

Pioneer

EM, RSPO-certified (MB) product portfolio

Product information

Application	Surfactants, emulsifiers, emollients, solvents for various applications
Customer industry	Home & Personal Care, I&I, Industrial Formulators
Market / Region	Global

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ 3rd party certified sustainable palm oil production and trade▪ Transparent value chain, traceable back to oil mill level▪ Reduced CO₂ footprint
Technical benefit	<ul style="list-style-type: none">▪ Palm (kernel) oil delivers the necessary C-chain for respective ingredients

Sustainability performance

- Renewable based raw materials that enhance circular economy (close the loop)
- Palm is the most resources efficient oil crop
- Roundtable on Sustainable Palm Oil (RSPO) is a global certification system for sustainable palm oil and is considered as a standardized implementation of a strong No Deforestation, No Peat, No Exploitation (NDPE) policy
- RSPO-certified production of palm (kernel) oil shows around 36% lower carbon footprint than the non-certified production*



RSPO-certified ingredients ensure sustainable cultivation and sourcing of palm kernel oil

*Schmidt and De Rosa (2020) Certified palm oil reduces greenhouse gas emissions compared to non-certified. J Cle Prod 277 (2020).

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EM, EcoBalanced portfolio

Product information

Application	Biomass balanced ingredients for various applications
Customer industry	Home & Personal Care, I&I, Industrial Formulators
Market / Region	Europe
Products	selection on next slide

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Substitution of fossil with renewable feedstocks*▪ Reduced PCF (Product Carbon Footprint)
Technical benefit	<ul style="list-style-type: none">▪ Drop-in solutions: Unchanged quality & performance▪ No reformulation required

Sustainability performance

- For our EcoBalanced portfolio, the biomass balance approach ensures that 100% of the fossil feedstock required is replaced by renewable raw materials at the early stages of the value chain
- The proportion of renewable raw materials is then allocated to the respective finished products using a certified mass balance method
- Both the attribution process as well as our EcoBalanced products themselves have been certified by TÜV Nord according to the global REDcert² scheme
- Products are like-for-like drop-in solutions with identical quality & performance, but reduced PCF



EcoBalanced – Performance and sustainability in balance

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EM, Selection of EcoBalanced products

Products	PCF reduction potential*
Surfactants	
Dehydol® LT 7 EcoBalanced	- 60%
Lutensol® AT 80 Powder EcoBalanced**	- 94%
Lutensol® AO 7 EcoBalanced**	- 96%
Plurafac® LF 403 EcoBalanced**	- 76%
Eumulgin® CO 40 X EcoBalanced	- 85%
Cetiol® HE X EcoBalanced	- 186%
Texapon® N 70 X EcoBalanced	- 33%
Dehyton® PK 45 X EcoBalanced	- 20%
Dehyton® PS X EcoBalanced	- 33%
Comperlan® 100 X EcoBalanced	- 31%

Products	PCF reduction potential*
Polymers	
Luviskol® K 90 AT1 X EcoBalanced	- 33%
Luviskol® VA 64 W X EcoBalanced	- 33%
Sokalan® CP 5 EcoBalanced**	- 91%
Sokalan® PA 25 CL EcoBalanced Gran**	- 52%
Sokalan® HP 20 EcoBalanced	- 79%
Sokalan® HP 56 A EcoBalanced	- 37%
Others	
Trilon® M Max EcoBalanced	- 33%
1,2-Propylene Glycol Care X EcoBalanced	- 57%
Monoethanolamine Care X EcoBalanced	- 82%

**Products not yet TripleS 3.0 segmented in SMART - no sales in the last 2 years.

* Cradle-to-gate Product Carbon Footprint (PCF) reduction potential incl. biogenic CO₂ (conventional grade vs. EcoBalanced grade) [Status: July 2024]
TÜV Rheinland confirms that the calculation procedure of Biomass Balance (BMB) product carbon footprints and associated PCF reduction follow conventional LCA procedure as described in ISO 14067 and TfS Guideline. For GHG accounting purposes, biogenic carbon embodied in a product is handled differently depending on the respective standard applied.

