



## Worlée **Film Formers**

Discover our WorléeMicromers product range for the use in cosmetic formulations.

## Product overview Film Formers

Acrylates, Polyester and natural film former

	<b>WorléeMicromer Eco 100/10-L1</b>	<b>WorléeMicromer Eco 200/10</b>	<b>WorléeMicromer Eco 300/10-L1</b>	<b>WorléeMicromer Eco Resist</b>	<b>WorléeMicromer C50/25</b>	<b>WorléeMicromer C61/42</b>
<b>Drying Time</b>	+++	no physical drying film, high viscous	++	+++	+	++
<b>INCI</b>	Acrylic Acid/Isobutyl Acrylate/Isobornyl Acrylate Copolymer	Hydrogenated Dilinoleyl Hydrogenated Dimer Dilinoleate/Stearate	Potassium Shellac	Acrylic Acid/Isobutyl Acrylate/Isobornyl Acrylate Copolymer	Ammonium Acrylates Copolymer	Ammonium Acrylates Copolymer
<b>ISO 16128</b>	NOC (incl. water) 80.0%	NOI 0.99	NOC (incl. water) 99.8%	NOC (incl. water) 87.7%	--	--
<b>Adhesion on the skin</b>	++	++	++	+++	++	+++
<b>Total solids [%]</b>	49 - 51	100	29 - 31	23 - 27	25	42
<b>Water resistance</b>	+++	+++	+++	+++	+	++
<b>Glass transition temperature [°C]</b>	14	--	--	28	34	-15
<b>pH value (Product)</b>	1.7 - 2.5	--	6.8 - 7.8	6.5 - 7.1	8.0 - 9.0	7.5 - 8.5
<b>Dry film characteristics</b>	flexible & elastic	--	hard	slightly flexible & elastic	hard	flexible, very elastic & stretchable
<b>Characteristics</b>	Natural Origin, EO/Sulfate free, water resistant, flexible	Natural Origin, water resistant, pigment dispersion	Natural Origin, water resistant, rub resistance	Natural Origin, EO/Sulfate free, water resistant, rub resistant	Transparent liquid, wetting & stabilization of pigments	Water resistant, smooth & very flexible, high adhesion
<b>pH value (Application)</b>	1.0 - 10.0	4.0 - 9.0	6.8 - 7.8	6.5 - 10.0	6.5 -10.0	6.5 -10.0
<b>Application area</b>	Mascara, Liquid Eyeliner, Lip Tint, Foundation	Lip Stick, Lip Gloss, Foundation, SkinCare	EyeLiner, Mascara, EyeBrow, Hairstyling, Foundation, Eyebrow Mascara	Mascara, Liquid Eyeliner, Lip Tint, Foundation	Mascara, Liquid Eyeliner	Mascara, Liquid Eyeliner, Lip Tint, Foundation
<b>Use level</b>	up to 50%	up to 50%	up to 50%	up to 50%	up to 50%	up to 50%

+++ very good/fast ++ good + rinseable/medium/hard



## WorléeMicromer / WorléeMicromer Eco

WorléeMicromers are a line of film formers used in cosmetic formulations. The WorléeMicromer Eco range is made from at least 50% renewable raw materials, making them more eco-friendly. Both WorléeMicromer and WorléeMicromer Eco have different chemical compositions, such as acrylates, polyesters, or natural polymers, which leads to variations in their film-forming properties such as adhesion, water resistance, and stability of the formulations. Our film formers can also provide a protective barrier for the skin or nails, helping to prevent damage from environmental factors. This allows formulators to choose the best option for their specific product requirements. We also offer customized products to help customers find a personalized solution for their specific needs.

Overall, film formers are an essential component, helping to enhance the performance and consumer experience of formulations.



