

STRUCTURAL · ENGINEERING SPECIFICATION

Light Steel Frame

Specification for Technopol's Light Steel Frame - a turnkey, in-house roll-formed cold-formed-steel building system delivered in a heavy lipped-channel portal/truss tier and a light-gauge LSF stud tier, closed in with Technopol's EPS-insulated EIFS/DEFS envelope, designed project-specifically to SANS 517:2009 and SANS 10162-2.

Verified technical data

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)	—

Scope

- 1.0** This specification covers the cold-formed galvanised steel frame (heavy back-to-back lipped-channel portal/lattice-truss tier and light-gauge LSF stud tier) and Technopol's EPS-insulated EIFS/DEFS envelope closing it in.
- 2.0** The system is a turnkey building system, not a single fixed-size catalogue product; sections are roll-formed to order within the machine capability envelope.
- 3.0** This specification excludes any generalised span or load-capacity rating: no general span/load tables exist for either tier and every building must be individually engineered.
- 4.0** Fire and thermal figures in this specification are scoped to their exact tested assemblies and do not extend to the frame or envelope in general.
- 5.0** Pricing is outside this specification and is not established in the available sources.

Materials

- 6.0** Frame sections are cold-roll-formed in-house from hot-rolled or hot-dip galvanised steel strip, documented as Q195/Q235 grade, 1.5-3.0 mm plate thickness.
- 7.0** The heavy tier comprises back-to-back lipped-channel (CFLC) sections roughly 125-300 mm deep, bolted into portal and lattice-truss frames.
- 8.0** The light-gauge tier comprises FrameCAD-style LSF studs with 89 mm and 150 mm web depths, with Snaplock roof sheeting and cladding.
- 9.0** Portal connections are made with M16 Grade 4.8 bolts through gusseted connections with 2 mm gusset plates welded to the columns; columns are cast into the foundation.
- 10.0** The frame is closed in with Technopol's own EPS insulation and EIFS/DEFS render finish; no single EPS envelope thickness, density grade or standard panel size for the LSF cladding is established.
- 11.0** The documented DEFS/LSF wall build-up is an 89x38 stud at 600 mm c/c with 14 kg/m³ cavity batt ($k = 0.040 \text{ W/m.K}$), 15 mm gypsum internal and 12 mm FC board external.

Performance

- 12.0** Roll-former capability: C-section flange 80-300 mm, Z-section flange 120-300 mm, web/waist 40-80 mm, lip 10-25 mm, plate thickness 1.5-3.0 mm.
- 13.0** Documented sections in use: 300x75x20x2.0, 150x50x20x2.0, 125x50x20x2.0, 100x50x20x2.0, 75x50x20x2.0 lipped channels; 50x50x3 cross-bracing; 89 and 150 mm light-gauge stud webs.
- 14.0** Documented portal clear spans: 15.4 m and 17.4 m (plus a 12x10 m house) at ~12 degree duo-pitch on 3.0 m bays.
- 15.0** Verified typical steel mass is 11.37 kg/m², being the 12x10 m poultry house (1364.8 kg over 120 m²); this is a project-specific value, not a general design rate.
- 16.0** Installed wall R-value for the DEFS/LSF assembly is 1.079 m².K/W with a 0.8 mm stud and 1.2284 m².K/W with a 0.6 mm stud; these are full-wall assembly values.
- 17.0** No single-product thermal conductivity (λ) and no U-value are published by Technopol; a U ~ 0.81-0.93 W/m².K can be derived from the installed R-values but is not a stated figure.
- 18.0** No general span or load-capacity tables exist for either the light-gauge studs or the heavy portals; capacity is established only by project-specific Prokon analysis.
- 19.0** Section sizes above are roll-former capability ranges plus ad-hoc project sections, not a published fixed-size or tolerance catalogue.

Fire

- 20.0** EPS is combustible; reaction-to-fire and fire-resistance are separate properties and must not be conflated.
- 21.0** The bare galvanised steel frame is a non-combustible substrate but carries no reaction-to-fire class and no fire-resistance rating on its own.
- 22.0** Reaction-to-fire of the EPS core is Class B-s1,d0 (Class B) to SANS 53501-1, tested on plain EPS at +/-18.37 kg/m³ x 60 mm (Ignis Testing, authorised 17-08-2023); this is a material combustibility classification of the EPS core, not a minutes-based fire-resistance rating.
- 23.0** Fire-resistance rating REI 60 (Stability, Integrity and Insulation each 60 min; FR60, load-bearing) to SANS 10177-2:2005 applies ONLY to the tested NuClad LiteCore LSF load-bearing wall: total thickness +/-240 mm, FRCell core 15 kg/m³ x 50 mm, 0.5 mm Chromadek exterior skin, plastered LiteCore brick interior, LSF studs at 635 mm c/c, Z-type horizontal joints.
- 24.0** The REI 60 test (CSIR Fire Testing Services report FT 24/003 Issue 2, tested 22 April 2024, valid 5 years to ~April 2029) recorded stud stability failure at 375 degrees C with a maximum measured deflection of 3.5 mm at 60 minutes; this rating must not be generalised to other frame or envelope configurations.
- 25.0** Neither the EPS core reaction-to-fire class nor the single-wall REI 60 result licenses a blanket fire claim for the product line.

