Agrochemical Formulants

Global Product Information

INDORAMA VENTURES

Integrated Oxides & Derivatives

> Empowering potential.

URFONIC®
TERMI
TERWET®
T
MUL®
TERMIX®
TERSP
ET®
TERSPERSE®
SURFON
RFONIC®
TERWET®
TERM
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TERMUL®
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RSPERSE®
TERMUL®
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ERWET®
TERWET®
E®
TERSPERS
T®
SURFONIC®

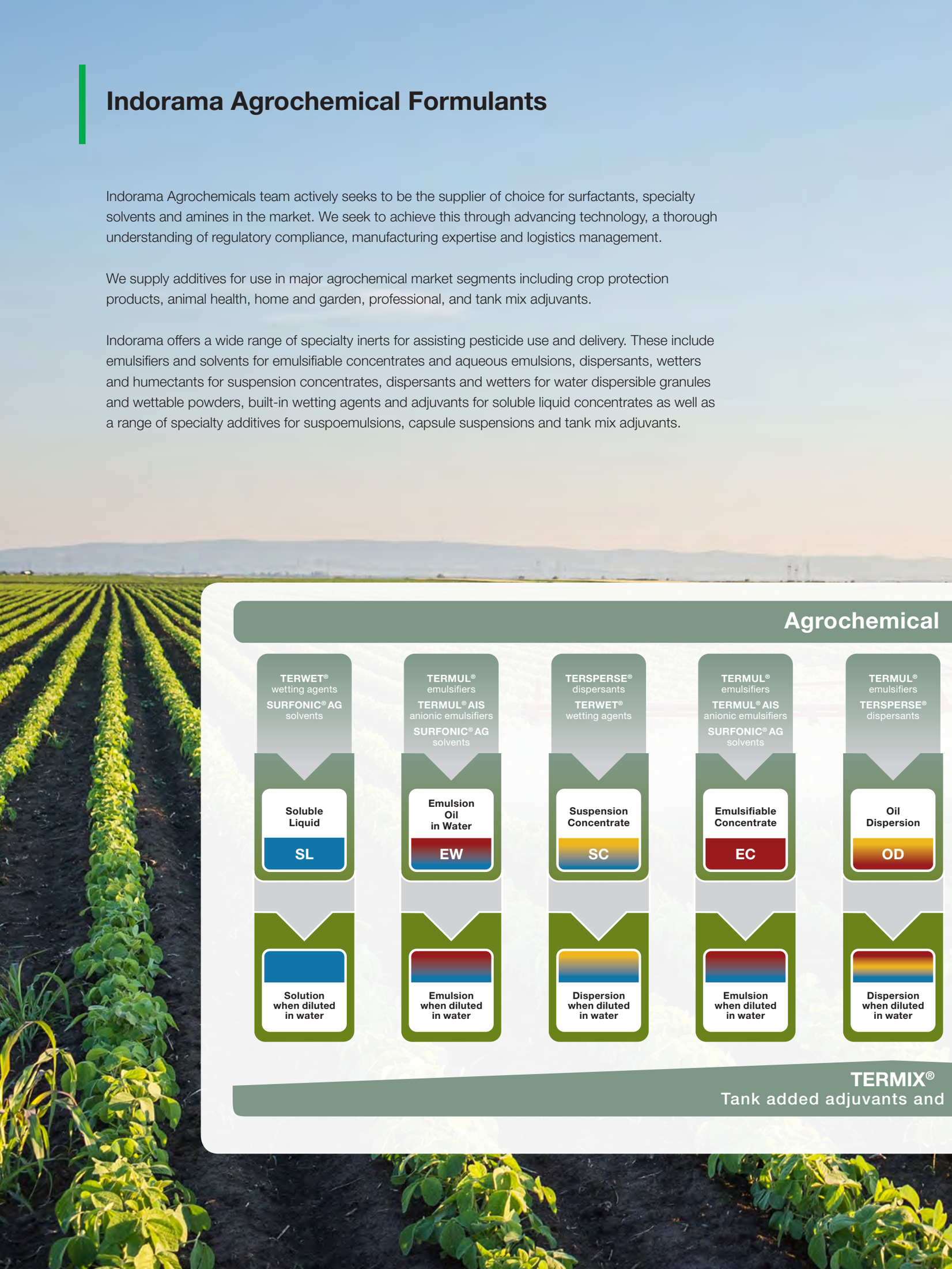
Content

Indorama Agrochemical Formulants

Indorama Agrochemicals team actively seeks to be the supplier of choice for surfactants, specialty solvents and amines in the market. We seek to achieve this through advancing technology, a thorough understanding of regulatory compliance, manufacturing expertise and logistics management.

We supply additives for use in major agrochemical market segments including crop protection products, animal health, home and garden, professional, and tank mix adjuvants.

Indorama offers a wide range of specialty inerts for assisting pesticide use and delivery. These include emulsifiers and solvents for emulsifiable concentrates and aqueous emulsions, dispersants, wetters and humectants for suspension concentrates, dispersants and wetters for water dispersible granules and wettable powders, built-in wetting agents and adjuvants for soluble liquid concentrates as well as a range of specialty additives for suspoemulsions, capsule suspensions and tank mix adjuvants.



New technology developments include more effective and environmentally friendly agricultural adjuvants, new generation polymeric dispersants and solvents, as well as low foam wetting agents and highly efficient emulsifiers. We continue to provide solutions to formulation problems for all major formulation types used for agrochemicals, with particular expertise in water dispersible granule technologies, suspensions and structured surfactant formulations.

Our dedication to the industry also extends into the regulatory process with successful US-EPA approvals for new solvents and surfactants being achieved and commitment to ensure compliance for our products under the European REACH system. The success of our technical efforts in product development and formulations is evidenced by the number of proprietary, patented technologies that have been commercialized by Indorama for use in agrochemical formulations over many years.

Indorama Agrochemical Formulants

