

STRUCTURAL · TECHNICAL DESIGN GUIDE

Light Steel Frame

A turnkey cold-formed steel building system whose galvanised C/Z sections are roll-formed in-house, then closed in with Technopol's own EPS-insulated, EIFS/DEFS-rendered envelope.

Overview

Technopol's Light Steel Frame (LSF) is a turnkey cold-formed-steel (CFS) building system rather than a single catalogue product. Technopol designs, roll-forms and fabricates its own galvanised C/Z sections in-house on a CZ roll-former, then closes the frame in with its own EPS insulation and EIFS/DEFS render finishes. The build partner is Steel Frame Warehouse (Pty) Ltd (project brand Poxon), and frames are engineered in Prokon.

The system is delivered in two structural tiers from the same in-house plant. The heavy tier is a back-to-back lipped-channel (CFLC) portal and lattice-truss frame (sections roughly 125-300 mm deep) for poultry houses, warehouses and agricultural sheds. The light-gauge tier is a FrameCAD-style LSF stud system (89 mm and 150 mm web studs) for walls, floor joists, girders and roof trusses, with Snaplock roof sheeting and cladding.

The envelope wraps the steel with Technopol's EPS-based products and a rendered (EIFS/DEFS) exterior. The reaction-to-fire behaviour of the EPS core, the installed thermal resistance of the clad wall, and the fire-resistance rating of the specific NuClad LiteCore LSF wall are three distinct, separately-tested properties that are scoped to their exact tested assemblies and must not be generalised across the whole product line.

The system is designed to SANS 517:2009 (light steel frame building) and SANS 10162-2 (cold-formed steel design). Each building is engineered project-specifically; no general span/load-capacity tables were found for either tier.

Key specifications

Property	Value	Standard
Product / build-up	Cold-formed steel frame system in two tiers: heavy back-to-back lipped-channel (CFLC) portal & lattice-truss frames (125-300 mm deep) and light-gauge LSF studs (89 & 150 mm web), closed in with Technopol's own EPS insulated / EIFS-rendered envelope	SANS 517 ; SANS 10162-2
Installed wall R-value (DEFS/LSF assembly)	1.08 (0.8 mm stud) to 1.23 (0.6 mm stud) m ² ·K/W	—
Typical steel mass	11.37 (12x10 m poultry house, 12° pitch, 4 bays) kg/m ²	—
Frame section range (roll-former)	Web/waist 40-80, flange C 80-300 / Z 120-300, lip 10-25, plate 1.5-3.0; light-gauge studs 89 & 150 web; heavy portal sections to 300x75x20x2.0 mm	—
Documented portal clear spans	15.4 and 17.4 (also 12x10 m house); ~12° duo-pitch m	—
Reaction-to-fire class (EPS core)	Class B-s1,d0	SANS 53501-1
Fire-resistance rating (NuClad LiteCore LSF wall)	REI 60 - R 60 / E 60 / I 60 (FR60, load-bearing) min	SANS 10177-2:2005
Applicable standards & approvals	SANS 517:2009 (LSF building); SANS 10162-2 (cold-formed steel design); fire: SANS 53501-1 & SANS 10177-2; Agrément 2020/609 (LiteCore Building System)	—

Materials & build-up

Sections are cold-roll-formed in-house from hot-rolled or hot-dip galvanised steel strip. The documented feed material is Q195/Q235 hot-rolled or galvanised strip, 1.5-3.0 mm thick, run at a 25 m/min discharge. The roll-former produces C-sections of 80-300 mm flange, Z-sections of 120-300 mm flange, a web/waist of 40-80 mm and lips of 10-25 mm.

The two structural tiers are drawn from the same plant. The heavy CFLC tier uses back-to-back lipped channels bolted into portal and truss frames; the light-gauge tier is a stud system with Snaplock roof sheeting and cladding.

- Heavy tier (portal/truss): back-to-back lipped channels, roughly 125-300 mm deep. On the 17.4 m poultry house the main rafter/column is 300x75x20x2.0, with 125x50x20x2.0 and 75x50x20x2.0 members; on the 12x10 m house, columns/rafters are 150x50x20x2.0 B2B, with 100x50x20x2.0 haunch/purlins and 50x50x3 cross-bracing.
- Light-gauge tier: 89 mm and 150 mm web studs for walls, floor joists, girders and roof trusses.
- Connections: portal joints use M16 Grade 4.8 bolts through gusseted connections with 2 mm gusset plates welded to the columns; columns are cast into the foundation.
- Envelope: frame closed in with Technopol's own EPS insulation and EIFS/DEFS render finishes.

