泛华化学 INTER-CHINA CHEMICAL

TITANIUM DIOXIDE FOR COATINGS | TECHNICAL REPORT

R-F9490
Water-Based Flat Emulsion Paint Application Performance Report

Color and whiteness · Contrast ratio · Formulation evaluation

Emulsion paint application illustration

BINDER SYSTEM	PIGMENT VOLUME	TiO_2 LOADING
Vinyl-acrylic copolymer	PVC = 50%	0.19 kg/L (13.64%)

Application test data: 2024

Version 1 | 2025

Performance Summary and Formulation

Color, whiteness and hiding in a vinyl-acrylic emulsion formulation

This report evaluates the color, whiteness and contrast ratio of R-F9490 in water-based flat emulsion paint. The formulation has a pigment volume concentration of 50% and a TiO_2 loading of 0.19 kg/L (13.64%). Evaluation was performed with a Datacolor® 600 spectrophotometer.

Property	R-F9490	Description
L*	96.58	Lightness
a*	−0.53	Red–green coordinate
b*	1.87	Yellow–blue coordinate
CIE whiteness	83.05	CIE/E313
Contrast ratio	95.6%	Flat emulsion paint

Test formulation

Component / condition	Description
Emulsion	Vinyl-acrylic copolymer emulsion
Pigment and extenders	TiO_2, ground calcium carbonate (GCC), precipitated calcium carbonate (PCC), talc and kaolin
Additives and other components	Wetting agent, defoamer, thickener, biocide, ammonia, Ropaque polymer, coalescent and water
Pigment volume concentration	50%
TiO_2 loading	0.19 kg/L (13.64%)

The report uses the 2024 flat-emulsion-paint test data for R-F9490, R-F9300 and six commercial comparison samples. Third-party samples are identified as Benchmark A–F, with consistent identifiers across all tables and figures.

Color and Whiteness

L*, a*, b* and CIE whiteness in the same flat emulsion paint formulation

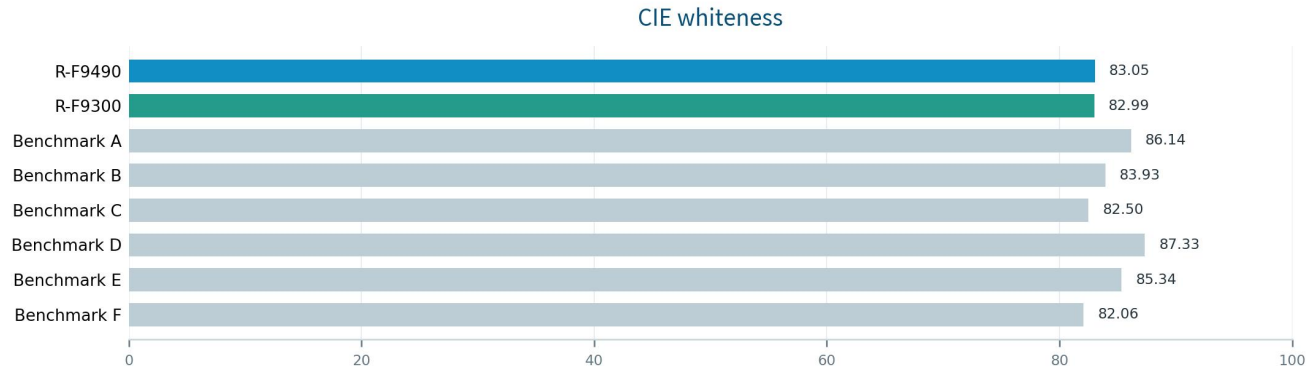

Figure 1. CIE whiteness in water-based flat emulsion paint.

Sample	L*	a*	b*	CIE whiteness
R-F9490	96.58	-0.53	1.87	83.05
R-F9300	96.55	-0.55	1.86	82.99
Benchmark A	96.98	-0.59	1.40	86.14
Benchmark B	96.72	-0.55	1.67	83.93
Benchmark C	96.50	-0.51	1.95	82.50
Benchmark D	97.05	-0.60	1.17	87.33
Benchmark E	96.85	-0.59	1.51	85.34
Benchmark F	96.50	-0.44	2.04	82.06

R-F9490 and R-F9300 show similar color and whiteness: L* values are 96.58 and 96.55, b* values are 1.87 and 1.86, and CIE whiteness values are 83.05 and 82.99, respectively.

Application interpretation

CIE whiteness among the six commercial benchmarks ranges from 82.06 to 87.33. R-F9490 falls within this range, above Benchmark C and F and below the other four benchmarks. Selection should consider both target whiteness and yellow–blue shade in the intended formulation.

Contrast Ratio and Application Conclusions

PVC: 50%; TiO_2 loading: 0.19 kg/L (13.64%)

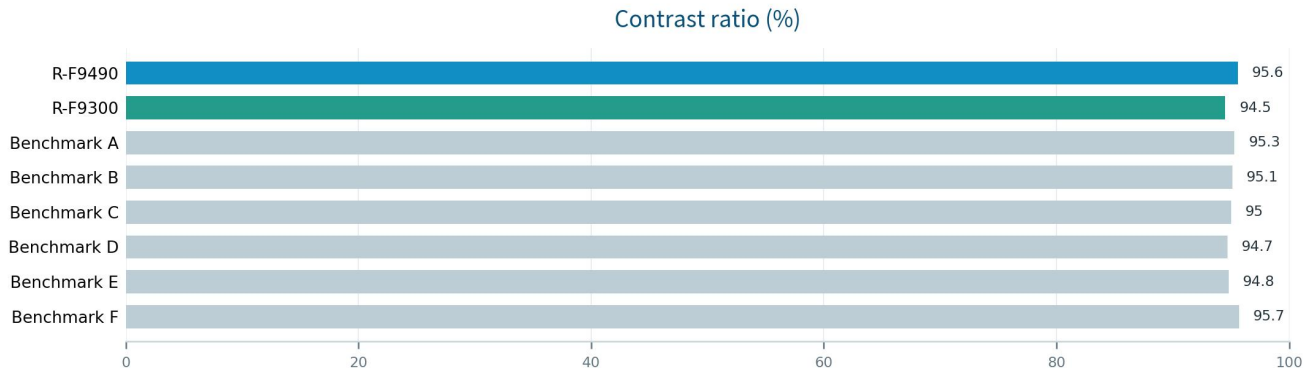

Figure 2. Contrast ratio in water-based flat emulsion paint.

Sample	Contrast ratio (%)
R-F9490	95.6
R-F9300	94.5
Benchmark A	95.3
Benchmark B	95.1
Benchmark C	95.0
Benchmark D	94.7
Benchmark E	94.8
Benchmark F	95.7

R-F9490 achieves a contrast ratio of 95.6%, the second-highest result among eight samples. It is 0.1 percentage points below the highest value of 95.7% and 1.1 percentage points above R-F9300.

Formulation evaluation

R-F9490 shows a high contrast ratio within this high-PVC flat emulsion paint test set and is a candidate for formulations prioritizing hiding. Its whiteness falls within the benchmark range. Validate the target whiteness, shade and hiding against the incumbent pigment at consistent loading, dispersion conditions and film thickness.

Technical note: Results apply to the stated test system and support application selection. Actual performance depends on formulation and processing. Supply quality is governed by the agreed specifications and contract.