

FABRICATION · TECHNICAL DESIGN GUIDE

2D Shapes & Sheets

Custom CNC hot-wire-cut expanded-polystyrene 2D profiles and cut-to-size sheets, made to your drawing in flame-retardant EPS grades.

Overview

2D Shapes & Sheets is Technopol SA's made-to-order hot-wire cutting service rather than a stocked catalogue product. A thin electrically heated wire is driven through an expanded-polystyrene (EPS) block on a CNC gantry, melting a narrow kerf through the foam with minimal mechanical resistance. The cut edge is clean and precise, without the tearing or crumbling produced by mechanical blades, so complex and intricate profiles, curves and geometric shapes reproduce to exact measurement.

The part is not a layered assembly but a single monolithic material shaped by cutting. It is cut from flame-retardant (fire-retarded grade) EPS in Technopol's standard density grades — nominally 12, 15, 16, 20, 24 and 30 kg/m³, plus a dedicated 27 kg/m³ cornice grade. Because EPS is a closed-cell rigid foam of roughly 98% air, the same cut part is simultaneously lightweight, thermally insulating and dimensionally stable; grade selection trades thermal conductivity and compressive strength against cost.

The service suits both decorative/creative work (letters, signage, cornices, cones, pillars, cake dummies, ceiling art) and functional work (cut-to-size insulation sheets, pipe lagging, packaging void-fill, refractory bushes, geofoam void-formers, 2D slopes and slabs). Everything is cut to a customer-supplied drawing or brief, so the specification of a given order is set by the chosen grade, thickness and profile rather than by a fixed product SKU.

Key specifications

Property	Value	Standard
Product / build-up	Custom CNC hotwire-cut 2D shapes & cut-to-size sheets, from flame-retardant EPS (cut to order, not stocked)	—
Nominal density (standard grades)	12–30 (plus 27 cornice grade) kg/m ³	—
Thermal conductivity (λ) at 10 °C	0.033–0.045 W/m·K	—
Compressive stress at 10% compression	60–200 kPa (min)	—
Reaction-to-fire class	B-s1,d0 (Class B)	SANS 53501-1 (EN 13501-1)
Cut-size limits (max length × width; thickness)	3000 × 1240; thickness 10–1030 mm	—
Standards & certifications	Fire tested to SANS 53501-1 / SANS 53823 (SBI) / SANS 11925-2 (ignitability); company ISO 9001:2015 (ISO 14001 & 45001 lapsed Mar 2026, recertification in progress); Agrément SA 2020/609 (covers the LiteCore Building System only)	SANS 53501-1

Materials & build-up

This is a single monolithic EPS material shaped by cutting, not a bonded or layered assembly. The finished part is defined by three customer choices — EPS grade, thickness and cut profile — rather than by a fixed product build-up.

- Base material: expanded polystyrene (EPS), supplied only in flame-retardant (fire-retarded) grades — the EPS price list states 'All Products are Fire Retarded Grades'.
- Forming method: CNC hot-wire cutting; a thin heated wire melts a narrow kerf through the foam, reproducing complex profiles, curves and geometric shapes to exact measure.
- Grades supplied: standard nominal densities 12, 15, 16, 20, 24 and 30 kg/m³, plus a 27 kg/m³ cornice grade (price-list codes 12XS/SD/DV, 15XS/SD/DV, 16DV, 20SD/DV, 24DV, 30DV and CORNICE).
- Property span: best thermal conductivity (λ 0.033 W/m·K) and highest compressive stress (200 kPa) at EPS30; weakest at EPS12 (λ 0.045 W/m·K, 60 kPa).
- Oversize parts: geometry larger than the cutting envelope is segmented and the pieces joined, which introduces joints.

Applications

The service covers both decorative/architectural and functional cut parts. The Riverstone Mall suspended-ceiling art — the large white organic hot-wire-cut panels shown in the brochure — is a showcase architectural installation of the service.

- Pipe insulation / lagging
- Cornices and 2D mouldings
- 2D letters, signage and display shapes
- EPS Buddha blocks (bulk block stock)
- Cut-to-size EPS insulation sheets
- Bushes and refractory products
- Tapered cones
- 2D slopes / slabs
- Pillars and cake dummies
- Packaging and void-fill
- Geofoam void-formers (as cut shapes)

Installation & handling

Installation is application-dependent and is not a single prescribed system. The brochure describes no mechanical fixing method; the fixing approach — adhesive bonding, plastering/skimming, embedding, or mechanical suspension for ceiling art — depends entirely on the end use and is set by the specifier, not by Technopol.

- Enclosed letterforms (A, D, O, P, R) carry a small deliberate perimeter break from the single continuous cutting pass; this is glued closed on site to restore the seamless closed shape.
- Oversized parts arrive segmented and are joined on assembly.
- Lightweight foam handling; the 10 mm minimum thickness carries a 10-sheet minimum order quantity to preserve packaging strength for thin cuts.
- General EPS caution: EPS is attacked by solvent-based adhesives and coatings — verify adhesive/coating compatibility (this is a general EPS property, not separately stated in the 2D-shapes brochure).

Dimensions & availability

Cutting is bounded by the machine's hot-wire working envelope. Parts exceeding the envelope are produced by segmenting the geometry and joining the pieces. Technopol does not stock pre-cut sheets, so lead time depends on size and complexity.

- Maximum length: 3000 mm; maximum width: 1240 mm.
- Minimum thickness: 10 mm (with a 10-sheet MOQ); maximum thickness: 1030 mm.
- Supply model: cut to order against a supplied drawing/brief; the flat-sheet price list is organised by thickness (about 5 mm up through 250 mm+), not by a fixed plan size — there is no single nominal board footprint.
- EPS Buddha blocks (raw offcut/block stock): available in a wide range of sizes at special bulk pricing, strictly collection-only and in block size as-is.

Design considerations & limitations

- Not a structural spanning element. No span tables or structural load-capacity data exist for 2D shapes & sheets; the compressive and cross-breaking figures are material properties, not member design values (structural EPS fill design data exists separately under Geofoam, not for this product).
- Grade drives performance. Thermal conductivity, density and strength all vary with the ordered grade — confirm the EPS grade on order and specify against the correct grade column.
- Combustible material. Despite the flame-retardant grade and B-s1,d0 classification, EPS is combustible; the reaction-to-fire class is a material property and NOT a fire-resistance rating for any assembly. Detail EPS in accordance with the relevant building fire requirements for the end use.
- Per-thickness R- and U-values are not published by Technopol for this product; they are derivable from the grade λ and a chosen thickness, but no Technopol table gives them.
- Cutting envelope constrains geometry. Any dimension beyond 3000 × 1240 mm or 1030 mm thick requires segmenting and joining, which introduces joints.
- Enclosed-letter break must be glued closed on install for a seamless result.
- Made-to-order lead time: nothing is stocked pre-cut, and no quantified turnaround is published — plan lead time by size and complexity.
- Solvent sensitivity (general EPS caution): verify adhesive/coating compatibility, as solvent-based products attack EPS.