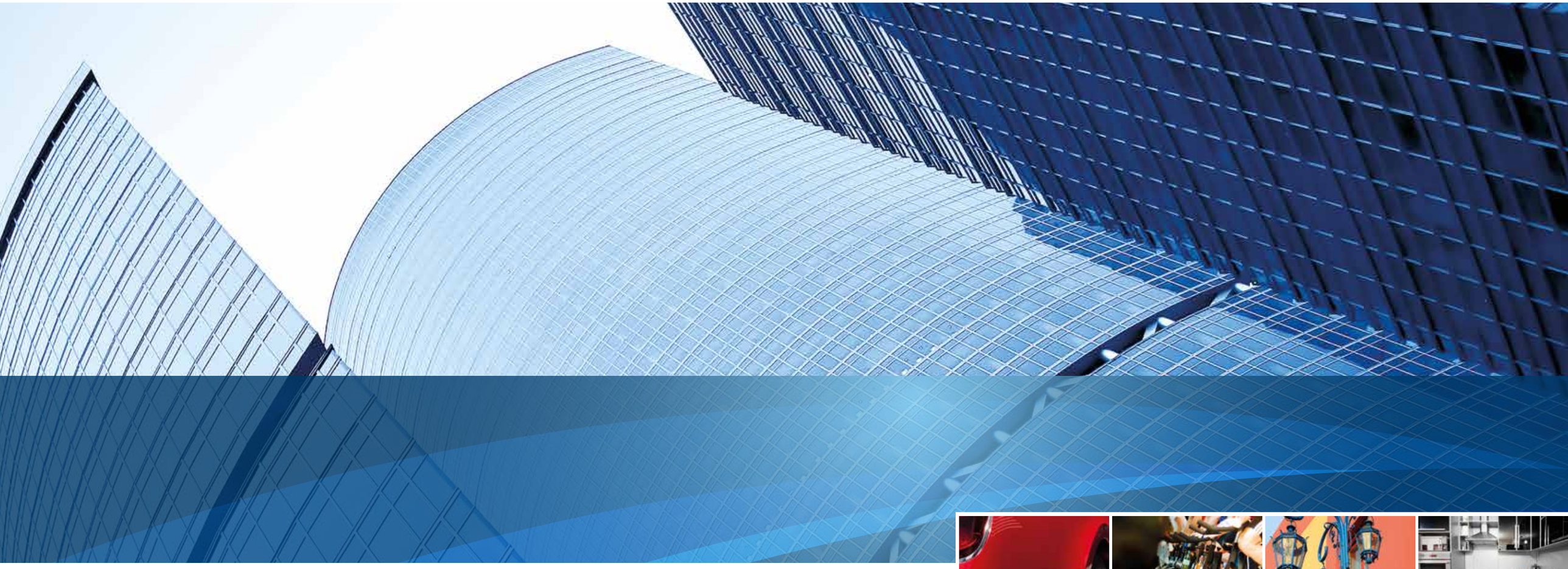
# POWDER COATINGS RESINS

Product Guide - Americas









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The operating allnex group is legally owned by Allnex Holdings S.à r.l., a company based in Luxembourg, which also provides long term strategic decisions relating to its investment in allnex.

**www.allnex.com**

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The Coating Resins Company

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# About allnex

## Facts & Figures

- Global company with $2 bln in sales
- Broad Technology portfolio: liquid coating resins, energy curable resins, powder coating resins, crosslinkers and additives, composites and construction materials
- Approximately 4000 employees
- Customers in more than 100 countries
- 33 manufacturing facilities
- 23 research and technology centers
- 5 joint ventures
- Extensive range of solutions for key coating segments: automotive, industrial, packaging coating and inks, protective, industrial plastics and specialty architectural

With manufacturing, R&D and technical facilities located throughout Europe, North America, Asia Pacific and Latin America, allnex offers global and reliable supply of resins and additives combined with local, responsive customer support.

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# 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 top-name polyester resins, coupled with global product availability, and expert technical support.

**Leading-edge Technologies**
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 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, 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.

allnex's powder coating resin technologies also include SYNTHACRYL® matting agents, specialty hardeners, and additives which can be supplied on a silica or resin 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<br>– Carboxyl (-COOH) resins for hybrid, TGIC, glycidylester and ß-HAA powder coatings<br>– Hydroxyl (-OH) resins for polyurethane and glycoluril powder coatings |
| SETAPOLL™ | Polyester powder coating resins<br>– Carboxyl (-COOH) resins for hybrid, TGIC, glycidylester and ß-HAA powder coatings<br>– Hydroxyl (-OH) resins for polyurethane and glycoluril powder coatings |
| UVECOAT® | Unsaturated resins for UV curable powder coatings. |
| **Curing Hardeners (Powder Crosslinkers)** | |
| ADDITOL® | Polyanhydride resin for epoxy functional (glycidyl) acrylics and urethane hardeners for hydroxyl functional binder resins (where available) |
| 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. |
| SYNTHACRYL® | GMA-acrylic matting agent |

