TECHNOPOL SA
ENERGY SAVING MATERIALS

TECHNICAL DESIGN GUIDE

EPS Bulk Insulation Boards

Fire-retardant FRCel expanded-polystyrene boards for ceilings, cavity walls, floors & rendered facades

Fire-retardant EPS cavity-wall boards built into a coastal face-brick wall (2025) — one of four verified bulk-board application families.

This guide covers Technopol's EPS bulk insulation boards — fire-retardant (**FRCel**) expanded polystyrene manufactured in Springs, Gauteng — from grade selection and physical properties through to installed application details for ceilings, cavity walls, under-floor / under-screed insulation and rendered external wall systems. Thermal, dimensional and fire claims are stated exactly as the current Technopol test and product data support them.

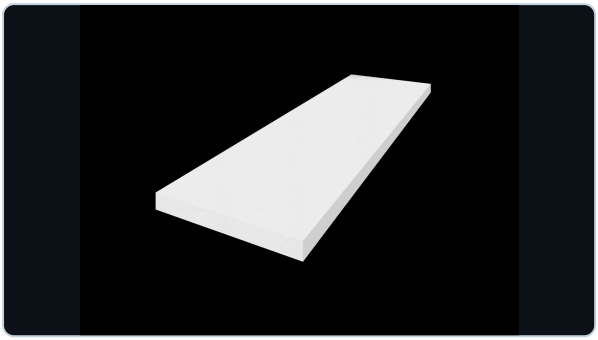
1 · Bulk sheets & boards
Fire-retardant FRCel EPS, hot-wire cut to order — 10 to 960 mm thick, grades 12SD–30DV.

2 · Ceiling insulation
PolyCool (vinyl-foil) & SuperCool (uPVC-faced) over-purlin / below-truss boards.

3 · Cavity-wall insulation
Flat Cavity boards, moulded PolyKey and the LiteCel Cavity & Drainage Board.

4 · Underfloor & facades
Under-slab / under-screed EPS and Polyclad ETICS/EIFS backing boards.

1 · The insulation principle & the board range



EPS bulk board resists heat flow by trapping still air in a closed-cell polystyrene matrix. Its performance is set by two numbers: the thermal conductivity **λ** of the grade and the board thickness. The thermal resistance is simply

$$R = \text{thickness} \div \lambda \quad (m^2K/W)$$

A required R-value is met by choosing a grade (lower λ for the densest grades) and cutting to the right thickness. Example: 100 mm FRCel at 20 kg/m³ (λ 0.035) gives **R 2.86 m²K/W** — the value used across the range for SANS 10400-XA deemed-to-satisfy energy compliance.

0.033	**12–30**	**6.0 × 1.24 m**	**B-s1,d0**
λ W/m·K, densest grade (EPS 30)	nominal grade densities (kg/m³)	maximum cut-sheet size	FRCel reaction-to-fire class (SANS 53501-1)

Published grade set

Five grades are published for thermal / R-value selection. Density buys two things at once: a lower λ (better insulation) **and** a higher compressive strength (more load capacity), so the grade is chosen to the thermal target and any sustained load.

Published grade	Nominal density (kg/m³)	Compressive stress @10% (kPa, min)	λ for R-calc (W/m·K)
EPS 30 (EHD)	30	≥ 200	0.033
EPS 24 (HD)	24	≥ 160	0.034
EPS 20 (SD)	20	≥ 110	0.035
EPS 15	15	≥ 80	0.038
EPS 12	12	≥ 60–80	0.045

λ values used for R-value calculation, per Technopol's published product page. See page 3 for the full laboratory property set and a note on the EPS 15 grade definition. All grades are fire-retarded (FRCel).

