泛华化学 INTER-CHINA CHEMICAL

TITANIUM DIOXIDE FOR COATINGS | APPLICATION SELECTION

R-F9300 and R-F9490
Acrylic and Flat Emulsion Paints
Performance Comparison and Selection

Color, whiteness, hiding and tinting performance in matched formulations

Coating application illustration

ACRYLIC SYSTEM	FLAT EMULSION SYSTEM
PVC = 15%	PVC = 50%

Version 1 | 2025

Selection Summary and Test Conditions

Each grade is compared within the same formulation

Under the reported test conditions, R-F9300 gives higher whiteness and contrast ratio in acrylic white paint and higher relative tinting strength in acrylic grey paint. R-F9490 gives a higher contrast ratio in flat emulsion paint, with similar color and whiteness. Grade selection should reflect the formulation and target properties.

Test	R-F9300	R-F9490
Acrylic white paint CIE whiteness	89.29	88.55
Acrylic white paint contrast ratio	93.3%	93.0%
Acrylic grey paint relative tinting strength	100	95.1
Flat emulsion paint CIE whiteness	82.99	83.05
Flat emulsion paint contrast ratio	94.5%	95.6%

Formulations and methods

Acrylic system: thermoplastic acrylic resin solution with 40% solids and TiO_2 PVC of 15%; black colorant is added for the grey paint. The mixture is ground with glass beads to below 10 µm, applied automatically using a 100 µm wet-film applicator and tested after air drying. Dry-film thickness is approximately 25 µm.

Flat emulsion paint: vinyl-acrylic copolymer emulsion at PVC 50%, with TiO_2 at 0.19 kg/L (13.64%). The formulation includes GCC, PCC, talc, kaolin, wetting agent, defoamer, thickener, biocide, ammonia, Ropaque polymer, coalescent and water.

Measurement instrument: Datacolor® 600 spectrophotometer. Results are interpreted within each system; absolute values are not directly compared across formulations.

Performance in Acrylic Paints

White paint color and hiding; grey paint color and relative tinting strength

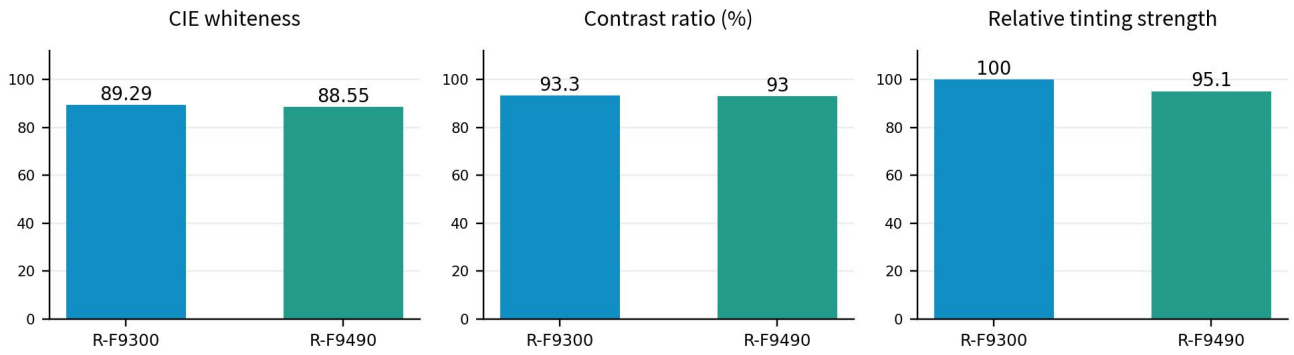

Figure 1. Performance in matched acrylic formulations.

White paint property	R-F9300	R-F9490
L*	97.23	97.13
a*	−0.64	−0.64
b*	0.83	0.94
CIE whiteness	89.29	88.55
Contrast ratio (%)	93.3	93.0

Grey paint property	R-F9300	R-F9490
L*	63.31	62.48
a*	−0.93	−0.88
b*	−2.69	−2.86
Relative tinting strength	100	95.1

R-F9300 has a 0.74 higher white-paint whiteness value and a 0.3 percentage-point higher contrast ratio. Its grey-paint relative tinting strength is 4.9 index points higher. R-F9490 has a more negative grey-paint b*, indicating a slightly bluer shade in this formulation. Relative tinting strength is expressed with R-F9300 = 100 for this test set.

Performance in Flat Emulsion Paint

PVC = 50% | TiO_2 = 0.19 kg/L (13.64%)

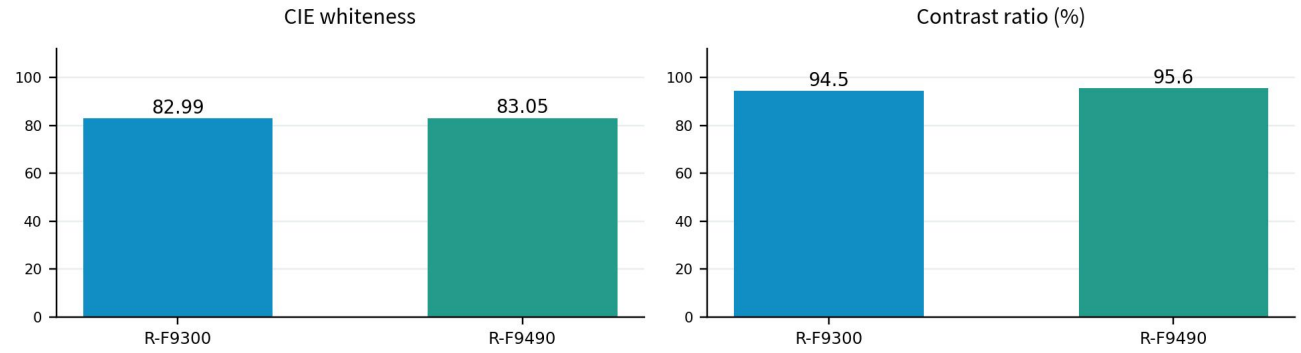

Figure 2. Performance in the same flat emulsion formulation.

Property	R-F9300	R-F9490
L*	96.55	96.58
a*	−0.55	−0.53
b*	1.86	1.87
CIE whiteness	82.99	83.05
Contrast ratio (%)	94.5	95.6

R-F9490 has a contrast ratio 1.1 percentage points above R-F9300. Whiteness differs by only 0.06, with similar color coordinates. Its main relative advantage in this formulation is hiding performance.

Grade selection guidance

Acrylic paints: prioritize evaluation of R-F9300 where white-paint whiteness, hiding and grey-paint tinting strength are key. Where a bluer grey-paint shade is required, assess R-F9490 with color-matching trials.

Flat emulsion paints: prioritize evaluation of R-F9490 for hiding in this high-PVC formulation. For substitution trials, keep TiO_2 loading, pigment/extender composition, dispersion conditions and film thickness consistent, and verify target color and hiding.

Technical note: Results apply to the tested samples and stated formulations. They do not directly establish pigment reduction or cost savings. Suitability requires validation in the customer’ s formulation; supply quality is governed by agreed specifications and contract.