



ORBISCOPE

Powered by Polyscope Polymers



XICARE™ 1305

A NEW GENERATION OF AQUEOUS COLOR COSMETICS

XICARE™ 1305

A NEW GENERATION OF AQUEOUS COLOR COSMETICS

BENEFITS

- Water-based formulation
- Silicone-free formulation
- Excellent overall stability of the foundation
- Better pigment dispersibility
- Better color development
- Use of untreated pigments
- Easier, faster and more versatile production

MARKETS / APPLICATIONS

- Pigment dispersant in cosmetics applications
- Pigment dispersant in water-based liquid foundation



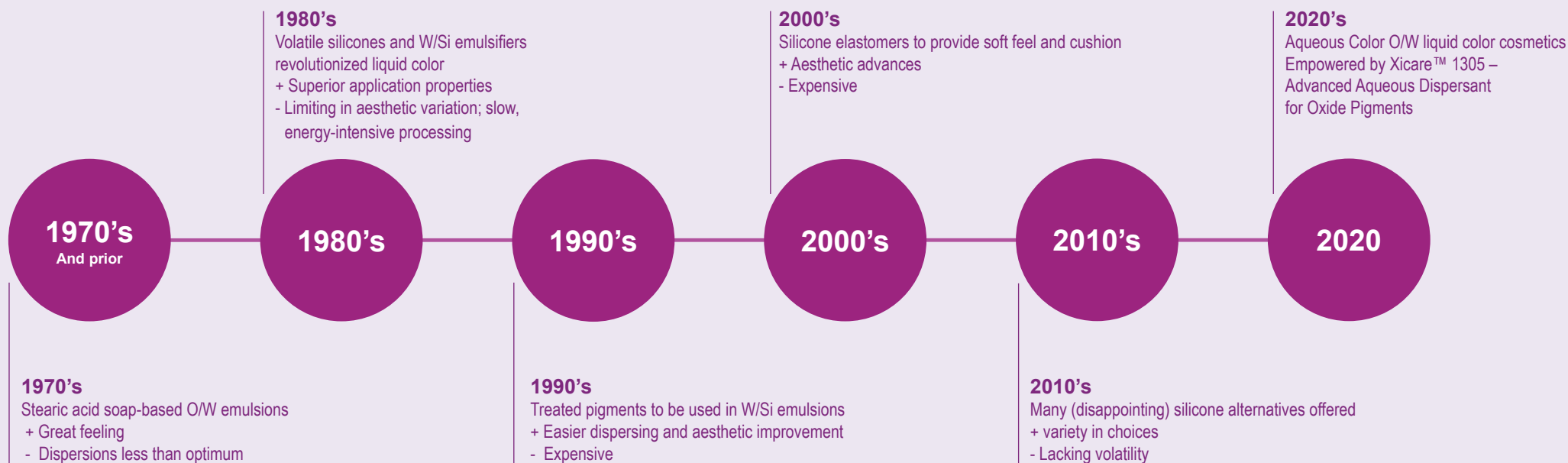
Empowered by XICARE™ 1305 - Advanced aqueous dispersant for metal oxide pigments

WHAT IS AQUEOUS COLOR

Liquid color cosmetics are currently based on water-in-silicone or water-in-oil based formulations.

Customers have concerns over the bio-persistence of silicones. In all other types of skin care products, oil-in-water is the preferred platform because of their exceptional aesthetics and feel. Xicare™ 1305 allows the optimum dispersion of various untreated (iron, titanium and zinc) oxide pigments in water, which makes aqueous color cosmetics possible. This eliminates the need for silicones or hydrocarbons, so switching to oil in water allows formulators to get a better connection with customers. Plus, Xicare 1305 dispersant can be used with untreated oxide pigments creating cost savings.

