

# CYTEC



## Liquid Coating Resins

**PRODUCT GUIDE –  
Americas**

## Total Solutions Provider

Cytec Industries is one of the world's leading specialty chemicals and materials technology companies. Our focus is on creating innovative technological solutions in global markets, including aerospace, adhesives, automotive and industrial coatings, chemical intermediates, inks, mining and plastics.

We offer a broad range of advanced products, and excellent technical service, research and applications development. Also, we provide industry leadership in safety, health, and environmental protection through the Responsible Care® management system and REACH initiatives.

## Innovative Technology

Cytec's surface specialty products are innovative and diverse, and can help manufacturers realize the competitive advantages of environmental compliance, while also meeting their needs for:

- Improved performance (scratch/stain/corrosion resistance, and adhesion)
- Greater ease of application (required cure response)
- Better finishes (gloss/matte, texture, and specialty)

## Broad Product Portfolio

We offer an extensive selection of performance-driven products, including low volatile organic compounds (VOC) and hazardous air pollutant substance (HAPS)-free technologies, for existing and emerging markets:

- Industrial
- Architectural/Construction

- Automotive/Transportation
- Wood/Paper
- Plastic
- Opto-electronics
- Graphic Arts
- Packaging/Adhesives

Our surface specialty product portfolio is inclusive:

- UV/EB energy curable resins
- Liquid coating resins
  - Waterborne
  - High solids
  - Solventborne
- Amino crosslinkers
- Powder coating resins
- Coating additives

## Global Technical Support

Through our ISO-certified manufacturing facilities, and technology and distribution centers, we are able to provide responsive service on a consistent global basis, and to help our customers identify and profit from emerging opportunities.



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## 3 Resins and Additives

### World-Class Portfolio

Cytec's comprehensive range of liquid coating resins complements our other advanced products—additives, solvents, crosslinkers, resins, monomers—used world-wide to formulate high-performance coating systems.

### Additives

Cytec provides a wide selection of specialty resins and additives for the coatings market. Our portfolio includes top-quality additives for energy curable, solvent-free, solventborne, high solids, waterborne and powder coating systems for automotive, architectural, industrial and specialty coating applications.

- MODAFLOW® and MULTIFLOW® flow modifiers
- ADDITOL® additives, including flow and leveling, defoaming, pigment wetting and dispersing agents
- AEROSOL® surfactants
- CYASORB® light stabilizers
- CYASTAT® antistatic agents
- CYANOX® antioxidants
- CYCAT® catalysts
- CYLINK® 2000 crosslinking agent used at additive levels to improve environmental etch resistance

### Solvents

Cytec's SANTOSOL® family of environmentally-friendly dimethyl ester solvents are used as high-boiling solvents in coil and container coatings, and as ingredients in paint strippers and industrial cleaners.

### Crosslinkers

Cytec offers a broad range of crosslinkers for liquid coatings. Our crosslinkers are used around the world for improving the durability and resistance properties of coatings.

- CYMEL® resins, including resins based on melamine, urea, benzoguanamine, or glycoluril
- CYLINK® 2000 crosslinking agent

### Monomers

Cytec provides specialty monomers for use in synthesizing polymers.

- TMI® (Meta) unsaturated aliphatic isocyanate
- TMXDI® (Meta) aliphatic isocyanate
- METHYL CARBAMATE
- DIPEB™ (Meta) diisopropenylbenzene

## 4 Nomenclature and Trade Names

Trade Names	Nomenclature	Description
BECKOPOX™	VEH	Solventborne and waterborne hardeners for epoxy resins
	EH	Solventborne and waterborne hardeners for epoxy resins
	VEP	Solventborne and waterborne epoxy resins
	EP	Solventborne and waterborne epoxy resins
	VEM	Solventborne and waterborne modified epoxy resins
	EM	Solventborne and waterborne modified epoxy resins
DAOTAN™	TW, VTW	Waterborne polyurethane dispersions (physically drying/self-crosslinking/carboxyl and hydroxyl functional)
DUOFTAL™	VPI	Solventborne hydroxylated polyesters for isocyanate crosslinking
	VPE	Solventborne hydroxylated polyesters for amino resin crosslinking
DUROXYN™	VEF	Solventborne and waterborne epoxy ester resins
MACRYNAL®	SM, VSM	Solventborne and waterborne acrylic polyols for isocyanate crosslinking
PHENODUR®	PR, VPM, VPR, VPW	Solventborne and waterborne phenolic resins
RESAMIN®	HF	Solventborne plasticizing resin
RESYDROL®	AF, VAF	Solventborne and waterborne fatty acid modified alkyd resins
	AL, VAL	Solventborne and waterborne linseed oil modified alkyd resins
	AX, VAX	Waterborne modified epoxy alkyd resins
	AY, VAY	Waterborne modified acrylic alkyd resins
	AZ, VAZ	Waterborne modified urethane alkyd resins
	VAN	Waterborne oil-free polyester resins
VIACRYL®	SC, VSC	Waterborne physically drying/self-crosslinking and baking acrylic resins
VIALKYD®	VAF	Solventborne fatty acid modified alkyd resins

# 5 Key Words and Abbreviations

Key Words	Abbreviations
ABS	Acrylonitrile butadiene styrene
Ac	Acetone
Aro 100	Aromatic 100
Aro 150	Aromatic 150
AV	Acid value
BA	Butyl acrylate
BDG	Dibutoxyethanol
BG	Butoxy-ethanol or Butyl glycol
BP	Butoxy-propanol
CED	Cathodic electrodeposition
cP	Centipoise
DACA	Diacetone alcohol
DBGE	Dipropylene glycol methyl ether
DIY	Do-It-Yourself
DMEA	Dimethylethanol amine
DTM	Direct to metal
EDG	Ethylene diglycol
EEP	Ethoxy ethoxy propanol
EEW	Epoxide equivalent weight
EG	Ethylene glycol
EP	Propoxyethanol
EPAc	Ethoxy propyl acetate
EtAc	Ethyl acetate
HEW	Amine hydrogen equivalent weight
IP	Isopropanol
Iso H	Isopar H
Isobut	Isobutanol
MB	Methoxy butanol
MeAc	Methyl acetate

Key Words	Abbreviations
MFFT	Minimum film formation temperature
MMA	Methyl methacrylate
MP	Methoxy propanol
MPP	Methoxy-propoxy propanol
n-BuAc	Butyl acetate
n-But	N-Butanol
NH <sub>3</sub>	Ammonia
NMP	N-methyl-pyrrolidone
OH#	Hydroxyl number
PA	Polyamide
PC	Polycarbonate
PMA	Propylene glycol methyl ether acetate
PMMA	Polymethyl methacrylate
PP flamed	Polypropylene flame-treated
PS	Polystyrene
PVC	Polyvinyl chloride
SCA	Sag control agent
T	Toluene
TEA	Triethylamine
Tg	Glass transition temperature in °C
VOC	Volatile organic compounds expressed in g/L or Lbs./Gal.
WA	Water
WPG	Weight per gallon
X	Xylene

# 6 | BECKOPOX™ Facts

## Epoxy-Amine Systems

$$EEW = \frac{MW}{\# \text{ of Epoxy groups}}$$

$$HEW = \frac{MW}{\# \text{ of Amine groups}}$$

Relationships used to calculate stoichiometric ratios between epoxy functional resins and amine functional resins.

Resin	Type	Solids	EEW	HEW
BECKOPOX EP 384w	Epoxy dispersion	53%	980 g/equiv (on FOD)	
BECKOPOX EH 623	Amine hardener	80%		200 g/equiv (on FOD)

Note: As used in the tables and figures herein, all references to PRODUCT NAME are understood to be the products described in the text.

### Question:

Calculate 1 to 0.9 Epoxy-Amine ratio for Epoxy-Amine system using 100g BECKOPOX EP 384w dispersion and BECKOPOX EH 623 hardener.

