

## **Abstract**

*The urea formaldehyde plant is made by reacting methanol and air with a catalyst used by iron molybdenum oxide. The reaction takes place at a temperature of 240 ° C and a pressure of 1.4 atm. The reaction is exothermic. The formaldehyde produced is then ensnared with urea solution to form urea formaldehyde which takes place at a temperature of 110 ° C with the reaction being exothermic. The production capacity of 35,000 tons / year requires methanol of 2918,3659 kg / hour, oxygen 7191,9697 kg / hour and urea 1112,9223 kg / hour. Utility needs consist of water of 120914.51 kg / hour, compressed air of 61.681 m<sup>3</sup> / hour, steam of 3891.8904 kg / hour, electricity of 182.6165 KW and fuel of 345.40 Kg / hour. The plant is planned to be established in Bontang, East Kalimantan with an area of 33,500 m<sup>2</sup> with a total of 107 employees. Urea formaldehyde plant is planned to operate 330 days / year. Based on the results of the economic analysis, the data obtained before tax is Rp. 128,477,239,648 and after tax is Rp. 64,238,619,824. Percent Return On Investment (ROI) before tax of 38.60% and after tax of 19.30%. Pay Out Time (POT) before tax is 2.1 years while after tax is 3.4 years. Break Even Point (BEP) is 43.47% and Shut Down Point (SDP) is 24.42%. Discounted Cash Flow (DCF) of 31.00%. Based on the data above, this urea formaldehyde plant from methanol and oxygen is suitable for establishment.*

*Keywords : Urea formaldehyde, Molybdenum oxide iron, DB Western*

## Abstrak

Pabrik urea formaldehida dibuat dengan mereaksikan metanol dan udara dengan katalisator yang digunakan iron molybdenum oxide. Reaksi berlangsung pada suhu 240°C dan tekanan 1,4 atm. Reaksi yang terjadi bersifat eksotermis. Formaldehida yang dihasilkan kemudian dijerab dengan larutan urea membentuk urea formaldehida yang berlangsung pada suhu 110°C dengan reaksi yang terjadi bersifat eksotermis. Kapasitas produksi 35.000 ton/tahun membutuhkan metanol sebesar 2918,3659 kg/jam, oksigen 7191,9697 kg/jam dan urea 1112,9223 kg/jam. Kebutuhan utilitas terdiri dari air sebesar 120914,51 kg/jam, udara tekan sebanyak 61,681 m<sup>3</sup>/jam, steam sebesar 3891,8904 kg/jam, listrik sebesar 182,6165 KW dan bahan bakar sebesar 345,40 Kg/jam. Pabrik direncanakan didirikan di Bontang, Kalimantan Timur dengan area seluas 33.500 m<sup>2</sup> dengan jumlah karyawan sebanyak 107 orang. Pabrik urea formaldehida direncanakan beroperasi 330 hari/tahun. Berdasarkan hasil analisa ekonomi diperoleh data bahwa keuntungan sebelum pajak sebesar Rp 128.477.239.648 dan setelah pajak sebesar Rp 64.238.619.824. *Percent Return On Investment* (ROI) sebelum pajak sebesar 38,60% dan setelah pajak sebesar 19,30%. *Pay Out Time* (POT) sebelum pajak sebesar 2,1 tahun sedangkan setelah pajak sebesar 3,4 tahun. *Break Even Point* (BEP) sebesar 43,47% dan *Shut Down Point* (SDP) sebesar 24,42%. *Discounted Cash Flow* (DCF) sebesar 31,00 %. Berdasarkan data diatas maka pabrik urea formaldehida dari metanol dan oksigen ini layak untuk didirikan.

Kata-kata kunci : Urea formaldehida, Iron molybdenum oxide, DB Western