We create chemistry

Joncryl® 550

Product Description **Joncryl 550 is a conventional solid, acrylic polyol for 2K polyurethane and melamine-crosslinked coatings.**

Key Features & Benefits

- Lacquer-like dry times
- Excellent gloss and gloss retention
- Good chemical resistance

Chemical Composition **Acrylic polyol**

Properties

Typical Properties

Appearance	clear liquid
Hydroxyl number of solids	~ 90
Acid number of solids	~ 8
Non-volatile at 150°C (0.5g, 60 minutes)	~ 62%
Viscosity at 25.0°C ± 0.5°C (Brookfield #4LV, 30 rpm, 30 seconds)	5,000 – 9,500 cP
Density at 20°C (68°F)	~ 1.05 g/cm³ (8.85 lbs/gal)
Equivalent weight as supplied, of solids	~ 1,000, 620
Tg	~ 49°C
Solvent	PM acetate/toluene (65:35)

* These typical values should not be interpreted as specifications.

Application

Joncryl 550 is a hydroxyl-functional acrylic oligomer designed for conventional solids isocyanate- and melamine-crosslinked systems. Joncryl 550 is a drop-in replacement with minimum levels of reformulation and testing for several commercially available competitive acrylic polymers. It is a typical “workhorse” acrylic resin supplied in a 65/35 blend of PM-acetate/toluene. Joncryl 550 differs from Joncryl 587 in cure time (faster) and UV durability.

Joncryl 550 is recommended for applications such as:

- Interior/exterior automotive OEM and refinish applications
- Interior/exterior general metal industrial coating applications
- Interior/exterior plastic component coating applications
- Interior/exterior concrete coatings

Joncryl 550 is available in the following solvents as the applicable product name:

- Xylene as Joncryl 551
- n-Butyl Acetate as Joncryl 552
- t-Butyl Acetate exempt solvent as Joncryl 558

Please refer to each product’s Technical Data Sheet for performance information and specific starting point formulation

SGO Polymerization Process

Joncryl 550 is produced by the exclusive SGO (Solid Grade Oligomer) polymerization process. The SGO process does not utilize a reflux solvent, as does a conventional bulk polymerization process. When a polyol is made via conventional polymerization utilizing a different reflux solvent, a different molecular structure result. Efforts are made to make both versions of the product as close as possible, however, differences are unavoidable. Since the SGO process does not utilize a reflux solvent in its polymerization process, the resulting product is THE same regardless of the solvent in which the resin is supplied.

The SGO process is a very high temperature and high-pressure process. When monomers enter this high temperature/pressure environment they become chemically excited and react in the same manner from batch-to-batch, minimizing quality issues.

Due to Joncryl 550 being produced by the SGO process, it exhibits excellent clarity and significantly less objectionable residual monomer odor and is inherently low in color.

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 isocyanate, 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. Toluene especially provides 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. VOC-exempt solvents have been found to work well and should be considered when lower VOC capability is desired.

Catalysis – Joncryl 550 is normally catalyzed at 0.005% to 0.015% with dibutyltin dilaurate. Catalysis with 0.01% 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, thixotropes such as bentonite clays, fumed silicas, or organic additives such as Thixatrol[2] can be used. CAB[3]-551-0.02 is recommended to modify flow properties when desired.

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

Starting Point Formulation

The following starting point formulation is recommended for an initial evaluation of Joncryl 550. Additional optimization of the formulation will be required to achieve desired results for specific applications.

Joncryl 550 ACRYLIC URETHANE AUTO REFINISH CLEAR TOPCOAT, Formula 0382a155-2

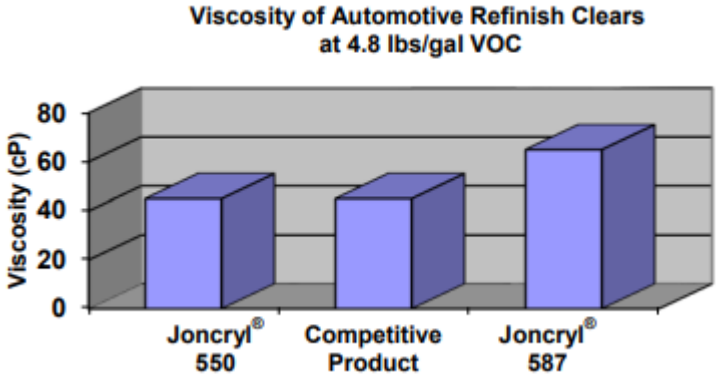
Part A	**Pounds**	**Gallons**
Joncryl 550	385.03	43.75
Efka® FL 3670	1.58	0.19
MAK	104.63	15.39
MIBK	104.63	15.69
MEK	103.33	15.40
Tinuvin® 1130	4.74	0.49
Tinuvin® 292	3.16	0.38
Irganox® 1010	3.16	0.33
1% DBTDL in 2,4-Pentanedione	3.16	0.39
Subtotal	713.42	92.01
Part B		
Basonat® HI 100 NG	77.23	7.94
Total	**790.65**	**99.95**

