



**Crop
Defense**

FORMULATIONS GUIDE

FORMULATION CHARTS

Building Crop Defense Formulas that Work

As the agricultural industry grows to meet increasing demands, growing crops safely, efficiently and economically becomes a greater priority. Losses to insects, weeds and disease are simply unacceptable.

You can help crop growers minimize those losses – and still meet strict environmental regulations – with crop defense formulations that incorporate products from The Dow Chemical Company (Dow). With a comprehensive range of formulation components, Dow is positioned to help you arrive at a customized solution engineered to meet exacting specifications.

Dow offers a single source for everything from surfactant adjuvants for in-can and tank mixes to propylene glycol, amines and chelants. Each product is backed by the Company's exceptional technical expertise, providing the guidance and support needed to create an optimized solution.

Many Dow materials also feature low toxicity, helping formulators deliver crop defense products with minimal environmental impact. Through ongoing research and innovation, along with its extensive global supply network, Dow is consistently improving agrochemical performance and helping the agricultural industry grow.

The following pages provide an overview of Dow's diverse portfolio of materials for crop defense formulations, including:

- Wetting agents
- Dispersants
- Foam control agents
- Adjuvants
- Emulsifiers
- Neutralizers
- Solvents
- Chelating agents
- Amines

Contact your local Dow Crop Defense technical representative or nearest Dow location for more information, including sampling and regional availability.

Stand Out in the Field with Dow

Meet the challenges of today's agricultural crop defense formulation requirements with:

- In-depth product performance expertise
- A diverse portfolio of formulation components
- Customized solutions
- Global supply capabilities

