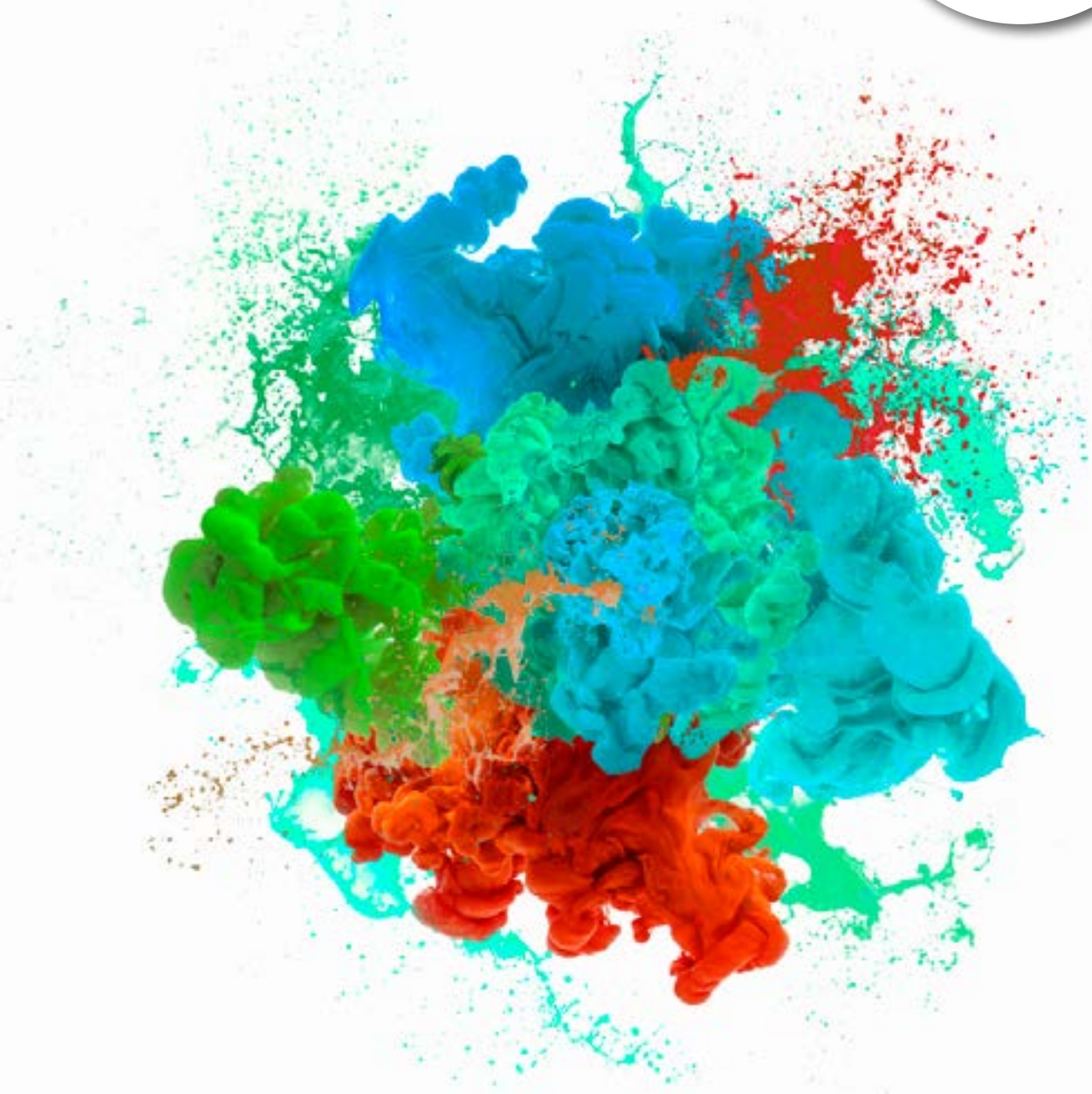
Lankem



Coating Additives - Overview

Expertise in Bio-based Technology

Lankem, founded in 1999, is a rapidly expanding business supplying innovative chemical products to industrial markets such as coatings, emulsion polymerisation, agrochemicals, textiles, oils and lubricants and industrial cleaning.