## 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) or lower 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®* and SETAPOLL™* polyester resins |
| ● CRYLCOAT and SETAPOLL new generation hybrids polyester resins |
| ● CRYLCOAT and SETAPOLL polyester resins pair for one-shot matte finishes |
| ● CRYLCOAT and SETAPOLL polyester resins pair for matte dry blends |
| ● CRYLCOAT and SETAPOLL polyester resins for low temperature curing |
| ● ADDITOL®*, MODAFLOW®*, SYNTHACRYL®* systems and additives |
| ● UVECOAT®* unsaturated resins for UV-curable powder coatings |

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 | Whenever possible equivalent to last two digits of former product name | - 0 = Standard (no additives) |
| | 6 = 60/40 | | - 1 = Tribo |
| | 7 = 70/30 | | - 2 = Overbake |
| | 8 = 80/20 | | - 3 = Tribo & Overbake |
| 2 = Standard Outdoor | 4 = TGIC | | - 4 = Clearcoat |
| 4 = Superdurable Outdoor | 5 = PT-910[1] | | - 5 = Special |
| 8 = Crystalline | 6 = Primid[2] | | - 6 = Low bake (< 160°C) |
| 9 = Other | 8 = Urethane | | |

Example: CRYLCOAT 1514-2 = 314
Digit 1: 1 for hybrid; Digit 2: 5 for 50/50; Digit 3 & 4: 14 from 314 and Digit 5: 2 for Overbake

| 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 | 3000 - 3999 |
| Special (i.e., crystalline) | 9000 - 9999 |

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

[1] Trademark of Huntsmann Advanced Materials international LLC
[2] Trademark of EMS-Chemie

## Polyester Resins for Hybrid Powder Coatings

| | 50/50<br>AV ~70 | 55/45 to 60/40<br>AV ~50-60 | 70/30 to 80/20<br>AV ~20-35 |
|---|---|---|---|
| 200°C<br>392°F | | ● CRYLCOAT® 1622-0 | ● CRYLCOAT 1702-0 |
| | | ● CRYLCOAT 1650-2 | ● CRYLCOAT 1783-0 |
| | | ● CRYLCOAT 1660-0 | ● CRYLCOAT 1843-0 |
| | | ● CRYLCOAT E04448 | |
| 180°C<br>356°F | ● CRYLCOAT 1510-0 | ● CRYLCOAT 1626-0 | ● CRYLCOAT 1716-0 |
| | ● CRYLCOAT 1514-2 | ● CRYLCOAT 1627-0 | ● CRYLCOAT 1721-0 |
| | ● CRYLCOAT 1573-0 | ● CRYLCOAT 1671-0 | ● CRYLCOAT 1770-0 |
| | | ● CRYLCOAT 1690-0 | ● CRYLCOAT 1771-0 |
| | | | ● CRYLCOAT 1781-0 |
| | | | ● CRYLCOAT 1721-0 |
| 170°C<br>338°F | | ● CRYLCOAT 1620-0 | ● CRYLCOAT 1701-0 |
| | | ● CRYLCOAT 1658-5 | |
| 160°C<br>320°F | ● CRYLCOAT 1506-0 | | ● CRYLCOAT 1750-1 |
| | ● CRYLCOAT 1540-0 | | |
| | ● CRYLCOAT 1593-0 | | |
| 150°C<br>302°F | | | |
| ≤140°C<br>≤284°F | ● CRYLCOAT 1574-6 | | |

● CRYLCOAT* and SETAPOLL™* polyester resins
● CRYLCOAT and SETAPOLL new generation hybrids polyester resins
● CRYLCOAT and SETAPOLL polyester resins for low temperature curing

