

Safe-Carb

Safe-Carb* ground marble is a high-purity, acid soluble, calcium carbonate used as a bridging and weighting agent in drilling, drill-in and workover/completion fluids.

Safe-Carb usually is preferred over limestone since it generally is harder and purer than limestone. Its higher purity provides nearly complete acid solubility. Safe-Carb is available in eight standard grind sizes: Safe-Carb 2, 10, 20, 40, 250, 500, 600 and 750, and special grind sizes of 1400 and 2500.

Typical Physical Properties

Physical appearanceWhite powder
 Specific gravity2.70-2.80 SG
 Acid Solubility.....>98%

Product Name*	Median Particle Size d_{50} (μm)**	Recommended Test Procedure
SAFE-CARB 2	1 - 4	Laser light scattering
SAFE-CARB 10	6 - 15	Laser light scattering
SAFE-CARB 20	16 - 29	Laser light scattering
SAFE-CARB 40	31 - 48	Laser light scattering
SAFE-CARB 250	225 - 300	Dry sieve analysis
SAFE-CARB 500	430 - 520	Dry sieve analysis
SAFE-CARB 600	550 - 650	Dry sieve analysis
SAFE-CARB 750	655 - 800	Dry sieve analysis
SAFE-CARB 1400	1200 - 1550	Dry sieve analysis
SAFE-CARB 2500	2100 - 2700	Dry sieve analysis

Applications

Safe-Carb additives are acid-soluble calcium carbonate bridging and weighting agents used to control fluid loss, lost circulation and density. They can be used in almost any aqueous or non-aqueous drilling fluid, as well as the Flopro* NT, Fazepro*, VersaPro* and Dipro* reservoir drilling fluids, and workover and completion fluids. They also are used in Seal-N-Peel* applications to seal the inside of sand-control completion assemblies.

Safe-Carb 2 to Safe-Carb 40 are the grind sizes normally used for fluid loss control and to minimize seepage losses (< 1.6 m³/hr or 10 bbl/hr of whole fluid).

Typically, the products are used as blends to treat the entire drilling fluid at a total concentration of 29 to 143 kg/m³ (10 to 50 lb/bbl). The M-I SWACO Optibridge* proprietary engineering software is recommended for selecting the optimum blend of Safe-Carb products to minimize lost circulation in permeable or naturally fractured formations.

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The amount of Safe-Carb required to increase the mud density can be calculated as follows:

$$\text{SAFE-CARB, lb/bbl} = \frac{980 \times (w_2 - w_1)}{23.3 - w_2}$$

where:

w_1 = Initial mud weight in lb/gal

w_2 = Desired mud weight in lb/gal

$$\text{SAFE-CARB, kg/m}^3 = \frac{2800 \times (w_2 - w_1)}{2.8 - w_2}$$

where:

w_1 = Initial mud weight as specific gravity

w_2 = Desired mud weight as specific gravity

Safe-Carb 250 to Safe-Carb 2500 grind sizes generally are used in lost circulation situations requiring larger particle sizes. They often are used in lost circulation and Seal-N Peel fluid loss pills at concentrations of 86 to 285 kg/m³ (30 to 100 lb/bbl) to bridge highly permeable zones, fractured zones and completions. In addition they may be used to treat the entire circulating system to prevent losses; in that case, treatment levels in the whole mud can range from 5 to 50 lb/bbl. Outside the reservoir, other lost circulation materials may be used with the Safe-Carb products to provide tighter seals.

Safe-Carb products also can be added periodically for seepage control to limit losses (lost circulation and leak-off) to high-permeability formations. They especially are effective when drilling with high differential pressures caused by an overbalanced condition or when drilling depleted zones. Treatments range from 2 to 10 sacks per hour when used for prevention of lost circulation. For sealing depleted zones or induced fractures, Safe-Carb is most effective when used in combination with G-Seal*, G-Seal Plus or G-Seal Plus Coarse additives.

Additions of Safe-Carb products to an oil- or synthetic-based drilling fluid system may also require additional oil-wetting agent.

Toxicity and Handling

Information on biological data can be provided upon request.

Handle in accordance with the Material Safety Data Sheet (MSDS) and general requirements for working with industrial reagents

Packaging and Storage

Safe-Carb 2, 10, 20, 40, 250, 500, 600, 750, 1400 and 2500 additives are packaged in 22.7 kg (50 lb), 25 kg (55 lb) and 50 kg (110 lb) multi-wall, paper sacks.

Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink wrapping and/or stacking.

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