

Nufarm Polymerization Inhibitors for Acrylonitrile

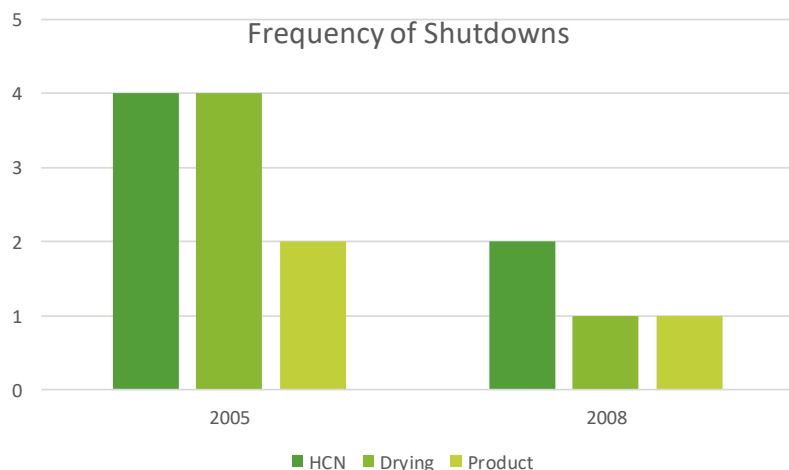
Acrylonitrile (ACN) is largely produced using the SOHIO process with propylene, ammonia and air (oxygen) as the raw materials giving acrylonitrile, water and HCN as products. The HCN can be recovered as a commercial product (a raw material for MMA production). The purification of ACN is essentially split into two sections (i) Recovery of ACN by quenching the gaseous reaction product in water and (ii) Purification of ACN to give the polymer grade product. Purification of the product includes a HCN column, a drying column and then the final product column.

Fouling in the acrylonitrile plant can occur in the HCN column but this is largely anionic polymerization of the HCN and cannot be controlled by free radical inhibitors. There are products that can mitigate this polymer formation and good engineering techniques combined with dispersants are used to keep this column free of fouling.

Free radical polymerization occurs in acrylonitrile, causing fouling of the column plates and the reboiler, and can be inhibited using stable free radical inhibitor products. Nufarm has developed a proprietary product for acrylonitrile polymerization inhibition that has provided excellent results as the **case history** below demonstrates.

2005: Hydroquinone/Phenylenediamine treatment

2008: **Nufarm treatment, Inhibitor AHM N720**



The reduction in annual cleaning costs for this plant was in the order of US\$570,000.

- Manual handling of solid inhibitors into toxic liquids was completely eliminated.
- AHM N720 also increased ACN/water separation rates in two decanters, thus increasing plant efficiencies.

This customer has been using AHM N720 for the last 16 years since the plant trial.