



HOME CARE, INSTITUTIONAL & INDUSTRIAL

PRODUCT GUIDE

INTRODUCTION

Formulating isn't just about cleaning and performance anymore. Along every step of the value chain, decision-makers are demanding that brands choose sustainable and ethical solutions that are safe for people and the planet - now and in the future.

At Verdant Specialty Solutions, our mission is to support human well-being through the power of science and nature. Our surfactants experts can help you formulate for today's discerning customers.

WHAT'S IN THIS GUIDE

On the following pages, you will find a range of secondary surfactants and specialty solutions for home, hygiene and industrial applications. Every product in this guide meets the regulatory requirements for its recommended uses and we strive to manufacture in a way that minimizes environmental impact. Many are from renewable, sustainable feedstocks.

OUR PROMISE

At Verdant, we understand what's happening in the market now and we stay ahead of emerging trends. We're here to help you create winning solutions. We deliver the personal attention you would expect from a small company with enterprise-level safety, environmental performance, and reliability.



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EMULSIFIERS

Emulsifiers are used in cleaning formulations to incorporate noncompatible ingredients (e.g., oils into water - based formulations such as cutting fluids) and to hold soils in the cleaning liquor during the cleaning process. Emulsifiers are generally combined, i.e., mixtures of oil- and water-soluble emulsifiers. Verdant surfactants can be used to form oil-in-water (O/W) or water-in-oil (W/O) emulsions, the choice of the system being determined by the nature of the emulsion phases, their relative proportions and the type of emulsion required.

Some products of particular interest in the preparation of emulsions are:

Oil Soluble Emulsifiers:

MACKAMIDE®	P: 16
• CDT • CMA • CPA	
MACKESTER®	P: 18
• Complete series	
DePHOS™	P: 15
• HP-739	

Water Soluble Emulsifiers:

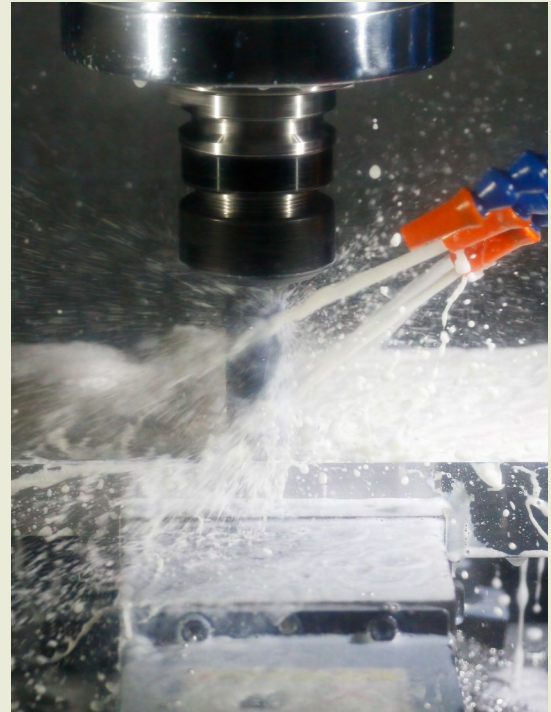
MACKAM®	P: 12
• BET O-30	
MACKAMIDE®	P: 16
• CDT	
DePHOS™	P: 15
• HP-739*	

Emulsion Stabilizers (Linkers):

MACKAM®	P: 10-11
• 2CSF • 2CY-75 • OIP 40	

Emulsion Stabilizers (Linkers):

DeTERIC™	P: 11
• ODP-LF	



* Becomes water soluble when neutralized with water soluble amines.

BLEACH STABILITY

Bleach (Sodium Hypochlorite) is used in many applications from hard surface cleaners to drain cleaners to mold removers. Surfactants are used in combination with hypochlorite to build viscosity, improve wetting, and give detergency. The following are recommended:

Key Products:

MACKAM®	P: 11
• CET • OAB • LHS E	
DeTERGE™	P: 17
• CS-45LF • CS-45LF MOD	

Key Products:

MACKAMINE®	P: 14		
• 654 • C 8 • CG • CS			
• C 14 E			



FOAM

Foam can be either a key function of a formulation, or an undesirable property to be controlled or eliminated. In a hand dishwashing formulation, foam is seen as a key indicator of both efficacy and quality. In many industrial processes the presence of foam can reduce both the speed and efficiency of cleaning. Verdant's product range includes surfactants which will produce copious volumes of stable foam, to ingredients which produce virtually no foam, even under severe agitation or aeration. Examples include:

High Foam:

MACKAM®	P: 10-12		
• 168L	• 2CSF	• 50 SB	
• 50 ULB	• C37	• C37B	
• DP 122	• LAB	• H2C-HA	
DeTERGE™	P: 17		
• LF-28	• LF-531	• LF-7315	

