

ABSTRACT

PRE-DESIGN OF PENTARYTHRITOL FACTORY FROM FORMALDEHYDE, ACETHALDEHYDE AND SODIUM HYDROXIDE CAPACITY 30,000 TON/YEAR (Design Crystallizer (CR-401))

By

VERNA DWI LESTARI PESEMA

Pentaerythritol is composed of raw formaldehyde (CH_2O), acetaldehyd ($\text{C}_2\text{H}_4\text{O}$), and sodium hydroxide (NaOH) which has applications in the chemical industry as raw materials for the production of resin alkydes. As for the application of resine alkyds in industries in Indonesia, it is very broad to include wood preservation industry, paint and ink printing industry, wood engraving crafts industry, textile fields for smoothing fibers, surface coatings, and explosives, as well as many other industries.

The pentaerythritol plant is designed with a capacity of 30,000 tonnes per year with a 24-hour operating time and 330 working days over a year. The plant is planned to be located in the JIPE Industrial Area, Gresik East Java with a workforce required of 162 people. The type of enterprise selected in the form of a limited corporation (PT) with the highest leadership is in the position of Chief Director assisted by olch General Manager who assumes the functional organizational structure.

Through the results of economic analysis obtained:

<i>Fixed Capital Investment (FCI)</i>	= Rp 301.858.991.892
<i>Working Capital Investment (WCI)</i>	= Rp 53.269.233.863
<i>Total Capital Investment (TCI)</i>	= Rp 355.128.225.756
<i>Break Even Point (BEP)</i>	= 35,38%
<i>Shut Down Point (SDP)</i>	= 28,12%
<i>Pay Out Time before Taxes (POT)_b</i>	= 0,91tahun
<i>Pay Out Time after Taxes (POT)_a</i>	= 1,11tahun
<i>Return on Investment before Taxes (ROI)_b</i>	= 85%
<i>Return on Investment after Taxes (ROI)_a</i>	= 68%
<i>Discounted cash flow</i>	= 25%

Considering the summary, the establishment of the pentaerythritol plant is subject to further study, both in terms of process and economy.

ABSTRAK

PRARANCANGAN PABRIK PENTAERITRITOL DARI FORMALDEHID, ASETALDEHID DAN NATRIUM HIDROKSIDA KAPASITAS 30.000 TON/TAHUN (Tugas Khusus Crystallizer (CR-401))

Oleh

VERNA DWI LESTARI PESEMA

Pentaeritriol ini berbahan baku formaldehid (CH_2O), asetaldehid ($\text{C}_2\text{H}_4\text{O}$), dan natrium hidroksida (NaOH) yang memiliki kegunaan bidang industri kimia sebagai bahan baku pembuatan alkyd resin. Adapun aplikasi alkyd resin pada perindustrian di Indonesia sangat luas meliputi Industri pengawetan kayu, Industri cat dan tinta cetak, industri kerajinan ukiran kayu, bidang tekstil untuk menghaluskan serat, bidang pelapis permukaan, dan bahan peledak, serta masih banyak industri lainnya.

Prarancangan pabrik pentaeritritol dirancang berkapasitas 30.000 ton/tahun dengan waktu operasi 24 jam/hari serta 330 hari kerja selama 1 tahun. Pabrik direncanakan berlokasi di Kawasan Industri JIPE, Gresik Jawa Timur dengan jumlah tenaga kerja yang dibutuhkan sebanyak 162 orang. Jenis badan usaha yang dipilih berbentuk Perseroan Terbatas (PT) dengan pimpinan tertinggi ada pada jabatan Direktur Utama yang dibantu oleh General Manager yang menganut struktur organisasi fungsional.

Melalui hasil analisis ekonomi diperoleh:

<i>Fixed Capital Investment (FCI)</i>	=Rp 301.858.991.892
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<i>Return on Investment after Taxes (ROI)_a</i>	=68%
<i>Discounted Cash Flow (DCF)</i>	=25%

Mempertimbangkan rangkuman tersebut, maka pendirian pabrik pentaeritriol ini layak untuk dikaji lebih lanjut, baik dari segi proses maupun ekonomi.