# Joncryl® 587

***Product Description*** **Joncryl 587 is a solid flake acrylic polyol for conventional solids polyurethane and industrial powder coating applications.**

***Key Features & Benefits***

***- Wide solvent selection latitude***
***- Exceptional appearance***
***- Excellent gloss and color retention***
***- Excellent exterior durability and chemical resistance***

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

## Properties

***Typical Properties***

| | |
|---|---|
| Appearance | clear flake |
| Hydroxyl number | ~ 92 |
| Non-volatile at 150°C (1g, 60 minutes) | ~ 97.5% |
| Density | ~ 1.16 g/cm³ (9.7 lbs/gal) |
| Hydroxyl equivalent weight as supplied, of solids | ~ 610 |
| Tg | ~ 57°C |

* These typical values should not be interpreted as specifications.

## Application

Joncryl 587 is a solid flake acrylic polyol for conventional solids 2K polyurethane and powder coating applications.

Joncryl 587 is recommended for applications such as:

- Interior/exterior automotive OEM and refinish coating applications
- Interior/exterior general metal coating applications
- Interior/exterior plastic component coating applications
- Exterior wood coatings for furniture applications
- Interior/exterior general metal powder coating applications

***Formulation Guidelines***

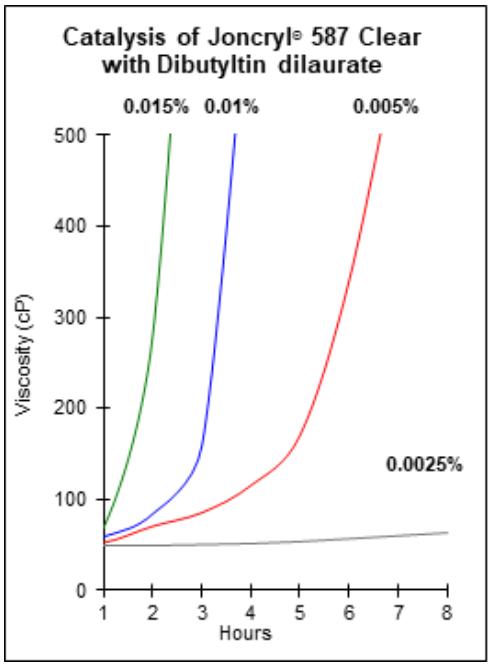
**Solvent selection** – Because the hydroxyl functionality of alcohols and glycol ethers can react with the isocyanates, their use should be avoided. Urethane-grade solvents should be used when available. Ketone solvents will give the best viscosity/VOC due to a combination of good solvency and low density. 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 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.

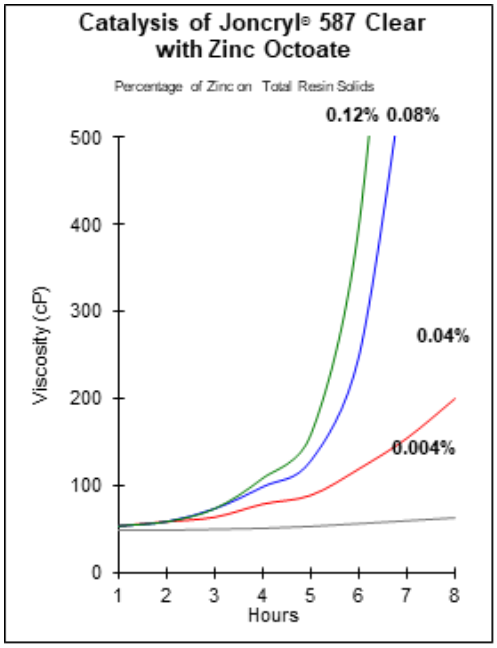
Joncryl 587-AC is recommended for applications such as:

- Interior/exterior automotive OEM and refinish coating applications
- Interior/exterior general metal coating applications
- Interior/exterior plastic component coating applications
- Exterior wood coatings for furniture applications

**Crosslinker selection** – For maximum gloss retention properties, aliphatic isocyanates are recommended. The 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.

**Catalysis** – 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. The following graphs illustrate the effect of increasing catalysis on pot life.



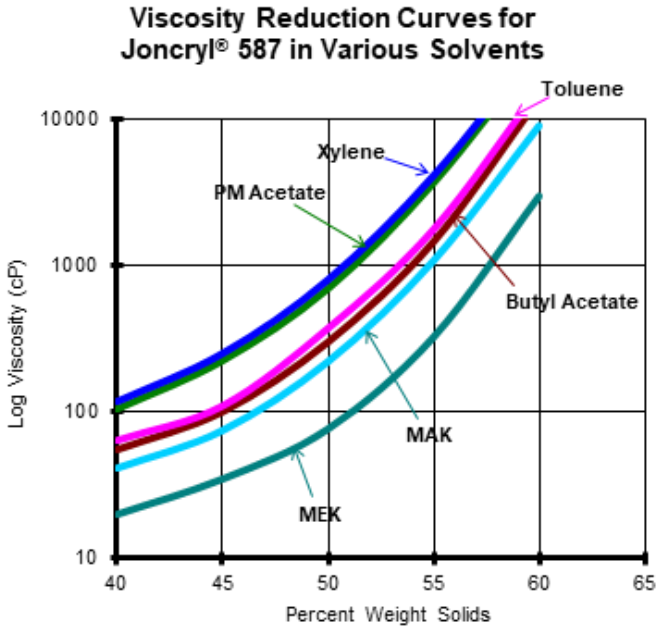

**Additives** – Efka® FL 3670 results in excellent flow and leveling. If a dispersant is necessary, Lecithin or Disparlon[1] KS-273N is recommended. For higher film build, thixotropes such as bentonite clays, fumed silicas, or organic additives such as Thixatrol[2] can be used.

**Conventional Solids for Polyurethane Coatings**

Joncryl 587 is a solid flake acrylic polyol designed for use in polyurethane coatings at conventional solids. The solid flake form of Joncryl 587 allows the coating manufacturer maximum formulation latitude in solvent selection as well as maximized cost-saving potential. The optimized equivalent weight of Joncryl 587 results in a low isocyanate demand with sufficient crosslink density to provide good chemical and solvent resistance. The acrylic polyol backbone of Joncryl 587 provides excellent gloss retention performance. Joncryl 587 should be considered for conventional solids applications in the maintenance, transportation, and other areas where two-component polyurethanes are used.

***Viscosity Reduction Curves*** Joncryl 587 is supplied as an easy-to-cut solid flake. The graph on the following page shows the viscosity when various solvents are used to cut Joncryl 587 into solution.

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

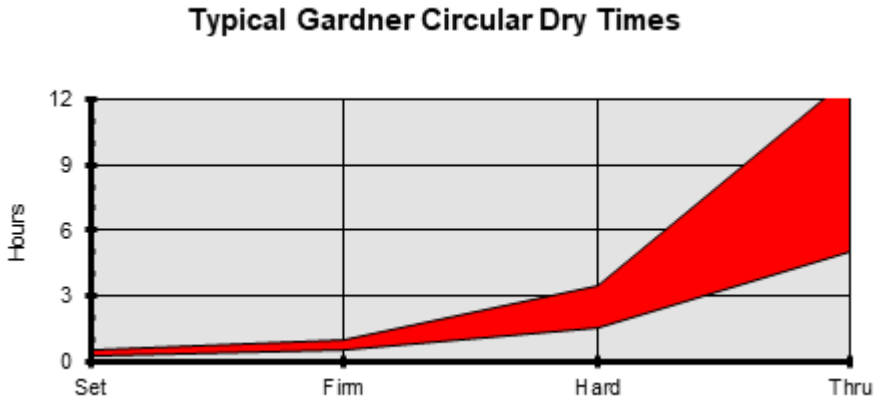



***Flake Cutting Procedures*** Joncryl 587 can be cut in-situ during the coating manufacture or pre-cut and stored for later use. The in-situ method is generally preferred for maximum cost saving and is illustrated in the following starting point formulations. A pre-cut may be prepared by the following method, using a high-speed disperser or equivalent:

- Charge solvent to mixing vessel and begin mixing at high speed.
- Add Joncryl 587 flakes while mixing. Increase speed of mixing to compensate for increasing viscosity. Maintain vortex during cutting phase.
- After all flakes have been added, cover tank and mix at high speed until resin dissolves.
- Filtration during filling is recommended to remove any undissolved material.

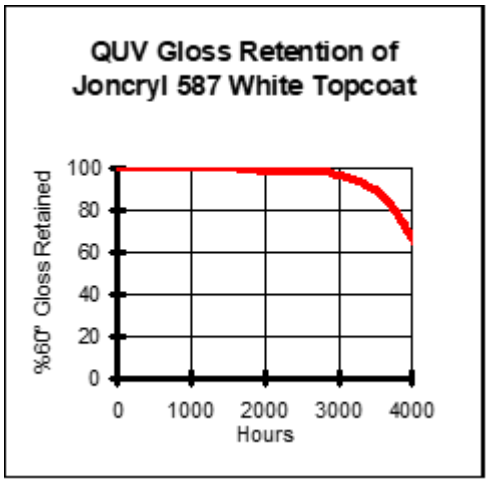
***Cure/Dry Characteristics***

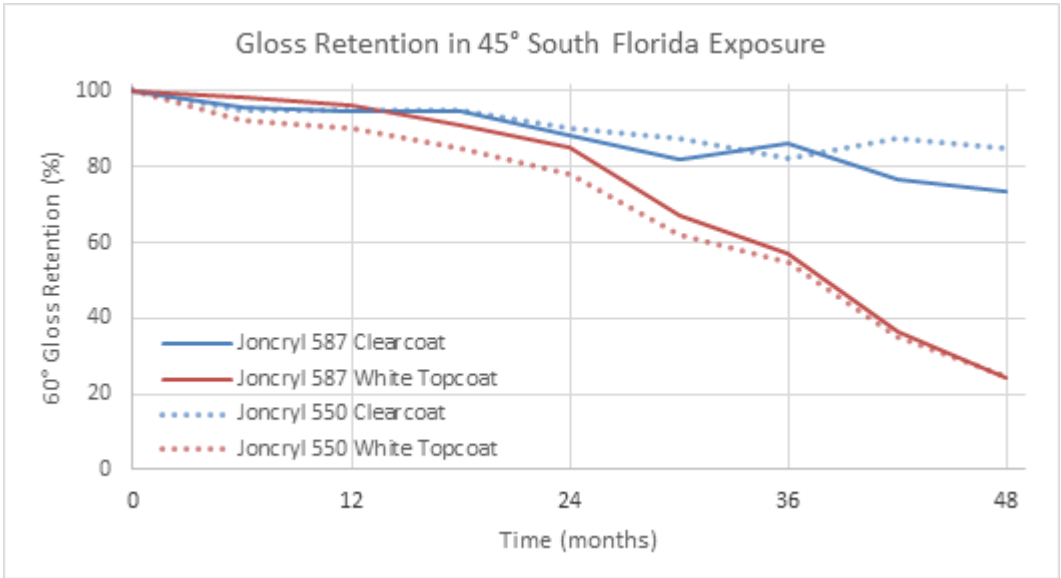
The following graph illustrates typical dry times/cure rates of white topcoat formulations based on Joncryl 587. Evaluations of Gardner Circular Dry Times are very subjective. Dry times will normally lie somewhere within the area plotted on the graph below. Pot life was determined with a recording Brookfield viscometer and is defined as the time required to double the initial viscosity of approximately 250 centipoises. The pot life will normally be between 4 – 8 hours when measured by this method.




***UV Durability***

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 60° gloss retention of polyurethane coating formulations based on Joncryl 587 in South Florida weathering (ASTM G7-05) are compared to those based on Joncryl 550. No UV stabilizers were used.



***Starting Point Formulations***

The following starting point formulations are recommended for an initial evaluation of Joncryl 587. Additional optimization of the formulations may be required to achieve desired results for specific applications.

**Joncryl 587 CLEAR COATING, Formula 587-6**

| **Part A** | **Pounds** | **Gallons** |
|---|---|---|
| Methyl n-amyl ketone | 268.33 | 39.46 |
| Efka® FL 3670 | 2.62 | 0.32 |
| **Add flakes while mixing:** | | |
| Joncryl 587 | 263.55 | 27.17 |
| **Mix at high speed until resin flakes dissolve, then add:** | | |
| Methyl n-amyl ketone | 156.54 | 23.02 |
| Dibutyltin dilaurate (10% in Mn-AK) | 0.20 | 0.03 |
| Subtotal | 691.24 | 90.00 |
| **Part B** | | |
| Basonat® HB 100 | 84.80 | 9.07 |
| Methyl n-amyl ketone | 6.32 | 0.93 |
| **Total** | 782.36 | 100.00 |

**Formulation Attributes**

| | |
|---|---|
| Solids | 45% by wt, 37% by volume |
| Viscosity (Brookfield, Stormer) | 200 cP, 53 KU |
| NCO:OH ratio | 1.05:1 |
| VOC (calculated) | 4.3 lbs/gal, 518 g/l |

**Joncryl 587 WHITE MAINTENANCE TOPCOAT, Formula 587-5**

| **Part A** | **Pounds** | **Gallons** |
|---|---|---|
| n-Butyl acetate | 90.48 | 12.31 |
| Efka® FL 3670 | 2.45 | 0.30 |
| **Add flakes while mixing:** | | |
| Joncryl 587 | 100.98 | 10.41 |
| **Mix at high speed until resin flakes dissolve, then add:** | | |
| Cab-O-Sil[5] M-5 | 2.00 | 0.10 |
| Ti-Pure[6] R-960 | 252.13 | 7.83 |
| **Disperse at high speed to 6 – 7 Hegman, then add the following directly to grind paste:** | | |
| Methyl n-amyl ketone | 90.37 | 13.29 |
| Joncryl 587 | 169.65 | 17.49 |
| **Mix at high speed until resin completely dissolves, then add:** | | |
| Methyl n-amyl ketone | 89.56 | 13.17 |
| n-Butyl acetate | 26.75 | 3.64 |
| Toluene | 63.60 | 8.76 |
| Dibutyltin dilaurate (10% in Mn-AK) | 0.20 | 0.03 |
| Subtotal | 888.17 | 87.33 |
| **Part B** | | |
| Basonat® HB 175 MP/X | 113.14 | 12.67 |
| **Total** | 1,001.31 | 100.00 |

**Formulation Attributes**

| | |
|---|---|
| Solids | 61% by wt, 45% by volume |
| Viscosity (Brookfield, Stormer) | 400 cP, 67 KU |
| NCO:OH ratio | 1:1 |
| PVC | 17% |
| Pigment:Binder ratio | 0.7 |
| VOC (calculated) | 3.9 lbs/gal, 468 g/l |

**Formula 587-5 Coating Physical Properties and Chemical resistance**

| | |
|---|---|
| Gloss 60° | 90 |
| Gloss 20° | 79 |
| Pencil hardness | 4H |
| König hardness | 125 |
| Direct impact | 6 in/lb |
| Reverse impact | < 4 in/lb |
| Acid resistance | 10 |
| Caustic resistance | 10 |
| Solvent resistance | 9 |
| *Acid, caustic, and solvent resistances are rated on a scale of 10 – 1, where 10 = no effect.* | |

[5]*Registered trademark of Cabot Corporation.*
[6]*Registered trademark of The Chemours Company.*

**Joncryl 587 BLACK HIGH GLOSS FORMULATION**

| **Part A** | **Pounds** | **Gallons** |
|---|---|---|
| n-Butyl acetate | 128.70 | 17.51 |
| Efka® FL 3670 | 4.17 | 0.51 |
| **Add flakes while mixing:** | | |
| Joncryl 587 | 63.24 | 6.52 |
| **Mix at high speed until resin flakes dissolve, then add:** | | |
| Disparlon[2] KS-273N | 0.40 | 0.06 |
| Cab-O-Sil[5] M-5 | 3.40 | 0.17 |
| Special Black[7] 4A | 12.60 | 0.80 |
| **Sand-grind to 7 Hegman, then add the following directly to grind paste:** | | |
| Methyl n-amyl ketone | 64.40 | 9.47 |
| Joncryl 587 | 192.93 | 19.89 |
| **Mix at high speed until resin completely dissolves, then add:** | | |
| Methyl n-amyl ketone | 54.60 | 8.03 |
| Toluene | 63.60 | 8.76 |
| Dibutyltin dilaurate (10% in Mn-AK) | 0.20 | 0.03 |
| Methyl ethyl ketone | 105.01 | 15.65 |
| Subtotal | 693.25 | 87.40 |
| **Part B** | | |
| Basonat® HB 175 MP/X | 112.52 | 12.60 |
| **Total** | 805.77 | 100.00 |

**Formulation Attributes**

| | |
|---|---|
| Solids | 45% by wt, 37% by volume |
| Viscosity (Brookfield, Stormer) | 250 cP, 59 KU |
| NCO:OH ratio | 1.05:1 |
| PVC | 3% |
| Pigment:Binder ratio | 0.04 |
| VOC (calculated) | 4.47 lbs/gal, 535 g/l |

**Hydroxy Functional Acrylic Polyol for Powder Coatings**

Joncryl 587 is a hydroxyl functional acrylic polyol designed for UV-resistant urethane acrylic powder coatings. These coatings typically utilize blocked polyisocyanate crosslinkers and result in very hard, durable films. Joncryl 587 provides an excellent alternative to UV-sensitive polyester powder coatings.

Joncryl 587 reacts readily with any crosslinker designed for use with hydroxy functional resins in powder coatings.

The following table represents the typical physical properties and chemical resistance of a Joncryl 587 high gloss black coating formulated on the following page.

| | | |
|---|---|---|
| Gloss 60° | 89 | ASTM D-523 |
| Pencil hardness | 2H | ASTM D 3363-74, Eagle Turquoise |
| MEK double rubs | 100+ | PCI test procedure #8 |
| Crosshatch adhesion | 95% | ASTM D 3359-83 |
| Conical mandrel (1/8") | Pass | |
| Direct impact (in. lbs) | 40 | ASTM D-2794 |
| Reverse impact | < 10 | ASTM D-2794 |
| Cure | 25 minutes at 190°C | |
| Substrate | B1000 over CRS | |
| Film thickness | 2.3 mils (58µ) | |

[7]*Registered trademark of Evonik Degussa GmbH LLC.*

***Starting Point Formulation***

The following starting point formulation is recommended for an initial evaluation of Joncryl 587. Additional optimization of the formulation may be required to achieve desired results for specific applications.

**HIGH GLOSS BLACK, Formula 414-B**

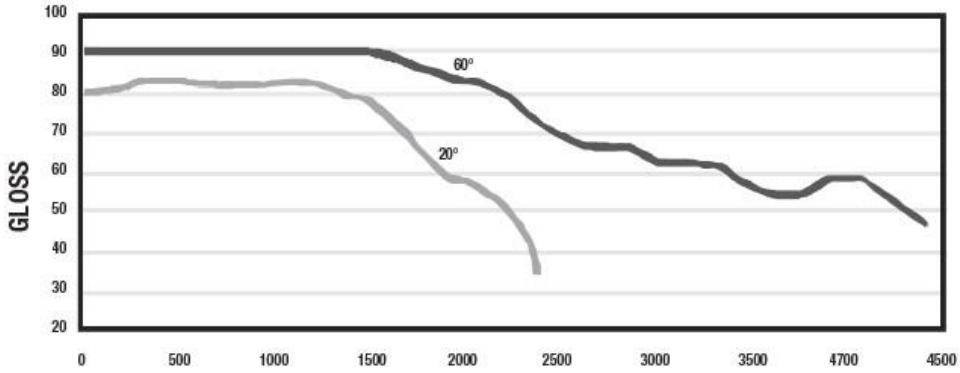
| **Materials** | **Weight %** |
|---|---|
| Joncryl 587 | 653.0 |
| Vestagon[7] BF-1530 | 307.0 |
| Modaflow[8] Powder III | 20.0 |
| Uraflow[9] B | 6.7 |
| Special Black[7] 4A | 13.3 |
| **Total** | 100.00 |

**Formulation Constants**

| | |
|---|---|
| PVC | 1.0% |
| Gel time at 200°C | 45 seconds |
| NCO:OH ratio | 1:1 |
| **Extrusion Parameters (Buss PLK 46)** | |
| Zone 1 (kneading screw temperature) | 50°C |
| Zone 2 (jacket temperature) | 90°C |
| RPM | 200 |

***Exterior Durability***

Powder coatings formulated with Joncryl 587 offer excellent QUV gloss retention. The following QUV gloss retention data was obtained using UVB-313B bulbs. The Joncryl 587 high gloss black coating was formulated at a pigment-to-binder ratio of 0.013 with a 1:1 resin-to-crosslinker stoichiometry.




Total Exposure Time (hours)
Conditions: QUV 313B, 4X4 Cycle, 40°C x 60°C

[8]*Registered trademark of Cytec Technology Corp.*
[9]*Registered trademark of GCA Chemical.*

## 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 587.

## Important


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

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