High Foam:

MACKAMINE®	P: 14		
• CAO	• CS	• LA	
• LO	• CAO E 36		
DeTERIC™	P: 10		
• LP			

Low Foam:

MACKAM®	P: 10-11		
• 2CY-75	• JEM		
• OAB	• OIP 40		
MACKAMINE®	P: 14		
• C 8			

Low Foam:

DeLONIC™	P: 15		
• LF-EP-15	• LF-EP-25		
• LF-EP-40	• LF-EP-61		
DeTERIC™	P: 11		
• ODP-LF			

WETTING



Wetting is the property that describes the contact between cleaning solutions and the surfaces to be cleaned. No matter how effective a cleaner or corrosion inhibitor is, if it is not in contact with the target surface, then it cannot do its job efficiently. There are some applications that require low wetting, e.g. carpet cleaning. Most cleaning applications benefit from fast wetting which aids in contact and penetration of soils and surfaces.

Fast Wetting:

MACKAM®	P: 10-11
<ul style="list-style-type: none"> • 168L • BB/FLA • CB-35 • DP 122 • LHS • LHS E • H2C-HA 	
DeIONIC™	P: 15
<ul style="list-style-type: none"> • LF-EP-15 • LF-EP-25 • LF-EP-40 • LF-EP-61 	
DePHOS™	P: 15
<ul style="list-style-type: none"> • 8028 	

Fast Wetting:

MACKAMINE®	P: 14
<ul style="list-style-type: none"> • 654 • C 14 E • CS • CG • CAO • FB 48 • LA • MO • MY • CAO E 36 	
DeTERGE™	P: 17
<ul style="list-style-type: none"> • LF-28 • LF-531 • LF-7315 	
DeTERIC™	P: 10
<ul style="list-style-type: none"> • LP 	

Slow Wetting:

MACKAM®	P: 10-11
<ul style="list-style-type: none"> • 2CY-75 • LSB 50 • MEJ • OAB • OIP 40 • CBS 50G E 	
MACKAMINE®	P: 14
<ul style="list-style-type: none"> • C 8 	

Slow Wetting:

DeIONIC™	P: 15
<ul style="list-style-type: none"> • LF-EP-15 • LF-EP-25 • LF-EP-40 • LF-EP-61 	
DeTERIC™	P: 11
<ul style="list-style-type: none"> • ODP-LF 	

CORROSION INHIBITION

When it comes to aerosols, metal cleaning, lubricants, aircraft cleaning and bathroom cleaners, the protection of metallic surfaces is essential to prevent oxidation, discoloration and corrosion. Amine-based and phosphate-based products are excellent choices as corrosion inhibitors and many of our detergent surfactants offer this secondary property.

Key Products:

MACKAM®	P: 10-12
<ul style="list-style-type: none"> • 168L • DP 122 • 2CSF • H2C-HA 	
MACKAMINE®	P: 14
<ul style="list-style-type: none"> • Complete Range 	
DePHOS™	P: 15
<ul style="list-style-type: none"> • HP-739 • RA-60 	

Key Products:

DeTERIC™	P: 10
<ul style="list-style-type: none"> • LP 	
DeCORE™	P: 16
<ul style="list-style-type: none"> • AFCl-45 • APCI-95 MOD • BE-85 • IMT-100LF 	
DeTERGE™	P: 17
<ul style="list-style-type: none"> • AT-100 	



LIME SOAP DISPERSION

Whether used in combination with soaps, or in removing soap-scum from surfaces, surfactants with the ability to perform in the presence of hard water and soap precipitates are important in the formulation of effective household and industrial cleaners. The products listed remain soluble in the presence of calcium and are effective lime soap dispersers.

Key Products:

MACKAM®	P: 11-12
<ul style="list-style-type: none"> • 50 SB • LAB • 50 ULB • CBS 50G E • DAB 	



METALWORKING & METAL CLEANING

Versatile multifunctional surfactants from Verdant are used as lubricants, emulsifiers, extreme pressure additives, corrosion inhibitors and wetting agents in a wide range of water and oil-based metalworking formulations. Verdant surfactants are also used to ensure thorough cleaning of metal surfaces prior to painting, electroplating, etc.

