COATINGS

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OXIMULSION® REACT

Reactive surfactant for emulsion polymerization

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Reactive APE-free nonionic surfactant

for emulsion polymerization designed to be easily incorporated into the polymer backbone and effectively stabilize latex particles, overcoming application problems caused by conventional surfactants, such as poor water resistance.

BENEFITS

- High level of incorporation
- Reduce the content of free surfactant and its migration in latex films
- Improve water resistance of waterborne coatings
- Control particle size during the process
- Allow to generate latex with small particle size
- Improve mechanical and electrolytic stability

FEATURES

PRODUCT	APPEARANCE @25 °C	ACTIVE (wt%)	HLB	pH	CMC (g/L)	SURFACE TENSION, 0.1% @25 °C (mN/m)
OXIMULSION® REACT N1	Liquid	> 99.0%	15.0	7.0	0.06	34.0

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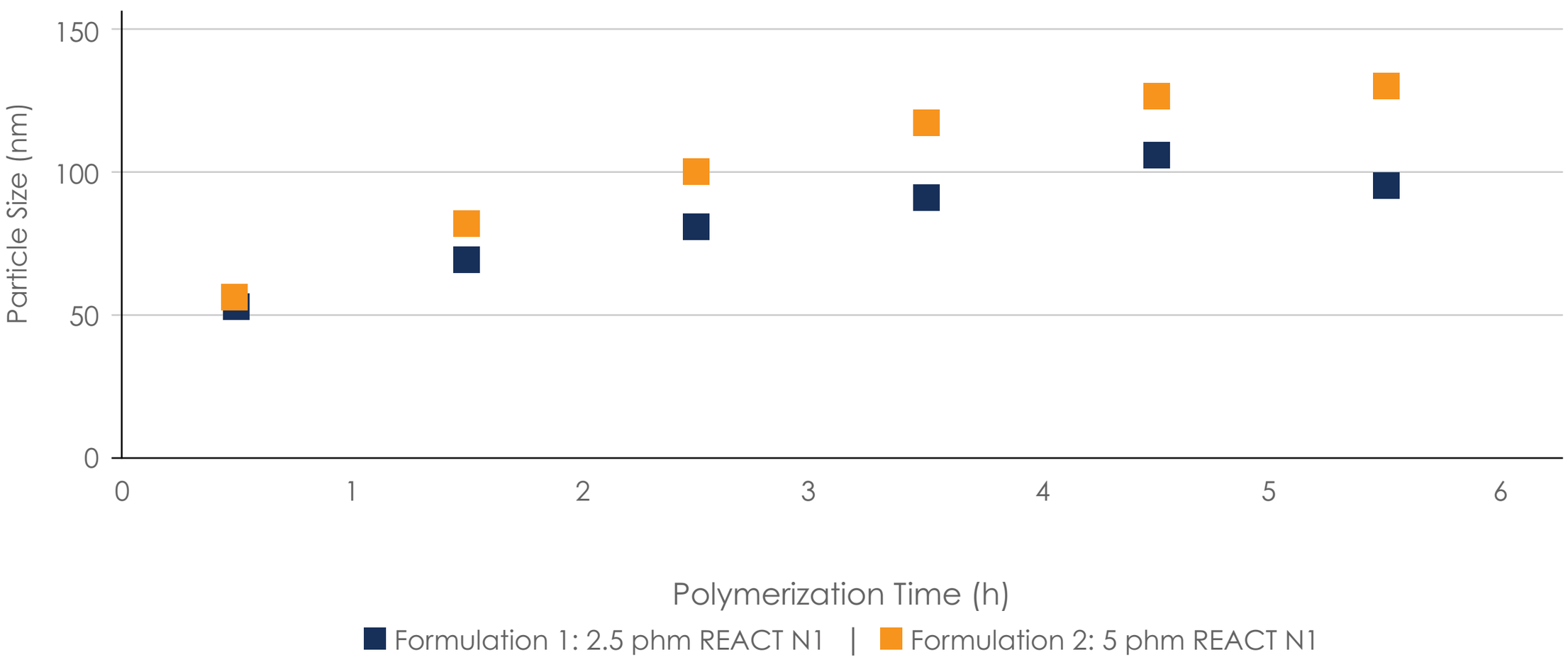
PERFORMANCE TESTS

Effect of reactive nonionic surfactant on particle size

PARTICLE SIZE DURING THE POLYMERIZATION



GENERAL PROPERTIES OF STYRENE-ACRYLIC LATEXES

PROPERTIES	FORMULATION 1 2.5 phm REACT N1	FORMULATION 2 5 phm REACT N1
pH	8.5	7.1
Solid Content (wt%)	50	47
Particle Size (nm)	128	107
Viscosity (cP, 25 °C)	280	75
Surface Tension (mN/m, 25 °C)	37	37

OXIMULSION® REACT N1 is effective for controlling latex particle size during the polymerization.