The Indorama Agrochemicals team is a team of dedicated sales and technical professionals with a strong background in the industry covering key regions of the world. Supporting each region are committed technical teams, with development laboratory facilities in Australia, India, Brazil and the United States.

Advanced Technology Center
The Woodlands, Texas

Our global research and technology headquarters dedicated to supporting our customers with innovative new products and designs.

Plant located in
Ankleshwar, India

Plant located in
Botany, Australia

This brochure contains typical properties of the Indorama range of agrochemical formulants.

Indorama Agrochemical Formulants Guide

Products in the Indorama surfactant series are typically used in formulations as dispersants, wetting agents, emulsifiers and agricultural spray adjuvants. Dispersants facilitate the dispersion and suspension of active particles of dry and liquid flowables in the formulation and the application tank. Wetting agents lower the surface tension of aqueous solutions and can improve the degree of surface coverage and penetration of the pesticide. Emulsifiers form stable mixtures of an oil or solvent solutions in water, enabling an easy-to-apply tank mix. Adjuvants can improve foliar retention and penetration or adjust the tank mix properties to improve the overall efficacy of the pesticide.

Indorama offers a whole range of surfactants as well as specialty solvents and specialty amines utilized in the agrochemical industry. In addition to the general Huntsman product range, dedicated products and their uses include:

Indorama Product Description

Products	Emulsifiable Concentrates (EC)	Water Dispersible Granules (WG)	Suspension Concentrates (SC)	Wettable Powders (WP)	Microemulsions (ME)	Emulsions in Water or Oil (EW) (EO)	Suspo Emulsions (SE)	Capsule Suspensions (CS)	Oil Dispersion (OD) (OF)	Soluble Liquids (SL)	Tank Mix Adjuvants
TERSPERSE® nonionic, anionic and anionic/ nonionic blended dispersant		■	■	■			■	■	■		
TERMUL® AIS anionic surfactants	■	■	■	■	■	■	■	■		■	■
TERWET® built-in adjuvants and functional wetting agents		■	■	■			■			■	■
TERMIX® tank-added adjuvants and compatibilizers											■
TERMUL® nonionic, anionic and blended emulsifiers	■		■		■	■	■	■	■		■
SURFONIC® AG solvents	■				■	■	■	■		■	■

TERSPERSE® Dispersants

PRODUCT DESCRIPTION

These agricultural surfactants may be oligomers, polymers or alkoxylates. They can be used as dispersants or as dispersant/wetter combinations.

