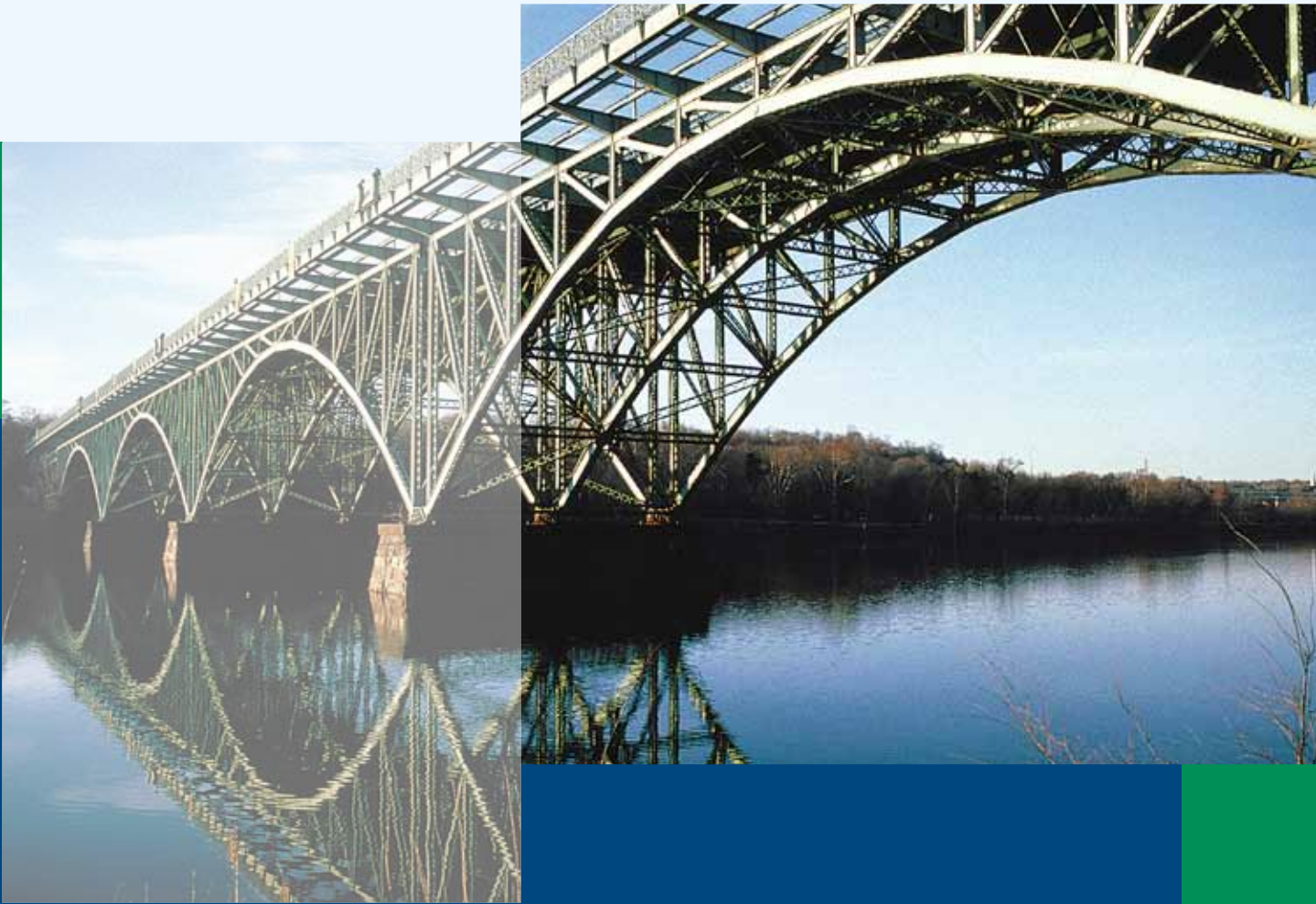


# CYTEC



## PRODUCT GUIDE – ICR Paint Industry

Europe, Middle East and Africa



From defining more efficient processes for mining customers to developing new additives for polymer-based alternatives to wood and metals, the product lines of Cytec Specialty Chemicals are unified in their dedication to customer-driven innovation.

Working closely with our customers, we develop revolutionary technologies that enable them to improve performance and productivity, enter new markets, and refine new applications. How to improve mine profitability or coatings efficiency in the face of important environmental concerns? How to develop polymers that really stand up to UV light? How to use phosphines to create better, safer biocides and fumigants for agriculture? Our technology and sales teams work on-site with customers every day to address today's business challenges and troubleshoot tomorrow's.

The applications are diverse, but the commitment is uniform: finding better solutions for customers through continual research, ongoing collaboration and a passion for innovation.

## An Expansive Portfolio

Cytec Specialty Chemicals is a complete solution provider for customers requiring high-value surface technologies in industries that include industrial coatings, automotive, architectural, wood and paper, graphics, adhesives and opto-electronics.

We offer our customers advanced and diverse products and technologies for surfaces with an emphasis on solvent free or low-VOC products, such as UV/EB curable resins and additives, powder coating resins and additives, as well as waterborne and solventborne coating resins and additives.

We are committed to working with our customers to develop environmentally advanced solutions and we are dedicated to open communication concerning the safe handling, distribution, use and disposal of the products we make.

## A Focus on Customer Satisfaction

Cytec Specialty Chemicals operates a globally integrated set of order fulfillment IT systems and

processes. All Spec Chem personnel in the order fulfillment processes are dedicated to delivering customer satisfaction through reliable and cost-effective supply of products to our customers. Cytec Specialty Chemicals has specialized personnel in Customer Service, Procurement, Manufacturing, Planning and Logistics to achieve this goal. In addition to timely and accurate order fulfillment, there is an equally important focus on maintaining safety and protecting the environment at all steps in the process, from the procurement of raw materials to the delivery of finished goods to the customer's door.

## Dedication to Operational Excellence

Cytec's Spec Chem Manufacturing Organization operates globally to provide superior service to our customers in all regions. Our vision of operational excellence brings value to our customers through ongoing, continuous improvement initiatives, including Lean Manufacturing, Six Sigma Principles, and Best Practice Engineering. Our value proposition is driven by excellence in our Safety, Environmental, Quality Systems and Employee Development Programs. We are structured by business technology, which enables our sites to work transparently with R&D, Customer Service and the Business, to share best practices across common processes. We also are able to gain leverage from overall global manufacturing synergies to most efficiently meet customer needs.