Nonionic Surfactants

Family	Product	Molecule	CAS Number	HLB ⁽¹⁾	Surface Tension ⁽²⁾	Cloud Point ⁽³⁾	Potential Formulations ⁽⁴⁾
Ethoxylates	ECOSURF™ EH-3	2 Ethyl Hexanol Alkoxyates	64366-70-7	7.9	30	52	EC, SL, SC, EW, OD, SE, ME
	ECOSURF™ EH-6			10.8	30	43	EC, SL, SC, EW, OD, SE, ME
	ECOSURF™ EH-9			12.5	31	64	EC, SL, SC, EW, SE, ME
	ECOSURF™ EH-14 (90%)			14.2	31.8	86	EC, SL, SC, EW, SE, ME
	ECOSURF™ SA-4	Seed Oil Fatty Alcohol Alkoxyates	68937-66-6 / 69227-22-1	7.5	Dispersible	Dispersible	EC, SL, SC, EW, OD, SE, ME
	ECOSURF™ SA-7			9.7	29	37	EC, SL, SC, EW, SE, ME
	ECOSURF™ SA-9			11.1	29	57	EC, SL, SC, EW, SE, ME
	ECOSURF™ SA-15			135	33.5	>100	EC, SL, SC, EW, SE, ME
	ECOSURF™ LF-20	Secondary Alcohol Alkoxyates	1013910-41-2	10 - 11	30.4	17 - 24	EC, SL, SC, EW, OD, SE, ME
	ECOSURF™ LF-30			11 - 12	30	26 - 34	EC, SL, SC, EW, OD, SE, ME
	ECOSURF™ LF-45			12 - 13	31.5	40 - 49	EC, SL, SC, EW, OD, SE, ME
	TERGITOL™ 15-S-3	Secondary Alcohol Ethoxyates	84133-50-6	8	Insoluble	Insoluble	EC, EW, SC, SE, ME, OD
	TERGITOL™ 15-S-5			10.5	Dispersible	Dispersible	EC, EW, SC, SE, ME, OD
	TERGITOL™ 15-S-7			12.1	30	37	EC, SC, EW, SE, ME
	TERGITOL™ 15-S-9			13.3	30	60	EC, SC, EW, SE, ME
	TERGITOL™ 15-S-12			14.5	33	89	EC, SC, EW, SE, ME
	TERGITOL™ 15-S-15			15.4	36	>100	EC, SC, EW, SE, ME
	TERGITOL™ 15-S-20			16.3	38	>100	EC, SC, EW, SE, ME
	TERGITOL™ 15-S-30			17.4	43	>100	EC, SC, EW, SE, ME
	TERGITOL™ 15-S-40 (70%)			18	45	>100	EC, SC, EW, SE, ME
	TERGITOL™ NP-4			Nonylphenol Ethoxyates	9016-45-9 / 127087-87-0	8.9	Insoluble
	TERGITOL™ NP-6	10.9	Insoluble			Insoluble	EC, SL, SC, EW, OD, SE
	TERGITOL™ NP-7	12	32			20	EC, SL, SC, EW, OD, SE
	TERGITOL™ NP-8	12.6	32			43	EC, SL, SC, EW, OD, SE
	TERGITOL™ NP-9	12.9	32			54	EC, SL, SC, EW, OD, SE
	TERGITOL™ NP-9.5	13.1	32			59	EC, SL, SC, EW, OD, SE
	TERGITOL™ NP-10	13.2	33			63	EC, SL, SC, EW, OD, SE
	TERGITOL™ NP-11	13.8	34			72	EC, SL, SC, EW, OD
	TERGITOL™ NP-12	13.8	35			78	SC, EW, SE, SL
	TERGITOL™ NP-13	13.9	35			82	SC, EW, SE, SL
	TERGITOL™ NP-15	15	41			>100	SC, EW, SE, SL
	TERGITOL™ NP-30	17.1	46			>100	SC, EW, SE, SL
	TERGITOL™ NP-30 (70%)	17.1	46			>100	SC, EW, SE, SL
	TERGITOL™ NP-40	17.8	50			>100	SC, EW, SE, SL
	TERGITOL™ NP-40 (70%)	17.8	50			>100	SC, EW, SE, SL
	TERGITOL™ NP-50 (70%)	18.2	53			>100	SC, EW, SE, SL
	TERGITOL™ NP-70 (70%)	18.7	51	>100	SC, EW, SE, SL		
	TERGITOL™ TMN-3	Branched Secondary Alcohol Ethoxyates	60828-78-6	8.1	Insoluble	Insoluble	SC, EW, SE, SL, OD, SE
	TERGITOL™ TMN-6 (90%)			13.1	27	36	SC, EW, SE, SL, OD, SE
	TERGITOL™ TMN-10 (90%)			14.4	30	76	SC, EW, SE, SL, OD, SE
	TERGITOL™ TMN-100X (90%)			14.1	27	65	SC, EW, SE, SL, OD, SE
	TRITON™ HW-1000			10	25.8	Not applicable due to partial solubility in water	EC, SL, SC, EW, OD, SE
	TRITON™ X-15	Octylphenol Ethoxyates	9036-19-5	4.9	Insoluble	Insoluble	EC, SL, SC, EW, OD, SE
	TRITON™ X-35			7.8	Insoluble	Insoluble	EC, SL, SC, EW, OD, SE
	TRITON™ X-45			9.8	29	Dispersible	EC, SL, SC, EW, OD, SE
	TRITON™ X-100			13.4	33	66	EC, SL, SC, EW, SE
	TRITON™ X-102			14.4	36	88	EC, SL, SC, EW, SE
	TRITON™ X-114			12.3	31	25	EC, SL, SC, EW, SE
	TRITON™ X-165 (70%)			15.5	39	>100	EC, SL, SC, EW, SE
	TRITON™ X-305 (70%)			17.3	49	>100	EC, SL, SC, EW, SE
TRITON™ X-705 (70%)	18.4			44	>100	EC, SL, SC, EW, SE	
Alkyl Polyglucosides	TRITON™ CG-50	Alkyl Polyglucoside C8-C10	68515-73-1	-	28.7	>100	SL, EW, SE, ME
	TRITON™ CG-110			-	27	>100	SL, EW, SE, ME
	TRITON™ CG-425	Alkyl Polyglucoside C10-C14	68515-73-1 / 110615-47-9	-	29	>100	SL, EW, SE, ME
	TRITON™ CG-600	Alkyl Polyglucoside C10-C12	110615-47-9	-	28.7	>100	SL, EW, SE, ME
	TRITON™ CG-650	Alkyl Polyglucoside C10-C14	68515-73-1 / 110615-47-9	-	28.7	>100	SL, EW, SE, ME
Ethylene Oxide/Propylene Oxide (EO/PO) Copolymers	TERGITOL™ XH	Ethylene Oxide/Propylene Oxide (EO/PO) Copolymers	9038-95-3	-	41	95	EC, SC, SE, EW
	TERGITOL™ XJ			-	36	49	EC, SC, SE, EW, OD
	TERGITOL™ XD			-	38	74	EC, SC, SE, EW
	TERGITOL™ XDLW	Ethylene Oxide/Propylene Oxide (EO/PO) Copolymers + Alcohol Ethoxyate	9038-95-3 / 84133-50-6	-	32	74	EC, SC, SE, EW
	TERGITOL™ L-61 (DOWFAX™ 63N10BRL)	Polyalkylene Glycol	9003-11-6	3	40	24	EC, SC, SE, EW, OD
	TERGITOL™ L-62			7	41	32	EC, SC, SE, EW, OD
	TERGITOL™ L-64 (DOWFAX™ 63N40BRL)			15	44	62	EC, SC, SE, EW
	DOWFAX™ 100N50			-	36	90.3	EC, SC, SE, EW
	TERGITOL™ L-81			2	36	20	EC, SC, SE, EW
	TERGITOL™ L-101			1	33	18	EC, SC, SE, EW

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⁽¹⁾Hydrophilic-lipophilic balance (HLB) range: <10 water-in-oil emulsifier, >10 oil-in-water emulsifier, 10-15 good wetting, 12-15 detergents

⁽²⁾Surface tension: dynes/cm at 1% actives, 25°C ⁽³⁾Cloud point (°C, 1% aqueous solution)

⁽⁴⁾EC = emulsifiable concentrate; SL = soluble concentrate; SC = suspension concentrate; EW = emulsion; oil in water; OD = oil dispersion; SE = suspo-emulsion; ME = micro-emulsion