Metal Cleaning:

MACKAM®	P: 10-12
<ul style="list-style-type: none"> • 2CSF • JEM • DP 122 • OIP 40 	
DeIONIC™	P: 15
<ul style="list-style-type: none"> • LF-EP-15 • LF-EP-40 • LF-EP-25 • LF-EP-61 	

Metal Cleaning:

MACKAMINE®	P: 14
<ul style="list-style-type: none"> • Complete series 	
DeTERIC™	P: 11
<ul style="list-style-type: none"> • ODP-LF 	
DePHOS™	P: 15
<ul style="list-style-type: none"> • H-66-872 • P-6LF-AS 	

Metalworking Fluids:

MACKAMIDE®	P: 16
<ul style="list-style-type: none"> • C-5 • CDT • LPA 	
MACKAZOLINE®	P: 17
<ul style="list-style-type: none"> • C • TD-80 	
DePHOS™	P: 15
<ul style="list-style-type: none"> • 8028 • HP-739 • P-6LF-AS 	

HIGH ELECTROLYTE CLEANERS



Industrial cleaning processes often use high concentrations of acids, alkalis or electrolyte to give effective performance in demanding applications. Surfactants can greatly improve the efficiency of cleaning but must be stable and effective under these harsh conditions.

Acidic Systems:

MACKAM®			P: 10-12
• 168L	• DP 122	• LHS E	
• OAB			
MACKAMINE®			P: 14
• 654	• C 8	• LA	
• LO			

Acidic Systems:

DeTERIC™		P: 10
• LP		
DePHOS™		P: 15
• H-66-872		• RA-60

Alkaline Systems:

MACKAM®			P: 10-12
• 2CSF	• 2CY-75	• 50 SB	
• DP 122	• LHS E	• LSB 50	
• MEJ	• JEM	• OIP 40	
• CBS 50G E			
DeTERIC™			P: 10-11
• LP	• ODP-LF		
DePHOS™			P: 15
• 8028	• H-66-872	• P-6LF-AS	
• RA-60			
DeTERGE™			P: 17
• LF-28	• LF-531	• LF-7315	

High Electrolyte (built) Systems:

MACKAM®			P: 10-12
• 168L	• 2CSF	• DP 122	
• LHS E	• LSB 50	• MEJ	
• OAB	• OIP 40		
MACKAMINE®			P: 14
• 654	• C 8		
DeTERIC™			P: 10-11
• LP	• ODP-LF		
DePHOS™			P: 15
• 8028	• H-66-872	• P-6LF-AS	
• RA-60			
DeTERGE™			P: 17
• LF-28	• LF-531	• LF-7315	

PRODUCT LISTING

Amphoterics: Hydrotropes, Electrolyte Tolerant Surfactants and Wetting Agents

Product Name	Chemical Name	Physical Form	%, Active	%, Solids	Properties & Applications
MACKAM® HPL-28	Sodium Lauroamphoacetate	Clear liquid	28	36	MACKAM® HPL-28 & MACKAM® ULTRA L-32E are optimized amphoterics based on a pure lauric source.
MACKAM® Ultra L-32E	Sodium Lauroamphoacetate	Clear liquid	28	36	
MACKAM® HPC 32 L	Sodium Cocoamphoacetate	Clear liquid	32	39	
MACKAM® Ultra C-32	Sodium Cocoamphoacetate	Clear liquid	32	40	
MACKAM® C 61	Sodium Cocoamphoacetate	Clear liquid	33	42	
MACKAM® C2M CONC NP	Disodium Cocoamphodiacetate	Viscous liquid	38	50	MACKAM® 2C & MACKAM® C2M CONC NP are stable over a wide pH range and are ideal for applications such as hospital cleansers and high alkalinity hard surface cleaners. MACKAM® 2C 75 is an optimized version of MACKAM® 2C , has lower viscosity and improved color.
MACKAM® 2C	Disodium Cocoamphodiacetate	Clear liquid	38	50	
MACKAM® 2C 75	Disodium Cocoamphodiacetate	Clear liquid	38	50	
MACKAM® 2CSF	Disodium Cocoamphodipropionate	Clear liquid	39	39	High Foaming, salt free surfactant with good electrolyte tolerance and coupling properties.
MACKAM® 2CSF-40CG	Disodium Cocoamphodipropionate	Clear liquid	39	39	Methanol free version of MACKAM® 2CSF . Used in Aluminum cleaners.
MACKAM® 2CY-75	Disodium Capryloamphodiacetate	Clear liquid	27	35	Very low foam surfactant and wetting agent. Stable in high alkalinity and high electrolyte systems. Recommended in built heavy duty cleaners.
AMPHIONIC™ XL	Higher Alkyl amino Carboxylates	Amber liquid	29	40	Soluble in up to 35% sodium hydroxide solution and also in acid down to pH 3.5. Used in disinfectant formulations and in many industrial applications including paints, ink & toners and building & construction.
MACKAM® EWC	Amphoteric Surfactant	Clear liquid	35	38.5	High foaming product with the ability to couple nonionic surfactants into high levels of electrolyte. It has excellent detergency in built systems and finds use in industrial cleaners, hard surface cleaners and in industrial laundry liquids.
MACKAM® H2C-HA	Sodium Lauriminodipropionate	Clear liquid	30	30	High Foaming, salt free amphoteric surfactants with good detergency and corrosion inhibition. These products give very stable, dense foam especially suited to demanding applications such as fire-fighting foam. Excellent hydrotrope and solubilizing properties & stability in high concentrations of acid, alkali and electrolyte.
MACKAM® 168L	Sodium Lauriminodipropionate	Clear liquid	30	30	
DeTERIC™ LP	Sodium Lauriminodipropionate	Clear liquid	30	30	
MACKAM® DP 122	Sodium Cociminodipropionate	Clear liquid	30	30	
					DETERIC™ LP in particular shows good corrosion protection in hard water and strong acids making it especially useful in metal cleaning.