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EMB, Verdessence™ Biopolymers

Product information

Application	Thickening, texturizing, film forming for: leave-on, rinse-off, styling and more
Customer industry	Personal Care
Market	Global
Region	Global

Differentiation potential

- Rationale**
 - Biodegradable and biobased multifunctional solutions, with a target on innovative production processes that allow to offer the highest performing ingredients
- Technical benefit**
 - Fits to broad range of applications
 - Synergistic effect when combine with each other

Sustainability performance

- Derived from natural, renewable feedstocks
- High natural origin index according to ISO 16128
- Readily biodegradable (OECD 301)
- COSMOS, Natrue approved
- Green manufacturing processes
- Non-GMO source and process



Star lineup of biopolymers in Personal Care

Pioneer

EMB, Lipofructyl[®] Argan LS 9779

Product information	
Application	Moisturization / Hair care
Customer industry	Personal Care
Market	Global
Region	Global

Differentiation potential	
Rationale	<ul style="list-style-type: none">▪ Wholly renewable based product▪ Based on certified sustainable feedstock
Technical benefit	<ul style="list-style-type: none">▪ When applied to the skin, argan oil spreads easily & penetrates rapidly without giving oily or shiny effect, leaving an extraordinary softness & sensory skin feel.



Sustainability performance	
<ul style="list-style-type: none">▪ Organic and fair trade certified argan oil▪ Sourced in partnership with an women's cooperative in Morocco▪ Enabling socio-economic development	<ul style="list-style-type: none">▪ Multiple valorization of different parts of the tree to foster a better local impact▪ Full end-to-end traceability to the source powered by a digital platform Monitoring of social & environment impacts

Responsible sourcing of argan based materials

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EMB, Cetiol[®] Ultimate

Product information

Application	Ultra-fast spreading emollient
Customer industry	Personal Care
Market	Face / Body / Sun Care and Color Cosmetics
Region	Global

Differentiation potential

- | | |
|--------------------------|--|
| Rationale | <ul style="list-style-type: none">▪ Wholly renewable-based▪ RSPO-certified |
| Technical benefit | <ul style="list-style-type: none">▪ Readily biodegradable▪ Dry smooth textures▪ Improve skin feel in natural cosmetics▪ Easy preparation of color cosmetics |

Sustainability performance

- Renewable-based and volatile emollient
- Replacement of volatile silicones possible
- Easier to use than volatile hydrocarbons
- Gives more flexibility in the development of natural cosmetic concepts for improved skin feel
- Cosmos and NATRUE approved, recommended for Natural/ Organic formulation concepts



Renewable-based, fresh, dry and volatile

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EMB, Cetiol[®] C 5C

Product information

Application	Sensory emollient
Customer industry	Personal Care
Market	Face, Body, Sun and Color Care
Region	Global

Differentiation potential

- Rationale**
 - Wholly renewable-based
 - RSPO-certified
- Technical benefit**
 - Readily biodegradable
 - Fast spreading emollient
 - Excellent skin compatibility
 - Enhances the solubility of crystalline UV filters

Sustainability performance

- 100% derived from renewable feedstocks
- Product derived from certified sustainable palm-based material acc. RSPO Mass balance scheme
- Silicone Alternative
- Recommended for Natural/ Organic formulation concepts
- Similar to Cyclomethicone's key sensory parameters



A sensory emollient alternative to Cyclomethicone

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EMB, Tinosorb[®] M

Product information

Application	Leave-on Skin Care
Customer industry	Personal Care
Market	Sun Protection
Region	Global

Differentiation potential

- Rationale**
 - Unique photo-stable, broad-spectrum UV filter
- Technical benefit**
 - UVB filters for preventing skin damage and premature skin aging
 - Excellent formulation flexibility
 - Excellent protection against free radicals