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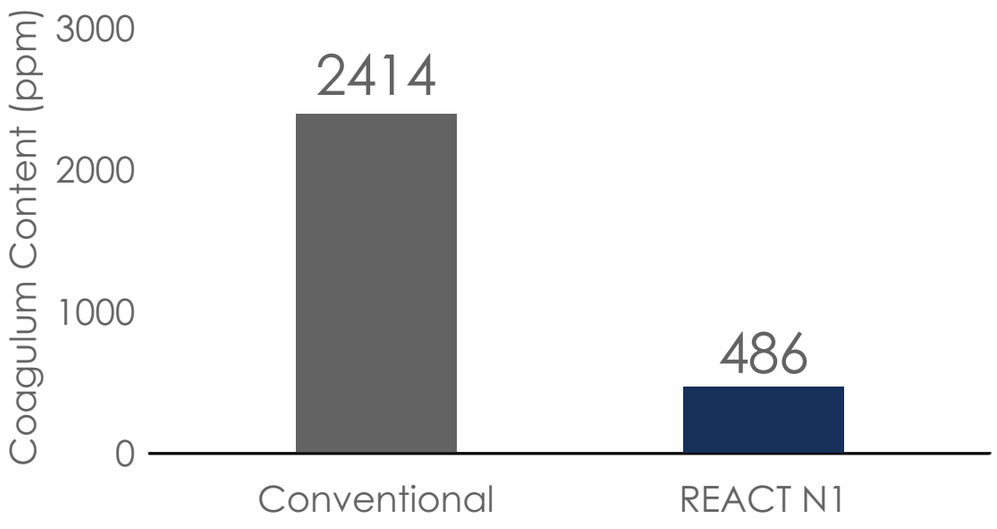
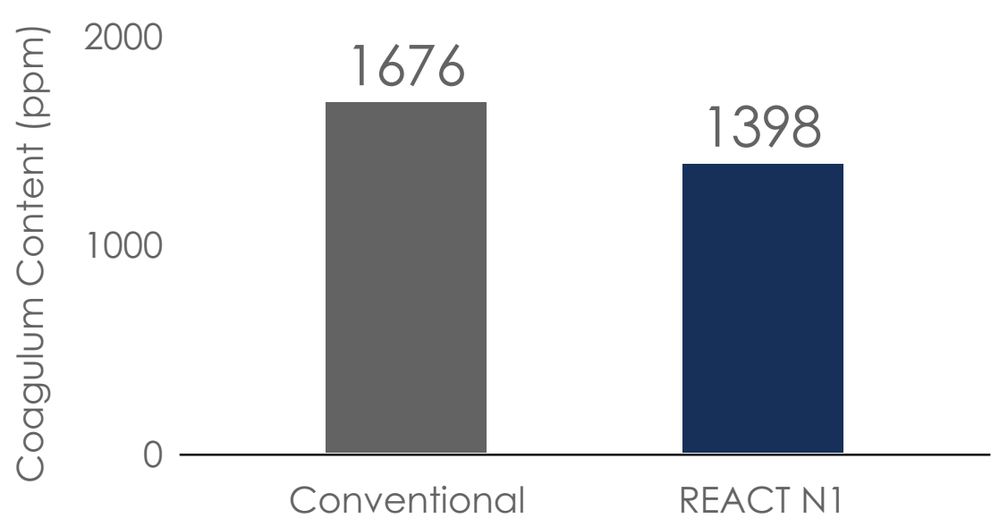
PERFORMANCE TESTS

Effect of reactive nonionic surfactant content on stability

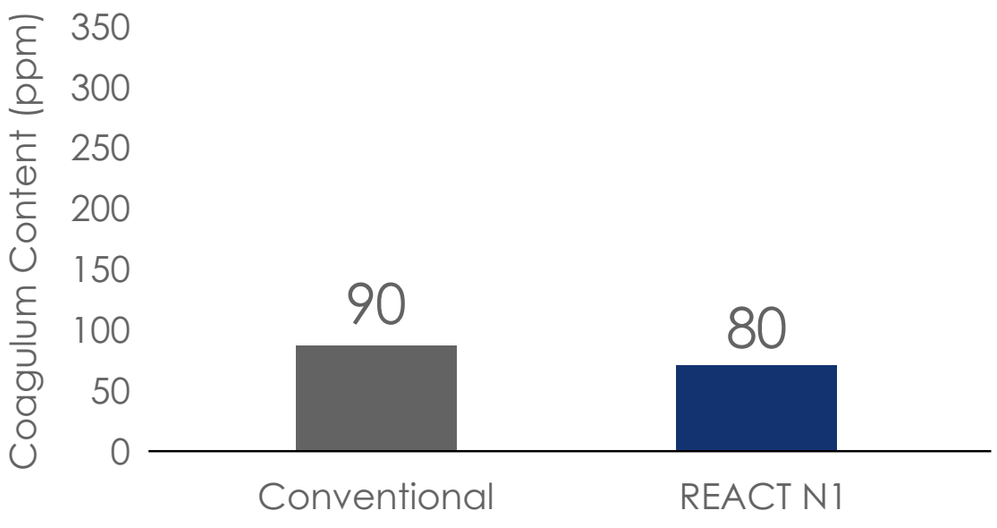
Latex polimerized with 2.5 phm of nonionic surfactant	Latex polimerized with 5 phm of nonionic surfactant

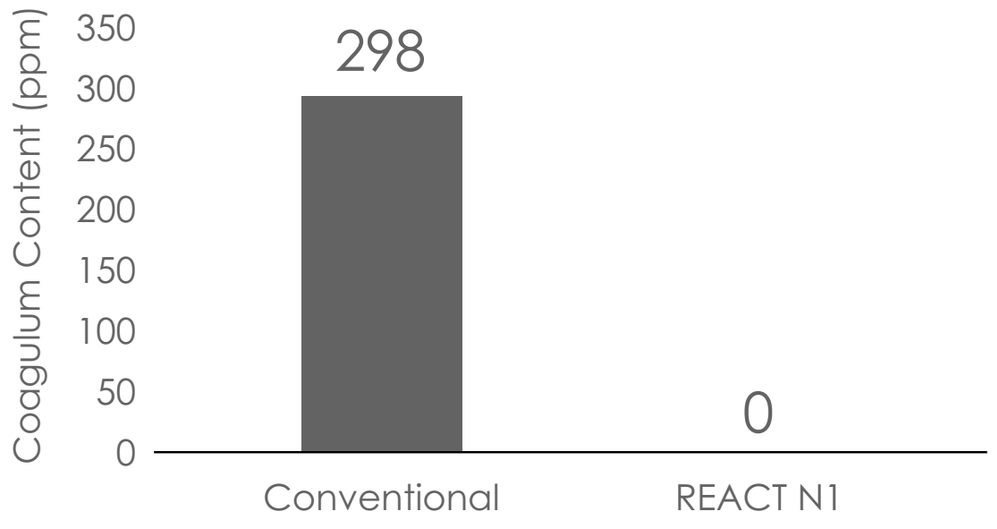
Coagulum formed in the reactor during the polymerization



