

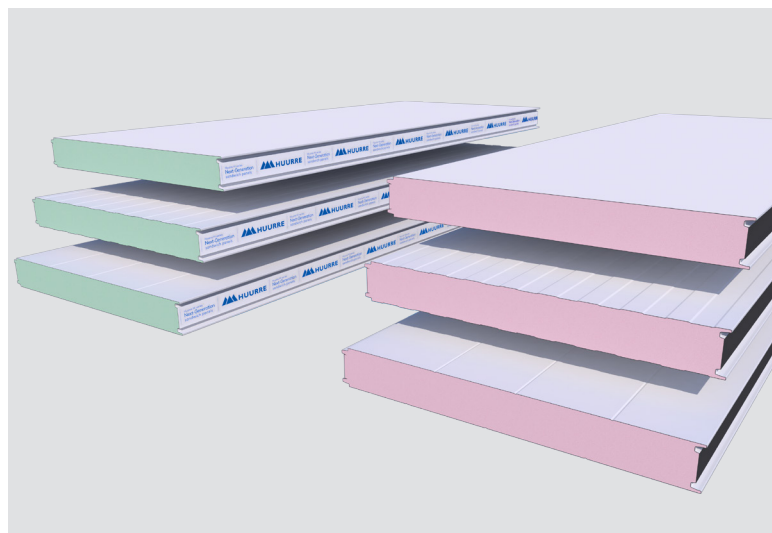
HI-F

Cold storage panel



**High thermal performance insulating panel
with high fire performance**

- ▶ High thermal insulation, resulting in a thermal transmittance of just 0,10 W/m²K (thickness of 230mm), accredited and certified.
- ▶ Good fire performance, certified by <FM GLOBAL>, without the need for sprinklers and without height limit (HI-PIRM F panel).
- ▶ High mechanical strength performance, suitable for outside use in earthquake zones, with hurricane risk or severe hail impact.
- ▶ Three available finishes (standard, flat and plank), with a wide range of coatings (PET, polyester and HDX etc) to ensure a high durability.
- ▶ Does not absorb water and maintains its performance throughout its lifetime and is not affected by biological agents.
- ▶ High joint leak-tightness, accredited by tests.



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High thermal performance insulating panel



Description and applications

Cold-storage sandwich panel, with metal faces and rigid insulation core, for applications that require a **high degree of insulation**: food and agricultural industry, cold stores, laboratories, etc.

Good fire performance, CLASS 1 certified by <FM GLOBAL> (HI-PIRM F panel).

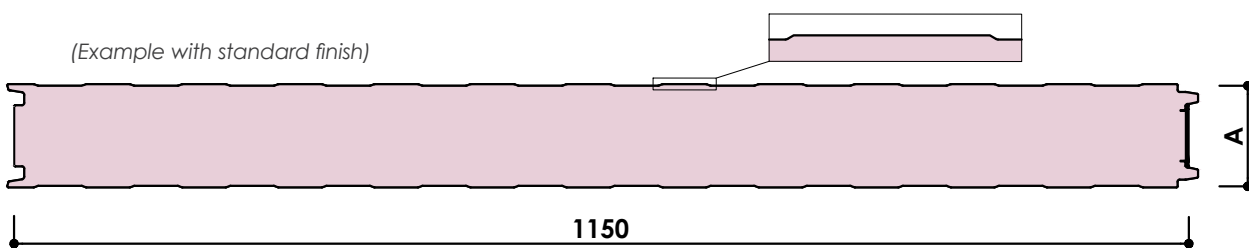
The range of HI-F panels is available with two insulating cores: **PIR** (HI-PIR F) and **PIRM** (HI-PIRM F).

Available in various **steel thicknesses**, with **coatings** suitable for contact with foodstuffs, and three finishing possibilities: **standard** lined profile, **flat** and **plank**.

High mechanical performance certified by laboratory tests.



