

INSULATION · ENGINEERING SPECIFICATION

Polykey Cavity Insulation

This specification covers the supply and installation of Technopol PolyKey/Cavity interlocking fire-retarded FRCel EPS cavity-wall insulation, a non-structural infill for double-leaf masonry built into the cavity as the outer leaf is raised.

Verified technical data

Property	Value	Standard
Thermal conductivity (λ , k-value @10°C)	≤ 0.035 W/m·K	—
Thermal resistance R (60/40 mm element, guarded hotbox with wall ties)	2.0 m ² K/W	—
Nominal density / grade	20 (HD / 20DV grade) kg/m ³ (20 g/l)	—
Compressive stress at 10% deformation	≥ 110 kPa	—
Reaction-to-fire classification	Class B (B-s1,d0)	SANS 53501-1
Element / panel size (H × L × thickness, T&G profile)	340 × 1200 × 60/40 mm	—
Applicable fire-test standards	SANS 53501-1 (reaction to fire); SANS 10177-9 (small-scale fire propagation)	SANS 53501-1 / SANS 10177-9

Scope

- 1.0** This specification covers the supply and installation of Technopol PolyKey/Cavity fire-retarded FRCel EPS cavity-wall insulation elements built into the cavity of double-leaf (double-skin) brick and blockwork walls.
- 2.0** The work includes the PolyKey interlocking element (tongue-and-groove, mortar-key) and the precision-cut Cavity Wall board variant, both built in as the outer leaf is raised.
- 3.0** This specification excludes the structural design of the masonry, wall ties and brickforce, which are the responsibility of the project engineer.
- 4.0** This specification excludes the design and verification of the wall's overall SANS 10400-XA energy compliance, which remains the designer's responsibility.
- 5.0** No structural, span or load-carrying function is specified for the product; it is a non-structural cavity infill only.

Materials

- 6.0** The core material shall be Technopol fire-retarded FRCell EPS (expanded polystyrene), closed-cell, moulded at a nominal density of 20 kg/m³ (20 g/l), the grade designated HD / 20DV on Technopol's EPS-grade datasheet.
- 7.0** The PolyKey element shall be a moulding with tongue-and-groove profiling on all edges and mortar-key grooves, supplied at a nominal 340 (H) x 1200 (L) x 60/40 mm (T&G thickness) profile.
- 8.0** The Cavity Wall board variant shall be precision-cut EPS built into the cavity with a nominal 25 mm air gap retained, in thicknesses of 50 / 100 / 150 mm as quoted in the brochures.
- 9.0** The element is unfaced; no facing, bonded skin or vapour barrier forms part of the product.
- 10.0** Wall ties and brickforce shall be supplied and specified separately per the project engineer's specification.

Performance

- 11.0** The nominal thermal resistance of the 60/40 mm PolyKey element is R 2.0 m²K/W, being the 2025 guarded-hotbox value tested with wall ties; this basis shall be stated whenever the R-value is cited.
- 12.0** Published R-values differ between brochure generations and test bases (2014/2017 'added' 1.5 at 60 mm; 2023 tables 1.60/3.20/4.84 for PolyKey and 1.43/2.85/4.29 for Cavity at 50/100/150 mm; 2025 bridged Cavity 1.5 at 30 mm and 2.0 at 50 mm); no single authoritative R-table has been published.
- 13.0** The declared thermal conductivity is $\lambda \leq 0.035$ W/m.K at 10 degrees C, being a grade-dependent value from the HD/20DV EPS-grade datasheet and not a PolyKey-specific test.
- 14.0** No U-value is established or published for this product in any Technopol document; only R-values are given.
- 15.0** The compressive stress at 10% deformation is ≥ 110 kPa, a grade-dependent value from the HD/20DV EPS-grade datasheet describing the material grade, not a PolyKey-specific test.
- 16.0** No dimensional tolerances are published for the 340 x 1200 x 60/40 panel.
- 17.0** No structural span or load-capacity data is established; the product carries no design load.
- 18.0** The nominal service temperature of the grade is 80 degrees C long-term / 100 degrees C short-term (max) per the EPS-grade datasheet.

Fire

19.0 The EPS core is a combustible material; in service the element is fully encapsulated inside the masonry cavity between two brick leaves.

20.0 The reaction-to-fire classification is Class B (B-s1,d0) to SANS 53501-1, obtained on a 60 mm EPS sheet at a measured density of approximately 18.37 kg/m³ (Ignis Testing report 2023-08-17) and scoped to the sample as tested.

21.0 Small-scale fire-propagation data to SANS 10177-9 (FR Cel 20 DV, 25 mm sample) records time to ignition/flaming 2 s, self-extinguishing after burner removal, flame spread 365 mm, heat contribution 0.39 degrees C/min and burning droplets at 8-11 s (report FTC 16/100 B, FIRELAB, 24 August 2016).

22.0 These results are reaction-to-fire / small-scale propagation classifications only and are NOT a fire-resistance (REI / integrity-insulation minutes) rating.

23.0 No fire-resistance (REI) rating exists for PolyKey/Cavity, and none shall be inferred from the surrounding masonry wall's performance.