Standard sheet supply

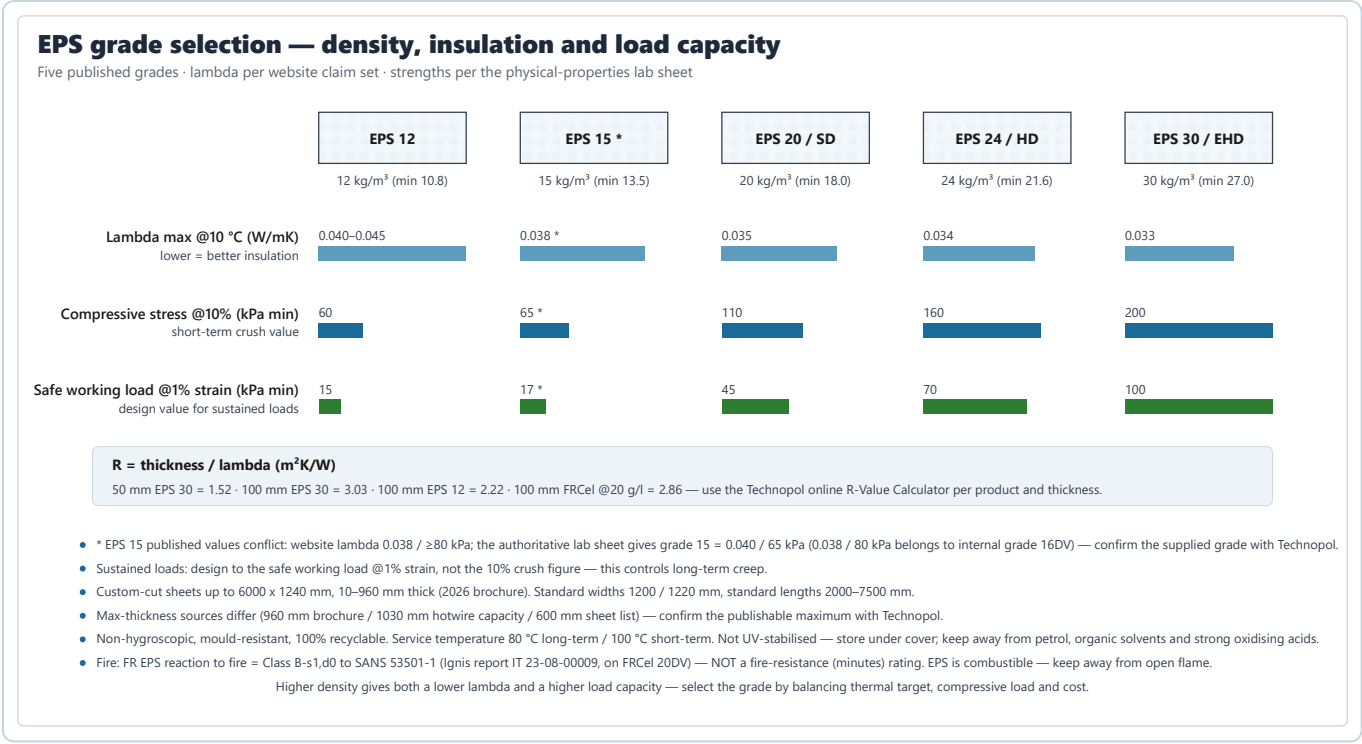
Boards are hot-wire cut to order within the cutting envelope; standard stock sizes speed common orders. All grades are fire-retarded.

- **Cut envelope:** up to 6000 × 1240 mm, from 10 mm thick (2026 brochure lists to 960 mm; confirm current maximum)
- **Standard widths:** 1200 / 1220 mm
- **Standard lengths:** 2000 / 2440 / 2500 / 3000 / 4800 / 5000 / 6000 / 7500 mm
- **Thickness menu:** stocked steps 5–600 mm (5, 10, 15, 20, 25, 30, 40, 50, 75, 100, 125, 150 … 600)
- **Grade menu:** 12XS–30DV (DV no regrind · DS low · XS high regrind); cornice grade 27 kg/m³
- 100 mm FRCel @ 20 kg/m³ → **R 2.86 m²K/W**

Design in one line. Pick the grade for the thermal target, confirm it also carries any sustained floor / screed load within its **safe working load at 1% strain**, then set the thickness so that R = t ÷ λ meets the required resistance.

