Industrial Coatings

Technical Data Sheet

Joncryl® 934 Polyol

BASF
We create chemistry

Product Description **Joncryl® 934 is high equivalent weight acrylic polyol for two-component polyurethane coating applications.**

Key Features & Benefits

- High equivalent weight for low isocyanate demand
- Fast cure
- Long pot life
- 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
Viscosity at 25.0 ± 0.5°C (Brookfield #4LV, 30 rpm, 30 seconds)	3,000 – 7,000 cps
Density at 20°C	~ 1.04 g/cm^3 (8.70 lbs/gal)
Equivalent weight as supplied, of solids	~ 1,040, 800
Tg	~ 7°C
Solvent	n-Butyl acetate

These typical values should not be interpreted as specifications.

Applications

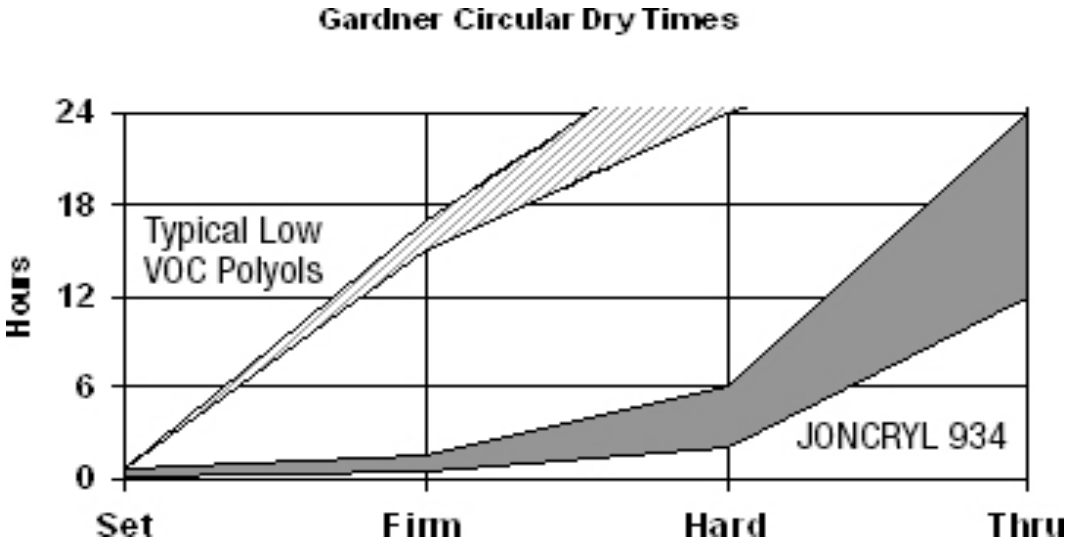
Joncryl® 934 is a high equivalent weight polyol designed for low isocyanate demand, 2-component polyurethane coatings. High solids coatings that are as low as 2.9 pounds per gallon of VOC can be formulated to spray by conventional or airless equipment. Joncryl® 934 displays good cure rate and pot life.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

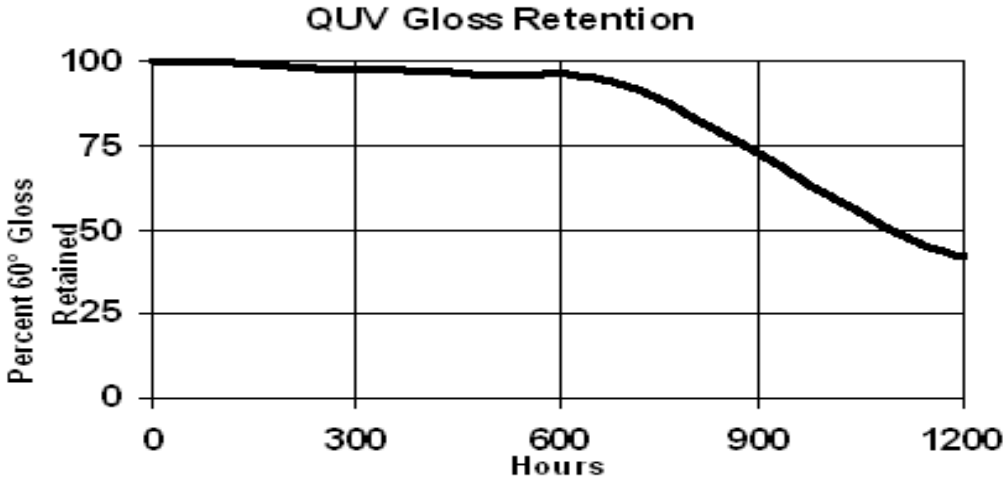
The following graph illustrates the dry times/cure rates of a typical white topcoat formulation based on Joncryl® 934. Due to the increased reactivity of Joncryl® 934, catalysts are not normally used. If increased reactivity is desired, typical urethane catalysts such as dibutyltin dilaurate can be used. 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.



