# Joncryl® 945

***Product Description*** **Joncryl 945 is a fast-curing acrylic polyol for high solids polyurethane coating applications.**

***Key Features & Benefits***

***- Very fast hardness development***
***- Low VOC capability***
***- Excellent gloss and gloss retention***
***- Good chemical resistance***

***Chemical Composition*** **Acrylic polyol**

## Properties

***Typical Properties***

| | |
|---|---|
| Appearance | Pale yellow liquid |
| Non-volatile at 150°C (0.5g, 60 minutes) | ~ 76 % |
| Hydroxyl number of solids | ~ 180 |
| Viscosity at 25.0 ± 0.5°C (Brookfield #4LV, 30 rpm, 60 seconds) | 3,500 – 5,500 cP |
| Equivalent weight as supplied, of solids | ~ 400, 310 |
| Density at 20°C | ~ 1.07 g/ml, 8.94 lbs/gal |
| Tg (measured) | ~ 17°C |
| Solvent | n-Butyl Acetate |

* These typical values should not be interpreted as specifications.

## Applications

Joncryl 945 is a fast-curing acrylic polyol designed for high solids polyurethane coatings. It displays excellent gloss and gloss retention as well as good chemical resistance. Joncryl 945 should be considered as a candidate for high performance maintenance and transportation coatings as a replacement for conventional solids urethane finishes.

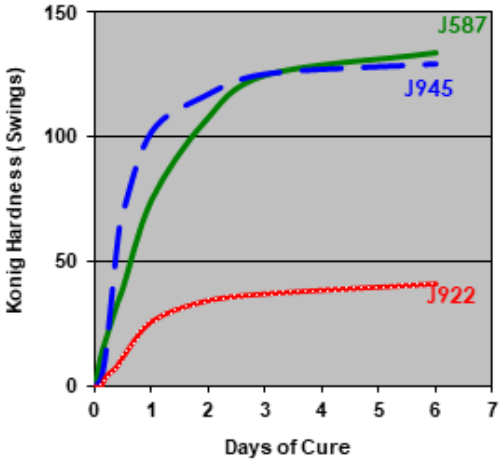
Joncryl 945 is recommended for applications such as:

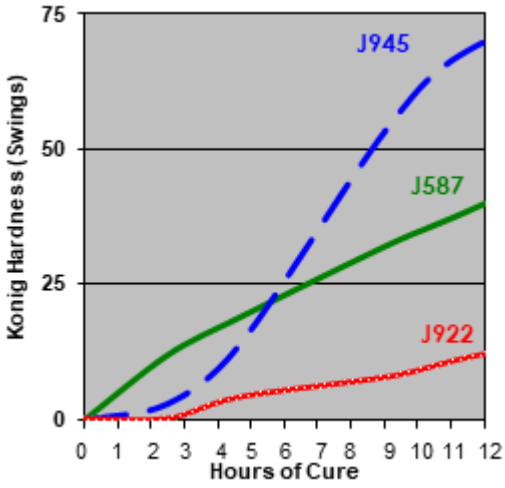
- Interior/exterior general metal coating applications
- Automotive refinish coating applications

***Cure/Dry Characteristics***

The following graphs illustrate the hardness development of an automotive refinish clear coats measured via König Hardness. Joncryl 945 has the hardness development approaching the lacquer drying of a Joncryl 587 polyol system and the viscosity/VOC approaching that of Joncryl 922.

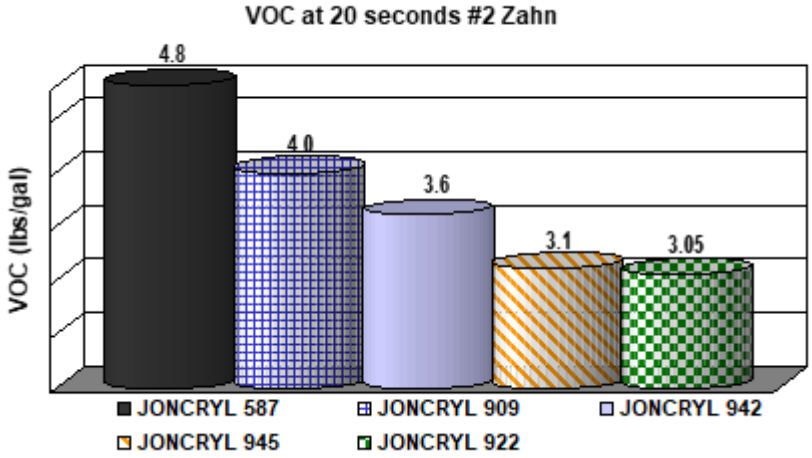
**König Hardness Development**



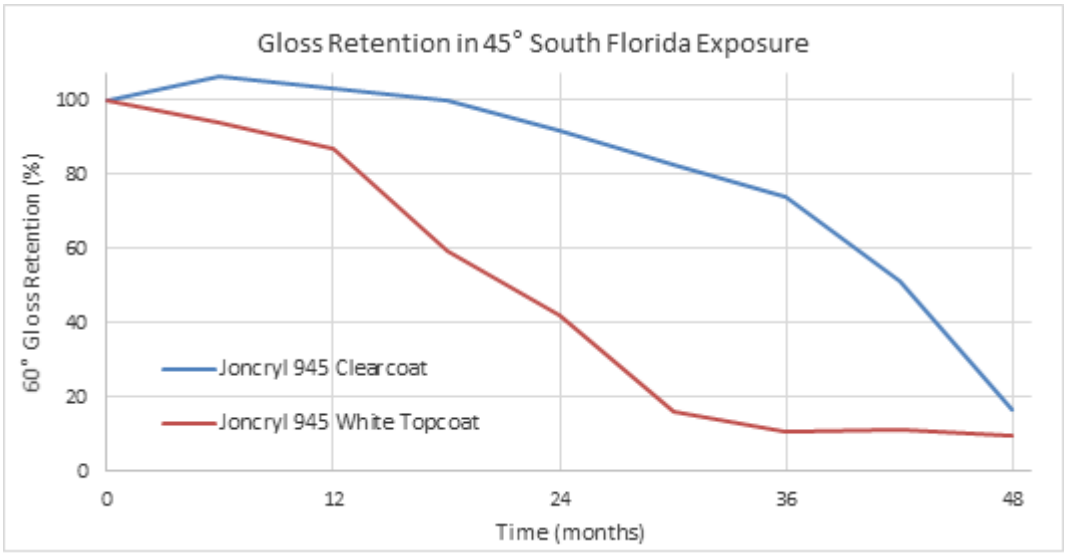

***VOC Capability***

Joncryl 945 is a low VOC acrylic polyol designed for 2-component acrylic urethane coatings. The VOC of Joncryl 945 is compared to the VOC of other BASF products in the following graph. All coatings were an automotive refinish-type, clear coats at 20 seconds on a Zahn #2.




***South Florida Weathering***

The following graph demonstrates the 60° gloss retention of polyurethane coating formulations based on Joncryl 945 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 the 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 more polar solvents. Toluene especially provides for low viscosity/VOC. 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** – Due to the increased reactivity of Joncryl 945, 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. 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[2] can be used.

**Use as a Modifier** – Joncryl 945 can be used as a modifier to upgrade the hardness development of slower curing polyesters and acrylic polyols. It can also be used to lower the viscosity/VOC of higher VOC systems including acrylics and polyesters. Significant utility can be expected by blending Joncryl 945 with Joncryl 587 or Joncryl 804.

***Starting Point Formulation***

The following starting point formulation is recommended for an initial evaluation of Joncryl 945. Additional optimization of the formulation may be required to achieve desired results for specific applications.

**Joncryl 945 LOW VOC CLEAR STARTING FORMULATION, Formula 1053111-02-17**

| **Part A** | **Pounds** | **Gallons** |
|---|---|---|
| Joncryl 945 | 415.58 | 46.69 |
| p-Chlorobenzotribluoride (PCBTF) | 237.85 | 21.26 |
| n-Butyl propionate | 24.85 | 3.40 |
| 2-Ethylhexyl acetate | 6.42 | 0.88 |
| Efka® FL 3670 | 2.29 | 0.28 |
| Efka® SL 3299 | 1.04 | 0.12 |
| 25% CAB[3]-551-0.02 in acetone | 42.19 | 5.89 |
| Tinuvin® 292 | 2.91 | 0.35 |
| Tinuvin® 1130 | 4.01 | 0.14 |
| 10% Irganox® 1010 in n-BA | 5.41 | 0.72 |
| Subtotal | 742.55 | 80.00 |
| **Part B** | | |
| Basonat® HI 100 NG | 194.60 | 20.00 |
| **Total** | **937.15** | **100.00** |

**Formulation Attributes:**

| | |
|---|---|
| Non-volatile | 56.50% by wt, 55.20% by volume |
| Viscosity (A + B) | 272 cP |
| Weight per gallon | 9.37 lbs/gal |
| Mix ratio by volume | 4:1 |
| NCO:OH ratio | 1:1 |
| VOC (calculated) | 1.86 lbs/gal, 223 g/l |

*[1]Registered trademark of King Industries, Inc.*
*[2]Registered trademark of Elementis Specialties, Inc.*
*[3]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 945.

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## Important

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