ZA (Ammonium Sulphate) Fertilizer Plant From Ammonia and Sulfuric Acid With Neutralization Process

Name / NRP : Renata P. NRP. 2308 030 013
Friska R. NRP. 2308 030 014
Major : Chemical Engineering D III FTI – ITS
Supervisor : Prof. Dr. Ir. Danawati Hari Prajitno, M.Pd

Abstract

ZA (Ammonium Sulphate) fertilizer plant is built to fulfill requirement of consumer of fertilizer, either domestic and export. ZA fertilizer plant will be located in the area of Paciran, Lamongan district, East Java and will operated continuously for 24 hours / day and 330 days / year. The resulting ZA (ammonium sulphate) fertilizer production capacity of 340,000 kg / day is made by neutralization process using De Nora technology.

ZA fertilizer production process consists of five stages. The first stage is the evaporation of liquid ammonia. The second stage is the reaction between ammonia and sulfuric acid (neutralization reaction) followed by the formation of ammonium sulfate crystals in a saturator at 105°C and atmospheric pressure. The third stage is the separation of ammonium sulfate crystals from the solution of the mother liquor and sieving on 30 mesh. The fourth stage is the drying of ammonium sulfate crystals at 110°C to achieve a water content of 0.15%. The last stage is the packaging of products on the commercial size 25 kg.

To achieve the capacity of production, raw materials used are 88.677 kg / day of ammonia (NH₃) and 257.280 kg / day of sulphuric acid (H₂SO₄) and 342.57 kg / day of material support anticaking (uresoft 150). The plant needs of utilities consumption, i.e sanitary water, cooling water, boiler feed water and process water, each of 20.227 m³/day, 441.93 m³/day, 16.358 m³/day and 3.61 m³ / day.

Keyword : Fertilizer of Ammonium Sulphate, Neutralization.