

ABSTRAK

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- Program Studi** : Teknik Kimia
- Judul** : **PRA-RANCANGAN PABRIK TRIMETHYLOLPROPANE
DENGAN KAPASITAS 18.000 TON/TAHUN**

Adanya pabrik *trimethylolpropane* akan memberikan dampak yang besar dunia industri. Sesuai fungsinya, *trimethylolpropane* digunakan sebagai zat *intermediate* dalam pembuatan produk cat. Pabrik ini direncanakan didirikan di Kawasan Industri Cilegon (KIEC), Cilegon, Banten pada tahun 2021. Pemilihan lokasi didasarkan atas ketersediaan bahan baku, sarana transportasi yang memadai serta tenaga kerja yang ada. Pabrik ini akan dioperasikan selama 330 hari dengan kapasitas 18.000 ton/tahun dengan jumlah karyawan sebanyak 90 orang. Bahan baku yang digunakan adalah *butyraldehyde* dan *formaldehyde* serta natrium hidroksida.

Proses pembentukan produk *trimethylolpropane* terjadi di dalam reaktor tangki berpengaduk (R-001) dengan suhu 40 s/d 60 °C pada tekanan 1 atm. Produk didistilasi dengan tekanan 3 atm. Kemudian diekstraksi hingga dikristalisasi hingga menghasilkan produk *trimethylolpropane* berbentuk *flakes* dengan kemurnian 99,9%.

Utilitas pabrik *trimethylolpropane* membutuhkan air untuk media pendingin, pemanas domestik dan proses sebanyak 35.109 kg/jam. Bahan bakar biosolar sebanyak 23 kg/hari.

Analisa kelayakan pendirian pabrik menggunakan analisa ekonomi dengan modal total tetap sebesar Rp 2.089.000.000.000, nilai titik impas (BEP) berada pada 59,33% dengan *Internal Rate of Return* (IRR) sebesar 39,2% dan *Minimum Payback Period* (MPP) selama 4 tahun 5 bulan, serta nilai *Net Cash Flow Present Value* (NCFPV) pada bunga bank sebesar 9,95% yaitu Rp. 3.742.000.000.000 (positif). Sehingga berdasarkan analisis ekonomi diperoleh Pra-rancangan Pabrik *trimethylolpropane* layak didirikan.

ABSTRACT

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Title : ***PRE-DESIGN TRIMETHYLOLPROPANE FACTORY WITH 18.000 TON/YEAR CAPACITY***

The trimethylolpropane factory will provide good prospects, especially in the painting industry. According to its function, trimethylolpropane is used as an intermediate material in the painting making. This factory is planned to be established in the Cilegon Estate Industrial Estate (KIEC), Cilegon, Banten in 2021. The location selection is based on the availability of raw materials, adequate transportation facilities and existing workers. This factory will be operated for 330 days with a capacity of 18,000 tons / year with 90 employees. The raw materials used were butyraldehyde and formaldehyde with sodium hydroxide.

The process of forming the trimethylolpropane product occurs in the Stirring Tank Reactor R-001 with a temperature of 40 until 60 °C at a pressure of 1 atm . The product is purified by a distillation Tower with a pressure of 3 atm to produce a product with a purity of > 99%. After that, the product will be extracted and crystallized to get the flakes product material.

Utility of Trimethylolpropane factory need 35.109 kg/hour water for cooler unit, boiler unit, domestic and factory process. And also need 23 kg/day solar.

Analysis of the feasibility of establishing a factory using economic analysis with a total fixed capital of IDR 2.089.000.000.000, the break-even point value (BEP) is at 59.33 % with an Internal Rate of Return (IRR) of 39.2% and a Minimum Payback Period (MPP) for 4 years and 2 months, and the value of Net Cash Flow at Present Value (NCFPV) on 10 years at bank interest is 9.95%, namely IDR 3.742.000.000.000 (positive). So that based on the economic analysis, it is obtained that the Pre-designed of trimethylolpropane Plant is feasible to establish.