Product Introduction:

Combining the non-combustibility, high temperature resistance of rock wool and the thermal insulation of polyurethane, it effectively isolates the heat and smoke of the fire from spreading and transferring, and hinders the spread of fire.

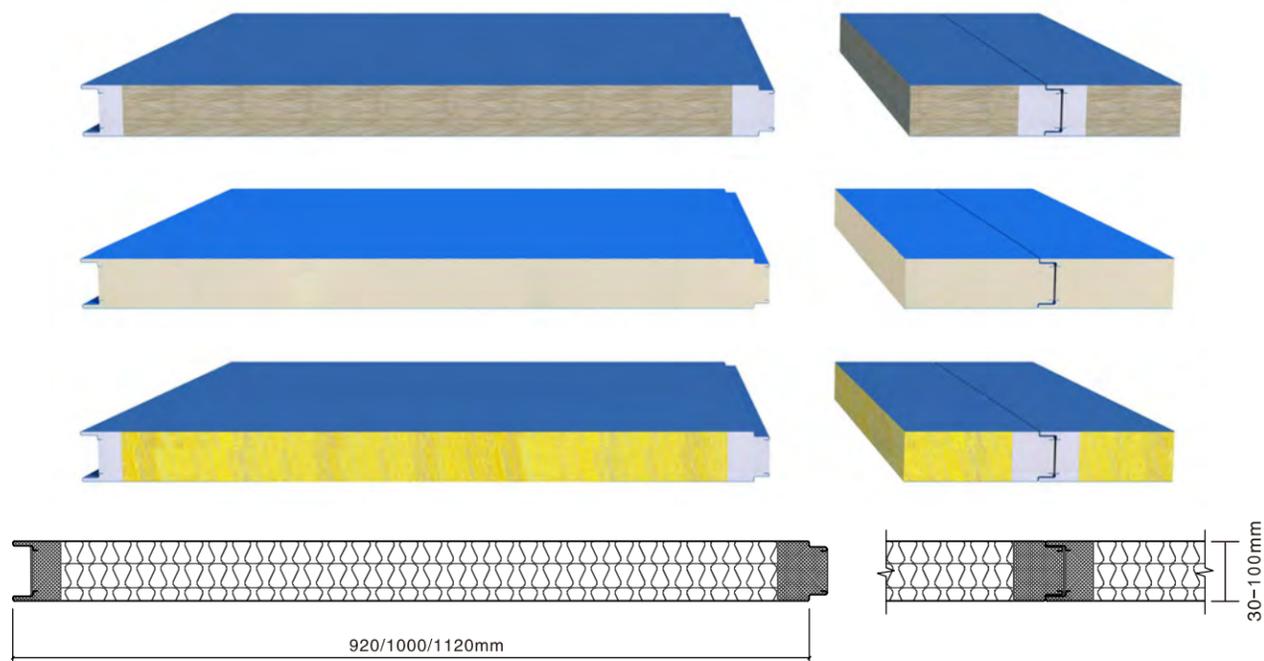
Product name	1+1 Rockwool & PUR sandwich panel	1+1 Rockwool & PIR sandwich panel
Model	1+1 RW/PUR1000	1+1 RW/PIR1000
Core material	Rockwool & PUR	Rockwool & PIR
Density	80-120kg/m <sup>3</sup> ;38-40kg/m <sup>3</sup>	80-120kg/m <sup>3</sup> ;40-42kg/m <sup>3</sup>
Thickness of panel	100/120/150/180/200mm (Regular PU/PIR 100/150mm+50mm rockwool)	
Both sides	Hot galvanized steel, Aluminum zinc plate, stainless steel, aluminium steel	
Thickness of steel plate	0.4-0.8mm	
Effective width	1000-1120 mm	
Length of panel	Max.11.8m	
Fireproof grade	Rockwool : A	PIR: B1 PUR: B2



