Technical Properties Data

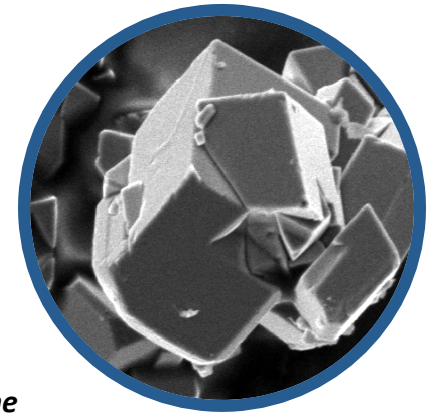
Oolitic Aragonite

and comparative to Calcite/Limestone

Oolitic aragonite - the world's only biogenic, recent origin, renewable and sustainable performance calcium carbonate mineral

Oolitic Aragonite - Sandy Cay's Calcean and Bio-Cal

Exceptionally Pure calcium carbonate



Mined Calcite/Limestone

Aragonite

Test	Calcite/Limestone	Oolitic Aragonite Calcean®
Specific Gravity	2.6 - 2.8	2.8 - 3.0
Mohs Hardness	3	3.5 - 4.0
Crystal Structure	Trigonal	Orthorhombic
Surface Area	.55 m2/g	1.82 m2/g
Zeta ζ Potential	-1.01mV to 11.55mV	-33.85mV to -6.65mV
Crystallinity	Low	High
Microporosity	Low	Very High

Although calcite/limestone and oolitic aragonite have the same chemical formula ($CaCO_3$), each belongs to a different crystal system (morphology) and each has different physical and chemical properties. Differences between these minerals include differences in density (aragonite 2.93; calcite 2.71), solubility, buffering capacity, Zeta potential, crystal morphology, trace element composition, surface area (oolites), and brightness.

Specific Gravity: is the ratio of the density of a substance to the density (mass of the same unit volume) of a the reference substance, water (which equals a specific gravity of 1). Calcium Carbonate is 2.5 to 3 times more dense than water (heavier than water). Oolitic Aragonite is slightly more dense than Calcite/Limestone.

Mohs Hardness: is a scale of mineral hardness which is based on the ability of one natural sample of matter to scratch another matter. The complete range of Mohs Hardness (or Absolute Hardness) is from Talc at 1 (1) to Diamond at 10 (1,600). Oolitic Aragonite has a Mohs Hardness of 3.5-4, almost equivalent to Fluorite, Iron or Nickel and an Absolute Hardness of 21, while Calcite/Limestone has a Mohs of 3 and Absolute Hardness of 9.

Crystal Structure: There are seven crystal systems which are used as a method of classifying crystals according to their atomic lattice or structure. The atomic lattice is a three dimensional network of atoms that are arranged in a symmetrical pattern. The shape of the lattice determines not only which crystal system the mineral belongs to, but all of its physical properties and appearance.

Calcite/Limestone belongs to the Trigonal System (Rhombohedral System) where three out of the four axes are in one plane, of the same length, and intersect each other at angles of 60 degrees. The fourth axis is of a different length and intersects the others at right angles. In the cross-section of a Trigonal crystal there will be three sides.

Oolitic Aragonite belongs to the Orthorhombic System (or Rhombic System) and is bipyramidal (second image) where there are three axes, all of different lengths, and are at right angles to each other. In the cross-section of a Rhombic crystal there will be four sides.

Surface Area: is the total area of the sum of the areas of an objects faces. Oolitic Aragonite due to its crystal structure has a surface area that is over 3.3 times that of Calcite/Limestone.

Zeta (ζ) Potential: is a value that can be related to the stability of colloidal dispersions. The zeta potential indicates the degree of repulsion between adjacent, similarly charged particles in a dispersion. For molecules and particles that are small enough, a high zeta potential will confer stability, i.e., the solution or dispersion will resist aggregation. When the potential is low, attraction exceeds repulsion and the dispersion will break and flocculate. A value of 25 mV (positive or negative) can be taken as the arbitrary value that separates low-charged surfaces from highly charged surfaces. Oolitic Aragonite is from moderately to highly charged and thus in solution disperses with moderate stability and resists coagulation or flocculation, allowing it to be stably combined with other chemicals while resisting breaking and instability.

Crystallinity: refers to the degree of structural order in a solid. In a crystal, the atoms or molecules are arranged in a regular, periodic manner. The degree of crystallinity has a big influence on hardness, density, transparency and diffusion. Oolitic Aragonite has a high degree of structural order observed in many of the features noted herein.

Microporosity: is the measurable amount of pores within a material with a diameters less than 2 nm. Oolitc Aragonite naturally has a high amount of microporosity. High microporosity in a material gives great potential for use of that material in applications such as catalysis, carrying host for chemicals, absorption, separations and much more.