



BULK SOLID HEAT-EXCHANGER

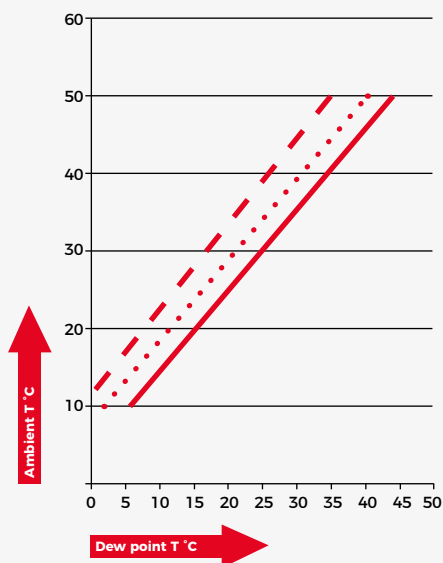
FERTILIZERS

When it comes to the cooling of fertilizers, it is essential that the equipment is sized considering both the thermal and physical characteristics of the product to be treated.

Fertilizers being inorganic chemicals have special hygroscopic properties, releasing moisture into certain conditions in the atmosphere. When this occurs in a closed system with surfaces at lower temperatures than the surrounding, moisture present in the environment start to condensate.

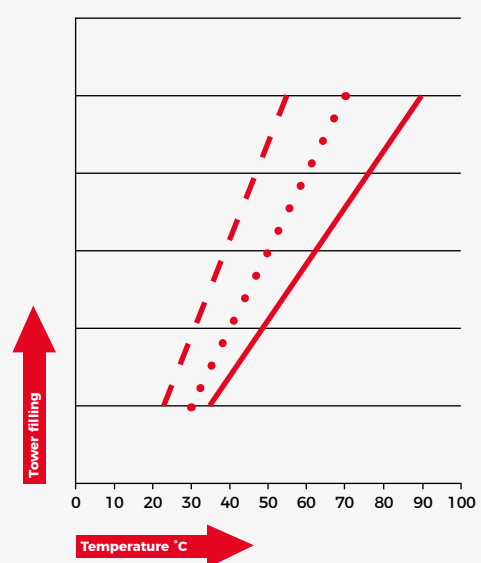
This phenomenon must be absolutely avoided in a BSHE since the condensation onto the surface of the plates within which hot water flows and the presence of powder in the environment causes the formation of caking and sticky products in a very quick time onto the plates, and therefore the heat exchange is inhibited, the product flow along the tower is prevented and finally the whole plant end into efficiency and capacity problems.

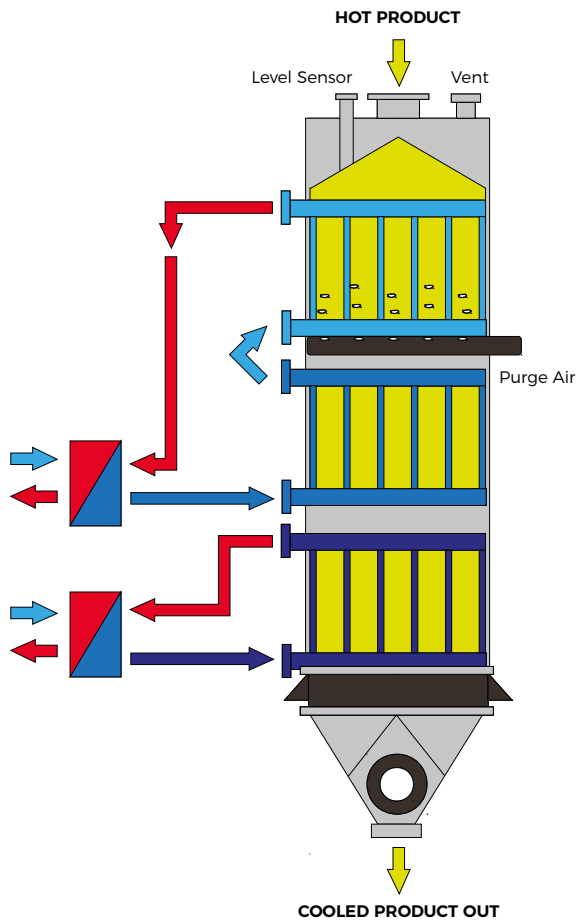
DEW POINT T VS. AMBIENT T AND R.H.



--- R.H 45%
..... R.H 60%
— R.H 75%

TEMPERATURE PROFILE ALONG THE FIC BSHE





The deep knowledge of condensation phenomena and of the hygroscopic characteristics of the products allows FIC to design its own BSHE for fertilizers so that the condensation is always avoided, keeping the operating temperature conditions on the plate surface always above the dew point . This result is obtained thanks particularly to:

- The Purge Air blowing system consisting of an air management system with blower and air distribution in the Tower at certain specific points. The air is then released from the tower through the vents on top of the Tower. The air flow rate varies according to the load and in particular situations can also be dehydrated before entering the Tower.
- The cooling water temperature management system with the adoption of particular Temperature profiles along the tower.

The FIC's BSHE for fertilizers are designed and manufactured for continuous operation, without the need for plate cleaning stops.

The FIC Bulk Solid Coolers are designed considering:

- The product to be treated
- The temperature set point
- The most critical environmental conditions of humidity and temperature

The Bulk Solid Coolers from FIC guarantee:

- High energy efficiency (savings of up to 70-90% compared to traditional systems)
- Operational continuity
- Absence of emissions
- Constant quality of the final product
- Optimal control of the thermal level of the product for packaging and storage operations.