## Key Product Lines

- Specialty Coating Resins and Additives
- Mining Chemicals
- Phosphine and Phosphorus Specialties
- Polymer Additives
- Powder Coating Resins and Additives
- Industrial Coating Resins and Additives
- Specialty Additives

## **Binders for Industrial Wood Coatings**

Binders for 1P PU Lacquers, Moisture Curing, for Parquet Sealing Lacquers	6
Binders for 2P PU Lacquers	7
Acrylic Resins for Wood and Furniture Lacquers	
Alkyd Resins for Wood, Furniture and Sealing Lacquers	
Binders for Acid Curing Lacquers, for Furniture and Sealing Lacquers	8

## **Additives for UP Putties and Spraying Fillers** 9

## **Binders for Decorative Paints**

Binders for Decorative Paints: Alkyds, M and S types	10
Binders for Decorative Paints: Alkyds, F and T types	10
Binders for Decorative Paints: Special Alkyds	10

## **Thermoplastic Acrylics for Road Marking** 12

## **Thermoplastic Acrylics for Decorative and Industrial Paints** 13

## **Epoxy Resins and Hardeners** 14

## **Binders for OEM** 16

### **1K Binders for GI:**

1K Binders for GI: DUROXYN®, special VIALKYD® types	17
1K Binders for GI: AF, AM Air Drying types	18
1K Binders for GI: AC, AN, AR, AV, AY types	19
1K Binders for GI: VIACRYL®, RESAMIN®, ALPEX®, BECKOPOX®, PHENODUR®, CYLINK®, SANTOSOL®	20

## **2K Binders**

Low Solids	22
Medium Solids	22
High Solids	24

<b>Self-crosslinking Acrylic Resins</b>	24
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## **Can and Coil Coatings**

Saturated Polyesters	26
Phenolic Resins for Can Coatings	28
Phenolic Resins for Special Usage	28
Waterborne Phenolic Resins	30

## **Aminos**

CYMEL®: Ureas	32
CYMEL®: Methylated Melamines	34
CYMEL: Butylated Melamines	36

# 6 Binders for Industrial Wood Coatings

## Binders for 1P PU Lacquers

### Binders for 1P PU Lacquers, Moisture Curing, for Parquet Sealing Lacquers

Products	Type	Isocyanate-content DIN EN ISO 11909	Dyn. viscosity [mPas]/23°C	TDI-content (look at SDS)	Properties and Use
BECKOCOAT®* PU 428 / 51XMPAC	glossy	3–5 %	290–590 / fod	< 1,7 %	Quick hardening, very high gloss, extremely good abrasion resistance, high impact tenacity, good adhesion; parquet sealing, wood coating and concrete impregnation; with alkyd resins as hardener in 2P-systems.
BECKOCOAT® VPU 4204 / 40LG	mat	2–4 %	160–370 / fod	< 0,8 %	Already flat, quick hardening, good abrasion resistance, excellent chemical resistance; parquet sealing, wood coating and concrete impregnation.
BECKOCOAT VPU 6072 / 38LG	glossy	2–4 %	35–140 / fod	<= 0,5 %	Xylene free, quick hardening, good abrasion resistance, high impact tenacity, good adhesion; parquet sealing and concrete impregnation for indoor use.

\* BECKOCOAT moisture curing resins



### Acrylic Resins for Wood and Furniture Lacquers

Products	Type	% OH	Dyn. visc. [mPas]/23°C	Properties and Use	Formulations
MACRYNAL® SM 507/ 53XBAC	Acrylic resin	1,8	5500–7500 (fod)	High quality two-pack clear lacquers for wood and furniture coatings, parquet sealings. For fast drying two-pack lacquers for industrial applications at ambient temperature as well as forced drying. Superior adhesion to aluminium and plastic parts (ABS and PC).	C1207BH lacquer, colorless, glossy A803/12 lacquer, colorless, satin
MACRYNAL® VSM 2760 / 50BAC	Acrylic resin	2,1	2000–4000 (fod)	Elastic type with good chemical resistances and quick drying; wood and furniture lacquers.	AM 86/2 lacquer, colorless, glossy AM 86/4 lacquer, colorless, satin WP 1595/3 filler, white

\* MACRYNAL acrylic resins

### Alkyd Resins for Wood, Furniture and Sealing Lacquers

Product	Type	% OH	Dyn. visc. [mPas]/23°C	Properties and Use	Formulations
VIALKYD® VAN 6130 / 75MPAC	Oil-free, OH-funct. PE	6,4	900–1300 (fod)	High chemical, solvent and abrasion resistance, excellent gloss; 2P PU-sealers with broad polyisocyanate compatibility and high body.	MG 9/1 lacquer, colorless, glossy

\* VIALKYD alkyd resins

# 8 Binders for Industrial Wood Coatings

## Binders for Acid Curing Lacquers, for Furniture and Sealing Lacquers

Product	Type	% free HCOH content	Dyn. visc. [mPas]/23°C	Properties and Use	Formulations
VIAMIN®* HP 366 / 60IBE	Acid curing plasti- fied urea resin	< 0,2 (fod)	590–1100 (fod)	Very low HCOH-separation, long processing time, quick handling; pollutant-poor 1P and 2P-lacquers for industrial furniture and par-quet sealing.	A 4805 2P sealer, color- less, glossy A 4806 2P sealer, color- less, mat A 4813 2P sealer, white, mat

\* VIAMIN urea resins



## Additives for UP Putties and Spraying Fillers

Product	Characteristics	Application
ADDITOL®* VXL 5918	Prolongs the processing time (potlife) of UP-paints, putties and spraying fillers, but delayed sandability of these systems can be marked.	UP-paints, putties and spraying fillers.

\* ADDITOL additives

## Binders for Decorative Paints: Alkyds, M and S types

Products	Type	Oil length	Architectural	Wood primers	Clear coats, floor	Wood stains	Marine paints	Combination	High solid	Mat paints	Special effects	Less aromatics	Thixotropic
VIALKYD®* AM 764 / 60WS	Phenolic, isophthalic soya tung	75	●	-	●	●	-	-	-	-	-	-	-
VIALKYD® AS 673m / 60SD60	Soya oil	64	●	●	-	●	-	-	-	-	-	●	-
VIALKYD AS 533tix / 50SD60	Soya oil	53	●	●	●	●	●	●	-	-	-	●	●
VIALKYD AS 6140sca / 49SD60	Soya oil	60	●	●	●	-	●	●	-	-	-	●	●

## Binders for Decorative Paints: Alkyds, F and T types

VIALKYD SAF 724 / 78SD60	Fatty acids, rich in linoleic acid	72	●	-	-	●	-	-	-	-	-	●	-
VIALKYD VAF 6091	Vegetable fatty acids	89	●	-	-	●	-	●	●	-	-	●	-
VIALKYD AF 474 / 55WS	Fatty acids	48	-	-	-	-	-	●	-	-	-	-	-

## Binders for Decorative Paints: Special Alkyds

Products	Type	Oil length	Architectural paints	Wood primers	Clear coats, floor	Wood stains	Marine paints	Combination resins	Mat paints	Reduced in aromatics	Properties and Uses
VIALKYD AR 680	De-hydrated castor oil	66	-	-	-	-	●	●	-	●	Excellent through drying properties. Anti-corrosion paints, with ALPEX® CK 450.
VIALKYD SAL 766	Linseed oil	100	-	-	-	-	-	-	-	-	Offset printing and letterpress printing.
VIALKYD AV 608 / 60WS	Styrene modified oil	60	●	-	-	-	-	-	-	-	Aluminium paints. Excellent weather water and corrosion resistance, high gloss.
VIALKYD TO 167 / 60IRH	Urethane, soya	68	-	-	●	-	●	-	-	-	Tough and abrasion resistant films with excellent water and chemical resistance.
VIALKYD TO 608 / 55SD60 TO 608 / 60WS	Urethane, soya	64	-	-	●	-	-	●	-	-	Rapid initial and through drying High abrasion resistance. Very good resistance to chemicals and water.
VIALKYD TO 750 / 65IRH	Urethane, vegetable oils	71	-	-	●	-	-	-	-	-	Floor oils.

