



ADJUVANTS FOR AGROCHEMICALS

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UNIQUE CHEMICAL SOLUTIONS



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Latro Kimya Head Office

Mahmutbey Mah.
Tasocagi Yolu Cad. No: 19/3 Balance Gunesli D Blok
Bagcilar 34218, Istanbul
Phone : +90 212 771 60 36

e-mail: info@latro.com.tr
www.latro.com.tr

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Graphic Design
www.studiota.co

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ADJUVANTS FOR AGROCHEMICALS

Agricultural adjuvants improve the efficiency by enhancing the performance of crop protection and crop nutrition products in the field.

They can be used as a tank mix adjuvant or an in-can additive in the product formulations.

The use of adjuvants provides a more sustainable agriculture application because it helps to reduce the water and resource consumption.

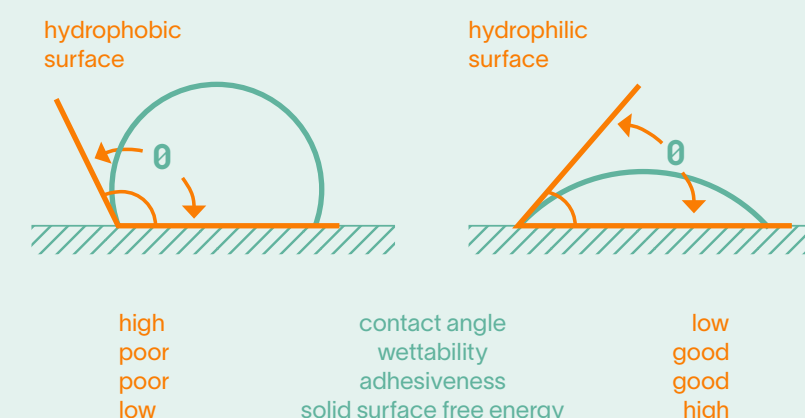
Advantages of Using Adjuvants

- Increasing yields thanks to better performance and activation
- Better spray efficiency and coverage
- Reducing costs
- More ecological because of less pesticide consumption
- More sustainable because of less water consumption

SURFECO® SILICONE ADJUVANTS

As Latro, we develop silicone-based solutions in the agricultural sector using our advanced know-how in silicone chemistry. We offer an extensive adjuvant range including super-spreading organomodified trisiloxane. Silicone surfactants improve the spray efficiency through better coverage, superior spreading and adhesion by decreasing the surface tension of water.

What is Surface Tension?



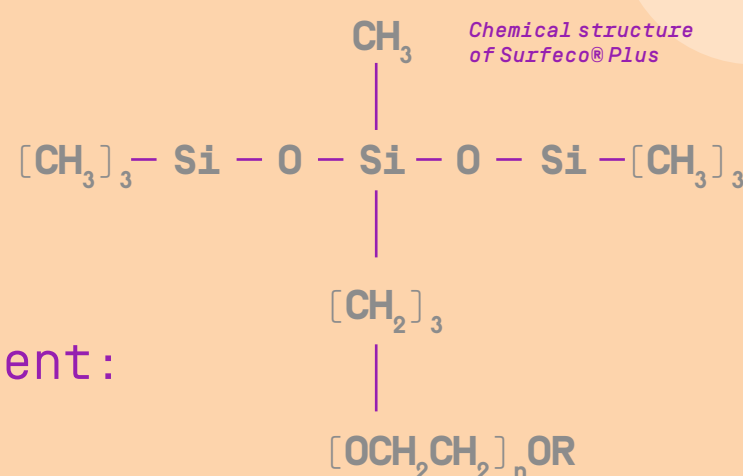
Surface tension is a physicochemistry term, in which the surface layer of a liquid shows similar properties to a flexible layer. The contact surfaces of a gas and a liquid or two non-mixing liquids resemble a stretched flexible membrane.

By scientific definition, surface tension is the force that keeps the unit length taut on the liquid surface. Its unit is dyn/cm. The reason for the capillarity, which is the rise and fall of the liquid observed in narrow tubes, is the surface tension.

The primary purpose of surfactants is to reduce the surface tension by increasing the contact angle between the sprayed droplet and the surface of the plant. By carrying the pesticide to the surface of the leaf at a narrower and closer angle, it creates the potential energy to reduce the contact force measured by dyn/cm.

The surface tension of the water is about 72 dyn/cm. The conventional surfactants reduce the surface tension of water generally between 40 and 50 dyn/cm. However, the Surfeco® Plus which is a super-spreading silicone surfactant can decrease the surface tension to 20 dyn/cm.

A modified Superspreading Agent: SURFECO® PLUS



Surfeco® Plus is a superspreading adjuvant utilized to modify the physical properties and enhancing biological activities of the agrochemicals. The use of Surfeco® Plus in agrochemicals is based on two different categories:

- 1 — It can be used as a tank mix adjuvant
- 2 — It can be used as an in-can additive in the product formulations directly.

