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1. Introduction

The Construction industry is facing some of its biggest challenges for years – changes in regulations, greater focus on sustainable construction and value for money throughout the product lifecycle. Therefore, this document has the purpose of illustrating the main elements that compose the Emmedue Building System.

The Emmedue Building system is here to combat the ever-changing market, allowing the construction industry to continue to grow and adapt with the times.

It is worth noting that the Emmedue Building System has been designed to meet the exact requirements of the project. Therefore, making it fully bespoke to your individual project. However, all the following information will provide you an insight into the more generic panels that are frequently used.

2. Description of the Emmedue Building System

2.1. Essentials of the Emmedue System

The Emmedue Building System is based on a combination of foam polystyrene sheet and galvanized steel wire meshes. The EPS shape has been specifically designed for the application of traditional plaster or shotcrete during on-site panel installation.

The Emmedue Building system provides industrialized modular panels allowing a faster assembly compared to conventional systems. The Emmedue system fulfils the required structural and load bearing functions, offering high thermal and sound resistance and a wide range of shapes and finishes to provide versatility in the design completion process.

2.2. Composition of the Emmedue Panels

2.2.1. Double Panel (PDME)

- The double panel is made up of two basic single panels, shaped as required and joined together by double horizontal connectors tying the two panels together throughout the section (acting as the rebar). This creates a hollow core which is then filled with the concrete of required strength to meet the project needs. (See Fig 1.)

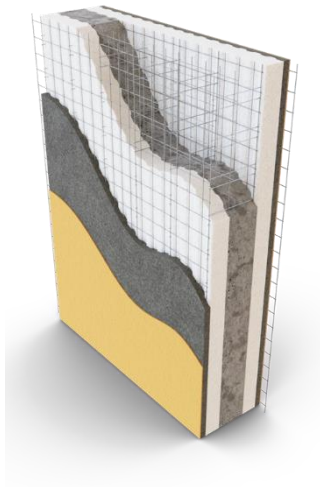


Fig 1.

2.2.2. Single Panel (PSM)

- The single panel which consists of an EPS rigid core with prefabricated, galvanized, high tensile steel wire mesh reinforcement (600Mpa). Following erection on site it is sprayed both sides in shotcrete (concrete) creating a structural building. (See Fig 2.)

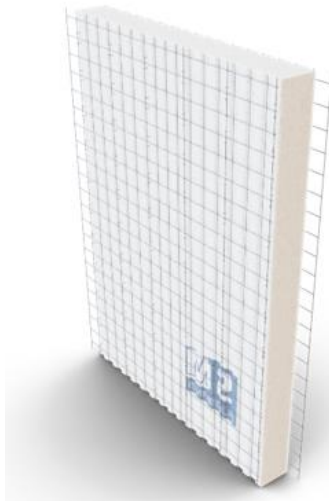


Fig 2.

2.2.3. Curved Panel (PSM Curve)

- The curved panel is just a single panel, the panel is manufactured as a curved panel to meet the design requirements. The single panel which consists of an EPS rigid core with prefabricated, galvanized, high tensile steel wire mesh reinforcement (600Mpa). Following erection on site it is sprayed both sides in shotcrete (concrete) creating a structural building. (See Fig 3.)

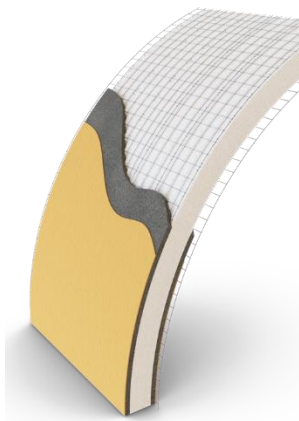


Fig 3.

2.2.4. Floor Panel (PSG)

- The Floor panel which consists of an EPS rigid core with prefabricated, galvanized, high tensile steel wire mesh reinforcement. The EPS has an in fill manufactured beam location. Once erected on site, concrete will be poured over the slab which will then create a concrete beam for structural purposes. (See Fig 4.)



Fig 4.

2.2.5. Stair Panel

- The stair panel consists of foam polystyrene block shaped according to designing requirements, coated with two layers of steel wire mesh joined together by electro-weld crosswise connectors. This panel, suitably reinforced and finished with casting on site in the suitable spaces, is used to build flights of stairs. (See Fig 5.)



Fig 5.



