

POWDER COATINGS RESINS

Product Guide - Americas





About allnex

allnex is a leading producer of industrial coating resins and additives for architectural, industrial, protective, automotive and special purpose coatings and inks. With manufacturing facilities and R&D centers located around the world, the allnex group offers access to a huge global network of innovation and provides

responsive, local support to our customers, helping them to quickly bring advanced coating solutions to market. Formed in 2016 by the merger of two leading resin companies, we have recently further strengthened (y)our business by becoming part of major international player PTT Global Chemical.



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Sustainability

A fivefold focus for a new tomorrow – the pillars of our sustainability program.

These pillars form the basis of allnex's sustainability program, which covers all aspects from product development, raw material sourcing and manufacturing to supply chain management and customer service. The pillars stand for the circularity that is at the core of all our considerations, defining both how we plan and execute our activities.



Circular Economy

We diligently explore options to limit the consumption of resources, keep them in use as long as possible, and eventually recover and recycle them at the end of service life.



Renewable Sourcing

We aim at minimal use of finite resources and strive to reduce climate impacts by looking at renewable alternatives for raw materials and the energy we use.



Energy Efficiency

We design our product and manufacturing process in a way that enables maximum efficiency in energy utilization across the product lifecycle.



Safer Materials

We are committed to making the substitution of potentially harmful chemicals by safer options one of our guiding considerations.



Emissions Reduction

We work to reduce the emissions of volatile organic solvents across the product lifecycle to protect people and the environment.

Being ECOWISE™ is the best way to be part of the solution – and that's exactly what our initiative and ECOWISE™ branded products help everyone to do. They spring from our deep commitment to a more sustainable future. They are also living proof that, with our broad range of technologies and sustainable focus, we are the ideal partner for smoothly and successfully making the transition to the solutions a more ECOWISE™ future needs.

Introduction

Global Supplier

allnex is a worldwide supplier of high-quality powder coating resins, hardeners and additives. We offer one of the broadest lines of resins for powder coating finishes, including topname polyester resins, coupled with global product availability, and expert technical support.

Leading-edge Technologies

Right across our global R&D, sales and production network, allnex continues to pioneer the development of innovative technologies to help our partners improve performance and productivity, enter new markets, refine applications and deliver advanced products to meet evolving needs and environmental regulations.

Our products are tailored to suit for a wide range of applications:

- Superdurable resins for exterior powder applications
- Resins for clearcoat and matte finishes
- Resins for low bake powder systems
- UV curing powder systems

Our newest resin technologies are designed for cutting-edge applications where powder paints are not widely used, including industrial and automotive finishes:

- High-performance exterior durable systems
- Natural and manufactured wood products
- Plastic and other heat-sensitive substrates

Wide Selection of Top Products

As a leading global supplier of powder coating resins, hardeners and additives, allnex offers one of the broadest choices of resins for powder coating finishes.

Proven worldwide, our extensive selection of CRYLCOAT® and SETAPOLL™ polyester resins include carboxyl and hydroxyl functional resins for hybrid, TGIC, glycidylester, hydroxy alkyl amide, isocyanates for urethane, and glycoluril powder coating systems. For new technologies like UV curable powder coatings, we have one of the widest product ranges available, including UVECOAT® unsaturated resins. Powder coating resin technologies of allnex also include the SYNTHACRYL® matting agent and specialty hardeners. Our flow additives can be supplied on silica carrier.

For improving flow and leveling characteristics in all types of coatings, the versatile MODAFLOW® powder product family is the benchmark name among flow modifiers and powder resins in the coatings industry.

Bringing value to the formulation of powder coatings are ADDITOL® masterbatch flow modifiers, catalysts and related products. Additionally, BECKOPOX® and ADDITOL specialty hardeners solve problems related to flow, and provide special textures or performance to finished coatings.



Product index

Product	Description
Vehicle Binder Resins	
CRYLCOAT®	Polyester powder coating resins – Hydroxyl (-OH) resins for polyurethane and glycoluril powder coatings – Carboxyl (-COOH) resins for hybrid, TGIC ¹ , glycidylester ² and β-HAA powder coatings ³
UVECOAT®	Unsaturated resins for UV curable powder coatings.
Curing Hardeners (Powder Crosslinkers)	
ADDITOL®	Polyanhydride resin for epoxy functional (glycidyl) acrylics and urethane hardeners ⁴ for hydroxy functional binder resins.
BECKOPOX™	Anhydride-like resin for epoxy or hydroxy functional binder resins.
Powder Additives and Modifiers	
MODAFLOW®	Powder coating flow modifiers on silica carrier.
ADDITOL	Flow additives, catalysts and tribo masterbatches provided on resin carriers and photoinitiators to accelerate the cure of UV powder coatings.
SYNTHACRYL®	GMA-acrylic matting agent.

¹ Supplier: Huntsman

² PT-910: Trademark of Huntsman

³ Supplier: EMS-chemie, Evonik, and other suppliers

⁴ Supplier: Dow, Huntsman and other suppliers



Product Nomenclature

Thermoset powder coatings are typically cured in a temperature range of 160-200°C (object temperature) for 10 minutes. General cure guidelines for products listed in this bulletin are summarized below.

Cure Temperature and Time Definitions

Slow	374°F (190°C) or greater for 10 min
Medium	~338 - 356°F (170 - 180°C) for 10 min
Fast	~ 320°F (160°C) for 10 min
Low Temp	302°F (150°C) for 10 - 30 min

Low temperature cure is used for heat sensitive substrates or thick metallic objects. allnex has products that can achieve the desired results through thermoset or UV cure.