2 · Grade range & physical properties

The grade-selection chart below plots thermal conductivity against strength for the published grades; the laboratory property sheet then gives the full six-grade data used for structural and vapour design.



EPS grade-selection chart — thermal conductivity, compressive stress at 10% strain and safe working load at 1% strain across the published grade range, with cut-sheet envelope and fire-honesty note.

Laboratory physical properties (six-grade sheet)

Property	30DV (EHD)	24DV (HD)	20DV (SD)	16DV	15SD	12SD
Nominal density (kg/m³)	30	24	20	16	15	12
Minimum density (kg/m³)	27.0	21.6	18.0	14.4	13.5	10.8
k max @ 10 °C (W/m·K)	0.033	0.034	0.035	0.038	0.040	0.045
Compressive stress @10% (kPa, min)	200	160	110	80	65	60
Cross-breaking strength (kPa, min)	250	205	150	140	100	80
Safe working load @1% strain (kPa)	100	70	45	21	17	15
Vapour transmission @38°C/88%RH (ng·m/N·s max)	4.2	4.2	5.0	6.9	8.0	—
Vapour resistivity (MN·s/g·m min)	238	238	200	145	125	—

Dimensional stability ≤ 1.0% (7 days at 80 °C) and service temperature 80 °C long-term / 100 °C short-term apply to all grades. Highlighted row (safe working load @1% strain) is the sustained-load design limit.

Grade-definition note (EPS 15). The public "EPS 15" row (λ 0.038, ≥80 kPa) matches the laboratory **16DV** column; the true 15SD grade is λ 0.040 at 65 kPa. For any load-bearing or energy-critical specification, confirm the exact grade and its design values with Technopol rather than relying on the marketing grade name.

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3 · Design & site considerations

Grade selection & sustained load

Balance λ, required compressive strength and cost: the densest grades give the lowest λ and the highest load capacity. For floors, screeds and other sustained loads, design to the **safe working load at 1% strain** (15–100 kPa across grades), not the 10%-deformation value, to keep long-term creep negligible.

Thermal / R-value

R = thickness ÷ λ. Technopol's free online R-Value Calculator covers all grades and thicknesses. Grades and thicknesses support **SANS 10400-XA** deemed-to-satisfy R-value compliance — an energy claim, not a fire claim.

Handling

Very low self-weight — boards are cut on site with a hot-wire, hand saw or knife and placed without special plant. Not UV-stabilised: store and stack under cover and build in promptly.

Chemical compatibility

EPS is **attacked by petrol, organic solvents and strong oxidising acids** — keep these away and isolate the board where they may be present. It is **resistant** to salt water, alkalis, soaps, alcohols, air-blown bitumen, cement and lime, so it sits happily against masonry, screeds and mortar. Bond with a compatible adhesive (Technopol 2-part PU adhesive).

Temperature

Service temperature 80 °C long-term / 100 °C short-term; the material softens near 150 °C. Keep boards clear of flues, downlights and other hot spots.

Moisture

Closed-cell, non-hygroscopic and mould-resistant; the boards hold their R-value and are 100% recyclable.

Fire — honest position. FR EPS is an organic, **combustible** material. Its one current published fire claim is a **reaction-to-fire** classification: **Class B-s1,d0** to SANS 53501-1, tested on FRCel 20DV, 60 mm (Ignis report IT 23-08-00009, Aug 2023) — the best class an EPS can achieve, with the lowest smoke class and no flaming droplets. This is **not** a fire-resistance (minutes) rating: plain EPS bulk board carries no FRR. Keep boards away from open flame and hot works during storage and installation; in service they are protected behind brick, screed, ceiling or render.

