Silwet* HS-312

Description
Silwet HS-312 spreader is a new, hydrolytically stable silicone with a broad pH stability range allowing formulators many options to incorporate it as a cost-effective adjuvant in many in-can pesticide products.

Silwet HS-312 spreader is an excellent candidate to consider for superb spreading performance and extended stability in water-based formulations between pH 3 to pH 12. This product offers excellent performance as a spreader, relative to commercial surfactants, for the effective delivery of many in-can pesticides with lower spray application rates. In addition, Silwet HS-312 spreader is used at much lower rates compared to conventional surfactant adjuvants.

Silwet HS-312 spreader is compatible with many agrochemical components and can therefore be dispersed into water-based agricultural formulations yielding products with excellent storage stability.

Key Features and Benefits
- 4-10X more surface spreading than surfactant adjuvants
- Improves spray coverage on crops
- Promotes spray volume reduction
- Compatible with Ag formulations
- Excellent stability with Ag formulations between pH 3-12

Typical Physical Properties

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### Appearance
Yellow to amber liquid

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Tension, mN/m (0.1 wt%) (^{(a)})</td>
<td>26.7</td>
</tr>
<tr>
<td>Spreading Diameter, mm</td>
<td>35</td>
</tr>
<tr>
<td>Viscosity 25°C, cps (LVT No 3, 100 rpm)</td>
<td>70</td>
</tr>
<tr>
<td>Cloud Point, °C</td>
<td>42</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.0</td>
</tr>
<tr>
<td>pH Stability</td>
<td>3-12</td>
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</tbody>
</table>

\(^{(a)}\) Wilhelmy Plate Method; solutions prepared in 0.005M NaCl

### Product Usage
Silwet HS-312 spreader is a cost-effective spreader that can be used in in-can pesticide products in the 3-12 pH range. It can be added as a component directly to such formulations to provide better spreading during spray application.

The addition levels of Silwet HS-312 spreader are dependent on the level of spreading required in the spray application of the pesticide. A recommended use rate is 5% of the total pesticide formulation, or 0.05% - 0.20% of the tank-mix mixture.

### Processing Recommendations

#### Performance Data
Because the Silwet HS-312 spreader has very low surface tension, the contact angle of spray solutions on leaf surfaces is reduced compared to other surfactant adjuvants. This important property is shown in Figure 1 below, which illustrates Silwet HS-312 spreader having less than 5° contact angle relative to the Octylphenol Ethoxylate containing 10 EO units (OPE-10), having a 31° contact angle. It is also important to note that the lower Silwet HS-312 spreader contact angle is achieved at much lower concentrations compared to the OPE-10 surfactant concentration.

#### Figure 1: Contact Angles of Spreader Adjuvants

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Figure 2 illustrates the excellent wetting properties of the Silwet HS-312 spreader. Compared to OPE-10 at equal concentrations, Silwet HS-312 spreader has 5 times larger spread diameter, which results in improved surface coverage during spray applications. Even at significantly lower concentrations, Silwet HS-312 spreader has better spreading performance than conventional adjuvants, which can potentially lower spray volumes during the application of pesticides to a crop.

Figure 3 illustrates an improvement in efficacy of a 1% glyphosate treatment on Velvetleaf (Abutilion theophrasti), when using Silwet HS-312 spreader. Plants grown indoors were treated at the 2 - 4 leaf stage with 1% glyphosate, using a track sprayer at a relative spray volume of 100 L/ha. Silwet HS-312 spreader was included as an adjuvant at 0.1% rate. Rain (2.5 cm) was applied two hours after treatment. A visual assessment was made at 7 and 14 days after treatment as compared to an untreated control.
Figure 3: Efficacy of 1% Glyphosate Control-V

Note: Test data. Actual results may vary.

**Patent Status**
US and foreign Patent applications pending

Standard copy to come

**Product Safety, Handling and Storage**
Standard copy to come

**Limitations**
Standard copy to come

**Contact Information**
For product prices, availability, or order placement, contact our customer service at Momentive.com/CustomerService/

For literature and technical assistance, visit our website at: www.momentive.com

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