The resin selection guide allows formulators to select resins for a given coating effect. The color background used for each product in the charts helps to delineate special product features, as summarized in the table below. From the wide range of resins available, users can match the desired properties with the required coating performance.

Resin Selection Guide

- CRYLCOAT® polyester resins
- CRYLCOAT new generation hybrid polyester resins
- CRYLCOAT polyester resin pair for one-shot matte finishes
- CRYLCOAT polyester resin pair for matte dry blend finishes
- CRYLCOAT polyester resins for clearcoats
- UVECOAT® unsaturated resins
- ADDITOL® masterbatch and additives
MODAFLOW® powder flow modifiers
SYNTHACRYL® acrylic resins
- Resins based on recycled raw material

The nomenclature of the allnex product line for powder coatings is provided in the table below.

Some of allnex's newer products are referenced with an "E" designation. These resins have been recently developed and have only been commercially available for a short time, and do not follow the product nomenclature system.

Digit 1	Digit 2	Digit 3 & 4	Digit 5
CRYLCOAT® System - 5 Digit System			
1 = Hybrid	5 = 50/50 6 = 60/40 7 = 70/30 8 = 80/20	Whenever possible equivalent to last two digits of former product name	- 0 = Standard (no additives) - 1 = Tribo - 2 = Overbake - 3 = Tribo & Overbake - 4 = Clearcoat - 5 = Special - 6 = Low bake (< 160°C)
2 = Standard Outdoor 4 = Superdurable Outdoor 8 = Crystalline 9 = Other	4 = TGIC 5 = PT-910 6 = Hydroxyalkyl Amide 8 = Urethane 9 = Wrinkle Finish		

Masterbatch Type	Number
ADDITOL® System	
Flow Aid	P 800 - P 899
Tribo, Catalysts, Crosslinkers	P 900 - P 999

Type	Number
UVECOAT® System	
General Purpose Resins	1000 - 1999
Resins for Metal Substrates	2000 - 2999
Resins for Wood and Plastic Substrates	3000 - 3999
Special (i.e., crystalline)	9000 - 9999

Type	Number
SYNTHACRYL® System	
Acrylic - All	P 700 - P 799

ECOWISE™ CHOICE

The **ECOWISE™ CHOICE** portfolio from allnex is a selection of **products meeting the most stringent global industry standards and ecolabels**, within the context of optimal end applications.

It is our responsibility to protect the planet in which we all live. Being ECOWISE™ is the best way to be part of the solution – and that's exactly what our initiative and ECOWISE™ branded products help everyone to do. They spring from our **deep commitment to a more sustainable future**. They are also living proof that, with our broad range of technologies and sustainable focus, we are the ideal partner for successfully transiting to sustainable solutions.

We are committed to improving the sustainability proposition of our products by taking action along the five high priority areas.



Polyester Resins Based on Recycled Raw Material

CRYLCOAT® OCEAN	Ratio	Tg(°C)	Visc. (200°C)	Acid#	Cure T (°C)	Descriptions/Benefits
TGIC Resins						
● 2489-5	95/5	59	6600	25	200	Standard durable 95/5 TGIC and 96.5/3.5 HAA; general purpose resin.
● E04864	93/7	54	2400	32	160	Low cure option; standard durable architectural resin; non-blooming.
● E04874	93/7	63	3145	32	200	Standard cure architectural grade with good flow, flexibility and outdoor durability.
● E04916	93/7	59	2000	33	160	Superdurable, low cure option.
● E04947	93/7	63	3300	33	200	Superdurable with balance of properties.
Hydroxyalkyl Amide (HAA) Resins						
● E04926	95/5	60	5200	34	160	Low cure option.
● E04929	90/10	60	3200	70	180	For matte HAA system in combination with CC 2489-5.
● E04932	95/5	63	1900	35	180	Medium reactivity superdurable HAA resins.
Hybrid Resins						
● 1541-5	50/50	70	2300	59	160	Low cure option, good pigment wetting.
● E 04980	50/50	73	3000	59	160	Low cure option with higher recycled raw material content.
● E 04942	60/40	53	2500	60	200	High Tg with good balance of properties.
● E 04946	60/40	54	2300	61	200	High Tg, high recycled raw material content.
● E 04971	60/40	54	2500	59	160	Low cure option.
● E 04770	70/30	33	4680	56	200	Standard cure with high recycled raw material content.
● E 04931	70/30	33	5000	59	180	Balanced properties.
● E 04950	70/30	33	5500	56	160	Low cure option.

^a Viscosity at 200°C unless otherwise specified

^b Viscosity at 175°C

** For a detailed description of FDA Status, please refer to page 24

● CRYLCOAT polyester resins
● CRYLCOAT new generation hybrid polyester resins
● Resins Based on Recycled Raw Material

Polyester Resins for Hybrid Powder Coatings

	50/50 Acid # ~70	55/45 to 60/40 Acid # ~50-60	70/30 to 80/20 Acid # ~20-35
200°C (392°F)		● CRYLCOAT® 1660-0	● CRYLCOAT 1702-0 ● CRYLCOAT 1783-0
190°C (374°F)		● CRYLCOAT 1638-2	
180°C (356°F)	● CRYLCOAT 1510-0 ● CRYLCOAT 1514-2 ● CRYLCOAT 1573-0	● CRYLCOAT 1671-0 ● CRYLCOAT 1658-5 ● CRYLCOAT 1626-0 ● CRYLCOAT 1627-0 ● CRYLCOAT 1690-0	● CRYLCOAT 1725-0 ● CRYLCOAT 1770-0 ● CRYLCOAT 1771-3 ● CRYLCOAT 1781-0
170°C (338°F)		● 1620-0 ● 1672-0	
160°C (320°F)	● CRYLCOAT 1506-0 ● CRYLCOAT 1540-0 ● CRYLCOAT 1593-0		● CRYLCOAT 1750-0
150°C (302°F)		● CRYLCOAT 1680-6	
≤140°C ≤284°F)	● CRYLCOAT 1574-6 ● CRYLCOAT E04758		
130°C (266°F)	● CRYLCOAT E04712		