Nonionic Surfactants – continued

Product	Recommended Applications
ECOSURF™ EH-3	Excellent emulsifier, soluble in oil, low foam formation, low odor, easy to handle, very low aquatic toxicological profile. Good emulsifier for OD formulations.
ECOSURF™ EH-6	Exceptional humectancy, low foam formation, for SC and SL formulations. Low odor, excellent handling and formulation properties, very low aquatic toxicological profile.
ECOSURF™ EH-9	Exceptional humectancy, low foam formation, for SC and SL formulations. Low odor, excellent handling and formulation properties, very low aquatic toxicological profile. Excellent water solubility, no gel formation.
ECOSURF™ EH-14 (90%)	High HLB, low odor and good humectant profile.
ECOSURF™ SA-4	Seed oil-based surfactant, low odor, avoids gel formation. Oil soluble emulsifier with excellent humectant profile, especially for OD formulations.
ECOSURF™ SA-7	Seed oil-based surfactant, provides better emulsifier properties for EC formulations. Low odor, avoids gel formation, is quick to dissolve. Excellent humectant.
ECOSURF™ SA-9	Seed oil-based surfactant, provides better emulsifier properties for EC formulations. Low odor, avoids gel formation, is quick to dissolve. Excellent humectant.
ECOSURF™ SA-15	Seed oil-based surfactant, low odor, avoids gel formation, is quick to dissolve. Excellent humectant and stabilizer for SC formulations.
ECOSURF™ LF-20	Antifoam alternative for non-polar formulations (oil based).
ECOSURF™ LF-30	Antifoam alternative for water based formulations.
ECOSURF™ LF-45	Very low foam humectant.
TERGITOL™ 15-S-3	Excellent compatibility with hydrocarbons. Good humectant and emulsifier for OD formulations.
TERGITOL™ 15-S-5	Excellent compatibility with hydrocarbons. Good humectant and emulsifier for OD formulations.
TERGITOL™ 15-S-7	High humectant and emulsifier capacity. Excellent formulation and handling properties.
TERGITOL™ 15-S-9	High humectant and emulsifier capacity. Excellent formulation and handling properties.
TERGITOL™ 15-S-12	High humectant properties, provides better stability for SC formulations.
TERGITOL™ 15-S-15	High humectant properties, provides better stability for SC formulations.
TERGITOL™ 15-S-20	Excellent emulsion stabilizer, brings stability to temperature cycles and has good handling properties.
TERGITOL™ 15-S-30	Excellent emulsion stabilizer, brings stability to temperature cycles and has good handling properties.
TERGITOL™ 15-S-40 (70%)	Excellent emulsion stabilizer, brings stability to temperature cycles and has good handling properties.
TERGITOL™ NP-4	Excellent oil soluble surfactant, emulsifier with low HLB.
TERGITOL™ NP-6	Excellent emulsifier, humectant and stabilizer.
TERGITOL™ NP-7	Excellent emulsifier, humectant and stabilizer.
TERGITOL™ NP-8	Excellent emulsifier, humectant and stabilizer.
TERGITOL™ NP-9	Excellent humectant and emulsifier, compatible with a large variety of active ingredients (AIs).
TERGITOL™ NP-9.5	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TERGITOL™ NP-10	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TERGITOL™ NP-11	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TERGITOL™ NP-12	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TERGITOL™ NP-13	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TERGITOL™ NP-15	Gives better stability for formulations, even in processes and applications with high temperatures.
TERGITOL™ NP-30	Emulsifier and stabilizer that is highly soluble in water, with high efficacy at high temperatures.
TERGITOL™ NP-30 (70%)	Emulsifier and stabilizer that is highly soluble in water, with high efficacy at high temperatures.
TERGITOL™ NP-40	Efficient in high temperatures, emulsifier and stabilizer, highly soluble in water, with humectant properties.
TERGITOL™ NP-40 (70%)	Efficient in high temperatures, emulsifier and stabilizer, highly soluble in water, with humectant properties.
TERGITOL™ NP-50 (70%)	Efficient in high temperatures, emulsifier and stabilizer, highly soluble in water, with humectant properties.
TERGITOL™ NP-70 (70%)	Efficient in high temperatures, emulsifier and stabilizer, highly soluble in water, with humectant properties.
TERGITOL™ TMN-3	Excellent for oil formulations (i.e., OD) and for waxes, paraffins and silicones.
TERGITOL™ TMN-6 (90%)	Agent with excellent humectant and penetrant properties (excellent surface tension reduction), especially for adjuvants and fungicide formulations. Excellent emulsifier for waxes, paraffins, and silicones.
TERGITOL™ TMN-10 (90%)	Penetrant and dispersant for high temperatures. High HLB emulsifier. Low gel range.
TERGITOL™ TMN-100X (90%)	Excellent humectant, penetrant and dispersant. Good emulsifier agent.
TRITON™ HW-1000	Excellent emulsifier for waxes, paraffins and silicones.
TRITON™ X-15	Excellent oil soluble surfactant, emulsifier with low HLB.
TRITON™ X-35	Excellent oil soluble surfactant, emulsifier with low HLB.
TRITON™ X-45	Excellent oil soluble surfactant, emulsifier with low HLB.
TRITON™ X-100	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TRITON™ X-102	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TRITON™ X-114	Excellent humectant and emulsifier, compatible with a large variety of AIs.
TRITON™ X-165 (70%)	Excellent stabilizer and dispersant for emulsions.
TRITON™ X-305 (70%)	Excellent emulsion stabilizer, offering stability for temperature cycles.
TRITON™ X-705 (70%)	Excellent emulsion stabilizers.
TRITON™ CG-50	Soluble in high alkaline solutions, low irritability, excellent humectant, high electrolyte stability. Ideal for formulations with glyphosate and/or nutrients.
TRITON™ CG-110	Soluble in high alkaline solutions, low irritability, excellent humectant, high electrolyte stability. Ideal for formulations with glyphosate and/or nutrients.
TRITON™ CG-425	Soluble in high alkaline solutions, low irritability, excellent humectant, high electrolyte stability. Ideal for formulations with glyphosate and/or nutrients.
TRITON™ CG-600	Soluble in high alkaline solutions, low irritability, excellent humectant, high electrolyte stability. Ideal for formulations with glyphosate and/or nutrients.
TRITON™ CG-650	Soluble in high alkaline solutions, low irritability, excellent humectant, high electrolyte stability. Ideal for formulations with glyphosate and/or nutrients.
TERGITOL™ XH	Steric stabilizer, increases stability and suspensibility. More polar characteristics when compared to TERGITOL™ XD.
TERGITOL™ XJ	Steric stabilizer, increases stability and suspensibility. Less polar characteristics when compared to TERGITOL™ XD.
TERGITOL™ XD	Excellent steric stabilizer and dispersant. Offers superior stability and suspensibility.
TERGITOL™ XDLW	Offers superior stability and suspensibility, with a humectant property. Handles better because it is a liquid.
TERGITOL™ L-61 (DOWFAX™ 63N10BRL)	Dispersant agent with efficient foam control.
TERGITOL™ L-62	Dispersant agent with efficient foam control.
TERGITOL™ L-64 (DOWFAX™ 63N40BRL)	Excellent steric stabilizer and dispersant. Offers superior stability and suspensibility.
DOWFAX™ 100N50	Excellent steric stabilizer and dispersant. Offers enhanced stability and suspensibility.
TERGITOL™ L-81	Dispersant agent with efficient foam control.
TERGITOL™ L-101	Dispersant agent with efficient foam control.

