



RayCryl 4133 Technical Bulletin Self-Crosslinking 100% Acrylic Emulsion

RayCryl 4133 is a 100% acrylic core-shell polymer with specialized morphology and self-crosslinking technology which provide excellent stain resistance and hardness with a low VOC demand. Optimized for wood application RayCryl 4133 can be formulated to meet KCMA requirements for stain and water resistance.

Key Features

- Exceptional chemical and stain resistance
- Very good hot water and hot coffee resistance
- Outstanding hardness and block resistance
- Excellent wet and dry adhesion properties
- Meets requirements set by the KCMA

RayCryl 4133 Typical Physical Properties*

Polymer type	100% Acrylic emulsion
Weight solids	45%
Viscosity (Brookfield Model RVT)	800 cps, #3/100 RPM
pH	8.0
Tg (DSC)	22/102°C
MFFT (ASTM D-2354)	17°C
Particle size (Mean)	0.08 micron
Surfactant charge	Anionic
Weight per gallon	8.8 lbs/gal
Freeze thaw stability	Do not freeze

** These properties are typical, but do not constitute specifications*

For 50 years Specialty Polymers has been developing state of the art resins for the paint, coatings and adhesive industries. With more than 300 products to choose from, Specialty Polymers has the right polymer to meet your needs.

IMPORTANT INFORMATION

If any product is defective in workmanship or materials, Specialty Polymers, Inc. will replace the product. The information contained in this Technical Bulletin is intended to be a guideline. It is offered in good faith, but without guarantee. We recommend users of the product perform their own testing to determine the suitability of the product in their application.



Suggested Formulation

RayCryl 4133 – Satin Wood Coating

Raw Materials	Weight (lbs)	Volume (gal)
DPM	15.5	1.96
Dowanol PnB	10.5	1.44
Ceraflour 929	16.00	1.81
Aquacer 539	40.00	4.85
Water	201.55	24.20
Kathon LX 1.5%	1.00	0.12
Tego Foamex 1488	0.50	0.06
RayCryl 4133	550.00	62.29
Premix then add:		
DI water	15.00	1.80
Acrysol RM 825	1.50	0.17
Tinuvin 1130	4.00	0.44
Tinuvin 292	2.00	0.22
Dynol 360	5.00	0.61
Capstone FS63	0.40	0.04
Total	862.95	100.01

Typical Physical Properties

VOC (g/L)	<100
pH	8.0
Viscosity (#2 Sign. Zahn)	15 – 20 seconds

Suggested Formulation

RayCryl 4133 – Gloss Wood Coating

Raw Materials	Weight (lbs)	Volume (gal)
DPM	15.5	1.96
Dowanol PnB	10.5	1.44
Aquacer 539	40.00	4.85
Water	183.85	22.07
Kathon LX 1.5%	1.00	0.12
Tego Foamex 1488	0.25	0.03
RayCryl 4133	585.00	66.25
Premix then add:		
DI water	15.00	1.80
Acrysol RM 825	1.50	0.17
Tinuvin 1130	4.00	0.44
Tinuvin 292	2.00	0.22
Dynol 360	5.00	0.61
Capstone FS63	0.40	0.04
Total	864.00	100.00

