

HIGH-FINENESS LIME AND HYDRATED-LIME

STATE OF THE ART TECHNOLOGY FOR PROCESSING OF LIME AND HYDRATED LIME

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Lime producers have known for years that hydrating lime is the first step towards adding value to the basic product: markets have now developed for ultra-fine lime and hydrated lime, and Hosokawa Alpine has a range of cost-effective machines for the job.

Depuis des années, les producteurs de chaux savent que pour ajouter de la valeur au produit de base, procéder à l'hydratation de la chaux constitue la première étape. De nouveaux marchés pour le traitement de la chaux ultra-fine et de la chaux hydratée viennent de se développer et Hosokawa Alpine possède une gamme de machines rentables pour effectuer ce travail.

Kalkhersteller wissen seit Jahren, dass die Löschung von Kalk der erste Schritt zum Mehrwert des Grundproduktes ist. Mittlerweile sind die Märkte für einen sehr feinen Kalk und gelöschten Kalk bereitet, und Hosokawa Alpine bietet eine Reihe von kostengünstigen Maschinen dafür an.

Desde hace años, los productores de cal saben que la hidratación del producto es el primer paso hacia una mejor valoración de sus fabricados. Con objeto de satisfacer el nuevo interés de los mercados por las variedades de cal ultrafina e hidratada, Hosokawa Alpine dispone de una gama de máquinas rentables para esta especialidad.

Lime and hydrated lime are products which have found many new applications in the construction and steel industry over the last few decades. Both products, in very high fineness grades, are nowadays used for desulphurisation processes (e.g. in power stations), water treatment, agricultural applications, as well as rubber and plastic fillers as so called 'coated grades.' Nowadays we can find also medical applications, like tooth paste, as well as special products with so called 'bi-modular' particle size distribution, as is used in plasters.

The processing of all these new products - as well as the standard products - needs a high flexibility of production equipment. In the following article, we would like to introduce processing machines for lime.

Alpine Table Roller Mill

The Alpine Table Roller Mill (Figure 1) is designed as a low-energy mill with the possibility to achieve particle finesses from $d_{97} = 15\mu\text{m}$ to $120\mu\text{m}$. For this reason, the mill is well-adapted to fulfil all the demands for the present markets. The mill can be equipped, depending on the main target of fineness, either with an MS Micron Separator or with a ATP Turboplex (single or multiwheel) head. Typical processing data on a medium sized mill are shown in Table 1.

Product fineness	t/h	Specific energy consumption (whole system)
D97 = $90\mu\text{m}$	13.2 t/h	18 kWh/t
D97 = $45\mu\text{m}$	6.3 t/h	37 kWh/t
D97 = $20\mu\text{m}$	4.0 t/h	60 kWh/t

Table 1: Performance of the Alpine Table Roller Mill 1200 AWM with 160 kW main mill drive.

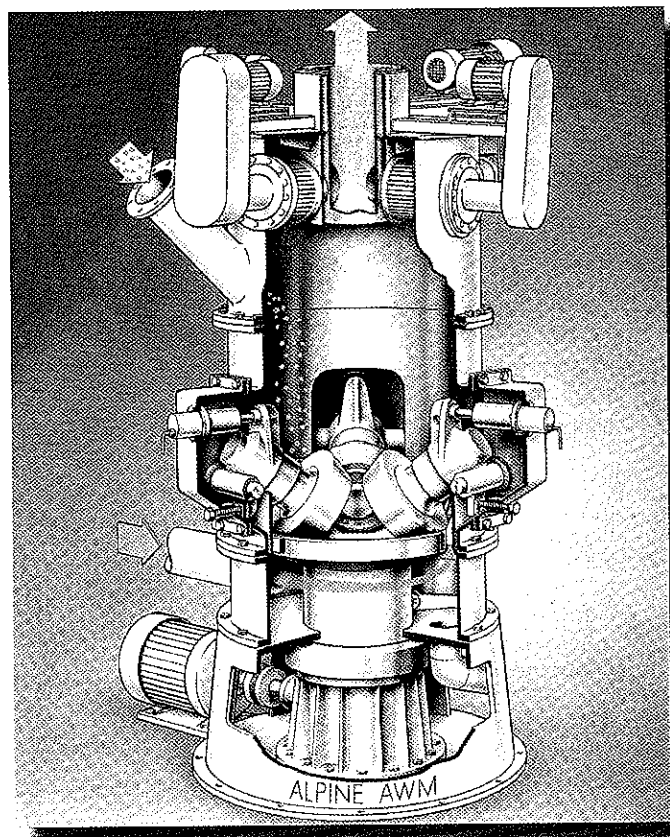


Figure 1, right: Alpine Table Roller Mill with Multiwheel ATP classifier head

Figure 2: Alpine Stratoplex high capacity, low energy classifier

Although the energy consumption on the AWM table roller mill is very interesting, products with higher reactivity are often requested. Such powders can be obtained from ball mill-classifying circuits. For such processing circuits, the high capacity, low energy classifier Stratoplex is ideal.

Since ball mills made in the so-called 'Western countries' are comparatively expensive, nowadays there is always an option, to use either a second hand ball mill or cheap ball mills, made in China in combination with the Stratoplex classifiers.

For example the model Stratoplex 1500 ASP is able to produce in combination with the right sized ball mill a capacity of 55t/h at $D_{97} = 90\mu\text{m}$, 25t/h at $D_{97} = 45\mu\text{m}$ and 10t/h at $D_{97} = 20\mu\text{m}$.

