

Agro Ingredients

Velcis™

LONZA

Velcis™

Formulated Performance for Plant Protection



# Lonza Agro Ingredient Products

A portfolio of products designed to help optimize crop protection formulations and help farmers deliver safe and abundant crops.

Lonza's history of supplying quality products to the agricultural sector can be traced back to our founding in the Swiss Alps in 1897. Ever since then we have striven to provide innovative and quality products to our partners around the world, helping them to deliver value-added solutions for the crop protection and food processing industries.

We now provide a wide range of basic and specialist chemical intermediates alongside our custom-manufacturing capability and leadership in the molluscicide market. We supply advanced intermediates and active ingredients for fungicides, herbicides and insecticides to all types of manufacturers around the world, encompassing the major agricultural companies as well as many smaller, entrepreneurial firms.

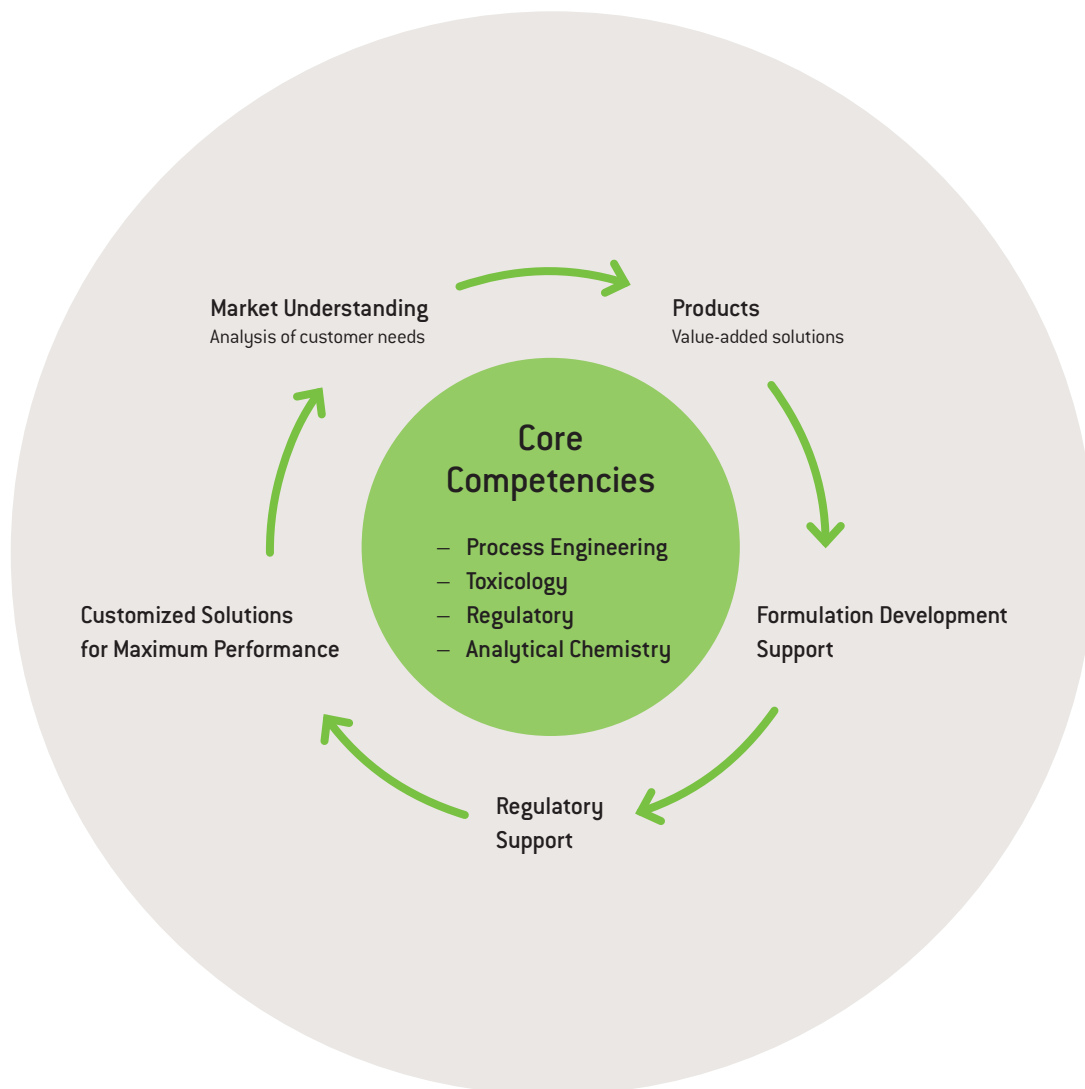
Lonza's expert chemists know very well that good formulation can make all the difference in the field. Improved product performance enables farmers to deliver better quality crops and higher yields. Good formulations allow more efficient application of active ingredients, while reducing operator exposure hazards and minimizing environmental intrusion. As more and more actives become generic, the value of smart formulation becomes increasingly important in creating differentiation.

