

ABSTRACT

Tricresyl Phosphate is one of industrial product, which is widely used in various industrial sectors. The initial design plant of Tricresyl Phosphate from cresol and phosphorus oxychloride planned in Gresik, East Java, in the area of land is 12,310 m² with capacity 15,000 tonnes/year. This plant will be operated for 330 days or 24 hours a day with 135 employees.

Tricresyl Phosphate made from 1,841,600kg/hour of cresol and 820,148kg/hour of phosphorus oxychloride using a Continuous Stirred Tank Reactor. The process of this reaction will be operated at temperature 150°C and pressure at 10 atm, the conversion of reaction is 80%. The utility needs 183,567kg/hour of water, 33,734.867 kg/hour of steam, and 235.55 kWelectricity provided by PLN and generator as a back up.

The economic analysis shows the value of Fixed Capital Investment (FCI) is Rp 1,538,271,112,456.6; Working Capital Investment (WCI) is Rp 522,181,062,057.96; Profit before tax is Rp 183,783,685,385.99; Profit after tax (50%) is Rp 91,891,842,692.9; Return On Investment before tax (ROI)_b is 56.63% and Return On Investment after tax (ROI)_a is 28.31%. Pay Out Time before tax (POT)_b is 1.50 years and Pay Out Time after tax (POT)_a is 2.61 years. Break Event Point (BEP) is 54.51% and Shut Down Point (SDP) is 44.06%. Discounted Cash Flow Rate(DCFR) 18.35%.

Based on the evaluation results, this Tricresyl Phosphate plant with capacity of 15,000 tons/year was worthy for further analysis.

Keywords: Tricresyl Phosphate; Cresol; Phosphorus Oxychloride; Continuous Stirred Tank Reactor