USE and APPLICATION

- Dispersants in WP and WG formulations
- Dispersants in aqueous suspension concentrates (SC) and suspoemulsions (SE)
- Wetter/dispersants in aqueous suspension concentrates
- Dispersants for oil-based suspensions (OD)
- Dispersants for inorganic suspension concentrates (SC)

BENEFITS

- Dispersants in high active-loading formulations
- Can reduce aging problems in WG formulations
- Wetter/dispersant combinations that are liquid at room temperature

40 CFR EXEMPTIONS

180.960 - Polymers that meet the definition under 40 CFR 723.250 are exempt from the requirement of a tolerance.

TERSPERSE® Naphthalene Sulfonate Formaldehyde Condensate (NSF)

TERSPERSE® Dispersants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
2020	Alkyl-NSF sodium salt	SC, WP, WG	Powder	0.5*	N/A	N/A	N/A	YES
2100	NSF sodium salt	SC, WP	Powder	0.5*	N/A	N/A	N/A	YES

** High degree of condensation*

TERSPERSE® Nonionic Wetter and Dispersant Multifunctional Blends

TERSPERSE® Dispersants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
4894 [2]	APE-free nonionic wetter and dispersant package	SC	Liquid	1.00	>100	7	800	YES
4895	APE-free nonionic wetter and dispersant package	SC	Liquid	1.00	>100	7	800	YES
4896 [2]	Nonionic wetter and dispersant package	SC	Liquid	1.04	>100	9	1400	YES

TERSPERSE® Ethoxylated Tristrylphenol Derivatives (TSP)

TERSPERSE® Dispersants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
2202	Phosphate triethanolamine (TEA) salt	SC, SE	Viscous Liquid	1.14	>150	10	>15000	NO
2218	Sulphate ammonium salt	SC, SE	Viscous Liquid	1.17	>150	16	>20000	YES
2219	Sulphate ammonium salt in glycol	SC, SE	Liquid	1.10	>150	<-12	600	YES
2222 [2]	Phosphate potassium salt in glycol	SC, SE	Liquid	1.05	>110	<0	<400	YES

TERSPERSE® Polymerics

TERSPERSE® Dispersants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
2500	Acrylic graft co-polymer surfactant	SC, SE	Liquid	1.07	>100	<0	200	YES
2510	Polycondensed fatty acid/ alkylene oxide adduct	SC, SE, OD	Paste	0.94	>100	45	N/A	YES
2520	Modified polyester condensate	SE, OD	Viscous Liquid	1.00	>75	>21	65000	YES
2612	Polymeric amide dispersant	SE, SC	Liquid	1.03	75	-30	386	YES
2700	Polymeric anionic	WG, SC	Powder	0.3[1]	N/A	N/A	N/A	YES

[1] Bulk Density

TERSPERSE® Specialty Dispersant Blends / Packages

TERSPERSE® Dispersants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
2280	Dispersant emulsifier blend	SE	Liquid	1.05*	60	<0	960	YES
2802 [2]	Dispersant wetting blend	SC	Liquid	1.07	>100	4	850	YES
5719 [2]	Dispersant emulsifier blend	SE, SC	Liquid	1.07	94	-15	413	YES

** at 40ºC*

TERMUL® AIS Anionic Surfactants

PRODUCT DESCRIPTION These anionic surfactants are based upon alkylbenzene sulfonic acids.

USE and APPLICATION Calcium salts have a generally low HLB value and are useful as emulsifiers in EC formulations. Certain sodium salts are useful as wetting agents in dry and liquid formulations.

AVAILABLE CHEMISTRY Linear dodecylbenzene sulfonic acids are available. The salts include calcium. Amine versions include alkylamines.