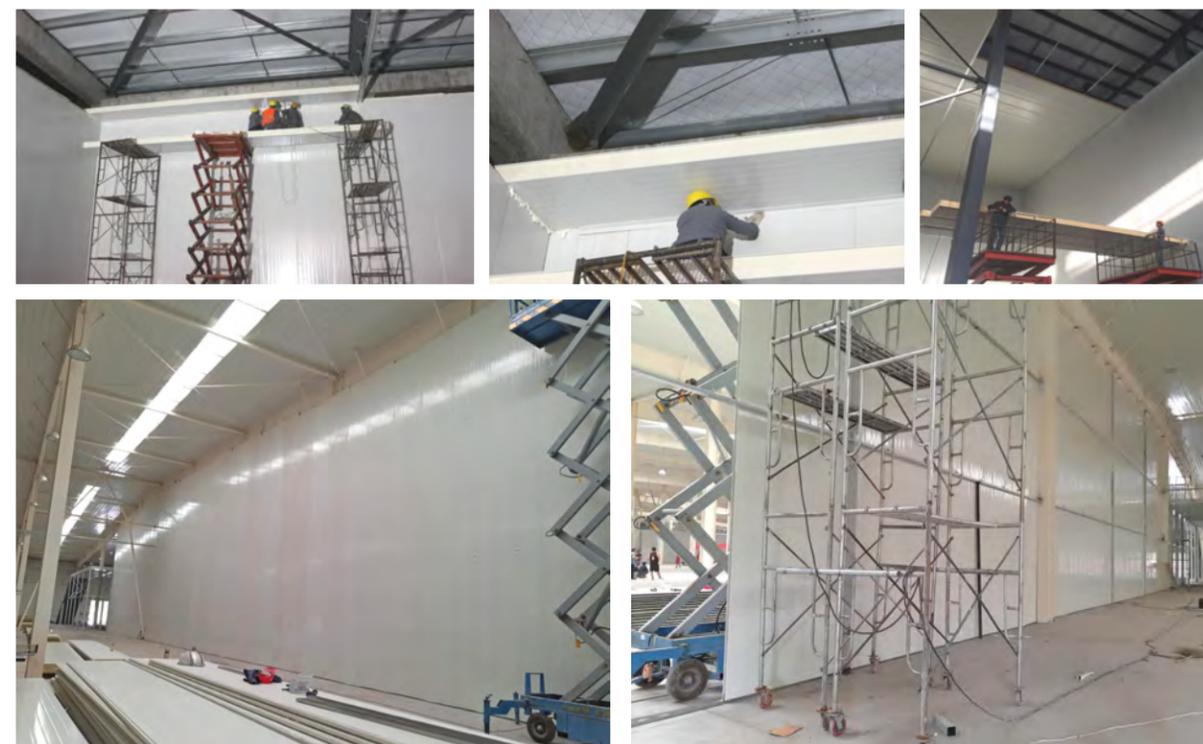
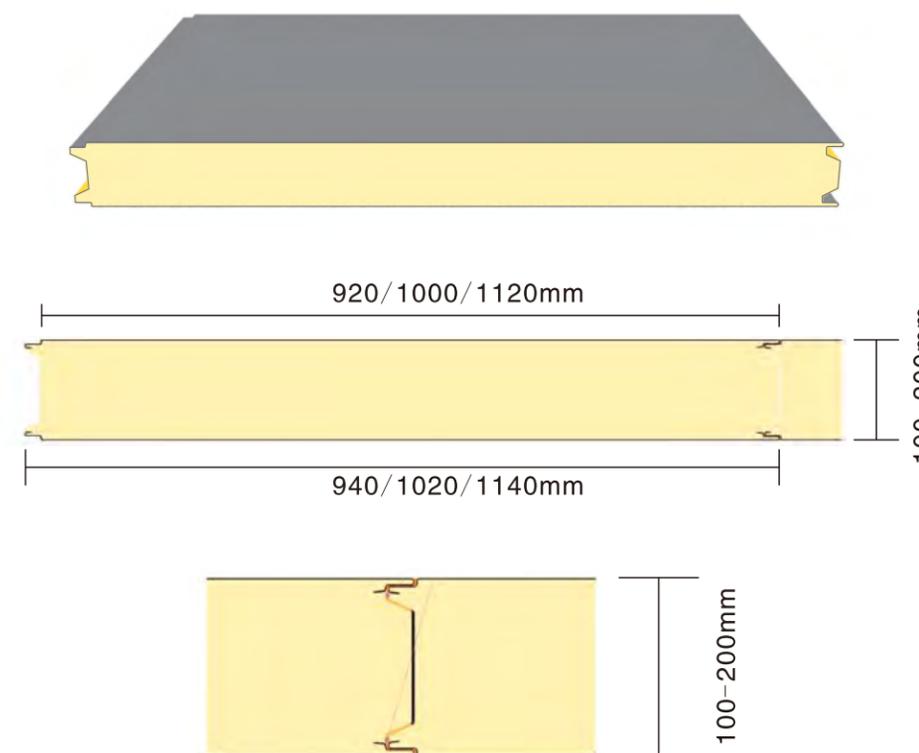
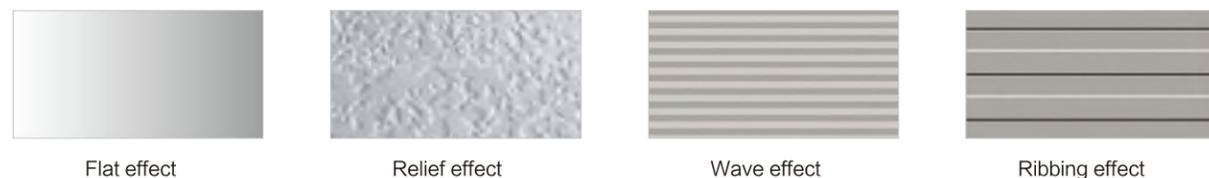
# PNS Brand Interior Wall Partition and Ceiling Sandwich Panel Series

## Product Introduction:

1. The tongue-and-groove panel is used for the inner partition wall and ceiling of the building, and also used for the wall of the mobile container house
2. Has good self-supporting performance
3. Good air tightness
4. Good insulation and anti-cold bridge function
5. The surface layer on both sides can be color coated steel plate, aluminum foil, rock steel plate and stainless steel
6. Core material : **PUR,PIR,Rockwool, Glasswool**
7. Thickness: 30,35,40,50,60,70,100,120,150,180,200mm
8. Effective width: 920-1120mm



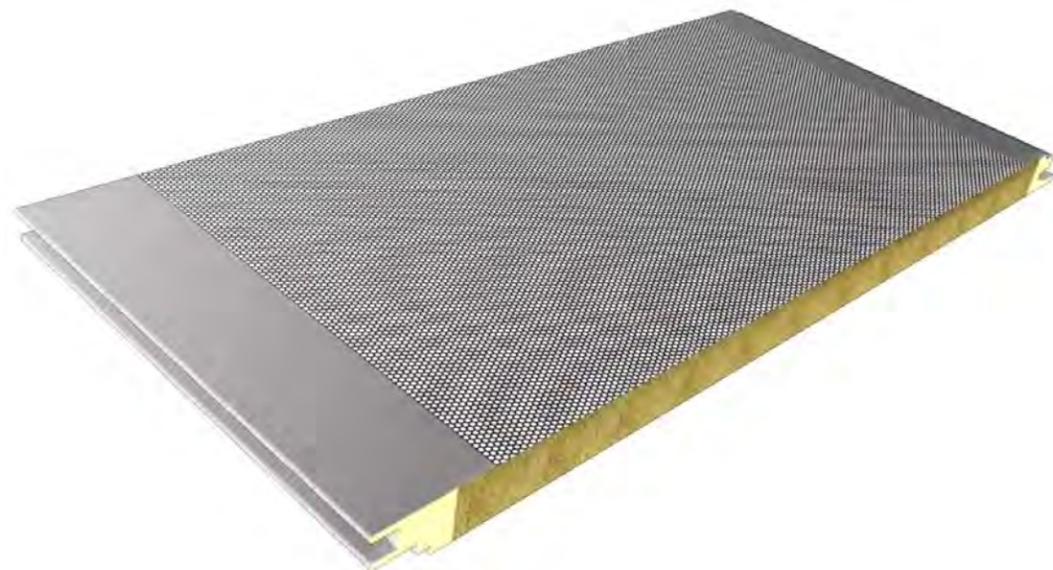
### Panel appearance



# Sound Absorbing Sandwich Panel

## Product Introduction:

Sound-absorbing sandwich panels have the advantages of sound absorption, environmental protection, flame retardant, heat insulation, heat preservation, moisture resistance, mildew resistance, easy cutting, simple construction, good stability, and good impact resistance. Variety of colors for choose to meet the needs of different styles and levels of sound-absorbing decoration, the thickness 50-100 mm.



The single-sided steel plate of the sandwich panel is punched, and the other side of the steel plate is not punched. the thickness 50-100 mm.

## Sound-absorbing sandwich panel' Composition:

Color coated galvanized sheet (outer) + Core material (Rockwool/Glasswool) + non-woven fabric + color coated galvanized perforated sheet (inner sheet with holes/perforated)

**Core material:** rockwool / glass wool ( fireproof grade A)

**Hole diameter:** 3mm

**Hole distance:** 6mm

**Perforation rate of the panels' surface:** 78%

**Opening hole range:** 600mm/800mm

## Product features:

### ▶ Airtight and sound insulation

It has good sound absorption and has a significant effect on reducing the sound caused by rain, hailstone and other impacts.