## Properties and Uses

Excellent resistance to weather and water. Radiant brilliance, good gloss retention. Yacht varnishes. Anti-corrosive systems.

Excellent initial and through drying. High gloss and good build. Excellent yellowing and weather resistance.

Strong thixotropy, rapid drying. In combination also for anticorrosive thick layer Paints.

Pumpable. Concerning gloss retention and weather resistance, shows better properties than polyamide thixotropic alkyds.

Outstanding outdoor and very good yellowing resistance. Fast drying, high flexibility and good gloss retention.

Application properties are the same as with normal conventional alkyds.

Combined with long oil alkyds for optimizing the good build and through drying.

\* VIALKYD alkyd resins



# 12 Thermoplastic Acrylics for Road Marking

## Thermoplastic Acrylics for Road Marking

Products	Type	Cold plastics Hand	Cold plastics Machine	Road marking 1K	Properties and Uses
VIACRYL® VSC 5745	Reactive polycondensate resin dissolved In acrylic monomers	●	●	–	Hard-elastic, very good weather and abrasion resistance.
VIACRYL® VSC 2990	Acrylic resin dissolved In acrylic monomers	●	–	●	Highly elastic, very good weather and abrasion stability.
VIACRYL VSC 5721 / 65BAC	Acrylic copolymerisate modified with drying fatty acids	–	–	●	Sole binder for non-aromatic road marking paints with high solid content.
VIACRYL SC 121 / 60LG	Copolymer based on styrene/acrylic acid ester	–	–	●	Sole binder for road marking paints.
VIACRYL SC 126 / 50LG	Thermoplastic acrylics	–	–	●	Rapid solvent release, excellent adhesion. Quick trafficability after application. Proved durability and flexibility.

\* VIACRYL acrylic resins



## Thermoplastic Acrylics for Decorative and Industrial Paints

Products	Type							Properties and Uses
		Decorative paints	Industrial paints	Car refinishing	Plastics	Concrete	Aerosol	
VIACRYL®* SC 121 / 60X	Copolymer based on styrene/acrylic acid ester	-	●	-	●	-	-	Fast drying primers and top coats for nonferrous metal and plastic substrates.
VIACRYL® SC 120 / 50WS	Physically drying plasticized acrylic copolymer	●	-	-	-	●	●	Sole binder for heavily filled paints for exterior and interior walls, Eternit, concrete and for brushing mortars, excellent levelling, high flexibility.
VIACRYL SC 124 / 50WS	Copolymer based on methacrylates	●	●	-	-	-	-	Excellent compatibility with alkyd resins. Excellent through-drying and surface hardness. Color stability.
VIACRYL SC 134 / 50WS165	Thermoplastic, flexible methacrylate resin	●	-	-	-	●	●	Very rapid physical drying. Outstanding weather resistance. Excellent alkali and water resistance. Excellent pigment wetting. Sole binder for full tone masonry paints or resin modified plasters. Aerosols.
VIACRYL SC 200 / 40X	Epoxy resin modified	-	●	●	●	-	-	Fast drying and high hardness. Adhesion on glass, precious metals and plastics.
VIACRYL VSC 5709 / 50BAC	Thermoplastic	-	●	●	-	-	-	Rapid drying, high surface hardness. Excellent resistance to ethanol.

\* VIACRYL acrylic resins



# 14 Epoxy Resins and Hardeners

## Epoxy Resins and Hardeners

Products	Type	H-equivalent weight g/mol f.o.d.	Classification	Dynamic viscosity, DIN EN ISO 3219, mPa.s, 25°C	Dynamic viscosity, DIN EN ISO 3219, mPa.s, 23°C
BECKOPOX® EP 075	Reactive diluent	320 – 360	–	–	40 – 70
BECKOPOX® EP 116	A / F-liquid	175 –185	Xi, N	6000 – 8000	7800 –11000
BECKOPOX EP 117	Reactive diluted A / F-liquid	175 –185	Xi, N	700 –1000	800 –1200
BECKOPOX EP 128	Reactive diluted A-liquid	190 – 200	Xi, N	700 –1000	900 –1300
BECKOPOX EP 140 EP 140 / 80SNB	A-liquid	180 –190	Xi, N	–	11000 –15500
BECKOPOX EP 151	Int plast A-liquid	400 – 500	Xi, N	20000 – 30000	25000 – 38000
BECKOPOX EP 301 / 75X	Solid (type1)	450 – 525	Xn	–	7800 –13000

## Epoxy Resins and Hardeners

Product	Type	H-equivalent weight g/mol f.o.d.	H-equivalent weight g/mol Solid matter	Start of gelation 23 °C	Classification
BECKOPOX EH 651 / 70X	Hardener polyamidoamine	255	178	ca. 8 h1)	Xn

\* BECKOPOX epoxy resins and epoxy hardeners

Dynamic viscosity, DIN EN ISO 3219, Shear rate s-1	Properties and Uses
500 (f.o.d)	Neutral odor, for unmodified epoxy resins (polypropylene glycol diglycidyl ether). Flexibilizing.
100 (f.o.d)	Non-crystallizing. For highly chemical-resistant coatings, trowelling compounds, adhesives, casting and laminating compounds.
500 (f.o.d)	Non-crystallizing. For chemical-resistant coatings, concrete injections, trowelling compounds, adhesives, casting and laminating compounds.
500 (f.o.d)	For chemical-resistant coatings, concrete injections, trowelling, casting, and laminating compounds, hydraulic epoxy mortars (ECC).
25 (Solid)	For highly chemical-resistant coatings, adhesives, trowelling, casting and laminating compounds.
25 cylind (f.o.d)	Compounding resin for unmodified epoxy resins in coatings, adhesives and casting compounds.
100 (f.o.d)	For solventborne coatings and anti-corrosion primers, additional binder for stoving paints, e. g. based on saturated polyesters or acrylates to achieve better chemical resistance and adhesion. Average OH: 120.