### Answer:

$$\frac{100g \text{ EP 384w}}{980} = 0.1020 \text{ equivalents}$$

$$0.1020 \times (0.9) \text{ equivalents} \times 200 = 18.3g \text{ EH 623 Hardener}$$

General Trends	Excess Amine	Excess Epoxy
Pot Life	Increases	Decreases
Flexibility	Increases	Decreases
Hardness	Decreases	Increases
Solvent Resistance	Increases	Decreases
Acid Resistance	Decreases	Increases
Adhesion	Increases	Decreases
Water Resistance	Decreases	Increases
Corrosion Resistance	Decreases	Increases

\* BECKOPOX™ epoxy resins/hardeners

## Amine Hardeners for Epoxy Resins and Dispersions

BECKOPOX	Type	Solids %	Solvent	Viscosity at 73°F in cP	HEW (H) on Form of Delivery	Amine Value	WPG Lbs./Gal.	Iodine Color
EH 613w/80WA	Aliphatic polyamine adduct	80	Water	23000 - 31000	145	230	9.16	10
EH 623w/80WA	Aliphatic polyamine adduct	80	Water	12000 - 21000	200	210	9.16	10
EH 624	Mannich-based aliphatic polyamine adduct	100		2300 - 3800	80	450	9.25	5
EH 625	Mannich-based aliphatic polyamine adduct	100		900 - 1400	73	415	9.33	3
EH 629	Mannich-based aliphatic polyamine adduct	100		2500 - 4400	70	470	9.33	5
EH 637	Cycloaliphatic polyamine adduct	100		90 - 120	100	325	8.33	2
EH 654	Polyamidoamine	100		17000 - 25000	100	390	8.08	20
EH 659w/50WA	Polyamidoamine	50	Water	17000 - 27000	215	160	8.58	70
EH 2104w/40WA	Aliphatic polyamine adduct; acrylic modified	40	Water	200 - 500	820	33-43	8.75	
EH 2142w/63WA	Aliphatic polyamine adduct	63	Water	5000 - 15000	192	220	9.5	20
EH 2179w/65WA	Aliphatic polyamine adduct	65	Water	8000 - 16000	200	210	9.25	30
VEH 2106w/80WA	Aliphatic polyamine adduct	80	Water	14000 - 25000	142	230	9.00	20
VEH 2177w/80WA	Aliphatic polyamine adduct	80	Water/IPA	7000 - 12000	175	215	9.16	10
VEH 2188w/55WA	Aliphatic polyamine adduct	55	Water	6000 - 14000	380	145	9.00	25
VEH 2849w/80WA	Aliphatic polyamine adduct	80	Water	18000 - 25000	134	255	9.08	10

\* BECKOPOX™ epoxy resins/hardeners

BECKOPOX	HAPS-Free	Low Temperature Cure	High Reactivity	Low Reactivity	Pigment Wetting	Flexibility	Shear Stable	Impact	Adhesion	Chemical Resistance	Water Resistance	Low Yellowing
EH 613w/80WA	●		●		●		●		●	●	●	
EH 623w/80WA	●			●	●	●	●	●	●			
EH 624	●	●	●				●		●	●	●	
EH 625	●	●	●				●		●	●	●	
EH 629	●	●	●				●		●	●	●	
EH 637	●			●			●		●			●
EH 654	●						●		●			
EH 659w/50WA	●			●	●	●	●		●			
EH 2104w/40WA	●	●	●		●		●		●	●	●	●
EH 2142w/63WA	●		●		●		●		●	●	●	
EH 2179w/65WA	●	●	●				●					
VEH 2106w/80WA	●		●		●		●		●			
VEH 2177w/80WA	●				●		●		●			
VEH 2188w/55WA				●		●			●			
VEH 2849w/80WA	●				●		●		●	●	●	

\* BECKOPOX™ epoxy resins/hardeners

## Application Area

BECKOPOX	Low Viscosity	Corrosion Resistance	Concrete Sealer	Concrete Primer	Concrete Topcoat	Metal Primer	Wash Primer	Aluminum Primer	Pipe Coatings	Mastic/Trowel	Low Color	Container	Tank Liner
EH 613w/80WA		●	●	●	●	●							
EH 623w/80WA			●	●	●								
EH 624		●				●	●	●	●			●	●
EH 625		●	●	●	●				●		●	●	●
EH 629		●	●		●	●			●			●	●
EH 637	●		●	●	●				●		●	●	●
EH 654										●			
EH 659w/50WA		●	●	●	●	●							
EH 2104w/40WA	●	●	●	●	●	●				●			
EH 2142w/63WA					●								
EH 2179w/65WA			●	●	●								
VEH 2106w/80WA		●											
VEH 2177w/80WA			●	●	●	●							
VEH 2188w/55WA		●	●	●	●	●							
VEH 2849w/80WA		●				●							

\* BECKOPOX™ epoxy resins/hardeners

Solventborne Epoxy Resins and  
Waterborne Epoxy Dispersions

<b>BECKOPOX</b>	<b>Solids %</b>	<b>WPG Lbs./Gal.</b>	<b>Solvent</b>	<b>Viscosity at 73°F in cP</b>	<b>Freeze/Thaw Stability</b>	<b>EEW on Form of Delivery</b>	<b>HAPS-Free</b>
EM 460/60IBX	60	8.5	Xylene/Isobut	800 - 1400	Yes	N/A	No
EP 075	100	8.83		40 - 70	Yes	320 - 360	Yes
EP 080	100	7.5		< 7	Yes	185 - 195	Yes
EP 122w	100	9.25		700 - 900	Yes	190 - 200	Yes
EP 128	100	9.33		900 - 1300	Yes	190 - 200	Yes
EP 140	100	9.66		11000 - 15500	Yes	180 - 190	Yes
EP 147w	100	9.75		9000 - 13000	Yes	188 - 200	Yes
EP 384w/53WAMP	53	9.16	Water/MP	400 - 750	No	980	Yes
EP 386w/52WA	52	9.0	Water/EP	300 - 1500	No	900 - 1100	No
VEP 2381w/55WA	55	9.0	Water/EP	3500 - 12000	No	910	No
VEP 2382w/55WA	55	9.0	Water/MP	3500 - 12000	No	910	Yes
VEP 2386w/56WA	56	9.0	Water/IP	400 - 1100	No	950	Yes
VEP 2390w/75MP	75	9.16	MP/Ethanol	3000 - 6000	Yes	655	Yes

N/A = Not Applicable.

\* BECKOPOX™ epoxy resins/hardeners

## Application Area

BECKOPOX	Chemical Resistance	Corrosion Resistance	Adhesion to Concrete	Shear Stable	Adhesion to Metal	Solvent-Free	Flexibility	Abrasion Resistance	Concrete Sealer	Concrete Primer
EM 460/60IBX			●	●	●					
EP 075			●	●		●	●			●
EP 080			●	●		●	●			●
EP 122w			●	●		●			●	●
EP 128	●	●	●	●	●	●		●	●	●
EP 140	●	●	●	●	●	●		●	●	●
EP 147w						●		●	●	●
EP 384w/53WAMP		●	●	●	●			●	●	●
EP 386w/52WA		●	●	●	●		●			●
VEP 2381w/55WA		●	●	●	●			●	●	
VEP 2382w/55WA		●		●	●		●		●	
VEP 2386w/56WA									●	●
VEP 2390w/75MP					●		●			

N/A = Not Applicable.

\* BECKOPOX™ epoxy resins/hardeners

Solventborne Epoxy Resins and  
Waterborne Epoxy Dispersions

## Application Area

BECKOPOX	Concrete Topcoat	Metal Primer	Wash Primer	Aluminum Primer	Zinc Rich Primer	Pipe Coatings	Mastic/Trowel	Coil	Container	Tank Liner
EM 460/60IBX			●					●		
EP 075		●					●		●	●
EP 080		●					●		●	●
EP 122w							●			
EP 128	●			●		●	●		●	●
EP 140	●			●		●	●		●	●
EP 147w	●					●				
EP 384w/53WAMP	●	●								
EP 386w/52WA	●	●								
VEP 2381w/55WA	●	●		●		●				
VEP 2382w/55WA	●	●		●		●				
VEP 2386w/56WA	●									
VEP 2390w/75MP					●					

N/A = Not Applicable.

\* BECKOPOX™ epoxy resins/hardeners

# DAOTAN™ Facts

## Adhesion to Plastics<sup>a</sup>

DAOTAN	PA	PC	PMMA	PP Flamed	PS	PVC Hard	PVC Soft	ABS
VTW 6462	5/3	5/5	0/0	5/4	1/4	5/5	5/5	5/5
VTW 6465	5/5	5/5	0/0	5/5	0/0	5/5	4/4	5/5
VTW 1225 + Desmodur® N 3400	5/5	5/5	0/0	5/5	5/5	5/0	5/5	5/5
VTW 1225 + Desmodur® N 3100	5/5	5/5	0/0	4/5	5/5	5/5	5/4	5/5
VTW 1227 + Desmodur® N 3400	5/5	0/0	0/0	5/0	5/5	5/0	5/5	3/5
VTW 1227 + Desmodur® N 3100	5/5	0/0	0/0	5/5	5/5	5/5	5/0	5/5

<sup>a</sup> Before/After 7 days @100% RH exposure. 0 = Best 5 = No adhesion. Desmodur® is a registered trademark of Bayer.