### ▶ Green and environmental protection

It does not contain formaldehyde, is not attacked by microorganisms, and can be recycled.

### ▶ Fast construction

Sandwich panels are highly controlled in the factory, produced in a constant temperature environment, with stable quality and fast construction speed.



## Application fields

Airport terminal, high-speed stations, server rooms, theaters, conference halls, excessively noisy industrial plants, sound-absorbing and noise-reducing building spaces, sound-absorbing wall panels, and large public building ceilings.

# Folding Container House

## Product Introduction:

This folding container house is made of high-quality automotive-grade galvanized steel, produced by professional assembly line equipment, error-free, slotted structure, multi-faceted force, high strength, saving labor installation costs. External dimensions: length\*width\*height=5800\*2480\*2540mm, the middle waist is folded, the interior contains circuits, doors and windows are all done, the overall height after folding does not exceed 40 cm.



## Installation Steps:



## Folding Container House Structure:



## Loading Container for Export:





## Parameter of Fold Container House :

Folding container house								
Part name	Description	Material Name	Specification	Thickenss (mm)	Qty	Unit		
Basic Features	External dimensions		5800*2480*2540mm					
	Internal dimensions		5640*2320*2420mm					
	folded state		5800*2480*395mm					
	Total weight		1200kg					
Design Parameters	Structural design service life		10years					
	Floor load		200kg/					
	Roof load		100kg/					
	Wind resistance level		8 grade					
	Anti-earthquake level		10 grade					
Framework	Top frame	Q235B Rectangular square tube	40*40*2.32m	1.6	4	pcs		
		Q235B Rectangular square tube	20*40*1.1m	1.4	5	pcs		
		Q235B Rectangular square tube	60*80*2.48m	1.6	2	pcs		
		Galvanized sheet	5.75m*1.5m	0.45	2	pcs		
		Glasswool/Rockwool	density( kg/m3) : 28/55	75				
		Ceiling panel		0.25	7	pcs		
	5.8m side	L-shaped steel sheet (galvanized)		1.160m	1.2	4	pcs	
		L-shaped steel sheet (galvanized)		1.175m	1.2	4	pcs	
		pipe		40*80*5.8m	1.5	8	pcs	
		pipe		1.08m	1.5	8	pcs	
		hinge		high strength material	1.7	34	pcs	
		Wall panels		1080*2.84m	0.25	8	pcs	
		Galvanized corner		1.08m	0.8	8	pcs	
		D-type rubber strip		5.8m		24	pcs	
		2.48m side	pipe		2.43m	1.5	4	pcs
					2.31m	1.5	4	pcs
	Wall panels			950	0.25	8.66	m	
	Galvanized corner			50#	0.8	20.41	m	

Folding container house							
Part name	Description	Material Name	Specification	Thickenss (mm)	Qty	Unit	
Framework	2.48m side	Window			2	pcs	
		Hanging head baffle			8	pcs	
		Door			1	pcs	
		white adhesive strip			21.32	m	
	Bottom frame	Customized bottom beam(galvanized sheet )		170*80*5.8m	1.8	2	pcs
				80*80	1.6	2	pcs
		hinge				4	pcs
		Galvanized square tube				9	pcs
		Floor				5	pcs
		Angle steel				3.5	pcs
Container top	Overall frame paint	Electrostatic spray/straight plastic powder					
	External top plate	Galvanized sheet 0.5mm					
	Internal ceiling	Color steel veneer V/831/0.25mm					
Wall panel	5.8m side	70mm sandwich panel 0.25mm PPGI+ glass wool /rock wool+0.25mm PPGI					
	2.48m side	70mm sandwich panel 0.25mm PPGI+ glass wool /rock wool+0.25mm PPGI					
Floor	Cement Mixed Floor 15mm						
Electrical System	Electrical wiring is installed in strict accordance with moisture-proof specifications, and all electrical products comply with CE certification. Connect the circuit according to the circuit engineering specifications, indoor: 4 national standard soft copper wire, 1pcs 32A circuit breaker, 1pcs three-hole air conditioner socket, 2.5 incoming socket, 1pcs five-hole single-opening socket, 1pcs five-hole socket, 1pcs LED light.						
Security door	Premium Security Door, Size: 980mm*1970mm						
Window	Plastic steel sliding window, single glass (4mm), with guardrail and screen, size: 925*930mm						

### Application Fields:

This product is widely used in construction, railways, bridges, water conservancy, power construction, tourism and military temporary housing; it can be used as unit offices, staff dormitories, field workshops, disaster relief points, outposts, toilets, etc. It is very convenient and fast to install and settle in immediately .



