NPK Fertilizer Plant Made of Composed Raw Material, Ie Urea, ZA, KCl, NH₃, and H₃PO₄ Through Mixed Acid Process

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Abstract

NPK fertilizer plant made of raw material composed, of urea, KCl, ZA, NH₃ and H₃PO₄ has a capacity of 300,000 tons/year. The fertilizer is used for enriching and increasing plant productivity. The selected location in Paciran (East Java) is based on raw material and the easy of transportation. This plant is operated for 22 hour/day and 330 days/year.

The production process of NPK fertilizer consists of 4 stage. Stage 1: all solid materials and recycle product are homogenation in Pug Mill. Stage 2: liquid raw materials is neutralized to produced ZA liquid and MAP. Stage 3: the neutralization product, homogenation product, NH₃ and H₃SO₄ are mixed together to convert ZA liquid and MAP to DAP simultaneously to form granulation. Stage 4: in the finally process, the granulation product is drying, screening, and coating to obtain the quality product: 1-1,5% water and 4-10 mesh.

To get capacity product of 300,000 ton/year need raw material ie NH₃ 36,570 tons/year, H₃PO₄ 90,000 tons/year, urea 18,900 tons/year, KCl 75,000 tons/year, and ZA 30,000 tons/year. Additional materials is coating oil 600 tons/year, coating powder 2,400 tons/year, and H₂SO₄ 49,500 tons/year. The plant need utility consumption, ie water sanitation, 1.42 m³/h, boiler feed water 123,37 m³/h, and cooling water 27,17 m³/h.

Keywords: NPK Fertilizer, mixed acid