



T E C H N I C A L A R T I C L E



An Introduction to Sofnolime®

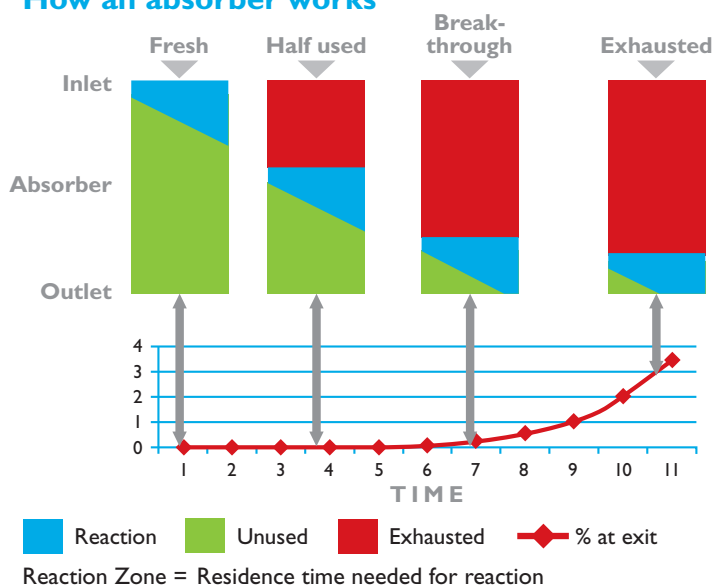
Technical article

An Introduction to Sofnolime®

Sofnolime® is Molecular Products' brand name for soda lime. Soda lime is a Carbon Dioxide absorbent used for removal of CO₂ mainly from breathable gases, in medical, military and safety applications. The Sofnolime® is contained in an absorber, appropriately sized for the application. The gas is passed through the absorber and the CO₂ is removed by a base catalysed chemical reaction, converting the CO₂ to Calcium Carbonate which is retained within the absorber. The absorber will have a finite life based on the quantity of Sofnolime contained and the level of CO₂ within the treated gas. The absorber will remove all of the CO₂ (if appropriately sized for the application) and once the Sofnolime is consumed, CO₂ breakthrough will occur and the CO₂ level in the exiting gas stream begins to increase.

Particle size and shape are particularly important in terms of the performance of Sofnolime® in its intended application. All Sofnolime® grades are irregularly sized extruded granules, with low dust and excellent attrition resistance.

How an absorber works



Particle shape

The majority of Sofnolime grades are now produced with a D-shaped profile giving a higher surface to volume ratio compared with other classical soda lime products. In addition, the D-shaped profile ensures maximum CO₂ penetration into the particles, by minimizing the distance to the centre of the particle, thereby increasing the CO₂ capacity of the product. Intrinsic capacity measurements have demonstrated that Sofnolime® has significantly higher capacity for carbon dioxide absorption compared with other manufacturer products.

For certain particle sized products and applications, the profile of the particles is circular in order to achieve specific performance for that application. The water content can also be varied depending on the application.

Particle size

Another key factor in the performance characteristics of Sofnolime® is the particle size distribution. Particle size has an effect on the speed of reaction, which in turn affects the volume of the reaction zone and the capacity of the absorber containing the Sofnolime®. In general terms, the smaller the particle size, the faster the reaction and the smaller the reaction zone volume. However, the smaller the particle size, the greater the pressure drop across the absorber which in some applications (particularly breathing applications such as diving re-breathers and medical anaesthesia) is a critical factor in absorber design. Therefore a well designed particle shape/size will look to optimise these effects - an area where Molecular Products Ltd has proved extremely proficient.

In summary, compared with other classical soda lime products, Sofnolime® has a high absorption capacity for carbon dioxide, low dust levels, and excellent attrition resistance.

Disposal of Sofnolime® waste – Waste Code: 060201 Landfill class: Hazardous waste

Hazards

The material is classified as special waste due to the small amount of sodium hydroxide present (minor component) and the irritant nature of the calcium hydroxide (hydrated lime – major component). A proportion of the sodium hydroxide will be water leachable.

Description

White to off white granular material with no significant odour, containing dust of the same composition.

Component	Hazard	
Calcium hydroxide	(irritant)	
Calcium carbonate	0 – 20 %	(non hazardous)
Calcium oxide	zero (< 0.1%)	
Sodium carbonate	0 – 3 %	(non hazardous)
Sodium hydroxide	0 – 4%	(corrosive)
Other inorganic components	< 1%	(all non hazardous)
Organic components	< 1%	(all non hazardous)

Note: The risk classification of Sofnolime® is Irritant Xi, Risk phrases: R36/R38, Safety phrases S2, S26, S37/39 and S45.

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