Industrial Coatings

Technical Data Sheet

Joncryl® 820

Product Description	**Joncryl® 820 is a solid flake acrylic resin for industrial hybrid powder coating applications.**
Key Features & Benefits	***- Exceptional flexibility*** ***- Hardness*** ***- Chemical resistance*** ***- Economical low gloss***
Chemical Composition	**Carboxyl functional acrylic resin**

Properties

Typical Properties

Appearance	light yellow, clear flake
Molecular weight (Mw)	~ 15,500
Non-volatile	> 99%
Acid number (1g, 50/50 ethanol/acetone, 0.1N NaOH)	~ 80
Equivalent weight	748
Tg	57°C
Typical combining ratio	52:48
Freeze-thaw stable	Yes

These typical values should not be interpreted as specifications.

Applications

Joncryl® 820 is a carboxyl functional, solid grade acrylic resin designed for powder coating applications. Joncryl® 820 is an internally catalyzed version of Joncryl® 819, and designed to be formulated with bis-phenol A epoxies. The resultant film displays all of the appearance and flexibility characteristics associated with more traditional polyester/epoxy hybrids with the additional advantages of superior UV stability, excellent chemical resistance, and excellent hardness.

Like Joncryl® 819, Joncryl® 820 should be considered as a polyester replacement in hybrid systems where improvements in hardness, chemical resistance, and UV resistance are desired. In addition, Joncryl® 820 (in combination with Joncryl® 848) epoxy hybrids produce excellent low gloss coatings that are frequently more economical than polyester or epoxy based low gloss systems.

Joncryl® 820 is recommended for applications such as:

- Interior/exterior general metal powder coating applications

Formulation Guidelines

There is a multitude of epoxy resins available for hybrid applications. Data presented here reflects work with Araldite[1] GT 6063. Many opportunities exist for improvement in properties with alternate epoxies, flow agents, antioxidants, and catalysts. The product review, *Powder Coatings Acrylic Epoxy Hybride: Choice of Epoxy*, discusses the effects of epoxy on film properties.

[1]Registered trademark of Huntsman Advanced Materials GmbH.

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.

Joncryl® 819, an un-catalyzed version of Joncryl® 820, is also commercially available.

Starting Point Formulation

The following starting point formulation is recommended for an initial evaluation of Joncryl® 820. Additional optimization of the formulation may be required to achieve desired results for specific applications.

Joncryl® 820 ACRYLIC HYBRID

	HIGH GLOSS, Formula 107-20B	**LOW GLOWW, Formula 46-40D**
Materials	**Parts by Weight**	**Parts by Weight**
Joncryl® 820	33.30	23.47
Joncryl® 848	0.00	4.59
Araldite[1] GT 6063	30.40	33.48
Modaflow[2] III	1.00	1.00
Benzoin	0.30	0.30
Ti-Pure[3] R-960	35.00	37.16
Total	**100.00**	**100.00**

Formulation Attributes

Pigment:Binder ratio		0.60	0.60
Acrylic:Epoxy ratio		52:48	46:54
Catalyst level on TRS		0.23%	0.23%
Extrusion Parameters			
BUSS PLK46		APV 19MM Twin Screw	
Zones 1, 2	60°C, 105°C	Zones 1, 2, 3, 4	25°C, 60°C, 105°C, 105°C
RPM	200	RPM	300

[2]Registered trademark of Cytec Technology Corp.
[3]Registered trademark of E.I. du Pont de Nemours and Company.

Coating Physical Properties and Chemical Resistance

The following properties are typical for an acrylic hybrid powder coating prepared along the guidelines presented here with Araldite[1] GT 6063 as the epoxy component of this system:

Powder Properties	**High Gloss Formula**	**Low Gloss Formula**	**Test Protocol**
Gel time @ 200°C	56 – 60 seconds	50 – 60 seconds	PCI test procedure #6
Storage stability	Flee flowing	Free flowing	7 days at 40°C
Film Properties			
Gloss, 60°, 20°	90, 70	25, 5	ASTM D-523
Pencil hardness	3H+	3H+	ASTM D-3363-74 Eagle Turquoise
Direct impact resistance	160 in/lbs (184kg/cm)	80 (92)	ASTM D-2794
Indirect impact resistance	120 in/lbs (138kg/cm)	40 (46)	ASTM D-2794
Conical mandrel (1/8")	Pass	Pass	
Crosshatch adhesion	95%+	95%+	ASTM D-3359-83
Chemical Resistance			
Fabric softener	Excellent	Excellent	
Alkali (Easy Off[4])	Excellent	Excellent	2-hr exposure, 24-hr recovery
Brake Fluid	12+ hours	12+ hours	Spot test, visual inspection & hardness
MEK (double rubs)	100+	100+	PCI test protocol #8
Substrate:	CRS, Bonderite[5] 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

[4]Registered trademark of Reckitt Colman Limited.
[5]Registered 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® 820.

Important

While the descriptions, designs, data and information contained herein are presented in good faith and believed to be accurate, they are provided for guidance only. Because many factors may affect processing or application/use, BASF recommends that the reader make tests to determine the suitability of a product for a particular purpose prior to use. **NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESCRIPTIONS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS.** In no case shall the descriptions, information, data or designs provided be considered a part of BASF's terms and conditions of sale. Further, the descriptions, designs, data, and information furnished by BASF hereunder are given gratis and BASF assumes no obligation or liability for the descriptions, designs, data or information given or results obtained all such being given and accepted at the reader's risk.

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