

Stable Flow

Cellular Concrete Technologies



CELLULAR CONCRETE
TECHNOLOGIES

8 Reasons to use Stable Flow™ over other CLSM products:

- +/- 1% volume control within 4 hours of mixing—far exceeding industry standards.
- High thermal resistance (R-value). Prevents cracks and other compromising damage caused by freezing and thawing.
- Can be custom designed to be as permeable as uniform sand or as dense as clay.
- Unconfined compressive strength, 150 psi (75-80% air), considered to be **EXCAVATABLE** by hand tools and conventional machinery.
- Works at any water-cement ratio above the required water needed for cement hydration.
- Can reach an unprecedented 85% air (plastic weight of 20 pcf) up to 12 ft. lifts with no collapsing.
- Hardening time can attain sufficient strength to support the weight of a person within just 8 hours after pouring using 80% air and .56 w/c ratio.
- ASTM C260 certified.

Controlled Low Strength Material (CLSM) Flowable Fill

Stable Flow™

Stable Flow™ is a Controlled Low Strength Material (CLSM) used primarily as flowable fill, back-fill, or structural fill in placement of compacted soil. Formulated for the production of low-density foams, it is both self-leveling and self-compacting. This cementitious material is deliverable in a ready mix truck, much like concrete.

Stable Flow™ is a mixture of water, cement, and our revolutionary Stable Air® product that contains an engineered air bubble system. Mix designs are customizable and can be created to maximize flow ability and be formulated for faster set times.

It is non-collapsible in lifts of 10-12 ft. after placement and requires no additional fill. No settlement or non-plastic shrinkage occurs, making it easy to place and trouble free! Our product is specially formulated to work in most equipment in the market today. We are also competitively priced compared to other surfactants with a superior foaming agent that can use up to 80% air in a flowable fill mix, which offers precise value and lasts up to 4 hours in the mix truck with no potential for collapse.

Performance Characteristics

Air Entraining System	lb./yd. ³	(kg/m ³)
Cement Factor	450	(205)
Water	250	(114)
w/c	.56	.56
Target Density	27lb/ft ³	(432)
Laboratory mixture. Foamed material pumped 150ft (45.7m) in increments of 50ft (15.2m)		
Initial Density	129 lb/ft ³	2064 kg/m ³
Density After Foaming	25lb/ft ³	400 kg/m ³ Foam Time 50 sec.
Density After Pumping	lb/ft ³	(kg/m ³)
50ft (15.2m)	29	(464)
100ft (30.5m)	32	(512)
150ft (45.7m)	35	(560)
Compressive Strength @28 days	psi	(MPa)
After foaming	60	(0.41)
After pumping 150ft (45.7m)	100	(0.69)
Compressive Strength @28 days	psi	(MPa)
After foaming	130	(0.89)
After pumping 150ft (45.7m)	220	(1.52)



Performing the 10' Sonotubes Stable Flow™ tests on site



A competing product's significant volume loss greater than 5ft

STABLE FLOW™ STANDS UP TO THE TEST

A large flowable fill contractor, who produces millions in annual sales, asked us to conduct our famous 10' Sonotube non-collapsing test: here are the results:

The Test:

After unsuccessfully testing several competing air entraining agents, a large flowable fill contractor asked Cellular Concrete Technologies to demonstrate the capabilities of Stable Flow™ on location. Tests of flowable fill collapsibility were performed using a 10 foot tall, 24 inch diameter Sonotube that was filled with a 5 sack cement mix with 76% air-entrainment, having an anticipated a density of 30 pounds per cubic feet.

Tested at densities of 35PCF, 27PCF, and 22PCF, each remained exactly as it had at pour, with the same consistency. Absolutely zero collapse was observed. An additional test proved that it met excavatable specifications of having the cured concrete below 150PSI. In addition, the Stable Flow™ concentrate only required a dilution rate of 1 part of concentrate to 120 parts of water, 3 times the dilution of most competitors.

How to Prepare Flowable Fill

Step 1: Order 4,500 lbs. cement and add 250 gallons of water.

Step 2: Add 76% Stable Air® foam by volume.

Step 3: Pump or Pour concrete in-to place as needed.

End result: 10 cubic yards of concrete at 110 psi and 30 pcf.



Cement truck and Cellular Concrete Technologies Model 300 machine on job site preparing Flowable Fill.