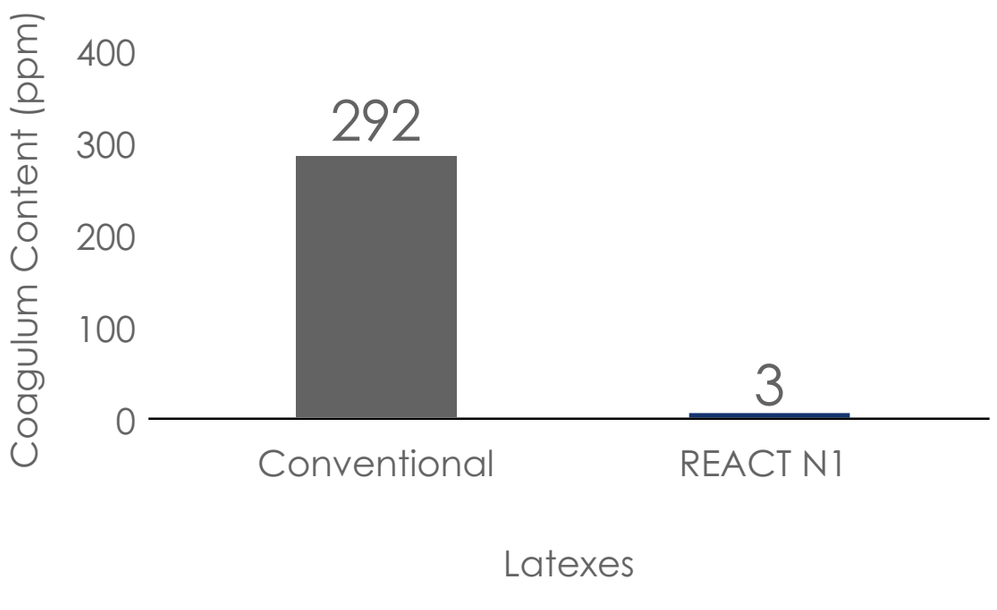


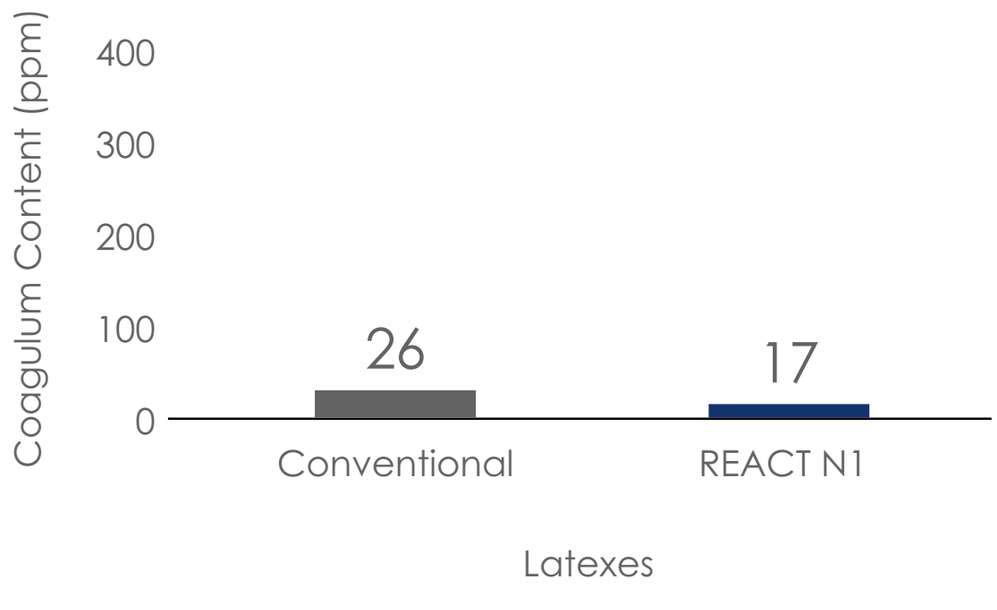
Coagulum formed in the neutralization





Coagulum formed in the mechanical stability test



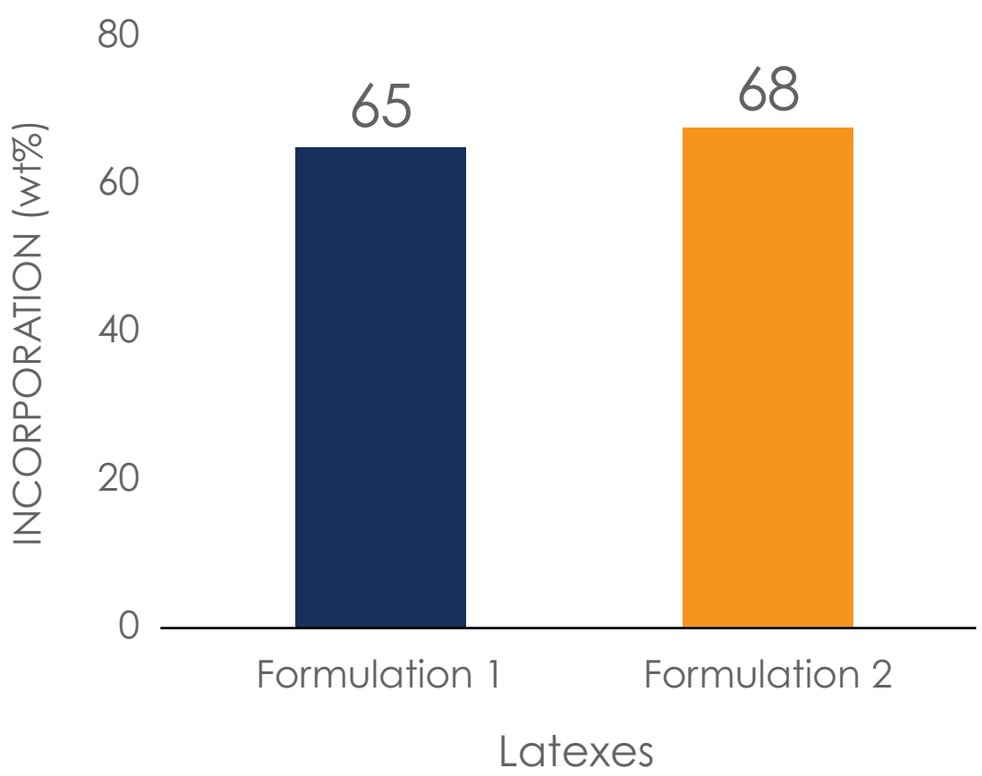


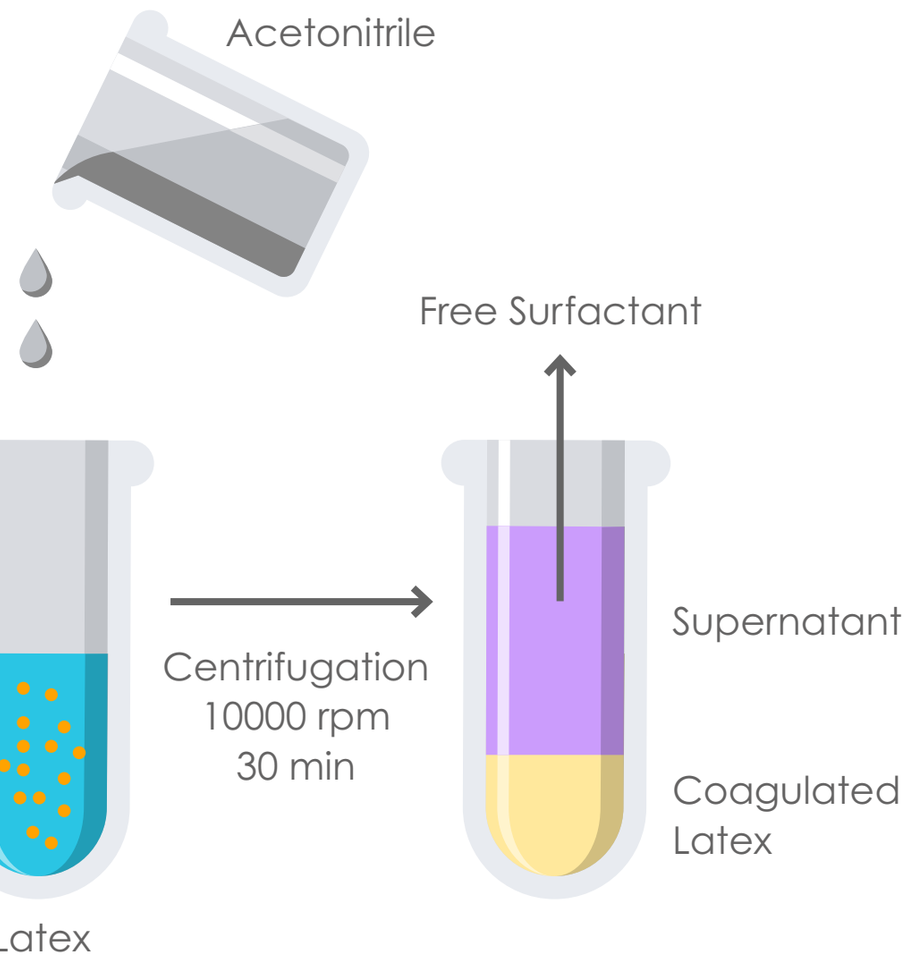
Based on the results of dispersed coagulum formed in the polymerization, neutralization and mechanical stability test, latexes polymerized with **OXIMULSION® REACT N1** presented higher stability than the ones polymerized with conventional nonionic surfactant.

PERFORMANCE TESTS

Incorporation of reactive nonionic surfactant*

SURFACTANT INCORPORATION**





*Conventional semi-batch emulsion polymerization
**Surfactant incorporation = Total surfactant used in the emulsion polymerization - Free surfactant estimated in supernatant of latex through HPLC

Latexes polymerized through a conventional one-step polymerization presented high incorporation of 70 wt%.