Sustainability performance

- High efficiency at low concentration
- Reliable and long-lasting protection
- Cold processing (low temperature and low energy consumption) is possible
- Designed for use in water phase
- Has boosting effect with oil soluble UV filters
- RSPO certified palm oil containing which enhances circular economy
- Better toxicological profile than standard UVB filters
- Does not contain preservative
- Consumer Health Protection



Unique carbon saving photo-stable broad-spectrum UV filter with formulation flexibility

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EMB, Tinosorb[®] S

Product information

Application Leave-on Skin Care

Customer industry Personal Care

Market Sun Protection

Region Global

Differentiation potential

- Rationale**
- Most efficient photo-stable UV filter at low concentration
- Technical benefit**
- Oil soluble broad-spectrum UV filter for formulations with excellent sensory properties
 - Outstanding stabilizer for photo-unstable UV filters

Sustainability performance

- High efficiency at low concentration
- Reliable and long-lasting protection
- Efficient shielding against UV radiation for preventing long term skin damage
- Better toxicological profile than standard UV filters
- Does not contain preservative
- Better photostability than conventional products



Highly efficient oil soluble broad-spectrum UV filter at even low concentration

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EMB, Tinosorb[®] S Lite Aqua, Sun Care

Product information	
Application	Leave-on Skin Care
Customer industry	Personal Care
Market	Sun Protection
Region	Europe, S. America, Asia (not sold in N. America)

Differentiation potential	
Rationale	<ul style="list-style-type: none">▪ High sun protection performance due to UV filter balance in water and oil phase
Technical benefit	<ul style="list-style-type: none">▪ Reduction of oil phase for more formulation flexibility▪ No solubilization required▪ Pumpable

Sustainability performance	
<ul style="list-style-type: none">▪ Encapsulation technology for optimal film formation on the skin leading to higher SPF▪ Partition of total UV filter amount to oil AND water phase▪ Absorption spectrum as broad as Tinosorb[®] M▪ Perfectly suited for formulations according to EcoSun Pass	<ul style="list-style-type: none">▪ Cold processable▪ Time and energy reduced for preparing formulation▪ Does not contain preservative▪ Helps to prevent long term skin damage



Award winning encapsulation technology allows formulation flexibility.



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EMB, Tinosorb[®] A2B

Product information

Application	Leave-on Skin Care
Customer industry	Personal Care
Market	Sun Protection
Region	Europe, S. America, Asia (not sold in N. America)

Differentiation potential

- Rationale**
- Most efficient photostable UVB / UVA II filter in water dispersible form
- Technical benefit**
- UVB filters for preventing skin damage and premature skin aging
 - Excellent formulation flexibility
 - Complexity reduction
 - Fills the Gap in UVA2 range

Sustainability performance

- High efficiency at low concentration
- Reliable and long-lasting protection
- Efficient shielding against UV radiation for preventing skin damage
- Designed for use in water phase
- Has boosting effect with oil soluble UV filters
- Cold processable
- Best choice for EcoSun Pass
- Does not contain preservative
- Helps to prevent long term skin damage
- Application in all market segments incl. sensitive skin and kids