Dynamic viscosity, DIN EN ISO 3219, mPa.s, 23°C	Shear rate s-1	Properties and Uses
550 – 1700	500	In combination with BECKOPOX EP 301 for solventborne primers and top coats with long processing time.

# 16 Binders for OEM

## Binders for OEM

Products	Type	Primer surfacer	Base-coat	Clear-coat	Topcoat	Temperature (°C)	Properties and Uses
VIACRYL® SC303 / 65XB	Thermosetting acrylic	-	●	-	-	130-150	Good compatibility with CAB, good pigment wetting and weather resistance.
VIACRYL® SC 341 / 60SNA-BAC	Thermosetting acrylic	-	-	●	-	130-150	Easy handling, high gloss.
VIACRYL SC370 / 75SNA	Thermosetting acrylic	-	-	●	-	130-150	Improves body, solids content and gloss.
VIACRYL SC 2960 / 75SNA	Thermosetting acrylic	-	-	●	-	130-150	High scratch resistance, tough-elastic, gloss.
MACRYNAL® SM 2930 / 70BAC	Acrylic OH 2K	-	-	●	-	120-150	Excellent chemical resistance and outdoor stability.
RESAMIN® HF 480	Urea Carbamide	-	●	-	-	130-150	Improves flip flop, flexibility.
VIALKYD® AN 950 / 70X	Saturated polyester	●	●	-	-	130-190	Basic resin with excellent all round properties. Good compatibility with CAB.
BECKOPOX® EP 301 / 75X	Solid (type1) epoxy	●	-	-	-	140-190	Modifier resin to improve adhesion and corrosion resistance.

\* VIACRYL acrylic resins

\* MACRYNAL acrylic resins

\* RESAMIN solventborne plasticizing resins

\* VIALKYD alkyd resins

\* BECKOPOX epoxy resins and epoxy hardeners

## 1K Binders for GI: DUROXYN, special VIALKYD types

Products	Type	Oil length	Iodine Col max	Pigment pastes	Primer	Topcoat	Properties and Uses
VIALKYD® AM 318 / 70SNA	Special fatty acids	31	15	●	–	–	Special binder for tinting pastes for paints.
VIALKYD® AC 290 / 70MPAC	Fatty acid modified, non-drying	29	5	●	●	●	Grinding resin for pigment pastes. Excellent compatibility characteristics with alkyd stoving paints, thermosetting acrylic paints, NC-lacquers, acid curing enamels, alkyd- or acrylic-isocyanate enamels.
VIALKYD VAS 9904 / 70SNA	Soya oil	42	10	●	–	–	Pigmented pasts, finish enamels with high resistance to yellowing, air drying and oven drying.
DUROXYN® EF 900 / 60X	DCO fatty acid Epoxy ester	42	8	–	●	●	Very good adhesion, hardness, flexibility. High pigment loading, good gloss. Excellent water and alkaline resistance.
DUROXYN® EF 935 / 60X	DCO, Soya FA Epoxy ester	35	10	–	●	●	Air-drying and stoving anticorrosive primers. Very good adhesion, hardness, flexibility. High pigment loading, good gloss. Excellent water and alkaline resistance.

\* VIALKYD alkyd resins

\* DUROXYN epoxy ester resins

## 1K Binders for GI: AF, AM Air Drying types

Products	Oil type	Oil length	Iodine Col max	Primer	Topcoat	Properties and Uses
VIALKYD®* AF 403 / 60X	Drying fatty acids	40	8	-	●	Excellent gloss. Agricultural machines.
VIALKYD® AF 474 / 55WS	Drying fatty acids	48	7	-	●	High hardness, excellent gloss. No surface defects up to 120µm dry.
VIALKYD VAF 7109 / 55SNA	Vegetable fatty acids	48	10	-	●	Top-quality automobile repair, industrial enamels and radiator paints. In combination with HMMM, forced drying systems (< 80 °C).

\* VIALKYD alkyd resins



## 1K Binders for GI: AC, AN, AR, AV, AY types

Products	Type	Air drying	Stoving	Oil length	Iodine Col max	Prime	Topcoat	Properties and Uses
VIALKYD® AR 308 / 50LG	Dehydrated Castor oil	–	●	30	12	●	●	Very good scratch resistance, excellent adhesion, radiant brilliance and weather resistance. Stoving conditions: 80–150°C.
VIALKYD® AV 352m / 50X	Styrene mod. Drying fatty acids	●	–	35	10	●	●	Hammer finishes. Anti-corrosive primers. Weldable zinc dust paints, spraying fillers. 33% Styrene.
VIALKYD AY 402 / 50X	Acrylic, vinyl and urethane mod. FA	●	–	30	20	●	●	Corrosion resistance, high pigment loading, quick drying, adhesion on metal, high hardness. 33% Monomers.
VIALKYD AC 451N / 70SNB	Medium oil alkyd	–	●	46	3	–	●	High body and weather durability. Stoving conditions: 30 mn 120–140°C.
VIALKYD AN 950 / 70X	Saturated Polyester	–	●	0	5	●	●	Excellent pigment wetting properties. Outdoor durable, non yellowing. Coating systems for motor vehicles, street signs and lights, heaters.

\* VIALKYD alkyd resins



**1K Binders for GI: VIACRYL<sup>®</sup>, RESAMIN<sup>®</sup>, ALPEX<sup>®</sup>, BECKOPOX<sup>®</sup>, PHENODUR<sup>®</sup>, CYLINK<sup>®</sup>, SANTOSOL<sup>®</sup>**

Products	Type	Primer	Topcoat	Properties and Uses
VIACRYL <sup>®</sup> SC 303 / 65XB	Thermosetting acrylic	–	●	Stoving Industrial applications such as electric night storage heaters, fluorescent lamps, household appliances, boilers and drying boxes.
VIACRYL SC 341 / 60SNA-BAC	Thermosetting acrylic	–	–	Stoving Industrial applications. Superior radiance, high surface hardness, excellent weather resistance.
VIACRYL SC 370 / 75SNA	Thermosetting acrylic	–	●	High solids stoving enamels for industrial purposes. Resin additive for improving solids content, body and gloss of stoving enamels 2K PU. Resin for pigment pastes.
ALPEX <sup>®</sup> CK 450 PAST	Cyclized rubber	●	●	Chemically resistant paints; anti-corrosion paints; zinc-rich paints; interior coatings for drinking-water tanks.
RESAMIN <sup>®</sup> HF 480	Urea Carbamide	●	●	Plasticizing component and compatibility promoter for thermoplastic backbone coating resins (e. g. nitrocellulose, HOSTAFLEX <sup>®</sup> , cyclized rubber, PVB), alkyd/amino stoving enamels and 2K PU.
BECKOPOX <sup>®</sup> EM 460 / 60IBX	Modified epoxy resin	●	–	Excellent adhesion to steel and nonferrous metals, high corrosion protection, best recoatability. With PVB, 1K and 2K wash primers, weldable shop primers.
ALNOVOL <sup>®</sup> PN 320 PAST	Non-self-curing phenolic resin of the novolak type	●	●	Usable in petrol-resistant coatings, sealers and electro insulating varnishes.
PHENODUR <sup>®</sup> PR 263 / 70B PR 263 / 55B	Phenolic resin	●	–	Compared to BECKOPOX EM 460, faster drying and less yellowing resistant.
PHENODUR VPR 59 / 1 / 50IBMP	Non plastified, phenolic resin	●	–	High performance coatings used in the chemical industry. Phenolic/epoxide resin combination for can coating systems.
CYLINK <sup>®</sup> 2000	Tris (alkoxy-carbonyl-amino) triazine	–	●	Non formaldehyde, non isocyanate chemistry. Excellent exterior durability and etch resistance.
SANTOSOL <sup>®</sup> DME 1	Dimethyl ester	–	–	Industrial paint strippers, industrial cleaners for polyurethanes, inks, acrylics and unsaturated polyesters, plasticizers, coil and container coatings.

