

Joncryl® 934

Product Description	Joncryl 934 is a high equivalent weight acrylic polyol for use in two-component polyurethane coatings applications.
Key Features & Benefits	<ul style="list-style-type: none">- High hydroxyl equivalent weight for low isocyanate demand- Long pot life- Fast cure- Supplied in n-butyl acetate
Chemical Composition	Acrylic polyol

Properties

Typical Properties	Appearance	clear liquid
	Non-volatile at 150°C (0.5g, 60 minutes)	~ 77 %
	Hydroxyl number of solids	~ 70
	Equivalent weight as supplied, of solids	~ 1040, 800
	Density at 20°C	~ 1.04 g/ml, 8.70 lbs/gal
	Tg (measured)	~ 7°C, 45°F

* These typical values should not be interpreted as specifications.

Applications

Joncryl 934 is a high equivalent weight polyol designed for low isocyanate demand, 2-component polyurethane coatings. High solids coatings that are as low as 2.9 pounds per gallon of VOC can be formulated to spray by conventional or airless equipment. Joncryl 934 displays good cure rate and pot life. Joncryl 934 should be considered as a candidate for high performance maintenance and transportation coatings as a replacement for conventional solids urethane finishes.

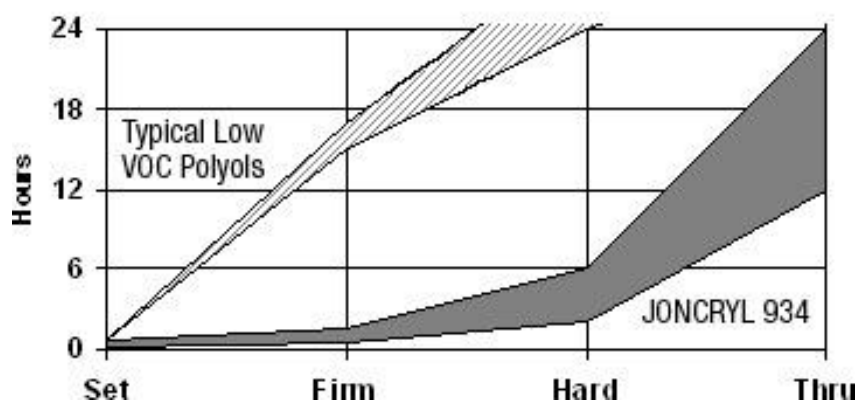
Joncryl 934 is recommended for applications such as:

- Interior/exterior general metal coating applications

Cure/Dry Characteristics

The following graph illustrates the dry times/cure rates of a typical white topcoat formulation based on Joncryl 934. Due to the increased reactivity of Joncryl 934, catalysts are not normally used. If increased reactivity is desired, typical urethane catalysts such as dibutyltin dilaurate can be used. If a catalyst is used, the dry times and the pot life will both be reduced. The pot life of this system will normally be between 4 – 6 hours when then pot life is defined as the time to double an initial viscosity of 250 cps.

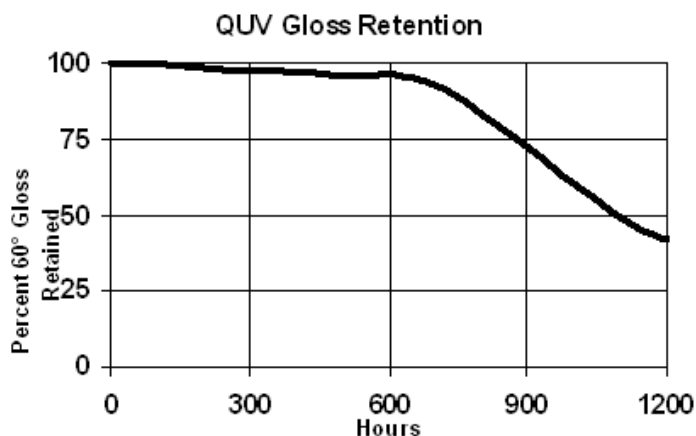
Gardner Circular Dry Times



Evaluations of Gardner dry times are very subjective. The dry times will normally lie somewhere within the area plotted on the chart above.

