Distillation Section: Green Retarders for Styrene Production

The “green” retarders offer an alternative to DNBP, which is highly toxic. They have been in commercial use for around 20 years but take-up is still not widespread due to the higher treatment cost compared to DNBP. They produce less NOx and have lower human toxicity but are still classified as toxic to the environment.

Retarder S440/S450 are commercialized products in use in a number of styrene units and are based on quinone methide technology. They are supplied as 40% or 50% solutions in ethylbenzene. The lower strength has extra cold temperature stability.

- Effective at temperatures up to 120°C
- *Retarder S440/S450* is not classified as toxic
- No NOx when distillation tars are burnt.
- Easy to handle solutions

The green retarders are used in combination with a true inhibitor for optimum performance.

Case History

POSM plant, 450 KTPA styrene monomer, Lights column bottom 95°C

2024	SM Production ton	Retarder consumption kg/t	Lights column polymer (ppm)	Styrene column polymer (ppm)	Program
Jan	37900	0.58	172	2603	Competitor
Feb	33900	0.56	170	2204	
Mar	33300	0.57	171	2239	
Apr	32600	0.76	131	1583	
Apr 16-May 26	38300	0.56	120	1405	Nufarm

For all our Green Retarder technologies, Nufarm’s experienced and skilled Technical Service Team will be on hand to guide you through all aspects of a plant trial/introduction.

Retarder MB-1 is a Nufarm patented formulation for use in styrene in combination with a true inhibitor.

The combination of *Retarder MB-1* and a true inhibitor provides excellent control of polymer during styrene distillation and is successfully used in several commercial styrene distillation units.

- Effective at temperatures up to 120°C
- *Retarder MB-1* is not classified as toxic
- Reduced NOx when distillation tars are burnt.
- Easy to handle solutions

Retarder MB-1 is not classified as toxic and is supplied as a 55% solution in ethylbenzene as standard.