Cold and hot processable



Shear resistant



Not in scope of commission regulation  
(EU) 2023/2055 for microplastics



Non-GMO



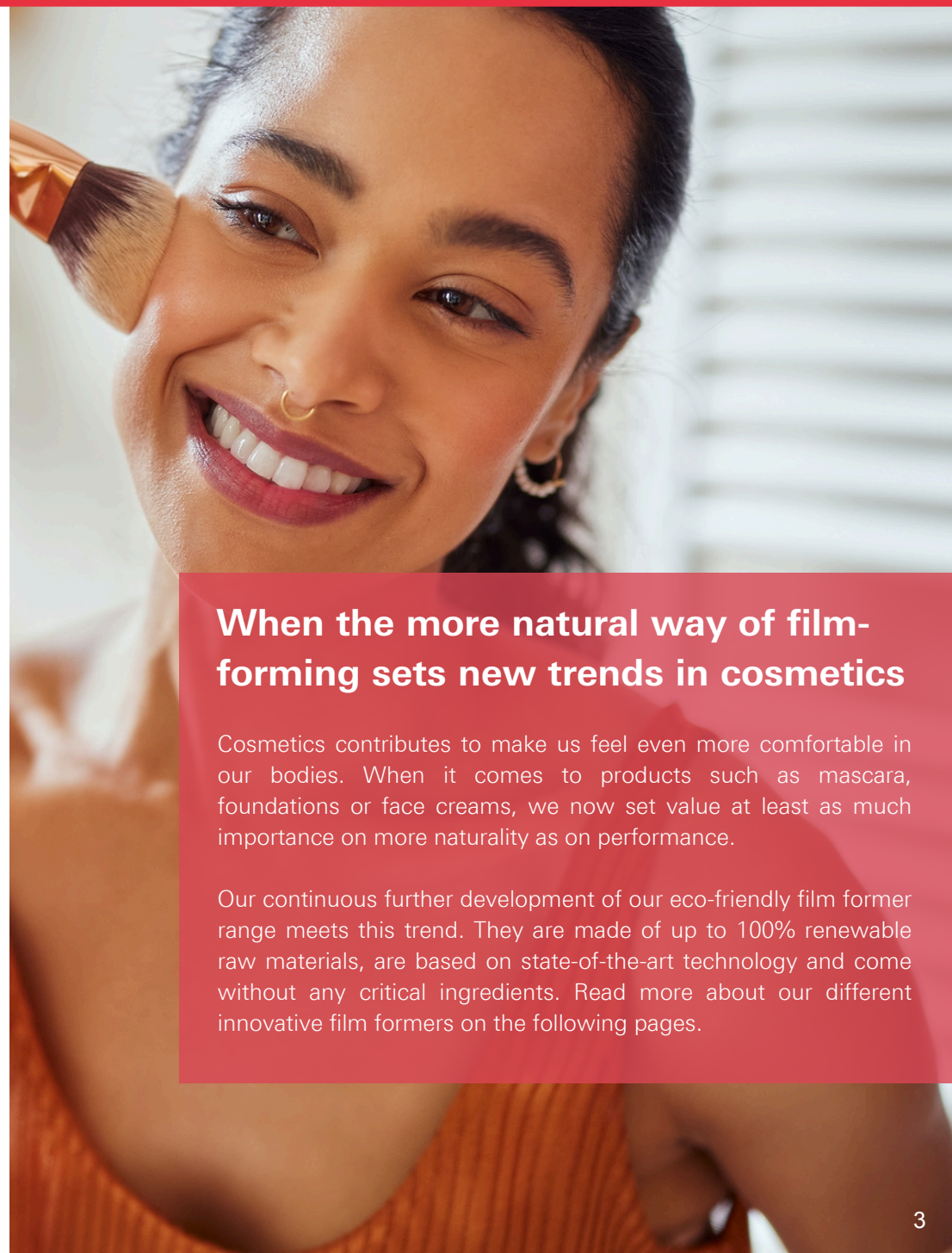
Cruelty free



Vegan\*



China IECIC listed\*\*



### When the more natural way of film-forming sets new trends in cosmetics

Cosmetics contributes to make us feel even more comfortable in our bodies. When it comes to products such as mascara, foundations or face creams, we now set value at least as much importance on more naturality as on performance.