The most widely used adjuvants are different types of surfactants. These products, like most other adjuvants are used to increase the wetting properties and spread of liquid agrochemicals that are desired to be spread on the leaves. They reduce the surface tension and spread the material to be sprayed over a wider area. Surfactants prevent water droplets from slipping off the leaf surface in oval drops, forming a thin film layer and help to cover the surface by holding on the leaf. They prevent the sprayed droplets from flowing by allowing them to hold onto the leaf surface.

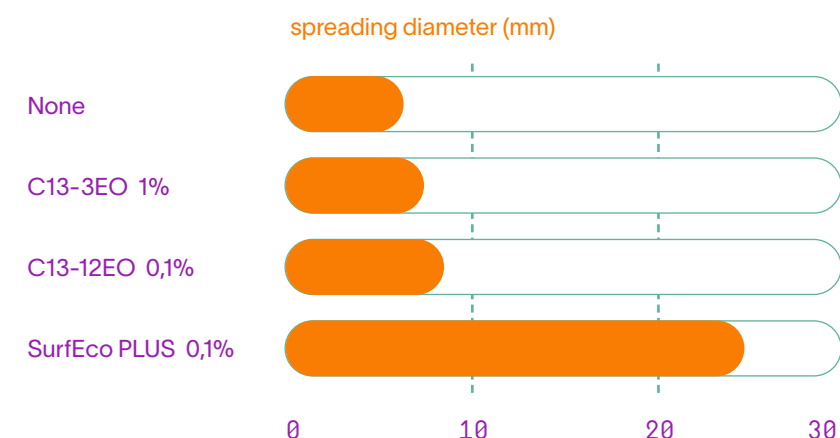


Key Performance Features

1. Lower surface tension than conventional surfactants
2. Decrease the spray volume
3. Sprinkler effect
4. Increase spray applied surface
5. Increased efficiency in pesticides and fertilizers
6. Safe applicability in every crops
7. Compatibility with EPA 40CFR 180.9104

Cloud Point (0,1wt %)	< 100°
Viscosity (cPs@25°C)	20 mpa
Density (25°C)	0,986 g/cm3
Ionic Character	Nonionic

Comparison Surfeco® Plus With Conventional Surfactants



without adding silicone surfactant adjuvant



added silicone surfactant adjuvant

Direct Usage In Irrigation Tank

Surfeco® Plus can be added directly into the mixing tank and the process can be terminated with a simple mixing process at low speed. Although the application amounts are at very low dosages as shown on the right side, using use within 72 hours after mixing will provide more effective results.

Application	Recommended Dosage
Herbicide, Defoliants and Desiccants	0,025% to 0,15%
Insecticide, Miticides	0,025% to 0,1%
Fungicide	0,015% to 0,05%
Nutrients	0,015% to 0,025%
Plant Growth Regulators	0,025% to 0,05%
Fertilizers	0,015% to 0,1%

A New Generation Powder Silicone Adjuvant:

SURFECO® ADF

Surfeco® ADF is an alkoxy modified solidified polymeric trisiloxane, which has super spreading and penetrating force. It can decrease the surface tension of spray fluid about 21 dyn/cm at the concentration 0.2%, while Op-10 can decrease only to 30 dyn/cm at the concentration 1%.

Applications

— For foliar application – solid fertilizers

Surfeco® ADF spray adjuvant may be used as a component of 1-10% in agrochemicals. Producers of fertilizers or pesticides should be adjusted to Surfeco® ADF usage levels for different kinds of products in order to achieve the most cost-effective results. Prior to the use, compatibility should be tested.

— For solid/powder pesticides:

WP/ wettable powder, GR/granule, WDG/ water dispersible granule, SP/soluble powder, dosage is about 0.5-2% in weight.



Key Performance Features

1. Easy to add to solid pesticide or fertilizer
2. Promotes rapid uptake of agrochemicals
3. Super-spreading and penetrating
4. Increases the product efficiency in the field

Environmental Benefits of Using Surfeco® Series

In drip irrigation, water accumulation and wetting are observed in a wide area around the plant. Some water will evaporate and some will be absorbed by the soil before it reaches to the root of the plant and be wasted.

As a result of irrigation, remained water on the soil surface and evaporation; salinity is formed on the soil surface, consisting of salts from the water that cuts the contact of the soil with air.

With Surfeco® Adjuvants, these adverse effects are not observed, since the water is absorbed very quickly by the soil in irrigation.



Saves 15-30% in irrigation water, so it is user friendly.



Saves electricity due to the reduction of irrigation water.



Provides efficiency in harvesting per acre



Protects equipment and materials used in irrigation.

