HP Thermopro D

Anti - foulant additive for DHDS pre-heat exchangers

Fouling of refinery process equipment is a common problem resulting in severe economic penalties. Typical problem areas include preheat exchangers, furnaces and reactor beds. Multiple factors impact fouling including equipment design, flow rates, temperature, operational severity and fluid characteristics. Fouling in DHDS is caused by polymerization reactions initiated by fouling precursors such as olefins. Due to polymerisation, the molecular chain length increases to the point that solubility in the DHDS feed is exceeded and deposition occurs. Unsaturates (especially conjugated double bond olefins) originating from cracked streams blended in DHDS feed mainly contribute to extremely high fouling tendency.

Fig.1: Fouled heat exchanger

Antifoulant is required to mitigate the polymerization of olefins and also to keep the foulants formed in dispersed state. HPGRDC has developed a novel, cost effective formulation which will mitigate the fouling and improve the pre-heat in DHDS heat exchangers.

Performance evaluation of the formulations was carried out with actual DHDS feed using a lab scale Refinery Process Fouling Simulator (RPFS).The in-house developed formulations exhibited superior performance in comparison with the commercial benchmarks. For the same dosage i.e 10 ppm of the additive, the delta T, i.e the difference in outlet temperature between start and end of the fouling experiment where a heated rod is allowed to exchange heat with diesel sample was measured. Results of the finalized formulation AFD -5 in comparison with benchmark additive (commercial) is provided below:

Formulation	ΔT in °C
	Sample 2
W/O antifoulant	60.0
Commercial Antifoulant	57.2
AFD-5	7.1

Trials at HPCL – VR DHDS unit has also provided better fouling mitigation compared to benchmark

Commercial antifoulant Vs Thermorpo D: