CROP SOLUTIONS

SURFOM® SC 8384

VERSATILE ANIONIC DISPERSANT

OXITENO

CROP SOLUTIONS | VERSATILE ANIONC DISPERSANT

SUSPENSION CONCETRATE

In agricultural applications

Suspension Concentrates accounts for 27% of all Crop Protection Market value and 15% of the volume applied, which illustrates a high relative price of this products compared to other formulations types. In the past 10y, the value has increase more than 10% in terms of value.

It’s common to have high loads of Active Ingredient in this kind of formulation, which is not soluble in water. The right package of Dispersant and Wetting Agent play an important role to estabilize the formulation

Oxiteno has a broad portfolio of Weeting Agents and Dispersants compatible within high load AI’s that supports our customers to explore the full potential of SC formulations in agrochemical applications.

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CROP SOLUTIONS | VERSATILE ANIONIC DISPERSANT

SURFOM® SC 8384

ANIONIC DISPERSANT/EMULSIFIER AGENT FOR LIQUID FORMULATIONS

Versatility – Good performance results in multiple formulations: high/low load of AI; inorganic/organic AI; easy-to-formulate / difficult-to-form AIs

Regulatory - EPA approved in inerts list and all components listed in IESC China

Efficiency – Usage in low dosages as 10g/L in SC formulations with good stability results when used w/ other co-dispersant / wetting agent

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APPLICATIONS

ANIONIC DISPERSANT FOR SUSPENSION CONCENTRATE

- **SC formulations usually have higher loads of AIs, which difficults the formulation estability. The combination of good surfactants allows the use of low dosages of Dispersant, which enables good stability and performance. SURFOM SC 8384 can be used AS LOW AS the dosage of 10 g/L and presented good results of stability for different herbicides formulations**

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SURFOM® SC 8384

ANIONIC DISPERSANT FOR SUSPENSION CONCENTRATE

CROP SOLUTIONS | VERSATILE ANIONIC DISPERSANT

ATRAZINE 600 #1 SUGGESTIVE FORMULATION	**Concentration g/L**
Active ingredient	600
Monoethylene Glycol (Antifreeze)	50
ALKOSYNT ® ID 60 (Wetting Agent)	16.5
SURFOM® SC 8384 (Dispersant)	**4**
ULTRARIC ® PE 104 (Co-dispersant)	4
Silicone Antifoam emulsion (Antifoam)	2
Xanthan Gum* (Thickener)	75**
Water (Vehicle)	Q.S. to 1L

Initial Condition

Viscosity*, 25°C, cP	Viscosity** 5s-1, mPa.s	Particle size (D50)	Suspensibility	Sieve test - residue	pH
588 (S34 – 50 RPM)	1382	1,99	99,1%	0,03%	5,6

After Stability Test

Stability	Syneresis	Cake	Viscosity** 5s-1 , mPa.s	Particle size (D50)
After 14 days, 54ºC (129ºF)	2,15%	No	1200	2,15
After 30 days, 45ºC (113ºF)	0%	No	1201	2,15

