



# Agrochemical Additives

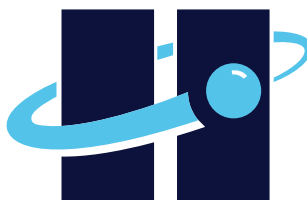


**Technology Driven. Customer Focused.**

Since our inception in 1917, we have been committed to safety, quality and responsible operations. Headquartered in Kansas City, Kansas, we maintain thirty distribution warehouses and six manufacturing facilities.

Our specialty chemicals manufacturing division (Harcros Organics) has rapidly expanded both domestically and globally. Our products have impacted industries in North and South America, Europe, Africa and the Asia-Pacific regions.

This catalog highlights Harcros' offerings to the Agrochemical Market. It is not all-inclusive. We have the ability to tailor-make formulations that are customer-specific utilizing chemistries that may or may not appear in this catalog. For our customers, we are as much a problem solver as we are a supplier of agrochemical and fertilizer components.



# HARCROS

## Contents

Introduction	1
Alkoxylates	2
Alkoxylates Part II	3
Agricultural Emulsifier Blends	4
Agricultural Emulsifier Blends Cont.	5
Phosphate Esters & Blends	6
Antifoams and Crystal Inhibitors	7

Our core competency rests with ethoxylation and propoxylation. Harcros Organics Manufacturing is well-versed in the reaction of ethylene and propylene oxides with a vast array of natural and synthetic feedstocks.

Harcros has extensive experience in the production of mixed ethylene oxide/propylene oxide adducts. These molecules are based on alcohols, triglycerides or low molecular weight glycols. The arrangement of the ethylene oxide and propylene oxide portions is critical to performance. These products offer acid stability, dispersion ability, emulsion performance, and hard water tolerance.

Our product line includes a variety of ethylene oxide/propylene oxide block polymers that may or may not be capped. Wetting performance in this product class is typically tailored to a given surface or terrain. Because of our unique processes, these types of products are better characterized as specialties rather than commodities.

## Castor Oil & Nonylphenol Ethoxylates

Product	Chemical Class	Physical Appearance	Pour Point (°F)	Cloud Point (°F) 1% aq	HLB	Activity (Min.)	Applications	FIFRA Title 40 CFR*
T-Det® C 20	Castor Oil	Yellow Liquid	20	115	9.7	99.5	Oil emulsifier, natural feedstock	4
T-Det® C 30	Castor Oil	Viscous Yellow Liquid	44	135	11.7	99.5	Emulsifier, dispersant, wetting agent.	4
T-Det® C 40	Castor Oil	Yellow Liquid/Paste	60	162	14.2	99.5	Microemulsifier, natural feedstock.	4
T-Det® C 54	Castor Oil	Yellow Liquid/Paste	90	185	15.0	99.5	Microemulsifier, wetting agent, natural feedstock.	4
T-Det® N 4	Nonylphenol	Clear Light Liquid	<0	Insoluble	8.9	99.5	Oil Emulsifier	1,2,3
T-Det® N 6	Nonylphenol	Clear Light Liquid	<0	Insoluble	10.9	99.5	Oil Emulsifier	1,2,3
T-Det® N 9.5	Nonylphenol	Clear Light Liquid	41	137	13.1	99.5	Emulsifier; agricultural spray adjuvant.	1,2,3
T-Det® N 40	Nonylphenol	White Solid	120	>200	17.7	99.5	Wetting agent. Stable in high electrolyte solutions.	1,2,3
T-Det® N 407	Nonylphenol	Clear Liquid	30	>200	17.7	70.0	Liquid version of T-Det® N-40.	1,2,3
T-Det® N 100	Nonylphenol	White Solid	127	>200	19.0	99.5	Very hydrophilic wetting agent.	1,2,3

