DARAFILL®

Controlled low strength material performance additive

Product Description

DARAFILL® produces engineered Controlled Low Strength Material (CLSM)* that is highly flowable, volume stable and excavatable in the future. DARAFILL is a viscous solution of organic compounds used in cementitious backfill mixtures. By developing a stable-air matrix in the CLSM mixture, DARAFILL improves flowability and reduces the required amount of mix water up to 50%, compared to a water-based CLSM. DARAFILL is packaged in 3.5 gal (13.25 L) pails, or in an inert wax capsule that releases its contents during the mixing action in large volume mixers. The capsule shatters upon impact inside the ready-mix truck and disintegrates during mixing. DARAFILL capsules are available in two sizes, 3 oz and 12 oz (90 mL and 360 mL).

Uses

The use of DARAFILL® produces a low water content CLSM that is primarily used to improve flowability, lower densities, eliminate segregation and settlement, and control strength development in applications where future excavation is required. DARAFILL is designed to be used with cement, and pozzolans such as ASTM grade fly ash and ground blast furnace slag. The addition of DARAFILL is a cost-effective alternative to a water-based CLSM mixture, and CLSM is a cost-effective alternative to soil backfill.

DARAFILL is designed for CLSM mixtures and is not recommended for use in conventional concrete.

Performance

The addition of DARAFILL generates stable air contents of 15 to 30% and significantly reduces mix water requirements by as much as 50% when compared to water-based CLSM. When used as recommended, DARAFILL enhances plastic and hardened properties of CLSM accordingly:

- Provides a CLSM which is highly flowable with no segregation.
- Controls strength development for future excavation, usually in the range of 50 to 200 psi (0.35 to 1.40 MPa) depending on the application requirements.
- Increases yield of materials up to 30%.
- Provides densities in the range of 90 to 120 lbs/ft^3 (1440 to1920 kg/m^3).
- Aids pumpability and minimizes segregation in pump between loads. Pre-job testing with actual equipment and intended configuration is strongly recommended.
- Reduces buoyancy problems in CLSM around embedded pipes and tanks when compared to water-based CLSM.

Batch Sequencing

The DARAFILL capsules are added in their entirety to the CLSM load. For ready-mix truck batching, best results are achieved by tossing the capsules against the bottom of the truck hopper to ensure breakage, or dosing the liquid DARAFILL into the rear of the drum, and and then washing down. DARAFILL should be added directly into mixers after the CLSM load is batched. For optimization of freight volumes, add DARAFILL at the job site. CLSM with DARAFILL reaches optimum consistency when the mixture reaches a creamy, flowing appearance. For central mix operations, add DARAFILL capsules into the central mixer and not into trucks to ease discharge from the central mixer.

Product Advantages

- Makes re-excavatable CLSM with 15–30% air entrainment and reduced buoyancy
- Produces CLSM with minimal subsidence relative to water-based fill systems
- Can be used in wide range of mix designs, to satisfy different performance requirements

Addition Rates

Addition rates are typically one 3 oz (90 mL) capsule to dose 1 yd^3 (0.75 m^3) of CLSM or one 12 oz (360 mL) capsule to dose 4 yd^3 (3 m^3) of CLSM. Alternatively, liquid DARAFILL may be dosed at 3 fl. oz. (90 mL) per 1 yd3 (0.75 m^3).

Mix design information may be obtained from a GCP Applied Technologies representative. If water-based CLSM is now being used, a mix design adjustment will be required in order to use DARAFILL.

Packaging & Handling

DARAFILL capsules have a storage tolerance in the temperature range of 32°F to 130°F (0°C to 55°C). Store DARAFILL above freezing, away from heat sources and out of direct sunlight.

Specifications

Material for backfill operations shall be cementitious Controlled Low Strength Material mixtures as supplied by concrete producer and contain DARAFILL, as manufactured by GCP Applied Technologies, Cambridge, MA. Mixture ingredients and proportions shall be submitted for approval. DARAFILL shall be added by the concrete producer personnel as per manufacturers' recommendations.

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