## Typical Properties for Hybrid Resins

| CRYLCOAT® | Ratio | Overbake stable | Tribo | Flow | Chemical | Economics | AV | Visc.[a] | Tg(°C) | Cure T(°C) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CRYLCOAT 1506-0 | 50/50 | + | | o | + + | - | 71 | 8000 | 62 | 160 | Good overbake. |
| CRYLCOAT 1510-0 | 50/50 | - | | o | + | o | 71 | 8500[b] | 58 | 180 | High loading possible. |
| CRYLCOAT 1514-2 | 50/50 | + + | | + | o | - - | 71 | 9250[b] | 55 | 180 | Excellent overbake. |
| CRYLCOAT 1540-0 | 50/50 | - - | | o | + | o | 71 | 8700[b] | 58 | 160 | Good pigment wetting. |
| CRYLCOAT 1573-0 | 50/50 | - | | o | o | + + | 70 | 3500 | 56 | 180 | Economical formulation. |
| CRYLCOAT 1574-6 | 50/50 | o | | - - | + | o | 71 | 5000 | 50 | 140 | Low cure for MDF. |
| CRYLCOAT 1593-0 | 50/50 | - | | - | + | + + | 70 | 3500 | 54 | 160 | Economical formulation. |
| CRYLCOAT 1620-0 | 55/45 | o | | - | o | + | 60 | 2650 | 54 | 170 | |
| CRYLCOAT 1622-0 | 55/45 | o | | + | o | + | 60 | 2500 | 54 | 200 | |
| CRYLCOAT 1626-0 | 60/40 | - - | | + + | o | + + | 48 | 3000 | 52 | 180 | Workhorse resin. |
| CRYLCOAT 1627-0 | 60/40 | - - | | + | o | + + | 44 | 4000 | 62 | 180 | High Tg. |
| CRYLCOAT 1650-2 | 60/40 | o | | + | - | - | 50 | 4200 | 57 | 200 | |
| CRYLCOAT 1658-5 | 60/40 | o | | - | + | - | 53 | 2500 | 57 | 170 | Scratch resistance. |
| CRYLCOAT 1660-0 | 60/40 | o | | + + | o | - | 48 | 9400[b] | 50 | 200 | High loading possible. |
| CRYLCOAT 1671-0 | 60/40 | - - | | + + | o | - | 48 | 11200[b] | 50 | 180 | Outstanding gloss. |
| CRYLCOAT 1690-0 | 60/40 | - | | ++ | ++ | o | 58 | 9500[b] | 58 | 180 | Detergent resistance. |
| CRYLCOAT E 04448 | 60/40 | o | | ++ | + | + | 48 | 3200 | 60 | 190 | Good balanced properties. |
| CRYLCOAT 1701-0 | 70/30 | + | | + | - | o | 30 | 6300 | 62 | 170 | High Tg resin with good balance of properties. |
| CRYLCOAT 1702-0 | 70/30 | + | | + | - | o | 36 | 5300 | 62 | 200 | |
| CRYLCOAT 1716-0 | 70/30 | + | | - | - | + | 30 | 6500 | 60 | 180 | TMA Free. |
| CRYLCOAT 1721-0 | 70/30 | o | | - | - | + | 40 | 5000 | 55 | 180 | |
| CRYLCOAT 1750-1 | 70/30 | - - | | - | - | + + | 34 | 4750 | 54 | 160 | Non-blooming. |
| CRYLCOAT 1770-0 | 70/30 | - | | o | - | + | 34 | 5400 | 58 | 180 | Economical formulation. |
| CRYLCOAT 1771-0 | 70/30 | - | | o | - | + + | 33 | 4700 | 56 | 180 | |
| CRYLCOAT 1781-0 | 70/30 | o | | - | - | + + | 33 | 5000 | 60 | 180 | High Tg. |
| CRYLCOAT 1783-0 | 70/30 | o | | o | - | + | 34 | 5000 | 58 | 200 | |
| CRYLCOAT 1843-0 | 80/20 | - - | | o | - - | + + | 22 | 10000[b] | 57 | 200 | Matting with. |

++ Outstanding + Excellent o Good – Fair – – Poor
[a] Viscosity at 200°C unless otherwise specified
[b] Viscosity at 175°C

## Polyester Resins for TGIC Powder Coatings

| | 93/7<br>AV ~33 | 95/5<br>AV ~25 | 90/10<br>AV ~50 | Superdurable |
|---|---|---|---|---|
| 200°C<br>392°F | ● CRYLCOAT® 2422-0 | ● CRYLCOAT 2432-0 | ● CRYLCOAT 2414-0 | ● CRYLCOAT 4420-0 |
| | ● CRYLCOAT 2425-0 | ● CRYLCOAT 2695-0 | | ● CRYLCOAT 4430-0 |
| | ● CRYLCOAT 2437-0 | ● CRYLCOAT 2496-2 | | ● CRYLCOAT 4488-0 |
| | ● CRYLCOAT 2440-2 | | | ● CRYLCOAT 4659-0 |
| | ● CRYLCOAT 2441-2 | | | ● CRYLCOAT E04482 |
| | ● CRYLCOAT 2471-4 | | | ● CRYLCOAT E04484 |
| | ● CRYLCOAT E04417 | | | |
| 180°C<br>356°F | ● CRYLCOAT 2408-0 | | | ● CRYLCOAT 4464-0 |
| | ● CRYLCOAT 2421-5 | | | |
| | ● CRYLCOAT 2443-3 | | | |
| | ● CRYLCOAT 2450-2 | | | |
| 160°C<br>320°F | ● CRYLCOAT 2409-0 | | | ● CRYLCOAT 4442-2 |
| | ● CRYLCOAT 2433-2 | | | ● CRYLCOAT E04553 |
| | ● CRYLCOAT 2473-4 | | | |
| | ● CRYLCOAT 2494-6 | | | |
| | ● CRYLCOAT 2499-6 | | | |
| 150°C<br>302°F | ● CRYLCCOAT 2451-6 | | | |

● CRYLCOAT* and SETAPOLL™* polyester resins
● CRYLCOAT and SETAPOLL new generation hybrids polyester resins
● CRYLCOAT and SETAPOLL polyester resins for low temperature curing

