DOWSIL™ Crude Oil Demulsifiers

Silicone Polyethers

Features & Benefits
- Efficient water coalescent
- Efficient water dropper
- Enhances interface definition
- Enhances water quality
- Non-ionic
- Inert

Applications
- The DOWSIL™ brand DMx line of silicone polyethers has been shown effective as stand-alone demulsifiers for crude oil.
- The DOWSIL DMx line of silicone polyethers could be used, as well, as performance boosters for other demulsifiers i.e., organic based demulsifiers.

Typical Properties
Specification Writers: These values are not intended for use in preparing specifications.

<table>
<thead>
<tr>
<th>Material</th>
<th>Viscosity cSt or mm2/s</th>
<th>Minimum Flash Point closed cup @ °C</th>
<th>HLB(^1) equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWSIL™ DM1 Demulsifier</td>
<td>2000</td>
<td>70</td>
<td>6.6</td>
</tr>
<tr>
<td>DOWSIL™ DM2 Demulsifier</td>
<td>315</td>
<td>60</td>
<td>12.3</td>
</tr>
<tr>
<td>DOWSIL™ DM3 Demulsifier</td>
<td>275</td>
<td>80</td>
<td>6.6</td>
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<tr>
<td>DOWSIL™ DM4 Demulsifier</td>
<td>40</td>
<td>100</td>
<td>11.5</td>
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<tr>
<td>DOWSIL™ DM5 Demulsifier</td>
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<td>60</td>
<td>9.2</td>
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<td>DOWSIL™ DM6 Demulsifier</td>
<td>260</td>
<td>60</td>
<td>10.5</td>
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<tr>
<td>DOWSIL™ DM7 Demulsifier</td>
<td>350</td>
<td>77</td>
<td>6.7</td>
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<tr>
<td>DOWSIL™ DM8 Demulsifier</td>
<td>285</td>
<td>103</td>
<td>7.9</td>
</tr>
</tbody>
</table>

1. HLB equivalent = (molecular weight of ethylene oxide/molecular weight of total polymer) x 20.
**Description**

The DOWSIL brand DMx line of silicone polyethers represents a range of different structures and molecular weights which have been proven effective in oil/water demulsification. Silicone polyethers are excellent surfactants, which benefit from the low surface tension of silicone, little cohesive energy, low sensitivity of the silicone to temperature, and low environmental toxicity - all desirable traits for a demulsifier as well.

The effectiveness of silicone polyethers as oil/water demulsifiers has been demonstrated over the years, both as stand-alone additives and as performance enhancers to organic based formulations. Some benefits that can be achieved are increased water drop rate, better interface definition, and overall improved cost efficiency for demulsification operations. They have shown efficacy with a wide range of crude oils, such as with both high and low asphalteneic crude oils, although they do not show improved performance in all systems.

Note that while the DOWSIL DMx line of demulsifier additives represents silicone polyethers with demonstrated performance in all applications, the specific products represent a range of structures available in this chemistry.

If a particular product is particularly interesting, we likely have other commercial silicone polyethers available with slight structural variations that may enhance ultimate performance.

**How To Use**

The DOWSIL brand DMx line of Crude Oil Demulsifiers is designed and have shown to be effective as stand alone demulsifiers. An additional option for specific applications could be to use the products as a booster to an organic (non-silicone) demulsifier formulation.

As with most demulsifiers, on site determination (usually with a standard bottle test) of the best formulation is typically required. The recommended procedure for determining booster effectiveness is to:

1. Determine the best non-silicone demulsifier formulation and addition rate for that particular system.
2. Replace 10% to 25% of the actives in that formulation with DOWSIL DM1 Crude Oil Demulsifier.
3. Run standard tests, at the same dose rate, to determine performance as compared to the formulation from step 1.
4. Repeat steps 2 & 3 for DOWSIL DM2–DM8 Crude Oil Demulsifiers.
5. Choose the best overall performing blend and optimize dose rate and DOWSIL DMx demulsifiers addition level to achieve the desired performance.
Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

When stored between -45°C (-49°F) and 50°C (122°F) in the original unopened containers, DOWSIL DM1 Crude Oil Demulsifier has a usable life of 18 months from the date of production; DOWSIL DM4 Crude Oil Demulsifier has a usable life of 24 months from the date of production; DOWSIL DM2, DM3, DM5, DM6, DM7 and DM8 Crude Oil Demulsifiers have a usable life of 30 months from the date of production.

Packaging Information

These products are available in a variety of container sizes.

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

Health And Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, consumer.dow.com or consult your local Dow representative.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer’s tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

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Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

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