40 CFR EXEMPTIONS 180.910/930 Alkyl (C8-C24) benzenesulfonic acid and its NH4, Ca, Mg, K, Na and Zn salts.

180.920 Diethanolamine salts of alkyl (C8-C24) benzenesulfonic acid. Not to exceed 7% of pesticide formulation. Dimethylaminopropylamine, isopropylamine, ethanolamine, and triethanolamine salts of alkyl (C8-C24) benzenesulfonic acid.

TERMUL® AIS Alkylbenzene Sulfonic Acids

TERMUL® AIS Anionic Surfactants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	Active Content % w/w	EPA 40 CFR180 Listing
SSA (1)	Linear alkylate	EC, SL	Liquid	1.05	>150	-10	1200	>95	YES

TERMUL® AIS Calcium Salts

TERMUL® AIS Anionic Surfactants	Alkylate Type & Solvent	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	Active Content % w/w	EPA 40 CFR180 Listing
AIS 70/B (1)	Linear in Iso-butanol	EC, EW	Viscous liquid	1.02	33	-6	12500	69	YES
AIS 70/13 (1)	Linear in n-butanol	EC, EW	Viscous liquid	1.02	36	-6	9500	70	YES
AIS 70/2E (1)	Linear in 2-ethylhexanol/ propylene glycol	EC, EW	Viscous liquid	0.99	63	<-10	1900	57	YES

TERMUL® AIS Amine Salts

TERMUL® AIS Anionic Surfactants	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	Active Content % w/w	EPA 40 CFR180 Listing
AIS 94 (1)	Isopropylamine salt based on a linear alkylate	EC, EW, SC	Viscous liquid	1.03	>120	-10	4000	96	YES

TERWET® Wetting Agents and Adjuvants

PRODUCT DESCRIPTION

These products can contain any or all types of surfactants or blends. Anionic, nonionic, cationic and amphoteric surfactants are present in this product family. Blends of the surfactants may contain solubilizers and solvents to aid in handling these materials.

USE and APPLICATION

These products can be used as wetting agents or built-in adjuvants in agricultural formulations. They can be used in soluble liquid (SL), suspension concentrate (SC), soluble powder (SP), soluble granule (SG), water dispersible granule (WG), and wettable powder (WP) formulations.

BENEFITS

- Improved efficacy of SL formulations
- Ease of addition of powders in SC formulation manufacture
- Improved dispersion of WG formulations

40 CFR EXEMPTIONS

Includes 180.910, 920, 960

TERWET® Wetting Agents and Adjuvants

TERWET® Wetters	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
107 (1)	Anionic/nonionic surfactant blend	Sticky paraquat	Viscous liquid	1.07	>100	11	7000	YES
109 (1)	APE-free anionic/nonionic surfactant blend	Sticky paraquat	Viscous liquid	1.05	>100	-4	1560	YES
157	Ethoxylated nonylphenol on silica	WP, SP	Powder	0.3*	N/A	N/A	N/A	YES
245 (2)	Alcohol alkoxylate	Tank-mix adjuvant	Liquid	1.00	>170	<0	900	YES
260 (2)	Alcohol alkoxylate	Tank-mix adjuvant	Liquid	0.99*	>100	16	156*	YES
1004 (1)	Anionic wetting agent	WG, WP, SC	Powder	0.4*	N/A	N/A	N/A	YES

** at 20°C*

TERWET® Wetting Agents and Adjuvants (continue)