TIMELINE OF LIQUID COLOR COSMETICS

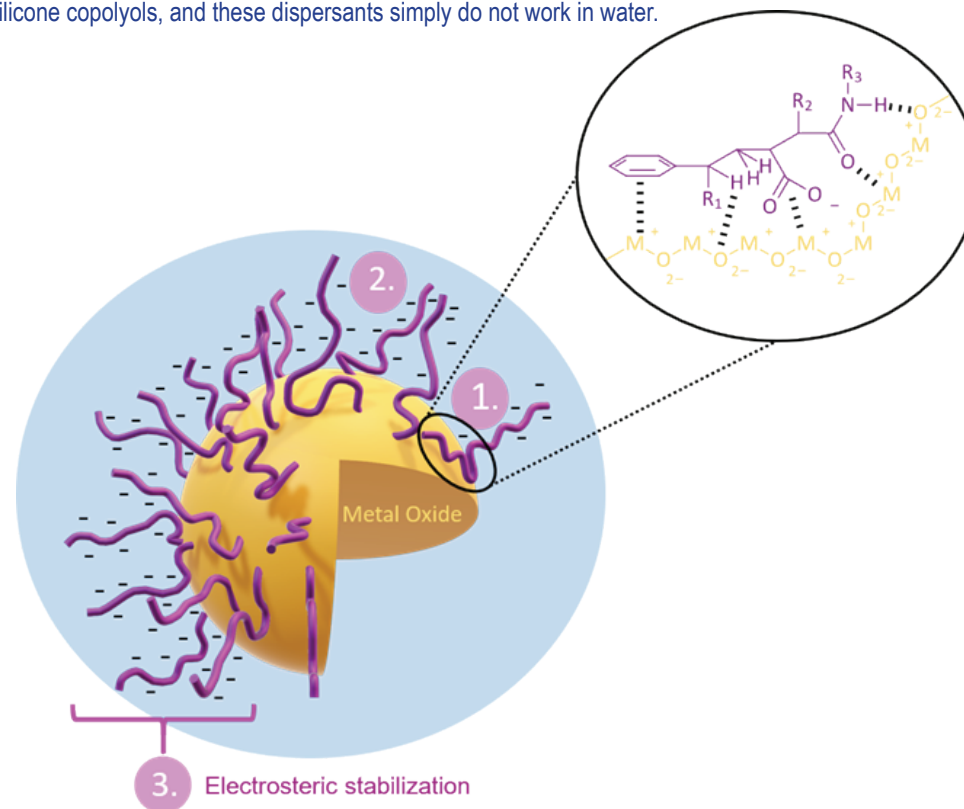
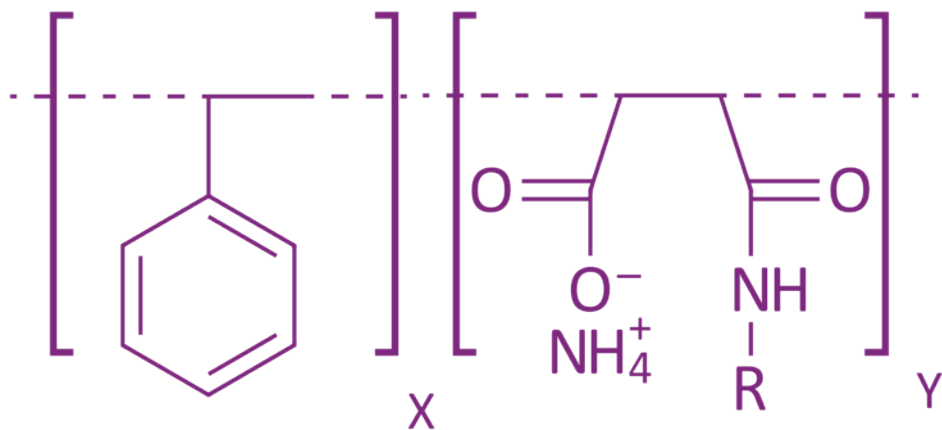


WHY XICARE™ 1305? - ADVANCED AQUEOUS DISPERSANT

Normally, metal oxide pigments are very difficult to disperse in water. However, as shown in the figure below, the unique structure of Xicare™ 1305 anchors strongly to the metal oxide surface via the phenyl, hydrogen, carboxylate and amide **1**. This anchoring is combined with the water soluble negatively charged carboxylates, which are neutralized, providing a steric barrier around the pigment particles **2**. The result is an electrosteric dispersion **3**, that provides long term stability against agglomeration and flocculation.

