

ABSTRAK

Pabrik *silica powder* dirancang untuk memenuhi kebutuhan silikon dioksida di dalam maupun di luar Indonesia. Kapasitas yang direncanakan sebesar 60.000 ton/tahun. Pabrik ini beroperasi secara kontinyu selama 330 hari dalam setahun. Pabrik ini direncanakan berdiri di Kecamatan Laren, Kabupaten Lamongan, Jawa Timur diatas tanah seluas 203.694 m². Proses pembuatan *silica powder* menggunakan *sol-gel process* yang dilakukan dalam dua tahap di mana keduanya menggunakan Reaktor Alir Tangki Berpengaduk (RATB). Untuk memproduksi *silica powder* sebesar 60.000 ton/tahun (7575,76 kg/jam) diperlukan bahan baku sekam padi sebanyak 6018,76 kg/jam, asam klorida sebanyak 63391,3 kg/jam, dan natrium hidroksida sebanyak 8411,16 kg/jam. Utilitas pendukung proses meliputi penyediaan air proses sebesar 7.897,92 kg/jam, air pendingin sebesar 5.018.807,97 kg/jam, penyediaan *saturated steam* sebesar 1.064.713 kg/jam, penyediaan udara tekan sebesar 29,91 m³/jam, penyediaan listrik sebesar 4227,59 kW diperoleh dari PLN dan 1 buah generator sebesar 6.000 kW sebanyak 0,21 kg/jam, dan kebutuhan fuel oil sebanyak 507,54 kg/jam. Dari analisis ekonomi terhadap pabrik ini menunjukkan keuntungan sebelum pajak Rp1,232,612,023,573/tahun setelah dipotong pajak 28 % keuntungan mencapai Rp887,480,656,972/tahun. *Percent Return On Investment* (ROI) setelah pajak 31,1%. *Pay Out Time* (POT) sebelum pajak selama 2 tahun dan setelah pajak 3 tahun. *Break Even Point* (BEP) sebesar 59,9%, dan *Shut Down Point* (SDP) sebesar 50,83%. *Discounted Cash Flow Rate* (DCFR) terhitung sebesar 8,7%. Dari data analisa kelayakan di atas disimpulkan, bahwa pabrik ini menguntungkan dan layak dipertimbangkan untuk pendirian di Indonesia.

Kata- kata kunci: *silica powder*, sekam padi, *sol-gel process*, RATB

ABSTRACT

Silica powder plant is designed to supply the needs of silicon dioxide both inside and outside Indonesia. The planned capacity of 60.000 tons/year. The factory operates continuously during the 330 days in a year. This factory is planned to stand in Laren, Lamongan, East Java above land 203,694 m². The process of making silica powder using sol-gel process that is carried out in two stages in which both use Continuous Stir Tank Reactor (CSTR). For producing silica powder amounted to 60.000 tons/year (7575.76 kg/h) takes the raw material rice husk as much as 6018.76 kg/h, hydrochloric acid as much as 63391.3 kg/h, and sodium hydroxide as much as 8411.16 kg/h. Supporting utilities water supply include process amounted to 7,897.92 kg/h, water cooling of 5,018,807.97 kg/h, providing saturated steam of 1,064,713 kg/h, compressed air supply of 29.91 m³/h, provision of electricity of 4227,59 kW obtained from PLN and 1 generator of 6.000 kW as much as 0.21 kg/h, and the need for fuel oil as much as 507.54 kg/hour. Of economic analysis against the factory shows a profit before tax of Idr Rp1,232,612,023,573/year after the tax cut 28% profit reaches Rp887,480,656,972/ year. Percent Return On Investment (ROI) after tax of 31,8%. Pay Out Time (POT) before tax for 2 years and after tax 3 years. Break Even Point (BEP) of 59.9%, and Shut Down Point (SDP) of 50,83%. Discounted Cash Flow Rate (DCFR) accounting for issuance for 8,7%. Feasibility analysis of the data above, it was concluded that the factory is profitable and worth considering for the establishment in Indonesia.

Key words: silica powder, rice husk, sol-gel process, CSTR