

# AVA – The expert for fly ash and dust conditioning



# Handling of ashes and dust

For an environment free of dust

**Application** Ashes and dust from the filters of incineration, de-dusting and drying plants are lyed, moistened or solidified. The result is a disposable final product, a transportable property or re-usable value products e.g.:

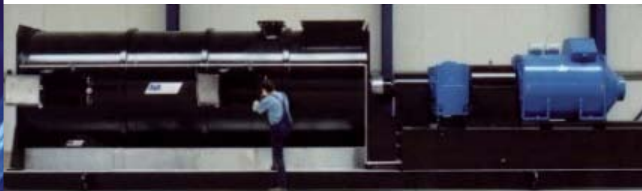
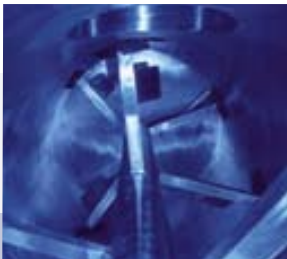
- Dust from power plants for the use in road construction and building material industry (cement admixture)
- Dust from steelworks for the use in sinter plants

The requirements in handling ashes and types of dust become more and more specifically. For the disposal to landfill defined environmental limit values must be adjusted as well as a defined firmness.

To guarantee these requirements AVA Mixers and Systems are operating in :

- |                                 |                                 |
|---------------------------------|---------------------------------|
| ■ Brown coal fired power plants | ■ Black coal fired power plants |
| ■ Waste Incineration plants     | ■ Dust extracting installations |
| ■ Steelworks                    | ■ Coking plants                 |
| ■ Biomass power plants          | ■ Orimulsion power plants       |
| ■ Paper Mills                   |                                 |

Furthermore ashes and types of dust are used as dry material for the conditioning of sludge or of any kind of filter cakes.



With AVA - Mixers, which are used continuous or in batch processes, a technology is available, which produces a 100 % dust free product within shortest time. This is usually reached by the addition of water and a humidification of the ashes and dust. With the addition of different bonding agents an additional solidification of the product for a following disposal can be obtained.

**Humidification** For the humidification of ashes and dust the following products are suitable:

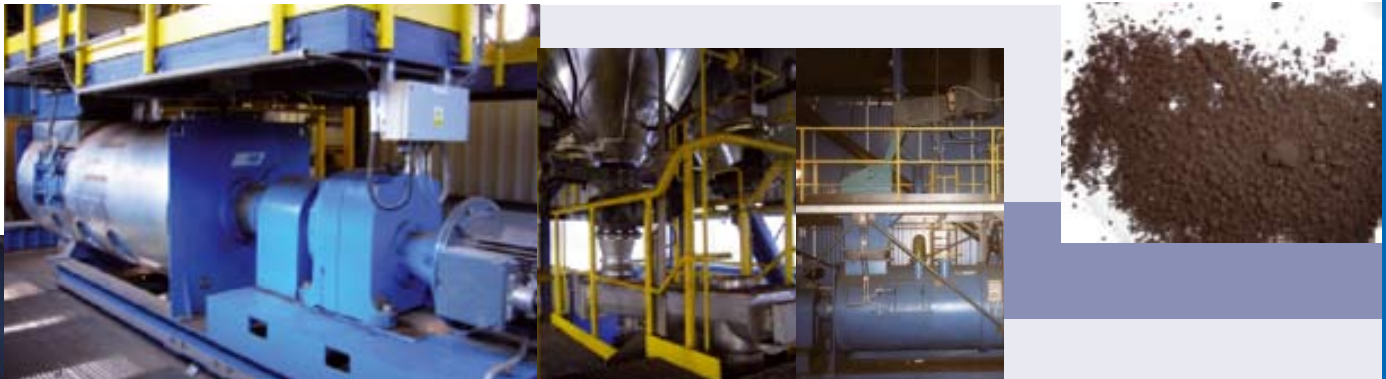
- Fluids, e.g. water
- Water and binding agents
- Extraction agents
- Sludge
- Filter cake

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**Advantages** The main cleaning and maintenance advantages of AVA are:

- The special AVA Mixing Elements operate near the complete surface of the mixing drum. This will cause a self-cleaning effect inside the mixing drum. A manual cleaning is not necessary in this area.
- The maintenance of the AVA Mixer can easily be done via the inspection doors
- Self cleaning system; no cleaning by hand, no blocking
- Only one dosing point without nozzles for water addition; waste water can be used as well
- Due to the intensive mixing process there is no need of fluid nozzles to spray the fluid onto the dry product. The mixing efficiency is so high that there will be an optimal homogeneity of the mixture even without spraying devices.
- The robust design of the AVA Mixers allows an automatic re-start of the mixer even after a downtime period.