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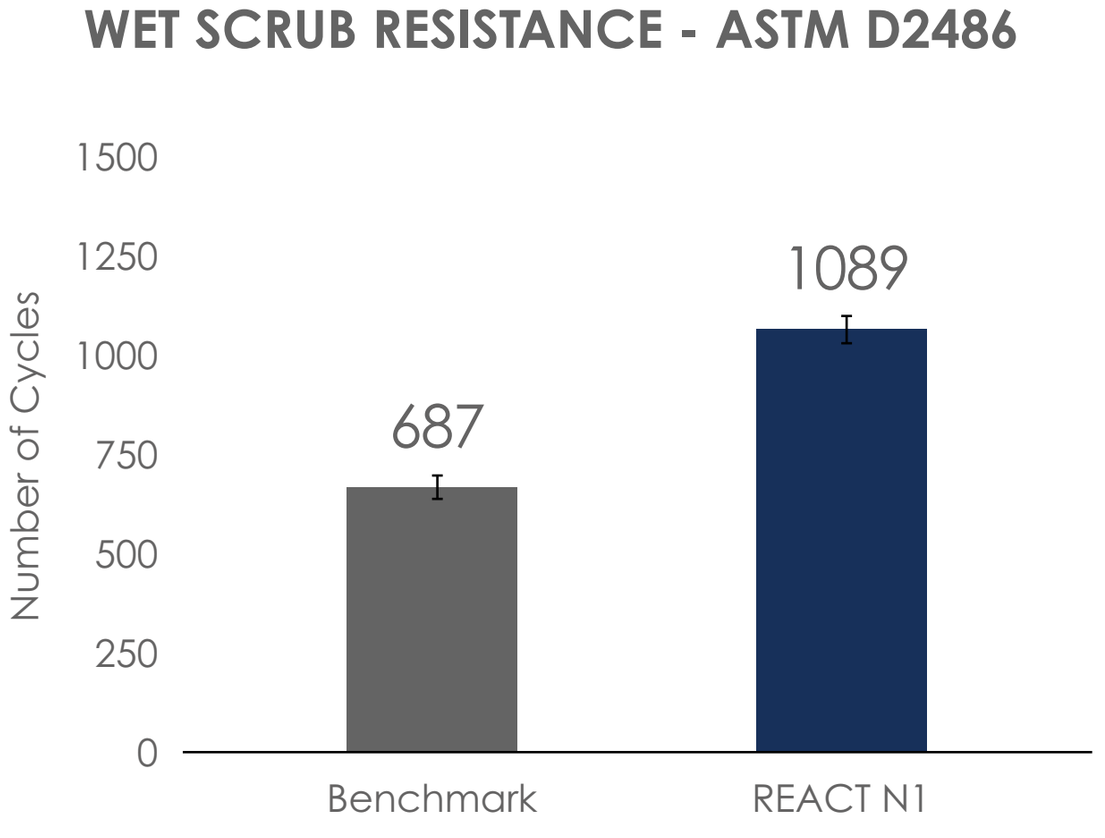
PERFORMANCE TESTS

Wet scrub resistance of semi-gloss paints

FORMULATION	
PVC	~ 26%
Latex	~ 43%
ULTRAFILM® 5000	~ 2%
Viscosity	105 +/- 5 KU
pH	9.0 – 9.5



Paints formulated with those latexes presented wet scrub resistance 60% higher than the benchmark.

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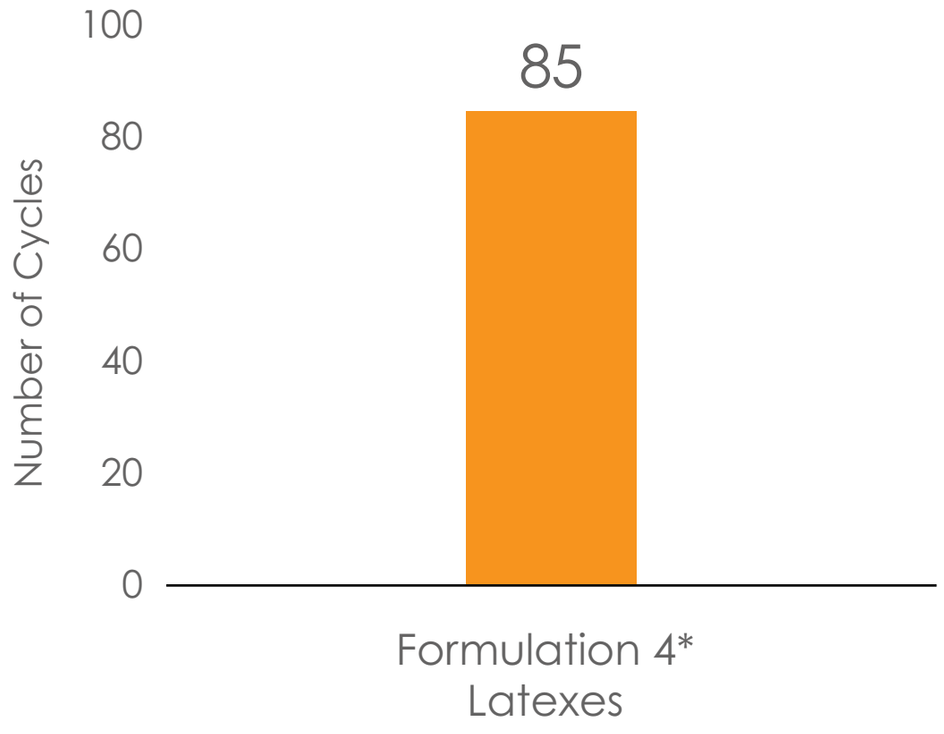
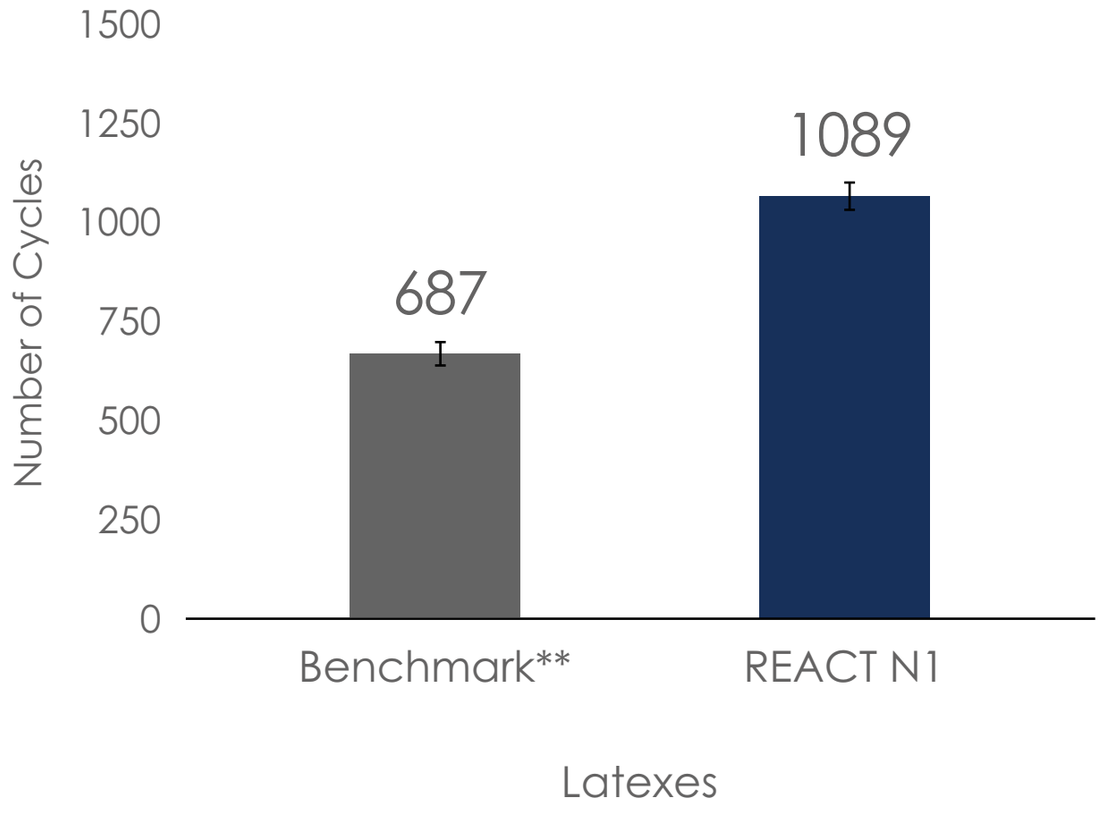
PERFORMANCE TESTS