## Typical Properties for TGIC Resins

| CRYLCOAT® | Ratio | Overbake stable | Tribo | Flow | Weathering | Economics | AV | Visc. | Tg (°C) | Cure T(°C) | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CRYLCOAT 2408-0 | 93/7 | + + | | + | o | o | 33 | 4500 | 55 | 180 | Good flow, flexibility and out-door durability. |
| CRYLCOAT 2409-0 | 93/7 | o | | o | - | - | 33 | 3900 | 58 | 160 | TMA-free. |
| CRYLCOAT 2414-0 | 90/10 | - | | - | - | - | 47 | 4700 | 57 | 200 | Dry blend semi.matte finish w/2432-0. Gloss from 25-35. |
| CRYLCOAT 2421-5 | 93/7 | + + | | o | o | - - | 33 | 4500 | 63 | 180 | For PCM Applications. |
| CRYLCOAT 2422-0 | 93/7 | + | | o | o | o | 35 | 8000 | 70 | 200 | Balanced properties. |
| CRYLCOAT 2425-0 | 93/7 | + | | + | o | + + | 34 | 6200 | 70 | 200 | Good flow, outdoor durability and mechanical properties. |
| CRYLCOAT 2432-0 | 96/4 | + | | - - | o | - | 20 | 7900 | 53 | 200 | Dry blend semi.matte finish w/2414-0. Gloss from 25-35. |
| CRYLCOAT 2433-2 | 93/7 | + | | o | o | - | 33 | 3000 | 60 | 160 | |
| CRYLCOAT 2437-0 | 93/7 | + | | + + | o | - - | 33 | 3200 | 62 | 200 | Non-blooming. |
| CRYLCOAT 2440-2 | 93/7 | + | | o | o | o | 33 | 5100 | 67 | 200 | Workhorse. |
| CRYLCOAT 2441-2 | 93/7 | + | | + | o | o | 33 | 5000 | 67 | 200 | Workhorse. |
| CRYLCOAT 2443-3 | 93/7 | + | | o | o | o | 34 | 4250 | 60 | 180 | Workhorse. |
| CRYLCOAT 2450-2 | 93/7 | + + | | o | - | o | 33 | 5000 | 67 | 180 | |
| CRYLCOAT 2451-6 | 93/7 | + | | o | o | o | 40 | 1500 | 53 | 150 | MDF and metal aplications. |
| CRYLCOAT 2471-4 | 93/7 | + | | + + | o | o | 33 | 3500 | 58 | 200 | Smoothness. |
| CRYLCOAT 2473-4 | 93/7 | + | | - | o | o | 33 | 3200 | 63 | 160 | Clarity. |
| CRYLCOAT 2494-6 | 93/7 | o | | - | - | o | 33 | 2800 | 58 | 160 | Non-blooming. |
| CRYLCOAT 2695-0 | 95/5 | o | | + | - - | + | 25 | 5500 | 59 | 200 | Also used with HAA. |
| CRYLCOAT 2496-2 | 95/5 | o | | o | + | + | 21 | 7250 | 62 | 200 | Edge coverage. |
| CRYLCOAT 2499-6 | 93/7 | o | | - | - | o | 30 | 4750 | 64 | 160 | Higher Tg. |
| CRYLCOAT E04417 | 93/7 | + | | o | o | o | 32 | 4000 | 62 | 200 | Improved corrosion. |
| CRYLCOAT 4420-0 | 90/10 | o | | - | + + | - - | 51 | 5500 | 64 | 200 | Dry blend semi-matte finish w/4430-0. Gloss from 25 -35. |
| CRYLCOAT 4430-0 | 93/7 | o | | + + | + + | - | 35 | 2000 | 62 | 200 | Superdurable. |
| CRYLCOAT 4442-2 | 93/7 | o | | ++ | + | - | 32 | 1700 | 59 | 160 | Smoothness and flexibility. |
| CRYLCOAT 4464-0 | 93/7 | o | | - | ++ | o | 33 | 4250 | 64 | 180 | Edge coverage and smoothness. |
| CRYLCOAT 4488-0 | 93/7 | + + | | - | + + | - | 30 | 5400 | 64 | 200 | Best Florida data. |
| CRYLCOAT 4659-0 | 93/7 | o | | + + | + | + | 33 | 3600 | 59 | 200 | Flexibility. |
| CRYLCOAT E04482 | 93/7 | o | | + | ++ | o | 32 | 2600 | 62 | 200 | Balanced properties. |
| CRYLCOAT E04484 | 93/7 | o | | o | ++ | o | 32 | 5700 | 65 | 200 | Improved corrosion. |
| CRYLCOAT E04553 | 90/10 | o | | ++ | + | - | 50 | 7000[b] | 61 | 160 | Chemical resistance and smoothness. |

++ Outstanding + Excellent o Good – Fair – – Poor
[a] Viscosity at 200ºC unless otherwise specified
[b] Viscosity at 175ºC

## Polyester Resins for Hydroxyalkyl Amide Powder Coatings

| 96.5/3.5<br>AV ~25 | 95/5<br>AV ~33 | 92/8<br>AV ~50 | 90/10<br>AV ~70 | Superdurable |
|---|---|---|---|---|
| ● CRYLCOAT® 2675-0 | ● CRYLCOAT 2606-3 | ● CRYLCOAT 2655-6 | ● CRYLCOAT 2621-2 | ● CRYLCOAT 4420-0 |
| ● CRYLCOAT 2691-2 | ● CRYLCOAT 2617-3 | ● CRYLCOAT 2671-3 | ● CRYLCOAT 2650-3 | ● CRYLCOAT 4626-0 |
| ● CRYLCOAT 2695-0 | ● CRYLCOAT 2618-3 | | | ● CRYLCOAT 4641-0 |
| | ● CRYLCOAT 2670-3 | | | ● CRYLCOAT 4642-3 |
| | ● CRYLCOAT 2689-0 | | | ● CRYLCOAT 4643-3 |
| | ● CRYLCOAT 2696-3 | | | ● CRYLCOAT 4655-2 |
| | ● CRYLCOAT 2698-3 | | | ● CRYLCOAT 4659-0 |
| | ● CRYLCOAT E04339 | | | ● CRYLCOAT E04327 |
| | ● SETAPOLL™ SP103 | | | ● SETAPOLL SP340 |
| | ● SETAPOLL SP290 | | | |