Amphoterics: Hydrotropes, Electrolyte Tolerant Surfactants and Wetting Agents

Product Name	Chemical Name	Physical Form	%, Active	%, Solids	Properties & Applications
MACKAM® OIP 40	Sodium Ethylhexyl-iminodipropionate	Clear liquid	40	40	Low foaming salt-free surfactants and hydrotropes. Good caustic stability and coupling. Ideal for alkali & high electrolyte cleaners where low foam and good coupling is needed. DETERIC™ ODP-LF is a 50% active version.
DeTERIC™ ODP-LF	Sodium Octyliminodipropionate	Clear liquid	50	50	
MACKAM® JEM	Sodium Mixed C8 Carboxylates	Clear liquid	29	34	Low foaming wetting agents ideally suited to applications such as bottle washing, wax stripping, etc. They exhibit excellent stability in high concentrations of electrolyte.
MACKAM® MEJ	Sodium Mixed C8 Carboxylates	Clear liquid	29	34	

Sultaines: Robust, Versatile, High Foam Surfactants

Product Name	Chemical Name	Physical Form	%, Active	%, Solids	Properties & Applications
MACKAM® CBS 50G E	Cocamidopropyl Hydroxysultaine	Clear liquid	42	40	MACKAM® CBS 50G E and MACKAM® CBS are a robust, high foaming surfactant, which gives excellent foam volume and stability across a wide range of pH and in high electrolyte systems. Excellent lime soap dispersion. MACKAM® 50 SB is an optimized grade with improved foaming, and is glycerin free.
MACKAM® 50 SB	Cocamidopropyl Hydroxysultaine	Clear liquid	44	50	
MACKAM® CBS	Cocamidopropyl Hydroxysultaine	Clear liquid	44	50	
MACKAM® LSB 50	Lauramidopropyl Hydroxysultaine	Clear liquid	43	50	Similar to MACKAM® 50 SB , but using a lauryl feedstock for improved foaming, even in high electrolyte systems.
MACKAM® LHS E	Lauryl Hydroxysultaine	Clear liquid	40	47	Extremely hydrolytically stable, and soluble in up to 40% NaOH. An effective wetter in highly acidic and alkaline systems.

Alkyl Betaines

Product Name	Chemical Name	Physical Form	%, Active	%, Solids	Properties & Applications
MACKAM® CB-35	Coco-Betaine	Clear liquid	29	35	Very high foaming, pH stable amphoteric surfactants. Find use in vehicle cleaning, hard surface cleaners and acid & alkali based industrial cleaners.
MACKAM® BB/FLA	Coco-Betaine	Clear liquid	30	37	
MACKAM® D 40	Coco-Betaine	Clear liquid	30	37	
MACKAM® LAB	Lauryl Betaine	Clear liquid	30	36	A high Lauric content gives enhanced foaming and excellent detergency. Also excellent in acidic formulations as foaming agents. Stable in hypochlorite bleach.
MACKAM® LB 35	Lauryl Betaine	Clear liquid	29	35	

