Cast in Place

Precast

Technology

Products

Allied Foam Tech Corp.
LIGHTWEIGHT CEMENT/CONCRETE
**Description:**

Allied AFT foam systems provide the most stable aqueous foams currently available in the construction industry.

The AFT series of foam agents, using compressed air and AFT foam generating equipment, generate very fine and stable foams. They provide cement, concrete and gypsum mixes with reduced weight, improved workability, insulation value, sound proofness, and expanded applications.

**Advantages:**

**Excellent Foam Stability**

Aqueous foams derived from AFT foaming agents will maintain foam stability for hours or longer. This ensures that the foamed cement/concrete maintains a fine and uniform foam texture through the whole hardening process. No other foam products available in the industry can match such foam stability.

**Provide a wide spectrum of rheological properties**

The dynamic nature of the AFT foam systems allow different foam rheology to be incorporated into the host cement/concrete matrix to satisfy a wide range of slump loss requirements in different applications.

**Broad compatibility with various cement/concrete admixtures**

AFT foams, unlike the conventional surfactant or protein based foams, are quite compatible with different kinds of cement, fly ash, sand/aggregate fillers, retarders, accelerators and water reducers.

**Properties:**

**Foaming agents**

**AFT-400 Series**

Our standard foam concentrates that provide foamed cement and concrete with excellent early (one day) and 28 day compressive strengths and high water resistance. Such materials are ideal for load bearing or light load bearing panels, blocks, and bricks.

Foamed cement at densities as low as 3 pcf (0.05 gram/cc) with fine cell size can be made with AFT-400. Such highly insulative, very low density cementitious foams with their high R value and non-flammability are ideal core materials as wall and cinder block infills.

**AFT-500 Series**

Our premium foam concentrates that provide cementitious foam coating with good cured properties at thin sections. It is ideal for various precast manufacturing processes and cast-in-place applications where lightweight and high integrity is needed.

**Foam Generating Equipment**

The AFT G-series of foam generators are economical, mobile and compact. The typical rate of foam production is from 3 to 20 cu. ft. per minute (depending on the model used). These foam generators incorporate a special design to refine
Application 1:
Vertically applicable and highly insulative cementitious foams based on AFT-500 foam system

Materials:
- Portland cement with suitable cement admixtures
- AFT-500 foam system

Density produced (dry): 6 - 35 pcf

Application:
cinder block and wall infills, roofdecks, vertically trowellable (low slump) and insulative foam on various wooden and cementitious substrate.

Properties:
- various slump features. Some foams can be applied at 45 degrees slope and as thick as several inches without sagging.
  - excellent sound and temperature barrier.
  - hardened foam maintains very fine pore size.
  - low water uptake.
  - good 28 days compressive strength.

Physical Properties and Test Results

Many applications have been undertaken successfully at various precast plants in North America and Europe. Some examples are given below:

FOAMED CEMENT MIX

Using conventional proteinaceous Foam
Density = 0.24 g/cc (15 pcf)

Using Allied AFT-500 Foam
Density = 0.24 g/cc (15 pcf)

Using Allied AFT-500 Premium Foam
Density = 1.25 g/cc (77.5 pcf)

FOAMED CONCRETE MIX

Using conventional proteinaceous Foam
Density = 1.25 g/cc (77.5 pcf)

3 inch thick, 35 pcf, 300 psi roofdeck over then roof of a 4 stories underground structure with low slump Allied foam cement mix (Harvard University, NW Labs., 2008)
**Application 2:**
Lightweight and load-bearing cementitious panels, blocks and bricks

**Materials:**
- Portland cement/aggregate mixes with suitable concrete admixtures such as superplasticizers
- AFT-510 foam system

**Density produced:** 40 - 85 pcf

**Application:** roofing, wall and floor panels, construction bricks and blocks.

**Properties:** lightweight with good strength profile, water resistance and workability (various slump loss characteristics), good sound and thermal insulation