2.3. Finishes to the Emmedue Building System

2.3.1. External Finishes

- Render
- Brick Slip
- Brick
- Wood Cladding
- Any form of Cladding

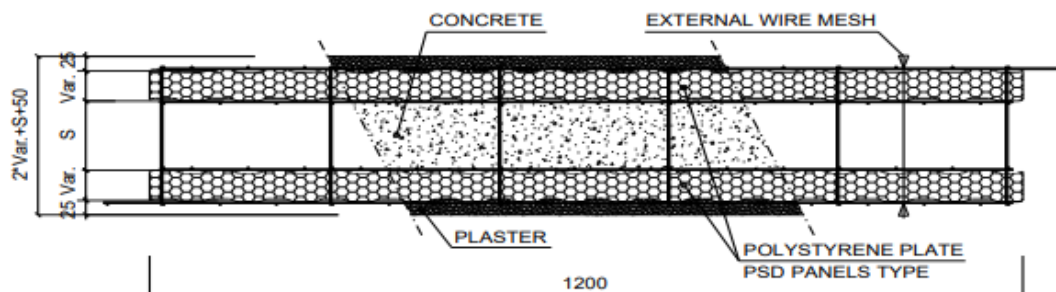
2.3.2. Internal Finishes

- Plastering
- Drylining

2.4. Advantages of the Emmedue Building System

- High Thermal Insulation.
- Versatility & Diversity of panels to accommodate different architectural and design features.
- Easy to move, rapid assembly with little or no need for lifting equipment, and high durability.
- Structural capacity and resistance to earthquakes and hurricanes.
- No skilled labour required.
- Lower costs and less construction time.
- Lower foundations costs compared with conventional systems.
- Complete construction system.
- Excellent integration with traditional systems.
- Highly fire-proof material.
- Easy and quick installation of the plumbing, heating, electric, telephone systems etc.
- Panels of customised length and thickness.
- Solid panel connection.
- EPS Core can avoid the thermal bridges.
- Made of ecological components.

3. Double Panels:



Galvanized steel wire external mesh:

- **Longitudinal Wires:** \varnothing 2.5mm every 77.5mm
- **Transversal Wires:** \varnothing 2.5mm every 75mm
- **Cross Steel Wire:** nr. 2 \varnothing 3mm every 150mm (Approx. 70 per M²)

Steel wire yield: $f_{yk} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{tk} > 680 \text{ N/mm}^2$

EPS density: Approx. 25 Kg/m³

EPS Thickness: From 5cm to 8cm

EPS Inter-plate distance: From 10cm to 20cm

3.1. PDME150 – 50+50 EPS

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height
0.3	0.2	100	250	REI 150	40	470.3	8.3	No Limit

3.2. PDME150 – 70+70 EPS

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height
0.22	0.19	100	290	REI 150	40	471.5	9.5	No Limit

3.3. PDME150 – 80+80 EPS

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height
0.19	0.17	160	310	REI 150	40	472.1	10.1	No Limit

3.4. PDME200 – 50+50 EPS

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height
		100	300	REI 150	40 DB	590.5	8.5	No Limit

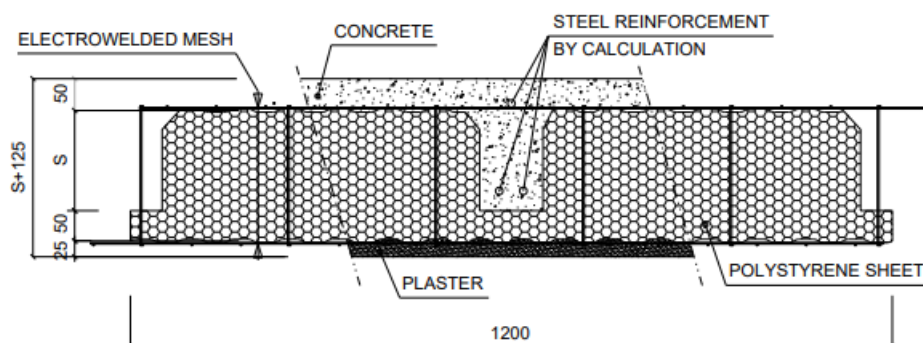
3.5. PDME200 – 70+70 EPS

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height
		140	340	REI 150	40 DB	591.7	9.7	No Limit

3.6. PDME200 – 80+80 EPS

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height
		160	360	REI 150	40 DB	592.3	10.3	No Limit

4. Floor Panels



Galvanized steel wire mesh:

- **Longitudinal Wires:** Ø 2.5mm every 77.5mm
- **Transversal Wires:** Ø 2,5mm every 112.5mm
- **Cross Steel Wire:** nr. 2 Ø 3mm every 225mm (Approx. 45 per M²)

Steel wire yield: $f_{yk} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{tk} > 680 \text{ N/mm}^2$

