泛华化学
INTER-CHINA CHEMICAL

TITANIUM DIOXIDE FOR COATINGS | TECHNICAL REPORT

R-F9300 Acrylic Coatings
Application Performance Report

Whiteness and color · Hiding and gloss · Tinting strength and undertone

Coating application illustration

WHITE PAINT	PAINT FILM	GREY PAINT
Color / CIE whiteness	Contrast ratio / 20° gloss	Tinting strength / undertone

Application test data: 2020

Version 1 | 2021

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Performance Summary and Formulation

White- and grey-paint evaluation in thermoplastic acrylic systems

R-F9300 combines good whiteness, hiding and gloss in this acrylic coating evaluation. Grey-paint relative tinting strength is 104%, with a b* value of −3.81 indicating a pronounced blue undertone. The results below apply to the stated formulations.

Property	R-F9300	System
CIE whiteness	89.27	White paint
Contrast ratio	93.4%	White paint
20° gloss	70	White paint
Relative tinting strength	104%	Grey paint
b*	−3.81	Grey paint

Formulation conditions

Item	White paint	Grey paint
Resin	Thermoplastic acrylic resin solution	Thermoplastic acrylic resin solution
Resin-solution solids	27%	33%
Pigment	TiO_2	TiO_2 + carbon black
TiO_2 pigment volume concentration	16%	15%

Tinting-strength reference: R-KB6. Pigment volume concentration is abbreviated as PVC.

Comparison samples

The report covers R-F9300, R-F9490 and 11 commercial comparison samples, anonymized as Benchmark A–K. Each benchmark identifier refers to the same sample throughout this report. All results are taken from the 2020 acrylic coating application test compilation.

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White Paint: Whiteness and Color

Resin-solution solids: 27%; TiO_2 PVC = 16%

Figure 1. CIE whiteness of acrylic white paints.

Sample	L*	a*	b*	CIE whiteness
R-F9300	97.17	-0.31	0.80	89.27
R-F9490	97.01	-0.33	0.90	88.44
Benchmark A	97.51	-0.41	0.68	90.67
Benchmark B	97.54	-0.33	-0.52	91.45
Benchmark C	97.00	-0.33	1.12	87.45
Benchmark D	97.54	-0.42	0.65	90.86
Benchmark E	97.36	-0.37	0.89	89.35
Benchmark F	97.41	-0.39	0.62	90.69
Benchmark G	96.98	-0.42	1.47	85.82
Benchmark H	97.26	-0.36	0.92	88.97
Benchmark I	97.10	-0.27	1.08	87.86
Benchmark J	97.20	-0.33	0.86	89.10
Benchmark K	97.32	-0.34	0.96	88.93

R-F9300 has a CIE whiteness of 89.27, 0.83 above R-F9490. Its white-paint b* is 0.80, 0.10 below R-F9490.

White Paint: Hiding and Gloss

Optical performance under the stated white-paint formulation

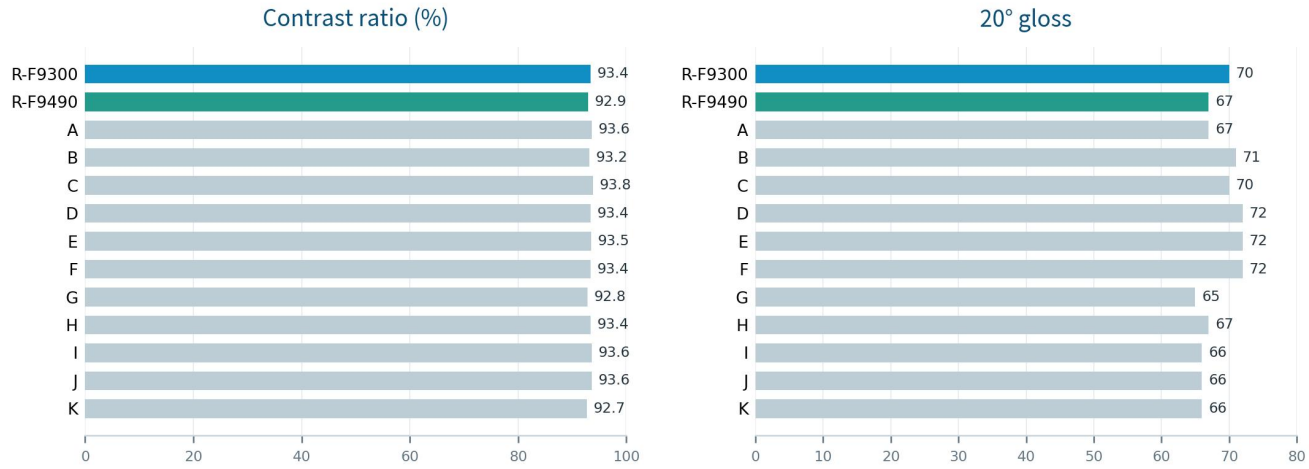

Figure 2. Contrast ratio and 20° gloss; A–K denote Benchmark A–K.