An Effective Compatibility Agent: **BLENDCHEF® MA**

Blendchef® MA is an adjuvant developed for enhancing compatibility and water conditioning. It prevents the reaction of metal elements by forming a barrier between the metal elements (Ca, K, Zn etc.) and the metal-containing compounds that react and dissolve in the solutions. It ensures that metals remain soluble in the solution and thus allow the plant to naturally take more than one fertilizer.

Blendchef®MA is able to work as a pH reducer. It also works as a spreader and penetrator and increases the amount of useful nutrients taken by the plants.

Blendchef®MA can be used by mixing with fertilizers and pesticides. The following points should be taken into consideration when diluting the Blendchef® MA.

The recommended dose is 100 to 500 ml of Blendchef® MA in 100 liters of water, but this amount may vary according to the area of use and the needs of the user. In this case the user should determine the most appropriate concentration before going into serial use. When used with herbicides, up to 400-500 ml of Blendchef® MA can be added to the pesticide container to be applied to a decare area.



Key Benefits

- Enables successful tank mixing of many fertilisers which aprecipitate and usually reactive when mixed together.
- May also enable successful tank mixing of pesticides and fertilisers which often react with each other.
- May rescue reacted tank mixtures and help the recovery of mixtures.
- It clears blurred mixtures due to precipitation.
- Works as a pH reducer
- Pre-conditions high alkalinity water for fertigation to enhance compatibility.
- Re-solubilises precipitation (salt build-up) caused by irrigation and bore water.
- Designed to be mixed with a wide range of agrochemicals

How Does It Work?

- Some trace elements such as zinc, iron, manganese, magnesium, calcium, copper and boron react antagonistically with other elements to form insoluble salts. For example, zinc and phosphorus form insoluble zinc phosphate. BLENDCHEF® MA separates the individual elements through a process which disassociates the ions making them soluble and available.
- BLENDCHEF® MA may also be beneficial when pesticide and fertilisers are mixed together and reacted. Generally this is an inorganic reaction where BLENDCHEF® MA can assist in compatibility.
- BLENDCHEF® MA is an effective treatment for precipitate build up (e.g. calcium or iron build up) in trickle lines by pre-conditioning hard water and high alkalinity water to minimise precipitation and/ or deposition.





A Carbon Based
Spreading Agent:

SURFECO® DISSOL

Surfeco® Dissol is a carbon based spreading adjuvant that can be used in agriculture or other fields. By using SURFECO® PLUS, high performance spreading and penetrating adjuvant can be obtained at desired cost & performance. It can be applied both alone or with silicone-based superspreaders.

- Compatible with silicone-based super-spreaders
- Reduces surface tension
- Prevents the turbidity of water diluted trisiloxanes

Formulation	Surface Tension 0,01 %
30% Surfeco® Plus + 20% Surfeco® Dissol + 50% Water	36 dyn / cm*
40% Surfeco® Plus + 40% Surfeco® Dissol + 20% Water	33 dyn/cm*
Surfeco® PLUS	25 dyn/cm*

*All surface tension measurements were made in Wonderlab®

Compatibility Enhancing and
Water Conditioning Agents

Compatibility enhancing agents are designed to prevent or reduce compatibility problems arised from mixing multiple pesticides, or pesticides and fertilizers in a single tank. Higher rates are required in rescue situations.

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Better
Solutions
for a Better
World!
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In order to make agriculture more sustainable, resources in the nature should be used more efficiently.

As Latro, we develop eco-friendly chemicals that aim to increase efficiency and decrease the consumption of natural resources. In this way, we contribute to a sustainable agriculture that can meet the needs of the rapidly increasing world population.



LET'S CREATE NEW POSSIBILITIES TOGETHER!

Latro is an ecosystem with a holistic perspective along the whole value chain, guided by our expertise and customer-first mentality.



introduction video



The experimentation at the heart of chemistry inspires us to create new possibilities with extraordinary solutions. Our purpose and values are the key driving force behind the continuous improvement of our products, processes and solutions. With this mindset, we are not only supplying raw materials, but also solving current and future's problems.

Adopting different approaches in the face of challenges distinguished us. Our Ministry of Industry and Technology-accredited R&D Center, is the confluence of our innate creativity with our technical know-how. We offer a wide range tailor-made solutions such as new product development, technical support and process consultancy.

Latro offers a wide range of innovative solutions for Agriculture industry. We are supporting our customers by creating tailor-made formulations and making various performance tests in our application laboratory. Our main goal is to create value-added and cost-effective products by following the market and customer needs.



Disclaimer

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Latro Kimya Head Office

Mahmutbey Mah.
Tasocagi Yolu Cad. No: 19/3 Balance
Gunesli D Blok Bagcilar 34218, Istanbul
Phone : +90 212 771 60 36

e-mail: info@latro.com.tr
www.latro.com.tr

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