*Aqueous Solution, 2% with biocide

**Or Q.S. to ideal viscosity

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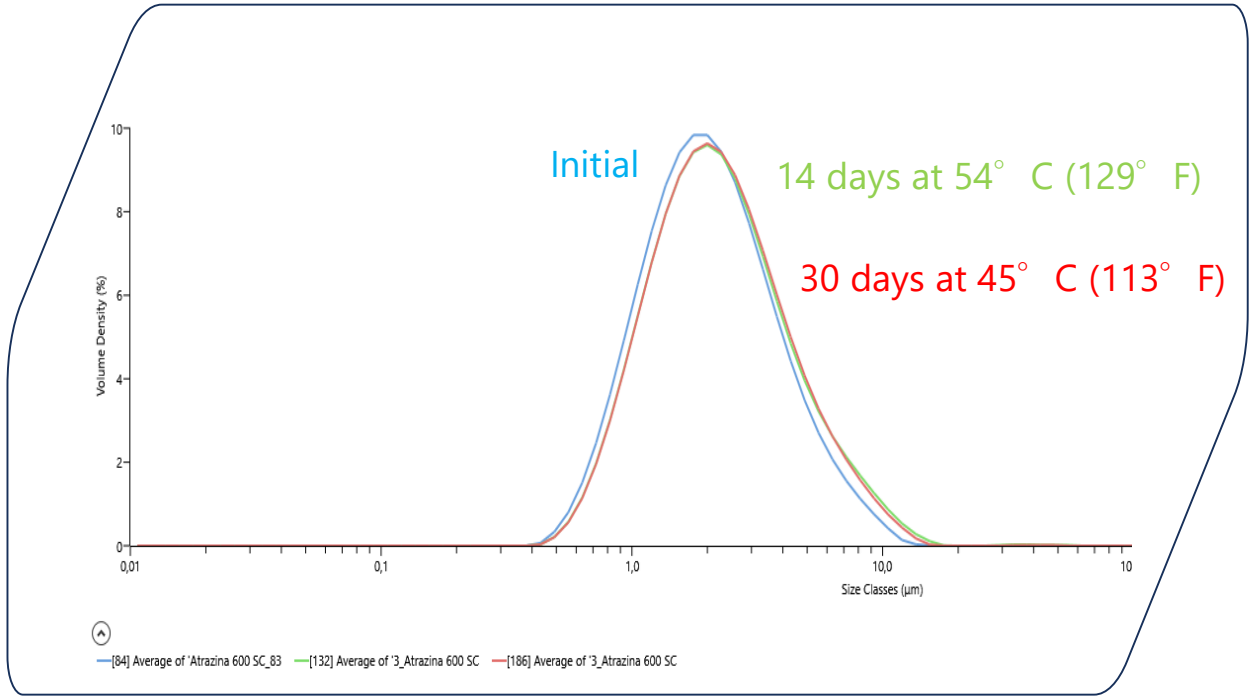
ULTRARIC ® PE 104 (Co-dispersant)	4
Silicone Antifoam emulsion (Antifoam)	2
Xanthan Gum* (Thickener)	75**
Water (Vehicle)	Q.S. to 1L

Particle size – No significant change in particle size after stability at different temperatures in rheology and microscopy analysis



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Silicone Antifoam emulsion (Antifoam)	2
Xanthan Gum* (Thickener)	75**
Water (Vehicle)	Q.S. to 1L

Appropriate combination of surfactants allows the use of low dispersant/co-dispersant concentration in this formulation

Excellent synergy with ULTRARIC PE 104: reduced viscosity and improved the milling process

Good stability after 30 days with no significant increase in particle size

*Aqueous Solution, 2% with biocide

**Or Q.S. to ideal viscosity

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SURFOM® SC 8384

ANIONIC DISPERSANT FOR SUSPENSION CONCENTRATE

CROP SOLUTIONS | VERSATILE ANIONIC DISPERSANT

MESOTRIONE 480 #2 SUGGESTIVE FORMULATION	**Concentration g/L**
Active ingredient	480
Monoethylene Glycol (Antifreeze)	150
SURFOM® SC 8384 (Dispersant)	**10**
Silicone Antifoam emulsion (Antifoam)	2
Xanthan Gum* (Thickener)	130**
Water (Vehicle)	Q.S. to 1L

Stability Results – Formulation of the suspension concentrate (SC) with Mesotrione at 480 g/L found a good formulation stability after 30 days.

Stability	Syneresis	Cake	Viscosity*, 25°C, cP	Viscosity ** $5s^{-1}$, mPa.s	Particle size (D50)	pH	Suspensibility, % w/w
Initial	0,0%	No	500 (S34 – 60 RPM)	1080	3,06	3,4	96,3
After 14 days, 54ºC (129ºF)	2,0%	No	268 (S34 – 110 RPM)	827	2,90	--	--
After 30 days, 45ºC (113ºF)	3,4%	No	346(S34 – 85 RPM)	819	3,14	--	--
After freeze/thaw test, 18 cycles	--	--	--	--	3,21	--	--

Viscosity after added xanthan gum; *= Brookfield viscometer; **= Tensiometer;
Freeze/thaw test (24 hrs -15ºC and 24 hrs 54ºC - each cycle) – Test to analyze increased particle size / crystallization.