Alkylamidopropyl Betaines

Product Name	Chemical Name	Physical Form	%, Active	%, Solids	Properties & Applications
MACKAM® OAB	Caprylamidopropyl Betaine	Clear liquid	30	37	Effective hydrotrope to couple non-ionic surfactants into systems with moderate amounts of electrolyte. Low foaming, good detergency for high cloud-point formulations.
MACKAM® LMB K	Lauric/ Myristic Amidopropyl Betaine	Clear liquid	30	35	MACKAM® LMB K is a high performance betaine with low color and odor. It improves foam quality and grease removal of light duty liquid cleaners.
MACKAM® DAB	Lauramidopropyl Betaine	Clear liquid	30	35	A C12 amidopropyl betaine, giving excellent foam volume and stability in anionic formulations.
MACKAM® 35	Cocamidopropyl Betaine	Clear liquid	30	36	Economic grade made from whole coconut oil.
MACKAM® CAB 818	Cocamidopropyl Betaine	Clear liquid	30	35	Made from hardened whole coconut oil, these betaines give good color and odor, with improved viscosity response. High foaming in high electrolyte, these products can also be effective in up to 20% NaOH.
MACKAM® CAB 818B	Cocamidopropyl Betaine	Clear liquid	30	35	
MACKAM® CAB 818U	Cocamidopropyl Betaine	Clear liquid	30	35	Preservative-Free: MACKAM® CAB 818, MACKAM® CAB 818U, MACKAM® 35 UL HA & MACKAM® 50 ULB
MACKAM® 35 UL	Cocamidopropyl Betaine	Clear liquid	30	35	Preserved with sodium benzoate: MACKAM® CAB 818B
MACKAM® 35 UL HA	Cocamidopropyl Betaine	Clear liquid	30	35	Preserved with DMDM Hydantoin: MACKAM® 35 UL
MACKAM® BET C 30	Cocamidopropyl Betaine	Clear liquid	30	35	
MACKAM® 50 ULB	Cocamidopropyl Betaine	Clear liquid	37	44	
MACKAM® DH 13T	Cocamidopropyl Betaine	Clear liquid	30	35	Glycerin free equivalent to 35 UL. Excellent foam and viscosity response. Preserved with DMDM Hydantoin.
MACKAM® C37	Cocamidopropyl Betaine	Clear liquid	30	35	High purity grades of CAPB with stripped alkyl distribution giving superior viscosity building and foam with low odor. Both are preserved with sodium benzoate.
MACKAM® C37B	Cocamidopropyl Betaine	Clear liquid	30	35	
MACKAM® BET O-30	Oleamidopropyl Betaine	Clear liquid	30	35	Higher molecular weight betaine. Effective viscosity builder in anionic formulations.

Specialty Betaines

Product Name	Chemical Name	Physical Form	%, Active	%, Solids	Properties & Applications
MACKAM® BAB	Babassuamidopropyl Betaine	Clear liquid	30	35	Derived from Amazonian babassu oil and has similar properties to Cocamidopropyl Betaine. Recommended for natural homecare products.
MACKAM® 1200 Powder	Lauramidopropyl Betaine	Powder	85	99	Flowable powder betaines for use in applications where water is not desired, for example high active formulations in water soluble packaging.
MACKAM® 2800 Powder	Cocamidopropyl Betaine	Powder	85	99	

Cold-Processable Amide-Betaine Pre-Mixes

These liquid amide systems are convenient alternatives for high melting point amides. These cold mix ingredients allow replacement without the need to introduce solid handling. Below are examples of the product range. Additional grades are available and can be tailored to precisely meet your formulation requirements. Contact your Verdant representative for further details.

Product Name	Chemical Name	Physical Form	Active Ratio	%, Solids	Properties & Applications
MACKAM® BC 39	Cocamidopropyl Betaine and Cocamide MEA	Clear liquid	0.24	39	These amide-betaine blends are easy-to-use alternatives to high melting point amides or polymers. They boost & stabilize foam while improving viscosity of anionic systems. Much higher performance and higher solids than just betaine alone. No heat is required to incorporate these materials. MACKADET® BC-51 consists of 25% Cocamide MEA in a light colored alkyl betaine that provides outstanding foam stabilization and viscosity enhancement.
MACKADET® BC-51	Cocamide MEA and Coco-Betaine	Flowable paste	1.18	50	

Additional ratios and compositions are available. Please contact your local Technical Service agent for details.