This brochure provides an overview of our formulation ingredients portfolio, from performance-boosting enhancers for active ingredients to preservatives to help stabilize the final formulations. Proxel® is already well known but formulation ingredients in all functionality types now reinforce Lonza's offering. As well as formulation ingredients Lonza can offer a range of formulation services, such as preservative efficacy testing.

## Lonza provides:

- Quality products matched to your needs
- Value-added adjuvants – supported by expertise from different Lonza businesses
- Preservatives to stabilize the integrity of aqueous-based formulations
- Small volume sample production for client testing
- Assistance with formulation-related issues
- Regulatory support throughout the world
- Reliable modern manufacturing with full quality control and traceability
- A strong background in manufacturing and organic synthesis

# Lonza's Value Proposition



« Lonza gives you more than just a product »



# The Velcis™ Family of Formulation Ingredients

Lonza offers a broad portfolio of ingredients for use in a wide range of agrochemical formulations covering the majority of formulation types as shown below.

In addition all of these products can also be used as tank adjuvants. Our strong process engineering capabilities allow the production of high quality 'off the shelf' or 'tailor made' solutions to your formulation needs. Products are backed by full regulatory packages and Lonza can assist in regulatory issues on a global basis. Some of our products can be derived from naturally occurring materials and manufactured under GMP if required.

## Formulation Types:

**SC:** Suspension Concentrates

**EC:** Emulsifiable Concentrates

**WG:** Water-Dispersible Granules

**SL:** Soluble Concentrates

**EW:** Emulsion, Oil-in-water

**EO:** Emulsion, Water-in-oil

**OD:** Oil Dispersion

**SG:** Water Soluble Granules

**CS:** Capsule Suspensions

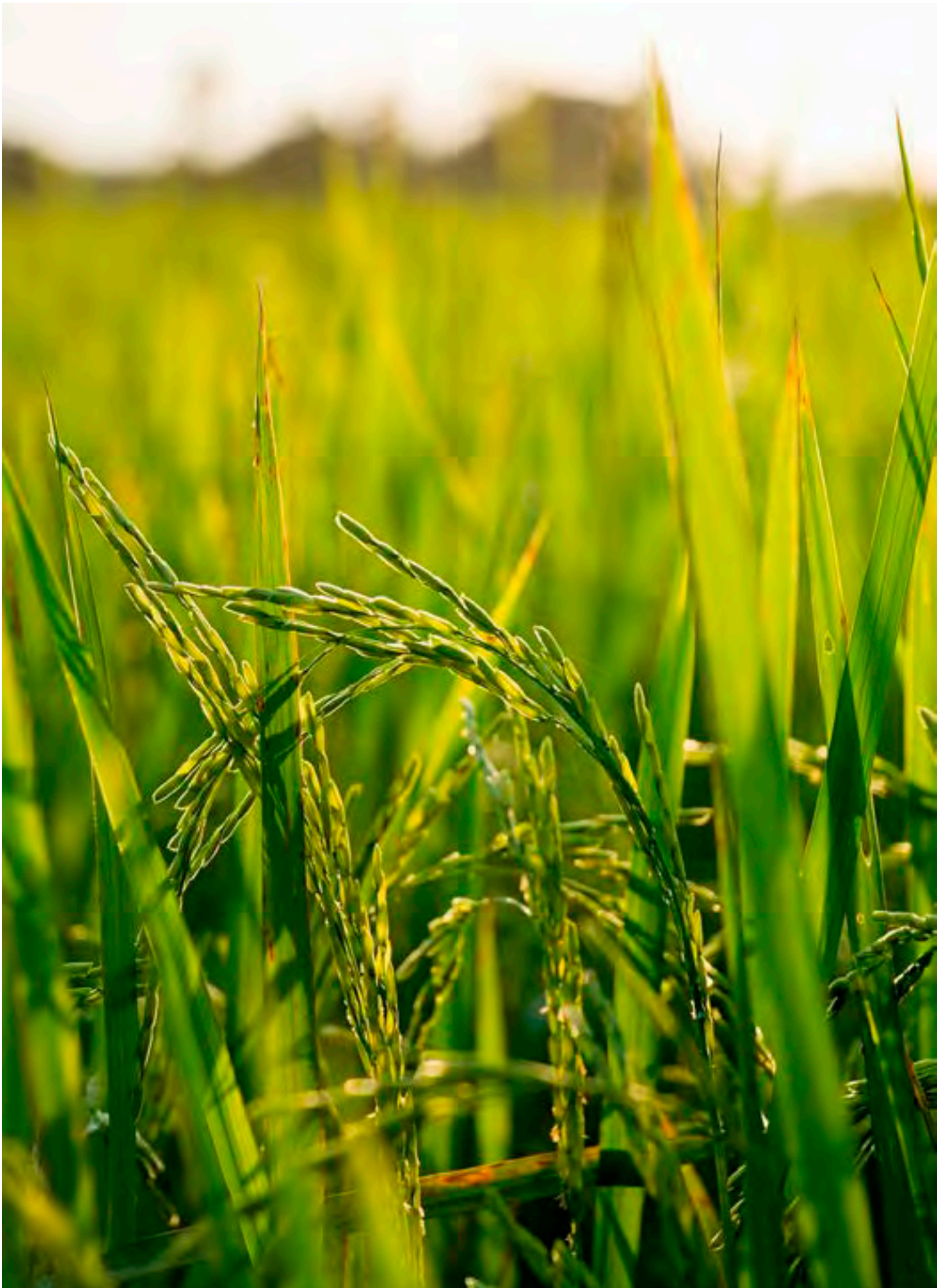
## Overview of Velcis™ Range product functionalities