In recent years we have shifted our focus to the development of novel bio-based dispersants and have introduced a range of new products based upon patented BioLoop technology.

Expertise in Dispersant Design

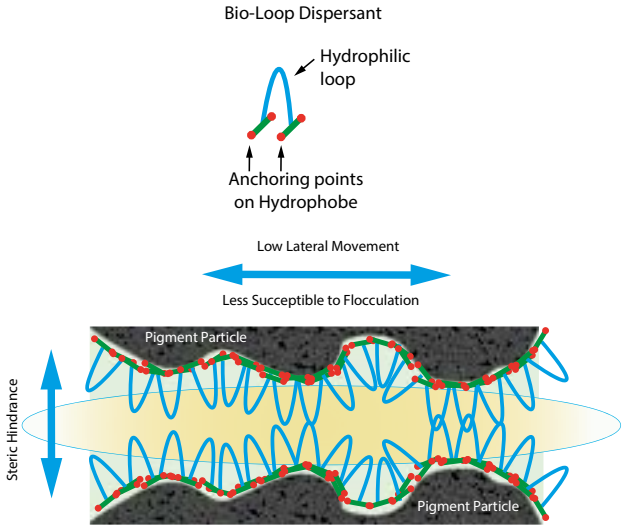
We pride ourselves on being able to provide true expertise and assistance to help the formulator develop new products and technologies. We have a dedicated laboratory facility aimed at innovation and testing of new bio-based products, and we see technical support as key to the growth of the business. As a company we continually develop new technical solutions to meet customer demand for high-performance products.

Our Chemistries

Surfactants contain both a hydrophobic and a hydrophilic section, and as a combination of these two characteristics within the molecule, many different properties can be achieved. From our historical expertise in surfactant technology, we offer a range of products over each of the surfactant types: anionic, nonionic, cationic and amphoteric.

Green technologies are becoming ever more important as a driver to a more sustainable world. Lankem have developed a new range of propietry dispersants with BioLoop technology.

These products have a renewable carbon idex of >98% and are extermely mild, with low ecotoxicity. Studies have shown that products using BioLoop tehcnology can be classed as readily biodegradable according to EC 1272/2008 4.1.2.9.5, enabling Lankem to offer a greren alternative to conventional dispersing agents for the coatings industry.



Global Player

A network of both agents and sales offices are in place to offer support to all global regions. The head office is located in the UK, with a sales office located in Ireland to support the European business and a sales office in the US to support North America.

Quality and the Environment

We view both quality and environmental compliance as essential components of the business. As expected we are a quality assured company with compliance in accordance with ISO9001 and with an excellent environmental profile, we have been certified to ISO14001. As a member of the Responsible Care programme, we are committed to managing the business both ethically and responsibly. Our Occupational Health and Safety Management System is certified to the ISO45001 standard.

Bio-based Dispersants

All dispersing agents on our range are:

- **VOC free**
- **APE free**

Lankem offer a range of innovative bio-based dispersants using our patented BioLoop technology. Each dispersant molecule has two hydrophobes, based on soybean or sunflower, that are then connected with a hydrophilic loop originating from molasses. The two hydrophobes help to achieve maximum bonding and spacing on the particle surface to deliver superior stability and dispersing properties.

Key Features

- Based on BioLoop technology
- Renewable carbon index > 98%
- Ultra-mild
- No skin or eye irritancy
- Low ecotoxicity
- Biodegradable
- A green alternative to conventional dispersing agents
- Hazard label free

Soybean Variants

Soybean is from a sustainable crop and is readily available. Although designed for aqueous systems, Lansperse BIO691 is also suitable for use in solvent systems and can be used in universal tinting systems.