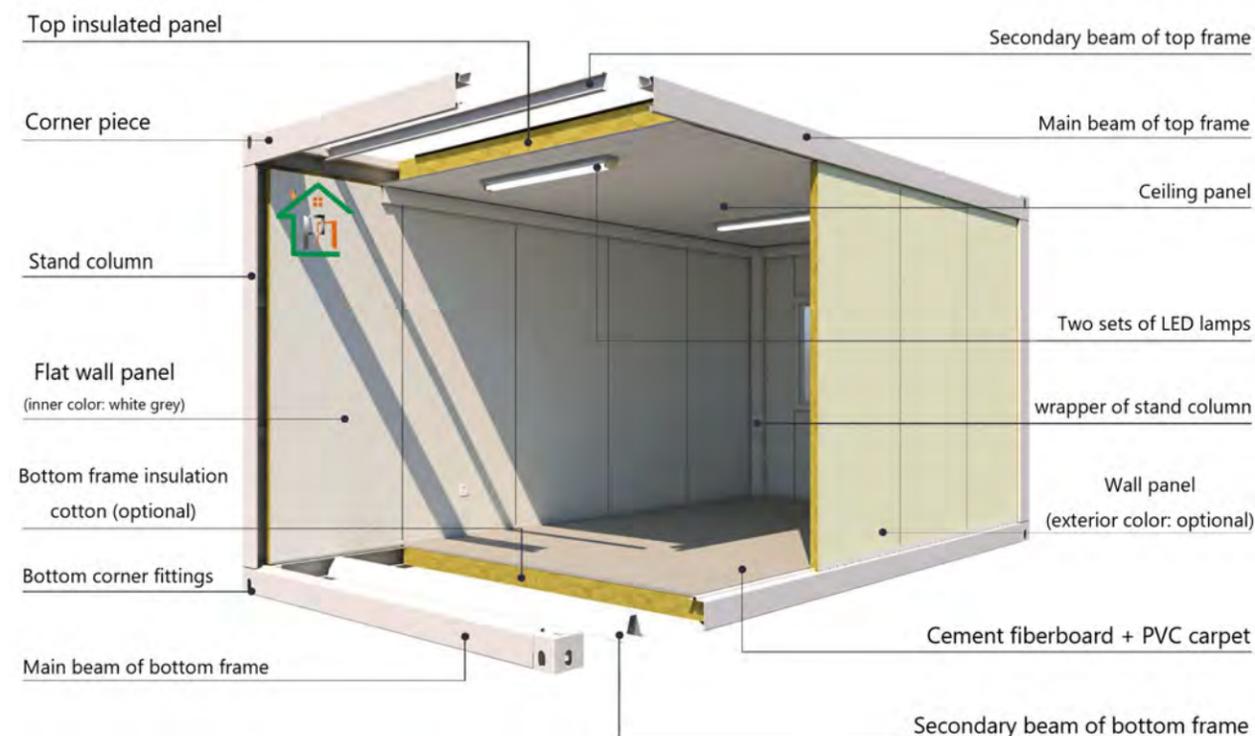
# Pack Container House

## Product Introduction:

The prefabricated integrated house can be assembled up and down, left and right, or customized according to customer needs. The factory is prefabricated, modular, flexible in layout, convenient and fast in movement, and used repeatedly.



## Structure of Pack Container House :

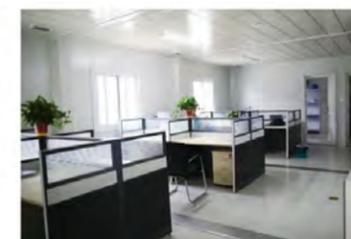


## Application fields:

The products are widely used in construction, railway, water conservancy, business, tourism and military fields, and can be widely used in offices, staff dormitories, toilets, integrated kitchens, bathrooms, headquarters, conference rooms, container stores, Container schools, container hotels, container factories, etc.



Meeting room



Office



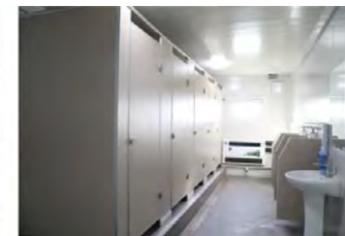
Staff canteen



Staff dormitory



Shower room



Bathroom

## Window Series

### Window used for wall



Aluminum alloy window

Thermal break Aluminum alloy window

Window spare parts



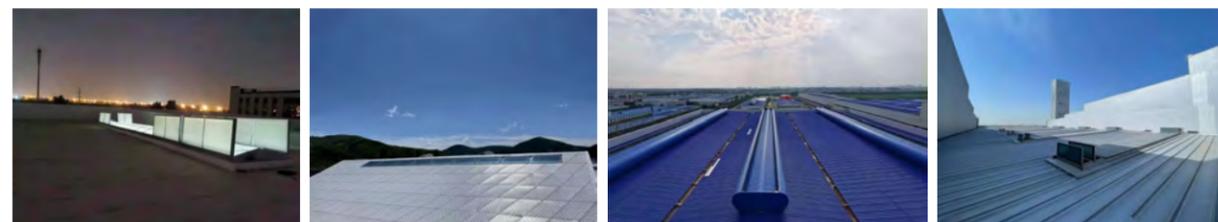
Plastic steel windows



Project case

Transport package

### Window used for roof



## Door Series

### Industrial door series



Industrial sliding door

Industrial roller shutter door

Industrial free door

Industrial clean door

### Cold storage door series

#### Hinged door:



Half-buried door

Return door

Retrofit doors

Double door

#### Sliding door:



C type manual sliding door

Lightweight manual sliding door

Electric sliding door



Electric double sliding door

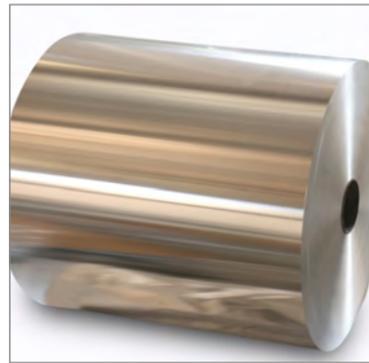


Electric vertical sliding door

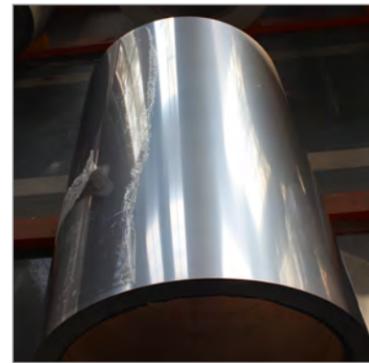
## Steel Sheet Series



Color coated sheet sheet



Aluminum plate



Stainless steel



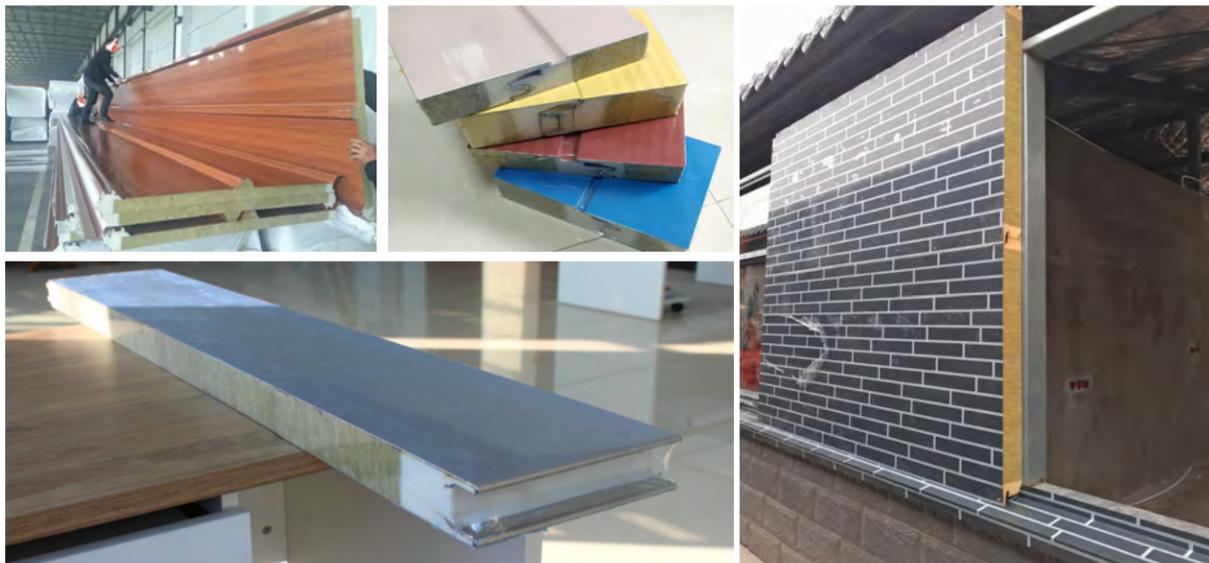
Color printing plate



Embossed aluminum coil



The above several types of steel plates can be used as the upper and lower steel plates of the sandwich panel:



## Flashing and Accessories

NAME	Graphics	Material
Center seam trim		Color prepainted steel sheet
Self-tapping screw		Carburized steel
Waterproof rivet		Carburized steel
Stitching screw		Carburized steel
Roof backbone covering flashing 1		Color prepainted steel sheet
Roof backbone covering flashing-2		Color prepainted steel sheet
Internal roof backbone flashing		Color prepainted steel sheet
Add on gutter brace		Color prepainted steel sheet
External corner flashing-1		Color prepainted steel sheet

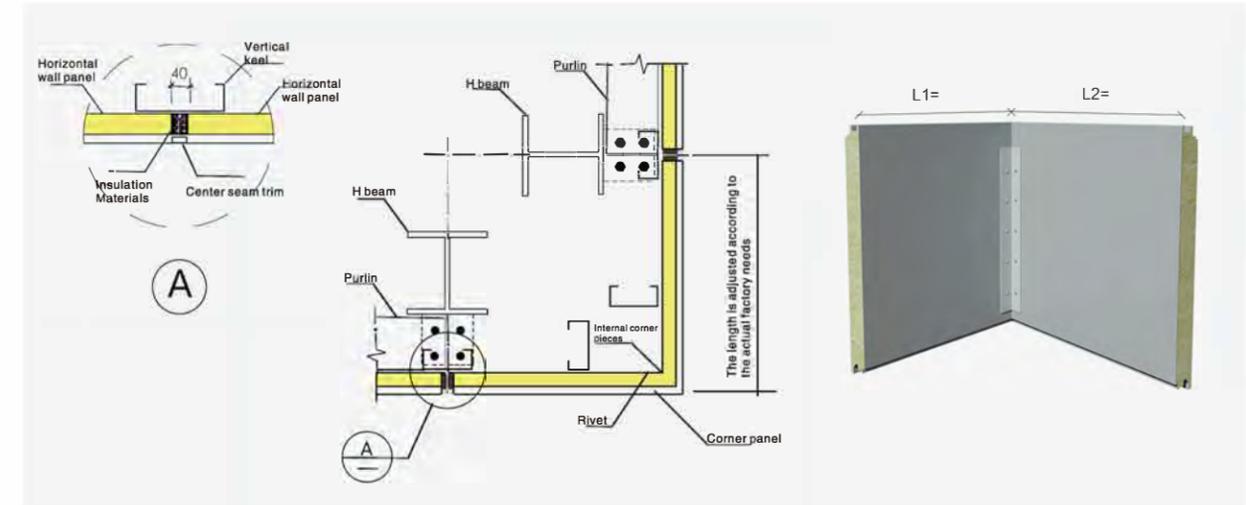
## Flashing and Accessories

NAME	Graphics	Material
External corner flashing-2		Color prepainted steel sheet
Cornice flashing		Color prepainted steel sheet
Bracket		Galvanized coated steel sheet
Bottom edge		Color prepainted steel sheet
Gable edge		Color prepainted steel sheet
External roof backbone flashing		Color prepainted steel sheet

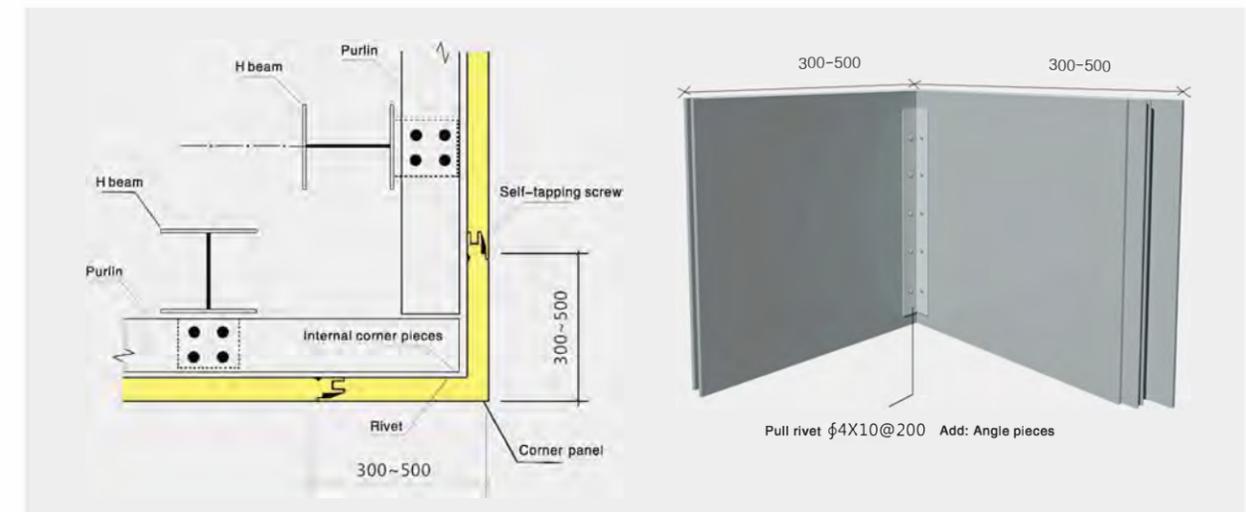
## Corner Panels

The corner panel is suitable for all right-angle wall constructions. Its main advantages are seamless corners, beautiful appearance, strong overall feeling, better heat preservation and waterproof performance, include horizontal mounting corner panels and vertical mounting corner panels.