Hybrid Polyester Resins based on Recycled Raw Material

CRYLCOAT® OCEAN	Ratio	AV	Visc. (200°C)	Tg(°C)	Cure T (°C)	Descriptions/Benefits
Hybrid Resins						
● 1541-5	50/50	70	2300	59	160	Low cure option, good pigment wetting.
● E 04980	50/50	73	3000	59	160	Low cure option with higher recycled raw material content.
● E 04942	60/40	53	2500	60	200	High Tg with good balance of properties.
● E 04946	60/40	54	2300	61	200	High Tg, high recycled raw material content.
● E 04971	60/40	54	2500	59	160	Low cure option.
● E 04770	70/30	33	4680	56	200	Standard cure with high recycled raw material content.
● E 04931	70/30	33	5000	59	180	Balanced properties.
● E 04950	70/30	33	5500	56	160	Low cure option.

- CRYLCOAT polyester resins
- CRYLCOAT new generation hybrid polyester resins
- Resins Based on Recycled Raw Material

Typical Properties for Hybrid Resins

CRYLCOAT®	Ratio	Acid #	Visc.a	Tg(°C)	Cure T (°C)	Descriptions/Benefits
● 1506-0	50/50	71	8000	62	160	Good overbake.
● 1510-0	50/50	71	8500 ^b	58	180	High loading possible.
● 1514-2	50/50	71	9250 ^b	55	180	Excellent overbake.
● 1540-0	50/50	71	8700 ^b	58	160	Good pigment wetting.
● 1573-0	50/50	70	3500	56	180	Economical formulation.
● 1574-6	50/50	71	5000	50	140	Low cure for MDF.
● 1593-0	50/50	70	3500	54	160	Economical formulation.
● 1620-0	55/45	60	2650	54	170	Intermediate reactivity.
● 1626-0	60/40	48	3000	52	180	Workhorse resin.
● 1627-0	60/40	44	4000	62	180	High Tg.
● 1638-2	60/40	48	3200	60	190	Good balanced properties.
● 1658-5	60/40	53	2500	57	170	Scratch resistance.
● 1660-0	60/40	48	9400 ^b	50	200	High loading possible.
● 1671-0	60/40	48	11200 ^b	50	180	Outstanding gloss.
● 1672-0	60/40	48	10750 ^b	50	177	Flexibility, excellent matting for MOF.
● 1680-6	60/40	48	10500 ^b	50	150	Highly reactive and high level filler.
● 1690-0	60/40	58	9500	58	180	Excellent mechanical properties, deterrent resistance.
● 1702-0	70/30	36	5300	62	200	Low reactive resin with excellent mechanical properties and over-bake resistance.
● 1725-0	70/30	30	6400	55	180	TMA free.
● 1750-0	70/30	34	4750	54	160	Non-blooming.
● 1770-0	70/30	34	5400	58	180	Economical formulation.
● 1771-3	70/30	33	4700	56	180	Medium reactivity new generation hybrid, Tribo, overbake resistance. Excellent overall properties.
● 1781-0	70/30	33	5000	60	180	High Tg.
● 1783-0	70/30	34	5000	58	200	Workhorse resin with low reactivity and good gloss.
● E04712	50/50	100	2050	44	130	Ultra-low cure hybrid designed for MDF, OSM w/Beckopox E 04943. Gloss from 14-20.
● E04758	50/50	100	2050	44	140	High reactive, non-yellowing hybrid for MDF; OSM w/Beckopox E 04943.

^a Viscosity at 200°C unless otherwise specified

^b Viscosity at 175°C

** For a detailed description of FDA Status, please refer to page 24

● CRYLCOAT polyester resins

● CRYLCOAT new generation hybrid polyester resins

● Resins Based on Recycled Raw Material

Polyester Resins for TGIC Powder Coatings

	93/7 Acid # ~33	95/5 Acid # ~25	90/10 Acid # ~50	Superdurable
200°C (392°F)	● CRYLCOAT® 2401-2	● CRYLCOAT 2432-0	● CRYLCOAT 2414-0	● CRYLCOAT 4420-0
	● CRYLCOAT 2422-0			
	● CRYLCOAT 2437-0			
	● CRYLCOAT 2422-0			
	● CRYLCOAT 2425-0	● CRYLCOAT 2695-0		● CRYLCOAT 4430-0
	● CRYLCOAT 2440-2			● CRYLCOAT 4432-4
	● CRYLCOAT 2441-2			● CRYLCOAT 4659-0
	● CRYLCOAT 2471-4			● CRYLCOAT 4478-0
	● CRYLCOAT 2488-2			● CRYLCOAT 4488-0
	● CRYLCOAT 2689-0			
	● CRYLCOAT 2689-0			
180°C (356°F)	● CRYLCOAT 2408-0			
	● CRYLCOAT 2405-0			
	● CRYLCOAT 2421-5			
	● CRYLCOAT 4464-0			
160°C (320°F)	● CRYLCOAT 2409-0			
	● CRYLCOAT 2494-6			
	● CRYLCOAT 2473-4			
	● CRYLCOAT 2433-2			
150°C 302°F	● CRYLCOAT 2451-6			

