

Cooling Section: Inhibitor AHM P500 to Prevent Fouling

Post reactor the hot gaseous styrene is cooled in heat exchangers and condensers. This area can foul with polymer as it is often uninhibited and is prone to cross-linked polymer as the higher boiling DVB contaminant will condense first. Following cooling the dehydro mix passes to the oil/water separator.

Inhibitor AHM P500 was developed in the Nufarm R&D lab for use in higher temperature applications. It is an SFR type molecule, but it is stable at higher temperatures than other Tempo molecules.

In addition to the high temperature stability Inhibitor AHM P500 has other useful properties;

- It is a liquid in the pure state. It does not require a solvent to be transported or pumped.
- It is physically and chemically stable between -20°C and $+50^{\circ}\text{C}$ for transport and storage
- It is insoluble in water. This is especially important because the water in the oil/water separator is not contaminated
- It is completely miscible with EB and styrene
- It can give protection against DVB polymerisation and prevent insoluble cross-linked polymer from forming

We have plant trial evidence of the molecule performing better in the prevention of high-temperature cross-linked fouling than other products

Off-Gas Compressor

Off-gas compressors run at different temperatures and can suffer from varying amounts of styrene polymer fouling. Most run with wash water for cooling but was oil can also be used as in the example below. EB has solvating properties for polymer but at this customer an oil soluble inhibitor was also added to keep the compressor free of polymer. Nufarm also has water soluble inhibitors for wash water but it is important that all inhibitors used can work in the oxygen free conditions of the compressor

