

STRUCTURAL · TECHNICAL DESIGN GUIDE

EPS Void Formers

Lightweight fire-retarded EPS blocks and cut-to-shape formers that displace concrete in reinforced slabs and serve as load-bearing civil geofoam — permanent formwork designed by the project engineer.

Overview

EPS Void Formers are lightweight expanded-polystyrene blocks that Technopol SA manufactures from its fire-retarded LiteCel/FRCel range, either moulded to the Technoblock void-former shape or cut to a project's required size. Cast into a reinforced-concrete slab, the blocks displace concrete between the structural ribs so the slab keeps its full structural depth while shedding a large fraction of its self-weight and concrete volume.

In the building application the product uses the moulded Technoblock: a 550 mm-long block, 120 mm or 190 mm deep, laid in rows to form a one-way rib-and-block suspended slab. Pre-stressed lintels or cast-in-situ ribs span between supports, the blocks seat between them, rib reinforcement and a topping mesh are placed, and a concrete topping is cast over and between the blocks, leaving the EPS as permanent lightweight void fill.

A specific use case is the suspended ground-floor slab over heaving (expansive) clay: the slab is cast on temporary timber shuttering so that, once the props are struck, a void remains beneath the structural slab and seasonal ground heave cannot lift or crack it. The same graded EPS is also supplied as civil geofoam, reusable slip-wrapped pit and valve-chamber fillers, buoyancy blocks, raft insulation and vibration-isolation blocks.

In every case the EPS is non-structural lost formwork and void fill. Spans, rib reinforcement, topping thickness, propping and de-propping are designed by the project structural engineer. Technopol SA (Pty) Ltd is a South African EPS manufacturer, founded 1993, based at 9 Wright Road, Nuffield, Springs, Gauteng.

Key specifications

Property	Value	Standard
Product / build-up	Custom-cut fire-retardant EPS (expanded polystyrene) blocks & sheets, LiteCel/FRCel range, cut to project size; cast into slabs as lightweight void formers	—
EPS grades / nominal density	Six grades — 12SD, 15SD, 16DV, 20DV (HD), 24DV, 30DV (EHD); nominal density 12–30 kg/m ³	—
Thermal conductivity (λ , max @ 10 °C)	0.033–0.045 W/m·K	—
Compressive stress @ 10% deformation (min)	60–200 kPa	—
Safe working load @ 1% nominal compression (min)	15–100 kPa	—
Reaction to fire	Class B — B-s1,d0	SANS 53501-1
Dimensions	Cut-to-order blocks; raw stock widths 1200 & 1220, thickness 5–600, lengths to 7500 mm	—
Applicable standards / certification	Reaction-to-fire tested to SANS 53501-1 (B1 per SANS 10177-11 at ≤ 120 mm and ≤ 18 kg/m ³); manufacturer QMS ISO 9001:2015 (ISO 14001 & 45001 lapsed Mar 2026, recertification in progress)	SANS 53501-1

Materials & build-up

The core material is expanded polystyrene from Technopol's fire-retarded LiteCel/FRCel range, moulded to the Technoblock shape or cut to a project's required size. The EPS is supplied in six graded densities (12–30 kg/m³, grades 12SD to 30DV/EHD), each engineered to a defined compressive stress so the former can be selected on its stress at 1 % and 10 % strain.

The moulded Technoblock comes in two verified sizes and includes locating and service features drawn from the CAD detail and schematics.

- TB120 — 550 × 320 × 120 mm, solid block.
- TB190 — 550 × 320 × 190 mm, with three longitudinal Ø80 mm cores.
- Underside locating notch/key that seats onto the top of a pre-stressed lintel.
- Moulded passage for electrical conduit and plastering grooves on the soffit; top face described as 'safe to walk on' during construction.
- Typical one-way #190 build-up: 255 mm total depth (190 mm block + 65 mm topping), 500 mm block face + 160 mm rib (660 mm rib pitch), 2 × Y12 per rib on a lipped channel/lintel, REF 193 mesh in the topping.
- The moulded Technoblock's own EPS grade/density is not separately published — it is specified to the structural design.

