Industrial Coatings

Technical Data Sheet

Joncryl® 924 Polyol

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Product Description **Joncryl® 924 is an acrylic polyol for polyurethane coating applications.**

Key Features & Benefits

- Supplied in VOC-exempt solvent
- Accelerated cure rate
- Excellent flow and leveling
- Good chemical resistance

Chemical Composition **Acrylic polyol**

Properties

Typical Properties

Appearance	clear liquid
Non-volatile at 110°C (1g, 60 minutes)	~ 70%
Hydroxyl number of solids	~ 140
Viscosity at 25°C (Brookfield #4LV, 30 rpm, 60 seconds)	3,500 – 7,500 cps
Density at 20°C	~ 1.16 g/cm^3 (9.68 lbs/gal)
Equivalent weight as supplied, of solids	~ 571, 400
Tg	~ -7°C
Solvent	p-Chlorobenzotrifluoride (PCBTF)

These typical values should not be interpreted as specifications.

Applications

Joncryl® 924 is an innovative acrylic oligomer for high solids urethane coatings, which features fast cure with a practical pot life. Joncryl® 924 is supplied in the VOC-exempt solvent PCBTF for very low to near-zero VOC applications, although most formulations will contain 1.0 – 2.8 lbs/gal of VOC content. It possesses outstanding exterior durability and outstanding gloss, flow, leveling, and application properties.

Joncryl® 924 is recommended for applications such as:

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

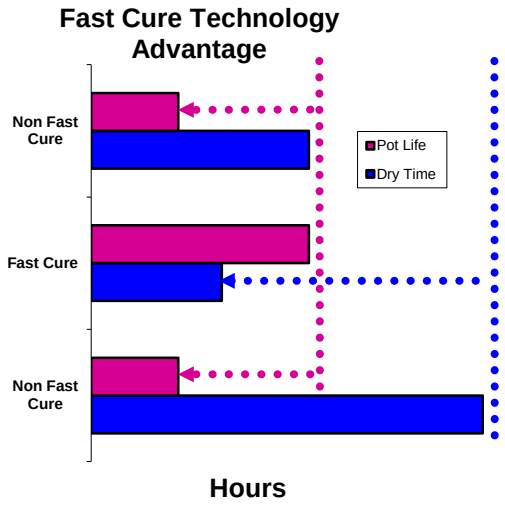
Since Joncryl® 924 is produced by SGO (Solid Grade Oligomer) polymerization, it provides the following attributes:

- Batch-to-batch reproducibility - The SGO process is a very high temperature and high pressure process. When monomers enter this high temperature/pressure environment they become very chemically excited and react in the same manner from batch-to-batch, minimizing quality issues.
- Improved clarity and color – Joncryl® 924 possess excellent clarity and is inherently lower in color than competitive products due to the SGO process.

- Low monomer odor – Joncryl® 924 exhibits significantly less objectionable residual monomer odor due to the SGO process than competitive products.
- Excellent gloss and appearance – Joncryl® 924 has excellent initial gloss and outstanding flow properties to combine for coatings with superior appearance properties.
- Outstanding flow, leveling, and application properties – Joncryl® 924 possess outstanding flow, leveling, and applications properties due to a reduction in high and low molecular weight tails from the SGO process.
- Alternate solvent availability – Joncryl® 924 is available in Methyl n-amyl ketone as Joncryl® 920 and in n-butyl acetate as Joncryl® 922. For more details on performance information please refer to the Joncryl® 920 Technical Data Sheet.

Fast Cure Technology

Joncryl® 924 is produced using BASF's "Fast Cure Technology." Fast cure technology, a proprietary technology, allows fast cure polyols to develop shorter cure cycles with long pot lives. The following chart compares a fast cure technology polyol to two conventional polyols of similar molecular weight, functionality, and Tg. These polyols all produce coatings of the same VOC capabilities.



The fast cure polyol has faster dry times and longer pot life than either of the materials it is compared to, even though all three are at the same VOC level. The pot life advantage diminishes at higher solids. However, if the conventional polyols are catalyzed at a level to provide similar dry time to products such as Joncryl® 924, they will typically have no useable pot life.

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 – PCBTF and Acetone have been found to be fully compatible with Joncryl® 924. Good film formation and spray application properties typically require a ratio in the area of 2:1 of PCBTF to Acetone in the overall formulation. When non-exempt solvents are used, the following guidelines are helpful. 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. n-Pentyl propionate solvent provides excellent flow and leveling and should be considered as a tail solvent.

Catalysis – Due to its increased reactivity profile, initial evaluations with Joncryl® 924 are recommended without catalysis. Joncryl® 924 does respond to typical catalysts and levels of 0.005% to 0.015% with dibutyltin dilaurate are typical. Catalysis with 0.005% dibutyltin dilaurate on total binder solids is normally recommended for first evaluation when a catalyst is desired. Catalyst addition will result in short pot lives and faster cure rates. 2,4-Pentanedione can be used to extend the pot life of systems when a tin

catalyst has been utilized. 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[3] can be used. CAB[2]-551-0.02 is recommended to modify flow properties when desired.

UV Stabilizers – For premium UV durability, a UV package will be required. A typical UV package includes 1% Tinuvin® 292 and 2% Tinuvin® 1130, based on resin solids. Irganox® 1010 which is an antioxidant can be useful in preventing yellowing in the QUV cabinet from the higher heat generated. This yellowing does not normally occur in outdoor exposures

Starting Point Formulations

The following starting point formulations are recommended for initial evaluation of Joncryl® 924. Additional optimization of the formulations may be required to achieve desired results for specific applications.

Joncryl® 924 "ZERO" VOC ACRYLIC URETHANE CLEAR TOPCOAT, Formula 0508a55-1

Part A	**Pounds**	**Gallons**
Joncryl® 924	293.04	30.21
p-Chlorbenzotrifluoride (PCBTF)	299.29	26.72
Acetone	124.77	18.79
Efka® FL 3670	0.25	0.03
25% CAB[2]-551-0.02 in Acetone	98.30	13.64
1% DBTDL in PCBTF	1.55	0.14
Subtotal	817.20	89.53
Part B		
Basonat® HI 100	101.51	10.47
Total	**918.71**	**100.00**

Formulation Attributes, Formula 0508a55-1

Solids	35.4% by wt, 35.4% by volume
Viscosity (Zahn #2)	16 seconds
NCO:OH ratio	1.04:1
VOC (calculated)	0 lbs/gal

Joncryl® 924 "2.1 lbs/gal" VOC ACRYLIC URETHANE CLEAR TOPCOAT, Formula 0508A55-3

Part A	**Pounds**	**Gallons**
Joncryl® 924	293.59	30.26
Methyl n-amyl ketone	46.00	6.77
Methyl iso-butyl ketone	45.00	6.75
PCBTF	195.27	17.44
Acetone	109.08	16.43
n-Pentyl propionate	36.00	4.76
Efka® FL 3670	0.25	0.03
25% CAB[2]-551-0.02 in Acetone	50.00	6.94
1% DBTDL in PCBTF	1.56	0.13
Subtotal	776.75	89.51
Part B		
Basonat® HI 100	101.71	10.49
Total	**878.46**	**100.00**

Formulation Attributes, Formula 0508A55-3

Solids	35.8% by wt, 34.2% by volume
Viscosity (Zahn #2)	16 seconds
NCO:OH ratio	1.04:1
VOC (calculated)	2.1 lbs/gal, 252 g/l

[1]Registered trademark of Elementis Specialties, Inc.
[2]Registered trademark of Eastman Chemical 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® 924.

Important

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