Frequently Asked Questions

Stable Air® Excavatable Flowable Fill (EFF)

- **Is EFF readily available?** YES, ready Mix concrete producers, using locally available materials, can produce EFF to meet most project specifications.
- **Is EFF easy to deliver?** YES, Ready Mix trucks can deliver specified quantities of EFF to the jobsite where the CCT foam is added and poured.
- **Is EFF easy to place?** YES, depending on the type and location of the void to be filled, EFF can be placed by chute, conveyor, pump, or bucket. Since EFF is self-leveling, it needs little to no spreading or compacting. EFF has tested and been placed in lifts of 10-12ft in a single application with zero shrinkage. This capability speeds construction and reduces labor requirements and costs.
- **Is EFF strong and durable?** YES, load-carrying capacities of EFF typically are higher than those of compacted soil or granular fill and EFF is also less permeable and more resistant to erosion. EFF can be designed to achieve 28 day compressive strengths of as high as 1200 psi when used as either flowable fill or permanent structural fill.
- **Can EFF be easily excavated?** YES, EFF which has compressive strengths of 50 to 100 psi, is easily excavated with conventional digging equipment, yet is strong enough for most backfill needs.
- **Does EFF allow a fast return to traffic?** YES, because EFF can be placed quickly and can support traffic loads within hours, it minimizes downtime for pavement repairs.
- **Will EFF settle or create voids?** NO, EFF has 0 shrinkage and therefore does not form voids during placement and will not settle or rut under loading. This advantage is especially significant if the backfill is to be covered by a pavement patch. Soil or granular fill, if not consolidated properly, may settle after a pavement is placed and form cracks or dips in the road.

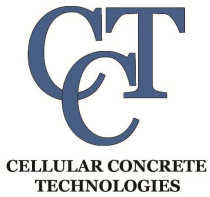
Stable Flow™ Used For Projects of Any Size

In a small town in Connecticut, a homeowner was having trouble with a driveway that had been partially washed out by a stream. When rain season would come each year, the stream would become backed up by debris and would flow over the driveway, causing the gravel to wash away and become a muddy mess. Every time this would happen, the owner would shovel new gravel to fix the problem temporarily and would have to repeat the process each time the problem occurred.

Having become fed up with the reoccurring issue, the homeowner decided to try something new. Using our Model 100 machine with a small compressor and a locally supplied cement truck, the homeowner poured our Flowable Fill to repair the void. Within 18 hours the driveway was repaired and ready to be driven on. The end result was a permanent, cost-efficient repair that was quick and easy!



Stable Flow™ can be used for any size of project including simple at home repairs.



"What began as a spark of innovation has become a revolution that is transforming the entire concrete industry"

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The Stable Air® system can generate lightweight, air-entrained concrete at predictable compressive strengths for a wide range of applications including:

- Conventional concrete applications such as footings, slabs, pre-cast panels, structural infill and overlays, etc.
- Structural fill applications including foundation sub base, floor slab base, pipe bedding, and structural fill for block and styrene forms.
- Sound barriers, retaining walls, tilt-up wall construction, perimeter walls, and sea walls.
- Flooring, driveways, parking surfaces, sidewalks, bridges, stadium overhangs, tunnels, park benches, fountains, parking stops and highway surfaces.
- Blocks, roofing tile, underground vaults, tanks, and manhole housings and covers.
- Flowable fill, backfill, cement reinforcement, soil stabilization, and more.

Guidelines for Use

Air Entraining System: Stable Air® is an ASTM C260 approved and ready to use admixture solution for producing lightweight cellular concrete. Stable Air® admixture provides freeze-thaw resistance, enhanced performance, and accurately controlled yield.

Pre-Foamed Method:

- The Stable Air® machine automatically determines the appropriate diluted ratio. No additional dilution is required.
- The Stable Air® foam is introduced into either a continuous mixer or agitator truck directly and mixed well with mortar or concrete (typically for 3-5 minutes at higher mixing truck speed).

Dosage: Typical Stable Flow™ dosage for flowable fill (as shown on page 2), 110 psi/30 pcf, is 76% foam.

Uses: Stable Air® is recommended for use in all ready-mix, precast, pre-stress and other concrete product plants. Stable Air® has been found to be very effective with different types of sand, which require a very accurate air-entraining admixture. Stable Air® is also utilized when air bubbles are required for a long waiting period or delay of time. Stable Air® can be poured 10-12 ft. without experiencing shrinkage.

Compatibility: Pre-testing of the concrete mix using Stable Air® should be performed before use to assure compatibility, and to optimize quality and performance of concrete batch.

Storage and Handling

Shelf Life: Stable Air admixture has a shelf life of 20 years. Depending on storage conditions, the shelf life may be greater than stated. Please contact Cellular Concrete Technologies regarding suitability for use and dosage recommendations if the shelf life of Stable Air has been exceeded.

Packaging: Stable Air® admixture is supplied in 5 gallon, 55 gallon, or 275 gallon totes.

Additional Information: For additional information on Stable Air® foaming agent or its use in developing a concrete mixture, contact Cellular Concrete Technologies at (949) 754-0570.