

Joncryl® 819

Product Description	Joncryl® 819 is a solid flake acrylic resin for industrial hybrid powder coating applications.
Key Features & Benefits	<ul style="list-style-type: none">- Exceptional flexibility- Hardness- Chemical resistance- Economical low gloss
Chemical Composition	Carboxyl functional acrylic resin

Properties

Typical Properties	Appearance	Clear flake
	Molecular Weight (Mw)	~15,000
	Non-volatile	>99%
	Acid number	
	(1g in 50:50 3A alcohol:acetone)	~ 75
	Equivalent weight	~ 748
	Tg	~ 57°C
	Typical combining ratio (acrylic:epoxy)	52:48

These typical values should not be interpreted as specifications.

Applications

Joncryl® 819 is a carboxyl functional, solid grade acrylic resin designed for powder coating applications. When reacted with a bis-phenol A epoxy to formulate a hybrid coating, the resultant film displays all of the flexibility characteristics associated with more traditional polyester/epoxy hybrids with the additional advantages of superior UV stability, excellent chemical resistance, and excellent hardness.

Joncryl® 819 should be considered as a polyester replacement in hybrid systems where improvements in hardness, chemical resistance and UV resistance are desired. In addition, Joncryl® 819 epoxy hybrids produce excellent low gloss coatings (in combination with Joncryl® 848) that are frequently more economical than polyester or epoxy based low gloss systems. This application is described in detail in the product review, *Acrylic Epoxy Hybrids: Low Gloss Applications*.

Joncryl® 819 is recommended for applications such as:

- Interior/exterior general metal powder coating applications

Formulation Guidelines

One important difference between Joncryl® 819 and the polyesters generally utilized in hybrid applications is that Joncryl® 819 requires the addition of a catalyst for the acid epoxy reaction. It is crucial that the low level of catalyst required be uniformly distributed to achieve maximum mechanical film properties. Joncryl® 820, a catalyzed version of Joncryl® 819, is also commercially available. A product review titled, *Powder Coatings Acrylic / Epoxy Hybrids: Joncryl® 819 Formulating Guidelines* offers specific recommendations for optimizing film performance.

There is a multitude of epoxy resins available for hybrid applications. Data presented here reflects work with Araldite¹ GT 6063. Many opportunities exist for improvement in properties with alternate epoxies, flow agents, light stabilizers, and catalysts. The product review, *Powder Coatings Acrylic Epoxy Hybrids: Choice of Epoxy* discusses the effects of epoxy on film properties.

Acrylic hybrids can be formulated to be almost completely compatible with other chemistries commonly used in powder coatings. The product review, *Powder Coatings Acrylic/Polyester Compatibility*, outlines best practices formulation recommendations to guide the development of compatible formulations.

Starting Point Formulation

The following starting point formulation is recommended for an initial evaluation of Joncryl® 819. Additional optimization of the formulation may be required to achieve desired results for specific applications.

Joncryl® 819 ACRYLIC HYBRID

	HIGH GLOSS, Formula 46-21	LOW GLOSS
Materials	Parts by Weight	Parts by Weight
Joncryl® 819	32.09	24.65
Joncryl® 848	----	3.69
Araldite ¹ GT 6063	29.39	33.15
Modaflow ² III	1.00	1.00
Benzoin	0.30	0.30
Ti-Pure ³ R-960	36.99	36.99
Actiron ⁴ NXJ 60	0.23	0.23
Total	100.00	100.00

Formulation Attributes

Pigment:Binder ratio	0.60	0.60
Acrylic:Epoxy ratio	52:48	40:6:54
Catalyst level on TRS	0.24%	0.24%
Extrusion Parameters		
BUSS PLK46		APV 19MM Twin Screw
Zones 1, 2	60°C, 105°C	Zones 1, 2, 3, 4
RPM	200	RPM
		300

¹Registered trademark of Huntsman Advanced Materials GmbH.

²Registered trademark of Allnex.

³Registered trademark of The Chemours Company.

⁴Registered trademark of Protex International Corporation.

Coating Physical Properties and Chemical Resistance

The following properties are typical for an acrylic hybrid powder coating prepared along the guidelines presented here with Araldite¹ GT 6063 as the epoxy component of this system:

Powder Properties	High Gloss Formula	Low Gloss Formula	Test Protocol
Gel time @ 200°C	56 seconds	60 seconds	PCI test procedure #6
Storage stability	Flee flowing	Free flowing	7 days at 40°C
Film Properties			
Gloss, 60°, 20°	93, 69	25, 7	ASTM D-523
Pencil hardness	3H	3H	ASTM D-3363-74 Eagle Turquoise
Direct impact resistance	160 in/lbs (184kg/cm)	80	ASTM D-2794
Indirect impact resistance	120 in/lbs (138kg/cm)	20	ASTM D-2794
Conical mandrel (1/8")	Pass	-	
Crosshatch adhesion	95%	95%	ASTM D-3359-83
Chemical Resistance			
Fabric softener	Excellent	-	
Alkali (Easy Off [®])	Excellent	-	2-hr exposure, 24-hr recovery
Brake Fluid	12+ hours	-	Spot test, visual inspection & hardness

MEK (double rubs)	100+	100+	PCI test protocol #8
Substrate:	CRS, Bonderite [®] 1000, P-60		
Cure:	20 minutes at 190°C		
Film thickness:	2.0 mils (50 µ)		

Typical Baking Schedule

Time (minutes)	Temperature (°C)
30	175
30	180
25	185
20	190
10	195
10	200

⁵Registered trademark of Reckitt & Colman Limited.

⁶Registered trademark of Henkel AG & Co.

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[®] 819.

Important

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