Product	Chemical Description	Formulation Suitability	Activator	Wetting/Spreading	Deposition	Humectant
Velcis™ Proxel®	1,2 Benzisothiazolin-3-one	SL, SC, EW, EO, WG, SG				
Velcis™ EMblem 0	Sorbitan Oleate	OD, EC, SC, EW				
Velcis™ EMblem 5	POE(5) Sorbitan Monooleate	OD, EC, SC, EW	✓	✓		
Velcis™ EMblem 20	POE(20) Sorbitan Monooleate	OD, EC, SC, EW	✓	✓		
Velcis™ EMmer 0	Sorbitan Monoolaurate	OD, EC, SC, EW				
Velcis™ EMmer 20	POE(20) Sorbitan Monoolaurate	OD, EC, SC, EW	✓	✓		
Velcis™ EMerald 40	POE(40) Sorbitan Hexoleate	OD, EC, EW, EO	✓	✓		
Velcis™ ADEpt 3	Polyglyceryl-3-Oleate	OD, EC, SL, SC, EW, EO	✓		✓	✓
Velcis™ ADEpt 10	Polyglyceryl-10-Oleate	OD, EC, SL, SC, EW, EO	✓	✓	✓	✓
Velcis™ ADvect 8	PEG-8-Oleate	OD, EC, EW, EO	✓	✓		
Velcis™ Dlamond 4	POE(4) Lauryl Alcohol	OD, EC, SL, SC, EW	✓	✓	✓	
Velcis™ WExipro 10	Decyl Amine Oxide	SL, SC, EW, EO	✓	✓	✓	
Velcis™ WExipro 12	Coco Amine Oxide	SL, SC, EW, EO	✓	✓	✓	
Velcis™ WEiplus 2250	Quaternary Ammonium Compounds	SL, SC, EW		✓		
Velcis™ Customized Services						

✓ Primary Functionality  
 ✓ Additional Functionality







# Velcis™ Preservatives

Lonza offers a number of preservatives for use in agrochemical formulations. These provide reliable and proven protection to maintain the integrity of the formulation and to extend the shelf-life of the final product. These preservatives are effective in controlling a wide range of organisms. All the products in this range have full global regulatory approvals. Lonza has extensive knowledge in the use of these preservatives and can offer detailed assistance in choosing the right preservative for your final chosen product. When you make the decision to use Proxel® preservatives, you know that you will also receive superior technical support on a global basis from a dedicated team of experts. Contact us to speak with a technical support expert who will help you determine if Proxel® preservative is the right product for your needs.