Lansperse BIO691

Lansperse BIO801

Lansperse BIO868

Sunflower Variants

The newest innovation within the Lankem biobased dispersant range, our sunflower variants offer good performance over a range of pigment types and surface chemistries.

Lansperse SUN10

Lansperse SUN20

Lansperse SUN30

Dispersing Agents for Aqueous Systems

Lankem offer a range of dispersing agents to meet the needs of formulators who are dispersing particles into aqueous systems. These give advantages such as more efficient pigment dispersion, improved stability and higher quality coatings.

Product Name	Appearance	Activity %	Pour Point °C	Viscosity* cP	Pigment Types				Key Features
					Organic	Inorganic	Carbon Black	Titanium Dioxide	
Biobased Dispersing Agents for Aqueous - Soybean Variants									
Lansperse BIO691	Liquid	100	10.0	468	●		●		Stable in both aqueous and solvent systems
Lansperse BIO801	Liquid	80	-8.0	509		●		●	Good sustainability profile and performace
Lansperse BIO868	Liquid	75	-8.0	539	●	●			>98% RCI, good dispersion performance
Biobased Dispersing Agents for Aqueous - Rapeseed Variants									
Lansperse RPS11	Liquid	100	8.0	501	●	●		●	Sustainable crop, broad pigment compatability
Lansperse RPS25	Liquid	80	11.2	584	●	●			Good dispersion performance on PB15.3
Lansperse RPS43	Liquid	75	10.0	556			●	●	Good sustainability profile and performance
Biobased Dispersing Agents for Aqueous - Sunflower Variants									
Lansperse SUN10	Liquid	100	7.0	334	●		●		Compatible with a range of solvent systems
Lansperse SUN20	Liquid	80	6.0	947	●		●	●	Good performance over a range of pigments
Lansperse SUN30	Liquid	75	15.0	1252			●	●	Good sustainability profile and performance
Dispersing Agents for Aqueous Systems - Conventional Types									
Lansperse LT87	Liquid	80	18.5	620	●		●		41% biobased with boosted hydrophilic nature
Lansperse DS200W	Liquid	80	< 0	620	●		●		Good performance over a range of pigments
Lansperse DS80	Liquid	80	15.0	978		●			Best performance with inorganic pigments
Lansperse SPA	Liquid	40	< 0	251		●		●	Designed for inorganics and extenders
Lanwet JH1	Liquid	70	< 5	284		●			Powerful wetting agent, very effective on PY42
Lansperse DS145	Solid	100	N/A	N/A		●			Solid dispersant for a wide range of applications

* Viscosity of product as supplied measured at 25°C

Reccomendations based upon our screening tests, we advise full testing in your systems to include disperant loading optimisation

Dispersing Agents for Non-Aqueous Systems

Key Features

- Powerful dispersing properties
- Extreme high gloss
- Enhanced steric hindrance
- Good colour strength
- Low flocculation
- Fast particle size reduction

Dispersing agents are used to provide effective dispersion of a wide range of solid materials such as inorganic and organic pigments. The dispersant molecule is a high molecular weight polymeric material, the structure of which can be optimised to give the correct affinity to the dispersed particle surface whilst offering good steric hindrance. The careful design of the optimum dispersant architecture can provide a range of products that can allow the preparation of high solids dispersions of low particle size, that exhibit excellent rheology and stability.