TGIC Polyester Resins Based on Recycled Raw Material

CRYLCOAT® OCEAN	Ratio	Tg(°C)	Visc. (200°C)	Acid#	Cure T (°C)	Descriptions/Benefits
TGIC Resins						
● 2489-5	95/5	59	6600	25	200	Standard durable 95/5 TGIC and 96.5/3.5 HAA; general purpose resin.
● E04864	93/7	54	2400	32	160	Low cure option; standard durable architectural resin; non-blooming.
● E04874	93/7	63	3145	32	200	Standard cure architectural grade with good flow, flexibility and outdoor durability.
● E04916	93/7	59	2000	33	160	Superdurable, low cure option.
● E04947	93/7	63	3300	33	200	Superdurable with balance of properties.

- CRYLCOAT polyester resins
- CRYLCOAT new generation hybrid polyester resins
- CRYLCOAT polyester resin pair for matte dry blend finishes
- CRYLCOAT polyester resins for clearcoats
- Resins Based on Recycled Raw Material

Typical Properties for TGIC Resins

CRYLCOAT®	Ratio	Acid #	Visc.	Tg(°C)	Cure T (°C)	Descriptions/Benefits
● 2401-2	93/7	33	3500	60	200	Flexibility.
● 2405-0	93/7	33	8000	61	180	Good flow, very good outdoor durability
● 2408-0	93/7	33	4500	55	180	Good flow, flexibility, outdoor durability.
● 2409-0	93/7	33	3900	58	160	TMA-Free.
● 2414-0	90/10	47	4700	57	200	Dry blend semi-matte finish w/ 2432-0. Gloss from 25-35.
● 2421-5	93/7	33	4500	63	180	For PCM Applications.
● 2422-0	93/7	35	8000	70	200	High Tg, balanced properties
● 2425-0	93/7	34	6200	70	200	Good flow, outdoor durability and mechanical properties.
● 2432-0	96/4	20	7900	53	200	Dry blend semi-matte finish w/ 2414-0. Gloss from 25-35.
● 2433-2	93/7	33	3000	60	160	Highly reactive, good flow and flexibility.
● 2437-0	93/7	33	3200	62	200	Non-blooming.
● 2440-2	93/7	33	5100	67	200	Workhorse.
● 2441-2	93/7	33	5000	67	200	Workhorse.
● 2451-6	93/7	40	1500	53	150	MDF and metal applications.
● 2471-4	93/7	33	3500	58	200	Smoothness.
● 2473-4	93/7	33	3200	63	160	Clarity.
● 2488-2	93/7	34	6000	64	200	Suitable for matting.
● 2494-6	93/7	33	2800	58	160	Non-blooming.
● 2689-0	93/7	34	4000	62	200	Also used with HAA.
● 2695-0	95/5	25	5500	59	200	Also used with HAA.
● 4420-0	90/10	51	5500	64	200	Dry blend semi-matte finish w/ 4430-0. Gloss from 25 -35.
● 4430-0	93/7	35	2000	62	200	Superdurable.
● 4432-4	93/7	35	2300	62	200	Superdurable.
● 4464-0	93/7	33	4250	64	180	Good balance of flow and smoothness, excellent outdoor durability, and low cure option.
● 4478-0	93/7	33	3300	64	200	Highly versatile durable resin with balanced properties.
● 4488-0	93/7	30	5400	64	200	Best Florida data.
● 4659-0	93/7	33	3600	59	200	Flexibility.

- CRYLCOAT polyester resins
- CRYLCOAT new generation hybrid polyester resins
- CRYLCOAT polyester resin pair for matte dry blend finishes
- CRYLCOAT polyester resins for clearcoats

** For a detailed description of FDA Status, please refer to page 24

Polyester Resins for Hydroxyalkyl Amide Powder Coatings

	96.5/3.5 Acid # ~25	95/5 Acid # ~33	92/8 Acid # ~50	90/10 Acid # ~70	Superdurable
180°C ↕ (200°F)	CRYLCOAT® 2695-0	CRYLCOAT 2618-3	CRYLCOAT 2671-3	CRYLCOAT 2621-2	CRYLCOAT 4688-2
	CRYLCOAT 2691-2	CRYLCOAT 2617-3	CRYLCOAT 2620-2	CRYLCOAT 2650-3	CRYLCOAT 4642-3
	CRYLCOAT 2675-0	CRYLCOAT 2689-0			CRYLCOAT 4659-0
		CRYLCOAT 2696-3	CRYLCOAT 2655-6		CRYLCOAT 4626-0
		CRYLCOAT 2670-3			CRYLCOAT 4641-0
		CRYLCOAT 2698-3			CRYLCOAT 4420-0
		CRYLCOAT 2606-3			CRYLCOAT 4643-3
					CRYLCOAT 4655-2

allnex also offers one shot matte powder coatings for hydroxyalkyl amide crosslinkers.

	HAA Standard	HAA Superdurables
Dry Blend Gloss Control Systems		
Semi-Gloss	CRYLCOAT 2622-2 Acid #21	
	CRYLCOAT 2620-2 Acid #50	
	Gloss 30 - 40	
Semi-Matte	CRYLCOAT 2670-3 Acid #20	CRYLCOAT 2650-3 Acid #70
	CRYLCOAT 2671-3 Acid #47	CRYLCOAT 2670-3 Acid #20
	Gloss 32 - 36	Gloss 25 - 35
Matte	CRYLCOAT 2691-2 Acid #21	
	CRYLCOAT 2621-2 Acid #72	
	Gloss 20 - 30	

Polyester Resins Based on Recycled Raw Material

CRYLCOAT® OCEAN	Ratio	Tg(°C)	Visc. (200°C)	Acid#	Cure T (°C)	Descriptions/Benefits
Hydroxyalkyl Amide (HAA) Resins						
E04926	95/5	60	5200	34	160	Low cure option.
E04929	90/10	60	3200	70	180	For matte HAA system in combination with CC 2489-5.
E04932	95/5	63	1900	35	180	Medium reactivity superdurable HAA resins.