\* DAOTAN™ waterborne polyurethane dispersions

## Waterborne Polyurethane Dispersions

DAOTAN	Urethane Type	Backbone Type	Modification	Solids %	% NMP	Viscosity at 73°F in cP	pH at 10% in Water	% Elongation <sup>a</sup>	Neutralization Amine	OH Number on Solids
TW 5461/37WA	Aliphatic	Polyester	Acrylic	37	5	50 - 200	7.5 - 8.5		TEA	
TW 6431/45WA	Aliphatic	Polybutadiene		45	0	150 - 1500	7.0 - 8.0	310	TEA	0
TW 6472/45WA	Aliphatic	Poly-carbonate	Polybutadiene	45	0	200 - 2000	6.7 - 7.7	250	TEA/DMEA	11
TW 6490/35WA	Aliphatic	Polyester		35		50 - 100	9.0 - 9.5	400	TEA	
TW 6491/33WA	Aliphatic	Polyester		33		50 - 100	10.0 - 10.5	525	TEA	
TW 6492/35WA	Aliphatic	Polyester		35		50 - 150	9.5 - 10.0	260	TEA	
TW 6493/35WA	Aliphatic	Polyester		35		50 - 100	9.5 - 10.0	30	TEA	
VTW 1225/40WA	Aliphatic	Polyester		40	6.5	100 - 800	6.7 - 7.7	230	DMEA	47
VTW 1227/40WA	Aliphatic	Polyester		40	0	50 - 850	7.2 - 7.6	210	DMEA	50
VTW 1233/36WANMP	Aliphatic	Polyester		36	8	40 - 500	7.2 - 8.0		TEA	0
VTW 1250/40WA	Aromatic	Fatty acid		40	4.6	800 - 3200	6.9 - 8.0		NH <sub>3</sub>	-
VTW 1252/42WA	Aliphatic	Fatty acid		42	3	500 - 1500	7.0 - 9.5		NH <sub>3</sub>	-
VTW 1262/35WA	Aliphatic	Poly-carbonate	Acryl hybrid	35	0	5 - 50	7.5 - 8.4	245	DMEA	32
VTW 6421/42WA	Aliphatic	Polyester		42	0	500 - 2500	8.2 - 8.8		DMEA	48
VTW 6460/35WA	Aliphatic	Polyester	Acryl hybrid	35	0	20 - 400	7.0 - 8.5	300	DMEA	29
VTW 6462/36WA	Aliphatic	Polyester	Acryl hybrid	36	0	25 - 120	7.4 - 8.4	140	DMEA	36
VTW 6465/36WA	Aliphatic	Polyester	Acrylic	36	0	10 - 420	7.0 - 8.5		TEA	0
VTW 6470/39WA	Aliphatic	Polyester/Polyether		39	4.7	100 - 1000	6.5 - 7.5		DMEA	77

<sup>a</sup> Elongation numbers are ± 50.

\* DAOTAN™ waterborne polyurethane dispersions

DAOTAN	WPG Lbs./Gal.	Freeze/Thaw Stability	Physically Drying	Self-Crosslinking	Crosslinking with NCO	Oxidative Cure	Crosslinking with Aziridine	Fast Drying	Pigment Wetting	Shear Stable	Sag Resistance	Chemical Resistance	Corrosion Resistance	Interior	Exterior	Humidity Resistance	Gloss
TW 5461/37WA	8.91	Yes	●					●				●		●	●	●	●
TW 6431/45WA	8.25	No	●				●	●	●	●		●		●		●	
TW 6472/45WA	8.16	No			●												
TW 6490/35WA			●				●	●				●		●	●	●	●
TW 6491/33WA			●				●	●				●		●	●	●	●
TW 6492/35WA		Yes	●				●	●				●		●	●	●	●
TW 6493/35WA		Yes	●				●	●				●		●	●	●	●
VTW 1225/40WA	8.83	No			●					●		●			●		
VTW 1227/40WA	8.91	No			●					●		●		●	●		
VTW 1233/36WANMP	8.75	No	●				●				●			●			●
VTW 1250/40WA	8.75	No				●		●				●	●	●	●	●	
VTW 1252/42WA	8.75	Yes				●		●	●	●	●	●	●	●	●		●
VTW 1262/35WA	8.66	No	●		●		●	●	●	●							
VTW 6421/42WA	8.83	No	●				●	●		●				●	●		
VTW 6460/35WA	8.83	No	●		●		●			●				●			
VTW 6462/36WA	8.83	No	●	●	●		●	●		●	●	●		●	●	●	●
VTW 6465/36WA	8.83	No	●	●				●		●		●					
VTW 6470/39WA	8.83	No			●			●	●	●		●			●	●	●

<sup>a</sup> Elongation numbers are ± 50.

\* DAOTAN™ waterborne polyurethane dispersions

## Application Area

DAOTAN	Solvent-Free	Abrasion Resistance	Surface Hardness	Flexibility	Adhesion to Plastic	Primer/Surfacer	Metallic Basecoat	Topcoat/Clearcoat	CARC/Military/Aerospace	Wood Flooring	Soft Feel	Strippable	Blend with Waterborne UV	Blend with Acrylic Emulsion	Electronic Cabinetry and Equipment	Inks for Plastics	Concrete Topcoat
TW 5461/37WA		●		●	●			●					●	●			●
TW 6431/45WA	●			●								●					
TW 6472/45WA	●			●	●						●						
TW 6490/35WA		●		●	●			●						●		●	
TW 6491/33WA		●		●	●			●						●			
TW 6492/35WA	●	●		●	●			●						●			
TW 6493/35WA	●	●		●	●			●						●			
VTW 1225/40WA				●	●	●		●							●		
VTW 1227/40WA			●	●	●	●		●							●		
VTW 1233/36WANMP				●						●				●			
VTW 1250/40WA			●	●		●								●			
VTW 1252/42WA		●	●	●				●									
VTW 1262/35WA				●		●	●								●		
VTW 6421/42WA	●			●													
VTW 6460/35WA				●		●	●										
VTW 6462/36WA	●	●	●	●	●	●	●	●		●			●	●			
VTW 6465/36WA	●	●		●	●												
VTW 6470/39WA		●	●	●			●	●	●	●				●	●		●

<sup>a</sup> Elongation numbers are ± 50.

\* DAOTAN™ waterborne polyurethane dispersions

## Waterborne Polyurethane Dispersions

DAOTAN	Construction/ Heavy Equipment	OEM Primer/ Surfacer	DTM	Adhesion to Rubber	Stone Chip Resistance	Single Coat	Anticorrosion	DIY Glue
TW 5461/37WA								
TW 6431/45WA				●				
TW 6472/45WA								
TW 6490/35WA						●		
TW 6491/33WA						●		
TW 6492/35WA						●		
TW 6493/35WA						●		
VTW 1225/40WA						●		
VTW 1227/40WA						●		
VTW 1233/36WANMP								
VTW 1250/40WA			●				●	
VTW 1252/42WA	●		●				●	
VTW 1262/35WA		●			●			
VTW 6421/42WA								●
VTW 6460/35WA								
VTW 6462/36WA					●			
VTW 6465/36WA								
VTW 6470/39WA	●		●			●		

<sup>a</sup> Elongation numbers are  $\pm 50$ .

\* DAOTAN™ waterborne polyurethane dispersions

## Solventborne Hydroxylated Polyesters

DUROFTAL	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	OH Number on Solid Resin	Aliphatic Structure	AV on Solid Resin	Tg °C	Structure	HAPS-Free	High Solids
VPE 6117	100	None	6000 - 12000	9.25	130	Yes	10 max	-55	L	Yes	Yes
VPI 2801/78BAC	78	n-BuAc	4000 - 17000	9.25	220	Yes	22	24	B	Yes	Yes
VPI 2803/78BAC	78	n-BuAc	7000 - 19000	9.5	180	Yes	22	21	B	Yes	Yes

DUROFTAL	Flexibility	Hardness	Interior	Exterior	Yellowing Resistance	Bake	2K Cure	Pigment Wetting	Impact Resistance	Long Potlife (in 2K System)	Flow and Leveling	Chemical Resistance	Corrosion Resistance
VPE 6117	●		●	●	●	●	●	●	●	●	●		
VPI 2801/78BAC	●	●	●	●	●	●	●	●	●	●	●	●	●
VPI 2803/78BAC	●		●	●	●		●	●	●	●	●	●	

## Application Area

DUROFTAL	Humidity Resistance	Skydrol® Resistance	Compatible with Acrylic Resins	Topcoat/Clearcoat	Primer	Refinishing	Aerospace	Industrial	Humidity Resistance	Transportation	Plastic Cabinetry	Application		
												Coil	Can	
VPE 6117			●	●	●	●	●	●	●	●	●		●	●
VPI 2801/78BAC	●	●	●	●	●	●	●	●			●		●	●
VPI 2803/78BAC	●		●	●			●	●				●		●

N/A = Not Applicable. L = Linear B = Branched. Skydrol® is a registered trademark of Solutia.

