

# Converting from mineral oil to Therminol 66<sup>®</sup> for enhanced performance

*Enhancing efficiency and reliability – the impact of switching to Therminol 66 synthetic oil in various industries*

## Customer 1

Plastic extrusion and processing

## Case

Therminol 66 vs. mineral oil

### Problem

The customer was using mineral oil at a temperature that created many low boilers and decreased the fluid's flash point, requiring venting more than once a year. In addition, the fluid condition caused system components to fail, resulting in unplanned maintenance.

### Analysis

Mineral oil was traditionally used but could not effectively handle the plant activity, resulting in operational failures.

### Solution

Eastman and KRAHN technical teams provided the customer with data on the thermal stability of synthetic heat transfer fluid (HTF) compared to mineral oil, demonstrating how the right HTF can help prevent certain problems such as continuous venting and top-up activity.

### Result

The customer now uses Therminol 66, and the facility is operating more effectively at the same temperature without the need for excess venting. This has reduced the cost of unexpected plant maintenance, operating expenses and fluid top-ups.

## Customer 2

Textile manufacturing processes

## Case

Therminol 66 vs. mineral oil

### Problem

This customer believed mineral oil was essential, but it led to significant issues for their system. Insoluble solids, or sludge, formed due to the low oxidation stress resistance of mineral oil and caused pump seal failure. This resulted in fluid leakage, difficulties maintaining the correct temperature and increased maintenance costs.

### Analysis

Mineral oil lacks thermal and oxidation stability compared to synthetic heat transfer fluids. This leads to the formation of sludge and issues with fluid circulation. The pump problems lead to additional system venting. Consequently, the customer was unable to maintain stable operations, resulting in lost production time, increased costs and additional maintenance issues.

### Solution

Eastman and KRAHN recognized these issues and assisted the customer in selecting a stable synthetic heat transfer fluid with the right heat transfer coefficient. They also provided guidance on designing a more suitable system.

As a result, the need for constant maintenance on the pump seals was resolved.

### Result

Therminol 66 has demonstrated exceptional performance by operating continuously for 30 years without any shutdowns caused by sludge or pump issues. The customer is satisfied and considers the decision to switch to a synthetic heat transfer fluid the correct choice. The remarkable thermal stability of Therminol 66 ensures the smooth operation of the heat transfer system without any adverse impact on production.

### Customer 3

Polymer production

### Case

Therminol 66  
vs. mineral oil

#### Problem

When using large volumes of heat transfer fluid, degradation can lead to increased issues. In this case, the customer's facility operated at a high temperature with mineral oil, resulting in low boilers and insoluble solids. Eventually, production became unsustainable.

#### Analysis

When considering the maximum operating temperature, the low thermal stability of the mineral oil compared to Therminol 66 was a major problem for the customer. With Therminol 66, low boilers and insoluble solid formation is reduced, which reduces the typical thermal stress mineral oil can experience at a certain temperature.

#### Solution

By using a heat transfer fluid that remains stable at high temperatures without succumbing to the typical effects of thermal stress, the customer can operate its facility at higher temperatures when necessary.

#### Result

The issues were resolved, and the customer has successfully used the same heat transfer fluid for over 27 years. When the customer's process requires higher temperatures, the system can operate without reaching the upper limit of the heat transfer fluid's capabilities.

### Customer 4

Food/meat processing

### Case

Therminol 66  
vs. mineral oil

#### Problem

Selecting the appropriate heat transfer fluid is crucial to prevent long-term issues. In this case, the use of a mineral-oil-based fluid resulted in numerous problems, including heavy thermal stress that frequently lowered the flash point and necessitated frequent fluid replacements.

#### Analysis

The mineral-oil-based fluid exhibited low thermal stability and high viscosity, leading to significant thermal stress that hindered proper plant operation. This resulted in increased maintenance costs, continuous service requirements and the need for frequent fluid volume replacements.

#### Solution

The customer transitioned to a more stable product specifically designed to withstand thermal stress, avoiding major maintenance issues and reducing associated costs.

#### Result

The customer's heat transfer system is now operating seamlessly without any problems. Replacing the incorrect fluid with Therminol 66 has significantly reduced maintenance expenses and production losses.

## Customer 5

Chemical/process reactions

## Case

Therminol 66 vs. mineral oil

### Problem

When a process requires continuous operation to maintain desired production quality, using an inappropriate heat transfer fluid can pose significant challenges. In this case, the selection of mineral oil was driven by its low initial investment cost. However, over time, this choice resulted in decreased production and unnecessary risks.

### Analysis

The presence of many low boilers and insoluble solids in the mineral oil rapidly diminished the heat transfer coefficient of the fluid. As a result, it was unable to maintain the required temperature for the production process. Additionally, the maintenance efforts doubled, leading to unforeseen expenses.

### Solution

Through continuous technical support and a thorough analysis of the heat transfer fluid, the problem was identified. The customer required a stable heat transfer fluid with optimal heat exchange capabilities and a long life span.

### Result

The customer can now operate its plant without concerns about the fluid's ability to withstand higher temperatures. The process has continued for over 24 years without the occurrence of low boilers or insoluble solids in the circuit. The exceptional thermal stability of Therminol 66 effectively prevents issues and ensures proper plant operation.

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