Amine Oxides

Product Name	Chemical Name	Physical Form	%, Active	Properties & Applications
MACKAMINE® C 8	Octyldimethylamine Oxide	Clear liquid	41	Low foam surfactant with excellent chemical stability. Suitable for use in bleach or high caustic formulations. Slow wetting agent and hydrotrope for household and I&I detergent formulations. Recommended applications include hard surface cleaners and disinfectants.
MACKAMINE® 654	Decylamine Oxide	Clear liquid	40	Wetter and moderate foaming agent. Excellent chemical stability, bleach stable and tolerant to high levels of electrolyte. Compatible with all surfactant types and suitable for use as a hydrotrope in household and I&I formulations. Recommended for laundry and dishwash detergents, rinse aids, cleaning in place, bottle washing and hard surface cleaners.
MACKAMINE® LA	Lauramine Oxide	Clear liquid	30	Foaming agent, foam booster and foam stabilizer, viscosity modifier, wetting agent and detergent. Good chemical stability and used as a thickener in formulations containing peroxide or hypochlorite, as well as an antistatic agent & emulsifier. Recommended for use in metal cleaning, hard surface cleaners, bathroom cleaners, light duty detergents and textiles.
MACKAMINE® LO	Lauramine Oxide	Clear liquid	30	
MACKAMINE® LO-SP	Lauramine Oxide	Clear liquid	30	
MACKAMINE® CS	Cocamine Oxide	Clear liquid	30	
MACKAMINE® CG	Cocamine Oxide	Clear liquid	30	
MACKAMINE® MY	Myristamine Oxide	Clear liquid	25	High foam surfactant with excellent viscosity building properties and chemical stability. Particularly useful as an antistatic agent, emulsifier, foam booster & stabilizer, and wetting agent. Applications include thickened bleaches, drain cleaners, toilet bowl cleaners and hard surface cleaners. MACKAMINE® MY is useful as an antistatic and dye dispersant in textiles. MACKAMINE® C 14 E is a higher active version of MACKAMINE® MY .
MACKAMINE® C 14 E	Myristamine Oxide	Clear liquid	29	
MACKAMINE® MCJ	Myristyl/Cetyl Amine Oxide	Clear liquid	20	Viscosity modifier, wetting agent and detergent. Good chemical stability and used as a thickener in formulations containing peroxide or hypochlorite. Also used as a viscosity builder in household or I&I detergent formulations.
MACKAMINE® CAO	Cocamidopropylamine Oxide	Clear liquid	30	High foam surfactants, wetting agents, emulsifiers and lime soap dispersants. Compatible with all types of surfactants, exhibit synergistic behavior in formulated products containing anionic surfactants. Suitable for use as a foam and viscosity booster in detergent formulations. Applications include manual dishwash detergents, vehicle wash, hard surface cleaners, car wash and fine fabric laundry detergents. MACKAMINE® CAO E 36 is a higher active version of MACKAMINE® CAO and MACKAMINE® FB 48 has enhanced foam generation due to its optimized carbon distribution.
MACKAMINE® CAO E 36	Cocamidopropylamine Oxide	Clear liquid	34	
MACKAMINE® FB 48	Lauramidopropylamine Oxide	Clear liquid	30	

Phosphate Ester Surfactants

Product Name	Chemical Name	Physical Form	%, Active	Properties & Applications
DePHOS™ H-66-872	Potassium Salt of a Phosphate Ester Derived from an Aromatic Ethoxylate	Clear liquid	50	Excellent low foam hydrotrope for non-ionic surfactants in alkaline and acidic cleaners. Recommended for use in high electrolyte cleaners, low foam spray metal cleaners and bottle washing formulations. Can also be used as a wetting agent in phosphatizing baths. Readily biodegradable.
DePHOS™ P-6LF-AS	Free Acid Phosphate Ester Based on Aromatic Ethoxylated Alcohol	Clear viscous liquid	100	Very low foam hydrotrope and detergent with excellent alkaline and electrolyte stability. Soluble in water, alcohols & glycols. Recommended for alkaline powder detergents, high electrolyte cleaners and spray cleaners. <i>DePHOS™ P-6LF-AS</i> also has good lubricant properties and is used in synthetic coolants & water based cutting fluids and low foam water based chain lubricants.
DePHOS™ 8028	Potassium Salt of Phosphated 2-Ethylhexanol Ethoxylate	Clear to slightly hazy liquid	80	<i>DePHOS™ 8028</i> is a low to moderate foam detergent and hydro-trope which has excellent wetting and dispersing properties and is peroxide stable making it useful in acid & alkali cleaners, peroxide-based cleaners and pigment dispersions. It can also be used in cutting fluids, metal cleaning and aerosols because of its corrosion inhibition properties. <i>DePHOS™ 8028FA</i> is the free acid form.
DePHOS™ 8028FA	Phosphated 2-Ethylhexanol Ethoxylate	Clear to slightly hazy liquid	100	
DePHOS™ RA-60	Polyoxyethylene Alkyl Phosphate Ester, Acid Form	Clear viscous liquid	100	<i>DePHOS™ RA-60</i> has good wetting and dispersing properties making it useful in industrial cleaners. It also has good anti-corrosion properties and is used as an extreme pressure additive in metalworking fluids.
DePHOS™ HP-739	Alkyl Phosphate Ester, Acid Form	Clear liquid	100	Good low foam emulsifier and lubricant with excellent anti-corrosion properties. It finds application as an emulsifier in soluble oils, an extreme pressure additive in metal working fluids and in hydraulic fluids and chain lubricants.