The main technology advantages of AVA are:

- The final product possesses an optimal homogeneity due to the effective mixing process in a mechanically produced whirling bed
- Continuous operated AVA Mixers are designed with a high rate of back-mixing which led to an increase of the relative mixing time
- The wear of the mixing elements of the AVA - Mixer is reduced, because only a few elements are used for an optimal mixing result.
- Variations in the dosing of the entire products are optimally balanced
- Moistening of hot ashes up to 300°C
- Moistening of dust with high reactive lime content
- Ashes and dust with lime content are reacting inside the AVA Mixers and extinguished, the formed vapours are condensed e.g. in a vapour washing system
- Based on the retention time the final product can be granules, agglomerates or only dust free product

# Conditioning of ashes and dust

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## A wide range of AVA equipment

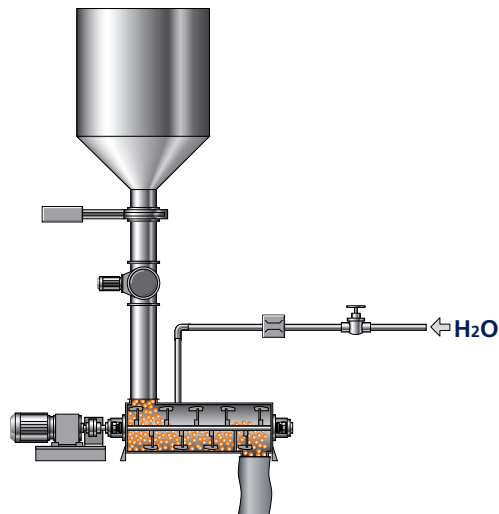
**AVA Mixing Plants** AVA offers a wide range of equipment for ash and dust humidification plants. Where the AVA Mixer is the key component of such an installation all needed product dosing, loading stations and controls will be offered.

The process of an ash or dust humidification plant might be different from site to site. The principles in the dosing of the dry material and the added water are either volumetric or gravimetric.

**Volumetric Dosing of the product** The volumetric dosing of the entire products is the most easiest and cost-effective way of handling ashes and dust.

Underneath a storage silo a rotary valve always is installed. The rotary valve in a robust design is designed to convey the dry product and even to stand the weight of the product inside the silo.

Either the product is moved from the rotary valve directly into the AVA Mixer or a conveying screw is installed in between. This depends on the plant layout and the special situation.



This concept of volumetric dosing is used for processes where always the same amount of ash and water is mixed together. There are no changes in the recipe and the plant is operated continuously with this setting. A change in the water quantity can be done manually via a manual driven control valve or – if installed - via an automatic driven control valve. If an automatic water dosing station is foreseen the control of the station can easily be done with the main control.

In case of a volumetric dosing the staff has to correct the water dosage on site by hand if there is any variation in product feeding caused by bridging or temperature variation.