## Proxel® product efficacy testing

As part of the product support and service Lonza offer behind the Proxel® range we offer:

- Consultancy in the application of biocides
- Audits and plant reviews of hygiene procedures
- Microbial monitoring of facilities and equipment used for formulated pesticides
- Analysis of samples (liquid, paste or solid) by qualified microbiological and chemical Lonza labs

## The Velcis™ Proxel® Range

Product	Chemical Description	Percentage Active	Formulation Type
Proxel® BD20	1, 2-benzisothiazolin-3-one [BIT]	20	Aqueous dispersion
Proxel® GXL	1, 2-benzisothiazolin-3-one [BIT]	20	Solution
Proxel® BN	Mixture of 1, 2-benzisothiazolin-3-one [BIT] and 2-Bromo-2-nitropropan-1,3-diol [BNP]	13.5/6.5	Aqueous dispersion
Proxel® BNP30	2-Bromo-2-nitropropan-1,3-diol [BNP]	31	Solution
Proxel® XL2	1, 2-benzisothiazolin-3-one [BIT]	9	Solution
Proxel® BD	1, 2-benzisothiazolin-3-one [BIT]	33.5	Aqueous Dispersion

# Velcis™ EMblem Family

Velcis™ EMblem is a non-ionic adjuvant family, with matching pairs of sorbitan monooleate in various ethoxylation units. They are stable over a broad range of pH values, and come in a wide range of HLB values allowing for maximum flexibility when formulating. The EMblem Family is suggested for use as a w/o emulsifier or as an o/w emulsifier in conjunction with an auxiliary surfactant. These products are produced with naturally derived materials. Some of these are offered as non-GMO. All products are made under GMP conditions when required.

## Functionality Properties

Product	Velcis™ EMblem 0	Velcis™ EMblem 5	Velcis™ EMblem 20
Chemical Description	Sorbitan Oleate	POE(5) Sorbitan Monooleate	POE(20) Sorbitan Monooleate
Active Cont. (%)	100	100	100
Activator		✓	✓
Wetting / Spreading		✓	✓
Deposition	✓	✓	✓
Uptake Enhancer	✓	✓	✓
Emulsifier	✓	✓	✓
Emulsifiable Oil Activator	✓	✓	✓
Tank Mix Adjuvant	✓	✓	✓

## Physical Data

Product	Velcis™ EMblem 0	Velcis™ EMblem 5	Velcis™ EMblem 20
Active Cont. (%)	100	100	100
Appearance @25 °C	Viscous yellow liquid	Yellow liquid	Clear amber liquid
Specific Gravity @22 °C	0.962	1.026	1.071
Flash Point, °C (ASTM D-56 Closed cup)	>195	>195	>195
Pour Point, °C	-6	-9	-1
Viscosity @25 °C (cps)	1350	367	403.9
Water Solubility	Dispersable	Miscible	Soluble
HLB	4.3	10	15
Initial Ross-Miles Foam Height (cm), 0.25% conc.	1	0.2	9.5
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	0.5	0.1	2
CMC (mg/L or ppm)		1259 ppm	501 ppm
Equilibrium Surface Tension at CMC (mN/m)		35	33
Dynamic Surface Tension at CMC, 30 mS (mN/m)		78	68

## Regulatory Status

Product	Velcis™ EMblem 0	Velcis™ EMblem 5	Velcis™ EMblem 20
EPA Inert Ingredients Listing <sup>1</sup>	180.910	180.910	180.910
REACH Registration Status	Yes	Yes	Yes
Brazilian Positive List Class	III	IV	IV



# Velcis™ EMmer Family

Velcis™ EMmer is a family of sorbitan monolaurates. These non-ionic adjuvants are stable over a broad range of pH values, and come in higher HLB values than the Velcis™ Emblem Family. The EMmer Family is suggested for use as a w/o emulsifier or as an o/w emulsifier in conjunction with an auxiliary surfactant. These products are produced with naturally derived materials. Some of these are offered as non-GMO. All products are made under GMP conditions when required.