Low Foam Nonionic Alkoxyates

Product Name	INCI Name	Physical Form	Cloud Point °C*	Properties & Applications
DeIONIC™ LF-60	Alkoxyated Alcohols	Clear to slightly hazy liquids	14-18	A series of biodegradable low foam non-ionic alkoxyates with good wetting and detergency. Applications in which these products are used include mechanical dishwashing and rinse aids, bottle washing, alkaline cleaners, metal cleaning, high pressure spray cleaners, textile scouring and agricultural sprays. Other products are available from our alkoxylation facility in Palestine, TX, US. For your specific needs please contact your Verdant Representative.
DeIONIC™ LF-EP-15	Alkoxyated Alcohols	Clear to slightly hazy liquids	13-18	
DeIONIC™ LF-EP-25	Alkoxyated Alcohols	Clear to slightly hazy liquids	23-27	
DeIONIC™ LF-EP-40	Alkoxyated Alcohols	Clear to slightly hazy liquids	38-42	
DeIONIC™ LF-EP-61	Alkoxyated Alcohols	Clear to slightly hazy liquids	56-63	

*1% in deionized water

Alkanolamides

Product Name	Chemical Name	Physical Form	Properties & Applications
MACKAMIDE® C-5	Cocamide DEA	Clear liquid	Foam boosters and stabilizers for detergent formulations Effective viscosity builder for industrial detergents. Lubricity modifier in metalworking fluids.
MACKAMIDE® C	Cocamide DEA	Clear liquid	
MACKAMIDE® CDT	Modified Cocamide DEA	Clear liquid	Exhibits excellent compatibility with inorganic builders and alkali and so finds use in industrial and specialty cleaners. Also widely used as a detergent, wetting agent, emulsifier and viscosity builder in aqueous and non-aqueous systems.
MACKAMIDE® LMA	Lauramide MEA	Flake / Pastille	Foam booster and foam stabilizer. Compatible with all surfactant types and viscosity builder for liquid detergent formulations containing anionic surfactants and is glycerin free. <i>MACKAMIDE® LMA</i> is also suitable for use in solid formulations as a foam booster or controlled release products. Suggested applications include hard surface cleaners, heavy duty detergent liquids and powders, metal cleaners and toilet rim blocks.
MACKAMIDE® CMA	Cocamide MEA	Pastille	Similar properties and applications to <i>MACKAMIDE® LMA</i> . <i>MACKAMIDE® CMA</i> contains 11% glycerin and is also recommended as a secondary surfactant to diethanolamides in household and I&I detergent formulations.
MACKAMIDE® LPA Flake	Lauramide MIPA	Flake	Foam booster and foam stabilizer. Compatible with all surfactant types and viscosity builder in liquid detergent formulations. Suggested applications include hard surface cleaners and heavy duty detergents.
MACKAMIDE® CPA Flake	Cocamide MIPA	Flake	Glycerin free alternative to diethanolamides and DEA-free. Similar properties and applications to <i>MACKAMIDE® LPA</i> . It is highly recommended for applications where optimum performance is required, e.g. foaming.

Corrosion Inhibitors

Product Name	Chemical Name	Physical Form	% Solids	Properties & Applications
DeCORE™ AFCI-45	Anionic Corrosion Inhibitors	Clear liquid	45	Multi-metal corrosion inhibitors suitable for use on copper, aluminum, brass, bronze, steel, cast iron and other ferrous and non-ferrous metals in aqueous solution above pH 7. They find application in metal cleaners, metalworking fluids, lubricants, radiator fluids and aerosols.
DeCORE™ APCI-95 MOD	Anionic Corrosion Inhibitors	Clear liquid	>95	
DeCORE™ IMT-100LF	Anionic Amine Carboxylate	Clear liquid	100	Corrosion inhibitor for ferrous and non-ferrous metals in solutions above pH 7 with wetting and lubricant properties giving it application in cutting fluids, water based lubricants, radiator fluids and paints & coatings.
DeCORE™ BE-85	Amine Borate	Clear liquid	>85	Used as a corrosion inhibitor in mildly alkaline water based systems.

Specialty Cationics: Amidoamines & Imidazolines

Product Name	Chemical Name	Physical Form	%, Active	Properties & Applications
MACKINE® 301	Stearamidopropyl Dimethylamine	Pastille	100	Neutralized salts are suitable for use as cationic emulsifiers or antistatic in textile applications. Amines are oil soluble and provide corrosion inhibition in metalworking applications. Can also be included in liquid soap formulations to give a conditioning effect at pH < 7.0.
MACKAZOLINE® C	Cocoyl Hydroxyethyl Imidazoline	Liquid	100	Salts below pH 7 are cationic surface active agents and above pH 7 the fatty acid salts are oil soluble and water dispersible. Used as antistatic agents for plastics and textiles, rheology modifiers for paints and inks, asphalt/diesel oil emulsifiers, wax emulsifiers and dispersants.
MACKAZOLINE® TD-80	Cocoyl Hydroxyethyl Imidazoline	Liquid	100	Mackazoline® TD-80 is derived from tall oil fatty acid and DETA. This oil soluble imidazoline is a film-forming corrosion inhibitor for drilling, production and transportation applications in the oil field market. In addition, its lubricity properties make it useful in metalworking fluids.