TERWET® Wetting Agents and Adjuvants

TERWET®	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
1007 (1)	Anionic wetting agent	WG, WP, SC	Powder	0.4[1]	N/A	N/A	N/A	YES
1010 (1)	Anionic wetting agent	WG, WP, SC	Solid	0.5[1]	N/A	N/A	N/A	YES
1108 (2)	Anionic/nonionic surfactant blend	Wetting agent	Liquid	1.05	>100	<0	100	YES
1109 (2)	Nonionic surfactant blend	Wetting agent	Liquid	1.00	>149	<0	50	YES
1110 (2)	Alcohol alkoxylate	Tank-mix adjuvant	Liquid	1.00*	>100	<0	61	YES
1116 (2)	Alcohol ethoxylate	Wetting agent	Liquid	0.96	>100	<0	N/A	YES
1118 (2)	Alcohol ethoxylate	Wetting agent	Liquid	0.99	>100	6	106	YES
1120 (2)	Nonionic surfactant blend	Wetting agent	Liquid	1.08*	>100	<-10	470	YES
1262 (1)	Sodium lauryl ether sulfate	Glufosinate wetting agent	Liquid	1.10	>100	7	8000	YES
1227 (1)	Dialkylsulphosuccinate in glycol solvent	SC	Liquid	1.09	100	<-10	300	YES
1259 (2)	Adjuvant dispersant	WP, WG	Powder	0.32[1]	N/A	N/A	N/A	YES
1300 (2)	Polyalkylene gylcol	Broadacre soil wetter	Liquid	1.10	171	<0	75	YES
1630 (2)	Ethoxylated tallowamine phosphate ester	High-load glyphosate	Viscous Liquid	1.01	168	8	2480	YES
1632 (2)	Ethoxylated tallowamine phosphate ester/APG blend	High-load glyphosate	Viscous Liquid	1.09	165	-16	208	YES
1650 (2)	Non-TAE alkylamine alkoxylate	High-load glyphosate	Liquid	1.05	>100	-2	2100	PENDING
3001 (2)	C8/10 alkyl polyglucoside	Adjuvant	Viscous Liquid	1.15	>100	-9	2500	YES

[1] Bulk Density
** at 20°C*

TERWET® Glyphosate Wetting Agents and Adjuvants

TERWET®	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
220 [2]	Ethoxylated tallow amine	Glyphosate	Liquid	1.05	>149	<0	250	YES
436 [2]	Formulated nonionic surfactant blend	Glyphosate low aquatic toxicity	Liquid	1.14	>100	<0	1100	YES
1170 [2]	Ethylene diamine alkoxylate	Glyphosate low toxicity	Liquid	1.09	>149	<0	560	NO
1215 [2]	Formulated nonionic surfactant blend	Glyphosate low aquatic toxicity	Liquid	1.14	>100	<0	600*	NO
1221 [2]	Alkyl Diamine alkoxylate	Glyphosate SG	Paste	1.02	>150	37	N/A	YES
1248 [2]	Formulated nonionic surfactant blend	Glyphosate SG	Paste	1.05	>100	32	N/A	YES
1251 [2]	Ethoxylated tallow amine	Glyphosate adjuvant	Liquid	1.02	>150	<0	50	YES
1255 [2]	Ethoxylated tallow amine	Glyphosate adjuvant	Liquid	0.98	>150	1	210	YES
3780 [2]	Formulated ethoxylated tallow amine blend	Glyphosate adjuvant	Liquid	1.05	>137	<0	250	YES
3782 [2]	Formulated ethoxylated tallow amine blend	Glyphosate adjuvant	Liquid	1.05	>200	<0	620	YES
3784 [2]	Ethoxylated tallow amine	Glyphosate adjuvant	Liquid	1.03	>160	0	180	YES
3788 [2]	Ethoxylated tallow amine blend	Glyphosate adjuvant	Liquid	1.15	>100	<-20	450	YES
3790 [2]	Formulated ethoxylated tallow amine	Glyphosate adjuvant	Liquid	1.13	>100	-50.6	100	YES
5735 [2]	Ethoxylated tallow amine blend	Glyphosate adjuvant	Liquid	1.04	>138	<25	78	YES

** at 20°C*

TERWET® Animal Care

TERWET®	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	EPA 40 CFR180 Listing
5522 [2]	Bovine teat dip	Iodophor stabilizer	Solid	1.06	253	39	126	YES
5838	Bovine teat dip	Iodophor stabilizer	Liquid	1.00	>200	15	36	YES

TERMIX® Tank Mix Adjuvants

PRODUCT DESCRIPTION

These products are defined by their function and are mainly used outside of the formulated product containing active ingredients. Most are added to the spray tank in the field. Members of this group may be added to the spray tank to boost functionality of the pest control product. All classes of surfactants may be used in this product group. Definitions for these functions can be found in ASTM Standard E 1519, Terminology Relating to Agricultural Tank Mix Adjuvants. These products may promote activity in the spray tank as wetting and compatibility agents. These products are currently not regulated by the U.S. EPA but the components commonly used in these products may meet a variety of 180.900 series exemptions from tolerance (should be verified independently).