## Functionality Properties

Product	Velcis™ EMmer 0	Velcis™ EMmer 20
Chemical Description	Sorbitan Monolaurate	POE(20) Sorbitan Monolaurate
Active Cont. (%)	100	100
Activator		✓
Wetting/ Spreading		✓
Emulsifier	✓	✓
Emulsifiable Oil Activator	✓	✓
Anti-foam Defoaming Agent	✓	
Rheology Modifier	✓	
Tank Mix Adjuvant	✓	✓

## Physical Data

Product	Velcis™ EMmer 0	Velcis™ EMmer 20
Active Cont. (%)	100	100
Appearance @25 °C	Amber liquid	Viscous yellow liquid
Specific Gravity @22 °C	1.008	1.081
Flash Point, °C (ASTM D-56 Closed cup)	> 195	> 195
Pour Point, °C	-2	3
Viscosity @25 °C [cps]	4050	324
Water Solubility	Miscible	Miscible
HLB	8.6	16.9
Initial Ross-Miles Foam Height (cm), 0.25% conc.	4	9.5
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	2.8	3
CMC (mg/L or ppm)	10 ppm	179 ppm
Equilibrium Surface Tension at CMC (mN/m)	32.5	34
Dynamic Surface Tension at CMC, 30 mS (mN/m)	73	71

## Regulatory Status

Product	Velcis™ EMmer 0	Velcis™ EMmer 20
EPA Inert Ingredients Listing <sup>1</sup>	Non-food Use	180.910
REACH Registration Status	Yes	Yes
Brazilian Positive List Class		IV

- ✓ Primary Functionality
- ✓ Additional Functionality



# Velcis™ EMerald

Velcis™ EMerald is an ethoxylated sorbitan hexaoleate. A product with medium-high range HLB, EMerald is ideal for use in both oil and water-soluble formulations. A blend of EMerald, EMblem and EMmer can form stable emulsifiers with a specific HLB value for formulation needs. In addition, due to the long ethoxylation chains, EMerald can be utilized as a defoamer.

## Functionality Properties

Product	Velcis™ EMerald 40
Chemical Description	POE(40) Sorbitan Hexaoleate
Active Cont. (%)	100
Activator	✓
Wetting/ Spreading	✓
Emulsifier	✓
Tank Mix Adjuvant	✓

## Physical Data

Product	Velcis™ EMerald 40
Active Cont. (%)	100
Appearance @25 °C	Amber liquid
Specific Gravity @22 °C	1.007
Flash Point, °C (ASTM D-56 Closed cup)	>195
Pour Point, °C	-15
Viscosity @25 °C (cps)	350
Water Solubility	Dispersible
HLB	10.2
Initial Ross-Miles Foam Height (cm), 0.25% conc.	0.7
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	0.3
CMC (mg/L or ppm)	708 ppm
Equilibrium Surface Tension at CMC (mN/m)	37.5
Dynamic Surface Tension at CMC, 30 mS (mN/m)	73

## Regulatory Status

Product	Velcis™ EMerald 40
EPA Inert Ingredients Listing <sup>1</sup>	180.910; 180.960
REACH Registration Status	No
Brazilian Positive List Class	No

- ✓ Primary Functionality
- ✓ Additional Functionality

# Velcis™ ADept Family

Velcis™ ADept family represents a range of polyglycerols and polyglycerol esters for applications in crop protection formulations.

ADept 3 and 10 are both natural PEG-free water/oil emulsifiers. ADept 3 low HLB value makes this ingredient ideal for water-resistant applications. In addition, ADept 3's an oil solvent adjuvant. ADept 10 has excellent dispersion properties making it an ideal ingredient for a range of applications.

They are ECOCERT and Soil Association approved which makes it a good choice for green and natural formulations.

## Functionality Properties

Product	Velcis™ ADept 3	Velcis™ ADept 10
Chemical Description	Polyglyceryl-3 Oleate	Polyglyceryl-10 Oleate
Active Cont. (%)	100	100
Activator	✓	✓
Wetting / Spreading		✓
Emulsifier	✓	✓
Deposition	✓	✓
Humectant	✓	✓
Uptake Enhancer	✓	✓
Anti-foam Defoaming Agent	✓	
Tank Mix Adjuvant	✓	✓

## Physical Data

Product	Velcis™ ADept 3	Velcis™ ADept 10
Active Cont. (%)	100	100
Appearance @25 °C	Viscous yellow liquid	Waxy amber liquid
Specific Gravity @22 °C	1.01	
Flash Point, °C (ASTM D-56 Closed cup)	> 195	> 195
Pour Point, °C	14	28
Viscosity @25 °C (cps)	5 710	>100 000
Water Solubility	Miscible at <0.4% solution	Completely miscible
HLB	6.5	14
Initial Ross-Miles Foam Height (cm), 0.25% conc.	1.5	3.3
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	1	2.8
CMC (mg/L or ppm)	63.1 ppm	1 122 ppm
Equilibrium Surface Tension at CMC (mN/m)	36	37.5
Dynamic Surface Tension at CMC, 30 mS (mN/m)	73	73

