



THERMINOL

Heat Transfer Fluids by Eastman

Hello, Therminol. Goodbye, mineral oil sludge.

PROBLEM

After years of exclusive mineral oil use in its heat transfer systems, Merino Laminates was unable to maintain optimal operating temperatures in its plant in Hapur, India, causing increased operating expenses and decreased production.

ANALYSIS

Test results indicated the mineral oil experienced severe thermal stress and oxidation. The thermal degradation led to the formation of carbon particles and resulted in sludge formation and blockage of the radiators and heat exchangers, causing severe inefficiencies in the heat exchangers, lower production throughput, and higher fuel consumption.

SOLUTION

With the help of Eastman's TLC Total Lifecycle Care® program, the system was cleaned with Eastman Therminol® FF flushing fluid. Additionally, the mineral oil was replaced with Therminol® 55 heat transfer fluid, a synthetic fluid noted for its precise temperature control and thermal stability.

RESULT

Before the changeover, production levels had dropped 40%. Now, with Therminol in the system, the plant has returned to its optimal operating temperature and surpassed previous production levels.

Wood laminate cabinets and paneling products from India-based Merino Laminates are widely admired for their elegant beauty and style. Since its founding in 1968, the Merino Group has grown to become a \$165 million company with 3,000 employees. As part of the Merino Group and exporting to 60 countries, Merino Laminates has become India's largest manufacturer of laminates.

The company's plant in Hapur had a decidedly unglamorous problem—mineral oil sludge in its heat exchange system. The company had used mineral oil exclusively for 15 years. But their Hapur plant system began to show signs of thermal degradation only four years after a mineral oil fill-up. Initially, the system successfully operated at 230°–240°C. But as time went on, engineers gradually had to increase the operating temperature to 270°C to achieve the needed process-side air temperature and throughput. The impregnation machines slowed because the desired heat exchange wasn't being reached with the compromised mineral oil. As a result, the deposition of sludge in heat exchangers caused a slowdown in production, often as much as 40%. In turn, operating costs increased. Another side effect—start-up time grew increasingly longer each week.

Clearly, a new solution to this murky problem was needed. Plant engineers called Eastman Therminol experts, who understood Merino's need for precise temperature control. Step one was an immediate request for an in-service heat transfer fluid sample to test and investigate the cause of the problem. The test was performed as part of the TLC Total Lifecycle Care® program, a

comprehensive program which includes sample analysis, system design support, operational training, safety awareness training, start-up assistance, and flushing and refilling of fluids.*

The results of the in-service test sample indicated the mineral oil was extensively thermally stressed. The mineral oil displayed elevated acidity, high viscosity, and insoluble solids. On further inspection, loose carbon particles were found settling in low-lying areas of the heat exchangers, causing the sludge that created inefficient heat exchange.



With mineral oil, loose carbon particles gathered in low-lying areas, causing sludge.

To clean out the sludge and restore system efficiency, the TLC team recommended Therminol FF flushing fluid. To minimize downtime, the Therminol team provided hands-on assistance with lowering the operating temperature and properly mixing Therminol FF into the existing mineral oil. This loosened and entrained the degradation solids within the flushing fluid and helped clean the system without disrupting operations.

*Flushing and refilling services are not currently supported in North and South America.



After the system was sufficiently cleaned, the TLC team continued assisting with the changeover from mineral oil to Eastman Therminol® 55 heat transfer fluid. Therminol engineers assisted in verifying the material compatibility for system components to help ensure there were no surprises. The process was managed over the course of eight days, and the expert Therminol team was on-site to help them each step of the way.

Therminol 55 was selected because it is a highly stable synthetic heat transfer fluid that could eliminate Merino's mineral oil sludge problem. It is ideal for use in nonpressurized/low-pressure indirect heating systems, delivering efficient, dependable, and uniform process heat with no need for high pressure.

Before the changeover, production levels dropped 40%. But thanks to Therminol, the plant has returned to its optimal operating temperature and previous production levels have been surpassed. Thermal efficiency has improved thanks to a reduction in fuel consumption, and operating throughput has increased 40% compared to system operation with degraded mineral oil.

With Therminol 55, proper system maintenance, and guidance from the TLC program, this facility can expect to run at its optimal operating temperature and production capacity for 15 years or more.

Shashikant Bhagwat, DGM at Merino Industries, shares, "After switching over to Therminol 55, we experienced many benefits like increases in production output, better heat transfer efficiency, and lower fuel consumption. In addition, we truly appreciate the on-site assistance given by Therminol technical experts and the various recommendations given regarding our HTF system."

Therminol fluids are designed to provide precise temperature control—and peace of mind. When used correctly, they provide years of trouble-free service.

Efficiency, optimal heat exchange, in-service fluid sampling, technical troubleshooting, and ongoing support—that's the Therminol advantage.



For more information, visit our website, Therminol.com.

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