Industrial Coatings

Technical Data Sheet

Joncryl® 902 Polyol

We create chemistry

Product Description **Joncryl® 902 is an acrylic polyol for high solids polyurethane coating applications.**

Key Features & Benefits

- Excellent durability
- Long pot life
- Excellent gloss retention
- Supplied in n-butyl acetate

Chemical Composition **Acrylic polyol**

Properties

Typical Properties

Appearance	clear liquid
Non-volatile at 150°C (0.5g, 60 minutes)	~ 75%
Hydroxyl number of solids	~ 112
Viscosity at 25.0 ± 0.5°C (Brookfield #4LV, 30 rpm, 60 seconds)	6,000 – 13,500 cP
Density at 20°C	~ 1.09 g/cm^3 (9.1 lbs/gal)
Equivalent weight as supplied, of solids	~ 667, 500
Tg (measured)	~ 20°C
Solvent	n-Butyl acetate

These typical values should not be interpreted as specifications.

Applications

Joncryl® 902 is an innovative acrylic oligomer for high solids polyurethane coatings. High solids coatings containing as low as 3.2 pounds per gallon of VOC (Volatile Organic Compounds) can be formulated to spray by conventional or airless equipment. Joncryl® 902 displays excellent viscosity characteristics without the addition of low molecular weight reactive diluents.

Joncryl® 902 should be considered as a candidate for high performance maintenance and transportation coatings as a replacement for conventional solids acrylic polyols.

Joncryl® 902 is recommended for applications such as:

- Interior/exterior general metal coating applications
- Automotive refinish applications

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 the isocyanates, their use should be avoided. Urethane-grade solvents should be used when available. Ketones will give the best viscosity/VOC due to a combination of good solvency and low density. Esters are the next best choice although they do not provide as low a viscosity/VOC as ketones due to their higher density. Generally, the lower the molecular weight of the solvent within the family, the lower the obtainable viscosity/VOC. 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 low viscosity/VOC. PM-Acetate should be avoided due to its film retention characteristics.

Catalysis – A level of 0.005% dibutyltin dilaurate on total binder solids is normally recommended. Higher catalyst level 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, then Lecithin or Disparlon[1] KS-273N is recommended. For higher film builds, thixatropes such as bentonite clays, fumed silicas, or organic additives such as Thixatrol[2], can be used.

Starting Point Formulations

The following starting point formulations are recommended for initial evaluation of Joncryl® 902. Additional optimization of the formulations may be required to achieve desired results for specific applications.

Joncryl® 902 CLEAR STARTING FORMULATION, Formula 1053111-02-07

Part A	**Pounds**	**Gallons**
Joncryl® 902	474.29	52.41
MAK	191.28	28.13
Efka® FL 3670	0.82	0.10
25% CAB[3]-551-0.01 in MAK	34.23	4.66
10% DBTDL in MAK	0.27	0.04
Subtotal	700.89	85.34
Part B		
Basonat® HI 100	142.61	14.66
Total	**843.50**	**100.00**

Formulation Attributes

Non-volatile	60.20% by wt, 51.62% by volume
Viscosity (A+B)	210 cP
NCO:OH ratio	1.05:1
VOC (calculated)	3.35 lbs/gal, 402.30 g/l
Weight per gallon	8.44 lbs
Mix ratio by volume	5.82:1

Joncryl® 902 GLOSS WHITE TOPCOAT, Formula 185-A

Part A	**Pounds**	**Gallons**
Joncryl® 902	205.00	22.30
Efka® FL 3670	2.21	0.27
n-Butyl acetate	37.00	5.10
Add while mixing:		
Ti-Pure[4] R-960	302.00	9.40
Disperse to 6 – 7 Hegman, then add:		
Joncryl® 902	244.00	26.40
n-Butyl acetate	169.00	23.00
10% DBTDL in MAK	0.22	0.03
Subtotal	959.43	86.50
Part B		
Basonat® HI 100	131.00	13.50
Total	**1,090.43**	**100.00**

[1]Registered trademark of King Industries, Inc.
[2]Registered trademark of Elementis Specialties, Inc.
[3]Registered trademark of Eastman Chemical Company.
[4]Registered trademark of The Chemours Company.