# AVA Horizontal Mixers

For environment applications

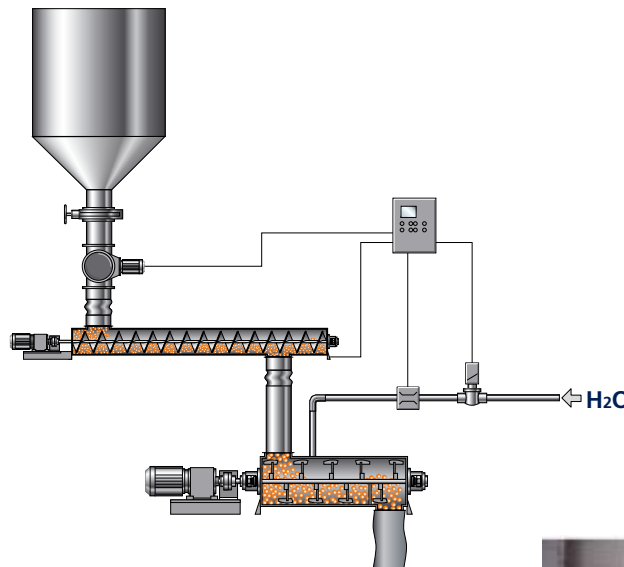
## Gravimetric Dosing of the product

The gravimetric dosing of the entire products is the more comfortable and safe way of handling ashes and dust.

The main advantage of a gravimetric process are:

- Variations in the dust dosing are possible combined with the variation in the water dosing. The weighing signal of the gravimetric device controls the amount of water which is added to the AVA Mixer. This is the most flexible way of ash and dust humidification.
- Depending on the equipment installed inside the silo (e.g. pneumatic actuators) and the process and surrounding conditions (e.g. humidity, condensing inside the silo) there is the risk of blocking inside the silo. If the ash or the dust stick together a blocking of the silo discharge might not be avoided. In this case and if a volumetric dosing plant is installed, there is no control and detection if a blocking occurs and there is no dry product conveyed to the mixer. With a gravimetric installation the dry product flow is always controlled and detected.

Underneath the rotary valve at the storage silo a conveying screw is installed. This conveying screw moves the dry product into the AVA Mixer and is set on load cells for a continuously gravimetric control. The water is added automatically into the mixer e.g. depending on the amount of dry product or to set different water contents.



## Water Dosage

Fully automatic operated water dosing system consisting of a manual shut-off valve, automatic control valve and an inductive water flow meter. The water dosing is installed direct into the water feeding pipe.

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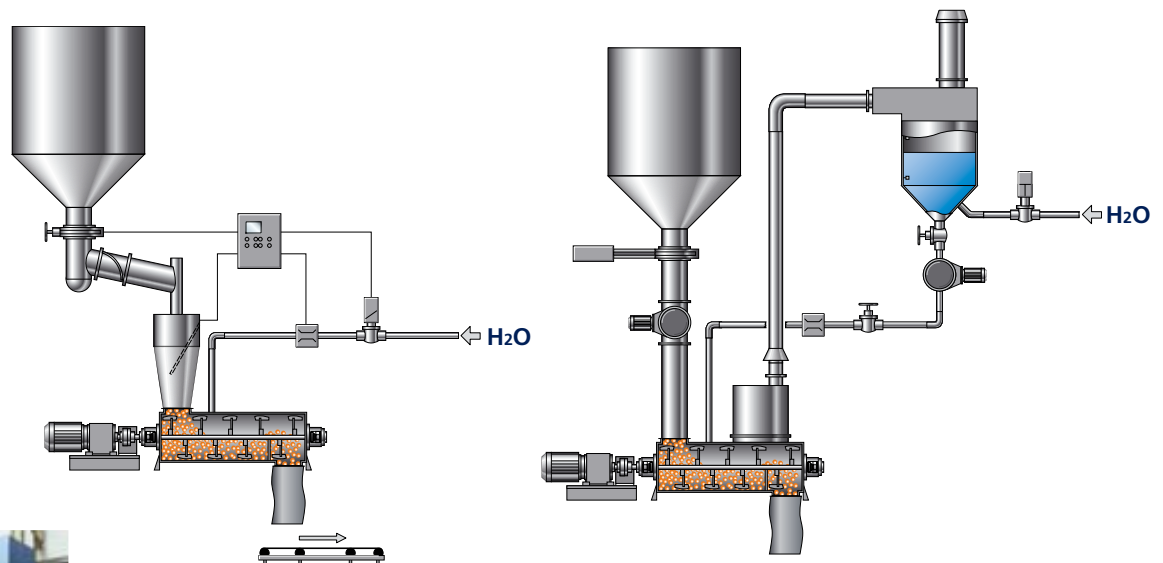
Also for big capacities

## Gravimetric Dosage of big capacities

Up to 2.000 t/h

Underneath the rotary valve at the storage silo a conveying screw is installed. This conveying screw moves the dry product into the AVA Mixer and is set on load cells for a continuously gravimetric control. The water is added automatically into the mixer e.g. depending on the amount of dry product or to set different water contents.