Solvent Systems

Product Name	Appearance	Activity %	Pour Point °C	Viscosity* cP	Pigment Types: Organic	Pigment Types: Inorganic	Pigment Types: Carbon Black	Pigment Types: Titanium Dioxide	Key Features
Lansperse SL18-60**	Liquid	55	12.0	100	●			●	Good performance for organic pigments in non-polar mediums: automotive & industrial
Lansperse SL58	Liquid	100	10.0	High	●		●		100% active to give a broad usage across different solvent systems, good dispersion of pigments
Lansperse SL66	Liquid	100	5.0	High	●			●	Suitable for a broad range of pigments and gives high gloss dispersions with good colour

**Supplied in n-butyl acetate

Tested in a Laropal A81 / PMA system

UV Systems

Product Name	Appearance	Activity %	Pour Point °C	Viscosity* cP	Pigment Types: Organic	Pigment Types: Inorganic	Pigment Types: Carbon Black	Pigment Types: Titanium Dioxide	Key Features
Lansperse UV74	Liquid	100	10.0	High	●		●		Good quality dispersions in UV monomer, giving excellent gloss when cured
Lansperse UV93	Liquid	100	5.0	High	●			●	Applicability across a broad range of pigments giving good colour strength

Tested in DPGA, TMP(EO)TA and Ebecryl 452

Phosphate esters from Lankem find application in a wide range of industrial applications including the formulation and manufacture of products for coating applications, including:

Emulsion Polymerisation

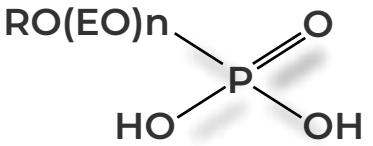
Pigment Dispersions

Wetting Agents

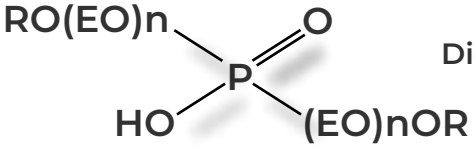
Adhesion Promotors

The chemistry of phosphate ester provides the capability to modify their characteristics by optimisation of structure-property relationships. Manipulation of the base hydrophobe structure and ethylene/alkylene oxide content, in combination with the monoester to diester ratio, provides a broad range of surface active properties that can be optimised for specific applications.

Lankem has great expertise in optimising the structures of phosphate ester to give exceptional performance in a all applications and has developed a range of products specifically targeted at emulsion polymerisation and coating applications.



Monoester



Diester

R = Alkyl (C8 – C18) or Aryl
n = 0 to 20 (typically)

Key Features

- Emulsification
- Dispersion
- Shear Stabilisation
- Improved Film Formation
- Wetting
- Corrosion Inhibition

Phosphate Esters for Coating Applications

Lanphos PS5, Lanphos PS6-25A

Ammonium and potassium salts of alkyl ether phosphates that are highly effective surfactants for use in the emulsion polymerisation process, being particularly suited to the manufacture of pure acrylic and styrene acrylic binders, where they can provide reduced water sensitivity and increased pigment acceptance.

Lanphos PS10

Potassium salt of an alkyl ether phosphate that is a highly effective surfactant for use in the emulsion polymerisation process, being particularly suited to the manufacture of pure acrylic and styrene acrylic binders, in combination with enhanced scrub resistance and increased colour performance. Lanphos PS10 provides enhanced shear stability, reducing the need for the addition of a stabilising surfactant.

Lanphos PE35, Lanphos PE36, Lanphos PE310

Alkyl ether phosphates in the free acid form, when neutralised these materials can be used as are highly effective surfactants for use in the emulsion polymerisation process, giving the same characteristics as the above salts. Being in the free acid form allows the formation of a range of salts, including alkaline metals salts and amines salts. These salts can be effective in the preparation of pigment dispersions; they can be used with a wide range of organic pigments but are particularly suited for use with inorganic pigments either alone or in combination with polymeric dispersants.

