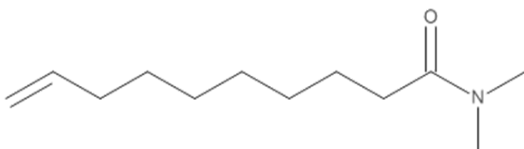


Product Bulletin

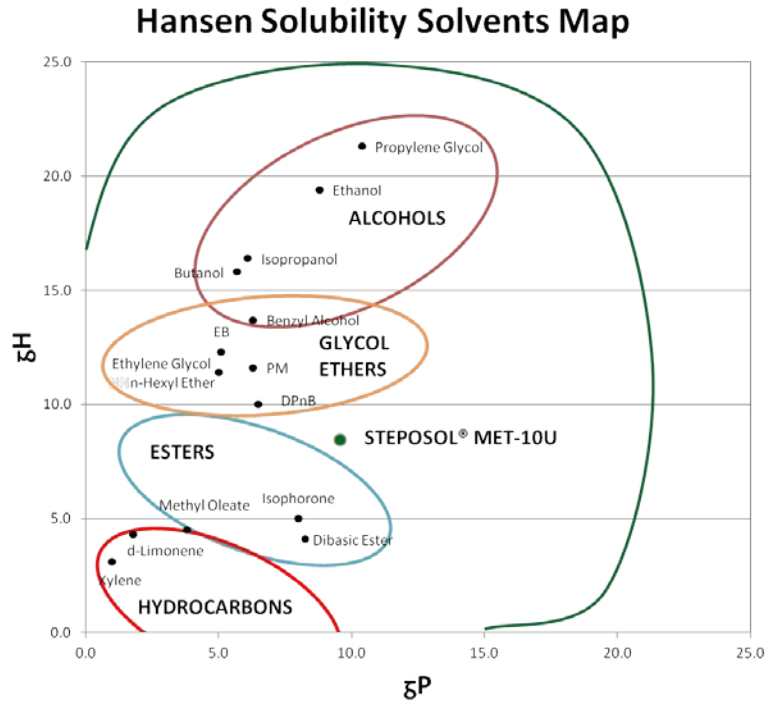
Product Name	STEPOSOL® MET-10U	<i>Surfactant Solution to Solvent Replacement™</i>																																						
Chemical Structure																																								
Chemical Description	N,N-dimethyl 9-decenamide																																							
CAS Registry Number	1356964-77-6																																							
INCI Name	Dimethyl 9-decenamide																																							
Features	STEPOSOL MET-10U is a unique unsaturated di-substituted amide derived from renewable sourcing from a bio-based feedstock manufactured using Nobel Prize-winning metathesis technology. Among other properties, STEPOSOL MET-10U exhibits rapid, soil-penetrating kinetics, excellent solvency, heat and hydrolytic stability, and a low VOC content.																																							
Applications	<p>STEPOSOL MET-10U is effective in cleaning and removing soils in a variety of formulations. Example applications include:</p> <table border="0"> <tr> <td>• All-Purpose Cleaner</td> <td>• Heavy Duty Degreaser</td> <td>• Rig Wash</td> </tr> <tr> <td>• Oven Cleaner</td> <td>• Grill Cleaner</td> <td>• Coating Remover</td> </tr> <tr> <td>• Metal Cleaner</td> <td>• Permanent Ink Remover</td> <td>• Paint Stripper</td> </tr> <tr> <td>• Graffiti Remover</td> <td>• Adhesive Remover</td> <td></td> </tr> </table>		• All-Purpose Cleaner	• Heavy Duty Degreaser	• Rig Wash	• Oven Cleaner	• Grill Cleaner	• Coating Remover	• Metal Cleaner	• Permanent Ink Remover	• Paint Stripper	• Graffiti Remover	• Adhesive Remover																											
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Typical Properties	<table border="0"> <tr> <td>Appearance at 25 °C</td> <td>Clear liquid</td> </tr> <tr> <td>Molecular Weight (g/mol).....</td> <td>197</td> </tr> <tr> <td>Amide, %</td> <td>> 97</td> </tr> <tr> <td>Moisture, %</td> <td>< 0.5</td> </tr> <tr> <td>Viscosity at 25 °C, cps</td> <td>4</td> </tr> <tr> <td>pH, 5% in 1:1 IPA/H₂O.....</td> <td>8.0</td> </tr> <tr> <td>Density at 25 °C, g/ml (lbs/U.S. gal)</td> <td>0.892 (7.4)</td> </tr> <tr> <td>Color, Gardner</td> <td>1 max</td> </tr> <tr> <td>Color, APHA</td> <td>20</td> </tr> <tr> <td>Cloud Point, °C (°F)</td> <td>-13.0 (8.6)</td> </tr> <tr> <td>Pour Point, °C (°F)</td> <td>-14.0 (6.8)</td> </tr> <tr> <td>Freeze Point, °C (°F)</td> <td>-16.0 (3.2)</td> </tr> <tr> <td>Melting Point, °C (°F).....</td> <td>-9.5 (12.5)</td> </tr> <tr> <td>Boiling Point, °C (°F).....</td> <td>297 (566)</td> </tr> <tr> <td>Flash Point, °C (°F).....</td> <td>134 (273)</td> </tr> <tr> <td>Auto-ignition Temperature, °C (°F)</td> <td>240 (464)</td> </tr> <tr> <td>Vapor Pressure at 25 °C, mm Hg.....</td> <td>0.0025</td> </tr> <tr> <td>Relative Evaporation Rate (ASTM 3539; Butyl Acetate = 1)</td> <td>< 0.01</td> </tr> <tr> <td>Dielectric Constant at 25 °C</td> <td>16.09</td> </tr> </table>		Appearance at 25 °C	Clear liquid	Molecular Weight (g/mol).....	197	Amide, %	> 97	Moisture, %	< 0.5	Viscosity at 25 °C, cps	4	pH, 5% in 1:1 IPA/H ₂ O.....	8.0	Density at 25 °C, g/ml (lbs/U.S. gal)	0.892 (7.4)	Color, Gardner	1 max	Color, APHA	20	Cloud Point, °C (°F)	-13.0 (8.6)	Pour Point, °C (°F)	-14.0 (6.8)	Freeze Point, °C (°F)	-16.0 (3.2)	Melting Point, °C (°F).....	-9.5 (12.5)	Boiling Point, °C (°F).....	297 (566)	Flash Point, °C (°F).....	134 (273)	Auto-ignition Temperature, °C (°F)	240 (464)	Vapor Pressure at 25 °C, mm Hg.....	0.0025	Relative Evaporation Rate (ASTM 3539; Butyl Acetate = 1)	< 0.01	Dielectric Constant at 25 °C	16.09
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Typical
Properties -
Continued