Nonionic Silicone Polyether Surfactants or “Superwetters”

Product	Molecule	Active (%)	Viscosity (cSt) ⁽¹⁾	HLB-EO ⁽²⁾	Surface Tension (dynes/cm)			Cloud Point ⁽³⁾	Flash Point (°C [°F]) ⁽⁴⁾	Properties
					0.100%	0.010%	0.001%			
XIAMETER™ OFX-5211 Superwetting Agent	Trisiloxane	100	41	11.5	21	23.4	36.5	< RT ⁽⁵⁾	101 (214)	Low molecular weight nonionic silicone polyether surfactant. Excellent surface tension reduction. Performance enhancer for agricultural chemicals, especially water-soluble broadleaf herbicides, insecticides, fungicides, and plant growth regulators. Rapid spreading and wetting for agricultural chemicals.
SYLGARD™ OFX-0309 Fluid	Trisiloxane	100	28	10.7	22	23.7	37.6	< RT ⁽⁵⁾	100 (212)	Organic Materials Review Institute (OMRI) Listed low molecular weight nonionic silicone polyether surfactant, developed to improve the wetting, spreading, and penetration of agricultural chemicals. Excellent surface tension reduction. Recommended to enhance performance of agricultural chemicals, especially water-soluble broadleaf herbicides and insecticides, fungicides, and plant growth regulators.

⁽¹⁾Viscosity at 25°C (77°F) ⁽²⁾Calculated by wt% EO/5 method ⁽³⁾1.0% in H₂O, °C (°F) ⁽⁴⁾Flash Point Closed Cup method ⁽⁵⁾RT = Room Temperature

