



**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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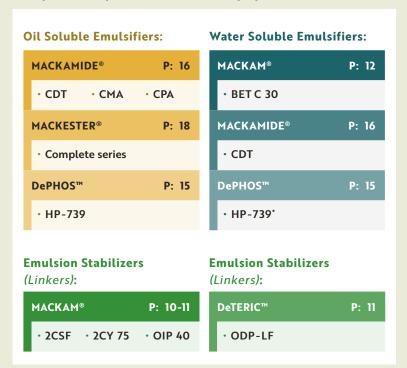
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## **EMULSIFIERS**

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.

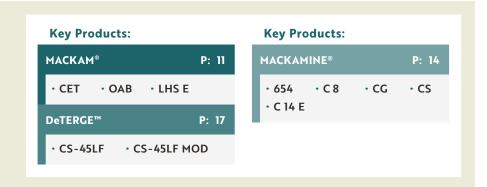
Some products of particular interest in the preparation of emulsions are:





## **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:

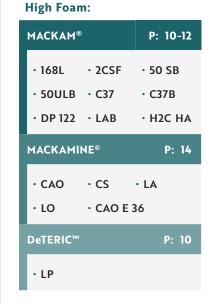


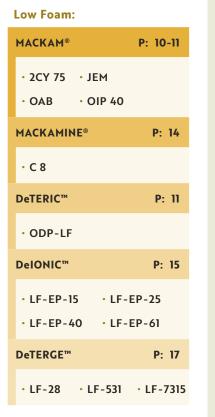
<sup>\*</sup> Becomes water soluble when neutralized with water soluble amines.



## **FOAM**

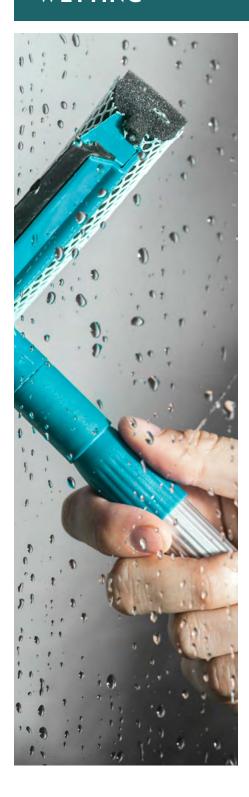
Foam can be either a key function of a formulation, or an undesirable property to be controlled or eliminated. In a hand dishwashing formulation, foam is seen as a key indicator of both efficacy and quality. In many industrial processes the presence of foam can reduce both the speed and efficiency of 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:







## 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
·168L ·BB/FLA	• CB 35
• DP 122 • LHS	· LHS E
· H2C HA	
DelONIC™	P: 15
· LF-EP-15 · LI	-EP-25
· LF-EP-40 · LI	-EP-61
DePHOS™	P: 15
· 8028	

### Fast Wetting:

MACKAMINE®		P: 14
• 654	• C 14 E	· CS
• cg	· CAO	• FB 48
• LA	• мо	• MY
· CAO E		
DeTERGE	тм	P: 17
• LF-28	• LF-531	• LF-7315
DeTERIC	м	P: 10
·IP		

### **Slow Wetting:**

MACKAM®	P: 10-11
· 2CY 75	· LSB 50
• MEJ	• OAB
· OIP 40	• CBS 50G E
MACKAMINE®	P: 14
· C 8	

### **Slow Wetting:**

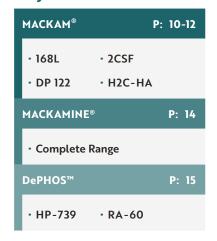
DelONIC™	P: 15
• LF-EP-15 • LF-EP-40	• LF-EP-25 • LF-EP-61
DeTERIC™	P: 11
• ODP-LF	



## **CORROSION INHIBITION**

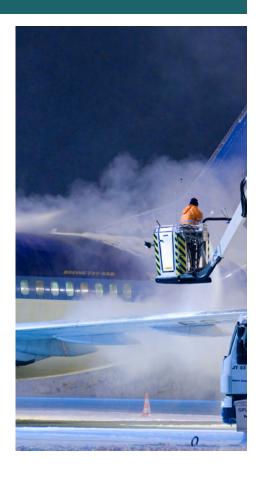
When it comes to aerosols, metal cleaning, lubricants, aircraft cleaning and bathroom cleaners, the protection of metallic surfaces is essential to prevent oxidation, discoloration and corrosion. Amine-based and phosphate-based products are excellent choices as corrosion inhibitors and many of our detergent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

### **Key Products:**



### **Key Products:**

DeTERIC™	P: 10
· LP	
DeCORE™	P: 16
· AFCI-45	• BE-85
• APCI-95 MOD	· IMT-100LF
DeTERGE™	P: 17
· 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
• 50 SB	· 50ULB	· DAB
· LAB	· CBS 50G	E





# **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
• 2CSF	• DP 122
• JEM	• OIP 40
DelONIC™	P: 15
· LF-EP-15	· LF-EP-25
· LF-EP-40	· LF-EP-61

## **Metal Cleaning:**

MACKAMINE®	P:	14
• Complete series		
DeTERIC™	P:	11
· ODP-LF		
DePHOS™	P:	15
• H-66-872 • P-6LF-AS		

## Metalworking Fluids:

MACKAMIDE®		P: 16
• C-5	· CDT	• LPA
MACKAZ	OLINE®	P: 17
· с	· TD-80	
DePHOS	гм	P: 15
• 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	<b>1</b> ®	P: 10-12
• 168L • OAB	• DP 122	· LHS E
MACKAM	IINE®	P: 14
· 654	· C 8	· LA