- CRYLCOAT polyester resins
- CRYLCOAT polyester resin pair for matte dry blend finishes
- Resins Based on Recycled Raw Material

Typical Properties for Hydroxyalkyl Amide Resins

CRYLCOAT®	Ratio	Acid #	Visc. ^a	Tg(°C)	Cure T (°C)	Descriptions/Benefits
• 2614-2	96/4	22	7500	62	180	TMA-Free, tribo charged, low demand of Primid resin.
• 2617-3	95/5	33	3500	61	180	TMA free.
• 2618-3	95/5	35	3100	61	180	Gas oven stabilized.
• 2620-2	92/8	50	4200	58	180	Semi-gloss dry blend.
• 2621-2	90/10	72	4000	62	200	Matte dry blend with 2691-2.
• 2622-2	96/4	21	5300	61	200	Semi-gloss dry blend.
• 2650-3	90/10	70	6200	51	200	For very low gloss.
• 2655-6	93/7	47	5800	58	160	Low cure options.
• 2670-3	97/3	20	6000	64	200	Semi-matte dry blend with 2671-3.
• 2671-3	93/7	47	4000	62	180	Semi-matte dry blend with 2670-3.
• 2675-0	96/4	24	8400	68	200	Low demand primid with moisture resistance.
• 2689-0	95/5	34	4000	62	180	Workhorse.
• 2691-2	97/3	21	7600	62	200	Matte dry blend with 2621-2.
• 2695-0	96.5/3.5	25	5500	59	180	Workhorse.
• 2696-3	95/5	38	4500	60	160	Tribo: Non-blooming low cure options.
• 2698-3	95/5	33	3500	56	180	High flow. Also used with TGIC.
• 4420-0	92/8	51	5500	64	200	Matte dry blend superdurable.
• 4626-0	92/8	50	4300 ^b	64	180	Storage stability.
• 4641-0	97/3	20	4200	60	200	Matte dry blend superdurable with 4420-0.
• 4642-3	95/5	35	1900	62	180	High flow.
• 4643-3	93/1	50	1800	62	155	Overbake and gas oven resistance, excellent flow and low cure options.
• 4655-2	95/5	31	7500	66	155	High Tgi, overbake and gas oven resistance and low cure options.
• 4659-0	95/5	33	3600	59	190	Primid or TGic, outstanding flow and non-blooming.
• 4688-2	95/5	30	5500	54	180	Flexible superdurable.

CRYLCOAT®	Acid #	Visc. ^a	Tg(°C)	Descriptions/Benefits
One-Shot Gloss Control Polyesters				
• 2611-0	25	5500	58	Polyester-HAA durable system that achieves a gloss range from 8-12%.
• 2687-2	90	3500	58	
• 2635-2	85	3000	57	Polyester-HAA durable system that achieves a gloss range from 25-40%.
• 2638-2	33	5500	62	
• 4693-2	90	3500	58	Polyester-HAA superdurable system that achieves a gloss range from 8-12%.
• 4651-0	21	4000	59	
• E04814	59	2300	58	Superdurable one-shot matte resin that achieves gloss range of 10-20%.
• E04824	56	2300	61	Superdurable one-shot matte resin that achieves gloss range of 3-7%. Outstanding mechanical properties and outdoor durability.
• E04884	61	2000	56	Superdurable one-shot matte resin that achieves gloss range of 20-30%. Outstanding mechanical properties and outdoor durability.

^a Viscosity at 200°C unless otherwise specified

^b Viscosity at 175°C

** For a detailed description of FDA Status, please refer to page 24

• CRYLCOAT polyester resins

• CRYLCOAT polyester resin pair for matte dry blend finishes

Hydroxyl Polyester Resins for Urethane Powder Coatings

OH # 30-40	OH # ~50	OH # 80-100	OH # >200	Superdurable
• CRYLCOAT® 2845-0	• CRYLCOAT 2839-0	• CRYLCOAT 2818-0	• CRYLCOAT 2814-0	• CRYLCOAT 4823-0
• CRYLCOAT 2890-0	• CRYLCOAT 2860-2	• CRYLCOAT 2842-2	• CRYLCOAT 2876-0	• CRYLCOAT 4874-0
• CRYLCOAT 2883-0				• CRYLCOAT 4890-0
				• CRYLCOAT 4891-0
				• CRYLCOAT E 04362
				• CRYLCOAT E 04375

Urethane Standard		Urethane Superdurable
One Shot Gloss Control Systems		
Matte	• CRYLCOAT 2876-0 OH #290	• CRYLCOAT 4874-0 OHV 290
	• CRYLCOAT 2860-0 OH #50	• CRYLCOAT 4891-0 OHV 30
	Gloss 8 - 30	Gloss 8 - 30
Ultra Matte		• CRYLCOAT E 04362 OHV 290
		• CRYLCOAT E 04375 OHV 30
		Gloss 2 - 9

