

## ABSTRACT

### DESIGN OF STEARIC ACID PLANT FROM STEARINE AND WATER CAPACITY 20,000 TONS / YEAR (Design Crystallizer (CR-301))

By  
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Stearic acid is a chemical intermediate can be used as a raw material surfactants, methyl ester, soap and detergent, emulsifier, stabilizer as an ingredient in various types of food products and medicines, as a wetting agent in textiles, plasticizer in packaging industry and as an ingredient used in the rubber vulcanization process in the polymer industry, through a saponification reaction. This product is produced from the hydrolysis reaction oils or fats with water.

Needs of stearic acid increased from year to year indicated by the increasing imports of Indonesia to stearic acid. So Stearic acid plant is needed to support the development of domestic industries.

Stearic acid produced by react stearine and water in a stirred flow reactor (CSTR) at a temperature of 260 °C and pressure of 47.6 atm. The output of the reactor in the form of stearic acid, oleic acid, glycerol, water and unreacted stearine separated again by decantation process. Mixed stearic acid, oleic acid and unreacted stearine again purified in distillation column, and then performed the separation of stearic acid with oleic acid by solvent process cryatallization. Glycerol and water as a result of side reactions was purified again until 67 % purity.

Factory production capacity is planned 20,000 tons / year with 330 working days within 1 year. The location of the plant planned to be located in the area of Jambi is located in the Teluk Sialang District, Jambi. Labor needed as many as 189 people with a form of business entity Limited Liability Company (PT) led by a Director who is assisted by the Director of Production and Financial Director with line and staff organizational structure.

Provision of utility plant needs a treatment system and water supply, steam supply systems, instrument air supply systems, and power generation systems. From the economic analysis is obtained:

|                             |       |                      |
|-----------------------------|-------|----------------------|
| Fixed Capital Investment    | (FCI) | = Rp 158,366,303,295 |
| Working Capital Investments | (WCI) | = Rp 27,946,994,699  |
| Total Capital Investment    | (TCI) | = Rp 186,313,297,994 |
| Break Even Point            | (BEP) | = 35.6150 %          |

|                                   |          |               |
|-----------------------------------|----------|---------------|
| Shut Down Point                   | (SDP)    | = 19.8833 %   |
| Pay Out Time Before Taxes         | (POT), b | = 1.8083 year |
| Pay Out Time After Taxes          | (POT), a | = 2.1626 year |
| Return on Investment Before Taxes | (ROI), b | = 38.5058 %   |
| After taxes Return on Investment  | (ROI), a | = 30.8046 %   |
| Discounted Cash Flow              | (DCF)    | = 32.8574 %   |

Considering the above summary, it is proper establishment of acetone plant is studied further, because it is a factory that is profitable and has good prospects.