



SIFLON DRUGS LIMITED

Increased Solvent Recovery through Installation of Additional Cooling Tower

SUMMARY OF THE OPTION

Siflon drugs are a leading manufacturer of about 4 to 5 different popular veterinary drugs. Among these, their main-stay product is oxyclozanide, since the company's inception in 1999. In the manufacture of veterinary products, acetone is used as the solvent in the reactor. Being expensive, the solvent (acetone) vapors are condensed and recovered in a distillation unit, which are then reused in the process. In the prevalent condition only part of the acetone (around 50 percent), is being recovered and the rest of the solvent was forced to be vented as vapors to the atmosphere due to inefficient condensation as a result of high cooling water inlet temperature. The Team was of the opinion that the solvent recovery of about 80 – 85 percent was possible provided the cooling water temperature was maintained at around 30°C as per the design. The prevalent cooling water inlet temperature was around 50 – 55°C. Due to ineffective cooling tower (CT) operation, the existing CT was of a natural draft type. In order to achieve CT outlet temperatures in the range of 30°C, a new CT (natural draft type) was installed to augment the capacity of the existing CT. In this case there was no increase in electricity consumption as the same pump was used to lift the water. The only difference is that this lifted water is distributed into the two CT's now. The CT is locally fabricated and is not of any particular brand or company.

This measure has resulted in enhanced recovery of acetone in the order of 300 liters annually with monetary worth of Rs. 1.44 lakhs (US\$ 3,349). The investment of Rs. 1.5 lakh (US\$ 3,488) towards procurement and commissioning of new CT was paid back within a year of implementation.

KEYWORDS

India, Chemicals, Cooling towers, Solvent recovery, Acetone

OBSERVATIONS

The observations made by the Team are as follows:

- Total solvent used in the process: 1000 liters/yr
- Solvent recovery before augmentation of CT
- Cooling water outlet temperature before CT augmentation:
°C



Old Cooling Tower



OPTIONS

In order to enhance solvent (acetone) recovery from the process (Distillation Column) a new and more efficient cooling tower was installed to augment the capacity of the existing cooling tower as well as to achieve lower cooling tower outlet water temperature. This temperature was brought down from 50 – 55 °C to 30 °C as a result of which solvent recovery has improved from a level of 500 liters/yr (50 percent) to 800 liters /yr (80 percent).

New Cooling Tower Along side The Old Cooling Tower



RESULTS

The following rationale measures were taken:

- Total solvent used in the process: 1000 liters/year
- Solvent recovery before augmentation of cooling tower: 500 liters/year
- Cooling water temperature before cooling tower augmentation: 50 – 55 °C
- Cooling water temperature after cooling tower augmentation: 30 °C
- Solvent recovery after augmentation of CT: 800 liters/year
- Increase in solvent recovery by maintaining CW inlet temp.
- To condenser at 30 °C: 300 liters (30 percent)
- Cost of Solvent: Rs. 480 /liter (US\$ 11.16/liter)

The impact of the above measures resulted in the following financial and environmental results:

Financial benefits:

- Investment: Rs. 1.5 lakh (US\$ 3,488)
- Annual operating cost: Same as earlier
- Annual monetary savings: Rs. 1.44 lakh (US\$ 3,349) (Rs. 480/liter X 300 liters)
- Payback period: 1 year

Environmental benefits:

- Annual GHG emissions reductions: none
- Annual energy savings: none
- Annual additional acetone recovery (input resource): 300 liters



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Other Benefits:

- The operators now enjoy a much cleaner ambience to work in.
- The process of looking for improvement has set in and small inexpensive house keeping measures have been implemented, which has improved the cleanliness of the plant and morale of employees.

FOR MORE INFORMATION

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