Execution / installation

- 26.0** Heavy portals and trusses are bolted assemblies using M16 Grade 4.8 bolts through gusseted joints with 2 mm gusset plates welded to the columns.
- 27.0** Columns are cast into the foundation; cast-in embedment is design-specific (250 mm and 500 mm are both documented on different projects).
- 28.0** Light-gauge studs are spaced per design: 600 mm c/c in the R-value wall build-up and 635 mm c/c in the fire-tested wall.
- 29.0** On the FT 24/003 tested wall only, the exterior 0.5 mm Chromadek skin is fixed with PU adhesive and Waver-type screws, the interior plastered LiteCore bricks are tied with galvanised strapping, and horizontal joints are Z-type.
- 30.0** Frames are supplied flat-pack or as pre-assembled modules.
- 31.0** No general erection manual, bolt torque schedule or handling/storage datasheet for the frame was found in the primary sources; erection and torque requirements must be obtained from the project engineer.

Standards & compliance

- 32.0** Design codes: SANS 517:2009 (light steel frame building) and SANS 10162-2 (cold-formed steel structural design).
- 33.0** Fire standards: SANS 53501-1 (reaction-to-fire of the EPS core, Class B-s1,d0) and SANS 10177-2:2005 (fire-resistance of the NuClad LiteCore LSF wall, REI 60, report FT 24/003).
- 34.0** Agreement South Africa Certificate 2020/609 (Amended March 2021), holder Technopol SA (Pty) Ltd, certifies the LiteCore Building System specifically and must not be presented as covering the bare LSF frame, other products, or the company generally.
- 35.0** Company quality certification (separate from this product): ISO 9001:2015 is current; ISO 14001 and ISO 45001 lapsed in March 2026. These are company certifications, not product ratings for the LSF frame.

Specifier's notes — not established in Technopol sources.

- Thermal conductivity (λ) for any single Technopol LSF product is not established - obtain externally; the R-value calc uses only component k-values and no overall product λ exists.
- U-value per thickness is not published by Technopol - the $U \sim 0.81\text{--}0.93 \text{ W/m}^2\text{K}$ figure is derived from the installed R-values, not stated; obtain/confirm externally if required.
- General span/load-capacity tables for the light-gauge (89/150 mm) studs and the heavy portals are not established - each building must be engineered project-specifically (Prokon) to SANS 517 / SANS 10162-2.
- A fixed-size stud/section catalogue with cover widths and manufacturing tolerances is not established - only roll-former capability ranges and ad-hoc project sections exist.
- The EPS envelope thickness range, density grade and standard panel sizes for the LSF cladding specifically are not established - the B-s1,d0 test was on $\pm 18.37 \text{ kg/m}^3 \times 60 \text{ mm}$ plain EPS and the REI 60 wall core is FRCell $15 \text{ kg/m}^3 \times 50 \text{ mm}$; neither is 'the' LSF envelope spec.
- Compressive strength of the EPS used in the LSF envelope is not given in any LSF-specific document - obtain externally.

- The ZincaMag/SpectraMag corrosion-life claim ('up to ~10x galvanised life') has NO Technopol primary source - it appears only in the brochure, whereas the machine spec lists Q195/Q235 galvanised strip only; do not specify as a property. (Contradiction to resolve: brochure steel material vs primary machine spec.)
- The brochure's '~517 kg for a 15.4 m portal + one 3.0 m bay (~11 kg/m2)' figure is not located in any primary weight sheet - the only verified mass is 11.37 kg/m2 for the different 12x10 m house. (Contradiction to resolve: brochure mass example vs verified figure.)
- Fire scope must not be conflated: the brochure lists 'EPS FR60' and 'FR60' together in one block - these are separate properties on different assemblies (B-s1,d0 reaction-to-fire on plain EPS per SANS 53501-1; REI 60 fire-resistance on the +/-240 mm NuClad LiteCore wall per SANS 10177-2, FT 24/003). Do not present as a single rating. (Contradiction to resolve.)
- The 'LiteSpan Panel 150 mm B-s1,d0' brochure line was not independently verified in this pass - a separate LiteSpan report would be needed; do not rely on it.
- No general erection/installation manual, bolt torque schedule or handling/storage datasheet for the frame was found - obtain from the project engineer/fabricator.
- Current selling prices for LSF frames/sections are not established (only a 2020 Clotan Steel supplier pricelist and internal costing sheets exist) - obtain externally.

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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.