NTE PROCESS

CASE STUDY

Food Industry – Coffee

How to minimize segregation of ground coffee blends and coffee bean breakage with dense phase pneumatic conveying?

BACKGROUND

A leading Italian company in the production of coffee turned to NTE Process to solve the problems related to both the segregation phenomena of the ground coffee blends and the breaking of the coffee beans during handling after the roasting phase.

CUSTOMER REQUEST

The customer needed to minimize the breakage of roasted coffee beans and solve the problem of segregation in the transport from the degassing systems to the capping or packing machines. NTE Process has successfully met these objectives with a solution that allows both to drastically limit the phenomena of segregation of the ground coffee blend, and to minimize the breakage of the coffee beans which become very fragile after roasting (up to <0 ,1%*).

THE SOLUTION

NTE Process has supplied a new generation solution based on a dense phase pneumatic conveying system combined with Air Assist® M366 technology which allows material handling at a reduced speed compared to the diluted 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 caps of product which reduce the resistance and pressure required for handling, working with a full tube. This also determines a reduction of the conveying speed and, consequently, of the segregation and degradation phenomena thanks to the absence of shocks and friction in the conveying line. NTE Process supplied a system composed of storage silos, pneumatic transporter, transport pipes with Air Assists®,

DENSE PHASE PNEUMATIC CONVEYING

CONVEYING LINE, AIR ASSISTS AND DIVERTERS

RECEIVING HOPPERS WITH FILTER

receiving hoppers and control systems with PLC. For roasted coffee beans, the convey included pressurized dense phase lines from 90m up to 160m with flow rates from 6 to 13 t/h. While for the ground coffee it was a question of flow rates of 2.5 t/h over distances of about 60m with vacuum dense phase technology, always equipped with the Air Assist® system.

BENEFITS

- Excellent control of the product speed, which reduces the operating pressures and the consumption of the conveying air.
- The pipes are kept constantly full of product and able to restart even in case of accidental stop.
- The conveyed product maintains its granulometric and quality characteristics with minimal degradation or segregation.
- Preservation of the integrity of the bean in the case of coffee beans and drastic limitation of the phenomena of demixing of the ground coffee thanks to the reduction of the product transport speed to a minimum.

TYPICAL GROUND COFFEE
AND COFFEE BEANS PRODUCTION PLANT

CONCLUSIONS

Delicate materials are subject to degradation which increases the higher the speed of the pneumatic conveying system. That is why to adequately handle this type of material it is necessary to minimize the conveying speed using dense phase pneumatic conveying with Air AssistS®. In this field, contacting a partner who has specific experience with a certain type of material and in a specific application is essential.

At the NTE Scientific Hub, equipped with a Research and Innovation Center and Pilot Plant, it is possible to carry out tests on a 1:1 scale to experience NTE Process technologies first hand, obtain reliable data on 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 dense phase pneumatic conveying to mixing, but also liquid injection, drying, spray drying and in-line formulation, up to packaging. The headquarters is in Gorgonzola (MI), while in Pessano con Bornago (MI) there are both the second site which includes the assembly and testing area and the NTE Scientific Hub, where a team of specialized engineers deals with R&D and carries out full scale and scientific test.

*Note: results achieved on specific plant configurations.

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