\* DUROFTAL™ solventborne hydroxylated polyesters

## Solventborne and Waterborne Epoxy Ester Resins

DUROXYN	Solids %	Solvent	Viscosity at 73°F in cP	Color	AV #	pH at 10% in Water	WPG Lbs./Gal.	Oil Length %
VAX 6127w/42WA	42	MB	200 - 3000	Beige	N/A	8.5 - 10	8.58	38
VEF 2406w/45WA	45	Water	50 - 1000	Opaque	N/A	4 - 6	8.91	N/A
VEF 4380w/35WA	35	Water/BG	2500 - 12000	Opaque	N/A	8.0 - 9.5	8.5	43

DUROXYN	Oxidative Drying	Adhesion to Metal	Flexibility	Corrosion Resistance	High Stability in Water	Fast Drying Time	Good Gloss	Primer	Industrial Paint	DTM	Recoatibility	Hardness	Temperature Resistance	Water Resistance
VAX 6127w/42WA	●	●	●	●	●	●	●	●	●	●	●	●	●	●
VEF 2406w/45WA				●	●	●		●	●		●	●	●	●
VEF 4380w/35WA	●	●	●	●	●	●	●	●	●	●	●			●

N/A = Not Applicable.

\* DUROXYN™ solventborne/waterborne epoxy ester resins

Resin	Solids, %	OH Number, Solids	NCO, %	OH Eq. Wt.	NCO Eq. Wt.
MACRYNAL VSM 6299w/42WA resin	42	135		416	
Desmodur® N 3600 resin	100		23		183
Bayhydur® 304 resin	100		18.2		231

Note: As used in the tables and figures herein, all references to PRODUCT NAME are understood to be the products described in the text.

### Isocyanate Stoichiometry Calculation

NCO equivalent weight =  $4200 / \% \text{ NCO}$

NCO Equivalence =  $(\text{resin weight} \times \text{solids content}) / \text{NCO equivalent weight}$

OH equivalent weight =  $56100 / \text{OH number}$

OH Equivalence =  $(\text{resin weight} \times \text{solids content}) / \text{OH equivalent weight}$

### Question:

Calculate the NCO: OH ratio to crosslink 75g of MACRYNAL VSM 6299 resin with a blend of 10g of Desmodur® N 3600 resin and 10g of Bayhydur® VPLS 2319 resin.

### Answer:

10g Desmodur N3600

- NCO Equivalent weight =  $4200/23 = 183$
- NCO Equivalence =  $(10 \times 100\%)/183 = 0.0546$

10g Bayhydur 304

- NCO Equivalent weight =  $4200/18.2 = 231$
- NCO Equivalence =  $(10 \times 100\%)/231 = 0.0433$

75g MACRYNAL VSM 6299

- OH Equivalent weight =  $56100/135 = 416$
- OH Equivalence =  $(75 \times 42\%)/416 = 0.0757$

NCO : OH Ratio

Ratio =  $\text{total NCO equivalence} / \text{total OH equivalence} = (0.0546 + 0.0433) / 0.0757 = 1.29$

Adhesion of MACRYNAL Crosslinking Resins	Polyamide	Poly-carbonate	PMMA	PP Pretreated	Poly-styrene	Hard PVC	Soft PVC	ABS
SM 565	5/0	0/0	5/0	5/5	0/0	5/5	5/5	5/5
SM 2540/60BAC	1/1	0/0	5/5	5/5	5/1	5/1	5/5	4/1
VSM 2570	5/5	0/0	5/5	5/5	0/0	5/5	5/5	5/5
VSM 2800	0/0	0/0	5/5	5/5	0/0	5/5	5/5	5/5
VSM 2872	5/0	0/0	0/0	5/5	0/0	5/5	5/5	5/0

Crosslinked with Desmodur® N 3390. <sup>a</sup>Before/After 7 days @100% RH exposure. 0 = Best 5 = No Adhesion  
Bayhydur® is a registered trademark of Bayer. Desmodur® is a registered trademark of Bayer.

\* MACRYNAL® solventborne/waterborne crosslinking resins

## Hydroxylated Solventborne Polyols and Waterborne Dispersions for Isocyanate Crosslinking

### Solventborne Resins

MACRYNAL	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	OH Number on Solid Resin	OH Equivalent on Form of Delivery	HAPS-Free	Fast Drying
SM 500/60X	60	Xylene	2000 - 3800	8.10	90	1050	●	
SM 510n/60LG	60	n-BuAc/Aro100/X	2400 - 3600	8.41	150	625		●
SM 510n/60LGV4	60	X/MPAc	2500 - 4000	8.58	150	625		●
SM 515/70BAC	70	n-BuAc	3600 - 6000	8.75	150	535	●	●
SM 516/70BAC	70	n-BuAc	7000 - 11000	8.75	150	535	●	
SM 540/60X	60	Xylene	1400 - 2400	8.26	45	2080	●	●
SM 565/70BAC	70	n-BuAc	2000 - 4200	8.75	145	550	●	●
SM 2540/60BAC	60	n-BuAc	1100 - 2500	8.33	45	2080	●	●
SM 2704/75BACX	75	n-BuAc/X	5000 - 7000	8.58	65	1150		●
SM 2708/75BAC	75	n-BuAc	2500 - 4500	8.58	95	788	●	
SM 2810/75BAC	75	n-BuAc	4500 - 6000	8.84	135	555	●	●
VSM 1004/75LGV2	75	PMA/EEP/MeAc	8000 - 15000	8.75	123	608	●	●
VSM 2570/70BAC	70	n-BuAc	2200 - 3800	8.66	80	1000	●	
VSM 2705/70LG	70	Aro100/n-BuAc	3000 - 6800	8.58	100	800	●	●
VSM 2800/70BAC	70	n-BuAc	2000 - 5000	8.66	145	550	●	
VSM 2805/80BAC	80	n-BuAc	4000 - 8500	9.08	142	495	●	
VSM 2872/70BAC	70	n-BuAc	1500 - 3700	8.66	145	550	●	●

\* MACRYNAL® solventborne/waterborne crosslinking resins

## Hydroxylated Solventborne Polyols and Waterborne Dispersions for Isocyanate Crosslinking

### Solventborne Resins

MACRYNAL	Pop Resistance	Fast Initial Hardness Development	Sandability	Hardness	Flow and Leveling	Flexibility	Yellowing Resistance	Exterior Durability	High Gloss	Long Potlife	Chemical Resistance	Humidity Resistance	Adhesion to Aluminum	Adhesion to Zinc	Adhesion to Plastic	Sag Resistance
SM 500/60X				●	●			●	●	●			●			
SM 510n/60LG			●	●	●	●	●	●	●	●	●	●			●	
SM 510n/60LGV4			●	●	●	●	●	●	●	●	●	●			●	
SM 515/70BAC			●	●	●			●	●		●	●			●	
SM 516/70BAC				●	●	●	●	●	●	●	●	●				
SM 540/60X						●				●			●	●		
SM 565/70BAC				●	●	●	●	●	●	●		●				
SM 2540/60BAC						●				●			●	●		
SM 2704/75BACX	●	●	●	●	●		●		●	●						●
SM 2708/75BAC	●				●	●	●	●	●	●			●			●
SM 2810/75BAC	●	●	●	●	●	●	●	●	●	●	●	●	●			●
VSM 1004/75LGV2	●	●		●	●	●		●	●							
VSM 2570/70BAC				●	●	●	●	●	●	●			●	●		
VSM 2705/70LG			●	●	●	●	●	●	●	●						
VSM 2800/70BAC				●	●	●	●	●	●	●		●				
VSM 2805/80BAC				●	●	●	●	●	●	●						
VSM 2872/70BAC				●	●	●	●	●	●	●		●				