\* VIACRYL acrylic resins

\* ALPEX cyclized rubber resins

\* RESAMIN solventborne plasticizing resins

\* BECKOPOX epoxy resins and epoxy hardeners

\* ALNOVOL phenolic resins

\* PHENODUR phenolic resins

\* CYLINK crosslinker resins

\* SANTOSOL dimethyl esters



## 2K Binders: Low Solids

Products	Type	Average hydroxyl content (solid resin), approx. [%]	Dynamic viscosity (f.o.d.) DIN EN ISO 3219, 23°C [mPa.s]
MACRYNAL®* SM 540 / 60X	Acrylic	1.4	1400 – 2400
MACRYNAL® VSM 2702 / 58XSNA	Acrylic	1.5	1000 – 2400
MACRYNAL SM 548 / 50X	Acrylic	2	600 – 1200
MACRYNAL SM 500 / 60X	Acrylic	2.7	2000 – 3800
MACRYNAL VSM 2706 / 60X	Acrylic	2.6	1500 – 3500
VIALKYD®* AY 120 / 65XMPAC	Alkyd resin, acrylic modified	3	230 – 620 (50X)
MACRYNAL SM 513 / 60LG	Acrylic	3.6	2400 – 4000
MACRYNAL SM 510n / 60LG	Acrylic	4.5	2400 – 3600
MACRYNAL VSM 2155 / 60EPAC	Acrylic	5.8	3900 – 4800

## 2K Binders: Medium Solids

Products	Type	Average hydroxyl content (solid resin), approx. [%]	Dynamic viscosity (f.o.d.) DIN EN ISO 3219, 23°C [mPa.s]
MACRYNAL VSM 2705 / 70LG	Polyester modified acrylic	3.5	3000 – 6800
MACRYNAL SM 2813 / 70X	Acrylic	3.3	7000 – 11000
MACRYNAL SM 2814 / 70BAC	Acrylic	4.5	7000 – 11000
MACRYNAL SM 2816 / 70BAC	Acrylic	4.5	7000 – 11000
MACRYNAL SM 516 / 70BAC	Acrylic	4.5	7000 – 11000
MACRYNAL SM 515 / 70BAC	Acrylic	4.5	3600 – 6000
VIALKYD® VAN 9460 / 80BAC	Saturated polyester	4.3	1500 – 3500

\* MACRYNAL acrylic resins, \* VIALKYD alkyd resins

## Properties and Uses

High flexibility, good adhesion to iron and non-iron metals and different plastics, for automotive refinishing primer surfacers, dtm monocoats etc.

Properties similar to SM 540 but faster drying.

Very quick drying for industrial paints.

Standard grade for industrial topcoats, also dtm monocoats.

Properties similar to SM 500, but faster drying and better outdoor durability.

Fast physical drying, very good mechanical properties, well suited for automotive refinishing primer surfacers.

Standard grade for primer surfacers and GI topcoats.

Standard grade for automotive refinishing clearcoats and topcoats, very good solvent and chemical resistance, very good outdoor stability.

Provides excellent chemical resistance (SKYDROL® etc.) and very high hardness, for industrial topcoats.

## Properties and Uses

Ease of application (airless), high gloss, good leveling, for industrial paint, also direct to metal monocoats.

Economy grade for medium solids industrial top coats and clear coats.

Similar properties as SM 516, but higher reactivity and slightly better in QUV-B yellowing.

Similar properties as SM 516, but faster drying.

Standard grade for high quality automotive refinishing clear coats and top coats, good balance of hardness and flexibility, good outdoor stability and chemical resistance.

Fast drying, high hardness, high gloss, very good chemical resistance, for automotive refinishing topcoats and clearcoats.

In combination with acrylics to improve flexibility.

## 2K Binders: High Solids

Products	Type	Average hydroxyl content (solid resin), approx. [%]	Dynamic viscosity (f.o.d.) DIN EN ISO 3219, 23°C [mPa.s]
MACRYNAL® SM 2704 / 75BACX	Acrylic	1.9	5000 – 7000
MACRYNAL® SM 2703 / 80BACX	Acrylic	2.2	7000 – 9000
MACRYNAL SM 2711 / 70BAC	Acrylic	2.7	1500 – 2500
MACRYNAL VSM 2806 / 75BAC	Acrylic	4.1	4000 – 7000
MACRYNAL SM 2810 / 75BAC	Acrylic	4.2	4500 – 6000
MACRYNAL VSM 2805 / 80BAC	Polyester modified Acrylic	4.3	4000 – 8500
MACRYNAL SM 565 / 70BAC	Acrylic	4.4	2000 – 4200
MACRYNAL VSM 2800 / 70BAC	Acrylic	4.4	2000 – 5000
MACRYNAL VSM 2868 / 70BAC	Acrylic	4.5	2700 – 5000
DUROFTAL® PI 2801 / 78BAC	Saturated Polyester	7.1	8000 – 13000
DUROFTAL® VPI 2803 / 78BAC	Saturated Polyester	6.0	7000 – 19000

## Self-crosslinking Acrylic Resins

Products	fod	Modifi- cation	Dynamic viscosity mPas DIN EN ISO 3219	Acid value (solid resin) [mg KOH/g]
VIACRYL® SC 434	50IBBAC	–	300 – 900	9 – 16
VIACRYL® SC 444	50BSNB	epoxy	1600 – 2400	13 – 16

- \* MACRYNAL acrylic resins
- \* DUROFTAL polyester resins
- \* VIACRYL acrylic resins

## Properties and Uses

Fast drying HS systems, economy grade for industrial applications.
Low NCO demand, for cost effective HS protective top coats.
Fast drying, high end hardness, good pigment wetting, for HS dtm monocoats or as combinatorial resin, cost effective HS clear coats and top coats.
High performance clear coats and top coats, very good outdoor stability.
Quicker hardness build up than VSM 2806 and SM 565, very balanced overall properties.
Very high solids lacquers with excellent weathering stability, high flexibility and ease of application (airless spray).
Standard grade for high quality automotive refinishing clear coats and top coats, excellent outdoor stability.
Higher reactivity than SM 565, high hardness, very good gloss and body, high flexibility for automotive refinishing primer surfacers, top coats and clear coats.
High solid alternative to SM 516.
Very high solids lacquers, high hardness, excellent outdoor stability and chemical resistance for high quality clearcoats and top coats.
Very high solids lacquers, properties and uses similar to PI 2801 but lower NCO demand.

