NTE PROCESS

CASE STUDY
Chemical Industry

How to reduce the degradation of detergents with dense phase pneumatic conveying?

Raw materials and final product handling

BACKGROUND

The customer is a multinational, world leader in the chemical industry for the production of soaps and detergents, as well as for a wide variety of applications in other sectors. It has turned to NTE Process for degradation problems related to the handling of dense & light soda ash, calcium carbonate, enzymes and other raw materials for the production of detergents in addition to the finished product.

CUSTOMER REQUEST

The detergents are composed of an engineered and very fragile crystalline powder, resulting from a spray drying process and normally mixed with additives and fragrances. The degradation of the raw materials sent to post dosing, or of the detergent microgranules, deriving from the handling through the existing traditional dilute phase pneumatic conveying systems, generated a final product that was too dusty and whose quality and performance were reduced. Consequently, the detergent appeared to be segregated during the packing and out of customer specification. The customer performed a series of tests with the product with several potential suppliers, but only NTE process was able to meet the expected performance results (up to 18 t / h at over 100 m distance) with a degradation of the product and generation of fines <1%.

THE SOLUTION

NTE Process has provided a next generation solution: Eco Dense-Tronic®. A dense phase pneumatic conveying system combined with Artificial Intelligence Air Assist® M533 technology that allows material handling at a reduced speed compared to the dilute phase.
The Air Assists® in fact inject compressed air (or nitrogen) at a controlled volume and pressure and are strategically positioned along the transport pipes. The material is thus gently pushed, creating regular

ECO DENSE-TRONIC®

BAG DUMP STATIONS


BULK BAG UNLOADING STATIONS

product slugs that reduce the resistance and pressure required for handling, working with a full tube. This also determines a reduction in the convey speed and, consequently, in the phenomena of segregation and degradation thanks to the absence of impacts and friction in the transport line.
NTE process supplied a system consisting of storage silos, stainless steel transporters, lines from 4 "to 6" that extend up to 110m in length each, serving different destinations located in different areas both for the preparation of slurry and for final mixing and post dosing. Each system has different layouts and thanks to the ease of positioning it is suitable even in congested areas. Depending on dosing needs, the systems have rates ranging from 4-5 t / h up to 18t / h. Together with the pneumatic conveying system, all the accessories for the silos were also supplied, as well as fluidizing systems (FBB M328) that homogenize the raw materials in the storage silo and day bins, manual big bag unloading stations with integrated filters dedicated to minor products, dust free and high containment big bag unloading stations for enzymes, weighing and dosing systems controlled by a SCADA management system.
A turnkey plant.

PLANT FOR THE PRODUCTION OF DETERGENTS

BENEFITS

- Excellent control of the speed of the product, which reduces operating pressures and the consumption of conveying air.
- The pipes are kept constantly full of product and able to restart even in the event of an accidental stop.
- The conveyed product maintains its granulometric and quality characteristics with minimal degradation.

CONCLUSIONS

Delicate materials are subject to degradation which increases the higher the speed of the pneumatic conveying system. This is why it is necessary to reduce the convey speed to a minimum by using pneumatic conveying in dense phase with Air Assist ®, in order to adequately handle this type of material.
In this field, it is fundamental turning to a partner who has experience with a specific type of material and in a specific application.
At NTE Scientific Hub, equipped with a Research and Innovation Center together with a Pilot Plant, it is possible to carry out tests on a 1: 1 scale to touch the NTE Process technologies, obtain certain data related to the advantages deriving from each solution and prevent any critical issues of each process.

ABOUT NTE PROCESS

NTE Process is the Single Source Provider of process solutions for the industry ranging from pneumatic conveying in dense phase to mixing, but also liquid injection, drying, spray drying and in-line formulation, up to packaging. The headquarters is in Gorgonzola, while in Pessano con Bornago (MI) there are both the second headquarters which includes the Workshop and NTE Scientific Hub, where a team of specialized engineers deals with R&D and carries out full scale and scientific tests.

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