

ABSTRACT

PREDESIGN OF CALCIUM SULFATE DIHYDRATE PLANT FROM CALCIUM HYDROXIDE AND SULFURIC ACID CAPACITY OF 300,000 TON / YEAR (Design Of Continuous Stirred Tank Reactor (Re-201))

**By
DIYAN SEERA**

Calcium sulfate dihydrate, or better known as gypsum is a chemical used as a mixture of cement, plaster and wallboard.

Requirement of calcium sulfate dihydrate in Indonesia has increased each year in line with the increasing physical development in the country. To meet this need, calcium sulfate dihydrate is still a lot on imports from abroad. So that the plant is needed calcium sulfate dihydrate.

Calcium sulfate dihydrate produced by reacting calcium hydroxide and sulfuric acid in the CSTR at 40 ° C and a pressure of 1 atm with 95% conversion. The output of the reactor are removed in a RDVF. The main product output $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ be sent to the RD to be dried so that the resulting calcium sulfate dihydrate with purity of 95%.

Plant's production capacity is planned 300,000 tons / year with 330 working days in a year. Manufacturing site is established in an area planned industrial park was established in Gresik, East Java. Manpower needed as many as 151 people with a business entity form Limited Liability Company (PT) which is headed by a

Director who is assisted by the Director of Production and Director of Finance 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. 470.486.030.533
Working Capital Investment (WCI)	= Rp. 83.026.946.565
Break Even Point (BEP)	= 55,24 %
Shut Down Point (SDP)	= 49,18 %
Pay Out Time before taxes (POT) b	= 1,1229 years
Pay Out Time after taxes (POT) a	= 1,3653 years
Before taxes Return on Investment (ROI) b	= 67,19 %
After taxes Return on Investment (ROI) a	= 53.76%

Consider the summary above, it is proper establishment of the plant calcium sulfate dihydrate was studied further, because it is a profitable plant and has good prospects.