### **Acidic Systems:**

DeTERIC™	P: 10
• LP	
DePHOS™	P: 15
· H-66-872 · I	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	
MACKAMIN	IE®	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, MACKAM® C61 & MACKAM® Ultra
MACKAM® HPC 32 L	Sodium Cocoamphoacetate	Clear liquid	32	39	C-32 have a broader carbon chain range. All are stable over a wide pH range and are useful in applications suc as liquid dish wash and hard surface cleaners. They hav
MACKAM® ULTRA C-32	Sodium Cocoamphoacetate	Clear liquid	32	40	excellent compatibility and stability in formulation.
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
MACKAM® 2C	Disodium Cocoamphodiacetate	Clear liquid	38	50	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 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 <b>MACKAM® 2CSF</b> . 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 als in acid down to pH 3.5. Used in disinfectant formulation and in many industrial applications including paints, in & 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
MACKAM® 168L	Sodium Lauriminodipropionate	Clear liquid	30	30	to demanding applications such as fire-fighting foam. Excellent hydrotrope and solubilizing properties &
DeTERIC™ LP	Sodium Lauriminodipropionate	Clear liquid	30	30	stability in high concentrations of acid, alkali and electrolyte.
					<b>DETERIC™ LP</b> in particular shows good corrosion protection



## 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
DeTERIC™ ODP-LF	Sodium Octyliminodipropionate	Clear liquid	50	50	needed. <b>DETERIC™ ODP-LF</b> is a 50% active version.
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	executive studently in high contentuations of electrony co.

## **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
MACKAM® 50 SB	Cocamidopropyl Hydroxysultaine	Clear liquid	44	50	systems. Excellent lime soap dispersion. <b>MACKAM® 50 SB</b> is an optimized grade with improved foaming, and is glycerin free.
MACKAM® CBS	Cocamidopropyl Hydroxysultaine	Clear liquid	44	50	
MACKAM® LSB 50	Lauramidopropyl Hydroxysultaine	Clear liquid	43	50	Similar to <b>MACKAM® 50 SB</b> , 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 &
MACKAM® BB/FLA	Coco-Betaine	Clear liquid	30	37	alkali based industrial cleaners.
MACKAM® D40	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
MACKAM® LB 35	Lauryl Betaine	Clear liquid	29	35	agents. Stable in hypochlorite bleach.



## **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	$\it MACKAM^{\odot}$ $\it LMB~K$ 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
MACKAM® CAB 818B	Cocamidopropyl Betaine	Clear liquid	30	35	effective in up to 20% NaOH.
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® 35UL	Cocamidopropyl Betaine	Clear liquid	30	35	Preserved with sodium benzoate: MACKAM® CAB 818B
MACKAM® 35UL 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® 50ULB	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	and presented men socialin senzoate.



## **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 incor-
MACKADET® BC 51	Cocamide MEA and Coco-Betaine	Flowable paste	1.18	50	porate these materials. <i>MACKADET® BC-51</i> consists of 25% Cocamide MEA in a light colored alkyl betaine that provides outstanding foam stabilization and viscosity enhancement.

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
MACKAMINE® LO	Lauramine Oxide	Clear liquid	30	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,
MACKAMINE® LO-SP	Lauramine Oxide	Clear liquid	30	bathroom cleaners, light duty detergents and textiles.
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
MACKAMINE® C 14 E	Myristamine Oxide	Clear liquid	29	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® 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
MACKAMINE® CAO E 36	Cocamidopropylamine Oxide	Clear liquid	34	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
MACKAMINE® FB 48	Lauramidopropylamine Oxide	Clear liquid	30	higher active version of MACKAMINE® CAO and MACKAMINE® FB 48 has enhanced foam generation due to its optimized carbon distribution.



## **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	<b>DePHOS™ 8028</b> is a low to moderate foam detergent and hydrotrope 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
DePHOS™ 8028FA	Phosphated 2- Ethylhexanol Ethoxylate	Clear to slightly hazy liquid	100	inhibition properties. <i>DePHOS™ 8028FA</i> is the free acid form.
DePHOS™ RA-60	Polyoxyethylene Alkyl Phosphate Ester, Acid Form	Clear viscous liquid	100	<b>DePHOS™ RA-60</b> 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 Alkoxylates

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

<sup>\*1%</sup> 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	modifier in metatworking reads.
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.  MACKAMIDE® LMA 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 MACKAMIDE® LMA. MACKAMIDE® CMA contains 11% glycerin and is also recommended as a secondary surfactant to diethanolamides inhousehold 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
DeCORE™ APCI-95 MOD	Anionic Corrosion Inhibitors	Clear liquid	>95	cleaners, metalworking fluids, lubricants, radiator fluids and aerosols.
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	Tall Oil Hydroxyethyl Imidazoline	Liquid	100	<b>Mackazoline® TD-80</b> 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
DeTERGE™ LF-531	Modified Carboxylates	Clear liquid	54	in alkaline electrolyte formulations eliminating the need for a hydrotrope. <i>DeTERGE™ LF-7315</i> is soluble and stable in up to 40% caustic and may also be used in acid systems.
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 1 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 11: Preservatives for liquid cooling & processing systems.

<sup>\*</sup> 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. <i>MACKESTER® GSV</i> is a vegetable based
MACKESTER® GSV	Glycol Stearate	Flake / Pastille	58-64	grade.
MACKESTER® EGDS	Glycol Distearate	Flake / Pastille	67-71	Excellent opacifying and pearlizing agents. <b>MACKESTER® GDSV</b> 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	





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