Companion boards for fire-critical or space-critical specs. The same 2026 range offers A1 non-combustible **Stonewool** (120 kg/m³, 100 mm → R 2.86) and rigid **PUR** (35 kg/m³, 100 mm → R 4.0) where an A-class reaction-to-fire or a thinner build-up is required.

Accessories & related items

PVC / aluminium **H-extrusion** jointing profiles (PolyCool) · **tongue-and-groove edging** and **reinforced boards** for self-supporting ceilings (SuperCool) · **2-part PU adhesive** (36 kg / 300 kg packs) · **SANS 28 single-wire wall ties** (LiteCel) · decorative **cornice-grade EPS** (27 kg/m³), all made on the same line.

Model specification clause (edit to project)

"Insulation shall be fire-retardant (FRCel) expanded-polystyrene bulk board, grade **EPS**___ (nominal density ___ kg/m³, k ≤ ___ W/m·K), cut to ___ **mm** thickness to achieve a thermal resistance of **R** ___ **m²K/W** (R = thickness ÷ λ). Boards shall be installed [over purlins / in the wall cavity / under the screed / as ETICS backing] to Technopol's current installation detail, kept clear of open flame and hot works, and protected from prolonged UV before being covered. Sustained loads shall not exceed the grade's safe working load at 1% strain. FR EPS carries a **Class B-s1,d0** reaction-to-fire classification to SANS 53501-1; this is not a fire-resistance rating."

4.1 · Ceiling insulation — PolyCool & SuperCool

PolyCool and SuperCool are faced over-purlin / below-truss boards on a fire-retardant 15 kg/m³ EPS core (20 or 30 kg/m³ optional). PolyCool carries a white vinyl-foil face; SuperCool a tougher 1 mm uPVC face for wash-down and agricultural interiors. Both give an insulated, wipe-clean soffit in a single board.

Faced EPS sheets installed over purlins under a steel roof — the boards span purlin-to-purlin to form an insulated ceiling plane.

Property	PolyCool	SuperCool
Facing	White vinyl foil, 1 side	White 1 mm uPVC, 1 side
Core	FR EPS 15 kg/m³ std	FRCel EPS 15 kg/m³ std
Max core thickness	100 mm	100 mm
Widths	600 / 1200 mm	1200 mm
Lengths	up to 6000 mm	up to 7500 mm
Thickness menu (2026)	35 / 50 / 75 / 100 mm	50 / 60 / 75 / 100 mm
Mass (kg/m²)	0.35 + 0.016 × t	1.0 + 0.016 × t
Max over-purlin span	1300 mm	1400 mm

R-values in application (15 kg/m³ core)

Thickness (15 kg/m³ core)	35	50	65	80 mm
Board-only R (m²K/W)	1.25	1.68	2.10	2.50
Board-only U (W/m²K) — 1/R	0.80	0.60	0.48	0.40

SuperCool 2026 also lists 50 mm→R 1.60 and 60 mm→R 1.87. **Caution:** the 2026 brochure's 75/100 mm rows reuse the R-values the source assigns to 65/80 mm boards — confirm the exact thickness-to-R mapping with Technopol before specifying.

Spans & fixing

- Maximum over-purlin support span: **PolyCool 1300 mm**, **SuperCool 1400 mm**
- PolyCool joints supported and sealed with **PVC or aluminium H-extrusions**
- SuperCool joints sealed by **tongue-and-groove** edges (specify at order)
- Install below truss, over purlins (SuperCool preferred) or across beams
- For along-purlin / self-supporting ceilings, order **reinforced boards** to prevent sagging
- Detailing on file: mid-purlin riveted lip joint, wedge ridge-plug closure, flat-top ridging