EPS density: Approx. 15 Kg/m³

4.1. PSG2_120

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		12	170	REI 120		223.6	4.6	3.5

4.2. PSG2_140

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		14	190	REI 120		231.9	4.9	3.8

4.3. PSG2_160

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		16	210	REI 120		240.2	5.2	4.5

4.4. PSG2_180

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		18	230	REI 120		248.5	5.5	5

4.5. PSG2_200

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		20	250	REI 120		256.8	5.8	6

4.6. PSG2_220

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		22	27	REI 120		265.1	6.1	6.5

4.7. PSG2_240

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		24	290	REI 120		273.4	6.4	7

4.8. PSG2_260

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span (M)
0.18	0.14	26	310	REI 120		290	6.7	9

4.9. PSG2_280

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
0.17	0.13	28	330	REI 120		281.7	7	9.5

4.10. PSG3_120

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		12	170	REI 120				3.5

4.11. PSG3_140

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		14	190	REI 120				3.8

4.12. PSG3_160

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		16	210	REI 120				4.5

4.13. PSG3_180

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		18	230	REI 120				5

4.14. PSG3_200

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		20	25	REI 120				6

4.15. PSG3_220

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		22	270	REI 120				6.5

4.16. PSG3_240

U- Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
		24	290	REI 120				7

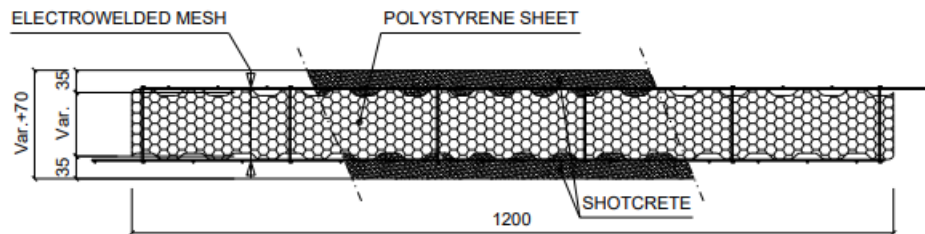
4.17. PSG3_260

U - Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
0.20	0.15	26	310	REI 120		345.7	6.4	9 / 10

4.18. PSG3_280

U - Value EX Thermal Bridge	U – Value With Thermal Bridge	Rib Height (cm)	Finished slab thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Span
0.19	0.14	28	330	REI 120		333.2	6.7	9.5 / 10.5

5. Single Panel (Structural)



Galvanized steel wire mesh:

- **Longitudinal Wires:** \varnothing 2.5mm every 77.5mm
- **Transversal Wires:** \varnothing 2.5mm every 75mm
- **Cross Steel Wire:** nr. 2 \varnothing 3mm every 150mm (Approx. 70 per M²)

Steel wire yield: $f_{yk} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{tk} > 680 \text{ N/mm}^2$

EPS density: Approx. 15 or 25 Kg/m³

EPS Thickness: Between 6cm and 16cm

For the use of this panel as structural wall a shotcrete thickness of 70mm must be applied.

5.1 PSM 80

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.40	80	150	REI 90	45 DB	158.6	4.6	4

5.2 PSM 100

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.32	100	170	REI 90	45 DB	159.2	5.2	4

5.3 PSM 120

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.27	120	190	REI 90	45 DB	159.8	5.8	4

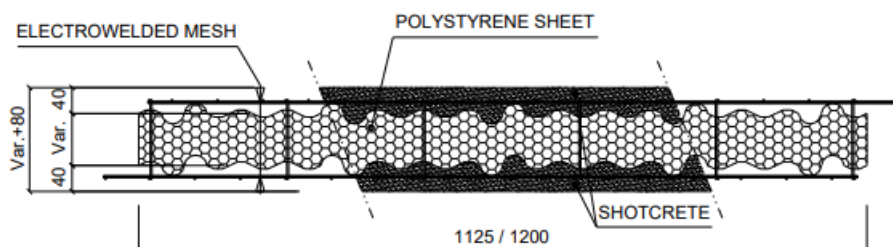
5.4 PSM 140

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.23	140	210	REI 90	45 DB	160.4	6.4	4

5.5. PSM 160

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.20	160	230	REI 90	45 DB	160.9	6.9	4

6. Single Panel (Load Bearing)



Galvanized steel wire mesh:

- **Longitudinal Wires:** Ø 2.5mm every 70.3mm / 77.5mm
- **Transversal Wires:** Ø 2.5mm every 70mm / 75mm
- **Cross Steel Wire:** nr. 2 Ø 3mm every 140mm / 150mm (Approx. 70 per M²)

Steel wire yield: $f_{YK} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{TK} > 680 \text{ N/mm}^2$

EPS density: Approx. 15 or 25 Kg/m³

EPS Thickness: Between 8cm and 16cm

For the use of this panel as structural wall a shotcrete thickness of 80mm must be applied.