USE and APPLICATION

Listed below are some of the common functions:

- Wetting agents
- Compatibility agents
- Spreader/stickers
- Crop oil emulsifiers/modified vegetable oil emulsifiers
- Drift reduction products

40 CFR EXEMPTIONS

These products are currently not regulated by the U.S. EPA but the components commonly used in these products may meet a variety of 180.900 series exemptions from tolerance.

TERMIX® Tank Mix Adjuvants – Wetting Agents

TERMIX® Adjuvants	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq	Draves Wetting Seconds
5017 [1]	Non-APE	Liquid	1.00	146	-12	120	7	7
5210 [2]	APE	Liquid	1.09	164	-12	323	6	3.4
5212 [2]	APE	Liquid	1.08	174	-8	349	6	3.9
5225 [2]	APE	Liquid	1.05	138	<-15	155	5	15

TERMIX® Crop Oil Emulsifiers

TERMIX® Adjuvants	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq
5300 [2]	APE	Liquid	0.98	138	-15	120	4-7
5800	Non-APE	Liquid	0.98	>150	-3	100	5

TERMIX® Spray Drift Reduction Agents

TERMIX® Adjuvants	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq	EPA 40 CFR180 Listing
5910 [1]	Proprietary	Liquid	0.99	99	-28	207	6-8	YES
5920 [2]	Alcohol alkoxylate	Hazy liquid	0.94	>300	-10	50	6-7	YES

TERMIX® Compatibility Agents

TERMIX® Adjuvants	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq
1190 [1]	Alcohol phosphate in free acid form	Liquid	1.13	115	<-15	500	1-3
AIS 4000 [1]	Ammonium isethionate	Liquid	1.29	>148	<-50	5.5	4-5
5270 [1]	Non-APE phosphate ester	Liquid	1.14	112	-12	830	2-3
5484 [1]	Non-APE phosphate ester	Liquid	1.17	>280	-14	100	5-7
5110 [1]	Paraquat compatibility agent	Liquid	1.01	>70	0	70	7-8

TERMIX® Spreader / Sticker

TERMIX® Adjuvants	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq	EPA 40 CFR180 Listing
5910 [2]	Proprietary	Liquid	0.99	99	-28	207	6-8	YES

TERMIX® Defoamer

TERMIX® Defoamer	Description	Appearance @ 25°C	Bulk Density @ 25°C, g/ml	pH 1% Aq	EPA 40 CFR180 Listing
AF 3060 [1]	Blend	Powder	0.4	4-5	YES

TERMIX® Tank Mix Adjuvants (continue)

TERMIX® Water Conditioning Agents

TERMIX®	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq	EPA 40 CFR180 Listing
4110 [2]	Non-ammoniated	Liquid	1.26	>100	-30	40	4-6	YES
4111 [2]	Non-ammoniated with drift reduction	Liquid	1.17	>100	-7	334	4-6	YES

TERMIX® Basic Blend / pH Adjuster

TERMIX®	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq	EPA 40 CFR180 Listing
5722 [1]	Alkalinity Agent / Surfactant	Liquid	1.04	95	<-41	63	11	YES

TERWET® Tank Mix Adjuvants – Wetting Agents

TERWET®	Description	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	Viscosity @ 25°C, mPa.s	pH 1% Aq	EPA 40 CFR180 Listing
5735 [2]	Ethoxylate tallow amine for glyphosate	Liquid	1.04	>138	<-4	81	10	YES

TERMUL® Emulsifiers

PRODUCT DESCRIPTION These products are anionic and nonionic surfactants. Primarily used in blends with each other, they provide the primary emulsifier for emulsifiable concentrates, concentrated emulsions, microemulsions and suspoemulsion formulations. In some cases, individual anionic or nonionic surfactants may be used.