Two-step process on incorporation and water resistance

INCORPORATION OF REACT N1



WET SCRUB RESISTANCE - ASTM D2486



*30% PVC Semi-gloss Paints
**Styrene-acrylic latex with MFFT about 18-20°C

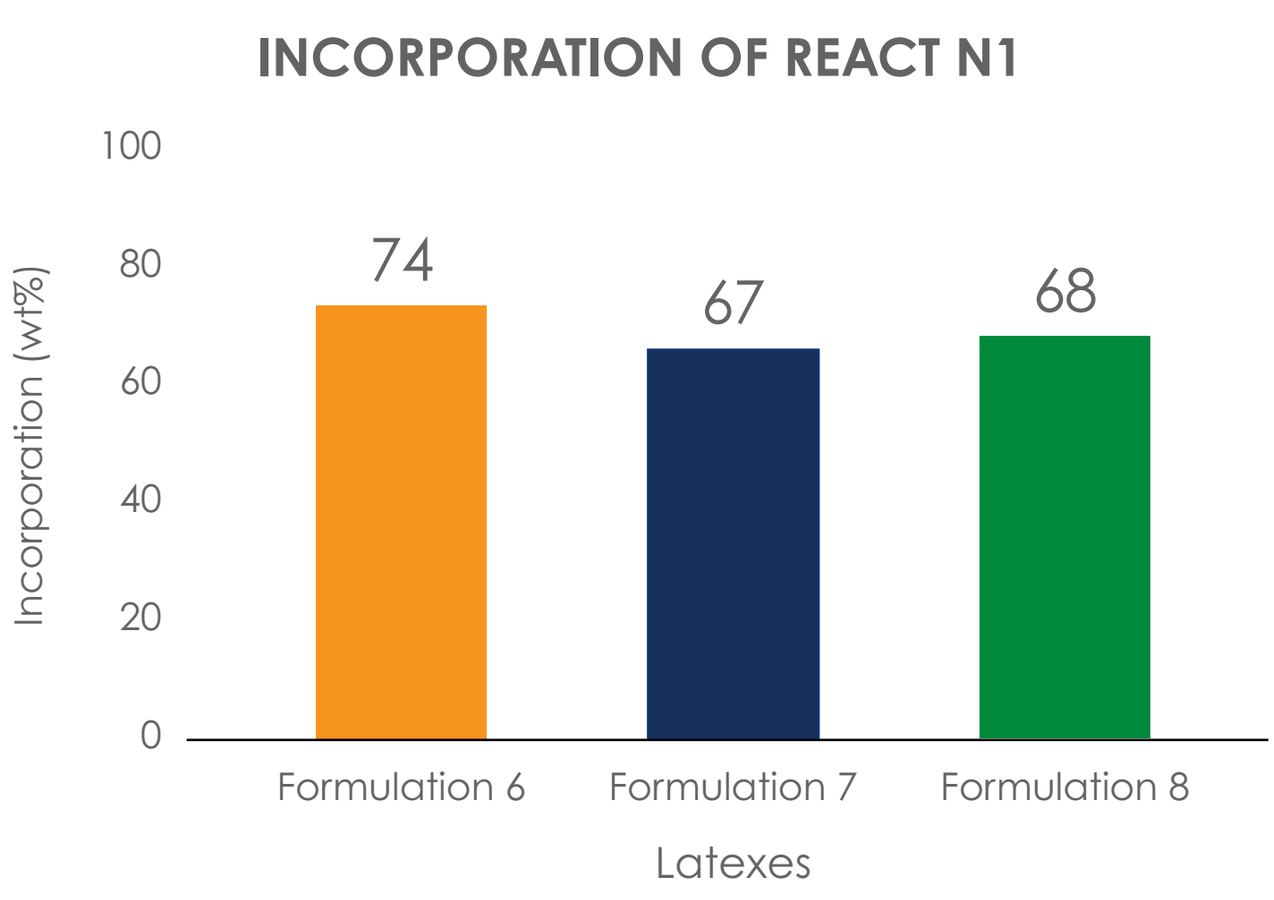
Latexes polymerized through a two step process comprising generation of 50 nm seeds in the first polymerization and seed growth in the second polymerization were performed to optimize the incorporation of **OXIMULSION® REACT N1**.