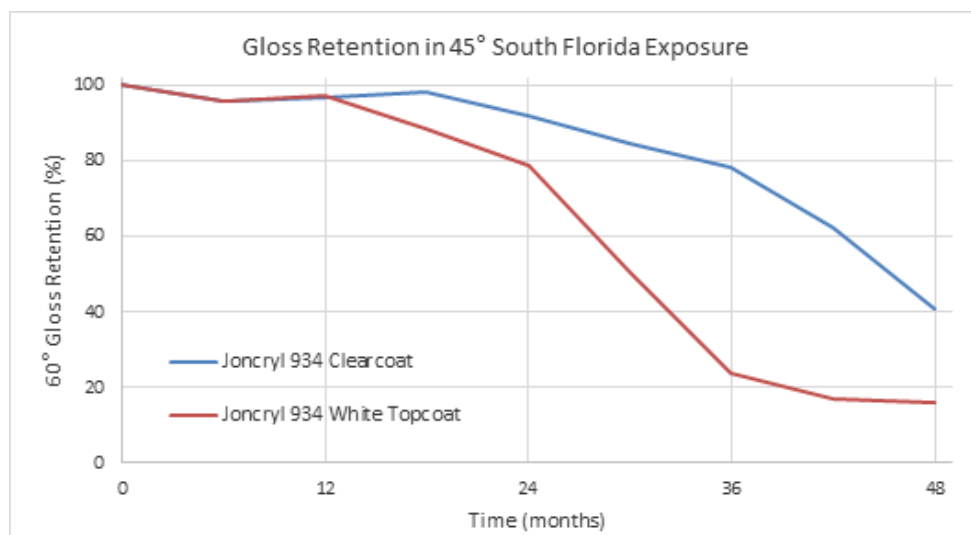
QUV Gloss Retention

The following shows the QUV gloss retention of Joncryl 934 in a white topcoat formulation. QUV gloss retention results were obtained using UVB-313 bulbs with 4 hours of light at 60°C followed by 4 hours of condensation at 40°C. The formulation uses a 17% PVC, Basonat® HI 100 NG as the crosslinker, and n-Butyl acetate as the solvent. Due to the increased reactivity of Joncryl 934, a catalyst is not normally needed and was not added to this formulation. UV light stabilizers were not utilized.



South Florida Weathering

The following graph demonstrates the 60° gloss retention of polyurethane coating formulations based on Joncryl 934 in South Florida weathering (ASTM G7-05). No UV stabilizers were used.



Formulation Guidelines

Crosslinker Selection – For maximum gloss retention properties, aliphatic isocyanates are recommended. The isocyanurate (trimer) or biuret versions of hexamethylene diisocyanate can be used. The trimer version may give better gloss retention and reactivity. A ratio of 1.05:1 of isocyanate to hydroxyl is normally recommended in the industry. However, a ratio of 1:1 of isocyanate to hydroxyl is more economical and does not sacrifice performance properties.

Solvent Selection – Because the hydroxyl functionality of alcohols and glycol ethers can react with isocyanates, their use should be avoided. Urethane-grade solvents should be used when available. Ketone solvents will give the best viscosity/VOC due to a combination of good solvency and low density. Esters generally provide the next best viscosity/VOC, but do not provide as low of a viscosity/VOC as the ketones due to their higher density. Generally, the lower the molecular weight of the solvent within the family, the lower the viscosity/VOC that is obtainable. Aromatics such as xylene and toluene provide good solvency and can be readily used in combination with the more polar solvents. Glycol ether acetates can be used but normally do not provide as low viscosity/VOC. PM acetate exhibits film retention characteristics.

Catalysis – Due to the increased reactivity of Joncryl 934, a catalyst is not normally required. If additional speed of cure is desired, typical urethane catalysts such as dibutyltin dilaurate can be utilized. If required, catalysis with 0.005% dibutyltin dilaurate on total binder solids is normally recommended. Higher catalyst levels will result in shorter pot lives and faster cure rates. Other catalysts such as zinc octoate and other metallic soaps can also be used.

Additives – Efka® FL 3670 results in excellent flow and leveling. If a dispersant is necessary, Lecithin or Disparlon¹ KS-273N is recommended. For higher film build, thixotropes such as bentonite clays, fumed silicas, or organic additives such as Thixatrol² can be used.

Use as a Modifier – Joncryl 934 can be used as a modifier to upgrade the performance of low molecular weight polyesters and acrylic polyols. It can also be used to lower the viscosity/VOC of higher VOC systems including acrylics and polyesters.

¹Registered trademark of King Industries, Inc.

²Registered trademark of Elementis Specialties, Inc.

Starting Point Formulation

The following starting point formulation is recommended for an initial evaluation of Joncryl 934. Additional optimization of the formulation may be required to achieve desired results for specific applications.

Joncryl 934 POLYURETHANE FORMULATION, Formula #447-AA

Part A	Pounds	Gallons
Joncryl 934	149.85	17.22
Efka® FL 3670	2.37	0.29
n-Butyl acetate	38.20	5.20
Add while mixing:		
Ti-Pure ³ R-960	329.89	10.24

Disperse to 7 Hegman, then add:		
Joncryl 934	339.81	39.06
n-Butyl acetate	<u>137.72</u>	<u>18.74</u>
Subtotal	997.84	90.75
Part B		
Basonat® HI 100 NG	<u>90.00</u>	<u>9.25</u>
Total	1,087.84	100.00

Formulation Attributes

Solids	73.4% by wt, 60.6% by volume
Viscosity	200 cP
PVC	17%
Pigment:Binder ratio	0.7
NCO:OH ratio	1:1
VOC (calculated)	2.8 lbs/gal, 347 g/l

Coating Physical Properties and Chemical Resistance:

The following table shows the physical properties and chemical resistance of Joncryl 934 White Topcoat Formula 447-AA:

Gloss, 60° / 20°	94 / 88
Pencil hardness – gouge	F
Direct impact	85 in/lbs
Reverse impact	60 in/lbs
Acid resistance	9+
Caustic resistance	9
Solvent resistance	6

Acid, caustic, and solvent resistances are rated on a scale of 10 - 1, with 10 equal to no effect after a 24-hour spot test.

³Registered trademark of The Chemours Company.

Safety

General

The usual safety precautions when handling chemicals must be observed. These include the measures described in Federal, State, and Local health and safety regulations, thorough ventilation of the workplace, good skin care, and wearing of personal protective equipment.

Safety Data Sheet

All safety information is provided in the Safety Data Sheet for Joncryl 934.

Important

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