Highest SPF formulation based only on particulated UV filter... now possible

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EMO, SFA range Surfactants

Product information

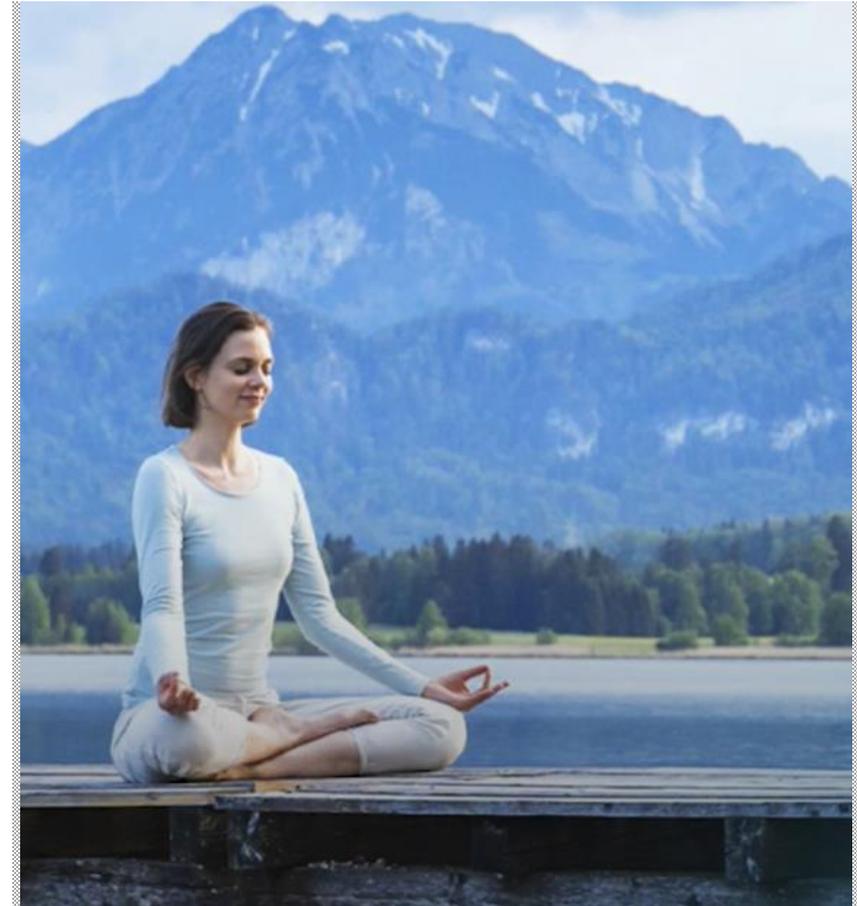
Application	Hair & Body cleansing (Rinse-off products)
Customer industry	Personal Care
Market	Natural cosmetics, mild cleansing, e.g. baby
Region	Global

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Renewable based product▪ Based on certified sustainable feedstock
Technical benefit	<ul style="list-style-type: none">▪ Improves hair conditioning, foam and sensory▪ Thickens without polymers▪ Digital formulation service▪ Different cold-processable formats

Sustainability performance

- High natural origin content > 99% (according to ISO 16128)
- RSPO mass balance-certified sustainable
- Readily biodegradable
- Low ecotoxicity
- Supports solutions not based on EO
- Suitable for zero-waste solid products
- Suitable for formulations with COSMOS label, even in effective blend with betaine
- Suitable for formulations with Natrue label
- Suitable for Safer Choice (US EPA)



Finally... Mild and natural is not a contradiction!

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EMH, Sokalan[®] Ecopure C

Product information

Application	Readily Biodegradable Polymer for Automatic Dishwashing Detergents
Customer industry	Home Care
Market / Region	Europe

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Biodegradable performance booster that supports powerful sustainable cleaning for automatic dishwashing detergents
Technical benefit	<ul style="list-style-type: none">▪ Readily biodegradable▪ Perfect fit to all automatic dishwashing detergent formats

Sustainability performance

- Readily biodegradable (OECD 301 F)
- Excellent eco-tox profile acc. to EU CLP
- Polyaspartic acid sodium salt
- Suitable for ecolabel formulations (EU Ecolabel, Blue Angel and Nordic Swan)



Meeting the performance level of standard polyacrylates while being readily biodegradable

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EMH, Sokalan[®] SR 400 A

Product information

Application	Performance Booster in Laundry Detergents
Customer industry	Home Care
Market / Region	Europe, North America, Asia

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Energy savings through low temperature washing▪ Helps to prolong lifetime of textiles
Technical benefit	<ul style="list-style-type: none">▪ Enables good performance at low temperatures▪ Innovative performance booster for laundry formulations

Sustainability performance

- Enables high cleaning performance at low washing temperatures
- Protects textiles and lets clothes last longer
- Excellent action against oily and fatty stains