USE and APPLICATION These products can be used in emulsifiable concentrates (EC), suspoemulsions (SE), emulsions in water (EW), and microemulsions (ME).

40 CFR EXEMPTIONS Most are exempt under 180.900 series.

TERMUL® Nonylphenol Alkoxylate

TERMUL® Emulsifiers	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	HLB	EPA 40 CFR180 Listing
200 [2]	EC, EW, SC	Solid	1.03	>150	30	16.1	YES
5370 [2]	EC, EW	Liquid	1.06	275	23	14.5	YES

TERMUL® Ethoxylated Castor Oil

TERMUL® Emulsifiers	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	HLB	Moles EO	EPA 40 CFR180 Listing
1284 [2]	EC, EW, SE, ME	Paste	1.05	>150	20	12.6	36	YES
1285 [2]	EC, EW, SE, ME	Paste	1.05	>150	36	14.4	54	YES
2507 [2]	EC, EW, SE	Liquid	1.05	>150	16	12.0	32	YES
3512 [2]	EC, EW	Liquid	1.01	>150	<-10	7.3	12	YES
3532 [2]	EC, EW	Liquid	1.01	>150	11	12.0	32	YES
3540 [2]	EC, EW	Paste	1.05	>150	28	13.0	40	YES

TERMUL® Emulsifiers (continue)

TERMUL® Alcohol Alkoxylate

TERMUL® Emulsifiers	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	HLB	EPA 40 CFR180 Listing
203 [2]	EC, EW, SC	Solid	1.04*	>149	33	17.5	YES
5429 [2]	EC, EW, SC	Solid	1.04*	230	37	14.5	YES
5459 [2]	EC, EW, SC	Solid	1.04[1]	>100	45	16.1	YES
5500 [2]	EC, EW	Liquid / paste	1.05	210	20	14.5	YES

** at 38°C*
[1] at 50°C

TERMUL® Tristyrylphenol Alkoxylate

TERMUL® Emulsifiers	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	HLB	Moles EO	EPA 40 CFR180 Listing
3115 [2]	EC, EW, SC, SE	Liquid	1.09	>188	-25	13.5	N/A	YES
3130 [2]	EC, EW, SC, SE	Liquid	1.10	>100	<0	10.5	10	YES
3150 [2]	EC, EW, SC, SE	Liquid	1.10	>150	17	12.5	16	YES

TERMUL® Formulated Emulsifier Anionic/Nonionic Blends

TERMUL® Emulsifiers	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	HLB	EPA 40 CFR180 Listing
3013 (1)	EC	Liquid	0.98[1]	240	-2	N/A	NO
3016 (1)	OD	Liquid	1.03	48	6	N/A	YES
3904 (1)	EC	Liquid	1.00	28	10	10.6	NO
3905 (1)	EC	Liquid	1.00	28	0	10.8	NO
3910 (1)	EC	Liquid	1.00	28	14	12.5	NO
3920 (1)	EC	Liquid	1.00	28	-10	10.9	NO
5030 (1)	EW	Paste	1.03	59	23	13.6	YES
5036 (1)	EW	Paste	1.03	47	32	N/A	YES
5123 (1)	EC, EW	Liquid	1.02	>100	18	13.8	YES
5390 (1)	EC	Viscous liquid	1.00	87	20	14	YES
5812 (1)	EC, EW	Liquid	0.98	66	-22	N/A	YES
7011 (1)	EC	Liquid	1.04	33	4	12.5	YES
7250 (1)	EC	Liquid	1.04	35	<0	11.9	YES

[1] at 20°C

TERMUL® Specialty Anionic Emulsifiers

TERMUL® Emulsifiers	Description	Use	Appearance @ 25°C	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Pour Point, °C	HLB	EPA 40 CFR180 Listing
219 (1)	Anionic blend	EC	Liquid	1.03	32	<-5	N/A	YES
3665 (1)	Dialkylsulphosuccinate in aromatic solvent	EC, OD	Liquid	1.01	43	<-50	N/A	YES
3667 (1)	DOS in high flash solvent	EC, OD	Liquid	1.04	67	<0	N/A	YES
3669 (1)	Dialkylsulfosuccinate in PG/water	EC, SC, OD	Liquid	1.12	>105	-20	N/A	YES
5243 (1)	Alkyletherphosphate	EC	Liquid	1.09	116	13	14	YES

SURFONIC® AG Solvents

PRODUCT DESCRIPTION

The SURFONIC® AG 1500 series of agricultural solvents are pure forms of alkylene carbonates. Other solvent chemistries are also available including esters, hydrocarbons and amides.

