

ABSTRAK

PRARANCANGAN PABRIK MAGNESIUM SULFAT HEPTAHIDRAT DARI MAGNESIUM OKSIDA DAN ASAM SULFAT DENGAN KAPASITAS 63.000 TON/TAHUN (Tugas Khusus Perancangan *Crystallizer* (CR-301))

Oleh

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Magnesium Sulfat Heptahidrat merupakan hasil produksi industri yang belum terealisasi produksinya di Indonesia. Industri produksi Magnesium Sulfat Heptahidrat berpotensi untuk menunjang bahan - bahan baku mentah bagi industri hilir dalam negeri serta meningkatkan nilai ekspor di dalam negeri. Proses pembuatan Magnesium Sulfat Heptahidrat yang umum digunakan adalah dengan mereaksikan bahan baku Magnesium Oksida dan Asam Sulfat dengan melewati beberapa proses diantaranya tahap pembentukan produk, Tahap pemurnian produk, dan Tahap penyimpanan produk. Penyediaan kebutuhan utilitas pabrik berupa sistem pengolahan dan penyediaan air, sistem pengolahan limbah, sistem penyediaan *steam*, *cooling water*, sistem refrigerasi dan sistem pembangkit tenaga listrik.

Kapasitas produksi pabrik direncanakan 63.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Lokasi pabrik direncanakan didirikan di daerah Gresik, Jawa Timur. Tenaga kerja yang dibutuhkan sebanyak 157 orang dengan bentuk badan usaha Perseroan Terbatas (PT) yang dipimpin oleh seorang Direktur Utama yang dibantu oleh Direktur Produksi dan Direktur Keuangan dengan struktur organisasi *line and staff*.

Dari analisis ekonomi diperoleh:

| | | |
|--|--------------------|-------------------------|
| <i>Fixed Capital Investment</i> | (FCI) | = Rp328.826.272.072 |
| <i>Working Capital Investment</i> | (WCI) | = Rp58.028.165.660 |
| <i>Total Capital Investment</i> | (TCI) | = Rp386.854.437.731,513 |
| <i>Break Even Point</i> | (BEP) | = 34% |
| <i>Shut Down Point</i> | (SDP) | = 23% |
| <i>Pay Out Time before taxes</i> | (POT) _b | = 1,162 years |
| <i>Pay Out Time after taxes</i> | (POT) _a | = 1,41 years |
| <i>Return on Investment before taxes</i> | (ROI) _b | = 65% |
| <i>Return on Investment after taxes</i> | (ROI) _a | = 52% |
| <i>Discounted cash flow</i> | (DCF) | = 46,27% |

Mempertimbangkan rangkuman di atas, penulis menyimpulkan bahwa pabrik Magnesium Sulfat Heptahidrat ini dapat dikaji lebih lanjut karena mempunyai prospek yang baik.

Kata kunci: Magnesium Sulfat Heptahidrat, Magnesium Oksida, Asam Sulfat

ABSTRACT

PRE-DESIGN OF A MAGNESIUM SULFATE HEPTAHYDRATE FACTORY FROM MAGNESIUM OXIDE AND SULFURIC ACID WITH CAPACITY OF 63,000 TONS/YEAR (Design of Crystallizer (CR-301))

By

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Magnesium Sulfate Heptahydrate is an industrial product whose production has not been realized in Indonesia. The Magnesium Sulfate Heptahydrate production industry has the potential to support raw materials for domestic downstream industries and increase the value of domestic exports. The commonly used manufacturing process of Magnesium Sulfate Heptahydrate is by reacting the raw materials Magnesium Oxide and Sulfuric Acid through several processes including Product formation stage, Product purification stage, and Product storage stage. Provision of factory utility needs in the form of a water treatment and supply system, a waste treatment system, a steam supply system, cooling water, a refrigeration system and a power generation system.

The factory's production capacity is planned to be 63,000 tons per year, with 330 working days in a year. The factory location is planned to be established in the Gresik area of East Java. The required workforce is 157 people in the form of a Limited Liability Company (PT) business entity led by a Main director, who is assisted by the Director of Production and the Director of finance, with a line and staff organizational structure.

From the economic analysis obtained:

| | | |
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Considering the summary above, the authors conclude that this Magnesium Sulfate Heptahydrate factory can be studied further because it has good prospects.

Key Words: Magnesium Sulfate Heptahydrate, Magnesium Oxide, Sulfuric Acid