

## ABSTRAK

Pabrik Urea dari amonia dan karbon dioksida menggunakan Aces 21 dirancang dengan kapasitas 125.000 ton/tahun. Pabrik akan didirikan di Sulawesi Tengah, di atas tanah seluas 18,000 m<sup>2</sup> dengan jumlah karyawan sebanyak 150 orang.

Bahan baku Amonia yang diperlukan sebanyak 96021 kg/jam sedangkan karbondioksida sejumlah 11413 kg/jam. Proses produksi dilakukan pada suhu 180 °C dan tekanan 175 atm di reaktor gelembung secara kontinyu. Reaksi 1 berlangsung secara Eksotermis dan reaksi 2 berlangsung secara Endotermis.

Kebutuhan utilitas meliputi total kebutuhan air pembangkit steam sebanyak 48833 kg/jam, total kebutuhan air proses sebanyak 138586 kg/jam dan air make up sebanyak 19533,3650 kg/jam, listrik untuk alat proses dan utilitas sebanyak 500 kW.

Berdasarkan analisis ekonomi terhadap pabrik ini menunjukkan *Percent Return On Investment* (ROI) sebelum pajak 44,1 % dan setelah pajak 37,5 %. *Pay Out Time* (POT) sebelum pajak selama 1,8 tahun dan setelah pajak 2,1 tahun. *Break Even Point* (BEP) sebesar 30 %, dan *Shut Down Point* (SDP) sebesar 20,9 %. *Discounted Cash Flow Rate* (DCF) terhitung sebesar 46,4 %. Dari data analisis kelayakan di atas disimpulkan bahwa pabrik ini menguntungkan dan layak untuk didirikan.

*Kata-kata kunci* : Amonia, Karbon dioksida, Urea, Aces 21

## ABSTRACT

Urea plant from ammonia and carbon dioxide using Aces 21 is designed with a capacity of 125,000 tons / year. The Plant will be established in Central Sulawesi, on an area of 18,000 m<sup>2</sup> with a total of 150 employees.

Ammonia raw material needed is 96021 kg / hour while carbon dioxide is 11413 kg / hour. The production process is carried out at a temperature of 180 oC and a pressure of 175 atm in a continuous bubble reactor. Reaction 1 takes place Exothermic and reaction 2 takes place Endothermic.

Utility requirements include total steam generator water needs 48833 kg / hour, total process water needs 138586 kg / hour and make up water needs 19533 kg / hour, electricity for process equipment and utilities needs 500 kW.

Based on economic analysis of this factory, the *Percent Return On Investment* (ROI) before tax is 44.1 % and after tax is 37.5 %. *Pay Out Time* (POT) before tax for 1.8 years and after tax 2.1 years. Break Even Point (BEP) by 30%, and *Shut Down Point* (SDP) by 21.9 %. *Discounted Cash Flow Rate* (DCF) is calculated at 46.4 %. From the feasibility analysis data above it can be concluded that this plant is profitable and feasible to be established.

*Key words* : Ammonia, Carbon Dioxide, Urea, Aces 21