\* MACRYNAL® solventborne/waterborne crosslinking resins

## Hydroxylated Solventborne Polyols and Waterborne Dispersions for Isocyanate Crosslinking

### Application Area

MACRYNAL	Scratch Resistance	High Solids	Metal Primer/Surfacers	Plastic Primer	Pigmented Topcoat	Clearcoat	Transportation	OEM Topcoat/Clearcoat	Wood Paint	Refinishing	Plastics	Anti-Graffiti	Aluminum Primer	Airless/Airmix Application	Single Coat/Direct to Metal	For Blending	High Film Build
SM 500/60X			●	●	●				●		●				●		
SM 510n/60LG	●			●	●	●			●		●				●		
SM 510n/60LGV4	●			●	●	●			●		●				●		
SM 515/70BAC	●	●	●	●	●		●			●	●						
SM 516/70BAC		●			●	●									●		
SM 540/60X	●		●	●					●	●	●		●			●	
SM 565/70BAC	●	●				●	●	●		●	●					●	
SM 2540/60BAC	●		●	●					●	●	●		●			●	
SM 2704/75BACX	●	●	●		●									●	●		
SM 2708/75BAC	●	●	●		●	●								●	●		
SM 2810/75BAC	●	●			●	●	●			●				●	●		
VSM 1004/75LGV2		●	●	●	●	●	●			●	●					●	
VSM 2570/70BAC	●	●		●	●	●	●			●	●		●	●	●		●
VSM 2705/70LG			●	●					●	●	●		●			●	
VSM 2800/70BAC	●	●	●	●	●		●		●	●	●			●		●	
VSM 2805/80BAC		●	●	●	●	●	●			●	●			●		●	●
VSM 2872/70BAC	●	●			●		●			●	●					●	

\* MACRYNAL® solventborne/waterborne crosslinking resins

## Hydroxylated Solventborne Polyols and Waterborne Dispersions for Isocyanate Crosslinking

### Waterborne Resins

MACRYNAL	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	OH Number on Solid Resin	OH Equivalent on Form of Delivery	AV on Solid Resin	Tg °C	Neutralization Agent
SM 6810 w/42WA	42	Water/BP	200 - 1200	8.75	135	989	19		DMEA
VSM 2521w/42WAB	42	Water/n-But	1000 - 4000	8.66	140	950	40		DMEA
VSM 6285w/43WABDG	43	Water/BDG	400 - 2000	8.75	110	1180	36	57	DMEA
VSM 6299w/42WA	42	Water	800 - 4000	8.83	135	990	25	38	DMEA

MACRYNAL	Fast Drying	Sandability	HAPS-Free	Hardness	Flow and Leveling	Flexibility	Shear Stability (for WB Resins)	Yellowing Resistance	Exterior Durability	High Gloss	Long Potlife	Chemical Resistance	Humidity Resistance	VOC < 2.5	VOC < 1.5
SM 6810 w/42WA		●	●		●	●	●	●	●	●	●	●	●		●
VSM 2521w/42WAB	●	●	●	●			●		●			●	●	●	
VSM 6285w/43WABDG					●	●	●	●	●	●				●	
VSM 6299w/42WA	●			●	●	●	●	●	●	●	●	●	●		●

### Application Area

MACRYNAL	Forced Dry	Metal Primer/Surfacer	Plastic Primer	Pigmented Topcoat	Clearcoat	Transportation	Wood Paint	Refinishing	Plastics	Solid Color Basecoat	Airless/Airmix Application	Single Coat/Direct to Metal	For Blending	High Film Build
SM 6810 w/42WA	●			●	●	●		●			●		●	●
VSM 2521w/42WAB		●		●	●		●		●			●	●	
VSM 6285w/43WABDG	●			●	●	●			●				●	
VSM 6299w/42WA		●	●	●	●	●	●	●	●	●	●		●	●

\* MACRYNAL® solventborne/waterborne crosslinking resins

## Phenolic Solventborne Resins and Waterborne Dispersions

PHENODUR	Solids %	Solvent	Viscosity at 73°F in cP	HAPS-Free	WPG Lbs./Gal.	Compatible with Epoxy Resins	Compatible with PVB (Butvar™) Resins	Usual Ratio Epoxy/Phenolic Phenolic/PVB Butvar™	Color	Silver Lacquer
EP 560	71	Butanol	1300 - 2600	●	9.2	●	●	80/20 to 50/50	Medium	
PR 263/70B	70	Butanol	250 - 1500	●	8.34	●	●	N/A	Light	
PR 285/551B/B	55	But/Isobut 4/5	180 - 250	●	8.25	●	●	80/20 to 50/50 / 90/10	Dark	
PR 307/63X/MP	63	X/MP	1000 - 7000		8.75	●	●	Additive	Very dark	
PR 308/62MP	62	MP	1000 - 2250 <sup>a</sup>	●	8.75	●	●	Additive	Very dark	
PR 411/75B	75	Butanol	390 - 530	●	8.84	●	●	80/20 to 50/50	Very light	●
PR 516/60B	60	Butanol	150 - 500	●	8.58	●	●	80/20 to 50/50	Light	●
PR 612/80B	80	Butanol	80 - 125 <sup>b</sup>	●	8.75	●	●	80/20 to 50/50 / 90/10	Medium	
PR 722/53BG/B	53	BG/But 3:1	1500 - 4000 <sup>a</sup>		8.75	●	●	80/20 to 50/50 / 90/10	Medium	
PR 898/52BGB	52	BG/But	400 - 1400		8.83	●		80/20 to 55/45	Medium	
VPM 1150/50EPAC	50	EPAC	1500 - 4000	●	9.16	●	N/A	Co-curing resin	Clear	●
VPR 1785/50MP	50	MP	50 - 700	●	8.33	●	●	3:7 and 7:3	Medium	
VPW 1942w/52WA	52	Water	100 - 1000	●	9.33	N/A	N/A	N/A	Light	

<sup>a</sup> Viscosity at 50% diluted with Butanol. <sup>b</sup> Viscosity at 60% diluted with Butanol. Butvar™ is a trademarked product of Solutia. N/A = Not Applicable.

\* PHENODUR® phenolic solventborne/waterborne resins/dispersions

PHENODUR	Typical Baking Conditions (minutes)	Temperature	ADDITOL® XK 406	Shock Curing	Induction Curing	Wedge Bend	Erichsen Number 2	2% Lactic Acid	Cysteine Test/ 90 min. at 121°C
EP 560	12	200°C	●	●		Medium	Medium	Good	Good
PR 263/70B	Air drying	Air drying				N/A	N/A	N/A	N/A
PR 285/551B/B	15	190°C		●		Very good	Good	Good	Good
PR 307/63X/MP									
PR 308/62MP									
PR 411/75B	12	200°C	●	●	●	Medium	Good	Good	Medium
PR 516/60B	12	200°C	●	●		Good	Good	Good	Good
PR 612/80B	12	200°C	●			Good	Very good	Good	Medium
PR 722/53BG/B	12	200°C	●			Very good	Very good	Good	Good
PR 898/52BGB	10 - 30	170°C - 210°C	●			Good	Good	Very good	Good
VPM 1150/50EPAC	12	200°C		●	●	Good		Very good	Medium
VPR 1785/50MP	12	200°C	●	●		Very good	Very good	Very good	Good
VPW 1942w/52WA	12	200°C	●	●		Good	Medium	Good	Medium

<sup>a</sup> Viscosity at 50% diluted with Butanol. <sup>b</sup> Viscosity at 60% diluted with Butanol. Butvar™ is a trademarked product of Solutia. N/A = Not Applicable.

\* PHENODUR® phenolic solventborne/waterborne resins/dispersions

## Application Area

PHENODUR	Free Phenol/ Cresol	Free Formaldehyde	Can	Tubes	Drums	Metal Foil	Waterborne	
EP 560	7%	< 0.4%	●	●	●		●	
PR 263/70B					●			
PR 285/551B/B	0.50%	0.50%		●	●			
PR 307/63X/MP	0.10%	0.10%					●	
PR 308/62MP	0.10%	0.10%	coloring resin					●
PR 411/75B	< 1%	< 0.1%	●		●	●	●	
PR 516/60B	< 3%	< 1%	●		●	●		
PR 612/80B	0.5%	1%		●		●	●	
PR 722/53BG/B	8%	5%	●					
PR 898/52BGB	3%	2%	●	●				
VPM 1150/50EPAC	0%	0%	●			●		
VPR 1785/50MP	< 1%	< 1%	●	●		●		
VPW 1942w/52WA	0.10%	< 0.1%	●	●		●	●	

<sup>a</sup> Viscosity at 50% diluted with Butanol. <sup>b</sup> Viscosity at 60% diluted with Butanol.  
Butvar™ is a trademarked product of Solutia. N/A = Not Applicable.