USE and APPLICATION

The SURFONIC® AG products are excellent solvents for many organic and inorganic materials. Additional uses include veterinary, wood preservation and viscosity reducers.

- Solvent/Co-solvent in emulsifiable concentrate (EC) formulations
- Solvent/Co-solvent in microemulsifiable concentrate formulations
- Solvent/Co-solvent in emulsion in water (EW) formulations
- Formulation component for tank-mix adjuvancy

BENEFITS

- Excellent solvency properties
- High boiling point
- Low toxicity
- High flash point
- Low odor
- Readily biodegradable
- Non-VOC according to Directive 1999/13/EC
- Evaporation rate, 25°C (n-BuAc = 1.00) is <0.005

40 CFR EXEMPTIONS

180.950 1,3-Dioxolan-2-one, 4-methyl-; JEFFSOL® AG 1555 propylene carbonate.

SURFONIC® AG Solvents

SURFONIC® Solvents	Type	Density @ 25°C, g/ml	Flash Point, PMCC, °C	Viscosity @ 25°C, mPa.s	Freeze/Melt Point, °C	Boiling Point °C, Initial	% water into solvent	% solvent into water	EPA 40 CFR180 Listing
AG 1700 [2]	Aromatic ester	1.00	118	2.67	-34	141	0.37	0	YES
AG 1705 [2]	Aromatic hydrocarbon	1.05	90	4.5	-54	212	<1.0	<0.5	YES
AG 1710 [2]	Fatty acid di-ester	1.09	121	2.8	<-48	244	5.3	3.1	NO
AG 1730 [2]	Blend	0.97	138	20	-20	295	>10	<4	YES
AG 1732 [2]	Blend	0.90	>150	6.26	-18	N/A	22[1]	0.1	YES

[1] at 21°C

At Indorama Agrochemicals,

your success is one of our top priorities.

We use our expertise in regulatory compliance, state-of-the-art science, manufacturing and global delivery systems to help add value to our customers.

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RSPERSE®
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E®
TERSPERS
T®
SURFONIC®

INDORAMA VENTURES

Integrated Oxides & Derivatives

About Indorama

Indorama Ventures is a world-class chemical company and a global integrated leader in PET and fibers serving major customers in diversified end-use markets. Following our core strategies, we develop innovative products for customer needs and to make great products for society. Headquartered in Bangkok, Thailand, Indorama Ventures has operating sites in 31 countries on five continents – in Africa, Americas, Asia, Europe & Eurasia.

Integrated Oxides & Derivatives

Indorama Ventures Oxides & Derivatives is a leading chemical intermediates and surfactants producer with a diverse range of products in growth markets such as home & personal care, agrochemicals, oilfield technologies, fuel & lube additives and more.

In January 2020, Indorama Ventures Public Company Limited completed its acquisition of Huntsman's world-class integrated oxides and derivatives business, including:

- **Surfactants:** Integrated producer of a wide range of products for home and personal care, oilfield technologies, agriculture and process industries.
- **Ethylene and Derivatives:** Highly integrated manufacturer of ethylene, ethylene oxide, ethylene glycol, ethanolamines and other derivatives.
- **Propylene Oxide & Derivatives:** Highly competitive technology offerings in propylene glycol, methyl tertiary butyl ether (MTBE) and other derivatives.

Our operating sites include a large flagship site on the US Gulf Coast (USGC) at Port Neches, as well as Chocolate Bayou, Dayton and Clear Lake in Texas, Lake Charles, Louisiana, Ankleshwar, India and Botany, Australia.

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