### Horizontal corner panel



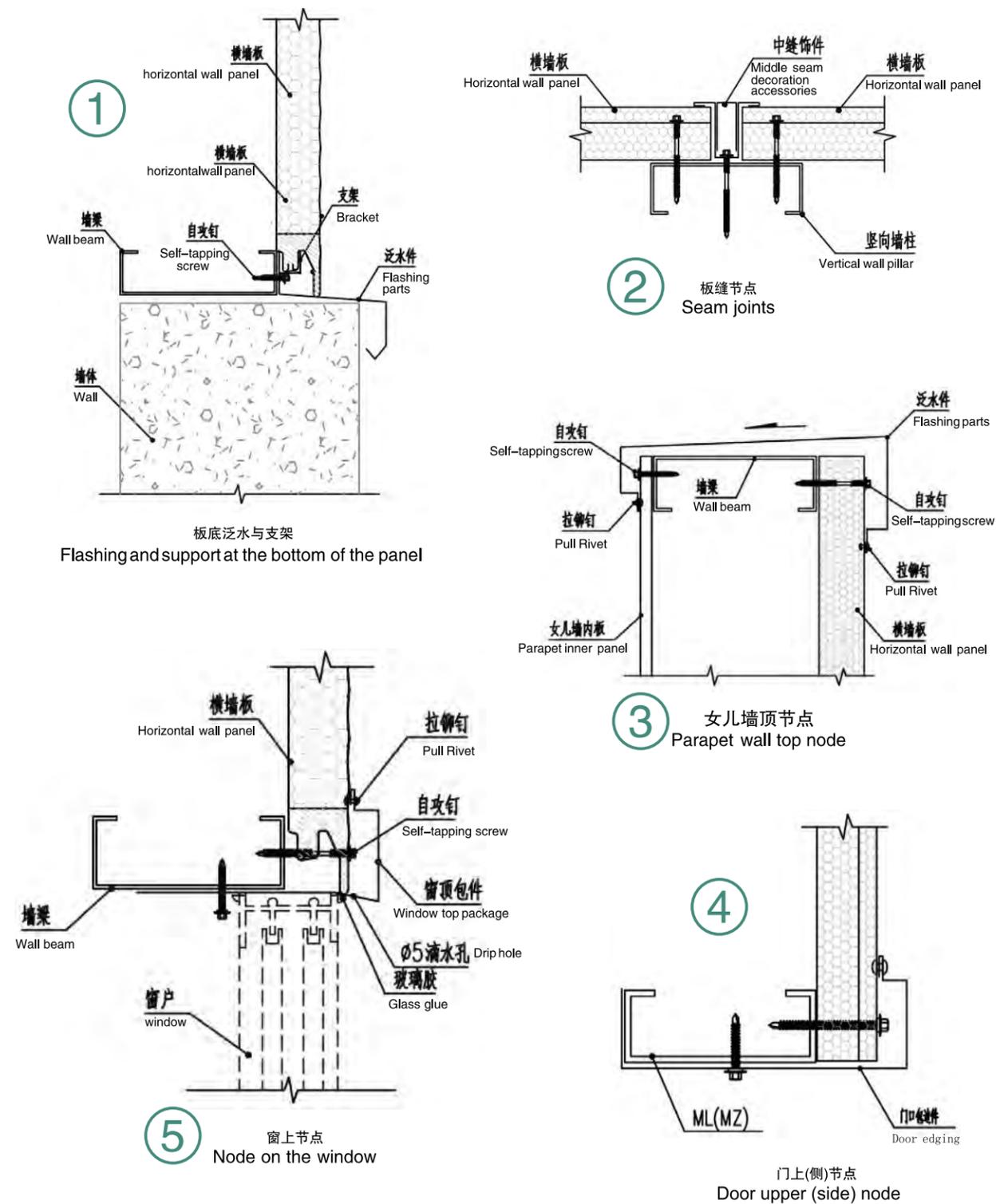
### Vertical corner panel



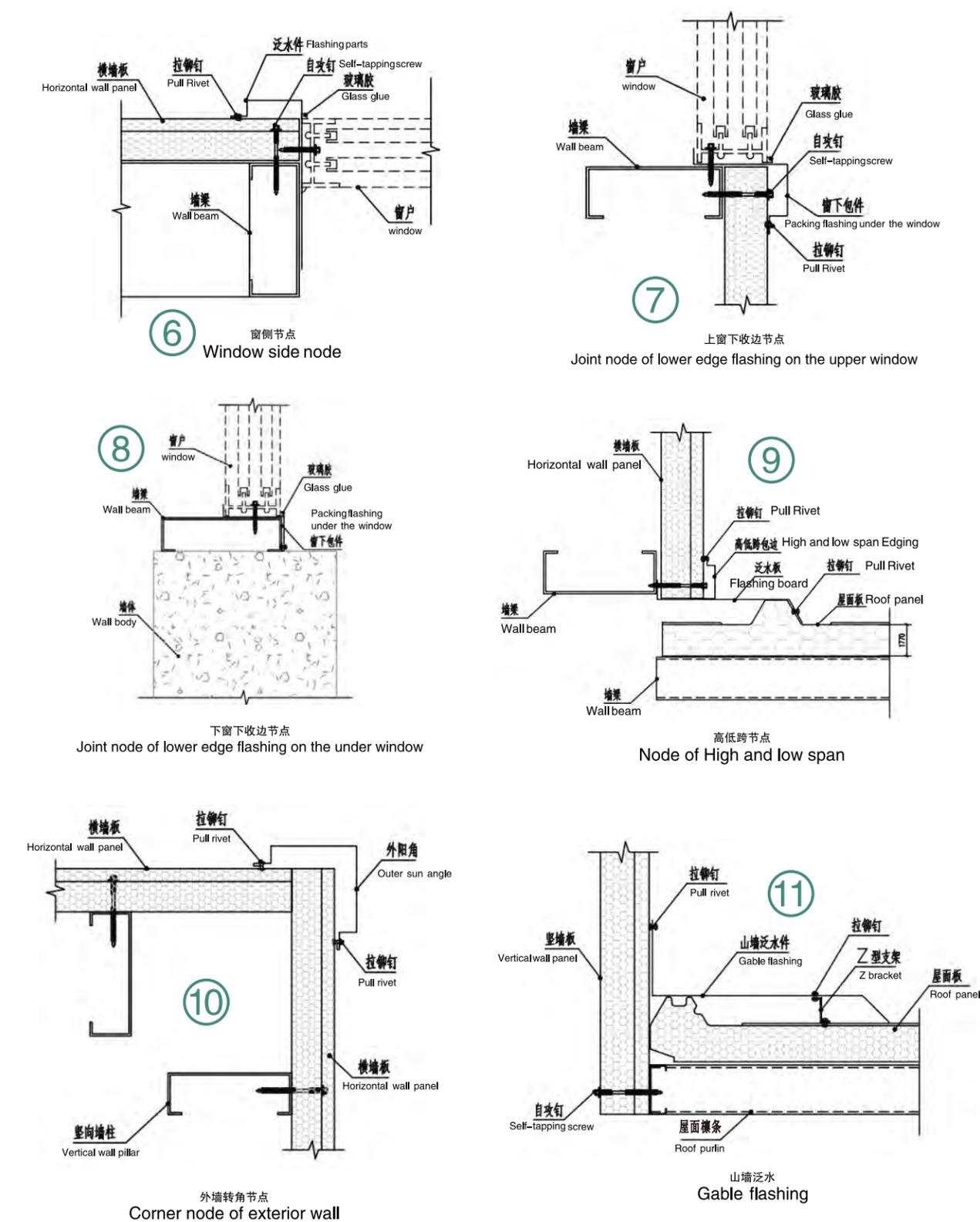
Product name	Corner panels		
Effective size	300-4000mm		
Color steel thickness	0.4-0.7mm		
Standing color	White grey, crimson, silver, sea blue, etc.		
Recommended coating	PVDF,HDP,PE		
Core thickness	50/70/75/80/100/150mm		
Name of core material	PUR/PIR	Rockwool with PU/PIR sealing side	Glasswool with PU/PIR sealing side
Thermal Conductivity	0.026-0.028w/m.k	0.037-0.043w/m.k	0.035-0.041 w/m.k



