Huntsman Performance Products brings together innovation and world-leading process technologies to produce more than 2,000 components used to formulate products that enhance people’s lives:

- **Amines:** Maleic Anhydride:
- **Ethylene and Derivatives:**
- **Surfactants:**
- **Chlorine-based Chemicals:**
- **Phenolics:**
- **Nitric Oxide:**
- **Phthalic Anhydride:**

About Huntsman
Huntsman Corporation is a publicly traded global manufacturer and marketer of differentiated and specialty chemicals with 2017 revenues of approximately $8 billion. Our chemical products number in the thousands and are sold worldwide to manufacturers serving a broad and diverse range of consumer and industrial end markets. We operate more than 75 manufacturing, R&D and operations facilities in approximately 30 countries and employ approximately 10,000 associates within our four distinct business divisions. For more information about Huntsman, please visit the company’s website at www.huntsman.com.

Huntsman Performance Products
Performance Products brings together innovation and world-leading process technologies to produce more than 2,000 components used to formulate products that enhance people’s lives:

- **Amines:** One of the largest global producers of specialty amines used in composites, coatings, fuel and lube additives, and gas treating
- **Maleic Anhydride:** A leading global producer and supplier into areas such as unsaturated polyester resins, food, oil additives and coatings
- **Surfactants:** Integrated producer of a wide range of products for home and personal care, offset, agriculture, and process industries
- **Ethylene and Derivatives:** Highly integrated manufacturer of ethylene, ethylene oxide, ethylene glycol and other derivatives

Contact a Huntsman sales representative for more information.

www.huntsman.com/pp
Huntsman offers numerous pour point depressants for waxy crystalline structure of the paraffins, making it difficult for them to form a "plug," thus improving crudes. Our chemistries work by modifying the 

Additionally, Huntsman offers a full line of linear alcohol ethoxylates and alkylbenzenesulfonic acids, which can be used along with other solvents, to help disperse the paraffins found in crude production.

### Paraffin Control Product Offering Overview

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Oil &amp; Gas</th>
<th>Petrochemicals</th>
<th>Surface Treatment</th>
<th>Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pour Point Depressants</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>FOUGLERS</td>
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<tr>
<td>JEFF-FLOW® P 350</td>
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<tr>
<td>JEFF-FLOW® P 811</td>
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<td>JEFF-FLOW® P 911</td>
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<tr>
<td>JEFF-FLOW® P 950</td>
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<tr>
<td>JEFF-FLOW® P 964</td>
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</tbody>
</table>

**Sculpting Block/Components**

- ALKYLARYL SULFONIC ACIDS
- MONOETHANOLAMINE (MEA)
- SURFONIC®
- TERIC®

**Formulated Materials**

- ALKYLARYL SULFONIC ACIDS
- MONOETHANOLAMINE (MEA)

### Rheological Studies

In this case study, JEFF-FLOW® products tested at 500 ppm dose rate. This data is in reference to the South East Asian crude with a blank pour point of 30°C.

**Rheology studies with the same samples revealed a significant improvement in the flowability of the crude after treatment with JEFF-FLOW® P 962 (JEFF-FLOW® Paraffin Inhibitors). These products offer not only a reduction in pour point of the crude, but also a reduction in its viscosity, even as the temperature is decreased.

**Dynamic Viscosity vs Temperature**

In this case study, JEFF-FLOW® P 964: Viscosity of Paraffinic Crude Oil

**Paraffin Inhibitors**

- **Jeff-FLOW® P 350**
- **Jeff-FLOW® P 811**
- **Jeff-FLOW® P 911**
- **Jeff-FLOW® P 950**
- **Jeff-FLOW® P 964**

* Aromatic solvent

**CASE 1 | SCENARIO 1**

**Jeff-FLOW® P 962 and P 964: Viscosity of Paraffinic Crude Oil**

**CASE 2 | SCENARIO 2**

**Jeff-FLOW® P 964: Laboratory Pour Point Analysis**

**Crude Type**

- South East Asian Crude

**SARA Analysis**

<table>
<thead>
<tr>
<th>Component</th>
<th>South East Asian Crude</th>
</tr>
</thead>
<tbody>
<tr>
<td>saturates</td>
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</tr>
<tr>
<td>aromatics</td>
<td>13%</td>
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<tr>
<td>resins</td>
<td>11%</td>
</tr>
<tr>
<td>asphaltenes</td>
<td>0.70%</td>
</tr>
</tbody>
</table>

**Pour Point**

- 30°C

**Dose Rate (PPM)**

- 2,000 ppm

**Paraffin Inhibitor**

- JEFF-FLOW® P 964

**Case 2**

In this case study, JEFF-FLOW® P 964 was diluted with aromatic solvent.