



Cooling a Bio-Based Product Using a Heat Transfer Processor

Question

We currently use a water bath screw conveyor when cooling bio-based products that exit the primary reactor at about 1,000-degrees F. How do we determine the length of that screw conveyor to get the material down to 150-degrees F? I noticed a previous post asking a similar question but that person was handling material beginning at 1,400-degrees F and your answer was to use a rotary screw conveyor.

Answer

The length and size of the heat transfer processor is determined based on your heat load requirements. We will need a few more pieces of information in order to determine the heat load. Based on the information you provided, we are cooling a bio-based product from 1,000 to 150-degrees F. We now need to know the flow rate of the product you are cooling, typically in lbs. per hour. Also, if you have a better description of the product being cooled or if you know the specific heat value of the product, we will use this information to calculate the heat load.

Once we calculate the heat load, we will calculate the surface area required for the heat transfer processor and design the cooling medium flow to match the heat load requirements of the application. Typically, for a cooling application like yours, we use plant process water at 90-degrees F for the cooling medium. If another cooling medium is available, then please let us know. The length and size of the heat transfer processor is determined after we calculate the required surface area.

Cooling a hot bio-based product from 1,000 to 150-degrees F is very feasible using a cooling screw conveyor or heat transfer processor. Once we know your flow rate and determine the specific heat value of the bio-based product, we can easily size the unit and solve the problem for you.



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