# Node graph

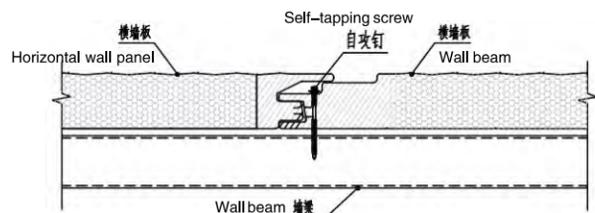


# Node graph

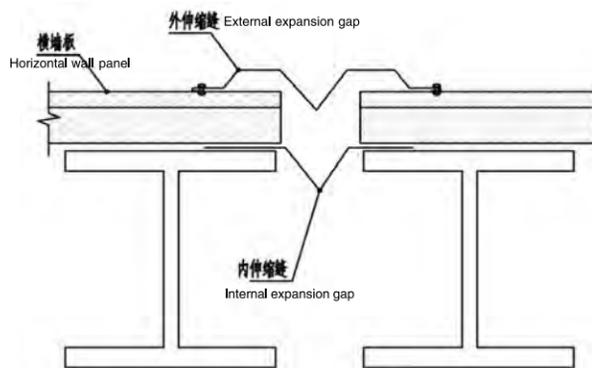




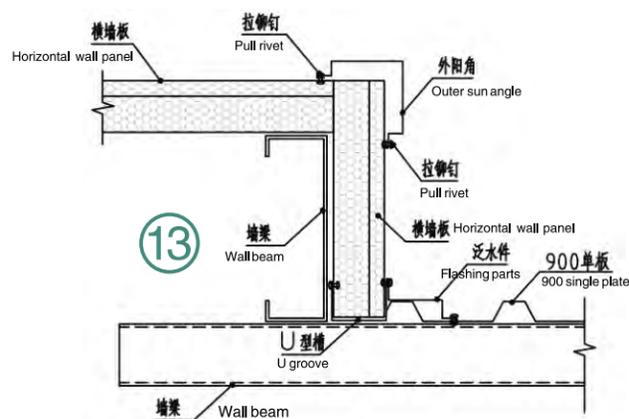
# Node graph



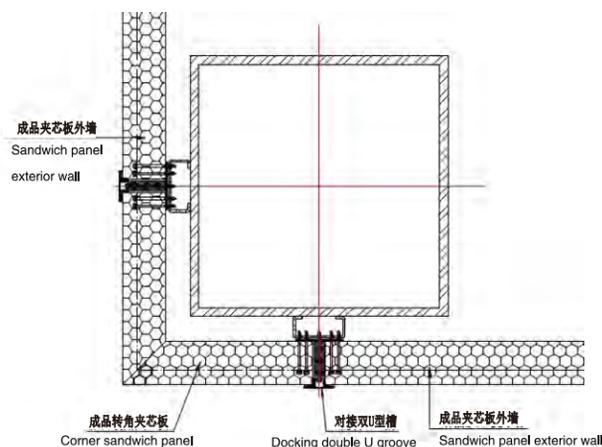
12 插接口板材节点  
Node of Plug interface panels