| | HAA<br>Standard | | | HAA<br>Superdurables |
|---|---|---|---|---|
| **Dry Blend Gloss Control Systems** | | | | |
| Semi-Gloss | ● CRYLCOAT 2622-2<br>AV 21 | | | |
| | ● CRYLCOAT 2620-2<br>AV 50 | | | |
| | Gloss 30-40 | | | |
| Semi-Matte | ● CRYLCOAT 2670-3<br>AV 34 | ● CRYLCOAT 2650-3<br>AV 70 | | ● CRYLCOAT 4641-0<br>AV 20 |
| | ● CRYLCOAT 2671-3<br>AV 47 | ● CRYLCOAT 2670-3<br>AV 20 | | ● CRYLCOAT 4420-0<br>AV 51 |
| | Gloss 32-36 | Gloss 25-35 | | Gloss 25-35 |
| Matte | ● CRYLCOAT 2691-2<br>AV 21 | | | |
| | ● CRYLCOAT 2621-2<br>AV 72 | | | |
| | Gloss 20-30 | | | |

● CRYLCOAT* and SETAPOLL* polyester resins
● CRYLCOAT and SETAPOLL polyester resins pair for matte dry blends

## Typical Properties for Hydroxyalkyl Amide Resins

| CRYLCOAT®/<br>SETAPOLL™ | Ratio | Over-<br>bake | AV | Flow | Weath-<br>ering | Eco-<br>nomics | Visc.[a] | Tg<br>(°C) | Cure<br>T(°C) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| CRYLCOAT 2606-3 | 95/5 | + | 33 | o | o | o | 4800 | 66 | 180 | Moisture resistance. |
| CRYLCOAT 2617-3 | 95/5 | o | 33 | ++ | - | o | 3500 | 61 | 180 | TMA free. |
| CRYLCOAT 2618-3 | 95/5 | + | 35 | + | - | o | 3100 | 61 | 180 | gas oven stabilized. |
| CRYLCOAT 2650-3 | 90/10 | - | 70 | o | o | - - | 6200 | 51 | 200 | For very low gloss. |
| CRYLCOAT 2655-6 | 93/7 | o | 47 | o | o | - - | 5800 | 58 | 160 | Low cure Options. |
| CRYLCOAT 2670-3 | 95/5 | o | 34 | o | - | o | 6000 | 64 | 200 | Semi-matte dry blend with 2671-3. |
| CRYLCOAT 2671-3 | 93/7 | - | 47 | + | o | - | 4000 | 62 | 180 | Semi-matte dry blend with 2670-3. |
| CRYLCOAT 2675-0 | 96/4 | o | 24 | o | o | o | 8400 | 68 | 200 | Low demand primid with moisture resistance. |
| CRYLCOAT 2689-0 | 95/5 | o | 34 | o | + | o | 4000 | 62 | 180 | TGIC and primid resin with very good outdoor durability. |
| CRYLCOAT 2621-2 | 90/10 | o | 72 | o | o | o | 9000[b] | 62 | 200 | Matte dry blend with 2691-2. |
| CRYLCOAT 2691-2 | 97/3 | + | 21 | - | - | + + | 7600 | 62 | 200 | Matte dry blend with 2621-2. |
| CRYLCOAT 2695-0 | 96.5/3.5 | o | 25 | o | - - | + + | 5500 | 59 | 180 | Workhorse. |
| CRYLCOAT 2696-3 | 95/5 | o | 38 | o | o | o | 4500 | 60 | 160 | Tribo; blooming-free low cure options. |
| CRYLCOAT 2698-3 | 95/5 | + | 33 | ++ | o | - | 3500 | 56 | 180 | High flow. |
| CRYLCOAT E04339 | 95/5 | o | 31 | o | o | o | 4200 | 66 | 180 | Improved corrosion resistance. |
| SETAPOLL SP103 | 95/5 | o | 36 | o | o | o | 7700 | 68 | 180 | General purpose resin. It is for use in the ratio 95:5 with HAA, but can also be cured with PT910 at a ratio 92:8, TGIC at a ratio 93:7 and epoxy resin at 70:30 ratio. |
| SETAPOLL SP290 | 95/5 | + | 36 | o | o | + | 3500 | 59 | 160 | For low bake applications. Very good flow and excellent gloss. Reduced bloom. |
| CRYLCOAT 4420-0 | 92/8 | - - | 51 | o | + + | - - | 5500 | 64 | 200 | Semi-matte dry blend superdurable with 4641-0. |
| CRYLCOAT 4626-0 | 92/8 | - - | 50 | + | + + | - - | 4300[b] | 64 | 180 | Storage stability. |
| CRYLCOAT 4641-0 | 97/3 | o | 20 | + | + + | o | 4200 | 60 | 200 | Semi-matte dry belnd superdurable with 4420-0. |
| CRYLCOAT 4642-3 | 95/5 | - | 35 | + + | + + | - | 1900 | 62 | 180 | High flow. |
| CRYLCOAT 4643-3 | 93/7 | + | 50 | ++ | ++ | o | 1800 | 62 | 155 | Overbake and gas oven resistance; excellent flow and low cure options. |
| CRYLCOAT 4655-2 | 95/5 | + | 31 | - | ++ | o | 7500 | 66 | 155 | High Tg; overbake and gas oven resistance. Low cure options. |
| CRYLCOAT 4659-0 | 95/5 | - | 33 | ++ | + | + | 3600 | 59 | 190 | Primid or TGIC; outstanding flow and blooming free. |
| CRYLCOAT E04327 | 95/5 | o | 33 | + | ++ | o | 1500 | 58 | 200 | Improved corrosion resistance. |
| SETAPOLL SP340 | 95/5 | + | 35 | + | ++ | o | 5500 | 60 | 200 | Good flow and gas oven stability. Good mechanical aging properties. |