Product Name	Appearance	Activity %	Specific Gravity	Viscosity* cP	Description
Lanphos PE35	Liquid	100	1.05	943	C13 + 5EO phosphate ester- free acid form
Lanphos PS5	Liquid	25	1.05	803	C13 + 5EO phosphate ester potassium salt
Lanphos PE36	Liquid	100	1.05	221	C13 + 6EO phosphate ester - free acid form
Lanphos PS6-25A	Liquid	25	1.03	555	C13 + 6EO phosphate ester ammonium salt
Lanphos PE310	Liquid	100	1.07	888	C13 + 10EO phosphate ester - free acid form
Lanphos PS10	Liquid	25	1.04	1010	C13 + 10EO phosphate ester potassium salt

* Viscosity of product as supplied and specific gravity measured at 25°C

Compatibility Agent for Pigmented Coatings

Lansperse UT57

Give your coating formulations a performance boost!

Lansperse UT57 helps to improve colour strength and reduce flocculation problems for pigment dispersions and paint formulations. Product can be added during processing or as a post-additive, and also benefits from being classed as readily biodegradable.

Pre-treatment

Post-treatment

Universal Tinters

Key Features

- Ease of use can be added to the millbase or as a post additive
- Improves compatibility
- Reduces rub-out (flocculation)
- Improves colour acceptance and hence stronger tints
- Suitable for both inorganic and organic pigments
- Bio-based
- Hazard label free

Lansperse BIO691

Lansperse BIO691 is unique as it is soluble in both aqueous systems and a wide range of solvents. As well as being a very effective dispersing agent, it is also bio-based.

Universal tinters, also known as universal colourants, are essential components in the paint and coatings industry.

Universal tinters are used to create a wide range of colours by mixing them with base paints or coatings. They come in various colours (such as red, blue, yellow, black, etc.) and can be combined to achieve custom shades.

When you need a specific shade that isn't available off-the-shelf, universal tinters allow you to fine-tune the colour by adding precise amounts of the desired colourant.

They work with different types of paint bases, including water-based, solvent-based, and oil-based paints. This versatility makes them suitable for various applications. As Lansperse BIO691 is soluble in a wide range of systems it can be used in both solvent and aqueous formulations.

Humectant for Aqueous Coatings

Kemectant EB3

A humectant that can be used to protect the in-can drying of paint and coating formulations by maintaining a moist air gap at the top of the tin. Kemectant EB3 also exhibits properties to help improve the freeze-thaw stability of aqueous pigment dispersions and coatings.

Open time is the time available in which the coating applied can be worked into a previously coated area. It is a key performance property for coatings, particularly for brush applications. Humectants slow the open times for better paint drying and minimal brush lines.

Key Features

- Prevents in-can drying
- Increases open time
- Improves freeze-thaw stability
- No VOC

Defoamers

Dfoam AX1

A mineral oil based defoamer for use in a wide of aqueous environments.

Dfoam AR2

Has the same composition as Dfoam AX1 but contains additional hydrophobic particles to provide an additional defoaming boost.

Both antifoam and defoamer are the same in many respects but the term antifoam suggests the prevention of the generation of foam and a defoamer operates by causing the collapse of the foam that has already been generated.

Both Dfoam AX1 and Dfoam AR2 are silicone-free antifoams that effectively prevent air entrainment, froth and foam. Antifoams coalesce minute air bubbles in the liquid, allowing them to rise easily to the surface, and promotes rapid bubble film rupture on the surface of the liquid. Foaming is not only suppressed during manufacture, but it also remains suppressed during stirring and application by the consumer. Foam control is easily and effectively achieved with our antifoam products, ensuring an economical method of foam control.

The recommended dosage level is up to 0.5%.

Foaming before addition of Dfoam

Foam control during aeration after Dfoam added

Wetting Agents for Aqueous Systems

Moving away from fluorosurfactants?

Many formulators are looking for alternatives to fluorosurfactants. Our substrate wetters offer a good alternative and are environmentally acceptable.

Lanwet JH1

Lanwet JH1 is an extremely effective wetting agent for a wide range of different substrates.

Lansperse BIO691 and Lansperse BIO868

Our new bio-based substrate wetting agents have two hydrophobes helping them to adhere to difficult substrates.

