

CASE STUDY 13: DISPOSING INDUSTRIAL ORGANIC RESIDUE AS ALTERNATE FUEL IN CEMENT KILN - DR. REDDY'S LABORATORIES, HYDERABAD

Project Implemented by : Dr. Reddy's Laboratories, Hyderabad

Project Implemented in : M/s Ultra Tech Cement, Tadipatri,

Project Implemented in : 2007

Company Details

Dr. Reddy's Laboratories established in 1984, The Company is an emerging global pharmaceutical company. As a fully integrated sustainable organization that simultaneously pursues economic, social and environmental benefits & their purpose is to provide affordable and innovative medicines through their three core businesses:

Pharmaceutical Services and Active Ingredients, comprising our Active Pharmaceuticals and Custom Pharmaceuticals businesses, Global Generics, which includes branded and unbranded generics; and proprietary products, which includes New Chemical Entities (NCEs), Differentiated Formulations, and Generic Bio-pharmaceuticals.

Background of the Project

The API (Active Pharmaceutical Ingredients) manufacturing process generates high calorific value organic residue, mostly from the solvent distillation process. These wastes were earlier disposed either through site incineration or sent to TSD for incineration. The opportunity of consumption of high calorific value wastes such as sludge from petrochemical plant; spent solvent residue from pesticide plant in cement industry as alternate fuel was thereby explored.

The waste generated at the Dr Reddy's API plants had a calorific value equivalent to the other waste already used in cement kiln; hence an effort was initiated to look at the possibilities of utilization as alternate fuel, by Co processing waste residue material as a source of energy, to minimize use of fossil fuels at cement plants.



Although there were some restrictions and uncertainties in types and quantities of wastes that could be used as fuels in cement plants, this form of disposal was found to be cost effective, with less environmental impact as compared to conventional disposal methods such as land fill and incineration.

Project Details

All high calorific value residue and its physical states were quantified and four streams of waste in liquid state identified which could be used as alternate fuel. The first batch of residue was sent to the cement plant for a trial that proved very successful. In the mean time visits were made to the cement plant to understand the process thoroughly.

As a consequence the possibility of pumping the liquid residue to the kiln from the top was identified and successfully tested out by installation of two pumps as in the schematic system of firing below.

Residue Collection

A total of 2395 MT (10.3% of total waste) of waste was sent to the cement plant in the FY 09-10.

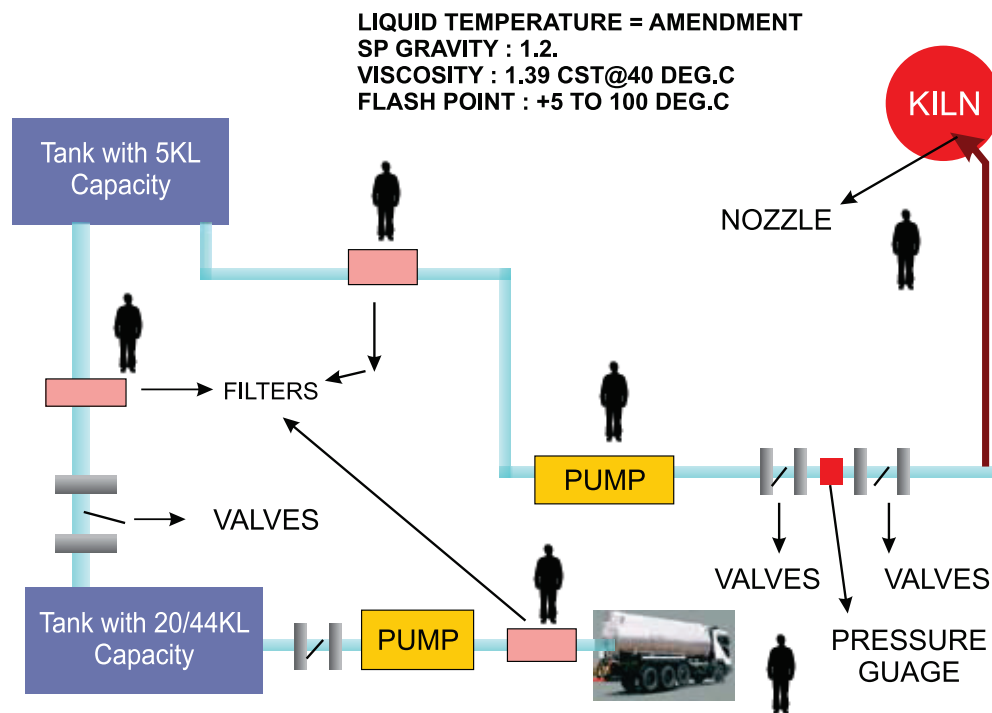


Figure : A facility to simultaneously mix 4 different streams of waste to make a homogeneous solution was created as in the visuals below:



Issues faced during implementation

- Organic residue generated from process & distillation had high specific gravity and was both difficult to transfer and segregate. Based on practical experience in the mixing sumps a specific gravity in the range 1.0 to 1.2 was maintained to ensure the ease of material pumping. Awareness was created amongst all employees handling this distillation process to ensure the material parameters to ensure proper flow.



- A comprehensive Risk Analysis by competent personnel was conducted to minimize the potential hazards during transportation and handling as also safety re-enforcement at the cement industry while handling waste organic residue to ensure safety at each stage.
- Continual awareness was ensured through continuous feedback on residue handling, storage and transfer from the co-process provider and the cement industries. The same learning's were also communicated to all production personnel at site to strengthen the procedures and systems. DRL believes that complete ownership is required at all stages and from every individual to handle; store and transfer residue smoothly with any safety compromise.

Savings

- Reduction of GHG emission = 1185 MT/Annum of CO₂
- 527 MT/Annum of coal savings at cement plant
- Reduced Organic waste disposal cost by 50%

Results of the Project

- Diversion of 2395 MT waste to cement industry for use as alternate fuel
- Reduction of GHG emission to the tune of 1185 MT/Annum of CO₂ e and about 527 MT/Annum of coal savings at cement plant.*.
- Reduced Organic waste disposal cost by 50%.

*Average Calorific value considered for coal and hazardous waste is 5076 kCal/Kg and 6200 kCal/Kg, based on CV 1 kg of Hazardous waste gives energy equivalent to 1.22kg of coal.

Replication Potential

Replication potential is very high. Cement plants can install alternative fuel handling system, depending on availability of alternative fuel.

Recommendation to other units

All cement plants are recommended to install alternative fuel handling system.

Contact Information of the plant

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