Ionic Surfactants

Family	Product	Molecule	CAS Number	Surface Tension ⁽¹⁾		Properties	Recommended Applications ⁽⁴⁾
				Neutral ⁽²⁾	Alkaline ⁽³⁾		
Alkyldiphenyl Oxides	DOWFAX™ 2A1	Alkyldiphenyloxide Disulfonate Salts	119345-04-9	34	35	Excellent solubility and stability in acid systems, alkaline, high electrolyte concentration and in other oxidizing systems. Dispersant, emulsion and nutrient solution stabilizer.	SL, EC, EW, ME, Liquid Fertilizers
	DOWFAX™ 3B2		36445-71-3 / 70146-13-3	37	38	Excellent solubility and stability in acid systems, alkaline, high electrolyte concentration and in other oxidizing systems. Dispersant, emulsion and nutrient solution stabilizer.	SL, EC, EW, ME, Liquid Fertilizers
	DOWFAX™ 8390		65143-89-7 / 70191-76-3	44	46	Excellent solubility and stability in acid systems, alkaline, high electrolyte concentration and in other oxidizing systems. Dispersant, emulsion and nutrient solution stabilizer.	SL, EC, EW, ME, Liquid Fertilizers
	DOWFAX™ C6L		147732-60-3	34	34	Excellent solubility and stability in acid systems, alkaline, high electrolyte concentration and in other oxidizing systems. Dispersant, emulsion and nutrient solution stabilizer.	SL, EC, EW, ME, Liquid Fertilizers
	DOWFAX™ C10L		36445-71-3 / 70146-13-3	35	37	Excellent solubility and stability in acid systems, alkaline, high electrolyte concentration and in other oxidizing systems. Dispersant, emulsion and nutrient solution stabilizer.	SL, EC, EW, ME, Liquid Fertilizers
Diocetyl Sulfosuccinate	TRITON™ GR-5M	Diocetyl Sulfosuccinates	577-11-7	26	NR ⁽⁶⁾	Excellent humectant, emulsifier and dispersant.	SL, SC, EW, ME
	TRITON™ GR-7M			Insoluble	Insoluble	Excellent emulsifier and dispersant, and is oil soluble.	EC, OD
Phosphate Esters	TRITON™ H-55	Phosphate Esters	By request	45	53	Hydrotope, stable in acid and alkaline conditions.	SL, EC
	TRITON™ H-66			45	41	Hydrotope, stable in acid and alkaline conditions.	SL, EC
Naphthalene Condensates	POWERBLOX™ SN	Naphthalene Condensate Sodium Salt	9084-06-4	–	–	Good dispersant agent. Powder presentation.	SC, WP, WG, SE
Sulfonates	TERGITOL™ W-610	Olefin Sulfonate	By request	–	–	Good dispersant agent. Powder presentation.	SL, SC, WP, WG, SE
Polycarboxylate Polymers	POWERBLOX™ D-205	Polycarboxylate Copolymers	By request	–	–	Dispersant agent	SC, EC, EW, ME
	POWERBLOX™ SP-20			–	–	High efficiency dispersant agent	SC, EC, EW, ME
	POWERBLOX™ D-305			–	–	Dispersant agent	SC, EC, EW, ME

⁽¹⁾Surface tension: dynes/cm at 1% actives, 25°C ⁽²⁾Neutral pH 7 (distilled water) ⁽³⁾Alkaline pH 12.5 (sodium hydroxide solution)

⁽⁴⁾EC = emulsifiable concentrate; SL = soluble concentrate; SC = suspension concentrate; EW = emulsion: oil in water; OD = oil dispersion; SE = suspo-emulsion; ME = micro-emulsion; WG = water dispersible granule; WP = wettable powder

⁽⁶⁾NR = Not Recommended

Oxygenated Solvents

Family	Product	Molecule	CAS number	Surface Tension ⁽¹⁾	Flash Point (°C)	Solubility ⁽²⁾		Density ⁽³⁾ @20°C
						Solvent in Water	Water Solvent	
Alcohols	n-Propanol	n-Propanol	71-23-8	23.8	24	∞	∞	0.804
	Isopropanol	Isopropanol	67-63-0	21.4	12	∞	∞	0.785
	n-Butanol	n-Butanol	71-36-3	24.2	35	7.7	20.1	0.809
	Isobutanol	Isobutanol	78-83-1	23	31	8.5	15	0.8
	n-Pentanol	n-Pentanol	71-41-0	25.7	48	2	9.5	0.814
	Primary Amyl Alcohol - Isomeric Mixture	Isomeric Mixture	137-32-6 / 71-41-0	23.7	46	1.7	9.2	0.814
	2-Methyl Butanol	2-Methyl Butanol	137-32-6	25.7	43	2.2	8.3	0.817
	2-Ethylhexanol	2-Ethylhexanol	104-76-7	26.9	72	0.07	2.6	0.832
	Methyl Isobutyl Carbinol	Methyl Isobutyl Carbinol	108-11-2	23	39	1.7	6.2	0.805
	Diisobutyl Carbinol	Diisobutyl Carbinol	108-82-7	26	65	0.06	1	0.809
UNOXOL™ Diol	Isomeric Mixture	3971-28-6 / 105-08-8	-	118	∞	-	1.046	
Ketones	Methyl Isobutyl Ketone	Methyl Isobutyl Ketone	108-10-1	24	18	1.8	1.9	0.799
	Diisobutyl Ketone	Diisobutyl Ketone	108-83-8	22.8	49	0.04	0.5	0.806
	Isobutyl Heptyl Ketone	Isobutyl Heptyl Ketone	123-18-2	26.8	77	0.002	0.3	0.818
Acids	Propionic Acid	Propionic Acid	79-09-4	26.2	52	∞	∞	0.995
	Valeric Acid	Pentanoic Acid	109-52-4	26.1	84	2.4	13	0.939
	Isopentanoic Acid	Isopentanoic Acid	109-52-4 / 116-53-0	-	77	3.2	-	0.937
	2-Ethylhexanoic Acid	2-Ethylhexanoic Acid	149-57-5	28.7	124	0.1	1.4	0.908
Esters	n-Propyl Acetate	n-Propyl Acetate	109-60-4	24.4	14	2	2.6	0.886
	Isopropyl Acetate	Isopropyl Acetate	108-21-4	22.3	23	- ?	1.9	0.872
	n-Butyl Acetate	n-Butyl Acetate	123-86-4	25.3	22	0.7	1.9	0.881
	Isobutyl Acetate	Isobutyl Acetate	110-19-0	23.4	18	0.66	1.1	0.87
	Primary Amyl Acetate - Isomeric Mixture	Isomeric Mixture	628-63-7 / 624-41-9	25.8	25	0.2	0.9	0.874
	UCAR™ n-Propyl Propionate	Propanoic Acid Propyl Ester	106-36-5	24.7	24	0.5	-	0.88
	UCAR™ n-Butyl Propionate	Propanoic Acid Butyl Ester	590-01-2	25.3	38	0.2	<0.02	0.875
	UCAR™ n-Pentyl Propionate	Propanoic Acid Pentyl Ester	624-54-4	26.4	57	<0.05	<0.03	0.872
	UCAR™ Ester EEP	3-Ethoxypropionic Acid Ethyl Ester	763-69-9	28.1	60	5.2	2.2	0.948
	POWERBLOX™ SV-17	Isobutyric Acid 2,2,4-triMethyl-1,3-Specialty Ester	By request	30.7	120	0.12	2.9	0.945