6.1. PSME 80

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.40	80	160	REI 90	45 DB	180.7	4.7	4

6.2 PSME 100

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.32	100	180	REI 90	45 DB	181.3	5.3	4

6.3 PSME 120

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.27	120	200	REI 90	45 DB	181.9	5.9	4

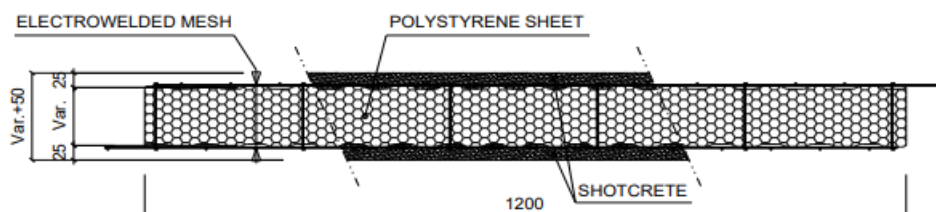
6.4 PSME 140

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.23	120	220	REI 90	45 DB	182.4	6.4	4

6.5 PSME 160

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.20	160	240	REI 90	45 DB	183.0	7.0	4

7. Single Panel (Partition Wall)



Galvanized steel wire mesh:

- **Longitudinal Wires:** \varnothing 2.5mm every 77.5mm
- **Transversal Wires:** \varnothing 2.5mm every 112.5mm
- **Cross Steel Wire:** nr. 2 \varnothing 3mm every 225mm (Approx. 45 per M²)

Steel wire yield: $f_{yk} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{tk} > 680 \text{ N/mm}^2$

EPS density: Approx. 15 or 25 Kg/m³

EPS Thickness: Between 5cm and 20cm

For the use of this panel as structural wall a shotcrete thickness of 50mm must be applied.

7.1 PST 80

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.40	80	130	REI 120	41 DB	104.2	4.2	No Limit

7.2 PST 100

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.32	100	150	REI 120	41 DB	104.7	4.7	No Limit

7.3 PST 120

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.27	120	170	REI 120	41 DB	105.3	5.3	No Limit

7.4 PST 140

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.23	140	190	REI 120	41 DB	105.8	5.8	No Limit

7.5 PST 160

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.20	160	210	REI 120	41 DB	106.3	6.3	No Limit

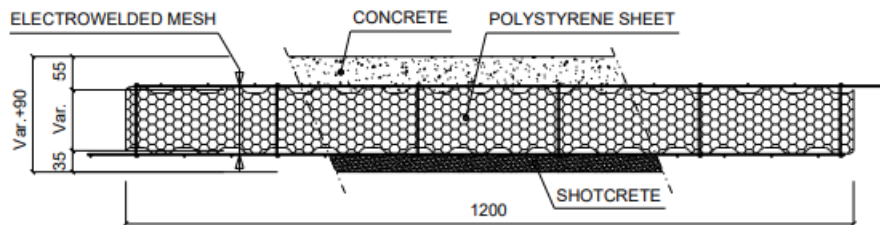
7.6 PST 180

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.18	180	230	REI 120	41 DB	106.9	6.9	No Limit

7.7 PST 200

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2	Max Height (Stories)
0.16	200	250	REI 120	41 DB	107.4	7.4	No Limit

8. Roof Panel (Pitched)



Galvanized steel wire mesh:

- **Longitudinal Wires:** \varnothing 2.5mm every 77.5mm
- **Transversal Wires:** \varnothing 2.5mm every 75mm
- **Cross Steel Wire:** nr. 2 \varnothing 3mm every 150mm (Approx. 70 per M²)

Steel wire yield: $f_{YK} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{TK} > 680 \text{ N/mm}^2$

EPS density: Approx. 15 or 25 Kg/m³

EPS Thickness: Between 8cm and 16cm

For the use of this panel as structural wall a shotcrete thickness of 90mm must be applied.