Latexes polymerized only with **OXIMULSION® REACT N1** in the second polymerization presented oustanding incorporation, 85 wt%, and generated paints wet scrub resistance 90% higher than the benchmark.

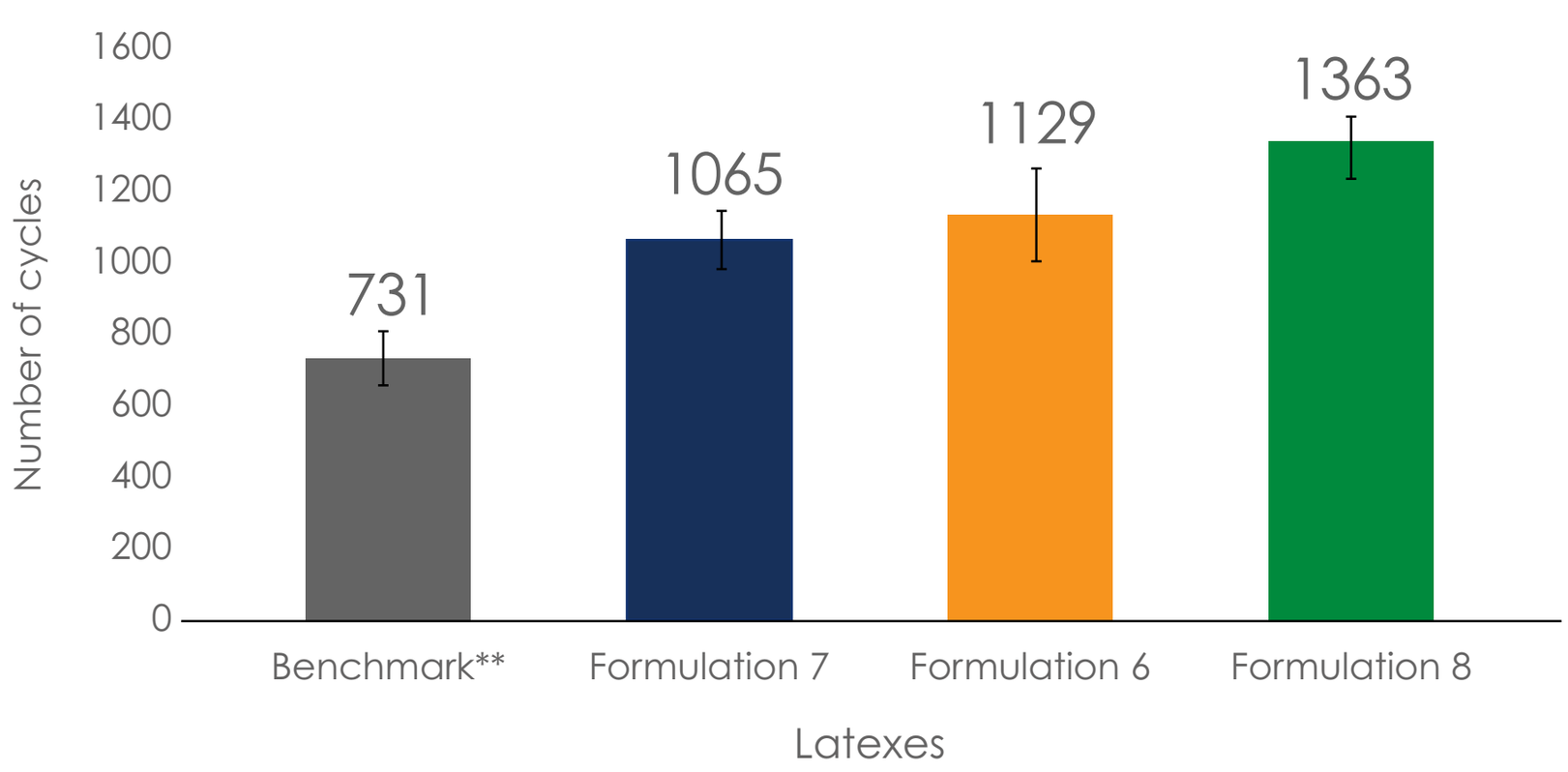
PERFORMANCE TESTS

Effect of temperature of polymerization on incorporation and water resistance*

INCORPORATION OF REACT N1



WET SCRUB RESISTANCE - ASTM D2486



*Latexes produced through a two-step process at different temperatures and with post-addition of anionic surfactant.
**Styrene-acrylic latex with MFFT about 18-20°C

Latexes polymerized with **OXIMULSION® REACT N1** and **OXIMULSION® 1228** conciliate high incorporation, close to 70 wt%, latex stability and excellent wet scrub resistance. Latex polymerized at 60 °C presented the highest wet scrub resistance, 90% higher than the benchmark.