Strong Performance Booster to combat oily and fatty stains in Laundry Detergents

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EMH, Trilon[®] M types / Trilon[®] Ultimate types

Product information

Application	Various I&I applications (e.g., scale inhibitor, water hardness control)
Customer industry	Industrial & Institutional Cleaning
Market / Region	Europe

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Alternative to STPP, NTA, GLDA, TSC▪ Enables solid formats (significant contribution to save energy, cost, packaging, space)
Technical benefit	<ul style="list-style-type: none">▪ Excellent performance and material protection

Sustainability performance

- High performance as strong chelating agents
- Readily biodegradable*
- Suitable for ecolabel formulations (e.g., EU Ecolabel, Blue Angel and Nordic Swan)**
- Good eco-tox profile compared to other strong chelating agent
- Ultimate types with glass protection
- Bio-grades available:
 - ✓ Trilon[®] M Max BioBased with a measurable bio-content of up to 43%
 - ✓ Trilon[®] M Max EcoBalanced, 100% bio via mass balance (incl. attributed renewable carbon) and with reduced Product Carbon Footprint



Phosphate free and biodegradable chelating agents that enable solid formats in I&I

Pioneer

EMH, Lavergy® M Ace 100 L

Product information

Application	Enzyme for Laundry Detergents
Customer industry	Home Care and I&I
Market / Region	Europe, North America

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Biological and renewable alternative▪ Energy savings (low temp.)▪ Efficient food stain removal
Technical benefit	<ul style="list-style-type: none">▪ High compatibility in liquid formulations▪ Enables cleaning on complex food stains (even at cold temp.)

Sustainability performance

- Majority bio-based*, readily biodegradable liquid mannanase
- Highly compatible in liquid detergents
- Boosts complex food stain removal even at cold temperatures
- Enables energy savings with lower wash temperatures
- Supports short wash cycle claims
- Enhances washing efficiency and water savings
- Suitable for ecolabel formulations (EU Ecolabel, Blue Angel and Nordic Swan)
- Textiles look new and clean for longer
- No preservatives added



New Mannanase for superior complex food stain removal in short & cold wash cycle

Pioneer

EMH, BVERDE™ GP 790 L

Product information

Application	Anti-redeposition laundry polymer
Customer industry	Home Care and I&I
Market / Region	North America

Differentiation potential

Rationale	<ul style="list-style-type: none">▪ Biodegradable Anti-redeposition polymer▪ Made from renewable feedstocks
Technical benefit	<ul style="list-style-type: none">▪ Harness the power of acrylate chemistry without compromising your sustainability claims

Sustainability performance

- Majority biobased (79%)*
- Modified polysaccharide
- Readily biodegradable**
- Safer Choice listed



Achieve anti-redeposition performance without compromising sustainability

* Measured by ASTM method D6866, Renewable carbon index: X > 50%

**Readily biodegradable” means ≥ 60% degradation within 28 days, as measured by OECD 301F method

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EMI, Agnique® BioHance 100

Product information		Differentiation potential	
Application	Biological tank mix adjuvant	Rationale	▪ First tank mix adjuvant in the market that tackle biological efficacy
Customer industry	Agricultural Chemicals	Technical benefit	▪ Tailor-made solution to improve biopesticide performance
Market / Region	North America		

Sustainability performance	
	<ul style="list-style-type: none">▪ Enables the use of biopesticides instead of synthetic pesticides by improving the field efficacy of <i>Bacillus</i> species-based biopesticide▪ Majority biobased* (renewable carbon content > 50%)▪ Label free▪ OMRI certified



Achieve adjuvacy performance without compromising sustainability

* Measured by ASTM method D6866, Renewable carbon index: X > 50%

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EMI, Agnique® PG 8105, Agnique® PG 8107-U

Product information

Application Various applications in pesticide formulation incl. adjuvant, compatibilizer, wetter

