ABSTRACT

PRADESIGN OF DIMETHYL ETHER (C_2H_6O) PLANT FROM METHANOL (CH_3COOH) WITH PRODUCTION CAPACITY 15.000 TONS/YEAR

(Design *of Reactor* (RE– 201))

By

NURHASANAH

This methanol-based plant will be established in Sebulu, East Kalimantan Province. his plant is established by considering the availability of sufficient raw materials, adequate transportation facilities, easily available labor, and to meet the needs of dimethyl ether at home and abroad. The plant's production capacity is planned to be 15,000 tons / year with 330 working days in 1 year.

The raw material used is 3411,1308 kg of methanol per day. Broadly speaking, the manufacturing process of dimethyl ether is divided into three stages: the preparation of raw materials, the reaction stage and the product purification stage.

The supply of dimethyl ether plant utility needs in the form of: water supply units, electricity supply units, fuel supply units, and compressed air supply units. The form of the company is a Limited Liability Company (PT) using a line and staff organizational structure, with a total of 177 employees.

From the results of the calculation of economic evaluation obtained:

Fixed Capital Investment	(FCI)	= Rp 211.595.041.983,1770
Working Capital Investment	(WCI)	= Rp 39.829.654.961,5391
Total Capital Investment	(TCI)	= Rp 251.424.696.944,7160
Break Even Point	(BEP)	= 44,34%
Pay Out Time before taxes	$(POT)_b$	= 2,11 tahun
Pay Out Time after taxes	$(POT)_a$	= 2,51 tahun
Rate on investment after taxes	$(ROI)_a$	= 25,11%
Discounted Cash Flow	(DCF)	= 25,44%
Shut Down Point	(SDP)	= 21,02%

Considering the above explanation, it can be concluded that the design of the dimethyl ether plant with a capacity of 15,000 tons / year is feasible to proceed to the planning stage.

ABSTRAK

PRARANCANGAN PABRIK DIMETIL ETER (C_2H_6O) DARI METANOL (CH_3COOH) DENGAN KAPASITAS PRODUKSI 15.000 TON/TAHUN
(Tugas Khusus Perancangan Reaktor (RE– 201))

Oleh

NURHASANAH

Pabrik berbahan metanol ini akan didirikan di daerah Sebulu, Provinsi Kalimantan Timur. Pabrik ini berdiri dengan mempertimbangkan ketersediaan bahan baku yang cukup, sarana transportasi yang memadai, tenaga kerja yang mudah didapatkan, serta untuk memenuhi kebutuhan dimetil eter di dalam dan luar negeri. Kapasitas produksi pabrik direncanakan 15.000 ton/tahun dengan 330 hari masa kerja dalam 1 tahun.

Bahan baku yang digunakan adalah metanol sebanyak 3411,1308 kg/hari. Secara garis besar proses pembuatan dimetileter dibagi menjadi tiga tahap yaitu: tahap penyiapan bahan baku, tahap reaksi dan tahap pemurnian produk.

Penyediaan kebutuhan utilitas pabrik dimetileter berupa: unit penyediaan air, unit penyediaan tenaga listrik, unit penyediaan bahan bakar, dan unit penyediaan udara tekan. Bentuk perusahaan adalah Perseroan Terbatas (PT) menggunakan struktur organisasi *line and staff*, dengan jumlah karyawan sebanyak 177 orang.

Dari hasil perhitungan evaluasi ekonomi diperoleh:

Fixed Capital Investment	(FCI)	= Rp 211.595.041.983,1770
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Mempertimbangkan paparan diatas, dapat disimpulkan bahwa prarancangan pabrik dimetil eter dengan kapasitas 15.000 ton/tahun layak untuk dilanjutkan ke tahap perencanaan.