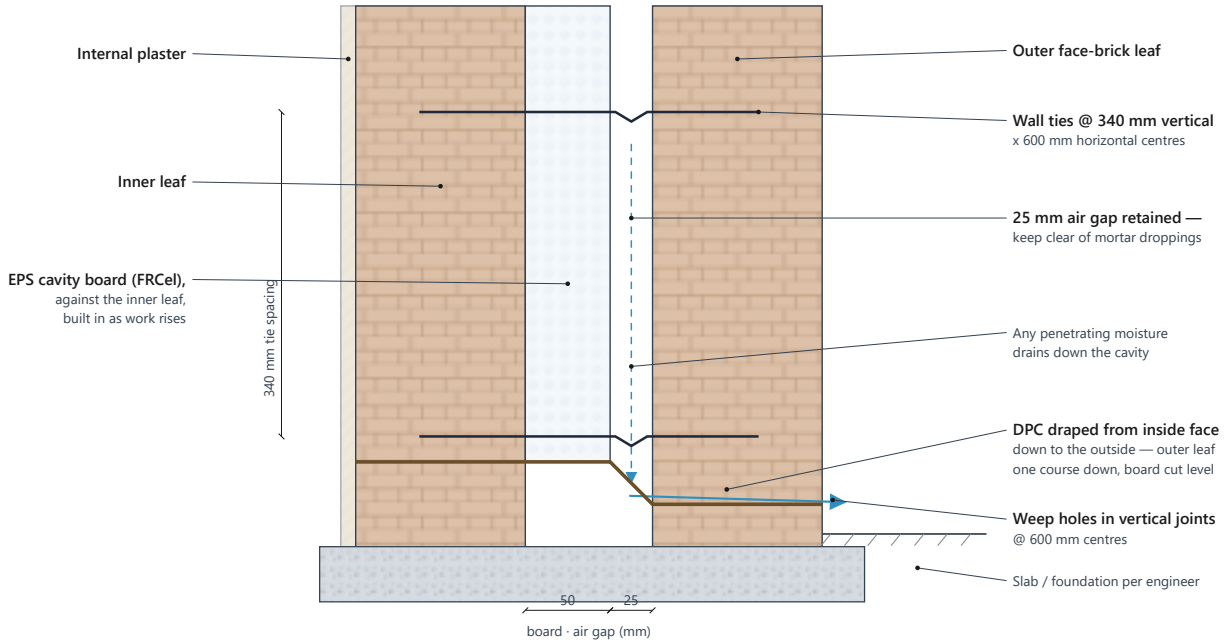
Fire note. The B-s1,d0 reaction-to-fire classification covers the unfaced FRCel core material. SuperCool's older printed "SANS 10177-11" fire rating rests on a lapsed 2016 test; no current SANS 53501-1 classification exists for PolyCool/SuperCool as faced boards — treat the faced-assembly fire performance as to be revalidated.

4.2 · Cavity-wall insulation — Cavity & PolyKey boards

EPS is built into the cavity of a masonry wall to insulate it: a plain **Cavity Wall** board fixed against the inner leaf with a retained air gap, or the moulded tongue-and-groove **PolyKey** element that fills the cavity and interlocks course-to-course. PolyKey addresses the four classic cavity-fill failures — water-wicking, shrinkage gaps, mortar droppings and tie corrosion.

Cavity wall insulation — typical vertical section

50 mm FRCel board against the inner leaf · 25 mm air gap · ties, weep holes and draped DPC per the 2025 install guide



Published bridged R-values, FRCel @20 g/l: 30 mm = R 1.5 · 50 mm = R 2.0 m²K/W (2025 brochure).

Boards are placed as the outer leaf is built. Brickforce per the engineer's specification. Leaf thicknesses indicative — only published values are dimensioned.

Cavity-wall vertical section: FRCel board against the inner leaf, retained air gap, wall ties at 340 × 600 mm centres, draped DPC as a cavity tray, weep holes at 600 mm, and the under-screed perimeter EPS detail.