**FOAMED CEMENT OR CEMENT/AGGREGATE MADE WITH AFT-420 FOAM**

<table>
<thead>
<tr>
<th>Density (a) (28 day)</th>
<th>Compressive Strength (28 day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(g/cc)</td>
<td></td>
</tr>
<tr>
<td>Cement 0.49 (30.4 pcf)</td>
<td>362 psi (2.50 N/mm)</td>
</tr>
<tr>
<td>Cement 0.58 (36.0 pcf)</td>
<td>487 psi (3.36 N/mm)</td>
</tr>
<tr>
<td>Cement 0.75 (46.5 pcf)</td>
<td>966 psi (6.66 N/mm)</td>
</tr>
<tr>
<td>Cem./Agg. 1.21 (75.0 pcf)</td>
<td>&gt;2,500 psi (17.2 N/mm)</td>
</tr>
</tbody>
</table>

\(a\) ASTM-796

**Application 3:**
Foamed concrete for void fills

**Materials:**
- regular cement or mortar mix
- admixtures such as plasticisers and superplasticizers
- AFT-400 foam system

**Density produced:** 20 - 40 pcf

**Application:** void fill, pipe, tunnel & trench infills, floor slabs

**Properties:** lightweight with good strength profile, good depth profile per pour without foam collapse, water resistance and workability, good sound and thermal insulation

**Application 4:**
Foamed Cement Roofdeck as Sports Field
First of its kind (Georgetown University, Washington D.C., 2003)

1. Equipment/Material Mobilization

2. Lightweight Cement Poured on top of the roof from ground

3. Hardening of Foamed Cement (140,000 square feet, 35 pcf, 300 psi)

Autoclaved lightweight concretes (ALCs) typically have much higher compressive strength than that of cast-in-place cement and concrete at the same densities. Higher strength allows ALCs to be used as load-bearing roof and wall panels, construction bricks and blocks, their room temperature cast-in-place counterparts are usually restricted to non-load bearing roofdecks and void fills. However, the capital investment for an ALC plant and the energy consumption for making ALCs are extremely high, and the ALCs are for precast applications only.

Allied Foam Tech Corporation, using an extremely innovative approach towards aqueous foam technology, has revolutionized the precast and cast-in-place applications for foamed cement and concrete. Aqueous foams derived from the AFT technology usually have hours or longer of foam stability after foam generation while foams derived from conventional surfactants or protein start to show foam collapse within minutes. Foamed cement and concrete derived from the AFT foam system, unlike the conventional room temperature cast materials, have strength characteristics that match quite well with the ALCs (see table on page 3). Furthermore, the cement and concrete from the AFT foams have coloring capability, much finer foam texture and significantly better water resistance than their ALC counterparts. Foamed cement and concrete based on the AFT foam technology, because of their unique strength and other performance characteristics, are suitable for both pre-cast/load-bearing and cast-in-place applications.
AFT FOAM APPLICATIONS - SCHEMATICS

PRECAST APPLICATIONS

CAVITY FILL FOR BLOCKS

WALL PANEL 1

CAST IN PLACE APPLICATIONS

WALL PARTITIONS

ROOFING & RE-ROOFING

LIGHTWEIGHT BLOCKS

FLOOR/FOUNDATION
ALLIED FOAM TECHNOLOGY

- FOAMED CONCRETE, GYPSUM AND CERAMICS
- FOAM FOR ODOR CONTROL AND AS LANDFILL COVER
- FOAMED ADHESIVE, TEXTILE BINDER

ALLIED FOAM TECH HAS DEVELOPED A SERIES OF FOAM REAGENTS AND FOAM GENERATING EQUIPMENT. AQUEOUS FOAMS BASED ON THE AFT TECHNOLOGY ACHIEVE EXTREMELY FINE STRUCTURE AND EXCELLENT FOAM STABILITY UNPARALLELED IN THE INDUSTRY.