⁽¹⁾ Surface tension (dynes/cm) at 20°C

⁽²⁾ Solubility (wt% at 20°C)

⁽³⁾ Density (g/cm³)

⁽⁴⁾ Solubility expressed in g/l at 20°C

∞ Miscible

Glycol Ethers

Family	Product	Molecule	CAS number	Surface Tension ⁽¹⁾	Flash Point (°C)	Solubility ⁽²⁾		Density ⁽³⁾ @25°C
						Solvent in Water	Water Solvent	
P-Series Glycol Ethers	DOWANOL™ PM	Propylene Glycol Methyl Ether	107-98-2	27.7	31 ⁽⁴⁾	∞	∞	0.916
	DOWANOL™ PMA	Propylene Glycol Methyl Ether Acetate	108-65-6	28.9	42 ⁽⁵⁾	16.0	3.0	0.963
	DOWANOL™ DPM	Dipropylene Glycol Methyl Ether	34590-94-8	28.8	75 ⁽⁴⁾	∞	∞	0.948
	DOWANOL™ DPMA	Dipropylene Glycol Methyl Ether Acetate	88917-22-0	27.3	86 ⁽⁵⁾	16.0	3.5	0.974
	DOWANOL™ TPM	Tripropylene Glycol Methyl Ether	25498-49-1	30	121 ⁽⁵⁾	∞	∞	0.962
	DOWANOL™ PnP	Propylene Glycol n-Propyl Ether	1569-01-3	25.4	48 ⁽⁴⁾	∞	∞	0.88
	DOWANOL™ DPnP	Dipropylene Glycol n-Propyl Ether	29911-27-1	27.8	88 ⁽⁴⁾	19.6	20.3	0.916
	DOWANOL™ PnB	Propylene Glycol n-Butyl Ether	5131-66-8	27.5	63 ⁽⁴⁾	5.5	15.5	0.875
	DOWANOL™ DPnB	Dipropylene Glycol n-Butyl Ether	29911-28-2	28.4	100 ⁽⁴⁾	4.5	12.0	0.907
	DOWANOL™ TPnB	Tripropylene Glycol n-Butyl Ether	55934-93-5	28.8	126 ⁽⁴⁾	4.5	8.0	0.927
	DOWANOL™ PPh	Propylene Glycol Phenyl Ether	770-35-4	38.1	126 ⁽⁴⁾	1.0	6.0	1.059
	DOWANOL™ PGDA	Propylene Glycol Diacetate	623-84-7	32.9	86 ⁽⁵⁾	7.4	4.1	1.051
	PROGLYDE™ DMM	Dipropylene Glycol Dimethyl Ether	111109-77-4	26.3	65 ⁽⁴⁾	35.0	4.5	0.899
E-Series Glycol Ethers	Propyl CELLOSOLVE™ Solvent	Ethylene Glycol n-Propyl Ether	2807-30-9	26.3	57 ⁽⁵⁾	∞	∞	0.907
	Butyl CELLOSOLVE™ Solvent	Ethylene Glycol n-Butyl Ether	111-76-2	27.4	65 ⁽⁵⁾	∞	∞	0.898
	Butyl CELLOSOLVE™ Acetate	Acetate of Ethylene Glycol n-Butyl Ether	112-07-2	27.4	74 ⁽⁵⁾	1.6	1.8	0.938
	Hexyl CELLOSOLVE™ Solvent	Ethylene Glycol Hexyl Ether	112-25-4	27.7	99 ⁽⁵⁾	0.88	17.7	0.883
	CARBITOL™ Solvent	Diethylene Glycol Ethyl Ether	111-90-0	31.8	102 ⁽⁵⁾	∞	∞	0.986
	Methyl CARBITOL™ Solvent	Diethylene Glycol Methyl Ether	111-77-3	34.8	92 ⁽⁵⁾	∞	∞	1.017
	Butyl CARBITOL™ Solvent	Diethylene Glycol n-Butyl Ether	112-34-5	30	99 ⁽⁵⁾	∞	∞	0.948
	Butyl CARBITOL™ Acetate	Diethylene Glycol n-Butyl Ether Acetate	124-17-4	30	105 ⁽⁵⁾	4.0	3.4	0.975
	Hexyl CARBITOL™ Solvent	Diethylene Glycol Hexyl Ether	112-59-4	29.2	126 ⁽⁵⁾	2.0	53.4	0.928
	Methoxytriglycol	Triethylene Glycol Methyl Ether	112-35-6	36.4	135 ⁽⁵⁾	∞	∞	1.043
	Ethoxytriglycol	Triethylene Glycol Ethyl Ether	112-50-5	33.7	129 ⁽⁵⁾	∞	∞	1.018
	Butoxytriglycol	Triethylene Glycol n-Butyl Ether	143-22-6	29.8	138 ⁽⁵⁾	∞	∞	0.984
	DOWANOL™ EPh Glycol Ether	Ethylene Glycol Phenyl Ether	122-99-6	42	121 ⁽⁴⁾	2.5	9.0	1.106