## Regulatory Status

Product	Velcis™ ADept 3	Velcis™ ADept 10
EPA Inert Ingredients Listing <sup>1</sup>	180.910	180.910
REACH Registration Status	Yes	Yes
Brazilian Positive List Class	IV	IV

# Velcis™ ADvect

Velcis™ ADvect 8 is a Polyethyleneglycol Ester Surfactant that is compatible with cationic, amphoteric, anionic, and nonionic surface active agents.

## Functionality Properties

Product	Velcis™ ADvect 8
Chemical Description	PEG-8 Oleate
Active Cont. (%)	100
Activator	✓
Wetting/ Spreading	✓
Emulsifier	✓
Emulsifiable Oil Activator	✓
Tank Mix Adjuvant	✓

## Physical Data

Product	Velcis™ ADvect 8
Active Cont. (%)	100
Appearance @25 °C	Clear liquid
Specific Gravity @22 °C	0.996
Flash Point, °C (ASTM D-56 Closed cup)	~195
Pour Point, °C	0
Viscosity @25 °C (cps)	90
Water Solubility	Miscible
HLB	11.6
Initial Ross-Miles Foam Height (cm), 0.25% conc.	2.5
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	1.2
CMC (mg/L or ppm)	1 000 ppm
Equilibrium Surface Tension at CMC (mN/m)	32
Dynamic Surface Tension at CMC, 30 mS (mN/m)	70

## Regulatory Status

Product	Velcis™ ADvect 8
EPA Inert Ingredients Listing <sup>1</sup>	180.910; 180.930; 180.960
REACH Registration Status	Yes
Brazilian Positive List Class	IV

- ✓ Primary Functionality
- ✓ Additional Functionality



# Velcis™ Dlamond

Velcis™ Dlamond is an ethoxylated lauryl alcohol surfactant with a medium-range HLB, and stable under a broad range of pH values.

## Functionality Properties



Product	Velcis™ Dlamond 4
Chemical Description	POE(4) Lauryl Alcohol
Active Cont. (%)	100
Activator	✓
Wetting/Spreading	✓
Deposition	✓
Uptake Enhancer	✓
Emulsifier	✓
Emulsifiable Oil Activator	✓
Tank Mix Adjuvant	✓

## Physical Data

Product	Velcis™ Dlamond 4
Chemical Description	POE(4) Lauryl Alcohol
Active Cont. (%)	100
Appearance @25 °C	Clear liquid
Specific Gravity @22 °C	0.942
Flash Point, °C (ASTM D-56 Closed cup)	>195
Pour Point, °C	3
Viscosity @25 °C (cps)	31.3
Water Solubility	Completely miscible
HLB	9.5
Initial Ross-Miles Foam Height (cm), 0.25% conc.	2.8
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	2.3
Dravers Wetting, Sec @ 25 °C, 0.25% conc.	33.82
CMC (mg/L or ppm)	50 ppm
Equilibrium Surface Tension at CMC (mN/m)	31
Dynamic Surface Tension at CMC, 30 mS (mN/m)	71

## Regulatory Status

Product	Velcis™ Dlamond 4
EPA Inert Ingredients Listing <sup>1</sup>	180.910
REACH Registration Status	Yes
Brazilian Positive List Class	IV

 Primary Functionality  
 Additional Functionality







# Velcis™ WExipro

The Velcis™ WExipro Family are alkyl dimethyl amine oxides which exhibit broad acid/alkaline stability, good electrolyte compatibility and hard water tolerance. These products function as wetting agents, specialty emulsifiers, and can aid in viscosity building.