\* PHENODUR® phenolic solventborne/waterborne resins/dispersions

RESAMIN	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	Plasticizer	Waterborne Systems	Solvent Systems	Grind Stability	Compatible – PVC, NC, PVB, Alkyds (see TDS)	Air Dry	Bake Systems
HF 480	99	0	3500 - 13500	9.16	●		●	●	●	●	●

\* RESAMIN® solventborne plasticizing resin

## Waterborne Alkyd Emulsions for Air-Drying and Forced Dry Systems – Decorative Wood

RESYDROL	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	Amine Neutralization	Appearance	pH at 10% in Water	Type of Modification	Oil Length	Freeze/Thaw Stability	VOC-Free
AF 6120w/62WA	62	Water	500 - 1500	8.91	Not needed	Whitish	5.5 - 9.5	None	35%	No	Yes
AY 241w/40WA	40	Water/BG	3000 - 6000	8.5	NH <sub>3</sub>	White opaque	8.0 - 9.5	Acrylic	24%	Yes	No
AY 430/42WA	42	Water/BG	6000 - 11000	8.58	NH <sub>3</sub>	White opaque	7.5 - 9.0	Acrylic	44%	Yes	No
AY 466w/38WA	38	Water/BG	3000 - 11000	8.58	NH <sub>3</sub>	Brown/Opaque	7.5 - 9.0	Acrylic	46%	Yes	No
AY 586w/42WA	42	Water	400 - 2500	8.5	NH <sub>3</sub>	Light Brown/Opaque	7.3 - 8.3	Acrylic	58%	Yes	Yes
AY 588w/42WA	42	Water	1000 - 4000	8.5	NH <sub>3</sub>	Light Brown/Opaque	7.0 - 9.0	Acrylic	58%	Yes	Yes
VAL 6088w/50WA	50	Water	10 - 60	8.5	None	White	2.5 - 7.0	None	68%	No	Yes
VAL 7149w	98		700 - 1500	8.5	None	Light Brown/Opaque	4.0 - 6.0	None	50%	Yes	Yes
VAY 6278w/45WA	45	Water	100 - 900	8.58	NH <sub>3</sub>	White opaque	7.8 - 8.6	Acrylic	15%	Yes	Yes
VAZ 4200w/45WA	45	Water/BG	3000 - 10000	8.5	TEA/ DMEA	Whitish	8.5 - 9.5	Acrylic/ Urethane	58%	Yes	No

\* RESYDROL® waterborne alkyd emulsions/dispersions

## Waterborne Alkyd Emulsions for Air-Drying and Forced Dry Systems – Decorative Wood

RESYDROL	Fast Initial Drying	Rapid Through Drying	Fast Development of Hardness	Fast Sandability	Early Water Resistance	High Hardness Coating	Adhesion on Non-Ferrous Metal	Water Resistance	Corrosion Resistance	Flexibility	Pigment Wetting	Yellowing Resistance	Compatible with Acrylic Dispersion	Sag Resistance	Increase the Open Time	Wood Penetration	Excellent Recoatability	Humidity Protection	Brushability
AF 6120w/62WA								●		●		●	●			●			●
AY 241w/40WA	●	●		●	●	●	●	●					●				●		
AY 430/42WA	●	●		●	●			●			●		●				●	●	●
AY 466w/38WA	●					●	●	●	●	●	●		●					●	●
AY 586w/42WA	●					●		●	●	●	●		●		●	●	●	●	●
AY 588w/42WA	●	●						●			●	●	●	●	●		●		●
VAL 6088w/50WA										●		●	●		●				●
VAL 7149w										●					●	●			●
VAY 6278w/45WA	●	●	●		●			●				●						●	
VAZ 4200w/45WA				●		●		●	●		●		●	●			●	●	

\* RESYDROL® waterborne alkyd emulsions/dispersions

## Waterborne Alkyd Emulsions for Air-Drying and Forced Dry Systems – Decorative Wood

### Application Area

RESYDROL	Shear Stable	High Gloss	Weathering Resistance	Gloss Retention	Anticorrosion Primer	DTM	Dip Enamel	Semitransparent Stain	Solid Color Stain	Wood Primer	Wood Impregnation	Wood Varnishes	Architectural Paints	High Film Build
AF 6120w/62WA		●							●				●	●
AY 241w/40WA	●		●	●		●				●				
AY 430/42WA						●		●	●	●				
AY 466w/38WA	●	●	●	●		●				●				
AY 586w/42WA	●	●				●		●	●			●		
AY 588w/42WA	●	●	●	●									●	●
VAL 6088w/50WA			●					●		●	●			
VAL 7149w			●	●				●			●			
VAY 6278w/45WA	●		●	●		●			●	●			●	
VAZ 4200w/45WA	●				●		●			●				●

\* RESYDROL® waterborne alkyd emulsions/dispersions

### Neutralization Equation

$$\frac{R \times AN \times E \times (\% \text{ neutralization})}{56,100} = \text{wt. of amine}$$

R = Wt. % Resin solids

AN = Acid number of weight solids

E = Equivalent wt. Amine

56,100 (KOH solution equivalent wt., constant)

### Question:

How many grams of ammonia and TEA are needed to neutralize 100g of a 70% solids alkyd, acid number = 40? Neutralize 50/50 with ammonia/TEA based on equivalents.

### Answer:

$$\frac{70 \times 40 \times 101^a \times (0.50)}{56,100} = 2.5\text{g TEA}$$

$$\frac{70 \times 40 \times 61^a \times (0.50)}{56,100} = 1.52\text{g NH}_3$$

<sup>a</sup> Equivalent wt. of Amine from table below.

Amine	Equivalent Weight	Boiling Point °C	pKb
Ammonia (26%)	61	-33	9.25
DEA	73	55	10.8
TEA	101	89	11.01
Morpholine	87	128	8.33
DMEA	89	134	9.3
AMP	89	165	9.69

\* RESYDROL<sup>®</sup> waterborne alkyd emulsions/dispersions

## Waterborne Alkyd Emulsions for Air-Drying and Forced Dry Systems – Industrial

RESYDROL	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	Amine Neutralization	Appearance	pH at 10% in Water	Type of Modification	Oil Length	Freeze/Thaw Stability	VOC-Free
AY 241w/40WA	40	Water/BG	3000 - 6000	8.5	NH <sub>3</sub>	White opaque	8.0 - 9.5	Acrylic	24%	Yes	No
AY 396w/37WA	37	Water	2000 - 11000	8.5	NH <sub>3</sub>	White opaque	8.0 - 9.5	Acrylic	43%	Yes	Yes
AY 430/42WA	42	Water/BG	6000 - 11000	8.58	NH <sub>3</sub>	White opaque	7.5 - 9.0	Acrylic	44%	Yes	No
AY 466w/38WA	38	Water/BG	3000 - 11000	8.58	NH <sub>3</sub>	Brown/Opaque	7.5 - 9.0	Acrylic	46%	Yes	No
AY 466w/45WA	45	Water/NMP	1500 - 6500	8.66	TEA	Light Brown/Opaque	7.5 - 9.0	Acrylic	46%	Yes	No
AY 6150w/45WA	45	Water	300 - 2000	8.75	NH <sub>3</sub>	Light Brown/Opaque	8.0 - 9.2	Acrylic	35%	Yes	Yes
AY 6173w/45WA	45	Water	300 - 1500	8.75	NH <sub>3</sub>	Light Brown/Opaque	8.0 - 9.2	Acrylic	33%	Yes	Yes
AZ 436w/45WA	45	Water/BG	4000 - 12000	8.66	NH <sub>3</sub> /DMEA	Milky	8.5 - 9.5	Acrylic/Urethane	43%	Yes	No
AZ 6116w/42WA	42	Water/BP	1500 - 9000	8.33	NH <sub>3</sub> /DMEA	White opaque	8.0 - 9.2	Acrylic/Urethane	37%	Yes	No
VAN 6113w/42WALG	42	Water/BG/MP	500 - 3000	9.08	Cationic resin	White opaque	3.0 - 5.0	Polyester	N/A	No	No
VAX 6050w/40WA	40	Water/BG	2000 - 6500	8.58	NH <sub>3</sub> /DMEA	White opaque	8.2 - 9.2	Acrylic/Epoxy	32%	Yes	No
VAX 6267w/40WA	40	Water	45 - 200	8.66	NH <sub>3</sub> /DMEA	Whitish	8.0 - 9.0	Acrylic/Epoxy	7%	No	Yes
VAY 6058w/40WA	40	PnB/DPnB/Water	1500 - 6500	8.58	NH <sub>3</sub>	White opaque	7.5 - 9.0	Acrylic	34%	No	No
VAY 6096w/39WA	39	Water/BG	2000 - 8000	8.66	NH <sub>3</sub>	Brown/Opaque	7.0 - 9.0	Acrylic	32%	Yes	No
VAY 6278w/45WA	45	Water	100 - 900	8.58	NH <sub>3</sub>	White opaque	7.8 - 8.6	Acrylic	15%	Yes	Yes
VAZ 4200w/45WA	45	Water/BG	3000 - 10000	8.5	TEA/DMEA	Whitish	8.5 - 9.5	Acrylic/Urethane	58%	Yes	No

N/A = Not Applicable.