Applications

The two tiers serve different building types. The heavy CFLC portal/truss tier is the best-documented and is aimed at agricultural and industrial enclosures; the light-gauge stud tier suits framed walls, floors and roofs.

- Heavy CFLC portal/truss tier: poultry houses (best-documented, with 12x10 m, 15.4 m and 17.4 m frames on record), warehouses and agricultural sheds.
- Light-gauge LSF stud tier: walls, floor joists, girders and roof trusses, plus Snaplock roof sheeting and cladding.
- The insulated, rendered envelope suits climate-controlled agricultural and general building enclosures.
- Frames are supplied flat-pack or as pre-assembled modules.

Installation, fixing & handling

Erection of the heavy tier is a bolted portal/truss operation; the fire-tested wall has its own specific cladding fixings that apply only to that assembly. No general erection manual, torque schedule or handling/storage datasheet was found in the primary corpus.

- Framing: heavy portals/trusses are bolted using M16 Grade 4.8 bolts through gusseted joints (2 mm welded gusset plates).
- Foundations: columns are cast into the foundation; embedment is design-specific (250 mm and 500 mm are both documented on different projects).
- Studs: spaced per design - 600 mm c/c in the R-value wall build-up, 635 mm c/c in the fire-tested wall.
- Fire-tested wall skins (FT 24/003 only): exterior 0.5 mm Chromadek fixed with PU adhesive and Waver-type screws; interior plastered LiteCore bricks tied with galvanised strapping; Z-type horizontal joints.
- Delivery: flat-pack or pre-assembled modules.

Dimensions & availability

Sections are made to order within the roll-former envelope rather than sold as a fixed-size catalogue; the sizes below are capability ranges plus documented project sections.

- Roll-former envelope: C 80-300, Z 120-300, web 40-80, lip 10-25, plate 1.5-3.0 mm.
- Documented sections in use: 300x75x20x2.0, 150x50x20x2.0, 125x50x20x2.0, 100x50x20x2.0, 75x50x20x2.0 lipped channels; 50x50x3 bracing; 89 and 150 mm light-gauge stud webs.
- Documented building envelopes: 12x10 m, 15.4 m and 17.4 m spans at ~12 degree duo-pitch on 3.0 m bays.
- Verified steel mass: 11.37 kg/m² for the 12x10 m poultry house (1364.8 kg over 120 m²).
- Build partner: Steel Frame Warehouse (Pty) Ltd (project brand Poxon); frames engineered in Prokon. Current LSF/steel pricing is not established.

Design considerations & limitations

- Project-specific engineering: no general span/load-capacity tables exist for either the light-gauge (89/150 mm) studs or the heavy portals; documented capacity is only project-specific Prokon analyses. Each building must be engineered to SANS 517 / SANS 10162-2.
- EPS is combustible. The three fire properties are separate and assembly-specific: the EPS core reaction-to-fire class (B-s1,d0) is a material combustibility class, not a fire-resistance rating; REI 60 belongs ONLY to the +/-240 mm NuClad LiteCore LSF wall of report FT 24/003. Neither result licenses a blanket fire claim for the product line.
- Thermal data is assembly-level, not product-level: the R-values quoted are for the full DEFS/LSF wall build-up. Technopol publishes no single-product thermal conductivity (λ) and no U-value; the derived $U \sim 0.81\text{-}0.93 \text{ W/m}^2\text{K}$ is not a stated Technopol figure.
- Steel-grade/corrosion: the machine spec lists only Q195/Q235 galvanised strip. Any ZincoMag/SpectraMag migration or 'up to $\sim 10\times$ galvanised life' corrosion claim appears only in marketing material with no primary source and must not be relied upon as a specified property.
- Unverified marketed figures: the brochure's ' $\sim 517 \text{ kg}$ for a 15.4 m portal + one 3.0 m bay ($\sim 11 \text{ kg/m}^2$)' is not backed by any primary weight sheet (the only verified mass is 11.37 kg/m^2 for the different 12x10 m house); the 'LiteSpan Panel 150 mm B-s1,d0' brochure line was not independently verified.
- Scope of approvals: Agreement SA 2020/609 certifies the LiteCore Building System specifically, not the bare LSF frame or the company generally. ISO 9001:2015 is current, but ISO 14001 and 45001 lapsed in March 2026; these are company certifications, not product ratings for the LSF frame.
- Site responsibilities: no general erection manual, bolt torque schedule or handling/storage datasheet was found; fixing details in the corpus are specific to the fire-tested wall only. Foundation embedment is design-specific.
- Not established: EPS envelope thickness range, density grade and standard panel sizes for the LSF cladding specifically; compressive strength of the EPS in the LSF envelope; a fixed-size stud/section catalogue with cover widths and tolerances.

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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.