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# Alkoxylates

## Continued

### Alcohol Alkoxylates & Block Polymers

Product	Chemical Class	Physical Appearance	Pour Point (°F)	Cloud Point (°F) 1% aq	HLB	Activity (Min.)	Applications	FIFRA Title 40 CFR*
T-Det® 25R2	Reverse block polymer	Clear to Slightly Hazy Liquid	20	85	4.0	99.5	Hydrophillic, low foaming, reduces gelling tendencies. Turf and soil wetting agent.	4
T-Det® A 104	Decyl alcohol ethoxylate	Hazy Liquid	20	80	10.5	99.5	Emulsifier, dispersant, wetting agent.	1,2,3
T-Det® A 106	Decyl alcohol ethoxylate	Hazy Liquid	34	108	12.3	99.5	Emulsifier, dispersant, wetting agent, herbicide adjuvant.	1,2,3
T-Det® A 109	Decyl alcohol ethoxylate	Hazy Viscous Liquid	58	178	14.3	99.5	Dispersant, wetting agent. Herbicide adjuvant.	1,2,3
T-Det® A 136	Tridecyl alcohol ethoxylate	Hazy Liquid	15	105	11.4	99.5	Emulsifier, wetting agent.	1,2,3
T-Det® A 139	Tridecyl alcohol ethoxylate	Hazy Viscous Liquid	50	134	13.3	99.5	Emulsifier, wetting agent. Herbicide adjuvant. Alkylphenol replacement	1,2,3
T-Det® A 1315	Tridecyl alcohol ethoxylate	Soft White Solid	120	180	16.0	99.5	Emulsifier, wetting agent. Alkylphenol replacement	1,2,3
T-Det® A 267	C12-16 alcohol ethoxylate	Hazy Liquid	55	138	14.7	99.5	Emulsifier, wetting agent. Alkylphenol replacement	1,2,3
T-Det® A 26-4.5 NR	C12-16 Narrow Range Ethoxylate	Hazy Liquid			10.5	99.5	Emulsifier, wetting agent. Alkylphenol replacement	1,2,3
T-Det® A 267 NR	C12-16 Narrow Range Ethoxylate	Hazy Liquid			14.0	99.5	Emulsifier, wetting agent. Alkylphenol replacement	1,2,3
T-Det® A 826	C8-12 alcohol ethoxylate	Clear Liquid	85	155	14.4	99.5	Emulsifier, wetting agent. Alkylphenol replacement	1,2,3
T-Det® A 91-6	C9-11 alcohol ethoxylate	Hazy Liquid	43	126	12.4	99.5	Branched Alcohol. Emulsifier, wetting agent. Alkylphenol replacement	1, 2, 3
T-Det® A 91-8	C9-11 alcohol ethoxylate	Hazy Liquid	61	176	13.9	99.5	Branched Alcohol. Emulsifier, wetting agent. Alkylphenol replacement	1, 2, 3
T-Det® EPO 61	EO/PO block polymer	Clear Light Liquid	-18	73	3.0	99.5	Insoluble in water and alcohol. Soluble in solvent. Low foaming.	4
T-Det® EPO 62	EO/PO block polymer	Clear Light Liquid	27	89	7.0	99.5	Stable over a wide pH range. Stable in salt solutions. Turf and soil wetting.	4
T-Det® EPO 64	EO/PO block polymer	Slightly Hazy	48	138	15.0	99.5	Emulsifier o/w or w/o, Good dispersant, pH and salt stable. Defoamer, turf and soil wetting agent.	4
T-Det® EPO 68 F	EO/PO block polymer	White Solid	125	190	29.0	99.5	Dispersant, thickening agent. Very hydrophilic.	4
T-Det® EPO 101	EO/PO block polymer	Hazy Liquid	-10	60	1 - 7	99.5	Dispersant, water-based flowables	4
T-Det® EPO 105	EO/PO block polymer	Paste	95	195	12 - 18	99.5	Dispersant, water-based flowables	4
T-Det® XH	EO/PO block polymer	White Semi-Solid	>100	205	15.0	99.5	Dispersant for pesticide actives. Formulation aid. Solublizer.	4
T-Det® XD	EO/PO block polymer	White Semi-Solid	95	163	12.0	99.5	Emulsifies aromatic solvents. More hydrophilic than XH.	4

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# Agricultural Emulsifier Blends

Harcros offers a full line of packaged emulsifier blends. These products are blends of anionic and nonionic surfactants and utilized in emulsifying oils and pesticides. Our experienced technologists are available to solve your formulation problems.

## T-Mulz® Emulsifiers

Product	Physical Appearance	Flash Point (°F) (PMCC)	Pour Point (°F)	Maximum Moisture Content 1%	Applications	FIFRA Title 40 CFR*
T-Mulz® 339	Hazy Amber Liquid	160	23	0.5	Dimethoate emulsifier	1,2,3
T-Mulz® 1237	Clear Amber Liquid	> 212	40	5.0	Microemulsifier for insecticides	2,3
T-Mulz® AS 1180	Viscous Yellow Liquid	115	50	0.5	Single emulsifier for 4 and 6 lb. phenoxy formulations	2,3
T-Mulz® MAL 5	Amber Liquid	106	25	0.5	5 lb/gal malathion formulations	1,2,3
T-Mulz® MAL 8M	Amber Liquid	105	40	0.5	8 lb/gal malathion formulations	1,2,3
T-Mulz® PR-2	Hazy Amber Liquid	112	40	0.5	Insecticide emulsifier	1,2,3
T-Mulz® PBM	Clear Yellow Liquid	> 300	25	0.5	Permethrin emulsifier	1,2,3
T-Mulz® SP 714T	Amber Liquid	144	63	1.0	Amine based single emulsifier for phenoxy formulations	2,3
T-Mulz® SP AG 3-55T	Hazy Amber Liquid	150	55	1.0	Emulsifies high acid content phenoxy actives	2,3
T-Mulz® SP AK 30-02BT	Dark Liquid	110	50	1.0	Microemulsifier for insecticides	1,2,3
T-Mulz® SP AK 31-56M	Dark Hazy Liquid	> 212	44	1.0	Microemulsifier for insecticides	1,2,3

