

Population and Granulation

Author

Mojtaba Hosseinzadeh

Abstract

Due to its high nitrogen content and easy absorption by plants, urea is being increasingly used in today's agriculture and fertilization industries around the world. Urea formulation is synthesized in production units under various licenses and provided to the market in different forms. Granular urea is one of the newest methods of offering this product which has been welcomed not only by consumers, but also by many urea process design licenses.

In this method, a stream of under size products is constantly circulating in the system. These seeds are always present in the granulator chamber as primary nuclei. Meanwhile, fine droplets of molten urea (which are formed by the nozzles at the chamber floor and by spouting air flow) adhere to these seeds. During this process, the primary nucleus grows and dries as it grows in size.

Finally, the product is discharged from the chamber in form of a mixture of under, normal and over size granules. After being separated, normal sized granules are sent to be loaded and stock in the storehouse as the final product. At the same time, under size granules are directly returned to the chamber while over size undergo a crushing phase before being reverted to the main chamber and used as the primary nuclei.

In the following sections, the article aims to describe some key points contributing to maintaining and enhancing the quality of granulation and its associated operational conditions by computing and analyzing the empirical data obtained from the 3250-MTPD Granular Urea Plant of Shiraz Petrochemical Complex, licensed by Toyo Engineering Corporation (TOYO).