

## ABSTRAK

Pabrik dimethyl phthalate dirancang dengan kapasitas 35.000 ton/tahun, menggunakan bahan baku *phthalic anhydride* yang diperoleh dari PT. Petrowidada dan *methanol* dari PT Kaltim Methanol Industri. Berdasarkan aspek ketersediaan bahan baku dan utilitas, lokasi pabrik didirikan di Lamongan, Jawa Timur dengan luas tanah 33600 m<sup>2</sup>. Pabrik beroperasi selama 330 hari efektif setiap tahun dan 24 jam/hari dengan jumlah tenaga kerja yang diserap sebanyak 140 orang.

Umpan segar *phthalic anhydride* dan *methanol* dicampur bersama-sama masuk kedalam Reaktor (R-01). Reaktor beroperasi secara isothermal pada suhu 60 °C dan keluar pada suhu 60 °C dan tekanan 1 atm. Reaksi bersifat eksotermis sehingga digunakan air sebagai media pendingin untuk mempertahankan suhu keluar reaktor. Hasil keluaran reaktor dimasukkan ke dekanter untuk memisahkan *dimethyl phthalate* dari campurannya. *Dimethyl phthalate* pekat yang berupa fase berat keluaran Dekanter kemudian masuk dalam Evaporator (EV) untuk memisahkan *methanol* dengan produk dan setelah dipisahkan akan dimurnikan di flash drum (FD-01) yang beroperasi pada tekanan 1 atm. Produk *dimethyl phthalate* merupakan hasil atas flash drum dengan kemurnian 99% ditampung dalam tangki (T-03).

Utilitas yang diperlukan berupa air sebanyak 38728 L/jam yang diambil dari sungai Bengawan Solo. Kebutuhan utilitas yang meliputi air umpan *boiler* sebanyak 1271.40791 kg/jam dan air Domestik sebanyak 980 Kg/jam. Kebutuhan uap air (*steam*) sebanyak 946,5019 kg/jam. Daya listrik sebesar 102,81 kW disuplai dari PT. Pembangkitan Jawa-Bali dengan cadangan 1 buah generator berkekuatan 150 kW. Kebutuhan listrik sebanyak 196.7887 kWh. Bahan bakar solar yang dibutuhkan sebanyak 89.6832 kg/jam. Kebutuhan *dowtherm* sebagai pendingin adalah sebanyak 3602.633 kg/jam.

Pabrik ini membutuhkan *Fixed Capital Investment* Rp429.663.947.885 dan *Working Capital* Rp260.572.880.842. Analisis ekonomi pabrik *dimethyl phthalate* ini menunjukkan nilai ROI sebelum pajak sebesar 19,74% dan ROI sesudah pajak sebesar 13,82%. Nilai POT sebelum pajak adalah 3,36 tahun dan POT sesudah pajak adalah 4,20 tahun. BEP sebesar 53,26% kapasitas produksi dan SDP sebesar 20,12% kapasitas produksi. DCF sebesar 7,13%. Berdasarkan data analisis ekonomi tersebut, maka *pabrik dimethyl phthalate* ini layak untuk dikaji lebih lanjut.

## ABSTRACT

*Dimethyl phthalate factory was stake with 35.000 ton/year, used the basic substance that is Phthalic anydride which came from PT. Petrowidada and methanol from PT Kaltim Methanol industry. Based on prepared aspect of basic substance and utility, the location of factory was built in Lamongan, east java with the wide ground 33600 m<sup>2</sup>. The factory has been operated during 330 days with efective every year and 24 hour/day with the amount of employee are 140 person.*

*Fresh bait phtalic anydride and methanol were shake together in Reactor (R-01). Reactor has been operated in isothermal at the temperature 60 C and out on the temperature 60 C and with 1 atm tension. The reaction have excotermis characteristic on order to used water as cooling media for staying the reactor out temperature. The result of reactor were entered to decanter for dissapear dimethyl phthalate from its shake. Thick dimethyl phthalate which like heavy phase of Decanter and then include in Evaporator (EV) for dissapear methanol with product and after dissapear it will be puring in flash drum (FD-01) which operated in 1 atm tension. Dimethyl phthalate product is a result of flash drum with the puring 99% patched in tank (T-03)*

*Utility that needed like water as much 38728 L/hour which took from Bengawan Solo river. Neccesity of utility which is bait water boiler as much 1271.407911 kg/hour and sanitation water as much 980 kg/hour. The needed of water steam as much 946,5019 kg/hour. Energy electric is 102,81 kW was supplied from PT. Pembangunan Jawa-Bali with one generator reserve with the strongly 150 kW. Neccesity of electric as much 196.7887 kWh. The diesel fuel which needed as much 89.6832 kg/our. Neccesity of dowtherm as cooling are 3602.633.*

*This factory need Fixed Capital investment Rp429.663.947.885 and working capital 260.572.880.842 rupiahs. The analyze of economic factory this dimethyl phthalate showing the score of ROI before tax as much 19,74% and ROI after tax as much 13,82%. Score of POT beforetax is 3,36 years and POT after tax is 4,20 years. BEP as much 53,26% production capacity and SDP as much 20,12 production capacity. DCF as much 7,13. Based on economic data analyze like that, meanwhile this dimethyl phthalate factory is worth to teach for longer.*