## CASUL® & AMSUL Anionic Emulsifiers

Product	Chemical Class	Physical Appearance	Pour Point (°F)	Cloud Point (°F) 1% aq	Flash Point (°F) (PMCC)	Activity (Min.)	Applications	FIFRA Title 40 CFR*
Casul® 55 HF	Calcium Sulfonate	Dark Amber Liquid	50	Insoluble	100 Min	53.0	Highly lipophilic anionic portion of blended emulsifiers.	1,2,3
Casul® 70 HF	Calcium Sulfonate	Dark Amber Liquid	60	Insoluble	100 Min	69.5	Highly lipophilic anionic portion of blended emulsifiers.	1,2,3
Amsul 60 HF	Amine Sulfonate	Dark Amber Liquid	62	Insoluble	> 150	60.0	Highly lipophilic anionic portion of blended emulsifiers.	2
Amsul DMAP 60	Amine Sulfonate	Dark Amber Liquid	62	Insoluble	100 Min	60.0	Anionic portion of blended emulsifiers. Works well with phenoxy esters.	2
Amsul DMAP 60PG	Amine Sulfonate	Viscous Amber Liquid	60	Insoluble	> 212	60.0	Highly lipophilic anionic portion of blended emulsifiers.	2
Amsul 70	Amine Sulfonate	Viscous Dark Amber Liquid	62	Insoluble	100 Min	70.0	Highly lipophilic anionic portion of blended emulsifiers.	2

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# Agricultural Emulsifier Blends

(Continued)

## T-Mulz® Emulsifiers

Product	Physical Appearance	Flash Point (°F) (PMCC)	Pour Point (°F)	Maximum Moisture Content 1%	Applications	FIFRA Title 40 CFR*
T-Mulz® 541 L	Amber Liquid	106	55	0.5	Phenoxy herbicide emulsifier. Paired with T-Mulz® 541 H	1,2,3
T-Mulz® 541 H	Amber Liquid	110	55	0.5	Phenoxy herbicide emulsifier. Paired with T-Mulz® 541 L	1,2,3
T-Mulz® 775	Light Yellow Liquid	>200	>0	0.5	Citrus oil emulsifier.	1,2,3
T-Mulz® 2000 L	Amber Liquid	155	35	0.5	High Flash, APE free, micro and macroemulsifier for herbicides. Paired with T-Mulz® 2000 H.	2
T-Mulz® 2000 H	Amber Liquid	155	60	0.5	High Flash, APE free, micro and macro emulsifier for herbicides. Paired with T-Mulz® 2000 L.	2
T-Mulz® AG 525	Yellow Liquid	>200	22	4.0	Vegetable oil emulsifier.	1,2
T-Mulz® AG 530	Yellow Liquid	>200	18	4.0	Paraffinic oil emulsifier.	1,2
T-Mulz® COE	Clear to Hazy Liquid	250	0	11.5	Crop oil emulsifier	1,2
T-Mulz® COE-APF	Clear to Hazy Liquid	250	0	11.5	Crop oil emulsifier APE Free	1,2
T-Mulz® DOE	Amber Liquid	>200	>20	10.8	Dormant oil emulsifier	1,2
T-Mulz® FCO	Pale Yellow Liquid	>200	>0	0.5	Citrus oil emulsifier	1,2,3
T-Mulz® HODE	Amber Liquid	>200	>20	0.6	Dormant oil emulsifier, OMRI listed	
T-Mulz® O	Amber Liquid	108	55	0.5	Macroemulsifier paired with T-Mulz® W	1,2,3
T-Mulz® W	Amber Liquid	109	64	0.5	Macroemulsifier paired with T-Mulz® O	1,2,3
T-Mulz® SP-22	Dark Brown Liquid	105	40	0.8	T-Mulz® SP 22, 33, and 88 are a trio of emulsifiers designed to emulsify many pesticide formulations	1,2,3
T-Mulz® SP-33	Dark Brown Liquid	105	36	0.8	T-Mulz® SP 22, 33, and 88 are a trio of emulsifiers designed to emulsify many pesticide formulations	1,2
T-Mulz® SP-88	Dark Brown Liquid	105	38	0.8	T-Mulz® SP 22, 33, and 88 are a trio of emulsifiers designed to emulsify many pesticide formulations	1,2,3

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# Phosphate Esters

Our phosphate esters are produced from both alcohol and alkylphenol ethoxylates. They can be manufactured to meet either high or low monoester content specifications. Phosphate esters prepared with high monoester content are especially useful as fertilizer compatibility agents.