For higher capacities an air slide system is installed underneath the silo. This system is working without rotary valve. The dry product is conveyed by a dosing roller and an air slide into a mass flow meter, where the gravimetric control takes place. (Fig. 1)



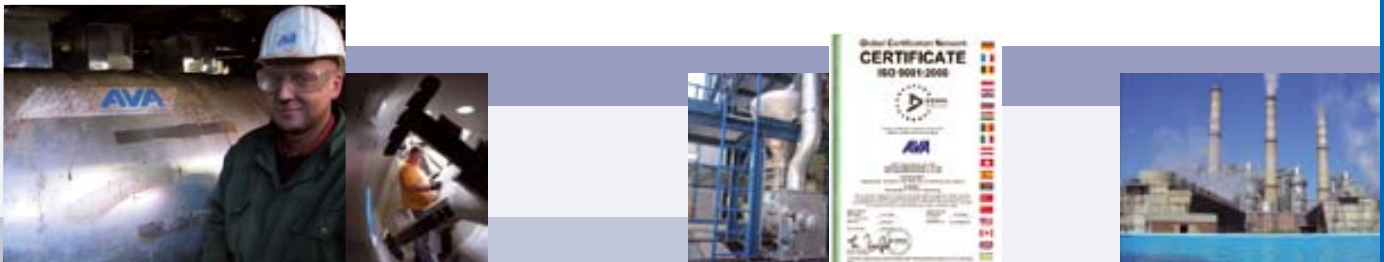
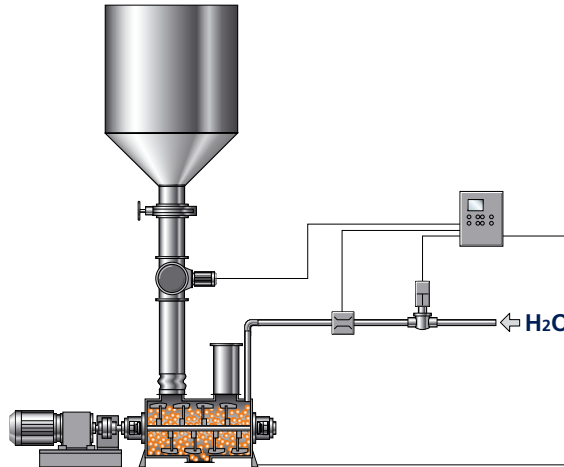
## Some Specials

- At the discharge of the AVA Mixer a loading hose is installed for a continuous discharge of the humidified ash into open trucks. The loading unit is designed as a rubber chute to avoid blocking inside. To avoid dirt and mud at the bottom of the plant and to reach a reliable plant the loading hose can be lifted and lowered via a cable winch.
- The AVA Mixers are designed to allow the reaction of the entire products inside the mixer. They are designed for the dusty as well as the reeky atmosphere during the reaction. It is self-evident that the AVA Mixers are also designed for the high temperature which is created by the reaction.
- The formed dusty and hot vapours are settled in a vapour dome. Inside the dome a high rate of the dust will fall back into the mixer and take part of the mixing process again. The remaining vapours can be condensed in a vapour washing system or blowing out to a deaeration. (Fig. 2)

# AVA Horizontal Mixer

Intensive mixing technology as well for batch operation

In case of very small capacities per hour or only temporarily appearance of dust AVA recommends to use batch systems. The product is dosed with a rotary valve or screw into the AVA-Mixer type HTC. The Mixer is placed on load cells to control the filling degree.



AVA offers the entire scope of supply for the tasks of the ash and dust handling as complete solution.

- Process engineering and design of the complete process
- Materials handling of the dry products and fluid components
- Loading systems e.g. in silo trucks, open trucks or container
- Silo technology
- Controls
- Gravimetric and volumetric dosing systems
- Vapour washing systems
- Steel construction
- Assembly, commissioning and start up
- After sales services

