

INTISARI

Asam akrilat merupakan bahan kimia *intermediate* yang banyak digunakan dalam produksi ester akrilat dan resin yang kemudian dipolimerisasi sehingga menjadi cat, pelapis, tekstil, perekat, polis, dan plastik. Pabrik asam akrilat direncanakan beroperasi selama 330 hari dalam setahun dengan kapasitas produksi 50.000 MTPY. Bahan baku utamanya ialah gliserol 99,5% sebanyak 81.921 MTPY dan oksigen sebanyak 11.046,3503 MTPY yang berasal dari udara. Secara umum, tahapan dalam produksi asam akrilat ini adalah pengenceran gliserol, dehidrasi gliserol, oksidasi akrolein, dan pemekatan asam akrilat. Sebagai unit pendukung dalam memproduksi 50.000 MTPY asam akrilat, unit utilitas menyediakan steam sebanyak 8205,5294 kg/jam, kebutuhan listrik sebanyak 766,5 kW, dan air sebanyak 856080,5 kg/jam.

Evaluasi ekonomi menghasilkan modal tetap yang dibutuhkan sebesar \$25.749.696,45 sedangkan *working capital* yang dibutuhkan adalah sebesar \$36.875.165,89. Berdasarkan hasil studi kelayakan bisa diperoleh hasil untuk ROI sebelum pajak 37,99% dan ROI sesudah pajak 26,59%. POT sebelum pajak sebesar 2,08 tahun dan POT sesudah pajak 2,73 tahun. BEP berada pada titik 48,63% dan SDP berada pada titik 32,81%. Nilai DCFRR sendiri diperoleh nilai sebesar 17,73%. Dari hasil perhitungan tersebut, pabrik ini dapat dikatakan menguntungkan dan layak untuk dikaji ulang.

Kata kunci : asam akrilat, gliserol, dehidrasi, oksidasi

ABSTRACT

Acrylic acid is a popular intermediate product that is widely used in the production of acrylic esters and resins, which are polymerized afterwards for paint, coating, textiles, adhesives, polishes and plastics. The plant is designed to operate for 330 days a year with a production capacity of 50,000 MTPY. The main raw material used are 81,921 MTPY glycerol 99,5% and 11,046.3503 MTPY oxygen originating from air. The main process involves the dilution of glycerol, the dehydration of glycerol, the oxydation of acrolein, and the distillation of acrylic acid. The production of 50,000 MTPY acrylic acid requires 8205,5294 kg/hr steam produced in the utility unit, 766,5 kW of electricity, and 856080,5 kg/hr supply of water.

An economic evaluation was conducted on the design to analyze the profitability of the plant and a fixed capital and working capital of \$25,749,696.45 and \$36,875,165.89 were calculated. Based on the profitability study done on the design, the Rate of Return on Investment (ROI) before tax and after tax were 37.99% and 26.59%. The Pay Out Time (POT) of the plan after and before tax were 2.08 and 2.73 years respectively. The Break Even Point (BEP) of the plant was 48.63% and the Shutdown Point (SDP) was at 32.81%. The Discounted Cash Flow Rate of Return (DCFR) was also calculated to be 17.73%. The acrylic acid plant is therefore proven by the previous parameters to be economically attractive and deserves further studies.

Keywords: acrylic acid, glycerol, dehydration, oxidation