Can-coatings	General Industry	Domestic appliances	Application	Properties
-	●	-	In combination with nitrocellulose for metal and wood enamels.	Very quick solvent release. Low viscosity, excellent built. Excellent durable flexibility combined with hardness.
●	●	●	Top quality single coats for domestic appliance. Clear and pigmented exterior coatings for cans.	Suited for spraying and roller coating application. Great hardness combined with good flexibility. Excellent chemical resistance.

## Can and Coil Coatings: Saturated Polyesters

Products	Solid content (%)	Solvent mixture	Viscosity 23 °C (Pa.s)	Acid value (on solid)	Hydroxyl value (on solid)	Mol.weight (Mn)	Tg (°C)	Structure	Outdoor architectural	Indoor architectural	Backcoat	Interior	Exterior	General industrial
DUROFTAL®* VPE 6104	60	MPAC	4,0 – 8,0	max 8	90	4000	20	SB	-	-	-	●	●	-
DUROFTAL® PE 6160	50	MPAC/X	6,0 – 9,0	max 5	30	8000	23	L	-	-	-	●	●	-
DUROFTAL PE 6163	66	SNA/BG	8,0 – 12,0	max 6	55	3700	27	SB	●	●	-	-	●	●
DUROFTAL PE 6607	60	BG/MP	1,0 – 4,0	25 – 35	345	1300	23	SB	-	-	-	●	●	-
DUROFTAL PE 6192	60	SNA/BG	5,0 – 8,0	max 10	150	4000	20	SB	●	●	-	-	●	●
VIALKYD®* VTS 1202	65	MPAC	7,5 – 9,0	max 10	Silicon modified polyester	-	-	HB	●	-	-	-	-	●

\* DUROFTAL polyester resins

\* VIALKYD alkyd resins



## Phenolic Resins for Can Coatings

Products	NV	Compatible with epoxy resins	Compatible with PVB	Colour (cured film)	Typical stoving conditions (mn)	T [°C]	CYCAT® XK 406N	Wedge bend
PHENODUR® PR 217	65 B	●	–	●	12 – 15	200	●	●+
PHENODUR® PR 260	65 B	–	●	○	15	230	–	○
PHENODUR PR 285	55 IBB	●	●	●	15	190	–	●+
PHENODUR PR 411	75 B	●	–	○	10 – 12	200	●	○
PHENODUR PR 516	60 B	●	●	○	10 – 12	200	●	●
PHENODUR PR 517	60 B, 70B	●	●	○	10 – 12	200	●	●+
PHENODUR PR 565	65 XB	●	●	○	12 – 15	200	●	●+
PHENODUR PR 612	80 B, 70B	●	●	○	12	200	●	●
PHENODUR PR 722	53 BGB	●	●	○	12	200	●	●+
PHENODUR PR 897	53 BGB	●	●	○	15 – 20	200	●	●
PHENODUR PR 898	52 BGB	●	●	○	10 – 12	200	●	●
PHENODUR PR 899	60 MPAC	●	●	○	10 – 12	200	●	●
PHENODUR VPR 1785	50 MP	●	●	○	10 – 12	200	●	●+

## Phenolic Resins for Special Usage

Products	NV	Compatible with epoxy resins	Compatible with PVB	Colour (cured film)	Typical stoving conditions (mn)	T [°C]	CYCAT® XK 406N	Wedge bend
<b>Crosslinker for epoxy, hydroxyl, carboxyl and amide functional resins</b>								
PHENODUR PR 371	70 B	●	●	○	–	160 – 200	●	●
SANTOLINK® EP-560	71	●	●	○	–	160 – 200	●	●
<b>Non-phenolic crosslinker for epoxy functional or polyester resins</b>								
PHENODUR VPM 1150	50 EPAC	●	n. a.	clear	10 – 12	200	–	●+
<b>Coloring resin as additive</b>								
PHENODUR PR 307	63 XMP	●	●	very dark	n. a.	160 – 220	–	n. a.
PHENODUR PR 308	62 MP	●	●	very dark	n. a.	160 – 220	–	n. a.

\* PHENODUR phenolic resins

Typically ratios EP:Phenolics, PE:Phenolics or Phenolic:PVB 80:20 to 1:1

Erichsen cup n °2	2 % lactic acid / 1h/ 129 C	Cysteine test 90 min at 121 C	Coil for can	Can	Tubes	Drums	Metal foils	Silver lacquer	for Bis-A/ BADGE free	for wb
●	●	○	●	●	●	-	-	-	-	-
○	●	●	-	-	-	●	-	-	-	-
●	●	●	●	●	●	-	-	-	-	●
●	●	●	●	●	-	●	●	●	-	-
●	●	●	●	●	●	●	●	●	●	-
● +	●	● +	●	●	●	-	-	-	●	-
● +	●	● +	-	●	-	-	●	●	-	-
● +	●	○	-	●	●	●	●	-	-	●
● +	●	●	-	●	-	-	-	-	-	-
●	● +	●	-	●	●	-	-	-	-	-
● +	● +	○	-	●	●	-	-	-	-	-
● +	●	○	●	●	●	-	-	-	●	-
● +	● +	○	●	●	●	-	●	-	●	-

Erichsen cup n °2	2 % lactic acid / 1h/ 129 C	Cysteine test 90 min at 121 C	Coil for can	Can	Tubes	Drums	Metal foils	Silver lacquer	for Bis-A/ BADGE free	for wb
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●	● +	●	●	●	-	●	●	-	●	●
●	● +	●	●	●	-	●	●	-	●	●

● +	●	○	●	●	-	-	●	●	-	-
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n. a.	n. a.	n. a.	Coloring resin				-	●	-
n. a.	n. a.	n. a.	Coloring resin				-	●	●

Color (cured film): ● = dark to ○ = bright

Flexibility/resistance properties: ○ = medium to ● + = excellent

n. a. = not applicable

## Waterborne Phenolic Resins

Products	NV	Compatible with epoxy resins	Compatible with PVB	Usual ratio Epoxy: Phenolic / Phenolic: PVB	Colour	Typical stoving conditions (mn)	T (°C)
PHENODUR®* VPW 1942	52WA	n. a.	n. a.	n. a.	n. a.	10 – 12	200 – 230
PHENODUR® VPW 1946	46WA	n. a.	n. a.	n. a.	n. a.	10 – 12	170 – 200
PHENODUR PW 165	40WAMP	n. a.	n. a.	n. a.	n. a.	n. a.	Air drying

