

## CalEssence® 450 Enhanced Purity

### USP / FCC Precipitated Calcium Carbonate

#### CalEssence® PCC Products:

CalEssence® 450 Precipitated Calcium Carbonate (PCC) is one of a family of enhanced purity, ultra-low lead calcium carbonates developed for those needing to meet the lead requirements of California Proposition 65. CalEssence® PCC products contain less than 125 parts per billion lead.

CalEssence® PCCs meet and exceed the requirements for Calcium Carbonate of the United States Pharmacopeia 24 and of the Food Chemicals Codex, Fourth Edition. All are certified as Kosher. Calcium carbonate is Affirmed GRAS (Generally Recognized As Safe) by the US FDA (21 CFR 184.1191) with no limitations other than good manufacturing practices. This makes calcium carbonate suitable for both direct and indirect food applications. CalEssence® PCC products are manufactured in the Specialty Minerals plant in Adams, MA under stringent quality assurance procedures and good manufacturing practices.

#### CalEssence® 450 PCC:

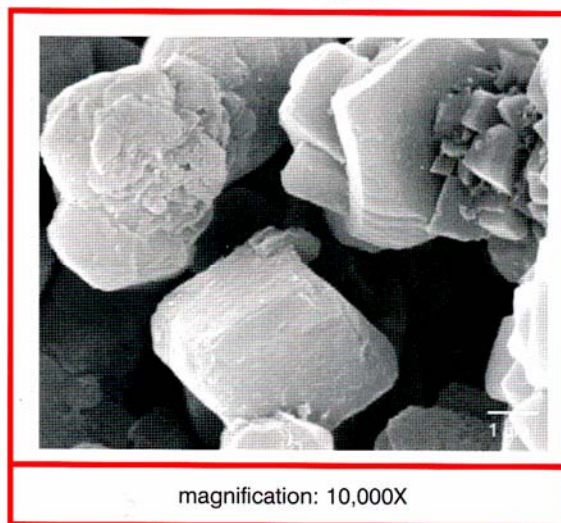
CalEssence® 450 PCC is an ultra-low lead calcite which is a 4.5 micron clustered cubic particle. Except for the much larger, super dense CalEssence® 1500 PCC, it has the highest density and lowest surface area of the CalEssence® PCC family.

CalEssence® 450 PCC is the ultra-low lead equivalent of ViCALity™ Extra Heavy PCC.

#### Characteristics:

- 4.5 micron particle size
- High density
- Low surface area
- Less than 125 ppb lead
  - Good for all Proposition 65 uses
- High elemental calcium level
  - ~40% calcium
- Low loadings to achieve desired calcium fortification level
- High bioavailability - equal to milk calcium
- Economical in use
- No calories, carbohydrates or fats
- Non-dairy, lactose-free

#### Scanning Electron Micrograph:



#### Applications:

CalEssence® 450 PCC is the best choice where a still-small particle sized calcium carbonate is wanted, but where high calcium dosage in a small volume is desired. In solid foods, taste is generally improved as the particle size increases and there is less surface area to absorb moisture in the mouth, reducing the possibility that the presence of the calcium is detected. The 4.5 micron particle size is generally below the taste's detection limit in solids, allowing the formulation of good tasting and textured foods. This grade has a low binder demand, aiding in the development of highly calcium loaded granulations and formulations.

Some of the uses for CalEssence® 450 PCC are:

- Cereal fortification
  - In batter, flavor bit, coating or dry blend
- Snack bars, energy bars, diet bars
- Baked goods
  - Cookies, crackers, pancakes, waffles, cakes
- Snack foods
- Flour enrichment
- Antacid tablets of small size
  - Chewable or swallowable
- High dosage calcium supplements
  - Chewable or swallowable
- Dry food mixes
- Vitamin and mineral premixes

### Typical Physical Properties

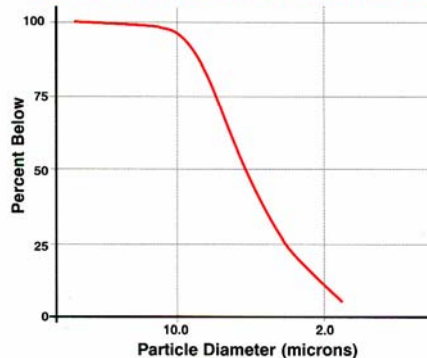
Crystal habit	.....	Calcite
Particle Shape	.....	Cubic
Particle Size, median, microns	.....	4.5
mode, microns	.....	5.5
Surface Area, meters <sup>2</sup> /gram	.....	2.2
Oil Absorption, grams oil/100 grams	.....	33
Tapped Density, grams/cc	.....	1.05
pounds/ft <sup>3</sup>	.....	65.6
Bulk Density, grams/cc	.....	0.67
pounds/ft <sup>3</sup>	.....	41.8
Specific Gravity	.....	2.71
pH	.....	9.7
Moisture, %	.....	0.2
Dry Brightness Hunter Y, Rd value	.....	96
Lead, parts per billion	.....	< 125
Solubility, in water, pH 7	.....	Insoluble
in acid	.....	Soluble

**Note:**

These are typical values, and should not be used to set specifications.

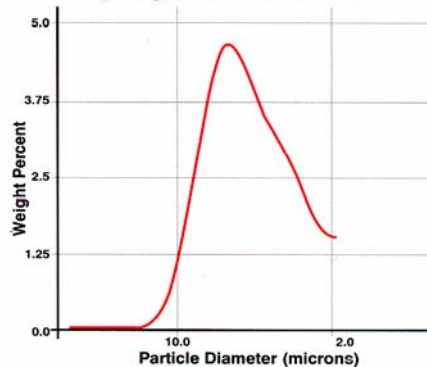
### Cumulative Particle Size Distribution

Total % by weight below each micron size



### Particle Size Distribution

% by weight at each micron size



### Dispersion and Slurry Viscosity:

High shear should be applied to a high solids suspension in order to achieve the smallest particle size in a dispersion.

After high shear dispersion for 10 minutes, the Brookfield RVT viscosity of a slurry in water, measured at 20 rpm, is:

30% solids	.....	.35 cps
40% solids	.....	.90 cps
50% solids	.....	.320 cps

If problems are encountered in preparing high solids slurries, an appropriate pigment dispersant should be used.

### Packaging:

CalEssence<sup>®</sup> 450 PCC is packaged in 50 pound, three-ply kraft bags. The standard shipping unit is a 48" x 40" 4-way GMA pallet of 50 bags, a total of 2,500 pounds. Pallets include slipsheets and shrinkwrap. Semi-bulk packaging, typically in 2,000 pound sacks, is also available. Contact Inside Sales or your SMI Representative for details.

### FDA Codes:

The Specialty Minerals plant in Adams, MA is registered with the US FDA as a Drug Establishment. The registration number for the plant is 1214544. The National Drug Code (NDC) for CalEssence<sup>®</sup> 450 PCC is 053004-0590-3 for product supplied in 50 pound bags.

**Product Code:** 100-0590-3

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**Visit Our Website:**  
[www.mineralstech.com](http://www.mineralstech.com)

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Customer Service – toll free: 877-684-7627

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