Formulation Attributes

Solids	41.50% by wt, 33.00% by volume
Viscosity (Brookfield)	140 cP
NCO:OH ratio	1.05:1
VOC (calculated)	4.63 lbs/gal, 554.63 g/l

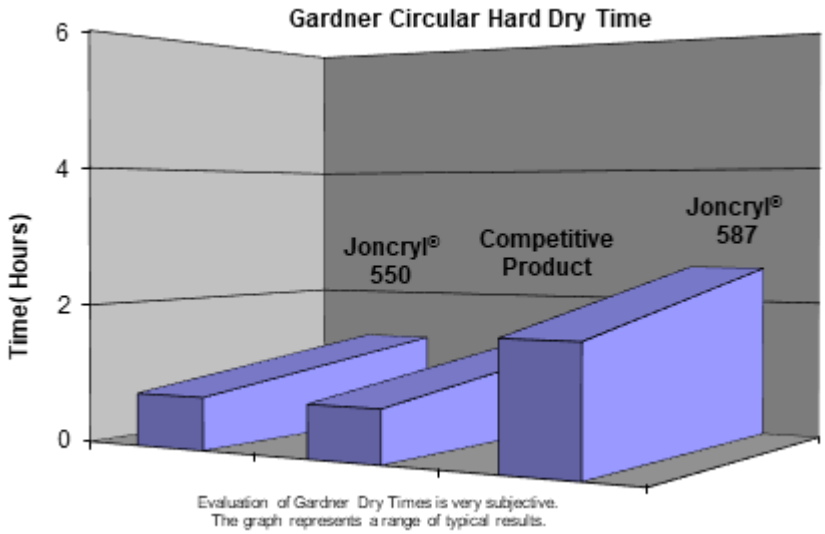
Viscosity/VOC Capability

The following graph illustrates the viscosity of a clear automotive topcoat formulation based on Joncryl 550 as compared to a competitive acrylic polyol and Joncryl 587.



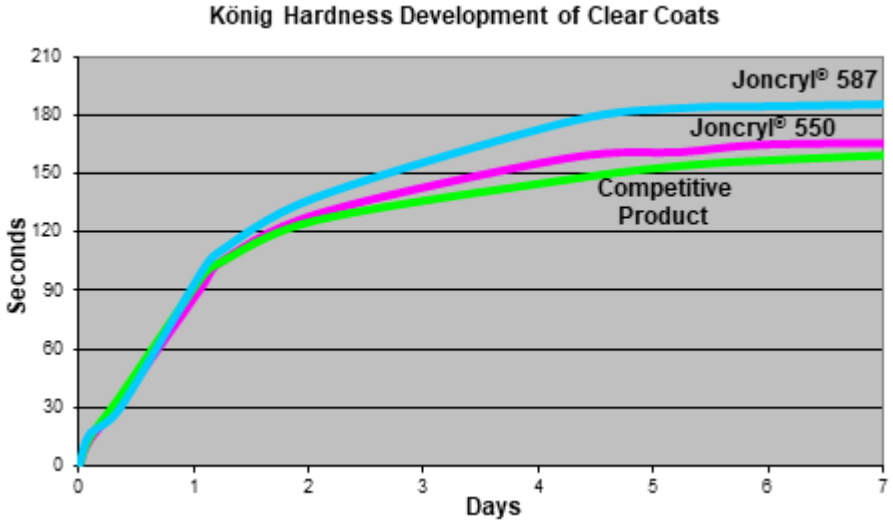
Cure/Dry Characteristics

The following graph illustrates the dry times/cure rates of a clear automotive topcoat formulation based on Joncryl 550 as compared to a competitive product and Joncryl 587.



Hardness Development

The following graph demonstrates the hardness development obtained with Joncryl 550 as compared to a competitive product and Joncryl 587.



Chemical Resistance

The following table compares the chemical resistance of clear coats based on Joncryl 550 to a competitive product and Joncryl 587. Test results are 24-hour covered spot tests.