8.1 PSS 80

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2
0.40	80	170	REI 120	41DB	213.6	4.6

8.2 PSS 100

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2
0.33	100	190	REI 120	41 DB	214.2	5.2

8.3 PSS 120

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2
0.27	120	210	REI 120	41 DB	214.8	5.8

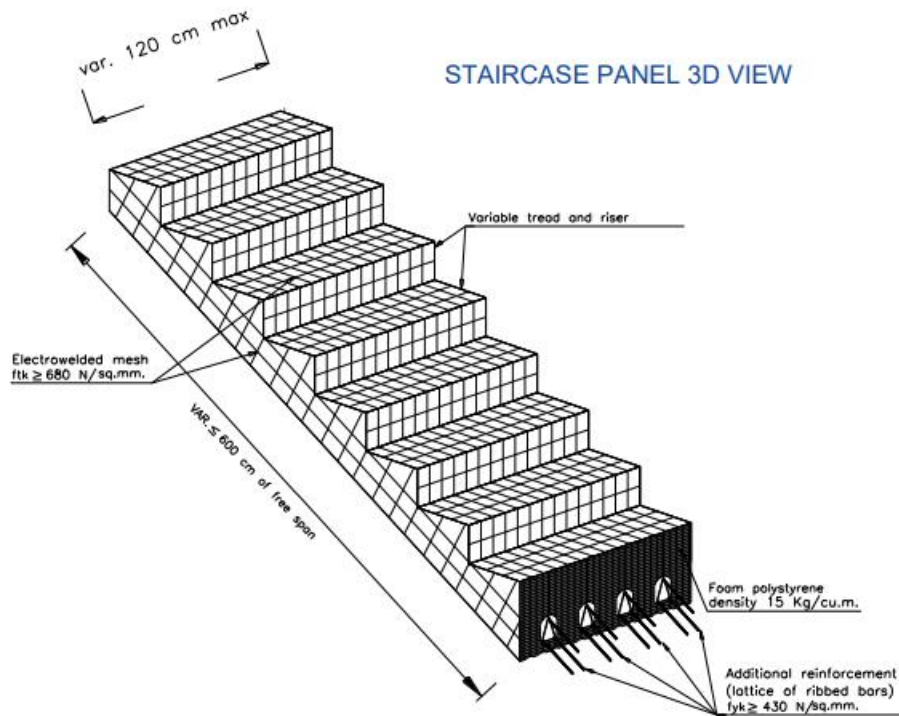
8.4 PSS 140

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2
0.23	140	230	REI 120	41 DB	215.4	6.4

8.5 PSS 160

U- Value EX Thermal Bridge	Total EPS thickness (mm)	Finished Wall thickness (mm)	Fire Rating	Sound Rating	Weight Inc Concrete KG/M2	Panel Weight KG/M2
0.21	160	250	REI 120	41 DB	215.9	6.9

9. Stair Panel



Galvanized steel wire mesh:

- Longitudinal Wires: $\varnothing 2.5\text{mm}$
- Transversal Wires: $\varnothing 2.5\text{mm}$
- Cross Steel Wire: nr. 2 $\varnothing 3\text{mm}$

Steel wire yield: $f_{yk} > 600 \text{ N/mm}^2$

Steel wire fracture: $f_{tk} > 680 \text{ N/mm}^2$

EPS density: Approx. 15 Kg/m^3

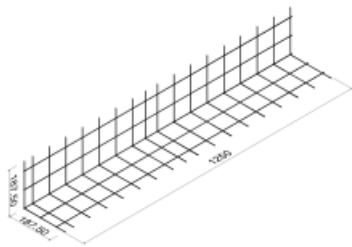
9.1 PSCA

Fire Rating	Max Span
REI 120	6

10. Reinforcement Mesh

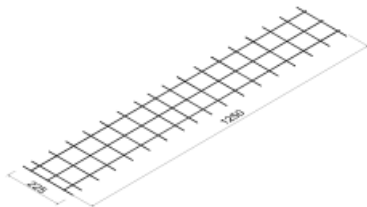
- Made with galvanized steel wire (\varnothing 2.5mm)
- The meshes are used to reinforce all the openings and corner-joists between the panels to obtain a monolithic behaviour of the structure.

10.1. Corner Mesh RG1:



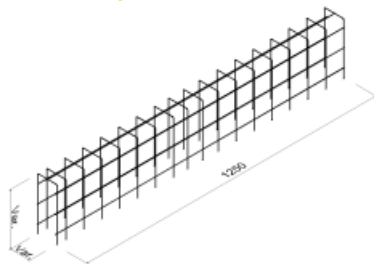
- Used on every wall intersection
- Used on every wall and ceiling intersection

10.2. Flat Mesh RG2:



- Used on every opening corner
- Used on every discontinuity of the mesh

10.3. "U" Shaped Mesh RU:



- Used around any opening
- Used to complete the top side of the wall panels, such as parapet and garden walls