Wrinkle System	NCO Hardeners
Specialty Hydroxyl Polyester Resins and Hardeners	
• CRYLCOAT 2920-0	• ADDITOL P 932
• ADDITOL® P 920	• ADDITOL P 965
	• BECKOPOX™ EH 694 ANHYDRIDE HARDENER



Typical Properties for Hydroxyl Resins and Hardeners

CRYLCOAT®	OHV	Visc.a	Tg(°C)	Cure T (°C)	Descriptions/Benefits
• 2814-0	295	3250	52	200	Anti graffiti, stain resistance.
• 2818-0	100	3200	58	200	Chemical resistance.
• 2839-0	50	5500	57	200	Workhorse.
• 2842-2	125	3600	56	200	Detergent, stain and chemical resistance.
• 2845-0	35	7100	57	200	Workhorse.
• 2860-0	50	3500	52	200	One shot matte.
• 2872-0	40	3700	55	200	Chemical resistance.
• 2876-0	290	4500	58	200	One shot matte.
• 2883-0	47	4000	61	200	Excellent hardness.
• 2890-0	30	6700	60	200	Workhorse.
• 2920-0	33	12700	67	200	Wrinkle.
• 4874-0	290	3000	52	200	Anti-graffiti.
• 4890-0	30	5000	58	200	Workhorse superdurable.
• 4891-0	30	5500	56	200	One shot matte with 4874-0.
• E 04362	220	3000	53	200	One shot matte with E 04375.
• E 04375	30	5000	58	200	One shot matte with E 04362.
• 4823-0	85	1925	57	200	Weathering and chemical resistance.

ADDITOL®	OH #	NCO %	Tg(°C)	Descriptions/Benefits
• P 920	42	N/A	58	Wrinkle.
• P 932	N/A	9-10	62	Canada only.
• P 965	N/A	16-17	62	Aromatic urethane.

BECKOPOX™	Acid #	MP(°C)	Cure	Descriptions/Benefits
• EH 694	31	50-60	N/A	Chemical resistance.

^a Viscosity at 200°C

** For a detailed description of FDA Status, please refer to page 20.

- CRYLCOAT polyester resins
- CRYLCOAT polyester resin pair for one-shot matte finishes
- ADDITOL masterbatch and additives
 - MODAFLOW® powder flow modifiers
 - SYNTHACRYL® acrylic resins

Resins for Low Temperature Cure Powder Coatings

allnex is dedicated to finding new applications for powder coating resins. Since many materials are sensitive to heat, standard thermoset powder coatings cannot be used. allnex has products that can be used in low temperature thermoset coatings as well as UV powder coatings. These technologies offer the following advantages compared to standard thermoset coatings:

- Cost savings during application by using less energy
- The most environmentally friendly coatings on the market

- Expanding the reach of powder into temperature sensitive substrates such as wood, plastic, and paper

This portfolio represents low temperature cure offerings across three product lines: CRYLCOAT® polyester resins for thermoset powder coatings, UVECOAT® resins for UV powder coatings, and ADDITOL® catalyst masterbatches that can lower the cure time and temperature of thermoset powder coatings.

Metal Applications	MDF/Wood Applications	Carbon Fiber Applications	PVC Applications	Toner Applications	Additives
• CRYLCOAT® 1680-6	• CRYLCOAT 1574-6	• CRYLCOAT 2451-6	• UVECOAT® 3003	• UVECOAT T37621	• ADDITOL® P 964
• CRYLCOAT 2494-6	• UVECOAT 3002				• ADDITOL P 963
• CRYLCOAT 2473-4	• UVECOAT 3005				• ADDITOL P 966
• CRYLCOAT 2433-2	• CRYLCOAT E04712				• UVECOAT 9010
• UVECOAT 2100	• CRYLCOAT E04758				• UVECOAT 9539
• UVECOAT 2200	• CRYLCOAT E04760				• ADDITOL E04771
	• CRYLCOAT E04892				• ADDITOL E04729

- CRYLCOAT polyester resins
- CRYLCOAT polyester resins for clearcoats
- UVECOAT unsaturated resins
- ADDITOL masterbatch and additives
- MODAFLOW® powder flow modifiers
- SYNTHACRYL® acrylic resins

Resins for Ultra-Low Cure Powder Coatings

Powder ACURE Technology	Descriptions/Benefits
Package Solution for MDF / Wood Indoor Application	
• ADDITOL® E 04773	Catalyst precursor.
• ADDITOL E 04729	Retardar.
• CRYLCOAT E 04892	Donor.
• UVECOAT E 04760	Acceptor resin.
• UVECOAT E 04586	Acceptor resin.

- CRYLCOAT polyester resins
- UVECOAT unsaturated resins
- ADDITOL masterbatch and additives

