

Design of DCC & vaporization cooler

Leading steel plant, India



With Munters' mass transfer expertise, a customer in the steel industry was able to improve their column performance with optimized chilled water outlet temperature and flow rate.

Process overview

The vaporization cooler is used to cool water with waste nitrogen from an air separation unit. This chilled water from the vaporization cooler is passed on for use in the direct contact air cooler.

In packed towers, heat is transferred by intimate contact between fluids. The absence of fouling and scaling in the packed columns results in a higher heat transfer rate and in turn higher heat transfer co-efficients. This leads to closer temperature approaches between the two fluids, considerably reducing the initial equipment costs. Lower pressure drops can also be achieved using packed columns.

Case study

- Design of DCC and vaporization cooler at steel company

Quick facts:

- Customer: Leading steel plant in India
- Location: Northern India
- Tower Name: Vaporization Cooler
- Tower Diameter: 1480 mm.
- Mass Transfer Equipment: Random Packing (Omni-Pak®) and high performance internals



Omni-Pak®.



Pipe Arm distributor.

Customer requirements

The customer was in need of vaporization cooler design and optimization to achieve close temperature approach at the cold end. Further requirements included:

- Chilled water outlet temperature
- Chilled water outlet flow rate
- Waste nitrogen outlet conditions
- Minimal pressure drop

Munters was also asked to provide process design and performance guarantees.

Solutions provided

Heat transfer calculations were done to simulate and achieve the output flow rate conditions. The tower hydraulic rating was done to obtain minimal pressure drop requirement.

Munters selected Omni-Pak® high performance random packing. The bed height suited customer requirements.

Mechanical designs for the high-capacity column internals were generated. Equipment was also manufactured and supplied along with the process design and performance guarantee.

Results achieved

Chilled water outlet temperature as low as 12.65°C (54.77°F) and flow rate of 20.5 m³/hr (723.85 ft³/hr) were achieved, with satisfactory column performance.

Would you like to find out if Munters has a solution for your company too? If so, please visit our website, www.munters.com

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