Formulation Attributes

Non-volatile	71.0% by wt, 55.0% by volume
Viscosity (A+B)	280 cP
PVC	17%
Pigment:Binder ratio	0.7
NCO:OH ratio	1.02:1
VOC (calculated)	3.20 lbs/gal, 383.0 g/l

Coating Physical Properties and Chemical Resistance

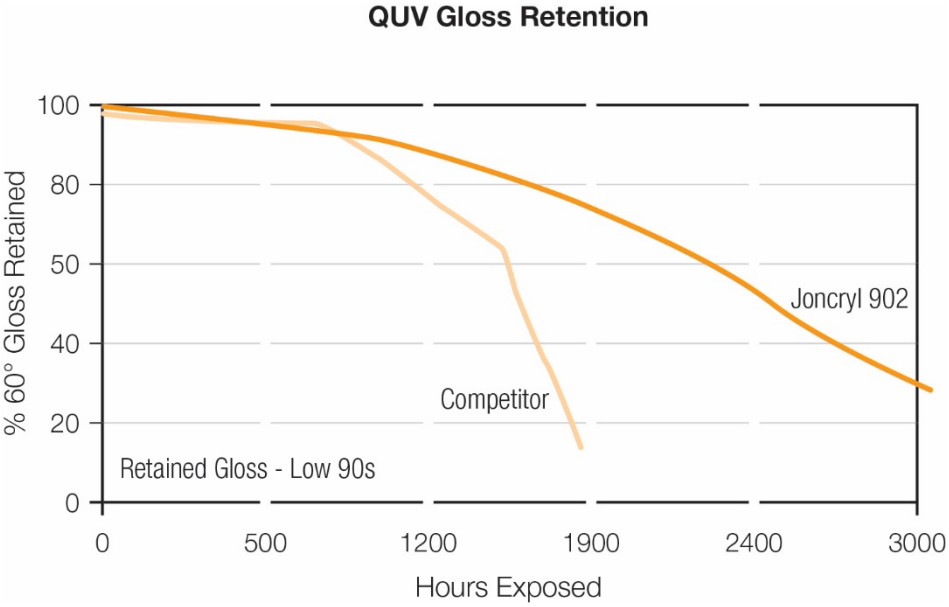
The following table displays the physical properties and chemical resistance of Joncryl® 902 White Topcoat Formula 185-A.

Gloss, 60°, 20°	92, 84
Pencil hardness	2H
Direct impact	32 in/lbs
Reverse impact	4 in/lbs
Acid resistance	8
Caustic resistance	9
Solvent resistance	8

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

QUV Gloss Retention

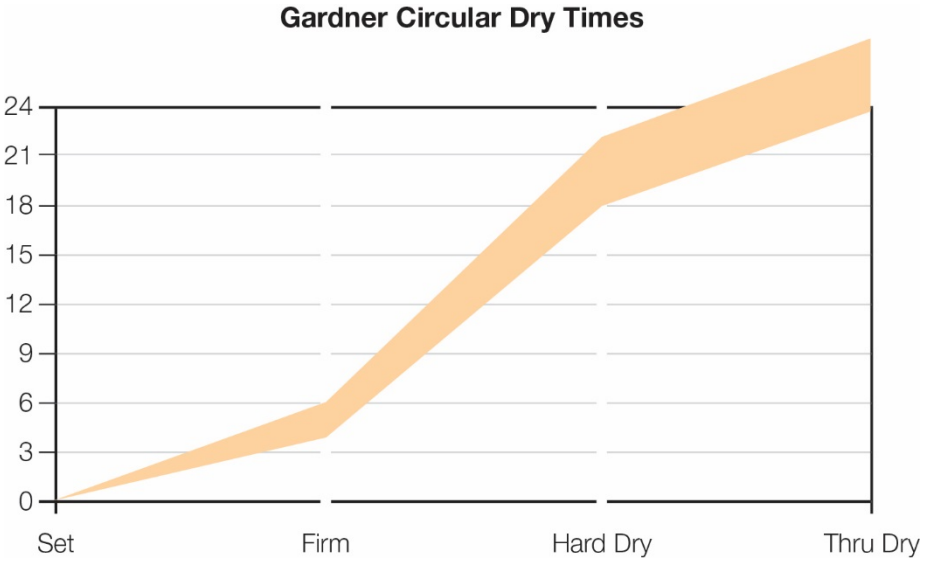
When formulated into a white topcoat formulation, Joncryl® 902 offers superior QUV gloss retention when compared to other systems of similar viscosity/VOC. QUV gloss retention results were obtained using UVB-313 bulbs with 4 hours of light at 60°C followed by 4 hours of condensation at 40°C. All coatings are white topcoat formulations at a 17% PVC with Basonat® HI 100 as the crosslinker and n-Butyl Acetate as the formulation solvent. The coatings are catalyzed with 0.005% dibutyltin dilaurate. No UV stabilizers were used.



*Note: **Both systems exhibit equal viscosity at 2.8 lbs/gal VOC.*

Cure/Dry Characteristics

The following graph illustrates the dry times/cure rates of a white topcoat formulation based on Joncryl® 902. Evaluation of Gardner dry times are very subjective and test results will normally lie somewhere within the area plotted on the chart below. The pot life of this system will normally be between 4 and 6 hours when pot life is defined as the time to double an initial viscosity of 250 cP.



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® 902.

Important

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