Dimensions, weight and thermal properties



Useful width	1,150 mm (1,120 mm, check availability)								
Manufacturing length	Standard	2.0 to 13.5 m							
	Special	13.5 to 18.0 m (special transport)							
Type of joint	FJ FS								
Fresh thermal conductivity	0.020 W/mK								
Declared thermal conductivity ¹	0.022 W/mK (considering an aged core)								
Insulating core density	PIR: 40 (± 5) kg/m³					PIRM: 40 (-2/+5) kg/m³			
Total thickness (A)	60	80	100	125	150	175	200	230	(mm)
Weight ²	10.86	11.69	12.49	13.49	14.49	15.49	16.49	17.69	(kg/m²)
Thermal transmittance ^{1,2} (PIR/PIRM)	0.39	0.28	0.22	0.18	0.15	0.13	0.11	0.10	(W/m²K)
Thermal resistance ² (PIR/PIRM)	2.85	3.76	4.67	5.81	6.94	8.08	9.22	10.58	m²K/W)

NOTES: (1) Thermal transmittance determined according to UNE-EN 14509:2014, standard, considering the effect of ageing of the insulating core, and certified by the AENOR "N" stamp.

(2) For 0.5/0.5 mm sheets (int/ext) and panel width of 1,150 mm. Consult other options.

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Components

Wall facings

Cold-profiled S220GD structural hot-galvanised steel sheet with certified quality according to EN 10346 and EN 10169. Standard sheet thicknesses: 0,5 mm for outer face / 0,5 mm for inner face.

It is essential to respect the outer face (transparent film) and the inner side face (blue film).

Insulating core

Rigid polyisocyanurate foam (PIR or PIRM), continuous injection by a process that does not release HCFCs.

Finishing options

Manufactured with three exterior profiling options: standard, plank and flat. Standard sheet thickness (exterior/interior) 0.5/0.5mm. Plank finish is not available in 1,120 mm width panels.

Leak-tightness and joint types

The HI-F panel is available with two types of joints, both with double tongue and groove and flexible polyethylene joint which guarantees the best water tightness with a simple and fast assembly.

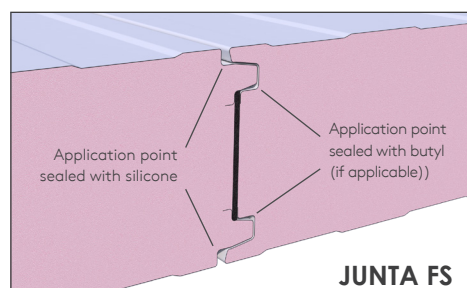
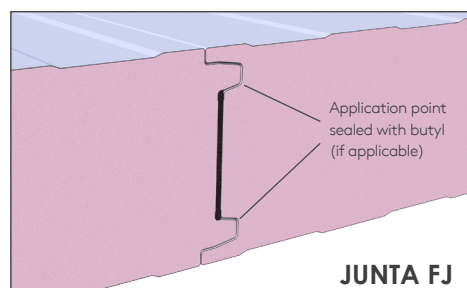
The **FJ joint** is certified as not requiring additional silicon sealing (under the permeability parameters indicated). Water-tightness accredited in laboratory tests (according to the EN 14509:2013, EN 12114:2000 y EN 12865:2002 standards).

Permeability to air: 0,00 m³/h · m² a 50 Pa. Values certified by external laboratory according to Standard EN 12114:2000.

Permeability to water: CLASS A* (joints permeable to water at pressures higher than 1,800 Pa). Best classification according to EN 12865:2002, for demanding applications with heavy rain and strong winds.

(*) Applies to thickness equal to or greater than 80mm.

The **FS joint** has been designed with the aim of adding an additional external sealing seam which can be applied once the panel installation is completed. The FS joint also allows the application of butyl seal at its interior during the assembly stage.



Recommended sealing	Positive storage	Negative (cold) storage
FJ joint	-	Butyl in interior joint, silicone in exterior joint
FS joint	Silicone in exterior joint	Butyl in interior joint, silicone in exterior joint

Mechanical strenght properties

The HI-F panel is suitable for exterior enclosure for façades because of its high rigidity, impact strength and durability.

Certified earthquake resistance

The HI-F panel is accredited for use in high seismic areas by the French CSTB through an extensive full-scale structural testing campaign in its laboratory. DTA certificate 2/16-1770.

Certified hurricane resistance

<FM GLOBAL> has issued the FM Approved* certification to the HI-PIRM F panel used as an exterior façade (according to FM 4881 standard), validating and certifying its suitability, even in areas with high risk of hurricanes ("TC" zones) and with the possibility of severe hail impacts (class "SH").

(*) Subject to installation conditions.

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Mechanical resistance and usage tables

The tables below indicate the maximum admissible distance between supports (m) depending on panel thickness (mm) and the characteristic downward load (without weighting) distributed uniformly (daN/m²). The tables are calculated according to **UNE-EN 14509:2014 Standard** for SLS and ULS. Please consult us for suction loads.