Our continuous further development of our eco-friendly film former range meets this trend. They are made of up to 100% renewable raw materials, are based on state-of-the-art technology and come without any critical ingredients. Read more about our different innovative film formers on the following pages.

## WorléeMicromer Eco 100/10-L1

INCI: Acrylic Acid/Isobutyl Acrylate/Isobornyl Acrylate Copolymer

WorléeMicromer Eco 100/10-L1 is our novel liquid acrylic film former consisting of natural, renewable raw materials with excellent durability and application properties. Its composition is based on state-of-the-art technology and comes without critical ingredients and therefore meets numerous Clean Beauty guidelines.

WorléeMicromer Eco 100/10-L1 does not contain a preservative due to the low pH value, as there is a low risk of microbial contamination during production and/or intended use according to ISO DIN EN ISO 29621:2011.



Vegan



GMO-free



Cruelty free

### Your benefits at a glance

- Suitable for solutions not containing EO and sulfate surfactants
- Increase of the natural origin content of your formulations
- Does not contain preservatives
- Meets a lot of Clean Beauty specifications
- Not in scope of commission regulation (EU) 2023/2055 for microplastics
- Fast drying and flexible long-lasting film former
- Water resistance and rub-off resistant
- Non-tacky and smooth feel
- Good film integrity
- Easy to incorporate as low viscous liquid
- Cold and hot processable

NOC  
80%

### Application possibilities



Skin Care



Color  
Cosmetics



Lip Color  
and Care





## WorléeMicromer Eco 200/10

INCI: Hydrogenated Dilinoleyl Hydrogenated Dimer Dilinoleate/Stearate

Looking for a natural choice for color cosmetics with the same performance properties? WorléeMicromer Eco 200/10 is an oil soluble, natural film former (NOI of 0.99) and dispersing agent based on rapeseed for color cosmetic e.g. foundations and lip applications. The gentle low-temperature production is perfectly suited as a sustainable manufacturing process. In order to comply with the clean label trend, GMO or animal ingredients were deliberately avoided in the production process.



Vegan



Non-GMO



Palmoil free

## Your benefits at a glance

- 99% plant-based raw material (rapeseed)
- Produced by an eco-efficient process (lower temperature and no organic entrainer required)
- Compatible with commonly used cosmetic ingredients, soluble in common emollients and natural oils
- Excellent choice for pigment dispersions (Iron Oxide) used in color cosmetics - increases the color intensity and an more even distribution
- Improves adhesion and creates an even application
- Supports the desired viscosity
- Refines the droplet distribution and improves the stability of a formulation



Lip Color  
and Care



Color  
Cosmetics

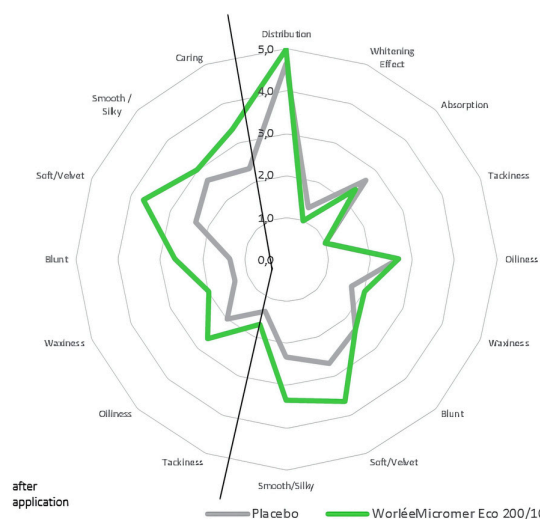


Skin Care

## Properties of WorléeMicromer Eco 200/10

- Light yellow liquid
- Tasteless & Odorless
- Good dispersing properties for inorganic pigments
- Adds gloss at high application concentrations
- Controls adhesion
- Promotes the stability of emulsions
- Application concentration can be 5 - 50%
- No significant influence on viscosity in oil formulations in concentrations up to 5% and should therefore be easy to use in a pump spray.