*Aqueous Solution, 2% with biocide

**Or Q.S. to ideal viscosity

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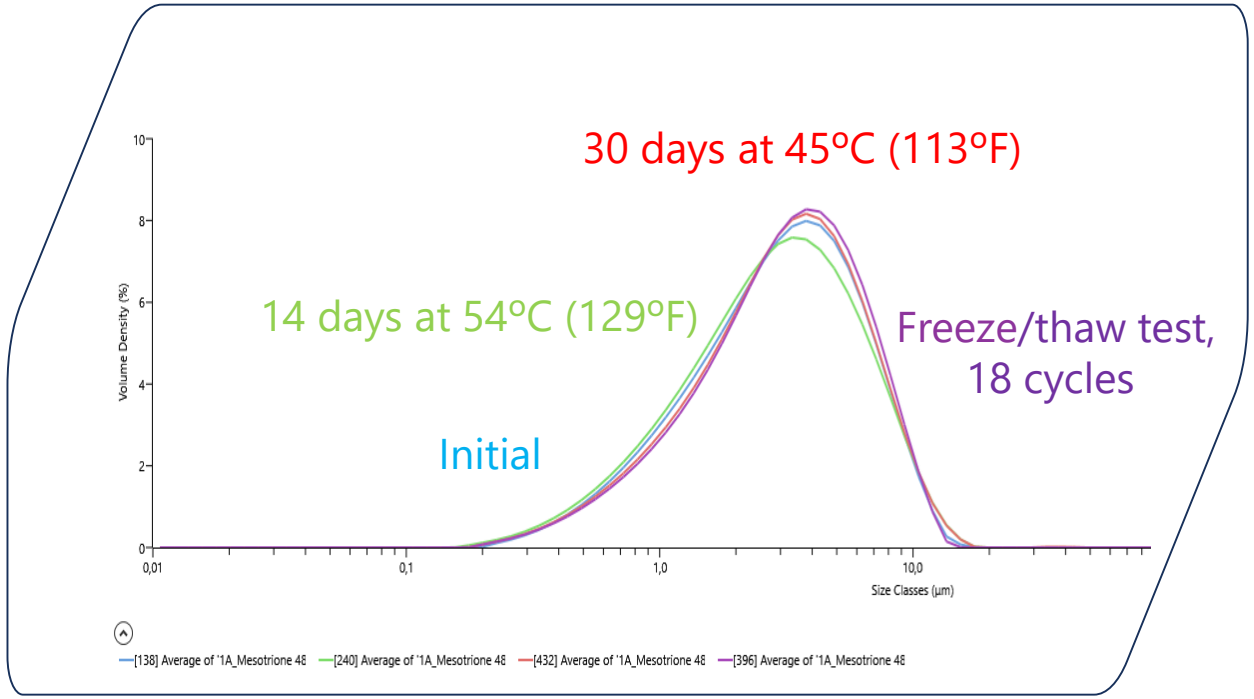
ANIONIC DISPERSANT FOR SUSPENSION CONCENTRATE

CROP SOLUTIONS | VERSATILE ANIONIC DISPERSANT

MESOTRIONE 480 #2 SUGGESTIVE FORMULATION	**Concentration g/L**
Active ingredient	480
Monoethylene Glycol (Antifreeze)	150
SURFOM® SC 8384 (Dispersant)	**10**
Silicone Antifoam emulsion (Antifoam)	2
Xanthan Gum* (Thickener)	130**
Water (Vehicle)	Q.S. to 1L

Particle size – No significant change in particle size after stability at different temperatures in rheology and microscopy analysis



*Aqueous Solution, 2% with biocide

**Or Q.S. to ideal viscosity

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Active ingredient	480
Monoethylene Glycol (Antifreeze)	150
SURFOM® SC 8384 (Dispersant)	**10**
Silicone Antifoam emulsion (Antifoam)	2
Xanthan Gum* (Thickener)	130**
Water (Vehicle)	Q.S. to 1L