Sample	Contrast ratio (%)	20° gloss
R-F9300	93.4	70
R-F9490	92.9	67
Benchmark A	93.6	67
Benchmark B	93.2	71
Benchmark C	93.8	70
Benchmark D	93.4	72
Benchmark E	93.5	72
Benchmark F	93.4	72
Benchmark G	92.8	65
Benchmark H	93.4	67
Benchmark I	93.6	66
Benchmark J	93.6	66
Benchmark K	92.7	66

R-F9300 achieves a contrast ratio of 93.4%, matching several commercial benchmarks, and a 20° gloss of 70. Compared with R-F9490, contrast ratio is 0.5 percentage points higher and the gloss reading is 3 higher.

Grey Paint: Tinting Strength and Undertone

Resin-solution solids: 33%; TiO_2 PVC = 15%; reference: R-KB6

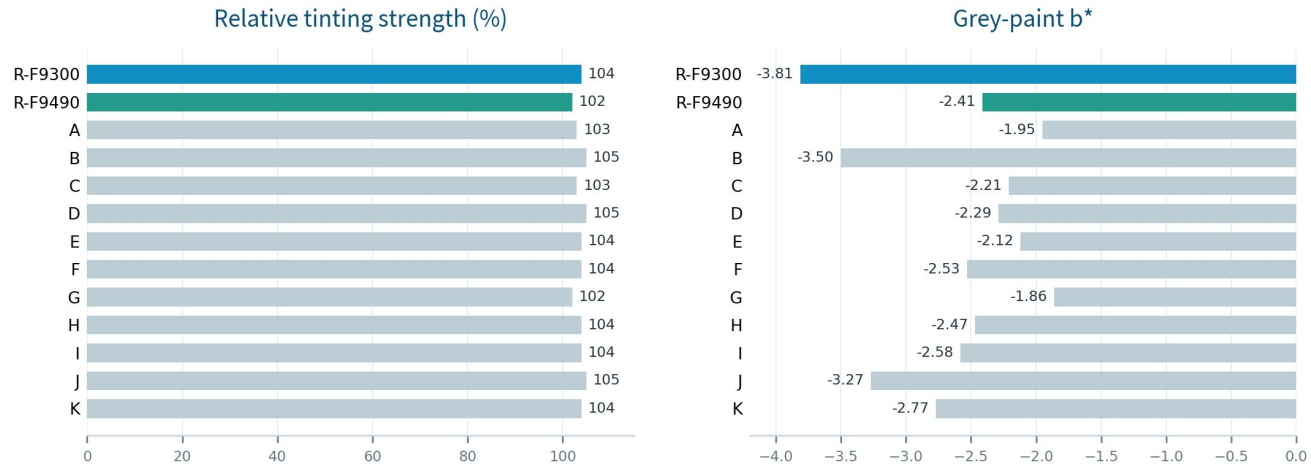

Figure 3. Relative tinting strength and grey-paint b*; A–K denote Benchmark A–K.

Sample	L*	a*	b*	Tinting strength (%)
R-F9300	62.29	-0.86	-3.81	104
R-F9490	61.08	-0.70	-2.41	102
Benchmark A	62.04	-0.74	-1.95	103
Benchmark B	63.03	-0.99	-3.50	105
Benchmark C	62.02	-0.82	-2.21	103
Benchmark D	62.71	-0.78	-2.29	105
Benchmark E	62.53	-0.78	-2.12	104
Benchmark F	62.34	-0.81	-2.53	104
Benchmark G	61.40	-0.69	-1.86	102
Benchmark H	62.15	-0.69	-2.47	104
Benchmark I	62.39	-0.69	-2.58	104
Benchmark J	62.80	-0.90	-3.27	105
Benchmark K	62.28	-0.78	-2.77	104

R-F9300 has a relative tinting strength of 104%, matching several commercial benchmarks. Its b* of −3.81 is the lowest in this set, indicating the strongest blue undertone. Undertone selection should follow the target shade.

Application Conclusions and Evaluation

Evaluate white-paint optics and grey-paint tinting performance together

Key findings

Evaluation	Observed performance
Whiteness and color	CIE whiteness 89.27; white-paint L* 97.17 and b* 0.80.
Hiding and gloss	Contrast ratio 93.4% and 20° gloss 70 characterize hiding and surface gloss in this formulation.
Tinting and undertone	Relative tinting strength 104% and grey-paint b* −3.81 provide a useful reference where a blue undertone is desired.

Comparison with R-F9490

Under these test conditions, R-F9300 has higher whiteness, contrast ratio, 20° gloss and relative tinting strength than R-F9490. Grey-paint b* values are −3.81 and −2.41 respectively, showing a stronger blue undertone for R-F9300.

Evaluation in customer formulations

Use the incumbent titanium dioxide as a control, with the same resin, TiO_2 loading, dispersion conditions and film thickness. Evaluate color, contrast ratio and gloss together in white paint. For grey paint, keep carbon-black loading and the tinting-strength reference consistent, and assess results against the target shade.

Technical note: These results support application selection in the stated test systems. Actual performance depends on formulation and processing. Product supply and quality acceptance are governed by the agreed specifications and contract.

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Product delivery and quality acceptance are governed by the mutually confirmed technical specification, inspection documents and contractual terms.