Thermal (FRCel core)

System & basis	50 mm	100 mm	150 mm
Cavity Wall board-only R (2021)	1.43	2.85	4.29
PolyKey board-only R (2021)	1.60	3.20	4.84
Cavity Wall bridged R, with ties (2025)	2.0	—	—
PolyKey 60/40 mm, guarded hot-box + ties (2025)	2.0	—	—

2021 figures are board-only R; the 2025 "bridged R" and guarded-hot-box values include wall ties — the two bases are not directly comparable (30 mm→R 1.5, 50 mm→R 2.0). 2014 benchmark: plastered double-brick wall ≈ R 0.36 vs R 1.5 with 60 mm PolyKey.

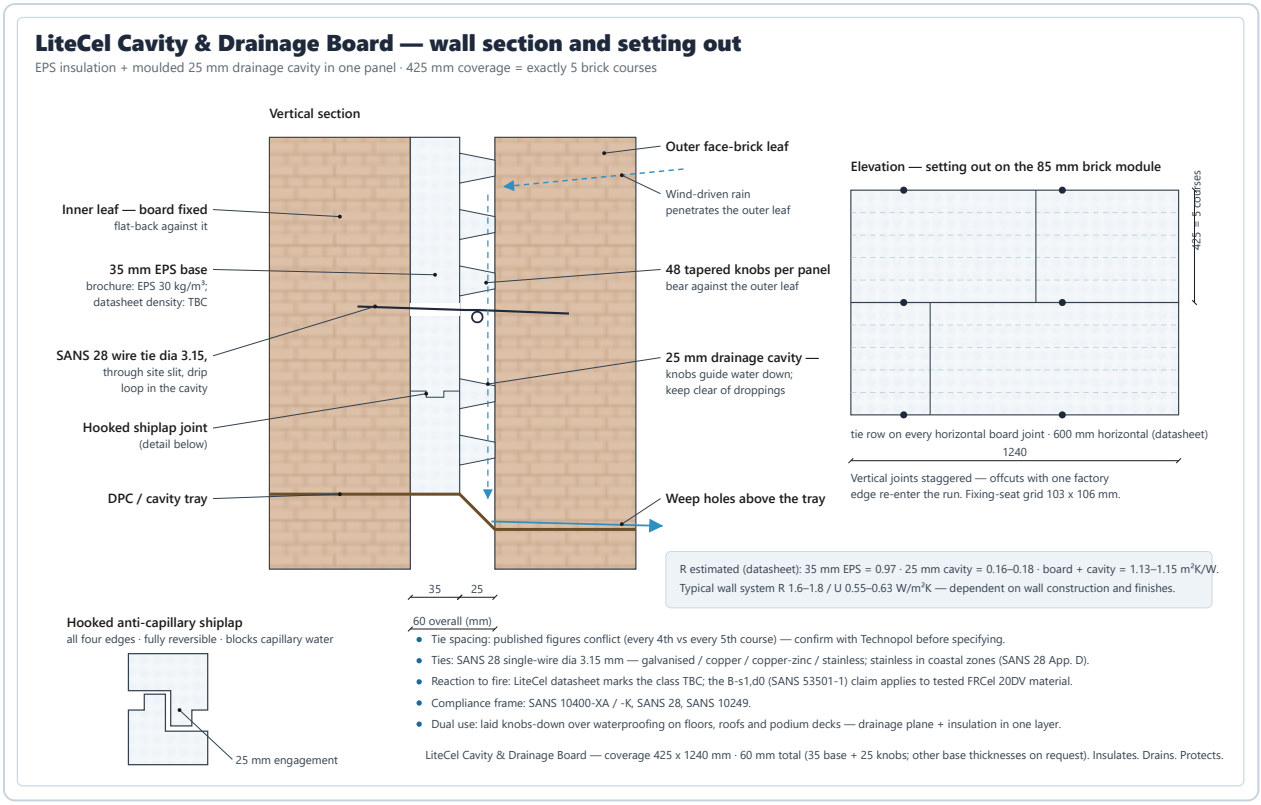
Installation

- Ties at **340 mm vertical × 600 mm horizontal** (every 4th course; ≈ 5 ties/m²); on PolyKey, pressed into the upward tongue of the joint
- Retain a **25 mm air gap** (flat board); PolyKey uses no-mortar drain channels
- **Weep holes** in vertical joints at 600 mm; DPC as a cavity tray, draped inside-down-to-outside
- Stop the outer leaf one course down, cut the EPS level so the DPC lies flat; Brickforce per engineer
- Carry the EPS down as **perimeter insulation** at the foundation wall