⁽¹⁾ Surface tension (dynes/cm) at 20°C

⁽²⁾ Solubility (wt% at 20°C)

⁽³⁾ Density (g/cm³)

⁽⁴⁾ Setaflash method (closed cup)

⁽⁵⁾ Tag Closed Cup method (TCC)

∞ Miscible

Amines

Family	Product	Molecule	CAS Number	Freezing Point (°C)
Ethanolamines	Monoethanolamine (MEA)	Monoethanolamine	141-43-5	10
	Diethanolamine (DEA)	Diethanolamine	111-42-2	28
	Triethanolamine (TEA) 99%	Triethanolamine	102-71-6	21
	Triethanolamine (TEA) LFG 85	Triethanolamine	102-71-6	-5
	Triethanolamine (TEA) Commercial Grade	Triethanolamine	102-71-6	15.8
Ethyleneamines	Ethylenediamine (EDA)	Ethylenediamine	107-15-3	11
	Diethylenetriamine (DETA)	Diethylenetriamine	111-40-0	-39
	Triethylenetetramine (TETA)	Triethylenetetramine	112-24-3	-35
	Tetraethylenepentamine (TEPA) UHP	Tetraethylenepentamine	112-57-2	-46
	Piperazine 68% Aq. (PIP)	Piperazine	110-85-0	48
	Aminoethylpiperazine (AEP)	Aminoethylpiperazine	140-31-8	-17
	Aminoethylethanolamine (AEEA)	Aminoethylethanolamine	111-41-1	-45
Isopropanolamines	Monoisopropanolamine (MIPA)	Monoisopropanolamine	78-96-6	3
	Diisopropanolamine (DIPA)	Diisopropanolamine	110-97-4	44
	Triisopropanolamine (TIPA) 99%	Triisopropanolamine	122-20-3	44

Chelants

Family	Product	Molecule	CAS Number	% Weight	Metal Complexation Capacity (chelant mass/metal mass)					Chelating Power (mg, CaCO ₃)	pH (saturated solution)
					Ca	Mg	Fe	Al	Mn		
Chelants	VERSENE™ Acid	H ₄ EDTA, EDTA - Ethylenediaminetetraacetic Acid	60-00-4	99	7.4	12.2	5.3	4.7	5.4	339	2.5 - 3
	VERSENE™ 100	Na ₄ EDTA, EDTA - Ethylenediaminetetraacetic Tetrasodium	64-02-8	39	25	41.2	17.9	15.8	18.2	102	11 - 11.8
	VERSENE™ Diammonium EDTA	(NH ₄) ₂ EDTA - Ethylenediaminetetraacetic (EDTA) Diammonium	20824-56-0	45	18.2	30.1	13.1	11.5	13.3	137	4.6 - 5.3
	VERSENE™ Tetraammonium EDTA	(NH ₄) ₄ EDTA - Ethylenediaminetetraacetic (EDTA) Tetraammonium	22473-78-5	38	19.2	31.6	13.8	12.1	14	130	9 - 9.5
	VERSENE™ 80	Na ₅ DTPA, DTPA - Diethylenetriaminepentaacetic Pentasodium	140-01-2	40.2	31.2	51.5	22.4	19.7	22.8	80	11 - 11.8