Metal oxide pigment dispersions in either silicone and oil based cosmetics use polyhydroxystearic acid and silicone copolyols, and these dispersants simply do not work in water.

INCI (proposed)
Styrene/Maleamide Copolymer



AQUEOUS COLOR EMPOWERED BY XICARE™ 1305

Aqueous color empowered by Xicare 1305™ is characterized by a wide formulating latitude, making it easy to tune coverage and color very exactly. The application of the water-based formulations feels very light due to their external aqueous phase while retaining excellent spreading, resulting from the oil in water polymer microgel structure. The result is a smooth, dry and weightless after-feel on the skin.

Due to our high standards in quality, we can support you in creating dispersions of pigments that remain stable in the bottle while providing magnificent consistent color on the skin. In addition, oil in water dispersions are much easier to prepare as this can even be done at room temperature with Xicare™ 1305. This allows also you the freedom to utilize thermally sensitive ingredients.

While Xicare™ 1305 is not biobased, it enables formulations to have >94% biobased content, without the normal compromises. By exchanging most of the formulation with water, instead of (biobased) oils, Xicare™ 1305 contributes to rational sustainability of the final formulation.

Xicare™ 1305 is a select synthetic that makes natural based formulations nicer.

Some examples of formulations made with Xicare™ 1305 are shown in the appendix:

- Tinted moisturizers
- Liquid blushes
- Liquid foundations
- Primers
- Highlighters

FORMULATING AND PROCESSING GUIDANCE FOR AQUEOUS COLOR

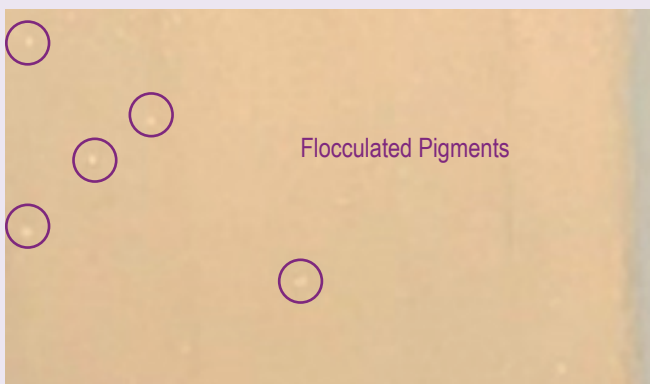
- Use 10% Xicare 1305 by weight of pigment
Example: 10% oxide pigment / 1% Xicare 1305
- Place wetting, suspending, and dispersing agents in water first
Then add pigments with a dispersion (Cowles) blade (May not require milling)
- Use enough humectant to modulate water evaporation
10% ZEMEA® Propanediol suggested (Remember, water is more volatile than volatile silicone)
- Use standard procedure for O/W emulsions (but now with pigments already in water)
Steric stabilized
Electrostatic stabilized
Polymer microgel stabilized
Liquid crystalline lamellar gel network stabilized
Pickering



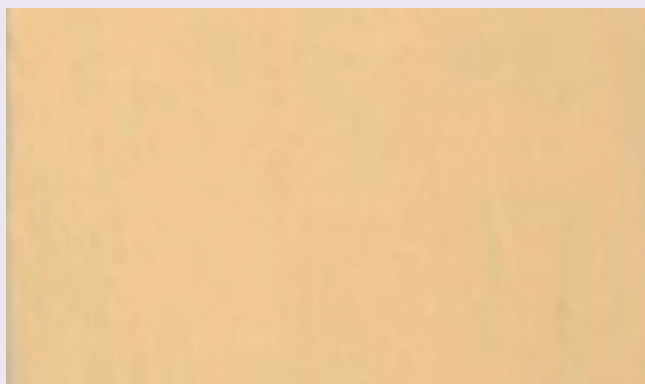
TEST RESULTS

Pigment Dispersions in Liquid Highlighter Formulation, with and without Xicare™ 1305