## T-Mulz® Phosphate Esters

Product	Substrate	Physical Appearance	Pour Point (°F)	pH (1% aq)	Max Moisture Content %	% Active (Min.)	Typical Acid Values Mg KOH/gm pH 5.5/ pH 9.5	Applications	FIFRA Title 40 CFR*
T-Mulz® 1396	Aliphatic	Pale Yellow Liquid	35	2.0	55.0	45.0	64/120	Agricultural emulsifier and fertilizer compatibility agent. Acidifier.	2
T-Mulz® 1183	Aliphatic	Pale Yellow Liquid	60	2.0 - 3.0	0.5	99.5	108/74	Agricultural formulations, water in oil emulsifier	2,3
T-Mulz® 800	Aliphatic	Pale Yellow Liquid	40	2.0 - 3.0	0.5	99.5	110/93	Electrolyte compatible. Hydrotrope and wetter	2
T-Mulz® T9PE	Aliphatic	Pale Yellow Liquid	>40	1.5 - 2.5	1.0	99.0	147/280	Agricultural tank mix additive, Water conditioner.	2
T-Mulz® D6PE	Aliphatic	Pale Yellow Liquid	>10	2.0 - 3.0	1.0	99.0	129/248	Agricultural emulsifier and fertilizer compatibility agent. Acidifier.	2
T-Mulz® 1227	Aliphatic	Yellow Liquid	>10	2.0 - 3.0	1.0	99.0	139/257	Agricultural emulsifier and fertilizer compatibility agent. Acidifier.	2
T-Mulz® D6PE-KS	Aliphatic	Clear Liquid	>32	7.0 - 8.5	65.0	35.0	n/a	Fertilizer compatibility. Aids in micronutrient uptake. Buffering aid.	2
T-Mulz® 734-2KS	Aliphatic	Clear, Amber Liquid	10	7.0 - 8.0	45.0	55.0	n/a	Agricultural emulsifier and fertilizer compatibility agent.	2
T-Mulz® 598	Aliphatic	Yellow Liquid	23	2.0 - 3.0	0.5	99.5	63/100	Agricultural emulsifier and fertilizer compatibility agent.	2

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## Antifoams & Crystal Inhibitors

Harcros produces a wide array of antifoaming and defoaming products. The antifoams are silicone emulsions or non-silicone particulate dispersions. Harcros antifoams can meet food grade requirements and can be certified Kosher. We have the ability to make small batches of antifoaming product that suit a variety of needs.

### Antifoams

Product	Physical Appearance	Type	Flash Point (°F) (PMCC)	Solubility in Water	% Active (Min.)	Specific Gravity	Applications	FIFRA Title 40 CFR*
Antifoam 8810 FG	White Liquid	Silicone	>200	Dispersible	10	1.00	Food grade, freeze/thaw stable	1,2
Antifoam 8820 FG	White Liquid	Silicone	>200	Dispersible	20	1.00	Freeze/thaw stable, general	1,2
Antifoam 8830 FG	White Liquid	Silicone	>200	Dispersible	30	1.00	Food grade, freeze/thaw stable	1,2
Antifoam 100M IND	Viscous Liquid	Silicone	>200	Insoluble	100	1.01	Extruded formulations	1,2
Antifoam 100 FG	Viscous Liquid	Silicone	>200	Insoluble	100	1.01	Food processing, general	1,2
Antifoam 100 IND	Viscous Liquid	Silicone	>200	Insoluble	100	1.01	Industrial grade, general	1,2
Antifoam 10 FG	White Liquid	Silicone	>200	Dispersible	10	1.01	Food processing, general, OMRI Listed	1,2
Antifoam 10 IND	White Liquid	Silicone	>200	Dispersible	10	1.01	Industrial grade, general	1,2
Antifoam 30 FG	White Liquid	Silicone	>200	Dispersible	30	1.01	Food processing, general	1,2
Antifoam 30 IND	White Liquid	Silicone	>200	Dispersible	30	1.01	Industrial grade, general	1,2
Antifoam HL-36	Clear Liquid	Non-Silicone	>200	Dispersible	100	1.00	Fermentation, yeast processing, Kosher	2

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### Crystal Inhibitor

Product	Physical Appearance	Chemical Class	Pour Point (°F)	Flash Point (°F) (PMCC)	Cloud Point (°F) 1% aq	% Active (Min.)	HLB	Applications	FIFRA Title 40 CFR*
Crystal Inhibitor #5	Amber Liquid	Vegetable Oil Ethoxylate	60	>200	162	99.5	14.0	Inhibits crystal growth in EC formulations. Aids in emulsification.	1,2

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**HARCROS**