Refractive Index at 20 °C.....	1.46
Surface Tension (as is), dynes/cm	31.5
Critical Micelle Concentration, %.....	0.05
Draves Wetting Time, 0.1% in DI water, seconds	4
Kauri-Butanol Value.....	> 1000
Enthalpy (Heat) of Vaporization, (J/g)	204.6
RVOC, U.S. EPA, %.....	0
Solubility:	
STEPOSOL MET-10U in Water (25 °C,% wt)	0.2
Water in STEPOSOL MET-10U (25 °C,% wt)	19
Methanol	Soluble
Kerosene	Soluble
Xylene.....	Soluble
Hansen Solubility Parameters	D: 16.58, P: 9.58, H.: 8.45

The Hansen solubility parameters are a key characteristic of solvency power used to predict if one material will dissolve another one to form a solution. As shown in the graph below, STEPOSOL MET-10U has a large Hansen space, overlapping the four solvent groups. This means that STEPOSOL MET-10U will dissolve a wide range of soils.



Environmental
Effects

This product is readily biodegradable.

Health
Effects

STEPOSOL MET-10U was found to be slightly toxic orally ($LD_{50} = 550$ mg/kg). Undiluted product may cause severe eye and skin irritation.

Storage &
Handling

Standard Packaging: STEPOSOL MET-10U is available in drums and in bulk quantities.

Non-Bulk Storage Recommendations: STEPOSOL MET-10U should be stored in closed containers and kept in a cool, dry place away from incompatible materials (see Section 10 of the SDS). If material is frozen it should be heated gently and stirred to ensure it is homogeneous before use.



Storage & Handling

Bulk Storage Recommendations: STEPOSOL MET-10U should be stored in vessels of 304 or 316 stainless steel. Temperatures up to 54 °C (130 °F) can be maintained for long periods of time without degradation of the product. Pumps, pipes and transfer lines should be 316 stainless steel.

Normal safety precautions (i.e., gloves and safety goggles) should be employed when handling STEPOSOL MET-10U. Contact with eyes, nose or prolonged contact with skin should be avoided. Wash thoroughly after handling STEPOSOL MET-10U. Consult the SDS for additional information on properties and handling.

Workplace Exposure

Occupational exposure can occur primarily through skin contact or via inhalation of vapors and mists. Engineering controls, personal protective equipment, and other workplace practices should be used to control these exposures.

Clearances

The international inventories (country clearances) of STEPANQUAT STEPOSOL MET-10Ua can be found in Section 15 of the Safety Data Sheet (SDS). **It is the responsibility of the formulator to review the chemical control regulations for each country where the end product is intended to be sold or used.** If you have any further questions regarding inventories, please contact North America Technical Service at techserv@stepan.com.

Per the California Air Resources Board (CARB) Consumer Product Rule, OTC Model Rule and Federal VOC Standards, STEPOSOL MET-10U is exempt from VOC limit requirements because it is a LVP-VOC (low vapor pressure VOC). All regulations define an LVP-VOC as a compound or mixture which meets one of the following criteria: 1) The compound has a vapor pressure of less than 0.1 mm Hg at 20 °C; 2) the compound has more than 12 carbon atoms, or a mixture comprised solely of compounds with more than 12 carbon atoms, and the vapor pressure is unknown or 3) the compound has a boiling point greater than 216 °C.

Product Stewardship

This product bulletin has been written in accordance with ACC's Product Stewardship guidelines.

Additional Safety Information

A Safety Data Sheet is available upon request.



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