Customer industry Agricultural Chemicals

Market/Region Global

Differentiation potential

Rationale

- Derived from renewable natural resources such as palm kernel oil, coconut oil, and glucose from corn

Technical benefit

- Exceptional compatibilizer and versatile surfactant with combined potentiating, dispersing & wetting properties

Sustainability performance

- Made from natural resources with >95% biobased content*
- Readily biodegradable
- Super adjuvants performance enables reduced synthetic content in formulations
- Better tox profile vs TAM-EO, Betaines
- Available as RSPO certified



Natural based products that provide excellent adjuvancy to improve pesticide efficacy

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EMI, Agnique® SBO 10

Product information

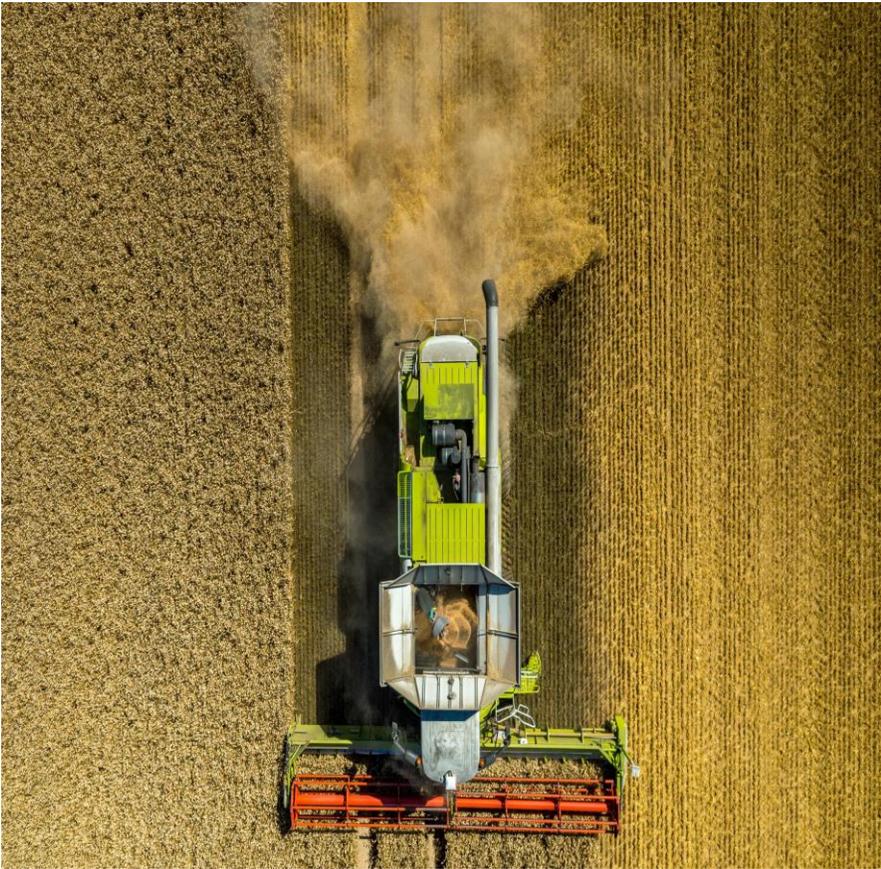
Application	Adjuvant for Crop Protection Formulations
Customer industry	Agricultural Chemicals
Market / Region	Europe, North America

Differentiation potential

- | | |
|--------------------------|---|
| Rationale | <ul style="list-style-type: none">Label-free adjuvant with negative cradle-to-gate PCF (incl. biogenic CO₂) |
| Technical benefit | <ul style="list-style-type: none">Boosts systemic active ingredient performanceIncreased efficiency of pesticide formulations (adjuvant) |

Sustainability performance

- Negative Product Carbon Footprint incl. biogenic CO₂
- Majority bio-based*
- Label-free according to GHS criteria**
- Readily biodegradable (according to OECD criteria)
- Increased efficiency of pesticide formulations (adjuvant) enables reduction of pesticide active