Typical Properties for Low Temperature Cure Powder Coating Resins

Product	Viscosity (temp.)	Tg(°C)	Product use
Thermal Cure			
• ADDITOL® E04729	700 (200°C)	55	Retarder for use in ULC Powder ACURE coatings.
• ADDITOL E04773	3400 (175°C)	48	Catalyst precursor for use in ULC Powder ACURE coatings.
• ADDITOL P963	3400 (200°C)	N/A	Catalyst for use in pigmented hybrid and TGIC coatings.
• ADDITOL P964	3200 (200°C)	N/A	Catalyst for use in pigmented hybrid and TGIC coatings.
• ADDITOL P966	1900 (200°C)	N/A	Catalyst for use in superdurable pigmented TGIC coatings.
• BECKOPOX™ E04943	4600 (120°C)	38	Hardener for ULC hybrid coatings.
• CRYLCOAT® 1680-6	10500 (175°C)	50	60/40 hybrid resin that can cure down to 150°C.
• CRYLCOAT 2494-6	2800 (200°C)	60	Non-blooming TGIC resin for cure at 160°C and lower.
• CRYLCOAT 2473-4	3200 (200°C)	49	160°C TGIC resin for use in clear powder coatings.
• CRYLCOAT 2433-2	3000 (200°C)	57	Workhorse resin that can cure at 160°C.
• CRYLCOAT 1574-6	5000 (200°C)	50	50/50 hybrid that can cure as low as 120°C.
• CRYLCOAT E04892	2500 (200°C)	64	Donor resin for ULC Powder ACURE coatings.
• CRYLCOAT E04712	2050 (200°C)	44	ULC hybrid for MDF and Metal applications for cure as low as 130°C.
UV Cure			
• UVECOAT® 2100	5500 (200°C)	57	Exterior durable UV powder resin for use in clear and pigmented coatings.
• UVECOAT 2200	4500 (200°C)	54	Superdurable UV powder resin that can achieve 1000+ hours corrosion resistance.
• UVECOAT 3002	4500 (175°C)	49	For MDF and wood substrates. Can be used for clear and pigmented systems. Excellent chemical resistance and improved UV resistance.
• UVECOAT 3003	3200 (175°C)	49	Improved chemical and abrasion resistance with good flexibility for indoor PVC applications.
• UVECOAT 3005	4000 (200°C)	48	General purpose grade for MDF and wood applications. Good chemical resistance.
• UVECOAT 9010	350 (100°C)	85	Semi-crystalline unsaturated additive to improve smoothness and flexibility.
• UVECOAT 9539	4000 (200°C)	44	For use with Uvecoat 2100 to provide excellent adhesion to various metal substrates.
• UVECOAT T37621	5200 (200°C)	51	Unsaturated resin that combines high reactivity and high Tg for toners.

- CRYLCOAT polyester resins
- CRYLCOAT polyester resins for clearcoats
- UVECOAT unsaturated resins
- ADDITOL masterbatch and additives
- MODAFLOW® powder flow modifiers
- SYNTHACRYL® acrylic resins



Masterbatches and Additives for Powder Coatings

Catalysts	Flow Promoters	Flow Aids	Tribo
• ADDITOL® P 964	• ADDITOL P 896	• MODAFLOW® POWDER III	• ADDITOL P 950
• ADDITOL P 963	• ADDITOL P 824	• MODAFLOW POWDER 6000	
• ADDITOL P 966	• ADDITOL P 820		
	• ADDITOL P 891		
	• ADDITOL P 810		

Epoxy Hardener	Acrylic Hardener
• BECKOPOX™ E04943	• ADDITOL P 791
	• BECKOPOX EH 694 ANHYDRIDE HARDENER
	• SYNTHACRYL® 700 MATTING AGENT

- ADDITOL masterbatch and additives
- MODAFLOW powder flow modifiers
- SYNTHACRYL acrylic resins



Typical Properties for Masterbatches and Additives

ADDITOL®	Acid/OH #	Visc. ^a	Tg (°C)	% Active	Used for	Catalyst	Tribo	Acrylic
● P 791	Acid #317	N/A	N/A	N/A	Coatings with Synthacryl 716			●
● P 810	OH #30	4500	N/A	5	Clear coatings			
● P 820	Acid #34	3000	60	10	Pigmented coatings			
● P 824	OH #45	1400	49	15	Pigmented coatings			
● P 891	Acid #35	2300	56	5	Clear coatings			
● P 896	OH #35	1700	57	15	Durable coatings			
● P 950	OH #28	8000	N/A	5	All coatings		●	
● P 963	Acid #33	3400	N/A	5	Hybrid and TGIC systems	●		
● P 964	Acid #33	3200	N/A	5	Hybrid and TGIC systems	●		
● P 966	Acid #35	1900	N/A	5	Superdurable coatings	●		

MODAFLOW®	Activity %	Volatile loss %	Density (g/cm³)	Descriptions/Benefits
● Powder III	Min. 65	Max. 4	0.58 - 0.64	Addition of 0.6-1.5% of the total formulation. FDA listed monomers.
● Powder 6000	Min. 65	Max. 4	0.58 - 0.64	Addition of 0.6-1.5% of the total formulation. Excellent flow and gloss. Lessens cross-contamination issues.

SYNTHACRYL®	Epoxy EEW	Visc. ^a	Tg (°C)	Descriptions/Benefits
● 700	714	40000	80	Glycidyl poly acrylic for use as a matting hardener. Only available in Latin America.

BECKOPOX™	Acid #	EEW (g/eq)	Tg (°C)	Cure (°C)	Descriptions/Benefits
● EH 694	31	N/A	50-60	N/A	Aromatic polyanhydride hardener for epoxy, hydroxyl-functional polyesters, or epoxy/polyester systems; chemical and overbake resistance.
● EH 04943	N/A	460	38	125	Highly reactive hardener for Crylcoat E 04712 or Crylcoat E 04815 for producing matte coatings at low 125°C on MDF; outstanding smoothness and chemical resistance.