Note. An earlier datasheet quoted 2.5 ties/m² at 1.1 m centres; the 2025 installation guidance (5 ties/m², 340 × 600 mm) supersedes it. Confirm the current tie schedule and whether 100/150 mm PolyKey elements are moulded (the standard element is 60/40 mm) with Technopol.

4.3 · LiteCel Cavity & Drainage Board

LiteCel is a moulded EPS cavity board with a knobbed outer face that forms a continuous drainage plane against the outer leaf while insulating the cavity. Its 425 mm coverage height equals exactly five brick courses, so every horizontal board joint lands on a wall-tie row; hooked shiplap edges on all four sides make the boards reversible and self-draining.



LiteCel wall section and setting-out — 35 mm EPS base + 25 mm tapered knobs, SANS 28 single-wire tie with drip loop, cavity tray and weep holes, on the 85 mm brick module (425 mm coverage = 5 courses); hooked anti-capillary shiplap inset.

Coverage size	425 × 1240 mm (425 mm = exactly 5 brick courses at the 85 mm module)
Total thickness	60 mm = 35 mm EPS base + 25 mm knob projection (48 tapered knobs)
Edge joint	Hooked anti-capillary shiplap on all 4 edges, 25 mm lap, fully reversible
Fixing-seat grid	103 × 106 mm
Material	EPS, 100% recyclable (density 30 kg/m³ on the Dimple Panel brochure; marked TBC on the Cavity & Drainage datasheet)
Thermal (estimated)	35 mm EPS ≈ R 0.97 + 25 mm cavity ≈ 0.16–0.18; typical cavity wall R 1.6–1.8 / U 0.55–0.63

Fixing & ties

- Flat back against the inner leaf, knobs facing the outer leaf
- **SANS 28 single-wire ties**, ø 3.15 mm (galvanized / copper / copper-zinc; stainless for coastal), through a site slit
- Ties every 5th course (425 mm) × 600 mm (≈ 3.9 ties/m²) so rows land on panel joints; drip loop in the cavity
- Also laid knobs-down over waterproofing as a drainage + insulation layer on floors, foundations and podium decks

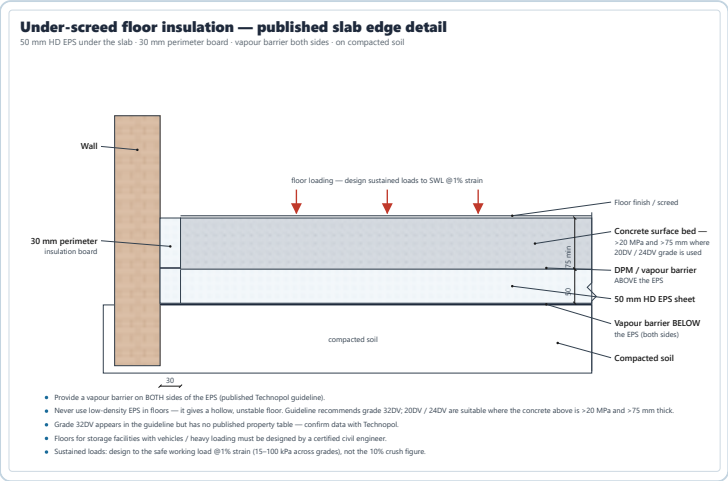
Compliance & open items

Referenced to **SANS 10400-XA / -K, SANS 28** and **SANS 10249**.

> **Confirm before specifying.** On this board the core density, reaction-to-fire class, water absorption and panel weight are marked **TBC**, and all thermal values are **estimated**, not tested. One source also quotes 340 mm vertical tie spacing against the 425 mm (every-5th-course) figure above — reconcile with Technopol.