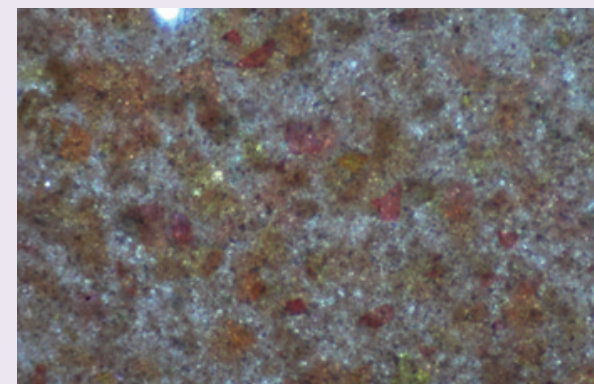
HEGMAN GAUGE TEST
Without Xicare™ 1305



With Xicare™ 1305



OPTIMAL MICROSCOPY
With Xicare™ 1305



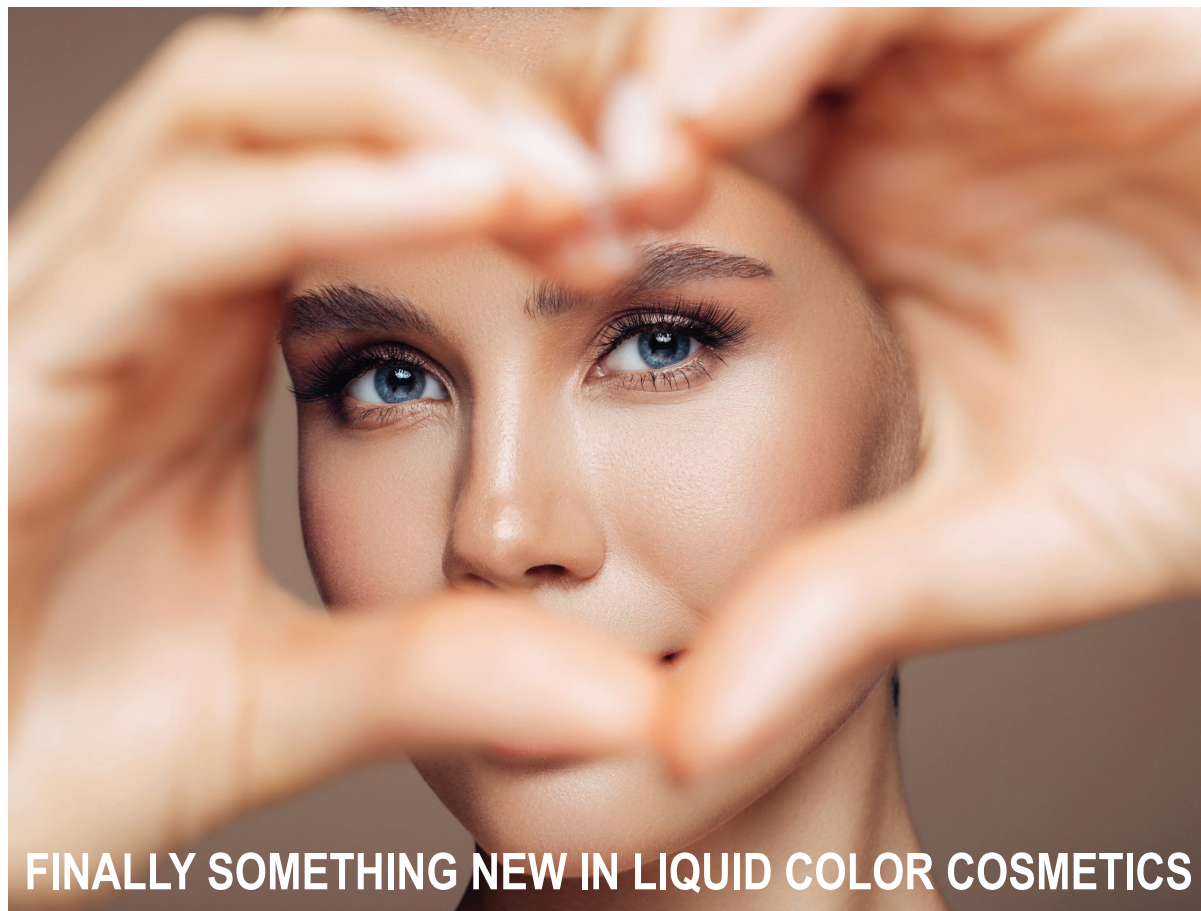
SUMMARY

A new generation of aqueous color cosmetics are empowered by the introduction of Xicare™ 1305 dispersant! Untreated metal oxide pigments can be easily dispersed and formulated into many types of oil-in-water based aqueous color products.