| CRYLCOAT | AV | OHV | Over-<br>bake | Flow | Weathering | Economics | Visc. | Tg(°C) | Cure<br>T (°C) | Description |
|---|---|---|---|---|---|---|---|---|---|---|
| **One-Shot Gloss Control System** | | | | | | | | | | |
| CRYLCOAT 2611-0 | 25 | 3 | o | + | o | ++ | 5500 | 58 | 200 | Polyester-HAA durable system that achieves a gloss range from 8-12%. |
| CRYLCOAT 2687-2 | 90 | 5 | o | + | o | ++ | 3500 | 58 | | |
| CRYLCOAT 2635-2 | 85 | 5 | o | - | o | ++ | 3000 | 57 | 200 | Polyester-HAA durable system that achieves a gloss range from 25-40%. |
| CRYLCOAT 2638-2 | 33 | 1 | o | - | o | | 5500 | 62 | | |
| CRYLCOAT 4693-2 | 90 | 5 | o | + | + | + | 3500 | 58 | 200 | Polyester-HAA superdurable system that achieves a gloss range from 8-12%. |
| CRYLCOAT 4651-0 | 21 | 1 | o | + | + | | 4000 | 59 | | |
| CRYLCOAT 4629-0 | 30 | 2 | o | - | + | + | 3500 | 57 | 200 | Polyester-HAA superdurable system that achieves a gloss range from 25-40%. |
| CRYLCOAT 4645-2 | 90 | 5 | o | - | + | | 2000 | 55 | | |

++ Outstanding + Excellent o Good – Fair – – Poor
[a] Viscosity at 200°C unless otherwise specified
[b] Viscosity at 175°C
** For a detailed description of FDA Status, please refer to page 20

## Hydroxil Polyester Resins and Hardeners for Urethane Powder Coatings

| OHV 30-40 | OHV ~50 | OHV 80-130 | OHV >200 | Superdurable |
|---|---|---|---|---|
| ● CRYLCOAT® 2845-0 | ● CRYLCOAT 2839-0 | ● CRYLCOAT 2818-0 | ● CRYLCOAT 2876-0 | ● CRYLCOAT 4823-0 |
| ● CRYLCOAT 2890-0 | ● CRYLCOAT 2860-2 | ● CRYLCOAT 2842-2 | | ● CRYLCOAT 4874-0 |
| ● CRYLCOAT 2883-0 | | | | ● CRYLCOAT 4890-0 |
| | | | | ● CRYLCOAT 4891-0 |
| | | | | ● CRYLCOAT E04362 |
| | | | | ● CRYLCOAT E04375 |

| | Urethane Standard | Urethane Superdurable |
|---|---|---|
| | One Shot Gloss Control Systems | |
| Matte | ● CRYLCOAT 2876-0<br>OHV 290 | ● CRYLCOAT 4874-0<br>OHV 290 |
| | ● CRYLCOAT 2860-0<br>OHV 50 | ● CRYLCOAT 4891-0<br>OHV 30 |
| | Gloss from 8 -30 | Gloss from 8-30 |
| Ultra Matte | | ● CRYLCOAT E04362<br>OHV 220 |
| | | ● CRYLCOAT E04375<br>OHV 30 |
| | | Gloss from 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<br>ANHYDRIDE HARDENER |

● CRYLCOAT* and SETAPOLL™* polyester resins
● CRYLCOAT and SETAPOLL new generation hybrids polyester resins
● CRYLCOAT and SETAPOLL polyester resins pair for one-shot matte finishes
● ADDITOL*, MODAFLOW®*, SYNTHACRYL®* systems and additives

