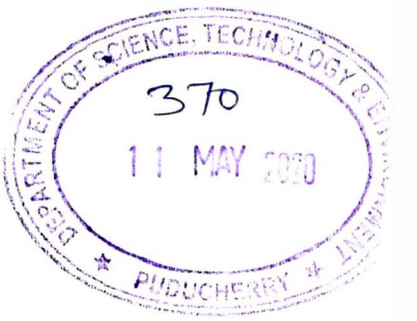
INSPECTION REPORT

The industry, M/s. Golden Cashew Products Pvt. Ltd. (Unit II & III) located at R.S. No. 34/1, Thuthipet Village, Villianur Commune, Puducherry was inspected by us on 07.02.2020 based on the letter dated 25.09.2019 from the Member Secretary, Puducherry Pollution Control Committee with a request to inspect the industry on its pollution aspects and furnish a report.



Products Manufactured

The following products are manufactured in the industry:

i) Distilled Cashew Nut Shell Liquid (Cardanol)
ii) Cashew Nut Shell Residue
iii) CNSL Resin
iv) Epoxy Hardener

Manufacturing Process:

i) Distilled Cashew Nut Shell Liquid (Cardanol) & Cashew Nut Shell Residue:

Cardanol is a natural phenol derived from Cashew Nut Shell used in paint, hardener and lamination industries. The industry purchases Refined Cashew Nut Shell Liquid (CNSL) from market and carries out vacuum distillation to produce purified cardanol. Process involves:

Refined Cashew Nut Shell Liquid (CNSL) purchased and stored in bulk storage tank ->Pumping to pre-heater -> heating to 175 deg. C ->Charging CNSL in the Agitated Thin Film Evaporator (ATFE) at 265 deg. C ->Vacuum distillation in ATFE through Evaporator duct ->Vapor condensation -> Filling in MS-barrels / tanker.

The Cashew Nut Shell Residue is recovered from the bottom of the ATFE as a by-product and sent as raw material to industries manufacturing Cashew Friction Dust.

ii) CNSL Resin:

CNSL Resin is a polymerized CNSL used in brake lining industries. Process involves polymerization of refined CNSL in an exothermic reaction with dilute Sulfuric acid. Process involves:

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Refined CNSL -> charging in Reactor -> heating to 60 deg C with electrical heater -> addition of 2.5% Sulfuric Acid -> Polymerization for 5 hours -> Toluene solvent addition to reduce viscosity -> CNSL resin collected MS-Barrels.

iii) Epoxy Hardener:

Epoxy hardener is phenalkamine curing agent used in paint industries. Epoxy hardener is produced by Mannich reaction of Cardanol, formaldehyde, and Ethylene diamine. Process involves

Charging distilled CNSL, Formaldehyde and EDA in Jacketed Reactor -> Heating the Reactor with steam ->Condensation in Condenser at 110 deg C -> Further heating rector to 150 Deg C ->Cooling reactor to 70 Deg. C -> Epoxy Hardener collected from reactor in HDPE Barrels -> Unreacted Amines from condenser collected and reused in further batch.

Pollution Aspects:

i) There is no effluent generation from the process.

ii) Entire manufacturing activity is carried out in closed reactors / vessels and no emissions occur during manufacturing process. However Mild odour was noticed inside the factory which is due to the characteristic smell of the CNSL raw material. The odour was localized one within plant area and it was not noticed outside the factory premises.

iii) Thermic Fluid Heaters are used for heating purpose in CNSL distillation. Fuel used is Biomass Briquettes. The combustion emission is passed through wet scrubber and discharged through stack of height 25 meters above ground level.

iv) One baby Boiler of 600 kg/hr is used for steam generation for epoxy hardener manufacture. Briquettes are used as fuel. Cyclone separator is provided for air pollution control and emission is discharged through stack of 20-meter height.

v) The boiler ash is sent for land filling in the company land.

vi) There is no Hazardous Waste generation from the process. The empty raw material barrels are reused for filling the finished products.

Overall Observation and Assessment for Future Compliance:

The unit is free from water pollution, but with light volatile odour left around the occupational area. The operational process ensuring minimum pollution at the current stage of assessment, requires modernization of the basic operation of CNSL to comply with risk

free safety operations posed by the application of heavy current density factor. No attempt has been made to bring in the renewable energy substitution over decades, however, it is suggested to substitute energy requirements by renewable energy, to achieve a long-term environmental sustainability in due course of time.

Recommendations:

i) The unit shall improve the barrel storage area with proper dyke walls.

ii) The unit shall get the ash tested in lab and dispose it as manure for agricultural fields.

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M/s. Golden Cashew Products Pvt. Ltd. (Unit II & III) – Inspection Photos