24.0 Fire-resistance ratings and fire temperatures established for other Technopol grades or assemblies shall not be attributed to this product.

Execution / installation

25.0 Build the inner stock-brick leaf to the required slab height, then install PolyKey elements as the outer face-brick leaf is raised; no loose fill or separate batts are used.

26.0 Fit wall ties per the current (2025) detail at 600 mm horizontal x 340 mm vertical centres (every 4th course) = 5 ties/m², pressed into the upward tongue of the horizontal joint, and confirm the tie schedule against the engineer's specification (the 2017 brochure specified 2.5 ties/m²).

27.0 Lay brickwork per the engineer's specification.

28.0 Stop the outer leaf one course down, cut PolyKey level with the top of the outer-leaf brick, and install the DPC draping from inside down to the outside.

29.0 Build the outer leaf leaving weep holes at 600 mm centres.

30.0 At openings, cut elements with a wood saw to fit around frames; secure frames with metal cramps coinciding with a horizontal brick joint or with plastic-sleeve/zinc-screw fixings to preformed openings, sealed with waterproof mastic.

31.0 At jambs and sills close the cavity with a suitable frame or by returning the inner leaf, and insert a vertical DPM/DPC where the inner leaf abuts the outer leaf, extending it into the cavity to avoid mortar bridging (150 mm DPM with 100 mm blocks).

32.0 Install continuously and gap-free so the tongue-and-groove interlock prevents shrinkage gaps, cold bridges and consequent surface condensation.

Standards & compliance

33.0 SANS 10400-XA (energy usage in buildings): the product is positioned as an aid to raising the external wall's R-value; the wall's overall compliance is the designer's responsibility.

34.0 SANS 53501-1 (reaction to fire): Class B / B-s1,d0 on the tested sample as noted in the fire clauses.

35.0 SANS 10177-9 (small-scale fire propagation): FR Cel 20 DV result, report FTC 16/100 B, as noted in the fire clauses.

36.0 Company quality management: Technopol SA holds ISO 9001:2015 (current); its ISO 14001 and ISO 45001 certifications lapsed in March 2026.

37.0 Agreement South Africa: there is NO Agreement certificate for PolyKey/Cavity. Agreement SA certificate 2020/609 covers the LiteCore Building System only and shall not be presented as covering this product.

Specifier's notes — not established in Technopol sources.

- U-value per thickness is not established: no U-value is published in any Technopol document (only R-values). Obtain any required U-value externally.
- The $\lambda \leq 0.035$ W/m.K figure is not established on a PolyKey-specific document; it is read from the generic HD/20DV EPS-grade datasheet for the material grade. (The site flat brochure quotes $\lambda \leq 0.038$ W/m.K; treat the grade-sheet 0.035 as the material figure - unresolved contradiction, confirm with Technopol.)
- Compressive/mechanical strength (≥ 110 kPa) is not established on a PolyKey-specific test; the value comes from the generic HD/20DV grade datasheet and applies to the material grade.
- No fire-resistance (REI / integrity-insulation minutes) rating is established for this product; only reaction-to-fire (B-s1,d0) and small-scale propagation (SANS 10177-9) data exist. Obtain any required assembly FRR externally to SANS 10177-2.
- Whether the SANS 53501-1 B-s1,d0 result (tested at 18.37 kg/m³, 60 mm) formally covers the 20 kg/m³ PolyKey grade is not established; the report is scoped to the sample as tested. Confirm scope with Technopol if the grade rating is relied upon.
- No Agreement South Africa certificate is established for PolyKey/Cavity; the corpus Agreement certificate (2020/609) covers the LiteCore Building System only.
- Dimensional tolerances on the 340 x 1200 x 60/40 panel are not published; obtain tolerances from Technopol if required.
- No span / load-capacity tables exist (non-structural cavity infill; ties and brickforce are 'per engineer').
- Water absorption (%) is not stated; only vapour transmission (≤ 5.0 ng.m/N.s) and vapour resistivity (≥ 200 MN.s/g.m) are given for the 20DV grade.
- A single authoritative, reconciled R-value table across the 2014/2017, 2023 and 2025 brochure generations has never been published; cite the 2025 figure with its basis (unresolved contradiction).
- The wall-tie schedule is contradictory between sources (2017: 2.5 ties/m²; 2025: 5 ties/m²); the current detail is 5 ties/m² but the engineer's specification governs.
- Panel price differs between sources (1 March 2025: R 45.39; 1 May 2026: R 48.34 excl. VAT); the 1 May 2026 figure is current - confirm with Technopol.
- The 50/100/150 mm thickness range describes the Cavity Wall board variant, not the 60/40 mm PolyKey element - do not conflate the two.
- Packaging/quantity-per-bundle and coverage-per-panel data for PolyKey specifically are not established in the sources reviewed.

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Figures trace to Technopol technical documentation. Properties listed as "not established" are not covered by Technopol primary sources and must be obtained from a qualified source. Confirm exact figures for your specification with Technopol. Not for construction without project-specific verification.