	Acetal	Acrylic Sheet	Aluminium	Coated PVC	Copper	GV Steel
Lanwet JH1	●	●	●	●	●	●
Lansperse BIO691	●	●	●			

	Glass	Lino	Nylon 6	Nylon 66	PE1000	PET G
Lanwet JH1	●	●	●	●	●	●
Lansperse BIO691				●		●
Lansperse BIO868	●					

	Polycarbonate	Polypropylene	PTFE	Rigid PVC	Stainless steel	Ceramic Tiles
Lanwet JH1		●	●	●	●	●
Lansperse BIO691	●	●				●

Product Name	Appearance	Activity %	Pour Point °C	Viscosity at 25°C cP	Surface Tension at 0.1% Aqueous mN/m	Key Features
Lanwet JH1	Liquid	70	< 5	284	2.0	Anionic functionality
Lansperse BIO691	Liquid	100	10.0	468	35.4	Nonionic, bio-based
Lansperse BIO868	Liquid	75	-8.0	539	39.2	Nonionic, bio-based

Coatings Product Portfolio

Product Name	Appearance	Activity %	Application Summary
Bio-based Dispersing Agents			
Lansperse BIO691	Liquid	100	Soybean bio-based dipsersing agent, suitable for universal tinter systems
Lansperse BIO801	Liquid	80	Soybean bio-based dispersing agent suitable for aqueous systems
Lansperse BIO868	Liquid	75	Soybean bio-based dispersing agent suitable for aqueous systems
Lansperse SUN10	Liquid	100	Sunflower bio-based dipsersing agent, suitable for universal tinter systems
Lansperse SUN20	Liquid	80	Sunflower bio-based dispersing agent suitable for aqueous systems
Lansperse SUN30	Liquid	75	Sunflower bio-based dispersing agent suitable for aqueous systems
Conventional Dispersing Agents			
Lansperse LT87	Liquid	80	41% bio-based with boosted hydrophilic nature
Lansperse DS200W	Liquid	80	Good performance over a range of pigments, nonionic
Lansperse DS80	Liquid	80	Co-dispersant with Lansperse DS200W, anionic
Lansperse SPA	Liquid	40	Designed for good dispersion of inorganics and extenders
Lansperse DS145	Solid	100	Solid dispersant, particularly effective for zinc oxide dispersions
Lansperse SL18-60	Liquid	55	Suitable for a wide range of pigments, supplied in n-butyl acetate
Lansperse SL58	Liquid	100	High actives gives usage with different solvents, good level of performance
Lansperse SL66	Liquid	100	Suitable for a broad range of pigments and gives high gloss dispersions
Lansperse UV74	Liquid	100	Good quality dispersions in UV monomer, giving excellent gloss when cured
Lansperse UV93	Liquid	100	Applicability across a broad range of pigments giving good colour strength
Phosphate Ester Surfactants			
Lanphos PE35	Liquid	100	C13 + 5EO phosphate ester- free acid form
Lanphos PS5	Liquid	25	C13 + 5EO phosphate ester potassium salt
Lanphos PE36	Liquid	100	C13 + 6EO phosphate ester - free acid form
Lanphos PS6-25A	Liquid	25	C13 + 6EO phosphate ester ammonium salt
Lanphos PE310	Liquid	100	C13 + 10EO phosphate ester - free acid form
Lanphos PS10	Liquid	25	C13 + 10EO phosphate ester potassium salt
Other Coatings Additives			
Lansperse UT57	Liquid	92	Improves compatbility and colour performance of coating formulations
Lanwet JH1	Liquid	70	Powerful wetting agent with anionic functionality
Kemectant EB3	Liquid	80	Prevents in-can drying, increases open time and improves freeze-thaw stability
Dfoam AX1	Liquid	100	Mineral oil based defoamer
Dfoam AR2	Liquid	100	Mineral oil defoamer with additional hydrophobicity

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