Enhancing biological performance of crop protection formulations

* According to EN 17035, Renewable carbon index: 95% ≥ X > 50%
** Status June 2023, please check the latest MSDS

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EMI, Lutropur[®] MSA

Product information

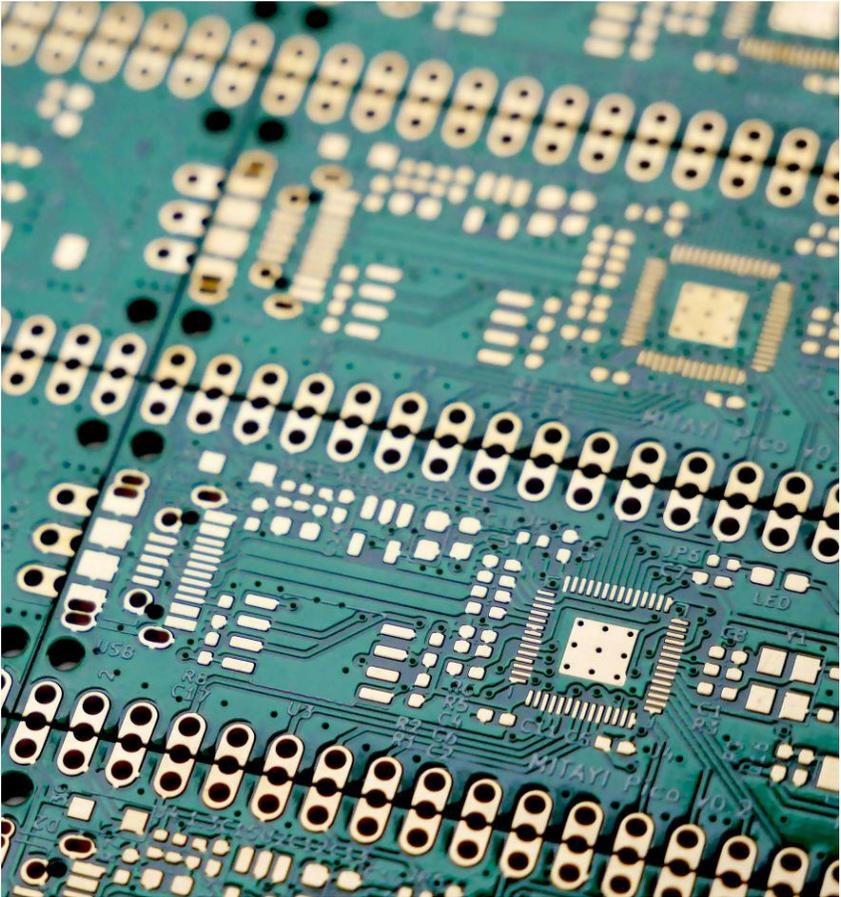
Application	Electroplating, Descaling, Acid Catalyst
Customer industry	Electronics, Chemical Industry, Biofuels, Paints & Coatings, Adhesives & Sealants
Market / Region	Global

Differentiation potential

- | | |
|--------------------------|--|
| Rationale | <ul style="list-style-type: none">▪ Safer & more efficient production & use▪ Odorless and not volatile |
| Technical benefit | <ul style="list-style-type: none">▪ Excellent solubility of metal salt▪ Excellent lime-scale, rust and greasy soil removal▪ Less corrosion, plastic compatible |

Sustainability performance

- Unique, more efficient and safer production process than traditional (e.g. no co-product, air oxidation instead of chlorine oxidation)
- Material protection (low corrosiveness)
- Readily biodegradable
- Meets requirements of labels
- Replacement of acids with low environmental and health profile (HCl, HF, PSA, HBF₄, HNO₃, etc.)
- Highly efficient catalyst with low side product formation
- Enabler for second generation biofuel technologies (biofuel from waste streams)



Strong organic acid with high performance efficiency and low environmental impact



We create chemistry