TWO SUPPORTS

		Pressure load (daN/m²)						
<div>L(m)</div> <div>Thickness</div>		50	75	100	125	150	175	200
	60	5.40	4.51	3.59	2.87	2.40	2.06	1.80
	80	6.67	5.60	4.82	3.86	3.22	2.77	2.42
	100	7.83	6.59	5.71	4.84	4.04	3.46	3.04
	125	8.86	7.23	6.27	5.61	5.07	4.34	3.80
	150	9.48	7.75	6.71	6.00	5.48	5.07*	4.56*
	175	10.00	8.17	7.07	6.33	5.77*	5.34*	5.00*
	200	10.42	8.51	7.37	6.59	6.01*	5.56*	5.21*
	230	9.18	7.49	6.49*	5.80*	5.30*	4.89*	4.57*

MULTI SUPPORTED

		Pressure load (daN/m²)							
		50	75	100	125	150	175	200	
L(m)	Thickness	60	6,13	4.79	3.60	2.88	2.40	2.06	1.80
		80	7.16	5.85	4.83	3.87	3.23	2.77	2.42
100		8.07	6.59	5.65	4.83*	4.03*	3.45*	3.02*	
125		8.87	7.24	6.26*	5.59*	5.05*	4.33*	3.79*	
150		9.49	7.61	6.70*	5.99*	5.47*	5.06*	4.56*	
175		10.51	8.56*	7.41*	6.63*	6.06*	5.61*	5.24*	
200		10.97	8.95*	7.74*	6.93*	6.33*	5.81*	5.48*	
230		9.18	7.49	6.47*	5.78*	5.28*	4.88*	4.57*	

1 daN/m² ≈ 1 kp/m²

NOTES: Support width = 50mm. (*) Support width > 50mm. Consult HUURRE for other support widths.
Tables for light coloured panels. Consult for dark panel.
Minimum external temperature considered -10°C.

Reaction to fire

Fire reaction classification

EUROCLASS B-s1,d0

B: Very limited contribution to fire and will not lead to flashover¹

s1: Little or no smoke production

d0: No flaming droplets / particles

(1) Best classification possible for an organic type material.

Reaction to fire is determined according to UNE-EN 13501-1:2019. With N stamp certification by AENOR.

EI 60 fire resistance with HI-PIR F panels in accordance with EN 13501-2:2016 for panels thicker than 200mm. Tested under the name "HI-PIR F 200mm (EI)". Consult assembly conditions.

Reaction to fire according to FM APPROVALS standards (only HI-PIRM F panel)



FM 4880 Class 1* Fire resistance of building panels or interior finishing materials. **FM 4881 Class 1*** Exterior wall systems.

Test programme assess the fire performance of facades or walls and interior ceilings with HI-PIRM F panels, of any height, for the most demanding fire protection requirements in fire protection.

(*) Subject to assembly and coating conditions. Consult with our technical department.

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Table of energy loss through the enclosure

The following table gives the energy losses through the enclosure (W/m^2), depending on the HI-F panel thickness and the temperature gradient between its two faces.

Panel thickness (mm)		60	80	100	125	150	175	200	230
U ($W/m^2 \text{ } ^\circ C$)		0.39	0.28	0.22	0.18	0.15	0.13	0.11	0.10
Temperature gradient between the faces of the enclosure ($^\circ C$)	10	3.86	2.80	2.23	1.77	1.47	1.26	1.11	0.97
	15	5.79	4.20	3.35	2.66	2.21	1.89	1.67	1.46
	20	7.72	5.60	4.46	3.54	2.94	2.52	2.22	1.94
	25	9.65	7.00	5.58	4.43	3.68	3.15	2.78	2.43
	30	11.58	8.40	6.69	5.31	4.41	3.78	3.33	2.91
	35	13.51	9.80	7.81	6.20	5.15	4.41	3.89	3.40
	40	15.44	11.20	8.92	7.08	5.88	5.04	4.44	3.88
	45	17.37	12.60	10.04	7.97	6.62	5.67	5.00	4.37
	50	19.30	14.00	11.15	8.85	7.35	6.30	5.55	4.85
	55	21.23	15.40	12.27	9.74	8.09	6.93	6.11	5.34
	60	23.16	16.80	13.38	10.62	8.82	7.56	6.66	5.82
	65	25.09	18.20	14.50	11.51	9.56	8.19	7.22	6.31
	70	27.02	19.60	15.61	12.39	10.29	8.82	7.77	6.79
	75	28.95	21.00	16.73	13.28	11.03	9.45	8.33	7.28
	80	30.88	22.40	17.84	14.16	11.76	10.08	8.88	7.76