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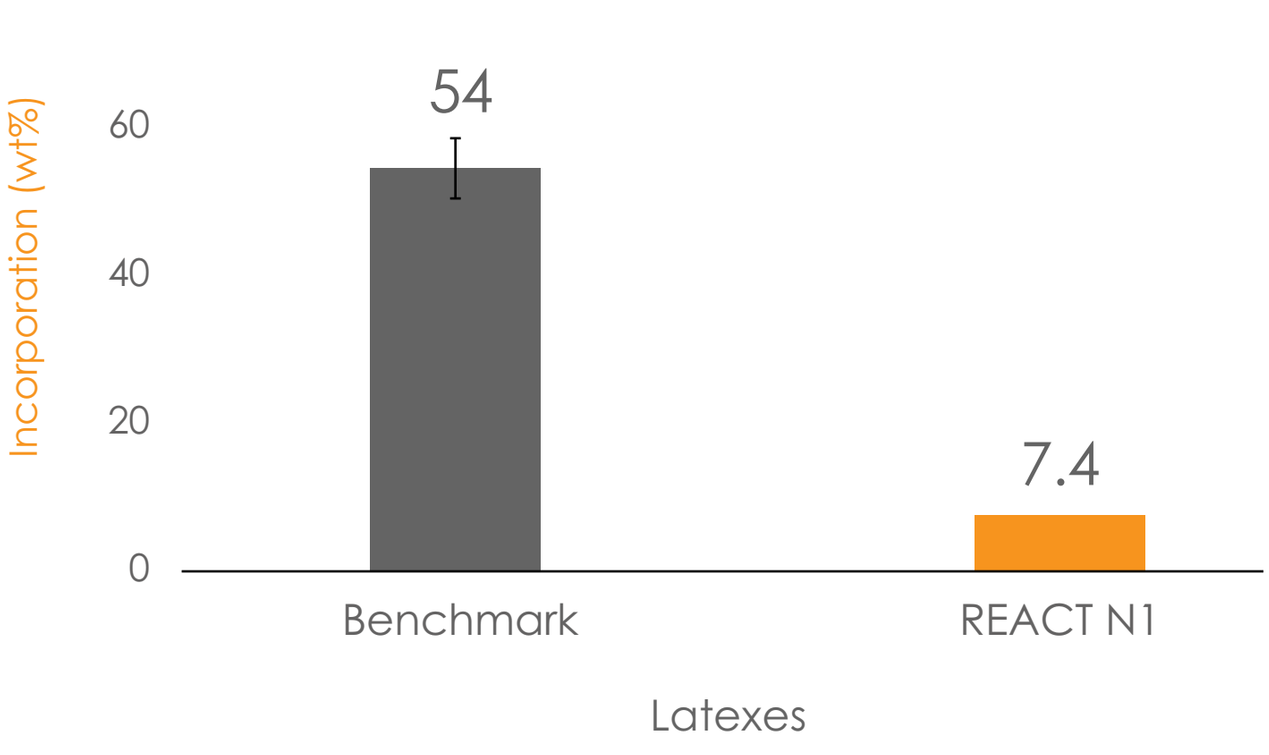
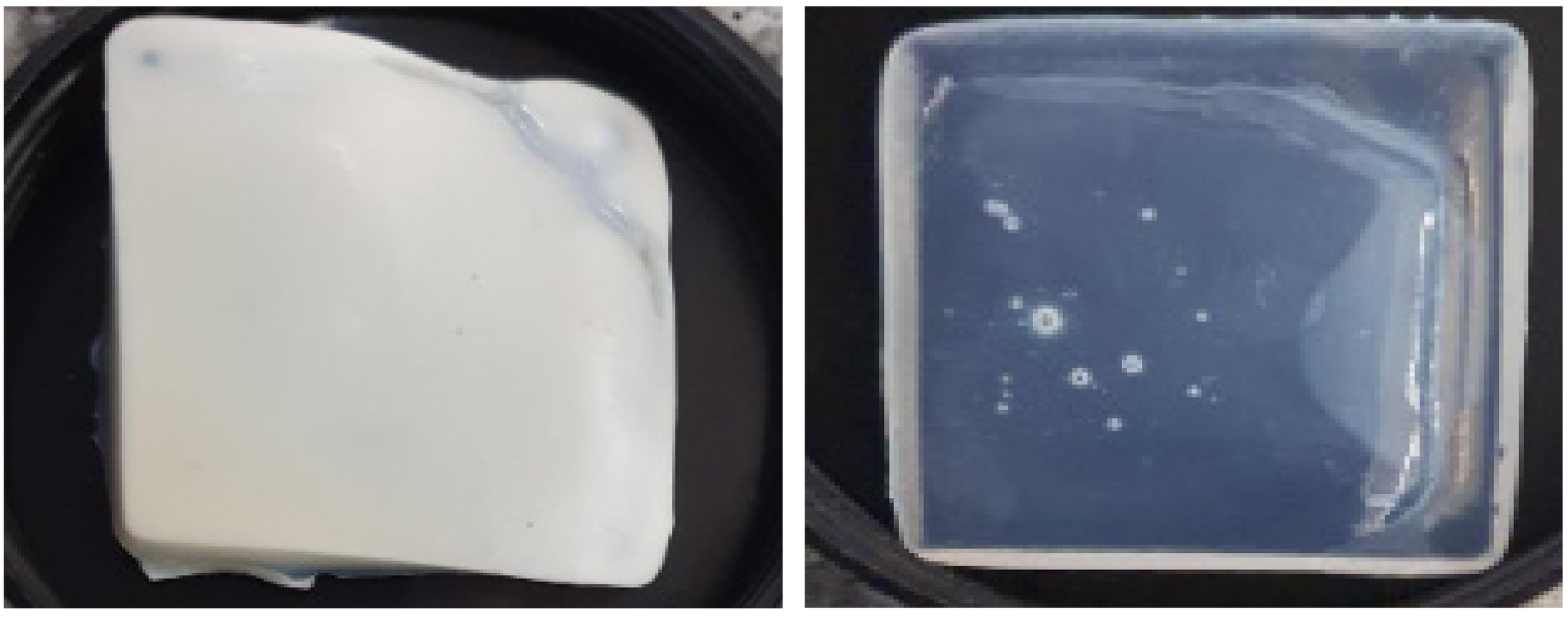
PERFORMANCE TESTS

Effect of OXIMULSION® REACT N1 on water absorption of acrylic latex

WATER ABSORPTION OF LATEX FILMS AFTER 7 DAYS OF IMMERSION IN WATER AT 25 °C





OXIMULSION® REACT N1 decreased the water absorption in 85 wt% in comparison to a benchmark.

If you are looking for reactive surfactants for emulsion polymerizarion, **OXIMULSION® REACT** is what you need!
Contact us and request a sample.

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