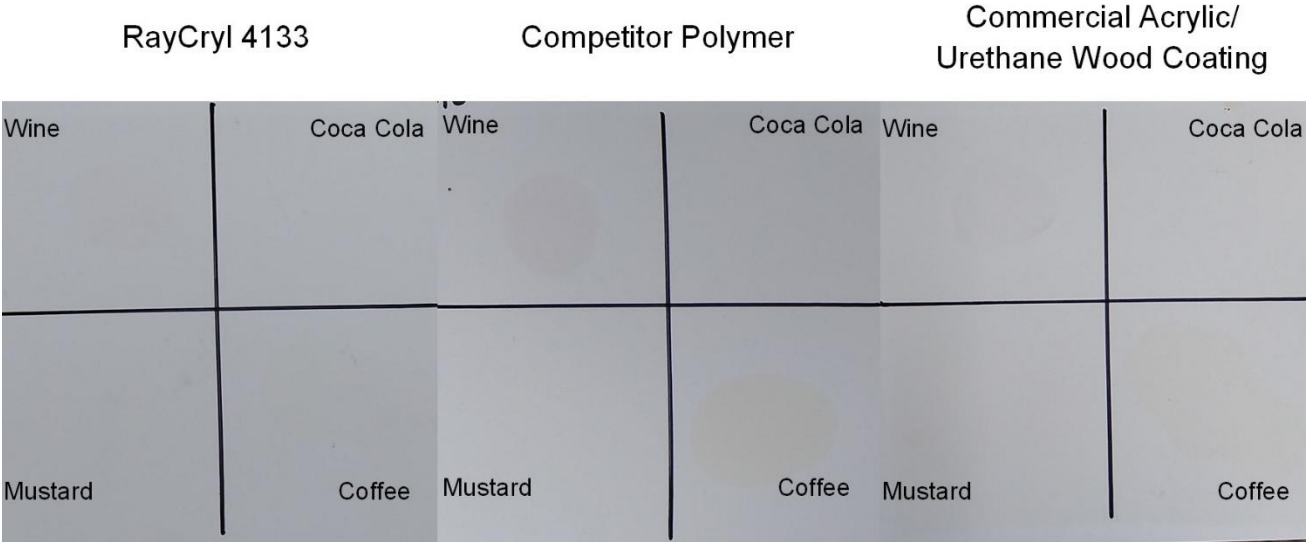
Typical Physical Properties

VOC (g/L)	<100
pH	8.0
Viscosity (#2 Sign. Zahn)	15 – 20 seconds

Comparative Testing

Clear wood coating formulated with RayCryl 4133 was compared to a clear wood coating formulated with a competitor polymer and a commercially available acrylic/urethane wood coating.

Early stain resistance



Picture 1. 10 mil wet drawdown cured 24 hours then exposed to chemicals for 1 hour before removing with a wet sponge.

KCMA stain resistance test

	RayCryl 4133	Competitor Polymer	Commercial Acrylic/Urethane Wood Coating
White Vinegar	5	5	5
Lemon Juice	5	5	5
Orange Juice	5	5	5
Grape Juice	5	5	5
Ketchup	5	5	5
Coffee	5	4.5	5
Olive Oil	5	5	5
100 Proof Vodka	5	4	5
Mustard	4.5*	4.5*	4.5*
Total	44.5	43	44.5

Table 1. 2 coats on oak, cured for 10 days at room temperature before 24-hour open spot test (with the exception of mustard which was left for 60 minutes). After exposure the panels are scrubbed under running water then rated.

**Recovered completely after 48 hours*

Rating:

5 = no discoloration/no loss of gloss, no film defects

4 = slight staining/loss of gloss, no film defects

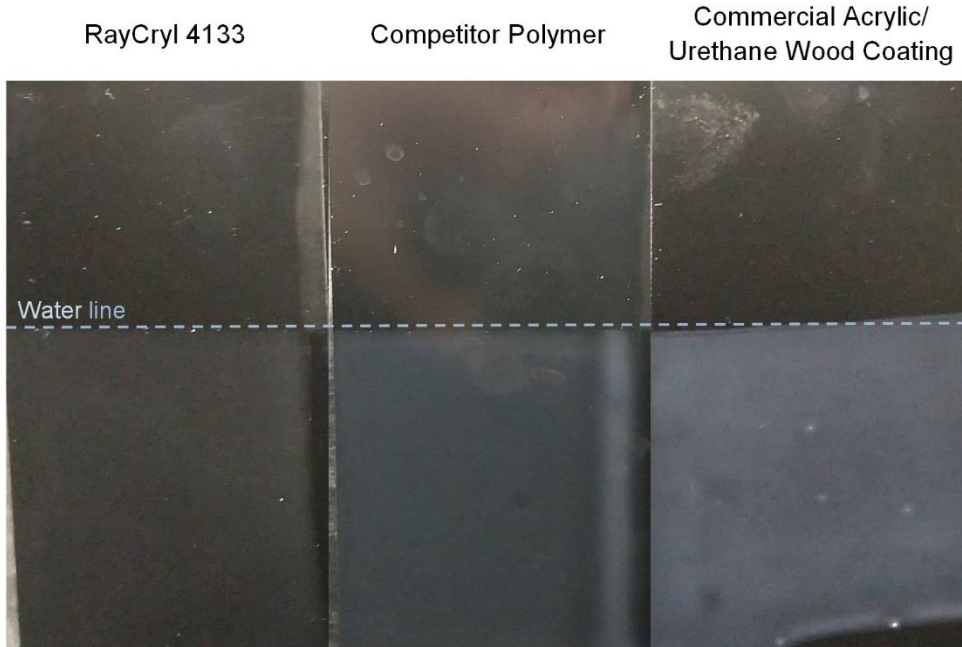
3 = dark staining/loss of gloss, no film defects

2 = film defects (swelling, blisters, lifting) , no discoloration

1 = film defects (swelling, blisters, tacky/softening), discoloration, loss of gloss

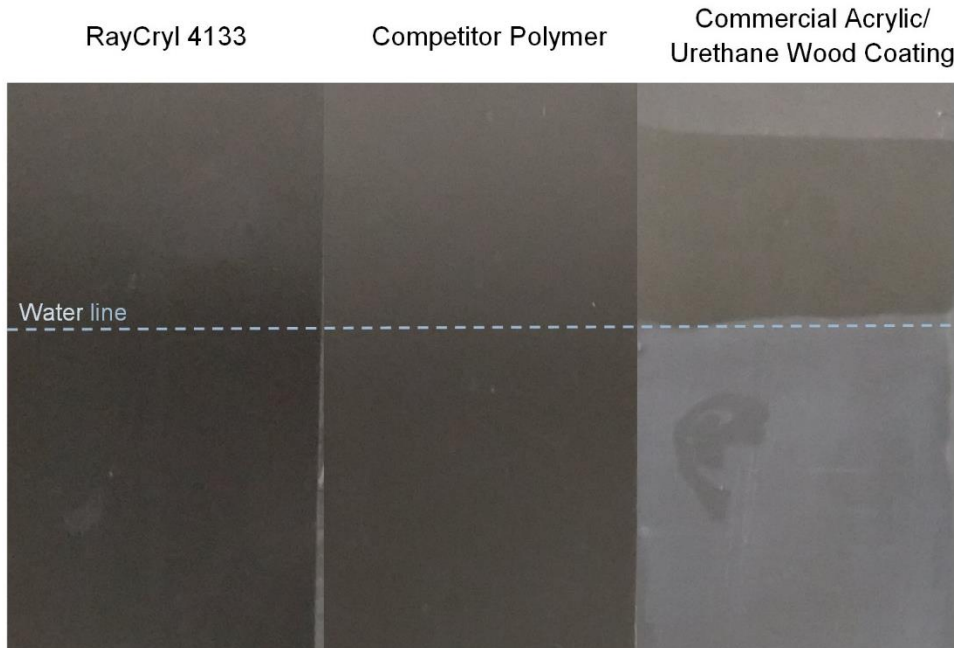
0 = total destruction of the film

Water blush resistance



Picture 2. 7 mil wet drawdown cured at room temperature for 24 hours before being immersed in water for 24 hours to test for water whitening.

Hot blush resistance



Picture 3. 7 mil wet drawdown cured at room temperature for 24 hours before being immersed in a 60°C water bath for one hour to test for hot blush resistance.