NOTE: In blue, the recommended losses through the enclosure in negative cold storages (máx. 6 W/m^2)
In yellow, the recommended losses through the enclosure in positive cold storage (máx. 8 W/m^2)

Available coatings

Table of coatings choice to ensure the maximum durability of the panel. CPI1 and RC1 classifications considered suitable for healthy environments, and CPI5 and RC5 suitable for very aggressive environments.

Outdoor environment										Indoor environment			
	Rural without pollution	Urban/Industrial		Marine			Resistance			Non-aggressive environments		Aggressive and/or very humid environments	Resistance Indoor corrosion category
		Moderate	Severe	Between 3 and 20 km	< 3 km ⁽¹⁾	Mixed	Outdoor corrosion category	UV		Low humidity	Medium humidity		
E5001	✗	✗	✗	✗	✗	✗	NA	NA	✓	✗	✗	✗	!
Polyester 25 μ	✓	✓	!	!	✗	✗	!	!	✓	✓	✓	Ai3 ²	CPI2
Polyester plus 25 μ	✓	✓	!	✓	✗	✗	RC3	RUV2	✓	✓	✓	Ai3	CPI3
PVDF 35 μ	✓	✓	!	✓	!	!	RC4	RUV4	✓	✓	✓	Ai3	CPI4
HDX 55 μ	✓	✓	✓	✓	✓	!	RC5	RUV4	✓	✓	✓	Ai3	CPI4
PET 50 μ	✗	✗	✗	✗	✗	✗	NA	NA	✓	✓	✓	Ai5	CPI5
INOX ⁽³⁾	✗	✗	✗	✗	✗	✗	NA	NA	✓	✓	✓	Ai5	Exc ²
INOX PVC + PET ⁽³⁾	✗	✗	✗	✗	✗	✗	NA	NA	✓	✓	✓	Ai6	Exc ²

✓ Suitable coating ✗ Unsuitable coating ! Check with HUURRE IBÉRICA (1) Please contact us for distances < 300 m (2) Check conditions
(3) Only widths of 1.150 mm. (NA) Not applicable. (Exc.) Excellent. For other coatings, consult our technical department.

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Manufacturing quality and standards

Guaranteed and certified quality

The HUURRE Comprehensive Quality Management System, which is in accordance to the ISO 9001 standard, is audited and certified by AENOR and IQNet (ER-0947/1998 certification).

HI-PIR F and HI-PIRM F panel certifications



CE marking according to EN 14509:2013 standard.



Product certified with the "N" quality assurance stamp of AENOR. (Certified to 020/003499 for PIR and 020/003500 for PIRM).



Avis Technique d'Application CSTB - 2/16-1770¹.

(1) Tested under the name HI-F. Excluding thickness of 230 mm.

HI-PIRM F panel certifications - FM APPROVALS

Insurer approvals are large scale testing regimes that provide objective third-party testing, which is underpinned by annual factory surveillance audits to verify compliance. Insurer approvals are subject to panel thickness, method of assembly and steel coating.

Características adicionales

Resistant to biological agents

HUURRE panels, thanks to the closed structure of the insulating core, are resistant to attack by fungi, moulds and other deteriorating biological agents.

They are, therefore, suitable for applications that require a high degree of hygiene and healthy conditions (agrofood sector, laboratories, etc.).

Water absorption

The insulating core of the panel does not absorb water and thus maintains its performance throughout its lifetime. For this reason, they can be installed in adverse weather conditions.

Warranty

The HUURRE HI-F panel has a warranty of up to 25 years for its functional features and up to 35 years for its coatings. Conditions apply.

Sustainability

Both the steel and their metallic and organic coatings are free of SVHC (Substances of Very High Concern), in conformity with the requirements of the European REACH regulation.

The insulating core of the panel is injected using a process that does not release HCFC type gases.

The HUURRE Environmental Management System (ISO 14001) and the Health and Safety in the Workplace System (ISO 45001) are certified by AENOR and IQNet (certifications GA-2003/0091 y ES-SST-0035/2010 respectively).

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