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

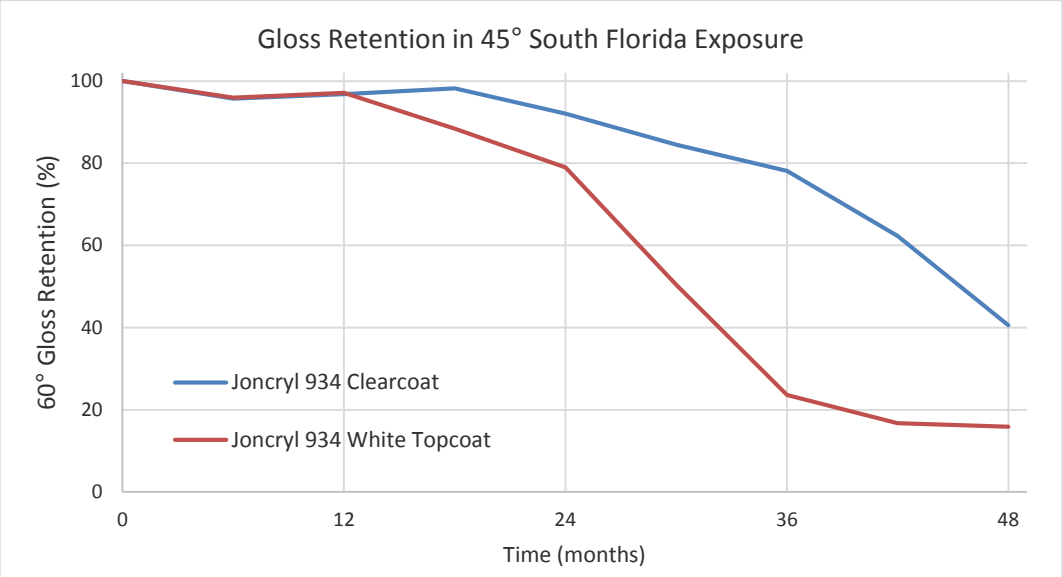
QUV Gloss Retention

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 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 Disparlon[1] KS-273N is recommended. For higher film build, thixatropes such as bentonite clays, fumed silicas, or organic additives such as Thixatrol[2] 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.

[1]Registered trademark of King Industries, Inc.
[2]Registered 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	137.72	18.74
Subtotal	997.84	90.75
Part B		
Basonat® HI 100	90.00	9.25
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.

[3]Registered 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

While the descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, they are provided for guidance only. Because many factors may affect processing or application/use, BASF recommends that the reader make tests to determine the suitability of a product for a particular purpose prior to use. **NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESCRIPTIONS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS.** In no case shall the descriptions, information, data or designs provided be considered a part of BASF's terms and conditions of sale. Further, the descriptions, designs, data, and information furnished by BASF hereunder are given gratis and BASF assumes no obligation or liability for the descriptions, designs, data or information given or results obtained all such being given and accepted at the reader's risk.

Responsible Care®
Good Chemistry at Work

BASF Corporation is fully committed to the Responsible Care® initiative in the USA, Canada, and Mexico.
For more information on Responsible Care® goto:
U.S.: www.basf.us/responsiblecare_usa
Canada: www.basf.us/responsiblecare_canada
México: www.basf.us/responsiblecare_mexico

U.S & Canada
BASF Corporation
24710 W Eleven Mile Road
Southfield, MI 48034
ph: 1(800) 231-7868
fax:1(800) 392-7429
Email: DispersionsPigmentsCC@basf.com
Email: edtech-info@basf.com
www.basf.us/dpsolutions

Mexico
BASF Mexicana, S.A. de C.V.
Av. Insurgentes Sur # 975
Col. Ciudad de los Deportes
C.P. 03710
Mexico, D.F.
Phone: (52-55) 5325-2756
Fax: (52-55) 5723-3011