Performance Concentrates: For Alkali & Acid Formulations

Product Name	Chemical Name	Physical Form	%, Solids	Properties & Applications
DeTERGE™ LF-7315	Modified Carboxylates	Clear liquid	54	Low foam products giving excellent detergency & wetting in high alkaline systems. They can often be used as the primary surfactant in alkaline electrolyte formulations eliminating the need for a hydrotrope. DeTERGE™ LF-7315 is soluble and stable in up to 40% caustic and may also be used in acid systems.
DeTERGE™ LF-531	Modified Carboxylates	Clear liquid	54	
DeTERGE™ LF-28	Modified carboxylates	Clear liquid	50	
DeTERGE™ CS-45LF & CS-45LF MOD	Modified Anionic Surfactant	Clear liquid	43	Anionic based low foam surfactants which are chlorine stable and recommended in formulations containing up to 15% caustic. Used in a wide range of alkaline based and hypochlorite containing cleaners.
DeTERGE AT-100	Complex Cationic Ethoxylated Amine	Liquid/ Paste	100	Corrosion inhibitor and thickener for acid systems and so finds application in acid toilet bowl cleaners, acid pickling & electroplating, vertical surface acid cleaners, concrete cleaners, metal cleaners and oil well drilling fluids.

Biocides/Algaecides

Product Name	Chemical Name	Physical Form	% Solids	Properties & Applications
MACKACIDE™ PQ	Polyquaternary Ammonium Chloride Aqueous	Clear liquid	50	MACKACIDE™ PQ & MACKACIDE™ PQ 60 are non-foaming and non-wetting biocides for use as algaecides in swimming pools & cooling water applications, they are long lasting, non-volatile products that do not smell and are not corrosive to water systems. In swimming pool applications They are compatible with commonly used bactericides and are effective against most forms of algae.
MACKACIDE™ PQ 60	Polyquaternary Ammonium Chloride Aqueous	Clear liquid	60	The active ingredient in MACKACIDE™ PQ & MACKACIDE™ PQ 60 is being supported towards Annex I listing under the BDP (98/8/EC) as an algaecide for Product Type 2: Private area and public health area disinfectants and other biocidal products and Product Type II: Preservatives for liquid cooling & processing systems.

* Product is manufactured in the UK and only registered in Europe under BPD

Stearate Esters

Product Name	Chemical Name	Physical Form	Melting Point, °C	Properties & Applications
MACKESTER® EGMS	Glycol Stearate	Flake / Pastille	58-64	Opacifying/pearlizing agents for hand cleansers and hand dish detergents. MACKESTER® GSV is a vegetable based grade.
MACKESTER® GSV	Glycol Stearate	Flake / Pastille	58-64	
MACKESTER® EGDS	Glycol Distearate	Flake / Pastille	67-71	Excellent opacifying and pearlizing agents. MACKESTER® GDSV is vegetable-based.
MACKESTER® GDSV	Glycol Distearate	Flake / Pastille	67-71	Low HLB emulsifiers. Mold release agents and plasticizers & lubricants for plastic.
MACKESTER® 515V	Glycol Distearate	Flake / Pastille	58-65	



LOCATIONS

www.verdantspecialty.com

info@verdantspecialty.com

AMERICAS

Phone +1 (708) 534-6200

Verdant Specialty Solutions Headquarters

700 Louisiana St., Suite 2400
Houston, TX 77002
United States of America

Verdant Specialty Solutions LLC

24601 Governors Highway
University Park, IL 60484
United States of America

Verdant Energy Solutions LLC

1502 Fort Worth St.
Liberty, TX 77575
United States of America

Verdant Energy Solutions LLC

2187 E. Fm 323
Palestine, TX 75801
United States of America

Verdant Energy Solutions LLC

3801 Mankins Ave.
Odessa, TX 79764
United States of America

Verdant Energy Solutions LLC

718 Hangar Dr.
New Iberia, LA 70560
United States of America

EUROPE

+44 1422 898300

Verdant Specialty Solutions Limited

Burwood Way
Holywell Green
Halifax, HX4 9BH
United Kingdom

Verdant Specialty Solutions GmbH

Fritz-Henkel-Str. 8
39307 Genthin
Germany



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