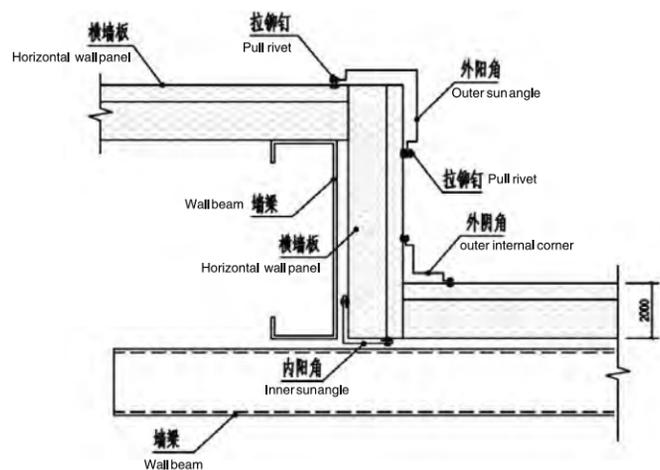
15 伸缩缝节点  
Expansion joint



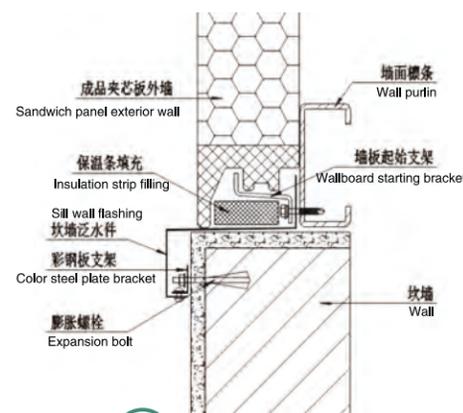
13 墙面转角节点1  
Wall corner node 1



16 墙面转角节点  
Wall Corner Node



14 墙面转角节点2  
Wall corner node 2



17 坎墙节点  
Sill wall node

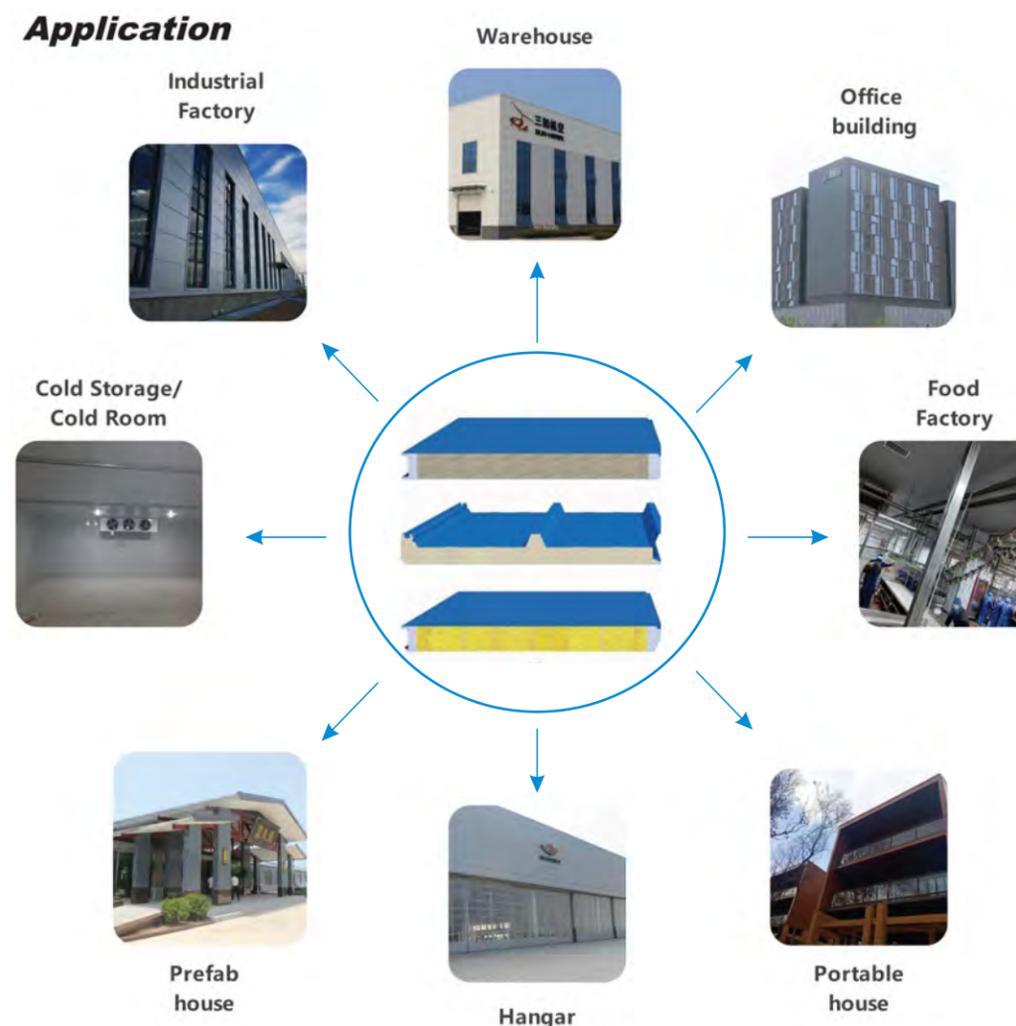
# Application Fields

## Main application areas of PUR/PIR insulation sandwich panels:

Electronic processing, biomedicine, purification engineering, food processing, preservation, aquatic product market, large supermarkets, cold chain logistics, cold storage/cold room, garages and other fields.

## The main application areas of rockwool/glasswool sandwich panels:

Industrial plants (roofing and walls), warehouses, exhibition halls, stadiums, integrated houses, light steel villas, prefabricated houses (factory prefabrication), shopping centers, airports, power plants, hospitals, low-rise and high-rise offices, etc.



## Our Projects >>>



## Our Projects >>>

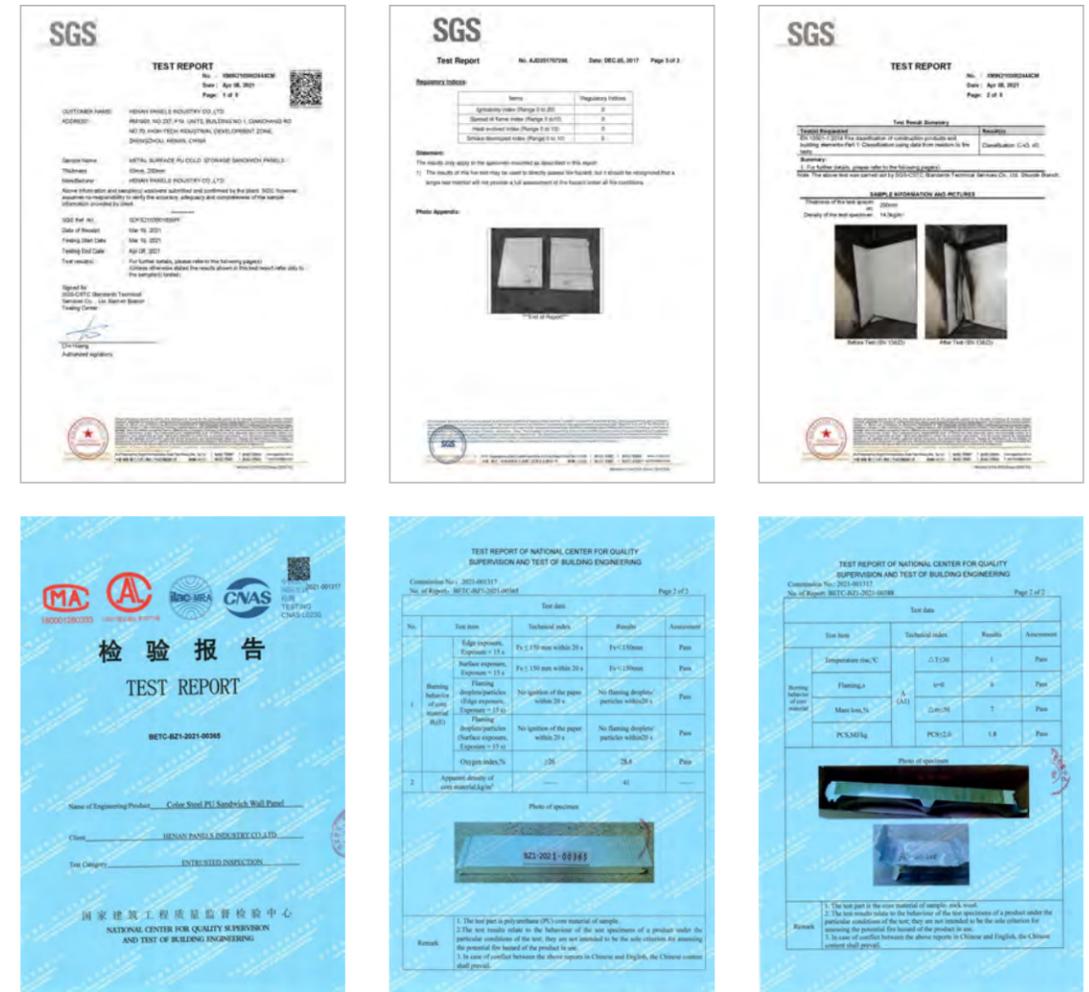




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