^a Viscosity at 200°C

● ADDITOL masterbatch and additives
MODAFLOW powder flow modifiers
SYNTHACRYL acrylic resins

FDA Status

Regarding the use of allnex polyester resins and additives in FDA applications:

The allnex Product Stewardship and Regulatory Affairs department can provide a letter/ Food contact Information Sheet verifying which CRYLCOAT® resins may be used in contact with food under what provisions. The certificate for CRYLCOAT resins is limited for applications to articles used in repeated-use applications such as: kitchen appliances, refrigerator shelving, commercial

food processing equipment, potable water tanks and food-preparation surfaces, that are not used in contact with alcoholic foods and beverages. Other provisions may apply and no verification of the suitable purity requirement under FDA 21 C.F.R. §174.5(a)(2) has been made. For full compliance statement, please contact us at PSRA-Customer-requests@allnex.com. The following table lists CRYLCOAT resins that might be considered for the type of repeated-use applications here described:

50/50 Hybrids	60/40 Hybrids	70/30 Hybrids	TGIC Resins	HAA Resins	OH Resins
CRYLCOAT® Polyester Resins that Qualify under 21 CFR 175.300					
● 1510-0	● 1620-0	● 1701-0	● 2414-0	● 2620-2	● 2818-0
● 1514-2	● 1622-0	● 1702-0	● 2425-0	● 2621-2	● 2839-0
● 1540-0	● 1626-0	● 1721-0	● 2432-0	● 2689-0	● 2883-0
● 1544-4	● 1627-0	● 1750-0	● 2437-0	● 2691-2	● 2890-0
● 1573-0	● 1660-0	● 1770-0	● 2440-2	● 2689-0	● 2920-0
	● 1671-0	● 1771-0	● 2441-2	● 2695-0	● 4890-0
		● 1783-0	● 2450-2	● 4659-0	
			● 2471-4		
			● 2494-6		
			● 4430-0		
			● 4488-0		

allnex Powder Coating Additives that Qualify For CFR Title 21

MODAFLOW® and ADDITOL® powder products may be used in certain indirect food applications. These applications are regulated by the U.S. Food and Drug Administration (FDA), under Title 21 of the Code of Regulations, CFR sections listed here:

Product	175.105	175.300	177.1010
● MODAFLOW Powder III	Yes	Yes	Yes
● MODAFLOW Powder 6000	Yes	Yes	Yes
● ADDITOL P 896	Not determined	Yes	Not determined

Health, Safety and Product Handling

Toxicity

CRYLCOAT® polyester products are solid, non-flammable resins with minimal toxicity. MODAFLOW® products have been subjected to acute toxicity and mutagenicity studies. Details on specific coverage of individual studies are available upon request.

Resin containers may contain polymer dust that could be irritating. Prevent dusty conditions and avoid breathing dust. Also, avoid contact with eyes and prolonged or repeated contact with skin. Use only with adequate ventilation. Equipment should be ground to prevent electrical sparking. For more information on each product, please consult the current material safety data sheet (MSDS) which will be provided by allnex. Take into account the potential risk resulting in formulation with other materials such as catalysts, hardeners, pigments, and fillers.

Storage

CRYLCOAT®, UVECOAT®, SYNTHACRYL®, and ADDITOL® resins should be stored in a dry location at room temperature. Keep away from heat sources

and direct sunlight. Do not stack more than two pallets high.

MODAFLOW powder products should not be stored in environments of high heat or humidity. The ideal storage temperature is between 40° F (4° C) and 100° F (38° C). Keep away from sparks and flame.

Shelf Stability

CRYLCOAT, UVECOAT, SYNTHACRYL, and ADDITOL resins have a minimum shelf life of one year when stored in a dry location at room temperature. The shelf life of MODAFLOW powder products is typically at least four years, when stored in the recommended environment.

Packaging Information

CRYLCOAT, UVECOAT, SYNTHACRYL, and ADDITOL resins are typically provided in 25 kg (55.1 lb) polyethylene bags. Supersack containers of 500 or 1,000 kg are available upon request. MODAFLOW powder products are typically provided in 150 lb (68 kg) fiber drums. Upon special request, 1,000 lb (454 kg) polypropylene bulk bags are available.



Glossary of Terms

Key Word	Description
Acid Value	The amount of KOH, reported in mg, necessary to neutralize the acid functional groups in 1 gram of polyester.
Blooming	A hazy appearance on the surface of the coating brought on by migration of low molecular weight material during low temperature cure or extended exposure to heat.
Curing Temperature	The metal or object temperature required to fully cure the powder coating system in 10 minutes.
Florida Exposure	Standard outdoor exposure test to approximate the natural weathering performance of a coating under severe conditions. The test panels are exposed in south Florida.
Glass Transition Temperature (T_g)	The characteristic temperature in °C of an amorphous polymer corresponding to the change from a solid to liquid state as measured by DSC.
Gloss	Degree to which a surface reflects light.
Hydroxyl Value	The amount of KOH, reported in mg, equivalent to the hydroxyl content of 1 gram of polyester.
Hardener	Powder coating raw material that reacts with polyester resin to create cured coating.
Matte	A coating surface that inconsistently reflects light to the eye. This causes coating to have non-glossy appearance.
Overbake Resistance	Ability of powder coating to withstand high or extended heating with minimal change.
Polyester: Hardener Ratio	Weight ratio between the polyester resin and the hardener recommended for optimal properties.
Semi Crystalline	Amorphous resins with crystalline functionality to allow for coatings with better flow.
Storage Stability	The ability of powder coatings to maintain uniform powder flow properties after being subjected to a specified storage condition.
Superdurable	A polyester resin that exhibits extended outdoor weathering characteristics, typically maintaining >50% gloss after 5 years.
Viscosity	The melt viscosity of the polymer, measured with a Brookfield5 viscometer in mPa.s at a specified temperature.
Wetting	The ability of a raw material to incorporate into the finished powder coating during processing. Can also refer to the ability of the coating to flow out the substrate.
Wrinkle	A unique, special effect finish characterized by closely associated ridge-like structures.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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