Omya
Natural Calcium Carbonate (NCC)
The sustainable mineral for food, pharma and personal care applications
Natural Calcium Carbonate (NCC)

When life appeared on earth, some living organisms such as corals and bivalves developed the ability to synthesize calcium carbonate, which was primarily utilized in the organism to create the shell or skeleton.

When the sea creatures died, their skeletons and shells settled down onto the ocean floors. Following a geological phenomenon called diagenesis and lithification, carbonated sedimentary rocks were produced from this calcium carbonate rich deposit.

Chalk and limestone are such sedimentary rocks. Marble has to undergo an additional process called metamorphosis, one that causes recrystallization through high pressure and high temperature.

Benefits of Natural Calcium Carbonate

- Carbon footprint of NCC is a third than that of a PCC (precipitated calcium carbonate)
- Products meeting international standards such as E170, FCC, USP, EP, JP
- Halal and Kosher certified
- COSMOS AND ECOCERT verified
Omya is familiar with the needs of various applications and tailors the NCCs to meet the requirements. This is why Omya's portfolio comprises chalk, limestone and also marble-based products for the food and personal care industries.

Omya offers pure-white natural calcium carbonate (NCC) for your food, pharmaceutical, nutraceutical and personal care applications. In addition to NCC, calcium carbonate can be obtained via a precipitation process where CO$_2$ is added to a calcium hydroxide slurry.

\[
\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}
\]

The obtained product is known as precipitated calcium carbonate (PCC). The precipitation process allows for the production of high-purity calcium carbonates, which are also available in food, personal care and pharmaceutical grades. However, the precipitation process can also expose potential impurities in the PCC, which can cause adverse reactions in the final product and therefore impact the stability of a foodstuff, for instance.

Omya is a global producer of minerals (including NCC and PCC) for all kinds of industries. For applications in food and personal care, Omya focusses on tailoring particles based solely on NCC. This allows us to also make a difference with regards to sustainability. The carbon footprint of a PCC is three times greater than that of a NCC.

Thanks to our global network of plants, we are able to supply products that comply with international and local legislations. Our quality management systems are certified to ISO 9001, HACCP and GMP standards.

These systems enable us to manufacture according to common product specifications across the world and to maintain the high purity of the raw material. Such product specifications include food standards such as the FCC (Food Chemicals Codex) and E170 purity requirements within the European Union. Pharmaceutical requirements from the European, Japanese and U.S. pharmacopoeia are met.

Under the brand name Omyacare®, Omya markets high-purity NCCs that comply with the most stringent quality requirements. They are attractive ingredients for all kinds of personal care applications. Selected products carry the COSMOS and ECOCERT label.

Omya Calcipur®, Calcipur® and Omya-Cal® are Omya's highest-purity food-grade NCCs. Omyapure – Omya's pharmaceutical grade – even comes with a CEP, and is not only an established excipient but also an API (active pharmaceutical ingredient) in various dosage forms.
Benefits of Natural Calcium Carbonate in various applications

Natural Calcium Carbonate for better flowability
Fine NCCs can act as anti-caking particles, thus keeping hygroscopic products free flowing. However, there are powdered formulations that require coarser particles in order to improve product flowability and avoid separation. Omya offers a range of different particle sizes tailored to industrial requirements.

Natural Calcium Carbonate for improved shelf life
Although PCCs are available in high-purity food and pharmaceutical grades, the smallest levels of trace elements can trigger side effects. Traces of calcium hydroxide residues can enhance fat oxidation, while even the smallest traces of iron ions can enhance peroxidation and create pentane.

Any kind of fat-based ingredient can be affected, such as flavors. There are no free iron ions or calcium hydroxide residues in NCC that could affect the fat stability, thus improving the shelf life of the final product.
Natural Calcium Carbonate in oral care

Various ingredients are established today as particles for tooth cleansing, including calcium carbonate. Omya has a profound understanding of how abrasivity and (expressed as RDA: Radioactive Dentin Abrasion) cleansing performance are related to the hardness and morphology of the cleaning particles. By choosing the right NCC, the texture, mouthfeel and stability can be adapted. Purity is once again of high importance here, as interactions with trace elements have to be reduced to a minimum. Whereas PCCs generally have low abrasion and provide average cleaning, a NCC can be more or less abrasive and thus provide more intensive or gentler tooth cleaning as required.

Please refer to our technical brochure on oral care for more detailed information. Relative RDA measurements performed by Omya in-house technology.
Natural Calcium Carbonate as sustainable scrubbing particles

In its coarse granular form, NCC is an ideal scrubbing particle and replacement for PE beads. It is natural and the production process is limited to grinding and classification. Moreover, NCC-based scrubbing particles are biodegradable and environmentally friendly. This allows the development of truly sustainable scrubs. Specific acid-tolerant Omyascrub products have been tailored to give formulators even more flexibility.

Natural Calcium Carbonate in tablets

NCC is an established source of calcium in nutraceuticals and pharmaceuticals. Due to the high specific density of 2.7 g/ml in NCC, high calcium concentrations can be achieved with small tablet sizes. The bulk density also has a significant impact on the tablet size. PCCs tend to be fluffier, thus having a lower bulk density.

Omya understands how the particle size distribution and bulk density impact the size of the final tablet and has specifically developed pharmaceutical grades that meet industrial requirements. Small tablets are much appreciated by patients as they are easier to swallow.

If you would like to learn more about NCC in various food, nutra and personal care applications, please refer to our technical brochures. Our team would be happy to assist you…
Omya Group

- Headquarters in Oftringen, Switzerland
- 8,000 employees
- 130 years of business
- 4th Generation privately held Swiss based Corporation
- ISO 9001 / ISO 14001 certified in most of the plants

LIFE SCIENCES
- Personal care
- Oral care
- Food
- Pharmaceuticals

R&D
- Interdisciplinary
- Targeted
- Cost-oriented
- Research clusters

SERVICE
- Technical customer service
- Expert skills
- Analytics
- Pilot facilities

PRODUCTION
- Secure supply of raw materials
- State-of-the-art production facilities
- ISO-certified quality control

LOGISTICS
- Optimized supply chain
- Flexibility
- Distribution network
- Warehouses
Natural Products for Sustainability

Omya has taken every possible care to ensure that the information herein is correct in all aspects. However, Omya cannot be held responsible for any errors or omissions which may be found herein, nor will it accept responsibility for any use which may be of the information, the same having been given in good faith, but without legal responsibility. This information does not give rise to any warranties of any kind, expressed or implied, including fitness for purpose and non-infringement of intellectual property. The technical information presented comprises typical data and should not be taken as representing a specification. Omya reserves the right to change any of the data without notice.