

Gas Oil Additive to reduce Pour Point

Overview

Gas oils are generally defined in the petroleum industry as hydrocarbon fractions in a crude oil ranging between the kerosene fraction and the lubricating oil fraction. However, the boundaries of the gas oil fraction can overlap into adjacent fractions within the standard definition employed. Some part of the gas oils are higher boiling portions of the gas oil and are recovered under vacuum, for e.g. 0.05 - 0.2 atmosphere.



Petroleum hydrocarbon oils employed in cold climates or exposed to low temperature, frequently require the use of an additive to maintain their fluidity, e.g. in pipeline transportation, or to meet pour point specifications. Additives that are effective for this requirement are called Pour Point Depressants (PPD).

Challenge

PPDs are mostly different molecular weight organic compositions polymers prepared from acrylates and alkylated anhydrides. Many of these additives are not entirely suitable in gas oils because they are relatively ineffective in reducing the pour point of gas oil base stocks containing higher molecular weight waxes. Other reasons being high cost & high concentration of additives required. The poor performance of these additives may result from the structural and/or molecular weight difference of waxes occurring in the various oil fractions. For selecting best suitable PPD, one must test different polymers on a particular gas oil to check its efficacy and modify polymer based on the initial results.

Solution

A European major service company approached Thermax for suggesting a suitable PPD for gas oil as they were facing issues with maintaining desired pour point specifications & also to improve fluidity. Until then Thermax PPDs were not used or tested for gas oil application. After meeting the customer and understanding their pain areas, a thorough research was conducted based on which Polymers were selected & a PPD kit was prepared and sent to the service company for testing in their lab.

Result

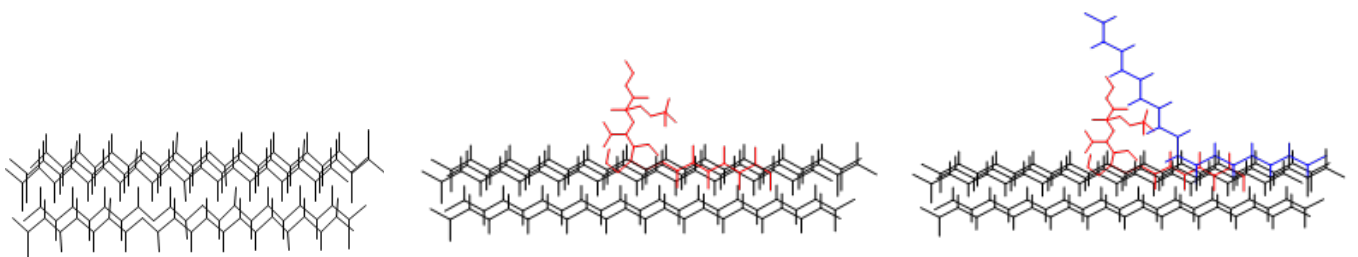
Service company shortlisted couple of polymers for further trials at end user lab on fresh gas oil. One of the polymers got finalised for field trial considering dosage and price of individual polymer. Generally, we sell our PPDs as technical grade i.e. with highest feasible active content. But in this case, the service company specifically asked us to make diluted version of same polymer since dilution at their end was not giving desired results. The field trial was also successful in reproducing lab tested results.

The gas oil sample, when tested had a blank pour point of about 39°C. The end user asked for the reduction in pour point to 9°C; to handle the oil effectively in their refinery unit. We tested various PPDs from our product basket and below are the results:

| PPD | Pour point with 400 ppm dose, °C |
|--------|----------------------------------|
| MD 70 | 24 |
| MD 45 | 21 |
| MD 62 | 18 |
| MDS 78 | 15 |
| MDS 82 | 12 |
| MDS 26 | 09 |



From the above results, we could suggest the right product fit to service company to satisfy their requirement of 9°C final pour point at the refinery, when tested as per standard ASTM D97 testing method.



Success Story

Post field trials, we were awarded bulk orders from the customer initially on monthly basis and later quarterly basis. Service company's Quality Assurance Manager visited our Jhagadia, Gujarat factory for audit and was extremely happy to see the manufacturing and quality control practices. After few months of successful execution of orders, the service company entrusted us & gave us permission to do an in-house pre-dispatch testing of PPD performance. Customer representative visited our laboratory for finalizing the testing method and was mighty satisfied with the product performance and consistency over various plant batches. We started testing performance of each batch at production location before clearing the quality check. The order quantity increased beyond our factory license for oilfield chemicals and thereby we started manufacturing this PPD at both our manufacturing locations. Within one year, we have successfully executed order for 106 ISO tanks containing more than 2000 MT quantity. There was no delay in delivery nor there was any quality related complaint. Henceforth, Thermax is quite positive of getting repeat and additional business from our happy & satisfied customer as and when they bid in future.