	5% Sulfuric Acid	5% Hydrochloric Acid	5% Acetic Acid	5% Sodium Hydroxide	5% Ammonia	Xylene
Joncryl 550	10	10	10	10	10	10
Competitive Product	10	10	10	10	10	10
Joncryl 587	10	10	10	10	10	10
Note: 10 = No effect or recovers						

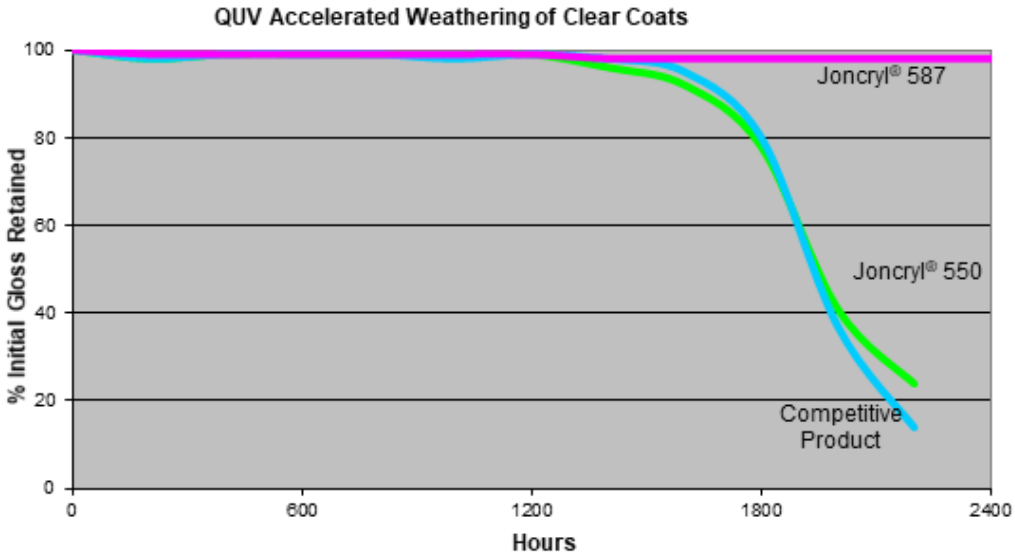
Physical Properties

The following table contains physical properties for clear coats based on Joncryl 550 as compared to a competitive product and Joncryl 587.

	Gloss 20° / 60°	Pencil Hardness	Impact Resistance Direct / Reverse
Joncryl 550	90 / 95	2H	160 / 80
Competitive Product	90 / 95	2H	100 / 50
Joncryl 587	90 / 95	2H	30 / 10

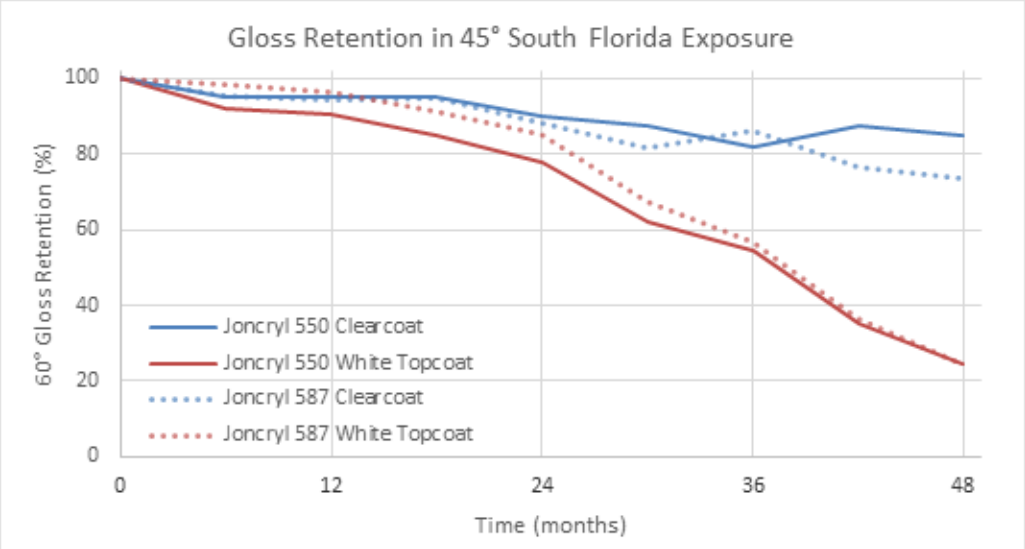
QUV Weathering

The following graph demonstrates the accelerated weathering resistance obtained with Joncryl 550 as compared to a competitive product and Joncryl 587. Test conditions involve 4 hours of light at 50°C and UVB-313 bulbs followed by 4 hours of condensation at 40°C.



South Florida Weathering

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



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 550.

Important

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BASF Corporation
Dispersions and Resins
11501 Steele Creek Road
Charlotte, North Carolina 28273
Phone: (800) 251 – 0612
Email: CustCare-Charlotte@basf.com
www.basf.us/dpsolutions