LIVOTON
PROTEIN FOAMING AGENT

LIVOTON PFA

PROTEIN FOAMING AGENT FOR CELLULAR CONCRETE

COOPERATION IN THE FIELD OF FOAM CONCRETE WITH LIVOTON

Dear Partner,

1. Collaboration and Business Opportunities

Market Prospects & Applications

The market for cellular lightweight concrete in many regional markets remains unsaturated, offering broad commercial prospects for both mobile equipment (on-site monolithic pouring) and factory production (prefabricated panels, blocks, and thermal insulation items).

Key Advantages & Uses of Foam Concrete

- **Mineral Insulation:** Non-combustible, non-decaying, and immune to corrosion or sagging over time.
- **Roofing & Solar Substrates:** Ideal for flat roof insulation and slope creation, especially where heavy equipment (e.g., solar panels) is installed, as foam concrete is an incompressible structural material.
- **Renovation & Void Filling:** Perfect for lightening floor loads in historical/old buildings and filling underground or structural voids without overloading foundations.
- **Monolithic Walls & LSTC Framing:** Excellent for pouring monolithic walls (using permanent or temporary formwork) and as an insulating core for Light Steel Thin-walled Structures (LSTC).
- **Road Construction:** Used as a lightweight sub-base material to prevent soil settlement and level structural differences.

2. Technical Specifications & Formulations

2.1 Floor Pouring in Basements

Foam concrete is highly suitable for basement floor screeds and sub-floors as a thermal insulation and leveling layer. Its closed-cell structure reduces thermal loss and mitigates moisture condensation. Proper base waterproofing prior to pouring is recommended.

2.2 Classification & Component Ratios by Density

Foam concrete strength correlates directly with its density grade (D) and compressive strength class (B).

Reference Mix Designs (per 1 m³ of finished foam concrete)

Density Grade (D)	PC500 Cement (kg)	Sand (kg)	Water / Cement Ratio (W/C)	Mixing Water (L)	LIVOTON PFA Conc. (kg)	Compressive Strength (MPa)
D200	165	0	0.97	90	1.80	0.3 – 0.5
D300	260	0	0.70	122	1.68	0.6 – 0.8
D400	300	0	0.66	135	1.60	0.8 – 1.0
D500	305	100	0.65	138	1.53	1.0 – 1.2
D600	310	210	0.64	140	1.43	1.4 – 2.0
D700	315	305	0.62	142	1.35	2.2 – 2.8
D800	320	400	0.61	145	1.25	3.2 – 4.0
D900	335	480	0.59	151	1.20	5.0 – 6.0
D1000	350	560	0.58	158	1.13	7.0 – 8.0

2.3 Load-Bearing Structures

For load-bearing structural elements or blocks, higher density grades (**D800–D1200+**) providing compressive strengths of **B5 (M75)** and above are required, in strict accordance with local building codes.

2.4 Multi-Purpose Applications of LIVOTON PFA

LIVOTON PFA is a protein-based foaming agent manufactured via enzymatic hydrolysis of natural protein raw materials enriched with functional stabilizing additives.

- **Air Entrainment in Heavy Concrete:** Adding a minimal dosage (approx. 0.05% by cement weight) entrains ~5% microscopic air bubbles, dramatically increasing frost resistance and freeze-thaw durability in paving slabs and outdoor elements.
- **Anti-Segregation Modifier:** Prevents phase separation/segregation in lean cement-sand mortars, maintaining plasticity and workability for hours.
- **Polystyrene Concrete Additive:** Replaces household surfactants/detergents to ensure uniform dispersion of EPS beads without strength loss.

3. Products, Order Terms & Logistics

3.1 Payment Terms

We offer flexible payment models depending on order scale and history:

1. **100% Prepayment:** For small trial or sample orders.

2. **Partial Prepayment:** Deposit upon contract signing, balance paid upon readiness/dispatch.

3. **Trade Credit / Deferred Payment:** Available for verified, long-term regional partners.

4. **Letter of Credit (L/C):** Supported for international containerized shipments.

3.2 Manufacturer Status & Quality Standards
We are direct original manufacturers of **LIVOTON** protein foaming agents (producing since 2008).

- **Official Website:** www.livoton.com.ua

- **Certifications:** ISO 9001 quality management, official Technical Specifications (TU), and complete Safety Data Sheets (SDS).

3.3 Minimum Order Quantities (MOQ) & Shipping

- **Flexibility:** We have no strict minimum order limit. Sample quantities (10–20 L) can be dispatched quickly via courier services.

- **Bulk Freight:** Orders are shipped on EUR pallets (~1,000 kg per pallet) via consolidated truckloads or sea containers (FCL).

3.4 Product Range
We specialize strictly in specialized foaming agents:

1. **LIVOTON PFA (Protein-based):** High-stability organic foam for premium structural and ultra-lightweight insulation concrete (D150–D1200).

2. **Synthetic Foaming Agent:** Optimized for basic baro-mixing installations without separate foam generators.

4. Technical Comparison & Equipment Options

4.1 Cellular Structure & Water Absorption
LIVOTON PFA generates a **closed-cell structure**, meaning air bubbles are isolated and not interconnected by capillaries (unlike autoclaved aerated concrete / gas silicate). True water resistance can be further enhanced using bulk hydrophobic additives if direct submersion resistance is required.

4.2 Production Technologies: Barotechnology vs. Pre-Generated Foam

Feature	Barotechnology (Baro-mixers)	Classic Pre-Generated Foam	LIVOTON Hybrid System
Process	Foaming agent mixed directly under pressure	Foam generated separately & blended	Both capabilities in one machine
Foaming Agent	Synthetic	Protein (LIVOTON PFA)	Protein or Synthetic
Density Range	D600 – D1200	D150 – D1200	D150 – D1200
Foam Stability	Moderate	Superior / Zero-collapse	Superior
Additives Needed	Accelerators/thickener often required	None required	None required

4.3 Mobile Equipment & Rental Models
We manufacture mobile units suitable for both direct purchasing and rental fleets:

- **Compact Single-Phase (220V):** For private contractors and small floor/roof screed projects.
- **Three-Phase Professional (400V):** High-output semi-automatic systems for commercial job sites.

5. Next Steps & Partnership
We welcome further discussions regarding dealership margins, equipment supply, and technical training for your team.

Best regards,

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