



TECHNICAL INFORMATION

# DRY LIME HYDRATION PLANT

Our dry lime hydration plant constitutes a system in which quicklime is slaked in a continuous process with just enough water for powdery hydrated lime to be produced.

## AREAS OF USE

### 1.1

The SCHAUB hydrator can be used wherever hydrated lime is required. The quantity of hydrated lime that is needed has a critical bearing on profitability. The system is also suitable for the particular requirements of waste-to-energy plants.

The following factors in particular were considered in the design of this system:

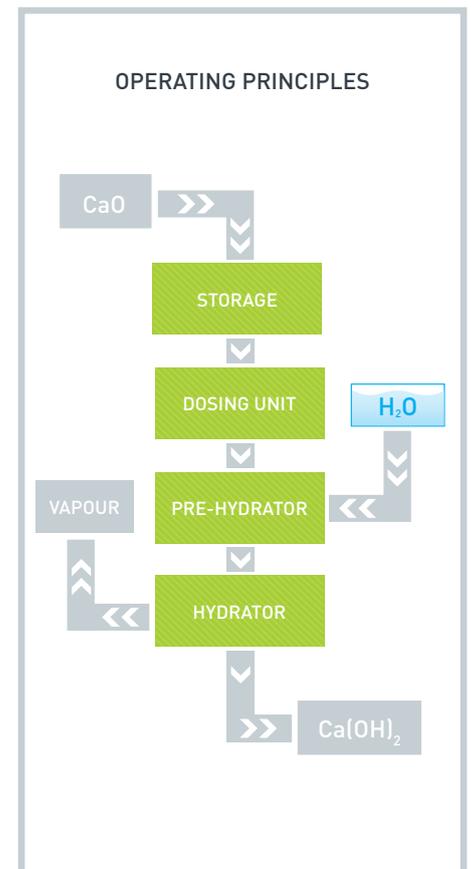
- A throughput tailored to the needs of the operator
- Continuous dosing control according to the operator's specifications
- Regulating range of the raw material of 1 : 5

## PROCEDURE

### 1.2

The dosing unit delivers the quicklime [CaO] into the pre-hydrator, where water (H<sub>2</sub>O) is added by means of a nozzle and mixed with the quicklime. In the downstream hydrator

the quicklime reacts completely with the added water to produce dry Ca(OH)<sub>2</sub>, the hydrated lime.



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**DRY LIME  
HYDRATION  
PLANT****PLANT DESIGN****1.3**

The design of each plant is tailored to the particular needs of the operator.

**The following factors are among those considered:**

- › Hydrated lime consumption
- › Variable vapour scrubbing
- › Variable lime dosing
- › Adaptation of siting to local conditions

**MAIN ELEMENTS OF THE DRY LIME HYDRATION PLANT****2.0**

The main assemblies are as follows:

- › Storage
- › Dosing unit
- › Pre-hydrator
- › Hydrator
- › Vapour scrubbing

**STORAGE****2.1**

The dimensions of the quicklime silo depend on the requirements for the supply and standby time and the replenishment

capacity. This also applies for the silo accessories, which must be selected on a project-specific basis.

**DOSING UNIT****2.2**

The dosing unit comprises a cellular wheel sluice for dosing and a weighing unit. Weighing can be achieved with the following methods, for instance.

**a) Weighing screw**

The weighing screw is a continuous measuring process, which offers the advantage that the system can be continuously adjusted.

**b) Weighed feed hopper**

The hopper is positioned on weighing cells. Weighing takes place in a differential proportioning weighing system. The advantage over a weighing screw is the greater dosing accuracy.

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**DRY LIME  
HYDRATION  
PLANT****PRE-HYDRATOR****2.3**

The pre-hydrator is the heart of the lime hydration plant. This is where quicklime (CaO) is mixed intensively with water to obtain dry hydrated lime, Ca(OH)<sub>2</sub>, in powder form. Nozzles for adding water are positioned in the pre-hydrator for that purpose. To ensure that the process material is mixed thoroughly with the hydration

water and to prevent caking caused by the product, the pre-hydrator is designed as a double-shaft paddle screw. The geometry makes this particularly suitable for material that is likely to cake. The product is exposed to high shearing forces from the mixing and kneading.

**INTENSIVE THOROUGH MIXING AND  
HIGH SHEARING FORCES  
ENSURE A HOMOGENEOUS END  
PRODUCT.**

**HYDRATOR****2.4**

The hydrator is located after the pre-hydrator in the process chain. This is where the quicklime (CaO) that has been mixed with water reacts completely in an exothermal reaction to produce dry, powdered hydrated lime, Ca(OH)<sub>2</sub>. To monitor the process, temperature sensors are installed which adjust the supply of water in the pre-hydrator. This allows the reaction temperature to be kept constant. One of the temperature sensors acts as a protective system so that the plant can be switched off or brought into a safe state if the temperature rises excessively.

The mixing tools do not have any conveying direction, which means that the main hydrator operates entirely according to the displacement principle. The fill level, and thus also the residence time in the main slaker, can be adjusted manually by plates of different heights at the discharge. The optimum setting is done at the time of commissioning to deliver the best possible product.

**THE SOPHISTICATED INTERPLAY  
OF THE MEASURING AND CONTROL  
COMPONENTS WITH THE MACHINE  
TECHNOLOGY ENSURES OPTIMUM  
PRODUCT QUALITY.**

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**DRY LIME  
HYDRATION  
PLANT**
**VAPOUR CLEANER**
**2.5**

The dry lime hydration plant offers the following options for treating the vapours.

**a) Vapour collecting chamber**

If there is a facility in the plant that allows the vapours that arise in the process to be drawn off over a vapour pipe into the flue gas channel, a vapour collecting chamber can be installed on the pre-hydrator. To prevent caking in the vapour pipe, a water curtain is generated in the collecting chamber to pre-clean the vapours. The cleaning is done in counterflow with water finely injected from a nozzle. The needed water is provided through a bypass from the hydration water pipe.

**b) Filter system**

Another option is to use a filter system to clean the vapours. The filter system is installed on the hydrator. In this variant, the required negative pressure is produced by a ventilator at the filter.

Because of the product properties, the filter material is moisture-repellent and heatresistant. To ensure that the filter does not clog up, it is cleaned automatically on a timed cycle by compressed air in counterflow.

Provision is made for the filter system to be heated so that the vapours do not condense in the filter.

**EACH PLANT IS DESIGNED TO MEET  
THE CUSTOMER'S REQUIREMENTS.  
THIS ENSURES THAT OFFICIAL AND  
STATUTORY REGULATIONS ARE MET.**

**MATERIAL HANDLING SYSTEM**
**2.6**

We offer suitable material-handling systems for conveying the hydrated lime from the SCHAUB hydrator to the place of use.

**OUR RANGE OF SERVICES COMPRISES:**

- › Plant engineering
- › Consultancy and design
- › Engineering
- › Service and provision of spare parts
- › Restoration and modernisation

**CERTIFIED QUALITY –  
WE ARE CERTIFIED TO**



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**ENGINEERING.  
CONSTRUCTION.  
SERVICE.**

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