

Detergent Powder Plant

Three kinds of plants can be supplied according to the required bulk density of product powder.

1. Detergent Powder Plant

with spray drying tower: The final product detergent powder from this kind of plant will have bulk density of 0.25 to 0.35.

2. Detergent Powder Plant

with agglomerator: mainly for producing high-density detergent powder with bulk density of 0.45 to 0.80.

3. Detergent Powder Plant

with both spray drying tower and agglomerator: combination of the technical advantages of above two kinds of plants, capable of producing both low-density and high-density detergent powders by one plant.

Manual or fully automatic computer controlled system can be used in the above-mentioned plants, depending on customer's requirements.

The capacity of the plants is 3,000 t/a to 200,000 t/a.

The operation mode can be manually and computer controlled.

The supply range is from renovation of existing plant to totally new plants.

Environmental impact: no wastewater is drained to outside.

Description of the processes

1. Detergent Powder Plant with spray drying tower

Raw materials in form of powder and liquid are dosed accurately, and then are sent to neutralization and ageing system to be neutralized and aged. The process stream in form of slurry now goes through a milling-homogenizing pump to be homogenized. After that the slurry is then fed to the spray-drying tower to form hollow beads with bulk density of 0.20 to 0.35 kg/L, granulation size of 0.5 to 1.5 mm. After sieved and conditioned in an airlift system, the powder becomes the base powder of low bulk density. A post-addition unit can be provided according to customer's requirements, where perfume, enzyme, perborate are mixed to the base powder to yield medium- or high-grade detergent powder.

2. Detergent Powder Plant with agglomerator

Solid raw materials in form of powder are sieved and premixed, then stored in respective silos. The solid materials are weighed accurately by dosing belts according to the detergent powder formulation, and fed to the agglomerator. While the liquid raw materials are dosed accurately by dosing pumps and fed the agglomerator in form of sprayed particles. The agglomeration product from its bottom is fed to a fluidizing bed to remove free water in the particle's surface and form crystal water in the powder to increase its added value. Perfume, enzyme and other minor ingredients are added into this powder in post-addition unit to obtain final high-grade product with bulk density of 0.45 to 0.8 kg/L, waiting to be packed.

3. Detergent Powder Plant Central control room with computers

- The whole plant is automatically controlled by PLC
- The startup and shutdown of the plant is controlled by programs in the computers.
- There are interlocks between critical items of equipment, and monitoring of operation data.
- The functions of the system include detergent powder formulation adjustment; report printout, operation data display and recording/filing.
- Big screen showing how the plant is running. There are also alarmings and operator intervene indications.
- Manual and automatic operation modes can be switched between each other by operator.
- All raw materials, both solid and liquid, are automatically dosed according to detergent powder formulation by computer.

4. Tower-Agglomerator Detergent Powder Plant

This plant can produce both low -density and high-density detergent powders in the bulk density range of 0.28 to 0.7 kg/L. Energy is saved tremendously because 70% of the raw materials are added by agglomeration system.

5. Detergent Powder Plant Post-Addition Unit

Base powder and minor solid ingredients, such as enzyme, and sodium perborate, etc., are dosed by electronic dosing belts or vibration feeders, then fed into a post-addition rotating mixer. While the liquid ingredients, such as nonionic and perfume are fed into the mixer by dosing pumps and sprayed inside the mixer. The powders and liquids are adsorbed/mixed together, yielding a stably formulated and homogenized medium/high-grade product detergent powder waiting to be packed.

30% of materials in the product powder can be added by this post-addition unit.



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