Applications

From the published brochure and Technoblock materials, the formers serve both structural-slab and civil-fill roles. They are sold to consulting engineers and civil contractors and have been delivered on engineer-stamped projects (Zutari-designed projects cited).

- Suspended reinforced-concrete slabs — one-way rib-and-block (Technoblock) and biaxial/ribbed RC slabs.
- Suspended ground-floor slab over heaving clay — cast on propped timber shuttering so a void remains after de-propping.
- Civil geofoam fill — lightweight embankment fill, fill over buried services, backfill behind retaining walls on settlement-sensitive ground.
- Reusable void/chamber fillers — pump-station valve chambers, pits and blockouts, slip-wrapped and re-used.
- Buoyancy blocks, raft-foundation insulation/under-slab thermal break, vibration isolation, under-floor-heating base, and sacrificial or reusable concrete beam/column moulds.

Installation & handling

The rib-and-block sequence runs from lintels/ribs, to seating the blocks, to placing reinforcement and casting the topping, to striking the shuttering to the engineer's de-propping schedule. The blocks are ultra-lightweight and placed by hand, reducing crane and formwork demand.

Technopol does not publish a formal installation datasheet; the 'placed by hand / slip-wrapped / cast-in' descriptions come from the brochure and schematics.

- Lintels (or cast-in-situ ribs on temporary timber shuttering) span between supports; Technoblocks seat between them via the moulded underside key.
- Rib reinforcement (typically 2 × Y12 per rib) and topping mesh (REF 193) placed to the engineer's design.
- Concrete topping cast over and between the blocks; shuttering/props struck to the engineer's de-propping schedule.
- Accessories: PolyKey Cavity extenders (1.230 m long) and connecting plugs (6 free per 5 blocks).
- No tie-down / anti-flotation (uplift during pour) fixing detail is documented — buoyancy against fresh concrete is a designer responsibility.

Dimensions & availability

Moulded Technoblocks are supplied in the two fixed sizes; cut-to-shape void formers are made to per-project cut schedules from raw EPS flat-sheet stock, so there are no fixed 'standard' void-former dimensions.

- Moulded: TB120 550 × 320 × 120 mm (solid); TB190 550 × 320 × 190 mm (three Ø80 mm cores).
- Packaging (per 01/09/2021 price list): TB120 30 blocks/bundle (1630 × 730 × 550 mm); TB190 20 blocks/bundle (1670 × 780 × 550 mm).
- Cut-to-shape stock: standard widths 1200 and 1220 mm; lengths 2000 / 2440 / 2500 / 3000 / 4800 / 5000 / 6000 / 7500 mm; thicknesses 5–600 mm (other sizes on application).
- Supplied in graded densities 12SD–30DV per the structural specification.

Design considerations & limitations

- Non-structural: the EPS void former / Technoblock is permanent lost formwork and void fill with no structural load rating; spans, reinforcement, topping, propping and de-propping are the project engineer's design.
- The compressive-stress figures describe the EPS material, not a slab load capacity; no void-former-specific span, deflection or load-capacity table exists.
- No Young's modulus, compressive-creep or long-term (e.g. 50-year) design values are published by Technopol; select grade on stress at 1 % and 10 % strain to limit creep.
- EPS is combustible; the B-s1,d0 / B1 classification is reaction-to-fire only, scoped to the tested 60 mm FR-EPS sample — not a fire-resistance (REI) rating and not to be generalised to a moulded block or slab assembly.
- Uplift during pour: no tie-down / anti-flotation detail is documented; block buoyancy against fresh concrete must be considered by the designer.
- No manufacturing dimensional tolerances (length/width/thickness/squareness/flatness) are stated for cut or moulded blocks.
- No R-/U-value tables are published — only λ per grade, from which $R = \text{thickness}/\lambda$ would be derived; the Technoblock's own λ /R/U is not published.
- For floors under heavy load Technopol recommends a higher-density grade (e.g. 32DV) and refers heavy-loaded storage floors to a certified civil engineer.