Understanding the use of calcium carbonate in glass manufacturing

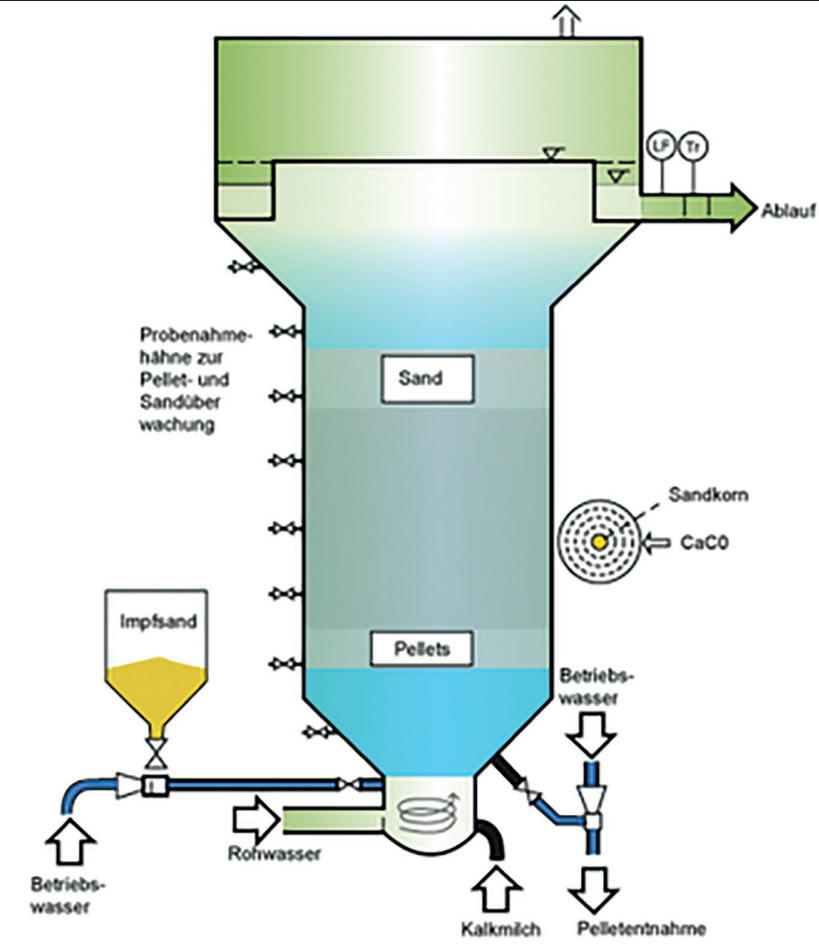
Harald Scheel* explains why natural mineral calcium carbonate is an ideal raw material to use in the glassmaking process.

Omya is a global producer of industrial minerals derived from calcium carbonate and dolomite, and a worldwide distributor of chemical products.

As a natural mineral, calcium carbonate has a multitude of characteristics that make it an ideal raw material for a wide variety of uses in various industrial as well as environmental applications.

In special cases Onya is processing and marketing the hardness of drinking water as pure calcium carbonate.

The by-product from waterworks is so called Stellacarb, a pure material for industrial applications as for the glass industry.



▲ Fig 1.

Highest content of calcium carbonate
Mono structured grain structure
Zero fines
Least chemical deviations
Free of anthropogenic substances PFC/PFT
Constant analytical monitoring
Registration to REACH by the producer Constantly low iron of <0.002 % results in whiter glass or enables other raw materials with more iron
Constantly low iron content reduces use of decolourisers
Consistently low iron content enables greater use of foreign cullet, thus saving raw costs
Higher cullet input results in melting energy savings
Higher cullet input results in higher furnace capacity, thus higher quantity
Low iron content brings more radiant heat due to higher batch transparency
Carbon Footprint = 0! (Credit factor flue gas emissions)
No dust components, thus 100 % usable raw material
Controlled production process, close monitoring intervals
Saving resources for green credits
No supply bottlenecks due to four sources of supply
Long-term supply contract possible
Free monthly test reports

Understanding the pellet softening process

Fast decarbonisation called crystallisation reactors happens when the water mixed with calcium hydroxide flows upstream through a fluidised bed of seed crystals for precipitation as pellets.

In Omya's case, the seed crystals are a defined sieving of e.g. 0.1-0.3 mm from broken pellets from previous reactor times.

The resulting calcium carbonate is deposited in crystalline form of aragonite on the seed crystals; as a result, the grain size of the pellets increases continuously.

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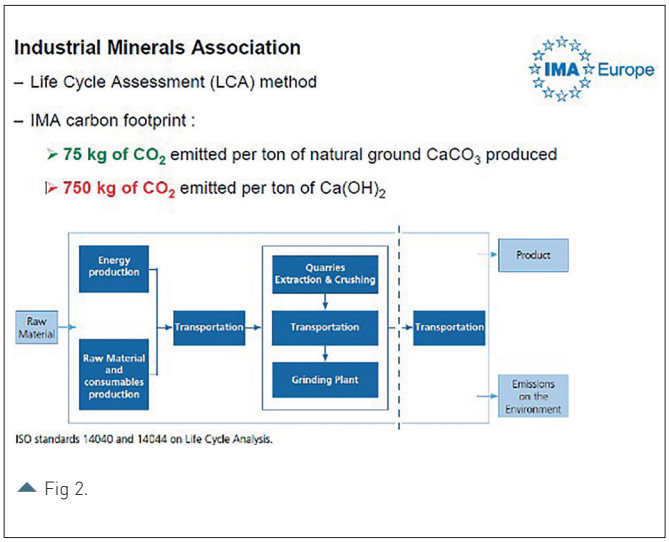
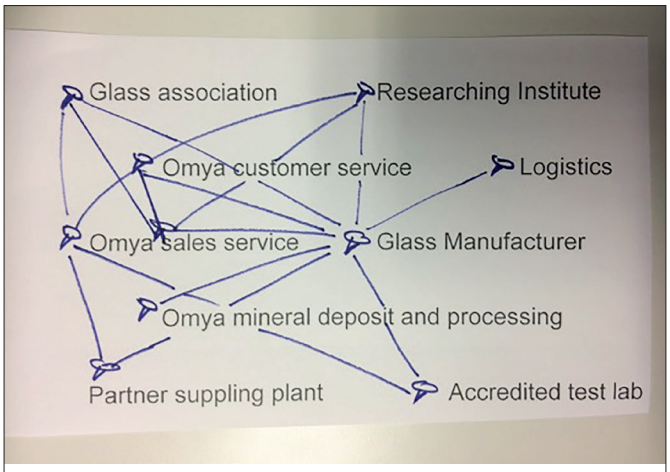


▲ Fig 2.



▲ Fig 3.

Grain sizes over 2mm reduce the reactivity due to the decreasing surface area in relation to the reactor mass. When the water emerges, the decarbonisation is practically complete. (***Fig. 1***)

Table 1 shows a comparison is shown of natural limestone to hydrated lime. Despite the already very low carbon footprint of natural limestone which is processed by only 62 kg per ton of $CaCO_3$ at our plants, there is another one with much less carbon footprint which is called Stellacarb. Hereby the creditable carbon footprint is equal to zero! (***Fig. 2***)

It shows more than a dozen pros listed as able to use Stellacarb as a calcium carbonate raw material for your melting process.

Omya understands its role as a networker for the glass industry, not only in Europe but everywhere where glass is made (***Fig. 3***). ■

Product Manager Water - Environmental Solutions Europe, Omya, Köln, Germany
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