In addition, oil in water dispersions are much easier to prepare as this can even be done at room temperature with Xicare™ 1305. This allows also you the freedom to utilize thermally sensitive ingredients. The application of the water-based formulations feels very light due to their external aqueous phase while retaining excellent spreading, resulting from the oil in water polymer microgel structure.

The result is a smooth, dry and weightless after-feel on the skin. While Xicare™ 1305 is not biobased, it enables formulations to have >94% biobased content, without the normal compromises. By exchanging most of the formulation with water, instead of (biobased) oils, Xicare™ 1305 contributes to rational sustainability of the final formulation. Xicare™ 1305 is a select synthetic that makes natural based formulations nicer.

* 50 subject Human Repeat Insult Patch Test - No adverse reactions even when tested neat.



FINALLY SOMETHING NEW IN LIQUID COLOR COSMETICS

APPENDIX – FORMULATIONS AND PROCESSES

LIQUID HIGHLIGHTER ACT 21609

Phase	Weight %	Tradename	Function	Supplier
A	61,4	Water	Solvent	
B	1	XICARE™ 1305	Dispersant	Orbisphere
B	1	Span 20	Emulsifier	Croda
C	2,5	Impact silver satin	Color	Sandream Impact
C	0,5	TC Silk satin	Color	Sandream Impact
C	2,75	Moonshine Astra Effect Silver White Super Shimmer	Color	Croda
C	0,5	Yellow Iron Oxides	Color	Color Techniques
C	0,25	Red Iron Oxides	Color	Color Techniques
D	0,3	Keltrol CG	Polymer	CP Kelco
D	5	ZEMEA®	Humectant	DuPont Tate & Lyle
E	3	Arlacel LC	Emulsifier	Croda
E	1	Cetearyl alcohol	Emollient	Noble Roots
F	20	LowFeel N5	Emollient	Inolex
G	0,8	Sensiva PA30	Preservative	Schulke

PROCESS

Premix B until uniform
 Mix B into A until uniform
 Add C to A/B with propeller mixing
 Heat A/B/C to 80° C while stirring
 Homogenize
 Premix D and add to A/B/C while maintaining heat
 Add E while maintaining heat until dissolved
 Remove from heat and continue stirring
 At 60° C add F
 When below 45° C, add G

Phase	Weight %	Tradename	Function	Supplier
A	54,95	Water	Solvent	
B	1	XICARE™ 1305	Dispersant	Orbisphere
B	10	ZEMEA®	Humectant	DuPont Tate & Lyle
B	4	Texturlux® stabil	Polymer	Tate & Lyle
B	1	Texturlux® resist	Film former	Tate & Lyle
B	0,5	Keltrol CG	Polymer	CP Kelco
B	1,15	Sensiva PA30	Preservative	Schulke
C	8	Titanium Dioxide	Color	Color Techniques
C	1	Yellow Iron Oxides	Color	Color Techniques
C	0,3	Red Iron Oxides	Color	Color Techniques
C	0,1	Black Iron Oxides	Color	Color Techniques
D	2	Poly Suga® Mulsal D6	Emulsifier	Colonial Chemical
D	2,5	Emosmart L1S	Emollient	Seppic
D	1	Cab-O-Sil MS	Salt	Cabot

PROCESS

Premix B, then add to A with dispersion blade
 Premix C, then add to AB mixture
 Mix the combination of C and AB for 30 minutes
 Slowly add D to ABC mixture
 Homogenize if necessary