Usage of SURFOM SC 8384 without any wetting agent presented good stability results

Better milling process, reduced viscosity and no significant increase in particle size during stability

*Aqueous Solution, 2% with biocide

**Or Q.S. to ideal viscosity

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SURFOM® SC 8384

CROP SOLUTIONS | VERSATILE ANIONIC DISPERSANT

ANIONIC DISPERSANT FOR INORGANIC ACTIVE - FERTILIZER

MANGANESE CARBONATE 430
#3 SUGGESTIVE FORMULATION

	Concentration %
Active ingredient (42% purity)	59
Glycerin (Antifreeze)	1
SURFOM® SC 8384 (Dispersant)	**3**
SURFOM® SC 8223 (Dispersant)	3
ALKOSYNT ® ID 60 (Wetting)	2
Silicone Antifoam emulsion (Antifoam)	0.5
Xanthan Gum* (Thickener)	2
Water (Vehicle)	29.5

*Aqueous Solution, 2% with biocide

Stability Results – Formulation of the suspension concentrate (SC) with Manganese Carbonate 59% (Manganese amount is 250g/L) found a good formulation stability.

Test	Initial	14D – 5°C	14D – 25°C	14D – 45°C
Appearance	Brown viscous liquid	OK	OK	OK
Phase separation (%)	0	7	0	0
pH	7,1	6,9	7,1	7,1
Suspensibility (%)	90	89	80	71
Particle size d(0,5)	0,252	0,344	0,572	1,09
Viscosity (cP)	780	798	800	900
Wet-sieve (%)	99	99	90	90

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Active ingredient (42% purity)	59
Glycerin (Antifreeze)	1
SURFOM® SC 8384 (Dispersant)	**3**
SURFOM® SC 8223 (Dispersant)	3
ALKOSYNT ® ID 60 (Wetting)	2
Silicone Antifoam emulsion (Antifoam)	0.5
Xanthan Gum* (Thickener)	2
Water (Vehicle)	29.5

*Aqueous Solution, 2% with biocide

Good stability results with low dosages of usage

Good performance in stabilizing difficult formulations of Inorganic AIs

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SURFOM® SC 8384

ANIONIC DISPERSANT AGENT FOR LIQUID FORMULATIONS

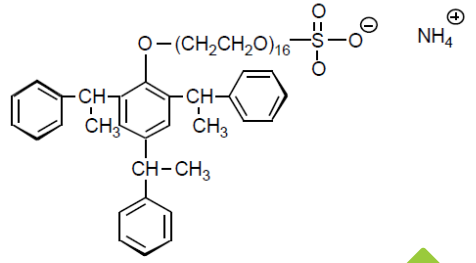
CROP SOLUTIONS | VERSATILE ANIONIC DISPERSANT

When developing Suspension Concentrate formulations it's important to choose the right package of surfactants to compatibilize with the high load of AI, in order to mantain the stability, rheology modifiers plays an important role in this formulation. **SURFOM® SC 8384** combine good dispersant properties and compatibility with wetting agents, delivering good performance for different suggestive formulations

CHEMICAL DESCRIPTION

Polyaryl Phenyl Ether Ammonium Sulfate

- Appearance (25°C) : Amber viscous liquid
- Solubility in water (10%) – soluble
- Density (25°C) : 1.15 g/cm3
- Superficial Tension (0,5% - 20°C) : 46.6 dyn/cm (mN/m)
- Viscosity (25°C) : approx. 12000 cP
- Flash Point > 100 ºC
- Pour Point: approx. 11ºC



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CHEMICAL DESCRIPTION

Polyaryl Phenyl Ether Ammonium Sulfate

Quality Requirement	Commercial Specification Min	Max
Acid number, mg KOH	40.0	50.0
pH, 5wt% aqueous solution, 25°C	3.0	7.0
Appearance, 25°C	viscous liquid	
Moisture, wt%	0.0	1.0
Cloud point, 1 wt%, NaCl 10 wt% aqueous solution, °C	TBS	

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