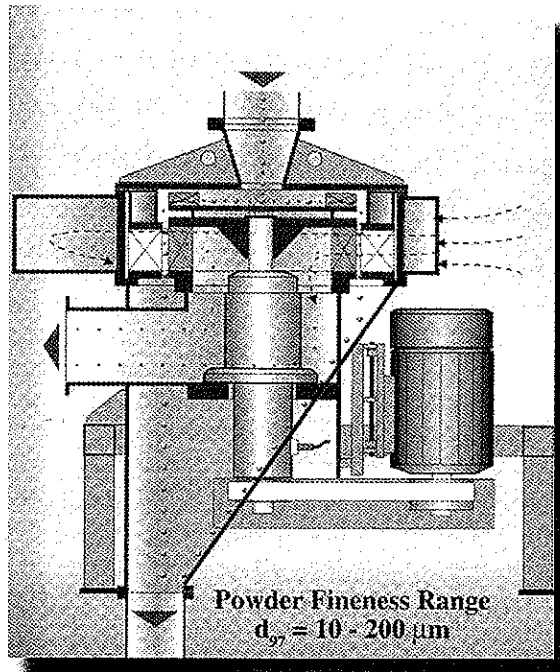
Machines and applications for hydrated lime

Besides the previously mentioned ball mill-classifying circuits, for highly reactive products the Alpine Contraplex pin mills, with two rotating plasma-coated wear-resistant pin discs are in operation. If steep particle size distributions are required, then the Alpine Circoplex Classifier mill can be used and for single classification of standard finenesses in the range of $d_{97} = 20\mu\text{m} - 120\mu\text{m}$, the well known Stratoplex classifier is optimal.

The new ultrafine products from $d_{97} = 6\mu\text{m} - 20\mu\text{m}$, can be obtained by the use of the Alpine Turboplex (single wheel or multi-wheel version).

The Alpine Circoplex Classifier mill is available up to mill drives of 315kW, which results in a capacity of 12t/h at $d_{97} = 90\mu\text{m}$. Depending on the abrasivity of the product, one can use Al_2O_3 wear-protected beaters and hard-cast grinding tracks.

For higher reactivity, the pin mill



is a low-investment solution with high efficiency and is available up to machine sizes of 1120 CW size with 2x 250kW drives.

There are a number of trends which are becoming increasingly apparent in the markets:

1. Much finer products are requested, in a range of $d_{97} = 6 - 20\mu\text{m}$ with high reactivity;

2. Huge capacities at high finenesses, which need bigger machines for the job:

Another service, which is now increasingly required by customers, is the so-called 'Teleservice,' by which the on-site plant PLC or PC control may be connected via modem directly to the electrical or service department of the supplier.

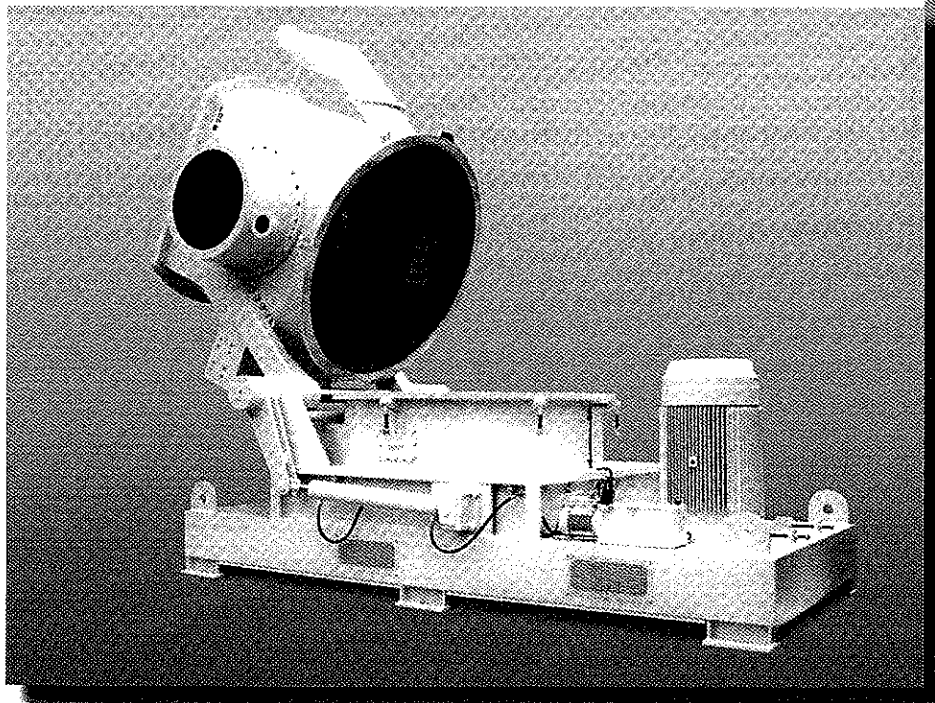
With the equipment connected to head-office via a modem and a telephone line, we can monitor systems around the world and assist the customer in solving any problems or upgrade customer software on demand.

Summary

Because of many new applications, especially in the highest fineness range, the highest flexibility in terms of achievable particle fineness - as well as particle size distributions - are needed. At the same time investment and running costs must be in an acceptable range.

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Figure 3: Alpine Circoplex Classifier Mill ZPS



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