

Conditioning of Ash and Dust

The usage of mixers in the conditioning of ashes and dusts is well established and a proven technology at AVA

The processes are highly developed in many years of practical application and the machines have proven themselves countless times. Nevertheless, new process tasks occur also in this market segment. The manufacturers of mixing and drying technologies are working on the solutions such as the reduction of limit values for dust emissions. The individual requirements of the customer in relation to the corresponding design of the mixer or dryer are always in the focus of solving matters during the project.

Depending on the process, AVA Mixers for continuous or batch operation are used in brown coal or black coal power plants, in bio mass or waste incineration plants, in de-dusting plants, e.g. for steelworks or in coking plants. Thereby dust and ash from the filters of incineration, de-dusting and drying plants are no longer a waste product. They are leached out, humidified or solidified. The result is a final product for landfill, a transportable or recyclable material, which is used for example in road construction or as a cement additive. The conditioned product must have a defined level of stability and specific eluate values may not be exceeded. In addition, ash and dust of all kinds are used as dry product for the conditioning of sludge, filter cake or, for example, fed back into the process as a granulate in the steelworks industry.

Advantages of AVA technologies in the field of ash and dust treatment

- No clogging / caking of the mixer, even after longer periods of operation
- No manual cleaning of the mixer required
- Short mixing times and high capacity reserves due to a large active surface of the mixer shovels
- Automatic re-start of the agitator even after long shutdown periods
- High level of back-mixing the product inside the machine; therefore deviations in product dosing relating to grain size and apparent density are compensated
- A higher residence time inside the mixer is achieved by means of a special shovel design
- A considerably better overall homogeneity with absolutely identical water content is achieved in combination with the high level of back-mixing
- No usage of liquid jets, an inlet pipe is sufficient
- Due to a slight vacuum from inlet to outlet, there is no risk of clogging the charging equipment
- Robust mixer design, no cast parts in mixer
- Low energy consumption
- Easy cleaning due to large inspection hatches



AVA received a contract to supply eight continuous mixers (type HTK) for the humidification of fly ash at a large power station in Turkey

The machines process 260 t/h of power station ash with gypsum suspension. The aim of the ash treatment is to achieve a dust-free final product with simultaneous reaction of the CaO contained in the ash and without the accumulation of not humidified material. For this purpose, as part of the mixing process, even single grains of the product are brought into a trajectory and in contact with the liquid. Even fine dust with a partial size of 10^{-6} m are moistened to a dust-free final product. The liquid is added into the AVA Mixer by a pipe without spray nozzles. Therefore dirty water can be used without complications. If a granular material is required instead of a just dust-free product, a separately driven cutting chopper is used. These units are also required for disintegration of larger lumps in the product.

The advantages of the type HTK system are obvious:

Short residence times of ~ 10 – 30 sec., no manual cleaning, automatic re-starting, even after long periods of shutdown, an extremely robust design and low maintenance expenditure. In order to ensure 24 hour operation under all circumstances, a stock keeping concept for replacement parts and wear parts was generated. Due to the high vertical integration, AVA is able to deliver spare parts within a very short time, even in the event of unusual breakdown.

In a waste incineration plant, fly ash is created, which is initially rinsed to separate the chlorides.

Subsequently, the still heavy metal loaded fly ash is dried in an AVA mixing dryer and then pelletized, with the aim of feeding the product back into the furnace. The final task is the complete disposal of non-recyclable pollutant fly ash. Instead slag ash is added after the incineration furnace, which can be returned into the economic cycle as a valuable product.

The essential components required for the functionality of the process are, among others, the peripherals around the mixing dryer such as the steam reduction station, the vapour condensation or the controls. In this respect, it is of advantage if the mixer manufacturer also adopts this peripheral equipment in order to avoid critical points in the coordination of several suppliers.



AVA complete solutions for ash and dust treatment

In order to reduce the number of interfaces, AVA supplies peripheral equipment for the core processes of mixing and drying. These include:

- Process design of the overall process
- Mixers and dryers for ash / dust conditioning
- Conveying technology for dry products and liquid components
- Silo technology
- Controls engineering
- Gravimetric and volumetric dosing systems (see details)
- Discharge systems, e.g. in silo vehicles, open vehicles or containers
- Wet scrubber technologies
- Steel construction
- Assembly, commissioning and start-up
- After sales service

With mixers, dryers and plants from AVA for the conditioning of ash and dust, a technology is available which fulfils even the most demanding requirements.

Ask us for further details such as:

- Advantages of AVA Technologies in comparison to ploughshare mixers
- Advantages of AVA Technologies in comparison to twin-shaft mixers
- Additional reference projects
- Typical machine dimensions and capacities