NOI  
0.99



## Sensory profile

- Superior sensory vs. placebo
- Improves spreadability
- Reduces stickiness
- Does not affect oiliness
- Soft and silky skin feel
- Nourishing effect on skin
- Typical sensory of dimethicone

## WorléeMicromer Eco 300/10-L1

INCI: Potassium Shellac

WorléeMicromer Eco 300/10-L1 is a very fast drying, natural film former based on shellac. Its high water resistance and drying speed make it perfect for decorative cosmetic formulations such as mascara and eyeliner but also for hair care products. Long hold, intense colour and time saving in the morning routine are guaranteed.

- Cold processing, simple addition possible within a few seconds
- Saving of process time and equipment
- Unproblematic storage at temperatures up to 25°C
- The employees no longer have to work with strong alkaline bases!



NATRUE certified



COSMOS-Ecocert compliant



Non-GMO



Cruelty free

### Your benefits at a glance

- Not in scope of commission regulation (EU) 2023/2055 for microplastics
- Physically drying film former
- Improves water resistance
- Intensifies colour
- Water soluble
- Increases drying speed
- Saves process time and equipment

## Shellac

- Obtained from the secretion of the female lac insect
- The shellac resin layer is harvested
- Physical manufacturing process to refine the shellac
- Polymer of natural/biological origin

### Application Possibilities



Hair Care



Color Cosmetics

NOC  
98.8%

#### Tip:

The brittle film of WorléeMicromer Eco 300/10-L1, which is typical for shellac, can be individually adjusted in its flexibility by adding smoothing agents.

With Propylene Glycol



With Triethyl Citrate



Without Smoothing Agent





## WorléeMicromer Eco Resist

INCI: Acrylic Acid/Isobutyl Acrylate/Isobornyl Acrylate Copolymer

Our water-soluble acrylic film former WorléeMicromer Eco Resist is made from natural, renewable raw materials. The product sets new standards with outstanding rub and water resistance. The composition is based on state-of-the-art technology and does not contain any critical ingredients and therefore meets numerous Clean Beauty specifications.



Vegan



GMO-free



Cruelty free

## Your benefits at a glance

- Increase of the natural origin content of your formulations
- Suitable for solutions not containing EO and sulfate surfactants
- Not in scope of Commission regulation (EU) 2023/2055 for microplastics
- Fast drying and ultra long-lasting film former
- Extremely rub-off and water-resistant
- Non-tacky and smooth feel
- Good film integrity



After 30 min  
drying



After 2 min running  
lukewarm water



100x rubbing with  
finger (back & forth)

## Application possibilities



Hair Care



Color  
Cosmetics



Skin Care

NOC  
**97.7%**

## Processing instructions

- Easy to incorporate as low viscous liquid
- Water soluble
- Cold and hot processable
- For formulations with a pH value of >6.5

## WorléeMicromer C50/25

INCI: Ammonium Acrylates Copolymer

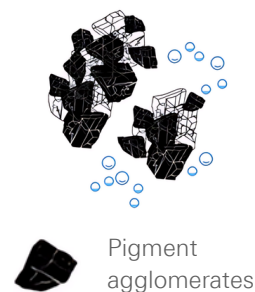
WorléeMicromer C50/25 is a transparent aqueous solution and the polymer has pigment-affinity groups, whereby the polymer attaches itself to the surface of pigments and thereby facilitates the dispersion and stabilization of pigments. This allows the pigments to be more easily deagglomerated and smaller particle size can be achieved. The color strength of the formulation is also improved.

