



Cooling Hot Bulk Materials Using Screw Conveyors

Question

I am discharging a very hot product from a rotary kiln. The product exit temperature is about 1,400-degrees F and is reducing the life of my downstream equipment. I need to cool the hot product as it exits the rotary kiln. Can a screw conveyor be used to cool extremely hot products?

Answer

Yes! A cooling screw conveyor or heat transfer processor can be used to cool almost any bulk material. Heat indirectly transfers from the product by introducing a heat transfer medium such as cool water through a special trough jacket and/ or through the pipe and hollow flights of the screw processor. Achieving the specified exit temperature of the product is accomplished by calculating the surface area of the screw processor and designing the system flow to match the heat load requirements of the application.

In other words, the size of the heat transfer screw processor required for your application is based on the volumetric flow rate and the amount of heat needing to be removed from the hot product. We need to know the inlet and desired outlet temperatures of the product being cooled and the temperature and flow rate of the cooling medium, which is typically water that is available at the plant. We use this information to determine the Heat Load, or the amount of heat needing to be removed from the product. Then, we size the heat transfer processor to handle the heat load with a conservative factor of safety.

Once we determine the heat transfer requirements for your application, we can size the heat transfer processor that best meets your needs. Typically, we can cool your product from 1,400 to less than 150-degrees F and extend the life of your downstream equipment indefinitely.



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