\* RESYDROL® waterborne alkyd emulsions/dispersions

## Waterborne Alkyd Emulsions for Air-Drying and Forced Dry Systems – Industrial

RESYDROL	Fast Initial Drying	Rapid Through Drying	Fast Development of Hardness	Fast Sandability	Early Water Resistance	High Hardness Coating	Adhesion on Non-Ferrous Metal	Water Resistance	Corrosion Resistance	Flexibility	Pigment Wetting	Yellowing Resistance	Compatible with Acrylic Dispersion	Sag Resistance	Wood Penetration	Excellent Recoatability	Humidity Protection	Brushability
AY 241w/40WA	●	●		●	●	●	●	●					●			●		
AY 396w/37WA	●	●				●		●	●	●	●	●	●					●
AY 430/42WA	●	●		●	●			●			●		●			●	●	●
AY 466w/38WA	●				●	●	●	●	●	●	●		●				●	●
AY 466w/45WA						●	●	●	●	●	●		●		●		●	●
AY 6150w/45WA	●	●	●		●	●	●	●	●	●	●		●				●	●
AY 6173w/45WA	●	●	●		●	●	●	●	●	●	●		●				●	●
AZ 436w/45WA	●					●		●	●		●		●	●		●	●	●
AZ 6116w/42WA	●	●	●	●	●	●		●	●		●		●			●	●	
VAN 6113w/42WALG	●					●		●		●	●		●				●	
VAX 6050w/40WA	●	●				●			●		●	●	●			●		
VAX 6267w/40WA	●	●	●				●	●	●				●			●		
VAY 6058w/40WA		●		●		●		●				●	●					
VAY 6096w/39WA	●	●	●		●	●		●			●		●			●		
VAY 6278w/45WA	●	●	●		●			●				●					●	
VAZ 4200w/45WA				●		●		●	●		●		●	●		●	●	

N/A = Not Applicable.

\* RESYDROL® waterborne alkyd emulsions/dispersions

## Waterborne Alkyd Emulsions for Air-Drying and Forced Dry Systems – Industrial

## Application Area

RESYDROL	Shear Stable	Abrasion Resistance	High Gloss	Weathering Resistance	Gloss Retention	Primer	Anticorrosion Primer	DTM	Industrial Topcoat	Dip Enamel	High Film Build	For UV Blend	Plastic Coatings
AY 241w/40WA	●			●	●	●		●	●				
AY 396w/37WA	●		●	●	●	●		●	●	●			
AY 430/42WA						●		●	●			●	
AY 466w/38WA	●		●	●	●			●	●				
AY 466w/45WA	●		●	●	●			●	●	●			
AY 6150w/45WA	●		●	●	●	●	●	●	●				
AY 6173w/45WA	●			●		●	●						
AZ 436w/45WA	●					●	●		●	●	●		
AZ 6116w/42WA	●		●			●	●	●	●		●		
VAN 6113w/42WALG	●	●	●										●
VAX 6050w/40WA	●		●			●	●	●					
VAX 6267w/40WA						●	●	●					
VAY 6058w/40WA			●	●	●				●				
VAY 6096w/39WA	●		●					●	●				
VAY 6278w/45WA				●	●	●		●					
VAZ 4200w/45WA	●					●	●			●	●		

N/A = Not Applicable.

\* RESYDROL® waterborne alkyd emulsions/dispersions

RESYDROL	Solids %	Solvent	Viscosity at 73°F in cP	WPG Lbs./Gal.	Amine Neutralization	Appearance	pH	VOC-Free	Modification	Freeze/Thaw Stability	Oil Length
AF 502w/35WA	35	Water	225 - 710 <sup>a</sup>	8.58	DMEA	Light brown	7.5 - 8.8	Yes	Fatty acid	Yes	N/A
AM 224w/40WA	40	Water/MP	100 - 700 <sup>a</sup>	8.91	DMEA	Opaque brown	7.5 - 9.0	No	Fatty acid	Yes	N/A
AX 246w/70BG	70	BG/MP	340 - 690 <sup>a</sup>	9.0	DMEA	Brown	Partially neutralized	No	Epoxy	Yes	22%
AX 906w/35WA	35	Water/MP	160 - 560 <sup>a</sup>	8.83	DMEA	Clear - Opaque	7.0 - 8.5	No	Epoxy polyester	Yes	N/A
AX 906w/55WALG	55	Water/n-But/ DPGE	185 - 600 <sup>a</sup>	9.0	DMEA	Clear - Opaque	7.0 - 9.0	No	Epoxy polyester	Yes	N/A
AZ 6608w/43WA	43	Water/ NMP/MP	100 - 1500	9.0	DMEA	Milky - White	7.5 - 8.5		Urethane	Yes	
VAF 5540w/70MP	70	MP	300 - 550 <sup>a</sup>	9.16	N/A	Clear	Not neutralized	No	Polyester	Yes	N/A
VAN 5526w/70BG	70	BG	300 - 800 <sup>a</sup>	9.41	AMP	Clear	7.0 - 9.0	No	Polyester	Yes	N/A
VAX 5227w/55LG	55	Water/ DPGE/BG	90 - 500 <sup>a</sup>	8.75	DMEA	Brown	7.0 - 9.0	No	Epoxy polyester	Yes	N/A
VAY 5536w/35WA	35	Water/NMP	500 - 8000	8.83	DMEA	Opaque	7.5 - 9.2	No	Acrylic polyester	Yes	N/A
VAZ 6600w/36WA	36	Water/MPP	100 - 800	8.83	DMEA	Brown	7.0 - 8.0	No	Alkyd urethane	Yes	N/A
VAZ 6605w/40WA	40	Water	100 - 1000	8.91	DMEA	Yellow	7.5 - 8.6	Yes	Urethane	Yes	

N/A = Not Applicable. <sup>a</sup>Diluted in solvent for viscosity measurement.

\* RESYDROL® waterborne alkyd emulsions/dispersions

RESYDROL	Hardness	Impact	Yellowing Resistance	Metal	Non-Ferrous Substrates	Single Coat	High Filled Topcoat	Stone Chip Resistance	Corrosion Protection	Water Resistance	Shear Stable	Pigment Wetting	High Gloss	Weathering
AF 502w/35WA		●		●		●	●				●	●	●	
AM 224w/40WA	●	●	●	●		●			●	●	●	●	●	●
AX 246w/70BG				●					●		●	●		
AX 906w/35WA	●	●		●	●					●	●	●		●
AX 906w/55WALG	●	●		●	●					●	●	●		●
AZ 6608w/43WA	●	●	●	●	●	●		●		●			●	●
VAF 5540w/70MP	●			●				●			●		●	
VAN 5526w/70BG	●	●	●	●									●	
VAX 5227w/55LG	●	●	●				●	●	●		●	●		
VAY 5536w/35WA		●	●	●	●	●					●	●	●	●
VAZ 6600w/36WA	●	●		●				●			●	●	●	
VAZ 6605w/40WA	●	●		●	●	●			●	●			●	

N/A = Not Applicable. <sup>a</sup>Diluted in solvent for viscosity measurement.

\* RESYDROL® waterborne alkyd emulsions/dispersions

## Application Area

RESYDROL	Sag Resistance	High Reactivity	Heat Resistance	For Use in Blend to Increase Reactivity	Increase of Solid Contents	Primer	Anticorrosion Primer	DTM	Dip Enamel	Industrial Topcoat	Drums Coating	OEM Primer/Surfacer	Low Temperature	Textured Paint
AF 502w/35WA						●	●	●			●			
AM 224w/40WA	●						●	●	●	●			●	
AX 246w/70BG		●	●			●	●		●				●	
AX 906w/35WA		●		●			●		●				●	
AX 906w/55WALG		●	●	●			●		●				●	
AZ 6608w/43WA								●		●				
VAF 5540w/70MP				●	●							●		
VAN 5526w/70BG			●		●			●		●				●
VAX 5227w/55LG							●					●		
VAY 5536w/35WA			●					●	●	●				
VAZ 6600w/36WA	●					●						●		
VAZ 6605w/40WA							●			●				

N/A = Not Applicable. <sup>a</sup>Diluted in solvent for viscosity measurement.

