

## INTISARI

Pabrik asetanilid berkapasitas 35.000 ton/tahun akan beroperasi selama 330 hari/tahun dan 24 jam/hari. Bahan baku yang dibutuhkan berupa anilin dan asam asetat sebesar 24.000 ton/tahun dan 19.000 ton/tahun. Bahan pendukung berupa larutan etanol 96,5% yang dibutuhkan sebesar 571 ton/tahun. Reaksi asetilasi antara asam asetat dan anilin terjadi di dalam reaktor alir tangki berpengaduk pada suhu 150°C dan tekanan 3 atm, dilanjutkan dengan pemekatan produk di evaporator dan kristalisasi asetanilid di dalam *crystallizer*. Proses terakhir adalah tahap pemisahan dan pemurnian dengan bantuan solven larutan etanol 96,5% di dalam *rotary drum vacuum filter*. Pemurnian lebih lanjut dijalankan di dalam *centrifuge* dan *rotary dryer* sehingga didapatkan produk asetanilid dengan kemurnian 99,9%.

Pabrik asetanilid akan didirikan di Kebakkramat, Karanganyar, Jawa Tengah dengan luas area sebesar 28.737 m<sup>2</sup> dan luas bangunan sebesar 11.343 m<sup>2</sup>. Pabrik diharapkan dapat menyerap tenaga kerja sebanyak 199 orang. Unit utilitas pabrik terdiri dari unit pengolahan air, unit pembangkit *steam*, unit penyedia udara instrumen, unit pengolahan limbah, dan unit pembangkit listrik. Kebutuhan air sebanyak 4,4383 m<sup>3</sup>/ton produk dipenuhi melalui sumber air Sungai Bengawan Solo. Kebutuhan listrik pabrik sebesar 5 MW diperoleh dari PLN.

Pabrik asetanilid direncanakan berdiri pada tahun 2022 dengan modal tetap Rp463.141.833.000,00 dan modal kerja sebesar Rp294.625.460.000,00. Keuntungan sebelum pajak yang diperoleh sebesar Rp180.420.897.000,00 dan keuntungan setelah pajak sebesar Rp126.294.628.000,00. Berdasarkan evaluasi ekonomi yang telah dilakukan, diperoleh *Return on Investment (ROI)* sebelum pajak sebesar 38,96% dan ROI setelah pajak sebesar 27,27%. *Pay Out Time (POT)* sebelum pajak sebesar 2,07 tahun dan POT setelah pajak sebesar 2,73 tahun. *Break Even Point (BEP)* sebesar 42,66%, *Shut Down Point (SDP)* sebesar 26,42%, dan *Discounted Cash Flow Rate of Return (DCFRR)* sebesar 28,85% per tahun. Berdasarkan hasil evaluasi tersebut, maka pabrik asetanilid ini menarik dan layak untuk dikaji lebih lanjut.

Kata kunci : Anilin, Asam Asetat, Asetanilid.

## **ABSTRACT**

*Acetanilide plant is designed with capacity of 35.000 tonnes/year and will be operated continuously for 330 days/year and 24 hours/day. The raw materials needed for the process are aniline and acetic acid at 24.000 tonnes/year and 19.000 tonnes/year. Ethanol 96,5% as supporting material needed is 571 tonnes/year. Acetylation reaction between aniline and acetic acid is carried out in continuous stirred tank reactor at pressure and temperature of 3 atm and 150°C. The process is continued with concentrating the product in evaporator and crystallizing the acetanilide in crystallizer. The last process is separation and purification by adding ethanol 96,5% as a solvent in rotary drum vacuum filter and taking further separation in centrifuge and rotary dryer as well, until the purity of acetanilide product reach 99,9%.*

*The plant will be established in Kebakkramat, Karanganyar, Jawa Tengah with a land area of 28.737 m<sup>2</sup> and building area of 11.343 m<sup>2</sup>. The plant is expected to provide work opportunity for at least 199 people. The utility unit in this plant consists of water treatment unit, steam generation unit, instrument air generation unit, waste treatment unit, and electrical generating unit. The amount of water needed for this plant is 4,4383 m<sup>3</sup>/tonne of product with which is taken from Bengawan Solo river. The energy needs for this plant requires electricity of 5MW from PLN.*

*Acetanilide plant is planned to be established in 2022 with fixed capital of Rp463.141.833.00,00 and working capital of Rp294.625.460.000,00. Profit before tax is Rp180.420.897.000,00 and Profit after tax is Rp126.294.628.000,00. After the economic evaluation, the return on investment (ROI) before tax for this factory is 38,96% and after tax is 27,27%. Pay Out Time (POT) before tax is 2,07 years and POT after tax is 2,73 years. Break Even Point (BEP) is 42,66%, Shut Down Point (SDP) is 26,42%, and Discounted Cash Flow Rate of Return is 28,85%/year. Based on the evaluation result, the acetanilide plant is economically feasible and deserves for further study.*

*Key words: aniline, acetic acid, acetanilide.*