SHELL RISELLA X OILS IN OIL-BASED DEFOAMER FORMULATIONS

Shell Process Oils

UNDERSTANDING YOUR NEEDS

Having worked closely with the world’s leading defoamer manufacturers for many years, Shell understands the challenges that you face. We know that you need defoamer formulations for your customers that offer excellent performance in minimising foam formation, rapidly releasing entrained air, and having low volatility to minimise the potential emission of volatile organic compounds (VOCs).

In oil based defoamer formulations, the oil can comprise up to 90% of the formulation. It functions as a carrier fluid, in order both to spread over the surface of the aqueous system to neutralise the surfactant molecules and to transport the hydrophobic ingredients of the defoamer to the double layers of surfactant molecule that stabilise the foam bubbles in order to destroy them.

Shell Risella X oils can help you to unlock competitive advantage because they offer:

- excellent performance
- extra purity.

REDUCED FOAM FORMATION

Shell Risella X oils produce

- up to six times less foam than alternative conventional oil technologies, this is known as the foaming tendency (red bars). Moreover, rapid air-release properties are demonstrated by the foaming stability (yellow bars).

<table>
<thead>
<tr>
<th>Performance at a glance</th>
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</thead>
<tbody>
<tr>
<td><strong>Excellent performance</strong></td>
</tr>
<tr>
<td><strong>Extra purity</strong></td>
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</tbody>
</table>

Foaming tendency:
- Foam after air blown through sample for 5 minutes
- ASTM D 892 at 25°C – Sequence 1
- The oils used have a comparable viscosity to each other at the test temperature

Foaming stability:
- Residual foam after air ingress stopped for 10 minutes
- ASTM D 892 at 25°C – Sequence 1
- The oils used have a comparable viscosity to each other at the test temperature
MINIMAL VOC EMISSIONS
Legislators worldwide are looking for safety and environmental improvements. Defoamers need minimised emissions of VOCs. In an oil-based defoamer, the oil is the major part of the formulation, so selecting the right low volatility oil can help you to minimise your product’s VOC emissions.

Recent laboratory tests\(^1\) on a batch of Shell Risella X demonstrate that Shell Risella X oils can meet the requirements of the US Environmental Protection Agency (EPA) 24.


\(^{1}\)Volatile Matter Content at 110°C, Gravimetric, EPA Method 24, wt. %
\(^{2}\)Calculated vapour pressure at a certain specified temperature
\(^{3}\)Initial boiling point based on simulated high temperature distillation, ASTM D 2887

TECHNICAL WHITE OIL CLASSIFICATION
(FDA § 178.3620 (b))

As Shell Risella X oils are made from purified natural gas and contain a high proportion of saturated paraffinic hydrocarbons, they are very pure and have a low aromatic content.

Their extra purity is demonstrated by the UV absorption measured at four wavelengths, this is much lower than the FDA standard requirements (FDA § 178.3620 (b)). Crucially, Shell Risella X oils can be used in numerous defoamer applications.

<table>
<thead>
<tr>
<th>SHELL RISELLA X 415</th>
<th>SHELL RISELLA X 420</th>
<th>SHELL RISELLA X 430</th>
<th>FDA § 178.3620 (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour (Saybolt)</td>
<td>30</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>280-289mm</td>
<td>0.05</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>290-299mm</td>
<td>0.04</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>300-329mm</td>
<td>0.03</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>330-380mm</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

FIND OUT MORE: TALK TO SHELL PROCESS OILS
If you are interested in unlocking valuable competitive advantage, talk to Shell about the benefits that Shell Risella X oils could have for your business.

www.shell.com/processoils

The data shown for the Shell Risella X grades are those typical of current production. While future production will conform to Shell’s specification, variation in these characteristics may occur.