Product News

Reliable and Food-safe Transport of poorly flowing Cocoa Powder for Beverage Production

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Regensdorf, Switzerland –

Cocoa powders are used to provide the characteristic taste and colour of chocolate beverages. Finely ground cocoa powders are usually mixed with the other ingredients to make the beverage powders. Handling cocoa powder can be tricky due to the nature and the fineness of the powder. Gericke has successfully supplied, installed and commissioned a pneumatic conveying, storage, feeding and mixing system for the production of chocolate drinks.

Gericke pneumatic dense phase conveying system for cocoa powder. (Picture: ©Gericke)

Cocoa powder should be processed at temperatures below 30°C and under dry conditions. The reason for this is that it is a hygroscopic product that would absorb moisture and form lumps, which would affect its flavour and make processing difficult. Therefore, it is advantageous to have a closed processing system that protects the product from possible contamination and interaction with the environment. Gericke uses pneumatic conveying systems in which the product is introduced into a pipeline through a special device and transported by means of a gas flow to a receiving hopper.

In a pneumatic lean phase conveying system, the product is introduced into the pipeline by a rotary valve. The conveying gas is usually generated by a roots blower operating at a pressure of less than 1 bar g. This type of pneumatic conveying system is characterised by high air velocities of usually more than 20 m/s and lean product loading of solids dispersed in the gas stream. Conveying hygroscopic powders containing fat (cocoa powder usually has a proportion of 10-20%) at high speeds can result in product layers within the pipeline, which can ultimately lead to clogged pipes, which is not hygienic at all.

With the PulseFlow PTA® pneumatic dense phase conveying system supplied by Gericke, the cocoa powder is conveyed as a slow moving plug of product. The system consists of a pressure vessel and is operated with compressed air from an air supply usually greater than 4 bar g. Since the line is filled with a dense volume of solids, called a high loading, the cocoa powder is transported at velocities well below 10 m/s, only a small amount of compressed gas is required. The air consumed from the air network is cleaned and typically dried with a freeze dryer, resulting in a very low residual water content corresponding to an atmospheric dew point of approximately - 20°C. This prevents the product from settling in the pipeline and causing interruption of the flow.

Depending on the supplier of the cocoa powder, the flow behaviour can range from very free flowing to poor flowing. The transport system must therefore be able to convey both types of cocoa powder. The cohesive and poor flowing type exhibits funnel flow in the hoppers, which can result in low performance. To prevent this, the conveying system has been equipped with a special fluidising system that enables uniform discharge.