STREAM INFINITY
ThermaCore Heavy Duty

Structural-Grade GPS Inserts with Integrated Galvanized Steel Reinforcement

1. PRODUCT OVERVIEW

ThermaCore Heavy Duty™ is a next-generation structural reinforcement system engineered to replace traditional steel skeletons in vinyl, fiberglass, and hybrid window and door frames. Built from **precision-cut Graphite Polystyrene (GPS) foam** combined with **16-gauge galvanized steel**, this hybrid insert delivers both **structural load-bearing performance** and **high-efficiency thermal insulation** in a single component.

Unlike loose steel channels or multi-piece reinforcement assemblies, ThermaCore Heavy Duty is manufactured as a **single, dimensionally stable, CNC-cut insert** that fits OEM cavities with tight tolerances. The GPS core maintains thermal continuity, while the steel layer provides the structural backbone required for hinges, locks, mullions, and high-load frame sections.

This system is ideal for manufacturers seeking to **increase structural rigidity**, **improve fastener holding**, and **boost thermal performance** without redesigning their frame profiles.

2. KEY BENEFITS

STRUCTURAL PERFORMANCE

- Integrated **16-gauge galvanized steel** (ASTM A653, G90 coating)
- Yield strength: **33,000–50,000 psi**
- Tensile strength: **50,000–65,000 psi**
- Shear strength: **~28,000 psi**
- Supports hinge loads, mullion loads, and locking hardware
- Provides secure anchor points for #8–#10 self-tapping screws

THERMAL PERFORMANCE

- GPS core delivers **R-5 per inch**
- Reduces thermal bridging compared to bare steel reinforcements
- Improves condensation resistance in cold climates
- Maintains thermal continuity across the frame

PRECISION FIT

- CNC-cut to ±1.0 mm tolerance
- Maintains drainage, pressure-equalization, and reinforcement zones
- Custom-fit for vinyl, aluminum, fiberglass, and hybrid frames

MANUFACTURING EFFICIENCY

- Replaces multi-piece steel skeletons
- Faster installation
- Consistent, repeatable geometry
- No field variability — fully factory-controlled

3. SYSTEM COMPOSITION

STEEL LAYER

- **16-gauge galvanized steel (0.060")**
- ASTM A653 compliant
- G90 coating for corrosion resistance
- Load capacity: **1,100–1,600 lbs shear strength per sq. in.** (depending on anchoring)

GPS FOAM LAYER

- **15 PSI compressive strength**
- **10–12 psi shear strength**
- **R-value ~5 per inch**
- Lightweight, machinable, dimensionally stable

ADHESIVE

- Polystyrene-safe construction adhesive
- Compatible with GPS and galvanized steel
- High-tack bonding for composite stability

FASTENERS

- #8–#10 TEK self-tapping screws
- Shear strength: **400–700 lbs**
- Pullout from 16-ga steel: **200–400 lbs per screw**

4. MECHANICAL PROPERTIES

STEEL (16-GAUGE GALVANIZED)

Property	Value
Yield Strength	33,000–50,000 psi
Tensile Strength	50,000–65,000 psi
Shear Strength	~28,000 psi
Modulus of Elasticity	29,000,000 psi
Coating	G90

GPS FOAM (16 PSI)

Property	Value
Compressive Strength	16 psi
Shear Strength	10–12 psi
R-Value (1")	~5
Tolerance	±1.0 mm
Thermal Conductivity	0.028 W/(m·K)

5. LOAD TRANSFER STRATEGY

ThermaCore Heavy Duty is engineered so that:

1. **Steel carries all axial and lateral loads**
2. Steel must be either:
    - Resting on structural stops, or
    - Fastened directly to the frame substrate
3. **GPS foam acts as a thermal filler**, not a structural anchor
4. Foam stabilizes steel placement and eliminates cold spots

This ensures predictable, code-compliant structural performance.

6. RECOMMENDED APPLICATIONS

HIGH-LOAD WINDOW & DOOR AREAS

- Hinge reinforcement (casement, awning, entry doors)
- Locking mechanism reinforcement
- Mullion joins in multi-panel frames
- Patio doors (sliding or multi-panel)
- Tall stacked window sections (>6 ft)
- Frames exposed to high wind or seismic loads

FRAME TYPES

Frame Type	Need for Reinforcement	Notes
Vinyl	High	Major rigidity improvement
Fiberglass	Moderate	Improves anchor support
Aluminum	Variable	Enhances fastener grip

7. INSTALLATION NOTES

- Do not rely on foam for fastener anchoring
- Use #8–#10 TEK screws for hardware attachment
- Maintain drainage and pressure-equalization paths
- Ensure steel is seated on structural stops where applicable
- Use polystyrene-safe adhesives only

8. TECHNICAL ASSISTANCE

Stream Infinity Ltd.
#106 – 43815 Progress Way
Chilliwack, BC
V2R 0E6, Canada
Tel: 604-349-1539
Email: info@streaminfinity.ca