### Your benefits at a glance

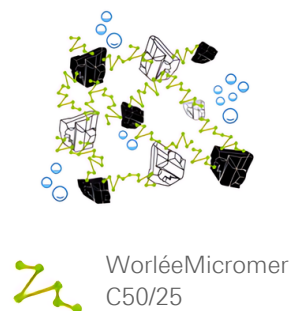
- Hard film
- Transparent liquid
- Dispersing and grinding of pigments

The WorléeMicromers can also be combined to optimize the film-forming properties of a formulation. Thus, by adding WorléeMicromer C50/25 to the other WorléeMicromers, the pigments can be better dispersed and the color intensity increased. In addition, the gloss of the film is increased. Is suitable for alcoholic solutions or sprays.

#### No Stabilization/Wetting



#### Steric Stabilization/Wetting



## WorléeMicromer C61/42

INCI: Ammonium Acrylates Copolymer

WorléeMicromer C61/42 is a very flexible and elastic film former ideal for vegan cosmetics, enhancing gloss and shine in decorative products. This film former dries extremely quickly, creating a soft and silky film on the skin. It is the ideal choice for use in foundations or mascaras and provides excellent protection against colour transfer and smearing.

### Your benefits at a glance

- Flexible film
- Very elastic and stretchable
- Fast drying film former
- Water resistance
- Very good film integrity



## The Film-Forming Process

### Step 1

Polymer dispersion or solution in water

The polymers are either dissolved in water without the addition of emulsifiers or dispersed and stabilised in water with emulsifiers. The polymers dispersed in water have a white and cloudy appearance in the delivery form. Following the film forming process, all polymers produce a clear, transparent film that exhibits different properties in terms of flexibility, water resistance, abrasion resistance or adhesion.

### Step 2

By evaporation of water, the polymer is concentrated. The repulsive force of the interface between the particles will be overcome

**Glass Transition Temperature (T<sub>g</sub>):** Without going too deeply into theory, the property of the glass transition temperature can be as follows: polymers with a low T<sub>g</sub> are soft and flexible, whereas polymers with a high T<sub>g</sub> are hard and brittle.

But this is only a point of reference, since plasticizers, oils and other ingredients can be used to adjust the properties of hard and brittle polymers in a formulation and to make them also soft and flexible. Therefore, if the formulation forms a film that is too hard and brittle, either a plasticizer can be used or a different polymer with a lower T<sub>g</sub> can be selected. However if the film is too soft and sticky, you can choose a polymer with a higher T<sub>g</sub>.



### Step 3

At the end of the film forming procedure, the particles flow into each other and build a uniform closed film.

**Minimum Film-Forming Temperature (MFFT):** MFFT is the lowest temperature at which a polymer or solid portion of an aqueous polymer dispersion will coalesce to form a continuous polymer film. At temperatures above MFFT of the polymer, the film is formed. At temperatures below its MFFT, the polymer cannot coalesce to form a continuous film and drying will result in a white, powdery, cracked film.

#### T > MFFT [Polymer] in °C


- polymer film is closed
- high adhesion
- water resistance
- enhance gloss
- mechanical stable polymer film

#### T < MFFT [Polymer] in °C


- polymer film starts to break
- no adhesion
- no water resistance
- loss of gloss




## WorléeMicromer Eco 100/10-L1 & Eco Resist

 Novel liquid acrylic film former with high natural content

## WorléeMicromer Eco 200/10

 Low temperatur polycondensation

 Palmoil free

## The values that guide our actions

We are committed to forward-looking and prudent environmental protection and to preventive and comprehensive occupational health and safety as a corporate goal.

We are convinced, that the natural goods of water, air, and soil must be treated carefully as a part of our responsible business practices. In this way, the ecosystem in which we live can be preserved as the basis of life for future generations as well. This particularly applies to the economical and efficient use of energy and natural resources.

We stand by our responsibility to provide safe and secure production, storage, and transport. We ensure that our products are handled conscientiously along the entire value-added chain.



## Let's work together

Do you have ideas for product developments? Feel free to contact us.  
We would be pleased about a cooperation or a joint project with you.

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