Propylene Oxide and Polyglycols

Family	Product	Molecule	CAS Number	Molecular Weight	Freezing Point (°C)	Viscosity (cSt)				
Propylene Oxide	Glycol	Propylene Glycol, Industrial Grade (PGI)	Propylene Glycol	57-55-6	76.1	Super cools	45.6 ⁽¹⁾			
		Dipropylene Glycol, Regular Grade (DPG)	Dipropylene Glycol	25265-71-8	134.2	Super cools	75 ⁽¹⁾			
Polyglycols	Propylene Glycol	POLYGLYCOL P 425	Polypropylene Glycol	25322-69-4	425	-45	26 ⁽²⁾			
		POLYGLYCOL P1000TB			1000	-25	80 ⁽²⁾			
		POLYGLYCOL P1200			1200	-41	153 ⁽²⁾			
		POLYGLYCOL P2000			2000	-31	143 ⁽²⁾			
		POLYGLYCOL P3000			3000	-28	255 ⁽²⁾			
		POLYGLYCOL P4000			4000	-20	438 ⁽²⁾			
	Polyethylene Glycol	Polyethylene Glycol	Polyethylene Glycol	25322-68-3	190 ⁽¹⁾ 210	-65	4.3 ⁽³⁾			
					285 ⁽¹⁾ 315	-11	5.8 ⁽³⁾			
					380 ⁽¹⁾ 420	4 - 8	7.3 ⁽³⁾			
					-	20 - 25	15.1 ⁽³⁾			
					570 ⁽¹⁾ 630	37 - 40	10.8 ⁽³⁾			
					950 - 1050	37 - 40	17.2 ⁽³⁾			
					1305 - 1595	17	26.5 ⁽³⁾			
					3015 - 3685	53 - 57	90.8 ⁽³⁾			
					3600 - 4400	-	140.4 ⁽³⁾			
					5400 - 6600	-	320 ⁽³⁾			
					7000 - 9000	60 - 63	821.7 ⁽³⁾			
					Metoxypolyethyleneglycol	Metoxypolyethyleneglycol	9004-74-4	335 - 365	(-5) - 10	3.9 ⁽³⁾
								525 - 575	15 - 25	6.5 ⁽³⁾
715 - 785	27 - 32	10.3 ⁽³⁾								

⁽¹⁾ 25°C

⁽²⁾ 100°F

⁽³⁾ 100°C

Isocyanates

Family	Product	Molecule	CAS Number	State Form	Functionality	Isocyanate Equivalency (mass)
Polymeric MDI	PAPI™ 27 MDI	Polymethylene Polyphenyl Diisocyanate	9016-87-9	Liquid	2.7	134
TDI	VORANATE™ T80 TDI	Toluene Diisocyanate Type I TDI	26471-62-5	Liquid	2	87.1

Silicone Antifoams

Product Type	Product	Active (%)	Performance					
			Persistency ⁽¹⁾ (at neutral pH)	Knockdown ⁽¹⁾ (at neutral pH)	At Low pH (pH<3)	After Low pH Aging (10 days @ pH<3)	At High pH (pH>13)	After High pH Aging (10 days @ pH>13)
Compound	XIAMETER™ ACP-1000 Antifoam Compound	100	●●●●	●●●●●	●●	—	●●	—
	XIAMETER™ ACP-0100 Antifoam Compound	100	●●●●	●●●●	●●	—	●●	—
	XIAMETER™ ACP-1500 Antifoam Compound	100	●●●●	●●●●●	●●	—	●●	—
	XIAMETER™ ACP-1400 Antifoam Compound	100	●●●●	●●●●	●●	—	●●	—
Emulsion	XIAMETER™ AFE-1510 Antifoam Emulsion	10	●●●●	●●●●●	●●	—	●●	—
	XIAMETER™ AFE-1520 Antifoam Emulsion	20	●●●●	●●●●●	●●	—	●●	—
	XIAMETER™ AFE-1530 Antifoam Emulsion	30	●●●●	●●●●●	●●	—	●●	—
	XIAMETER™ AFE-2210 Antifoam Emulsion	10	—	—	—	—	—	—
	XIAMETER™ AFE-0700 Antifoam Emulsion	10	●●●●●	●●●●	●●	●●	●●	●●
	XIAMETER™ AFE-0100 Antifoam Emulsion	30	●●●●	●●●●●	●●	—	●	—
	XIAMETER™ AFE-1410 Antifoam Emulsion	10	●●●●	●●●●	●●	—	●●	—
	XIAMETER™ AFE-0010 Antifoam Emulsion Food Grade	10	●●●●	●●●●●	●●	—	●	—
	XIAMETER™ AFE-0310 Antifoam Emulsion	30	●●●●	●●●●	●●	●●	●●	●●
	XIAMETER™ AFE-0110 Antifoam Emulsion	10	●●●●	●●●●	●●	—	●●	—
	XIAMETER™ AFE-0020 Antifoam Emulsion	20	—	—	—	—	—	—
XIAMETER™ AFE-0120 Antifoam Emulsion	21	—	—	—	—	—	—	
Powder	XIAMETER™ ACP-1920 Powdered Antifoam	20	●●●●	●●●●●	●●	—	●●	—

Contact your local Dow representative for sampling and regional availability.

⁽¹⁾Compared to other U.S. Environmental Protection Agency (EPA) approved antifoams.

Compound: Silicone fluids containing a suspension of finely powdered silica to enhance their defoaming efficiency. Primarily used in nonaqueous foaming systems.

Emulsion: Emulsified antifoam compound in water. Good option for controlling foam in aqueous applications.

Powder: Solid powdered compound antifoam. Can be added to dry products to prevent foaming when liquids are added.

●●●●● Enhanced performance
 ●●●● Good performance
 ●● Limited or no loss of performance
 ● Loss of performance
 — Not evaluated

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Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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