\* RESYDROL® waterborne alkyd emulsions/dispersions

## Solventborne Acrylic Resins, Physically Drying/ Self-Crosslinking and Amino Resins Crosslinking

VIACRYL	Solids %	Solvent	Viscosity at 73°F in cP	AV on Solids	WPG Lbs./Gal.	OH Number on Solid Resin	OH Equivalent on Form of Delivery
SC 160/60T	60	Toluene	8000 - 15000	6 - 18	8.08	N/A	N/A
SC 303/65XB	65	X/n-But	19000 - 30000	10 - 15	8.41	80	1079
SC 341/60SNABAC	60	Aro100/n-BuAc	1000 - 2000	13 - 20	8.25	86	1090
SC 370/75SNA	75	Aro100	4200 - 7200	8 - 12	8.58	120	625

N/A = Not Applicable.

### Application Area

VIACRYL	HAPS-Free	Physically Drying	Crosslink with Amino Resin	Fast Dry	High Solids	Shear Stability	Compatible with Nitrocellulose	Humidity Resistance	Metal Primer	Metal Topcoat	DTM	Road Paint	OEM Topcoat	OEM Clearcoat	Basecoat
SC 160/60T		●			●	●			●	●	●	●			
SC 303/65XB			●	●			●	●		●					●
SC 341/60SNABAC	●		●							●			●	●	
SC 370/75SNA	●		●		●					●			●	●	

\* VIACRYL® solventborne/waterborne acrylic resins

## Waterborne Acrylic Resins, Physically Drying/ Self-Crosslinking and Hydroxylated Acrylic Dispersions

VIACRYL	Solids %	Solvent	Viscosity at 73°F in cP	pH at 10% in Water	WPG Lbs./Gal.	MFFT in °C	OH Number on Solid Resin	OH Equivalent on Form of Delivery
SC 175w/40WAIP	40	Water/IP	550 - 850	7.5 - 8.0	8.66			
VSC 5611w/60BG	60	BG	11000 - 18000	Not neutralized	8.5			
VSC 6250w/65MP	65	MP	18000 - 35000	Not neutralized	8.66			
VSC 6254w/40WA	40	Water	150 - 700	8 - 9	8.66	45	60	2337
VSC 6265w/40WA	40	Water	200 - 1300	8 - 9	8.75	26	65	2158
VSC 6275w/38WA	38	Water/BG	30 - 100	2.8 - 4.3	8.58			
VSC 6279w/45WA	45	Water	280 - 1600	7.7 - 8.5	8.66	25	65	1918
VSC 6286w/45WA	45	Water	30 - 600	6.5 - 7.8	8.75	11		
VSC 6288w/35WA	35	Water/BG	20 - 90	7.4 - 8.1	8.58		65	2465
VSC 6293w/45WA	45	Water	50 - 800	7.5 - 8.8	8.66	20		
VSC 6295w/45WA	45	Water	30 - 200	6.5 - 7.8	8.75	30		

### Waterborne Acrylic Resins for 1K Baking Systems or 2K with Isocyanates

SC 383w/50WA	50	Water	60 - 240	6.5 - 7.5	8.75		100	1120
VSC 6273w/44WA	44	Water	200 - 2400	8.0 - 9.1	8.66		85	1500
VSC 6292w/38WA	38	Water	450 - 4500	3.8 - 5.3	8.75			
VSC 6800w/47WA	47	Water	300 - 2000	8.0 - 9.0	8.83		100	1195

\* VIACRYL® solventborne/waterborne acrylic resins

## Waterborne Acrylic Resins, Physically Drying/ Self-Crosslinking and Hydroxylated Acrylic Dispersions

VIACRYL	Physically Drying	Self-Crosslinking	Crosslink with Amino Resin	Fast Dry	Sandability	Hardness	Flow and Leveling	Flexibility	Shear Stability	Yellowing Resistance	Exterior	Corrosion Resistance
SC 175w/40WAIP	●						●	●	●			
VSC 5611w/60BG	●			●						●	●	
VSC 6250w/65MP										●	●	●
VSC 6254w/40WA	●			●					●	●	●	●
VSC 6265w/40WA	●			●	●	●			●	●	●	●
VSC 6275w/38WA	●				●	●	●	●	●	●	●	
VSC 6279w/45WA	●			●	●	●			●	●	●	●
VSC 6286w/45WA	●	●				●	●	●	●	●	●	
VSC 6288w/35WA	●	●	●								●	●
VSC 6293w/45WA	●			●		●			●	●	●	●
VSC 6295w/45WA	●	●				●	●		●	●	●	

### Waterborne Acrylic Resins for 1K Baking Systems or 2K with Isocyanates

SC 383w/50WA			●			●	●	●	●	●	●	
VSC 6273w/44WA			●			●			●	●	●	
VSC 6292w/38WA		●	●			●			●			
VSC 6800w/47WA			●				●	●	●	●	●	

\* VIACRYL® solventborne/waterborne acrylic resins

## Waterborne Acrylic Resins, Physically Drying/ Self-Crosslinking and Hydroxylated Acrylic Dispersions

VIACRYL	Humidity Resistance	Chemical Resistance	Stain Resistance	Metal Primer	Metal Topcoat	DTM	Anticorrosion	CED	Soft Plastic	Hard Plastic	Glass	Architectural Paint	Wood Furniture	Wood Flooring
SC 175w/40WAIP														
VSC 5611w/60BG	●													
VSC 6250w/65MP				●	●	●	●	●						
VSC 6254w/40WA	●			●		●					●	●		●
VSC 6265w/40WA	●	●	●	●	●	●	●		●	●				
VSC 6275w/38WA	●	●		●										●
VSC 6279w/45WA	●	●	●	●	●	●	●		●	●				
VSC 6286w/45WA	●	●					●						●	●
VSC 6288w/35WA		●	●	●	●	●			●	●				
VSC 6293w/45WA	●		●	●	●	●	●					●		●
VSC 6295w/45WA	●	●								●			●	●

### Waterborne Acrylic Resins for 1K Baking Systems or 2K with Isocyanates

SC 383w/50WA	●	●			●									
VSC 6273w/44WA	●	●			●									
VSC 6292w/38WA	●							●						
VSC 6800w/47WA					●									

\* VIACRYL® solventborne/waterborne acrylic resins

## Waterborne Acrylic Resins, Physically Drying/ Self-Crosslinking and Hydroxylated Acrylic Dispersions

### Application Area

VIACRYL	Solid Color Stain	Stain Block	OEM Topcoat	OEM Clearcoat	Basecoat	Aluminum	Flexo and Printing Inks	Concrete Topcoat
SC 175w/40WAIP							●	
VSC 5611w/60BG					●			
VSC 6250w/65MP								
VSC 6254w/40WA	●							
VSC 6265w/40WA	●	●				●		●
VSC 6275w/38WA	●		●					
VSC 6279w/45WA	●	●				●		●
VSC 6286w/45WA								
VSC 6288w/35WA						●		
VSC 6293w/45WA	●	●						
VSC 6295w/45WA								

### Waterborne Acrylic Resins for 1K Baking Systems or 2K with Isocyanates

SC 383w/50WA			●	●				
VSC 6273w/44WA			●	●	●			
VSC 6292w/38WA								
VSC 6800w/47WA			●					

\* VIACRYL® solventborne/waterborne acrylic resins

VIALKYD	Solids %	Viscosity at 73°F in cP	AV #	Oil Length	Oil Type or Modification	Iodine Color	WPG Lbs./Gal.
VAF 6091	100	450 - 800	< 10	89%	Fatty acid	< 6	7.91
VAF 6103	100	170 - 350	< 6	92%	Fatty acid	< 12	7.83

VIALKYD	High Solids	HAPS-Free	Exterior	Air Dry/ Forced Air	Brushability	Pigment Wetting	Primer	Topcoat	Gloss	Wood Penetration
VAF 6091	●	●	●	●	●	●	●	●	●	●
VAF 6103	●	●	●	●	●	●	●	●	●	●

VIALKYD	Compatible with RESYDROL®	Wood Impregnation Primer	Wood Semi-transparent Stain	Paint for Wood	Exterior
VAF 6091					
VAF 6103	●	●	●	●	●

\* VIALKYD® 100% solids alkyd resins

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