## Typical Properties for Hydroxyl Resins and Hardeners

| CRYLCOAT® | OHV | Visc.[a] | Tg(°C) | Cure(°C) | Benefit | Flow | Weathering | Overbake | Economics |
|---|---|---|---|---|---|---|---|---|---|
| CRYLCOAT 2876-0 | 290 | 4500 | 58 | 200 | Anti-graffiti, hardness and stain resistance. One Shot Matte w/2860-0 | - - | o | o | - - |
| CRYLCOAT 2818-0 | 100 | 3200 | 58 | 200 | Chemical resistance | - - | o | + | - - |
| CRYLCOAT 2839-0 | 50 | 5500 | 57 | 200 | Workhorse | - | - | - | + |
| CRYLCOAT 2842-2 | 125 | 3600 | 56 | 200 | Stain, detergent, and chemical resistance | + | - | + | o |
| CRYLCOAT 2845-0 | 35 | 7100 | 57 | 200 | Workhorse | - | - | - | + + |
| CRYLCOAT 2860-2 | 50 | 4500 | 52 | 200 | One-shot matte w/E04176 | + | o | o | -- |
| CRYLCOAT 2883-0 | 47 | 4000 | 61 | 200 | Excellent Hardness | + | o | + | - |
| CRYLCOAT 2890-0 | 30 | 6700 | 60 | 200 | Workhorse | + | o | + | o |
| CRYLCOAT 2920-0 | 33 | 12700 | 67 | 200 | Wrinkle | - - | o | o | - |
| CRYLCOAT 4823-0 | 85 | 1925 | 57 | 200 | Chemical and weathering resistance | ++ | ++ | o | -- |
| CRYLCOAT 4874-0 | 290 | 3000 | 52 | 200 | Anti-graffiti | -- | ++ | -- | -- |
| CRYLCOAT 4890-0 | 30 | 5000 | 58 | 200 | Workhorse | + + | + + | + | + + |
| CRYLCOAT 4891-0 | 30 | 5500 | 56 | 200 | One Shot Matte w/4874-0 | ++ | ++ | o | -- |
| CRYLCOAT E04362 | 220 | 3000 | 53 | 200 | One-shot SD Ultra matte w/E04375 | ++ | ++ | o | -- |
| CRYLCOAT E04375 | 30 | 5000 | 58 | 200 | One-shot SD Ultra matte w/E04362 | ++ | ++ | o | -- |

| ADDITOL® | OHV | NCO % | Tg(°C) | | Benefit | Flow | Weathering | Overbake | Economics |
|---|---|---|---|---|---|---|---|---|---|
| ADDITOL P 920 | 42 | NA | 58 | | Wrinkle | - - | o | o | o |
| ADDITOL P 932 | NA | 9-10 | 62 | | Canada only | + | o | o | - |
| ADDITOL P 965 | NA | 16-17 | 62 | | Aromatic urethane | - | - - | + | - |

| BECKOPOX™ | AV | | MP(°C) | Cure | Benefit | Flow | Weathering | Overbake | Economics |
|---|---|---|---|---|---|---|---|---|---|
| BECKOPOX EH 694 | 31 | | 50-60 | NA | Chemical Resistance | o | o | - | o |

++ Outstanding + Excellent o Good – Fair – – Poor
[a] Viscosity at 200°C
[b] Viscosity at 175°C
** For a detailed description of FDA Status, please refer to page 20.

## 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 | PVC Applications | Toner Applications | Additives |
|---|---|---|---|---|
| ● CRYLCOAT 2409-0 | ● CRYLCOAT 2451-6 | ● UVECOAT 3003 | ● UVECOAT T37621 | ● ADDITOL P 964 |
| ● CRYLCOAT 2451-6 | ● UVECOAT 3002 | | | ● ADDITOL P 963 |
| ● CRYLCOAT 2494-6 | ● UVECOAT 3005 | | | ● ADDITOL P 966 |
| ● CRYLCOAT 2473-4 | | | | ● UVECOAT 9010 |
| ● CRYLCOAT 2433-2 | | | | ● UVECOAT 9539 |
| ● CRYLCOAT 1574-6 | | | | |
| ● UVECOAT 2100 | | | | |
| ● UVECOAT 2200 | | | | |

● CRYLCOAT and SETAPOLL™ polyester resins pair for one-shot matte finishes
● CRYLCOAT and SETAPOLL polyester resins pair for matte dry blends
● CRYLCOAT and SETAPOLL polyester resins for low temperature curing