4.4 · Under-floor / under-screed & rendered facades

Under-floor / under-screed insulation

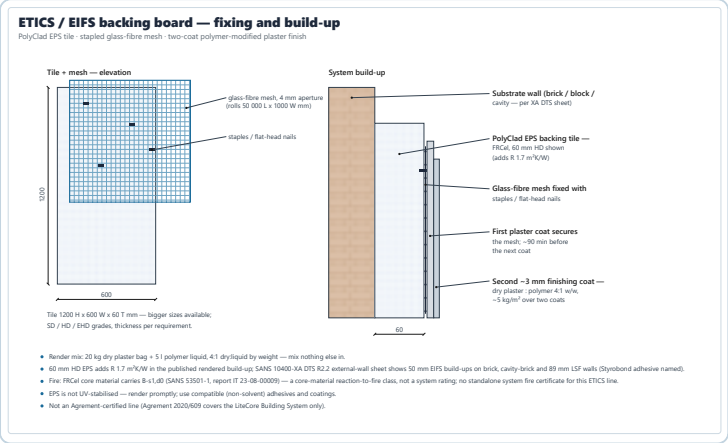


The published detail is a **50 mm HD EPS sheet under the concrete slab** over a DPM, with a **30 mm perimeter board** isolating the slab edge and the screed cast over. Grade mapping: 20SD/20DV/24DV for floor & roof insulation; **30DV for high-traffic floors**.

- Never use low-density EPS in floors; cold-store guidance recommends **32DV** (no published λ — confirm)
- Where slab concrete > 20 MPa and EPS > 75 mm thick, 20/24DV is suitable; use a **vapour barrier both sides** of the EPS
- Floors for vehicle / heavy loading to be designed by a certified civil engineer

Slab-edge detail: 50 mm HD EPS under the slab, 30 mm perimeter board, vapour barrier both sides, on compacted subgrade.

Polyclad ETICS / EIFS backing boards



Polyclad EPS tiles (1200 × 600 × 60 mm, SD/HD/EHD) are adhesive- and mechanically-fixed to the wall, then covered with a stapled glass-fibre mesh (4 mm aperture) and a two-coat 4:1 polymer plaster (≈ 5 kg/m²). Added R 1.7 at 60 mm HD.

Polyclad ETICS: 1200 × 600 mm EPS tile, stapled glass-fibre mesh and two-coat render; supports the SANS 10400-XA DTS R 2.2 external-wall build-ups.

Compliance. The published XA DTS build-ups pair 50 mm EIFS insulation with brick, cavity brick or 89 mm LSF walls to reach R 2.2. These bulk boards are **not an Agrément-certified line** (certificate 2020/609 covers the LiteCore Building System only).

5 · EPS bulk insulation in the field

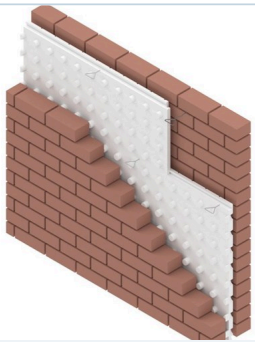
Technopol EPS bulk boards on South African projects — manufactured in Springs, Gauteng and built into cavity walls, ceilings, floors and rendered facades across the four application families in this guide.

Cavity wall build — full-height fluted PolyKey EPS boards and wall ties built into a face-brick wall.

Cavity detail — keyed board profile, wall ties and a loose sample seen from above the cavity.

Coastal cavity wall — EPS boards between the leaves on a seaside residential site.

ETICS facade — Polyclad EPS backing boards mechanically fixed with anchor discs, ready for render.



LiteCel drainage board — the knobbed EPS cavity element shown in a brick cavity wall.

Manufactured in SA — Technopol's EPS plant, Springs, Gauteng; leaders in EPS since 1993.

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