	CYCAT® XK 406N	Wedge bend	Erichsen cup n °2	2 % lactic acid / 1h/ 129 C	Cysteine test 90 min at 121 C	Silver lacquer	Coil for can	Can	Tubes	Drums	Metal foils	wb
PHENODUR VPW 1942	Yes (blocked)	***	**	***	**	-	●	●	-	●	●	●
PHENODUR VPW 1946	Yes (blocked)	***	**	*****	**	-	●	●	-	●	●	●
PHENODUR PW 165	-	Air drying or/and forced drying one-pack wash primer				-	-	-	-	-	-	●

\* PHENODUR phenolic resins



## CYMEL®: Ureas

Products	Etherification	Alkylation	Acid curing	Paper coatings	Inks	Textile finishes	Coil coatings	Can coatings	Ind primers	Ind finishes
CYMEL* FP-127	IsoBut	Part alk	●	-	-	-	-	-	-	-
CYMEL U-610	nBut	Part alk	-	-	-	-	●	●	●	-
CYMEL U-640	nBut	Part alk	-	-	-	-	●	●	●	-
CYMEL U-662	IsoBut	Part alk	●	-	-	-	-	-	-	-
CYMEL U-663	IsoBut	Part alk	●	-	-	-	-	-	-	-
CYMEL U-665	IsoBut	Part alk	●	-	-	-	●	●	●	●
CYMEL U-80	nBut	High alk	-	-	-	-	●	●	●	-
CYMEL UB-24-BX	nBut	Part alk	-	-	-	-	●	●	●	-
CYMEL UB-26-BX	nBut	Part alk	-	-	-	-	●	●	●	-
CYMEL UB-30-B	nBut	Part alk	-	-	-	-	●	●	●	-
CYMEL UI-19-I	IsoBut	Part alk	●	-	-	-	-	-	-	-
CYMEL UI-19-IE	IsoBut	Part alk	●	-	-	-	-	-	-	-
CYMEL UI-20-E	IsoBut	Part alk	●	-	-	-	-	-	-	-
CYMEL UI-21-E	IsoBut	Part alk	●	-	-	-	●	●	●	-
CYMEL UI-27-EI	IsoBut	Part alk	●	-	-	-	●	●	●	-
CYMEL UI-38-I	IsoBut	Part alk	●	●	-	-	●	●	●	-
CYMEL UM-15	Met	High alk	●	●	●	●	-	-	-	-

\* CYMEL amino crosslinking resins

Auto primers	Auto finishes	Waterborne	High solids	Electrostatic	Emulsions	Properties	Solvents	Solids (Foil)	Free HCHO
-	-	-	-	-	-	High film gloss	IsoBut	58 – 62	-
●	-	-	-	-	-	Very fast reaction speed	nBut	68 – 72	< 2.5
●	-	-	-	-	-	Very fast reaction speed	nBut	58 – 62	< 2.5
-	-	-	-	-	-	Fast drying	isoBut/Xylene	58 – 62	< 0.3
-	-	-	-	-	-	High film gloss	isoBut/Xylene	60 – 64	< 0.3
●	-	-	-	-	-	Very good gloss	-	63 – 67	< 0.6
-	-	-	●	-	●	Water resistance	nBut	> 96	< 0.2
●	-	-	-	●	-	Very fast reaction speed	nBut/xylene	61 – 65	< 1.0
●	-	●	-	-	-	Very fast reaction speed	nBut/xylene	61 – 65	< 0.6
●	-	-	-	-	-	Very fast film hardness development	nBut	63 – 67	< 0.6
-	-	-	-	-	-	Very fast drying	IsoBut	61 – 65	< 1.2
-	-	-	-	-	-	Very fast drying, Low odor	IsoBut/EtOH	58 – 62	< 1.2
-	-	-	-	-	-	Fast drying, Low odor	EtOH	76 – 80	< 0.7
●	-	-	-	-	-	Fast drying, Low odor	EtOH	76 – 80	< 0.3
●	-	-	-	-	-	Fast drying, Low odor	EtOH/IsoBut	58 – 62	< 0.7
●	-	-	-	●	-	Excellent adhesion and intercoat adhesion properties	IsoBut	67 – 71	< 1.5
-	-	-	-	-	●	Very fast cure, water solubility	-	> 96	< 0.7

## CYMEL®: Methylated Melamines

Products	Alkylation	Acid curing	Paper coatings	Appliances	Inks	Textile finishes	Coil coatings	Can coatings	Ind primers	Ind finishes	Auto primers	Auto finishes
CYMEL* 301	High alk	-	●	●	●	●	●	●	●	●	●	●
CYMEL 303 LF	High alk	-	●	●	●	●	●	●	●	●	●	●
CYMEL 303 ULF	High alk	-	●	●	●	●	●	●	●	●	●	●
CYMEL 323	High NH	-	-	-	-	●	-	-	●	●	-	●
CYMEL 325	High NH	-	-	-	-	●	●	●	●	●	●	●
CYMEL 327	High NH	-	●	●	-	●	●	●	●	●	●	●
CYMEL 328	High NH	-	●	●	-	●	-	●	●	●	-	●
CYMEL 350	High alk	-	-	●	●	●	-	●	●	-	●	●
CYMEL 370	Part alk	-	-	-	-	●	-	●	-	-	●	●
CYMEL 373	Part alk	-	-	-	-	●	-	●	-	-	●	●
CYMEL 385	Part alk	-	-	-	-	●	-	-	-	-	-	-
CYMEL 3717	High NH	-	-	●	-	●	●	●	●	●	●	●
CYMEL 3745	High alk	-	●	●	●	●	●	●	●	●	●	●
CYMEL 9370	High alk	-	-	●	●	●	-	●	●	●	●	●
CYMEL MM-100	High alk	-	●	●	●	●	●	●	●	●	●	●

\* CYMEL amino crosslinking resins

Waterborne systems	High solids	Medium solids	Low cure systems	Electrostatic coatings	Emulsions	Properties	Solvents	Solids (Foil)	Free HCHO
-	●	●	-	●	-	Excellent deformation and flexibility	-	<sup>3</sup> 98	< 0.5
●	●	●	-	●	-	Excellent deformation and flexibility	-	<sup>3</sup> 98	< 0.25
●	●	●	-	●	-	Very low free formaldehyde content	-	<sup>3</sup> 98	< 0.10
-	-	-	-	-	●	Exceptional fast cure response	IsoBut	78 – 82	< 1.0
●	-	●	-	●	●	Very fast cure response	IsoBut	78 – 82	< 1.3
●	-	●	●	●	●	Fast cure response	IsoBut	88 – 92	< 1.3
●	-	-	●	●	●	Fast cure response	Water	83 – 87	< 0.7
●	●	●	-	●	-	Very high solids contents	-	<sup>3</sup> 97	< 2.5
●	-	●	-	●	●	Fast cure response, hardness development	IsoBut	86 – 90	< 3.5
●	-	-	-	●	●	Fast cure in water borne formulations	Water	83 – 87	< 1.5
-	-	-	-	-	●	Very fast cure response	Water	77 – 81	< 0.50
●	-	●	●	●	●	Very fast cure response	nBut	82 – 86	< 1.0
●	●	●	-	●	-	Excellent deformation and film flexibility	-	<sup>3</sup> 98	< 0.70
●	-	-	-	●	-	Fast cure response at short dwell time	-	<sup>3</sup> 98	< 0.50
-	●	●	-	●	-	Good sterilization resistance	-	<sup>3</sup> 98	< 0.50

