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Oil Soluble Agricultural Silicone Adjuvant Silfluo LA-13

Alkyl-Modified Trisiloxane Oil-Soluble Agricultural Adjuvant

Description:

Silfluo LA-13 is a 100% active lipophilic alkyl-modified trisiloxane (CAS 17955-88-3), solvent-free, and completely insoluble in water. The alkyl side-chain modification replaces the polyether groups of LA-10/LA-11/LA-12 with non-polar alkyl chains, shifting solubility from aqueous to hydrocarbon and lipid matrices.

In oil-based pesticide delivery systems, LA-13 reduces the surface tension of the oil phase, lowering the contact angle of oil droplets on wax-coated leaf cuticles and increasing the spreading area of the oil carrier per unit volume applied. The mechanism acts on the oil-cuticle interface rather than the water-air interface relevant to polyether trisiloxane adjuvants.

Typical Technical Properties:

Silfluo Code:	LA-13
Chemical Name: Synonyms:	Alkyl-Modified Trisiloxane Oil-Soluble Silicone Extender, Lipophilic Spreader, Alkyl Siloxane Adjuvant
CAS NO.:	17955-88-3
Appearance:	Clear, colorless to pale yellow liquid
Active Content (%):	100(Solvent-free)
Viscosity (25°C, mPa·s):	2.5 - 3.5
Specific Gravity (25°C, g/cm³):	0.82 - 0.85
Refractive Index (at 25°C):	1.412
Aqueous Solubility:	Insoluble
Hydrocarbon Solubility:	Completely miscible

Mechanism of Action

Alkyl groups on the LA-13 trisiloxane backbone are compatible with hydrocarbon and lipid matrices, allowing the molecule to orient at the oil-cuticle interface. At this interface, the trisiloxane backbone reduces interfacial tension between the oil carrier and the waxy leaf surface, lowering the contact

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angle of the oil droplet and increasing the spread area per unit volume of applied formulation.

This mechanism operates on lipophilic active ingredients carried in oil-based systems — the reduced contact angle at the cuticle surface increases the area of cuticle exposed to the active ingredient and the time of contact, both of which affect passive diffusion rate through the lipophilic cuticular wax layer per Fick's first law. The pathway is distinct from the stomatal infiltration mechanism of aqueous polyether trisiloxane adjuvants; LA-13 improves cuticular penetration of lipophilic actives rather than promoting stomatal entry of hydrophilic actives.

Application

LA-13 is used in non-aqueous or low-water agricultural systems where polyether trisiloxane adjuvants are incompatible due to aqueous insolubility requirement. Primary applications:

1. Emulsifiable Concentrate (EC) and Oil Dispersion (OD) formulations — incorporated as an in-can additive to reduce surface tension of the oil phase and improve spreading of the formulated product on leaf surfaces after dilution and application. Use level: 0.1 – 10.0 wt% of total formulation, depending on target spreading profile and compatibility with active ingredient.

2. Ultra-Low Volume (ULV) aerial applications — used as a spreading additive in undiluted or minimally diluted oil-carrier ULV formulations applied at 0.5 – 5.0 L/ha. Low viscosity (2.5 – 3.5 mPa·s) is compatible with ULV atomizer nozzle requirements (typically <5 mPa·s).

3. Crop Oil Concentrate (COC) and Methylated Seed Oil (MSO) tank-mix enhancement — added to oil-based tank-mix adjuvants at 0.01 – 5.0 wt% of the oil carrier volume to reduce surface tension of the oil carrier phase and increase leaf coverage area.

Recommended Use Rates

Application Type	Recommended Loading
In-can EC / OD formulation additive	0.1%–10.0% by weight of total formulation
ULV oil carrier additive	0.1%–5.0% by weight of oil carrier

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Application Type	Recommended Loading
COC / MSO tank-mix adjuvant	0.01%–5.0% of oil carrier volume

Initiate testing at the mid-range concentration for each application type. Compatibility and spreading performance vary with active ingredient polarity, oil carrier type (mineral oil, methyl oleate, aliphatic hydrocarbon), and crop surface wax composition; verify by contact angle measurement on representative leaf wax or artificial cuticle models at formulation development stage.

Formulation Compatibility

LA-13 is miscible with mineral oils, methyl oleate (MSO), aliphatic hydrocarbons, and most non-polar organic solvents used in EC and ULV formulations. It is not compatible with aqueous systems and will phase-separate on contact with water — do not use in aqueous spray tank applications. Verify compatibility with specific carrier oil and active ingredient combinations before incorporation into production batches.

Package &Storage:

In 20kg, 200kg plastic barrel or 1000kg, or up to clients request.
Keep in cool, dry and ventilated place. Keep away from sunlight and fire sources. Keep in unopened containers, shelf life is 24 months from the date of production. It is shipped as non-hazardous substance.
Storage beyond the shelf life does not necessarily mean that the product is no longer usable. In this case however, the properties required for the intended use must be checked for quality assurance reasons.

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