

# DRYING AND TEMPERING OF PVC GRANULES



## APPLICATION AND OPERATION:

In the plastics processing industry, PVC granules of varying composition and qualities, dried, dosed and tempered to the exact temperature, are required to produce sheeting in a calender line. As the plasticiser content can sometimes be high in the raw material, and, depending on the product composition, this can occasionally cause considerable degassing at increased temperature and place special demands on the process design, in particular with respect to exhaust air purification. The product data and process data determined in a series of experiments in Jöst's own experiment centre were transferred in the course of a scale-up to the plant to be installed. A thermal plant which the customer had available was integrated as a heat supplier to heat the process air and an existing exhaust air purifier was integrated into the plant concept. The thermal performance of the existing thermal oil plant was not suitable for every product and season. For this reason, a partial recirculated air mode of operation was set up, which took account of the special conditions of the exhaust air from the heated PVC granules with the plasticiser content.

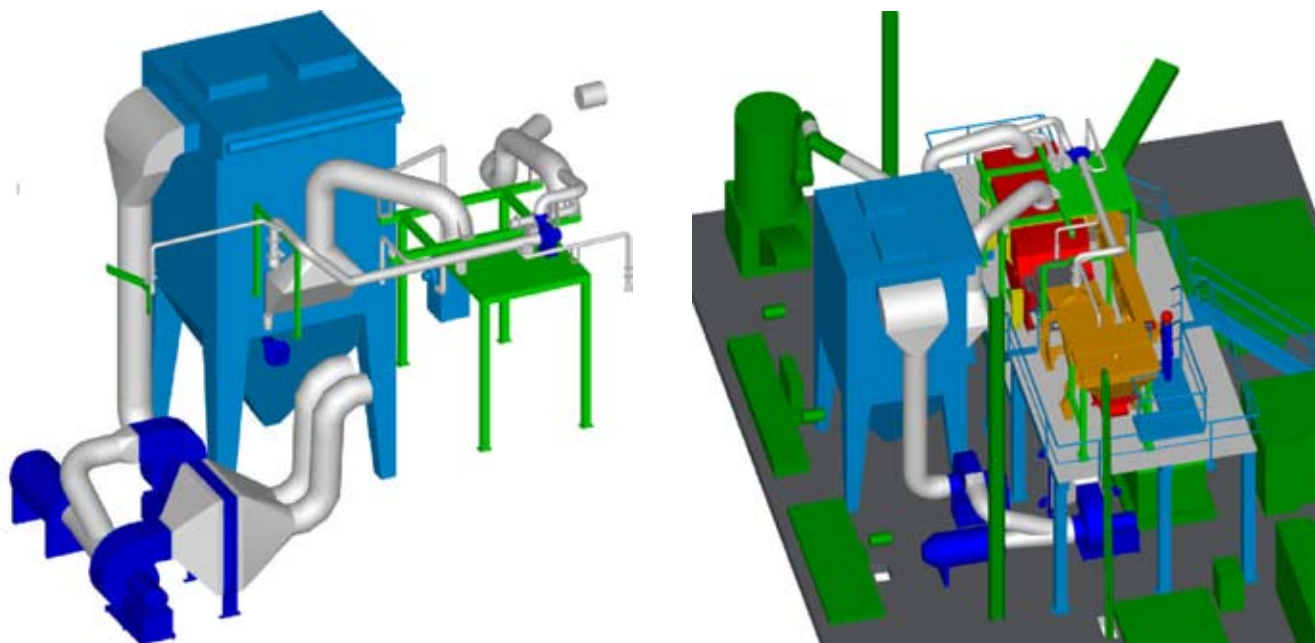
The product is drawn off from a supply tank by means of a magnetic conveyor channel and fed to a screen with a separator stage. The coarse matter, which makes up the main flow mass, passes over the separator stage where whatever fine material pieces are

still clinging are removed. The granules then pass through a weigh belt feeder fitted with a moisture meter and are conveyed to the fluid bed dryer. Heated process air flows through them here to dry and temper them to the required final temperature. The screened pre-heated fine material passes through an oil-heated vibratory feeder channel to the vibratory fluid bed dryer's product output.

Ambient air is mixed with purified exhaust air from the first drying stage and heated by means of the thermal-oil-heated heat exchanger. To ensure that the temperature remains constant, the heat exchanger is equipped with a secondary circuit that has its own circulating pump and oil from the primary circuit is fed into this through a 3-way valve.

## YOUR BENEFIT:

- In the turn-key project from one source process design by our own specialist department
- flexible machine design for installation into an existing plant
- integration of customer's components e.g. exhaust air purifier
- creation of the control and regulation structure in our own house
- program generation and testing in our own house
- assembly and commissioning by our own personnel



The exhaust air from the plant is split into two exhaust air flows:

The dust is removed automatically from the cooler exhaust air flow in the first process section of the fluid bed dryer by means of an exhaust filter included in the scope of supply and it is then fed again along with fresh air into the process air heating (partial recirculated-air operation). Depending on the product, a filter aid can be fed into the exhaust air to adsorb aerosol before entrance into the filter.

The exhaust flow from the second process section with higher temperature is on account of the high degree of plasticiser content cleaned in the customer's exhaust-air cleaning system. To prevent too high an increase there in the temperature of the washing fluid and to avoid having a high level of evaporation, quench cooling was installed for the exhaust air to take effect before entrance into the washer. This also ensures that the condensed plasticiser contents in the pipes do not combine with dust content and cause increased caking.

The system which was created in the house of JÖST® is controlled and regulated by means of a PLC with performance characteristics control, which depending on the formula regulates the process air quantity and temperature by means of the product moisture, product mass flow and product temperature. The volume flow is measured in the process air flow to check that the flow conditions remain constant so that the product will be dried and heated evenly. The plant was installed completely (mechanically and electrically) over a period of 12 days and put into operation. It has been operated continually since the day it was commissioned.

The output temperature is clearly less than the permissible tolerance of the required product output temperature, which can vary greatly depending on the formula. Thermographs of the product in the fluid bed dryer showed only very low deviations in the product temperature over the width of the fluid bed dryer.