## Typical Properties for Low Temperature Cure Powder Coating Resins

| Product | Visc.[a] | Tg(ºC) | Product use |
|---|---|---|---|
| **Thermal Cure** | | | |
| ADDITOL® P963 | 3400 | NA | Catalyst for use in pigmented hybrid and TGIC coatings. |
| ADDITOL P964 | 3200 | NA | Catalyst for use in pigmented hybrid and TGIC coatings. |
| ADDITOL P966 | 1900 | NA | Catalyst for use in superdurable pigmented TGIC coatings. |
| CRYLCOAT® 1574-6 | 5000 | 50 | 50/50 hybrid that can cure as low as 120ºC. |
| CRYLCOAT 2409-0 | 3900 | NA | Smoothest TGIC resin for cure at 160ºC and lower. |
| CRYLCOAT 2451-6 | 1500 | 53 | MDF and metal application for cure as low as 135ºC |
| CRYLCOAT 2494-6 | 2800 | 60 | Non-blooming TGIC resin for cure at 160ºC and lower. |
| CRYLCOAT 2473-4 | 3200 | 49 | 160ºC TGIC resin for use in clear powder coatings. |
| CRYLCOAT 2433-2 | 3000 | 57 | Workhorse resin that can cure at 160ºC. |
| **UV Cure** | | | |
| UVECOAT® 2100 | 5500 | 57 | Exterior durable UV powder resin for use in clear and pigmented coatings. |
| UVECOAT 2200 | 4500 | 54 | Superdurable UV powder resin that can achieve 1000+ hours corrosion resistance. |
| UVECOAT 3002 | 4500 (175ºC) | 49 | For MDF and wood substrates. Can be used for clear and pigmented systems. Excellent chemical resistance and improved UV resistance. |
| UVECOAT 3003 | 3200 (175ºC) | 49 | Improved chemical and abrasion resistance with good flexibility for indoor PVC applications. |
| UVECOAT 3005 | 4000 | 48 | General purpose grade for MDF and wood applications. Good chemical resistance. |
| UVECOAT 9010 | 350 (100ºC) | 85* | Semi-crystalline unsaturated additive to improve smoothness and flexibility. |
| UVECOAT 9539 | 4000 | 44 | For use with Uvecoat 2100 to provide excellent adhesion to various metal substrates. |
| UVECOAT T37621 | 5200 | 51 | Unsaturated resin that combines high reactivity and high Tg for toners. |

[a] Viscosity at 200ºC
* Melting Temperature

## 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 891 | | |

| | Acrylic Hardener | Crystalline | |
|---|---|---|---|
| | ● ADDITOL P 791 | | |
| | ● BECKOPOX™ EH 694 ANHYDRIDE HARDENER | | |
| | ● SYNTHACRYL® 700 MATTING AGENT | | |

● ADDITOL*, MODAFLOW*, SYNTHACRYL* systems and additives

## Typical Properties for Masterbatches and Additives

| ADDITOL® | Acid/OHV | Visc.[a] | Tg (°C) | % Active | Used for | Flow | Catalyst | Tribo | Acrylic |
|---|---|---|---|---|---|---|---|---|---|
| ADDITOL P 791 | AV 317 | NA | NA | NA | For use with solid acrylic resin containing glycidyl groups | | | | ● |
| ADDITOL P 824 | OHV 45 | 1400 | 49 | 15 | Pigmented coatings | ● | | | |
| ADDITOL P 891 | AV 35 | 2300 | 56 | 5 | Clear coatings | ● | | | |
| ADDITOL P 896 | OHV 35 | 1700 | 57 | 15 | Durable coatings | ● | | | |
| ADDITOL P 950 | OHV 28 | 8000 | NA | 5 | All coatings | | | ● | |
| ADDITOL P 963 | AV 33 | 3400 | NA | 5 | Hybrid and TGIC systems | | ● | | |
| ADDITOL P 964 | AV 33 | 3200 | NA | 5 | Hybrid and TGIC systems | | ● | | |
| ADDITOL P 966 | AV 35 | 1900 | NA | 5 | Superdurable coatings | | ● | | |

| MODAFLOW® | Activity % | Volatile loss % | Density (g/cm²) | Description |
|---|---|---|---|---|
| MODAFLOW Powder III | Min. 65 | Max. 4 | 0.58 - 0.64 | Addition of 0.6-1.5% of the total formulation. FDA listed monomers. |
| MODAFLOW 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) | Description |
|---|---|---|---|---|
| SYNTHACRYL 700 | 714 | 40000 | 80 | Glycidal poly acrylic for use as a matting hardener. |

| BECKOPOX™ | AV | MP(°C) | Cure | Benefit | Flow | Weathering | Overbake | Economics |
|---|---|---|---|---|---|---|---|---|
| BECKOPOX EH 694 | 31 | 50-60 | NA | Chemical resistance | o | o | – | o |

++ Outstanding + Excellent o Good – Fair – – Poor
[a] Viscosity at 200°C
[b] Viscosity at 175°C

## 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 certification letter verifying which CRYLCOAT® resins may be used in contact with food. 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.

This provision holds true if the coatings are not used in contact with alcoholic foods and beverages and these coatings meet applicable end tests identified in 21 Code of Federal Regulations (CFR) § 175.300 (c). Other provisions may apply. For full compliance statement, please contact us at PSRA-Customer-requests@allnex.com. The following table lists CRYLCOAT resins that may be used in the type of repeated-use applications described here in full compliance with the Federal Food, Drug, and Cosmetic Act and all applicable regulations regarding food contact coatings, including 21 CFR § 175.300 ("Resinous and polymeric coatings").

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

+ Provided the can coating complies with the end test specifications of both 175.300 and 177.1010

● CRYLCOAT* and SETAPOLL™* polyester resins
● CRYLCOAT and SETAPOLL new generation hybrids polyester resins
● CRYLCOAT and SETAPOLL polyester resins pair for matte dry blends

## Health, Safety and Product Handling


**Toxicity**
CRYLCOAT® and SETAPOLL™ 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, SETAPOLL, BECKOPOX®, 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, SETAPOLL, BECKOPOX, 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, SETAPOLL, 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 68 kg (150 lb) fiber drums. Upon special request, 454 kg (1,000 lb) polypropylene bulk bags are available. BECKOPOX is typically provided in 25 kg paper bags with polyethylene in-liner.

## 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 (Tg) | 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. |