LifeTech ® Ultrafines Admixture **CAS No. 554-13-2**

QS-PDS-800 Revision: 05 **Date of Last Revision: September 13, 2022**

Formula: Li_2CO_3

Appearance: An odorless, white powder. Lithium carbonate based admixture.

Application: LifeTech ultrafines is the finest of the LifeTech grades of lithium carbonate available from Livent. Because of its fine particle size and narrow particle size distribution, this product has been chosen as the grade of choice where reactivity and performance are based on the surface area of the lithium carbonate particles providing controllable, uniform and predictable rates of reaction. Since it is the finest of the grades, it is also the most reactive in these situations. If a slower reaction is desired, the other LifeTech grades should be evaluated in use.

Cementitious Systems

LifeTech ultrafines is a chemical admixture that can be used to adjust and accelerate the setting time of cementitious systems such as high-alumina cements (HAC) and alumina-portland cement blends. Common applications for HAC and HAC/PC blends include:

- Refractory cements
- Self-leveling floor systems
- Quickset mortars
- Shotcrete / gunite
- Quickset adhesives
- Rapid-repair materials

The dosage of LifeTech ultrafines depends on the type of cementitious system in use, as well as the cement factor of the mix design. LifeTech ultrafines provides an accelerating effect by increasing the rate of cement hydration at an early age. In the presence of LifeTech ultrafines, compressive strength begins to develop immediately. The desired setting time can be adjusted by changing the dosage rate (See figure 1). For example, in a HAC system, the setting time can be adjusted to several seconds. In general, LifeTech ultrafines is significantly more reactive than technical grades of lithium carbonate.

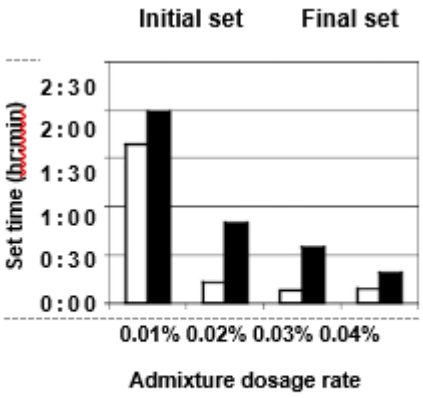

Figure 1
Effect of LifeTech ultrafines dosage rate on set times of HAC

In general dosages of 0.01-0.05 % are sufficient for pure HAC systems, and addition rates of LifeTech ultrafines should be increased as percentage of HAC in HAC/PC mixes is decreased. For example, in mixes containing 10% HAC, set times similar to those obtained at 0.02% addition of LifeTech ultrafines in pure HAC systems may need addition rates of 0.5-1.0 %. All addition rates are based on total cementitious amount. Our technical experts can provide assistance on dosage based on intended use. LifeTech fines provides a uniform set throughout the mix not achievable with grades that provide a wider particle size distribution.

Other

The unique properties of LifeTech ultrafines have made this product the grade of lithium carbonate of choice in a number of other applications such as in manufacture of ceramics, welding rods, refractory materials, and specialty glasses. Dosage rates vary widely depending on the application. Because this product is more reactive due to its reduced particle size in these applications, in general lower quantities of LifeTech ultrafines are needed than other grades of lithium carbonate. Testing should be conducted in the application to optimize dosage when substituting LifeTech ultrafines for another grade of lithium carbonate.

Livent

Product Specifications:

Li_2CO_3, wt. %	99.0	min
Loss @ 500° C	0.6	max
SO_4, wt. %	0.1	max
Acid Insolubles, wt. %	0.01	max
Na, wppm	1500	max
Ca, wppm	350	max
Fe, wppm	20	max
Cl, wppm	120	max
Malvern Median d_{50}	3.6 min	6.8 max
Malvern d_{90}	25	max
H_2O*, wt. %	0.6	max

* Loss at 500ºC

Other Data:

Loose Bulk Density	0.5 g/cm^3 (31 lb/ft^3)
Tapped Bulk Density	0.8 g/cm^3 (50 lb/ft^3)

Physical Properties:

Molecular Weight	73.89
Melting Point	720ºC
Specific Heat @ 25ºC	0.315 cal/g/ºC
Standard Heat of Formation	-290.64 kcal/mole
Standard Heat of Fusion	10.7 kcal/mole

Water Solubility: Lithium carbonate solubility varies between 8-12 gm/L depending on temperature of the water. Water solubility is 1.3 wt. % @ 20ºC

Toxicity/Safety Data Handling / Storage / Disposal: *Information on toxicity, safety, handling, storage and disposal is contained in the Safety Data Sheet (SDS) for this product.*

Shipping Containers: LifeTech ultrafines is packaged and shipped in polyethylene lined fiber drums containing 220 lbs (100 Kg) or in 55 lb (25 Kg) bags packaged 40 to a pallet for a total of 2,200 lbs (1,000 Kg) per pallet. Packaging in supersacks is available upon special request.

Shipping Limitations: Shipments of LifeTech ultrafines require no hazardous shipping labels.

Post, Parcel, Air, Water, Rail, Truck	Acceptable within each carrier's weight limits and packaging requirements.

LifeTech Ultrafines is not manufactured nor intended for drug use.