APPENDIX – FORMULATIONS AND PROCESSES

PRIMER ACT 21798

Phase	Weight %	Tradename	Function	Supplier
A	57	Water	Solvent	
B	10	ZEMEA®	Humectant	DuPont Tate & Lyle
B	4	Texturlux® stabil	Polymer	Tate & Lyle
B	1	XICARE™ 1305	Dispersant	Orbiscope
B	1	Keltrol CG	Polymer	CP Kelco
B	1	Sensiva PA30	Preservative	Schulke
B	8	Titanium Dioxide	Color	Color Techniques
C	2	Poly Suga® Mulsa D6	Emulsifier	Colonial Chemical
C	15	Emosmart L1S	Emollient	Seppic
C	1	Cab-O-Sil MS	Salt	Cabot

PROCESS

Premix B, then add to A with dispersion blade
 Mix for about 30 minutes
 Slowly add C to A/B with dispersion blade until uniform.
 Homogenize if not glossy

LIQUID BLUSH ACT 21598

Phase	Weight %	Tradename	Function	Supplier
A	56,48	Water	Solvent	
B	1	XICARE™ 1305	Dispersant	Orbiscope
B	1	Span 20	Emulsifier	Croda
C	8	Titanium Dioxide	Color	Color Techniques
C	1,2	Yellow Iron Oxides	Color	Color Techniques
C	1,05	Red Iron Oxides	Color	Color Techniques
C	0,17	Black Iron Oxides	Color	Color Techniques
D	5	ZEMEA®	Humectant	DuPont Tate & Lyle
D	0,3	Keltrol CG	Polymer	CP Kelco
E	3	Arlacel LC	Emulsifier	Croda
E	2	Cetearyl alcohol	Emollient	Noble Roots
F	20	Emogreen L15	Emollient	Seppic
G	0,8	Sensiva PA30	Preservative	Schulke

PROCESS

Premix B until uniform
 Mix B into A until uniform
 Slowly add C to A/B with propeller mixing
 Heat A/B/C to 80° C while stirring
 Homogenize
 Premix D and add to A/B/C while maintaining heat
 Add E while maintaining heat until dissolved
 Remove from heat and continue mixing
 At 60° C, add F
 When below 45° C, add G

APPENDIX – FORMULATIONS AND PROCESSES

LIQUID FOUNDATION ACT 21788

Phase	Weight %	Tradename	Function	Supplier
A	39,25	Water	Solvent	
B	5	ZEMEA®	Humectant	DuPont Tate & Lyle
B	1	XICARE™ 1305	Dispersant	Orbiscope
B	25	Solaveil XT-40W	Sunscreen	Croda
B	1	Sensiva PA30	Preservative	Schulke
C	0,2	Keltrol CG	Polymer	CP Kelco
C	5	ZEMEA®	Humectant	DuPont Tate & Lyle
D	2,5	Yellow Iron Oxides	Color	Color Techniques
D	0,4	Red Iron Oxides	Color	Color Techniques
D	0,15	Black Iron Oxides	Color	Color Techniques
D	1	Impact Velvet	Color	Sandream Impact
E	15	Myvacet 9-45K	Emollient	Essential Ingredients
E	2,5	Crodacol C70	Wax	Croda
E	1,5	Aqstar M1	Emulsifier	Aqdot
E	0,5	Esterlac Care+	Surfactant	Corbion

PROCESS

Heat and maintain A at 80° C

Premix B and C individually, then add C to B with propeller mixing

Premix D, then add to B/C with propeller mixing

Add B/C/D to A with propeller mixing

Homogenize if needed

Heat E to 70° C and stir until uniform

Add E to A/B/C/D with propeller mixing until uniform

Homogenize if needed



Solutions through innovation

At Orbiscope, our goal is to inspire and assist our customers to push their application's boundaries to the next level.

Orbiscope is powered by Polyscope Polymers, the global leader in the research, product development, production, and supply of styrene-maleic anhydride (SMA[®]) derivatives. Besides offering commercial and experimental (SMA[®]-based) (co)polymers for your research needs, we also aim to support your development efforts.

With our products and solutions, we address some of the world's biggest challenges, while creating environmental and societal value for all our stakeholders – customers, employees, shareholders, and society at large.

While SMA[®]-based copolymers are at the heart of our organization, we aren't limited to them. Indeed, the combined expertise of Orbiscope, Polyscope Polymers, and our extended network reaches much further.

For more information please contact our specialists or go to www.Orbiscope.com.