## Functionality Properties

Product	Velcis™ WExipro 10	Velcis™ WExipro 12
Chemical Description	Decyl amine oxide	Coco amine oxide
Active Cont. (%)	30	30
Activator	✓	✓
Wetting/ Spreading	✓	✓
Deposition	✓	✓
Uptake Enhancer	✓	✓
Compatability Agent	✓	✓
Rheology Modifier		✓

## Physical Data

Product	Velcis™ WExipro 10	Velcis™ WExipro 12
Chemical Description	Decyl amine oxide	Coco amine oxide
Active Cont. (%)	30	30
Appearance @25 °C	Yellow liquid	Yellow liquid
Specific Gravity @22 °C	0.975	0.954
Flash Point, °C (ASTM D-56 Closed cup)	~140	~145
Pour Point, °C	-3	-3
Viscosity @25 °C (cps)	15.3	25.1
Water Solubility	Completely miscible	Completely miscible
HLB		~22
Initial Ross-Miles Foam Height (cm), 0.25% conc.	10.5	13.5
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	8	11.5
Dravers Wetting, Sec @ 25 °C, 0.25% conc.	> 180	21.4
CMC (mg/L or ppm)	589 ppm	355 ppm
Equilibrium Surface Tension at CMC (mN/m)	38	33
Dynamic Surface Tension at CMC, 30 mS (mN/m)	69	71

## Regulatory Status

Product	Velcis™ WExipro 10	Velcis™ WExipro 12
EPA Inert Ingredients Listing <sup>1</sup>	180.910	180.910
REACH Registration Status	Yes	Yes

- ✓ Primary Functionality
- ✓ Additional Functionality

# Velcis™ WEIplus

Velcis™ WEIplus cationic surfactants are unique adjuvants that can be used with both non-ionic and cationic ingredients. WEIplus is primarily used as adjuvants for wetting/spreading. It is also found to enhance penetration and improve fungicide performance, as well as a cationic emulsifier.

## Functionality Properties

Product	Velcis™ WEIplus 2250
Active Cont. (%)	50
Wetting / Spreading	✓
Compatability Agent	✓

## Physical Data

Product	Velcis™ WEIplus 2250
Chemical Description	Quaternary Ammonium Compound
Active Cont. (%)	50
Appearance @25 °C	Pale yellow liquid
Specific Gravity @22 °C	0.974
Flash Point, °C (ASTM D-56 Closed cup)	37.8
Pour Point, °C	12
Viscosity @25 °C (cps)	24.5
Water Solubility	Completely miscible
HLB	10
Initial Ross-Miles Foam Height (cm), 0.25% conc.	24
Final Ross-Miles Foam Height at 5min (cm), 0.25% conc.	10
Dravers Wetting, Sec @ 25 °C, 0.25% conc.	1.97
CMC (mg/L or ppm)	1000 ppm
Equilibrium Surface Tension at CMC (mN/m)	37
Dynamic Surface Tension at CMC, 30 mS (mN/m)	48

## Regulatory Status

Product	Velcis™ WEIplus 2250
EPA Inert Ingredients Listing <sup>1</sup>	180.910
REACH Registration Status	Yes

- ✓ Primary Functionality
- ✓ Additional Functionality



# Velcis™ Customized Services

## Lonza's Technical Service Provides:

In addition to the current portfolio offerings, Lonza's strong process engineering capabilities, together with competencies from our other business segments, allow us to develop customized value-added ingredients to suit our customers' particular formulation needs. For example, customized blends of current surfactant offerings can be made to produce a desired HLB value. The degree of ethoxylation can be modified for our Velcis™ Emblem and Velcis™ EMmer brands. The alkyl chain lengths can be modified for our WExipro brands. We can also make specialized preservative blends if needed. In addition Lonza, has the ability to make new ingredients through both chemical synthesis and fermentation processes.

## Lonza's Technical Support Provides:

- Consultancy in the application of biocides
- Audits and plant reviews of hygiene procedures
- Microbial monitoring of facilities and equipment used for formulated pesticides
- Analysis of samples (liquid, paste or solid) by qualified microbiological and chemical Lonza labs.

## Proxel® efficacy testing

As part of the product support and service Lonza offer behind the Proxel® range we can:

- Help determine the best Proxel® product for a given formulation
- Help determine the best rate for maximum benefit
- Help solve problems surrounding the formulation performance.



### 1 EPA Inert Ingredients Listings

40 CFR 180.910: Inert Ingredients used pre and post harvest; exemptions from the requirements of a tolerance

40 CFR 180.920: Inert ingredients used pre harvest; exemptions from the requirements of a tolerance

40 CFR 180.930: Inert ingredients applied to animals; exemptions from the requirements of a tolerance

40 CFR 180.940: Tolerance exemption for active and inert ingredient for use in antimicrobial formulations (food contact surface sanitizing solutions)

40 CFR 180.960: Polymers, exemptions from the requirements of a tolerance

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