## CYMEL®: Butylated Melamines

Products	Etherification	Alkylation	Acid curing systems	Wood finishes	Coil coatings	Can, drums and container coatings	Ind primers	Ind finishes	Auto primers	Auto finishes
CYMEL* 651	nBut	Part alk	-	●	●	●	●	●	●	-
CYMEL 658	nBut	Part alk	-	●	●	●	●	●	●	●
CYMEL 683	nBut	Part alk	-	●	●	●	●	●	●	●
CYMEL 688	nBut	Part alk	-	●	●	●	●	●	●	●
CYMEL 1156	nBut	High alk	-	-	●	●	●	●	-	-
CYMEL 1158	nBut	High NH	-	-	●	●	●	●	●	●
CYMEL FM-003	nBut	Part alk	-	-	●	●	●	●	●	●
CYMEL FM-100	nBut	Part alk	-	-	●	●	●	-	●	-
CYMEL MB-14-B	nBut	Part alk	-	●	●	●	●	●	●	-
CYMEL MB-98	nBut	High alk	●	-	-	-	-	-	-	-
CYMEL MI-12-I	IsoBut	Part alk	-	-	●	●	●	-	●	●
CYMEL MI-97-IX	IsoBut	Part alk	●	-	-	-	-	-	-	-

\* CYMEL amino crosslinking resins

Waterborne systems	High solids	Medium solids	EID	Dipping enamels	Properties	Solvents	Solids (Foil)	Free HCHO DS
-	-	-	-	●	Very good film hardness development	nBut	58 – 62	< 1.5
-	-	-	-	●	Very good film hardness development	nBut	53 – 60	< 1.6
-	-	●	-	●	Very good outdoor and mar resistance	nBut	73 – 77	< 1.5
-	-	●	-	●	Good outdoor resistance properties, adhesion	nBut	68 – 72	< 2.0
-	●	-	●	-	Good water extraction resistance	-	≥ 98	< 0.50
-	-	●	-	●	Fast cure response	nBut	78 – 82	< 1.0
-	-	-	-	-	Good adhesion and intercoat adhesion properties	nBut	60 – 62	< 1.0
-	-	-	-	-	Very fast reaction speed	nBut/xyl	50 – 52	< 1.0
-	-	-	-	●	Good adhesion and intercoat adhesion properties	nBut	68 – 72	< 1.5
-	-	-	-	-	Good chemical resistance	-	95 – 99	< 0.2
-	-	-	-	●	Good wetting of metal substrates	IsoBut	58 – 62	< 1.0
-	-	-	-	-	Good stackability properties	IsoBut/Xyl	68 – 72	< 1.0

## CYMEL®: Butylated Melamines

Products	Etherification	Alkylation	Acid curing systems	Paper coatings	Appliances	Inks	Textile finishes	Coil coatings	Can, drums and container coatings	Industrial primers	Industrial finishes	Automotive primers
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## Melamines Mixed etherified

CYMEL* 202	Mix eth	High NH	-	●	-	-	-	-	●	●	●	●
CYMEL 203	Mix eth	High NH	-	●	-	-	-	-	●	●	●	●
CYMEL 1116	Mix eth	High alk	-	-	●	●	-	●	●	●	●	●
CYMEL 1130	Mix eth	High alk	-	-	●	●	-	●	●	●	●	●
CYMEL 1133	Mix eth	High alk	-	-	●	●	-	●	●	●	●	●
CYMEL 1141	Mix eth	Carbox	-	-	-	-	-	●	●	●	-	-
CYMEL 1161	Mix eth	High alk	-	-	●	●	-	●	●	●	●	●
CYMEL 1168	Mix eth	High alk	-	-	●	●	-	●	●	●	●	●
CYMEL 3020	Mix eth	High alk	-	-	●	●	-	●	●	●	●	●

## Benzoguanamines

CYMEL 659	nBut	Part alk	-	-	-	-	-	●	●	●	-	●
CYMEL 1123	Mix eth	High alk	-	-	-	-	-	●	●	●	-	●
CYMEL 1125	Mix eth	Carbox	-	-	-	-	-	●	●	●	-	-

## Glycolurils

CYMEL 1170	Non alk	Non alk	-	-	●	●	-	●	●	●	●	●
CYMEL 1172	nBut	Non alk	-	-	●	●	●	●	-	●	●	●

\* CYMEL amino crosslinkers

Automotive finishes	Waterborne systems	High solids	Medium solids	Low cure systems	Electrostatic spray coatings	Electrodeposition	Emulsions	Properties	Solvents	Solids (Foil)	Free HCHO DS
●	●	-	●	●	-	-	-	Very fast cure response	nBut	80 – 84	< 1.2
●	●	-	●	●	-	-	-	Very good film appearance properties	nBut	70 – 74	< 1.0
●	-	●	-	-	-	●	●	Excellent film flexibility	-	≥ 98	< 0.30
●	-	●	-	-	-	●	-	Resistance properties	-	≥ 96	< 0.50
●	-	●	-	-	-	●	-	Adhesion and intercoat adhesion	-	≥ 98	< 0.50
-	●	●	●	-	-	●	-	Adhesion, corrosion resistance	IsoBut	83 – 87	< 0.90
●	-	●	-	-	-	●	-	Adhesion and intercoat adhesion	-	≥ 98	< 0.15
●	-	●	-	-	-	●	-	Adhesion and intercoat adhesion	-	≥ 98	< 0.5, < 0.15
●	-	●	-	-	●	●	-	Adhesion and intercoat adhesion	-	≥ 98	< 0.5
-	-	-	●	-	-	-	-	Corrosion and chemical resistance, adhesion	nBut	70 – 74	< 2.0
-	●	●	●	-	-	●	-	Film flexibility, detergent resistance	-	≥ 98	< 0.30
-	●	●	●	-	-	●	-	Adhesion, detergent resistance	2 Butoxy-ethanol	83 – 87	< 0.25
●	-	●	●	-	-	-	-	Excellent corrosion and overbake resistance	-	≥ 96	< 0.10
●	-	-	-	-	-	-	●	Stable under acidic conditions, excellent chemical resistance	water	43 – 47	< 1.50

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