

ABSTRAK

**PRARANCANGAN PABRIK *TRICRESYL PHOSPHATE* DARI *CRESOL*
DAN *PHOSPHORUS OXYCHLORIDE* DENGAN KAPASITAS 20.000
TON/TAHUN
(Prancangan *Absorber* (AB-201))**

Oleh

DIANDRA PUSPARINI

Tricresyl Phosphate (TCP) merupakan bahan yang digunakan dalam aplikasi industri seperti *plasticizers* (bahan pelunak), *cable coating* (pelapis kabel), zat penghambat api pada plastik dan karet, serta sebagai bahan aditif tambahan dalam cairan. Pabrik *Tricresyl Phosphate* dari *Cresol* dan *Phosphorus Oxychloride* dengan kapasitas produksi 20.000 ton/tahun yang direncanakan beroperasi pada tahun 2028 selama 330 hari per tahun. Pabrik ini didirikan di Kawasan Industri Katibung, Lampung Selatan. Reaksi pembentukan *Tricresyl Phosphate* dilakukan dalam *Bubble Reactor* (Reaktor Gelembung), dengan bahan baku *Cresol* sebanyak 2.281,03995 kg/jam dan *Phosphorus Oxychloride* sebanyak 1.077,6 kg/jam serta katalis berupa *Magnesium Chloride* sebanyak 33,33 kg/jam yang berlangsung pada kondisi operasi isothermal pada suhu 150°C, 1,5 atm, dan konversi sebesar 93% dengan sifat reaksi eksotermis. Penyediaan kebutuhan utilitas pabrik *Tricresyl Phosphate* berupa unit penyediaan air, *steam*, *Dowtherm A*, udara instrumentasi serta pengadaan Listrik dari PLN dan satu buah generator set.

Dari analisis ekonomi diperoleh:

<i>Fixed Capital Investment</i>	(FCI)	= Rp349.296.012.728
<i>Working Capital Investment</i>	(WCI)	= Rp61.640.472.834
<i>Total Capital Investment</i>	(TCI)	= Rp410.936.485.562

<i>Break Event Point</i>	(BEP)	= 42,580%
<i>Shut Down Point</i>	(SDP)	= 22,983%
<i>Pay Out Time before taxes</i>	(POT)_b	= 1,365 Tahun
<i>Pay Out Time after taxes</i>	(POT)_a	= 1,932Tahun
<i>Return on Investment before taxes</i>	(ROI)_b	= 53,775%
<i>Return on Investment after taxes</i>	(ROI)_a	= 35,491%
<i>Discounted Cash Flow</i>	(DCF)	= 42,049%

Mempertimbangkan paparan di atas, sudah selayaknya pendirian pabrik *Tricresyl Phosphate* ini dikaji lebih lanjut, karena merupakan pabrik yang menguntungkan dan mempunyai masa depan yang baik

ABSTRACT

PREDESIGN OF A TRICRESYL PHOSPHATE PLANT FROM CRESOL AND PHOSPHORUS OXYCHLORIDE WITH A CAPACITY OF 20,000 TONS/YEAR (Design of Absorber (AB-201))

By

DIANDRA PUSPARINI

Tricresyl Phosphate (TCP) is a material used in industrial applications such as plasticizers, cable coatings, flame retardants in plastics and rubber, as well as additional additives in liquids. The Tricresyl Phosphate plant from Cresol and Phosphorus Oxychloride with a production capacity of 20,000 tons/year is planned to operate in 2028 for 330 days per year. This plant was established in the Katibung Industrial Area, South Lampung. The reaction to form Tricresyl Phosphate was carried out in a Bubble Reactor, with Cresol as raw materials as much as 2,281.03995 kg/hour and Phosphorus Oxychloride as much as 1,077.6 kg/hour and a catalyst in the form of Magnesium Chloride as much as 33.33 kg/hour which took place under conditions isothermal operation at a temperature of 150°C, 1.5 atm, and conversion of 93% with exothermic reaction properties. Providing utility needs for the Tricresyl Phosphate plant in the form of water supply units, steam, Dowtherm A, instrumentation air as well as electricity procurement from PLN and one generator set.

From the economic analysis it is obtained:

Fixed Capital Investment	(FCI)	= Rp349.296.012.728
Working Capital Investment	(WCI)	= Rp61.640.472.834
Total Capital Investment	(TCI)	= Rp410.936.485.562
Break Event Point	(BEP)	= 42,580%

<i>Shut Down Point</i>	(SDP)	= 22,983%
<i>Pay Out Time before taxes</i>	(POT)_b	= 1,365 Tahun
<i>Pay Out Time after taxes</i>	(POT)_a	= 1,932Tahun
<i>Return on Investment before taxes</i>	(ROI)_b	= 53,775%
<i>Return on Investment after taxes</i>	(ROI)_a	= 35,491%
<i>Discounted Cash Flow</i>	(DCF)	= 42,049%

Considering the explanation above, it is appropriate to study the establishment of this Tricresyl Phosphate plant further, because it is a profitable plant and has a good future.