

# CYTEC



**Automotive  
Refinish Coatings**

## Total Solutions Provider

Cytec Industries is one of the world's leading specialty chemicals and materials technology companies. Our focus is on creating advanced technological solutions in global markets, including aerospace, coatings, mining, plastics and water treatment.

We are a total solutions provider with a broad range of products, including eco-friendly technologies. We support our customers worldwide with excellent technical service and applications research

## Innovative Technology

Cytec's 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-free (HAPS) technologies, for existing and emerging markets:

- Industrial
- Architectural/Construction
- Automotive/Transportation
- Wood/Paper
- Plastic

- Opto-electronics
- Graphic Arts
- Packaging/Adhesives

Our product portfolio is inclusive:

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

## Global Technical Support

Through our manufacturing facilities, 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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## 6 | Introduction Automotive Refinish Industry

### **Provider of innovative and environmental friendly solutions to the automotive refinish industry**

The whole European Union and some regions in the Americas have to switch to VOC regulation compliant coatings before 2007. Therefore, currently there is a major technology switch and on-going new development to move away from conventional technologies. It is expected that the legislation will become even stricter in some regions in the coming five years.

Cytec has taken up the challenge and is leading the environmental friendly technical alternatives offered to the automotive refinish industry including UV-technology, while consolidating and offering cost effective solutions in the conventional segments.

Cytec offers a full range of products: liquid resins and additives that address all the stringent needs of the automotive refinish industry, while meeting the VOC requirements.

To fulfill our objective of delivering superior value to our customers, we have a dedicated technical service team investigating OEM paints for car body layers and plastic coatings parts.

We are committed to deliver added value to our customers through innovative market-driven solutions based on technological and operational excellence.

With numerous plants, research and technological service centers around the world, we are in a strong position to satisfy the multi-dimensional requirements of our customers with the required refinish needs and future trends.

This brochure lets formulators select resins and additives to match the desired automotive refinish performances, either based on the coating layer, or by chemical family.



Cytec offers an extensive range of putties and primer surfacer resins for the refinish market.

Our unsaturated polyesters have been used in the putty layer for decades. Polyesters and acrylics are used in the 2K system for the primer surfacer layer.

### Liquid Resins

Products	Product description	Form of delivery % solids content	Viscosity [mPas]	Acid value [mg KOH/g]	Curing	Potlife
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#### Solvent-borne

<b>VIAPAL®* UP 156 E</b>	Unsaturated PE	68 in styrene	530–760	< 30	Co/CHPO	long
<b>VIAPAL UP 192 B</b>	Pre-accelerated unsaturated PE	65 in styrene	320–420	<= 17	BPO	short
<b>VIAPAL UP 260 B</b>	Pre-accelerated unsaturated PE	62 in styrene	450–670	< 18 <sup>1</sup>	BPO	short
<b>VIAPAL UP 282 B</b>	Pre-accelerated unsaturated PE	65 in styrene	460–710	< 30 <sup>1</sup>	BPO	short
<b>VIAPAL UP 527 E</b>	Unsaturated PE	68 in styrene	630–950	< 30	Co/CHPO	long
<b>VIAPAL VUP 4738 B</b>	Pre-accelerated unsaturated PE	65 in styrene	500–690	< 20	BPO	short

1 = DIN EN ISO 3682

### Additives

Products	Product description	Key features	Chemistry
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#### Solvent-borne

<b>ADDITOL®* VXL 4992</b>	Modified polyester	Reduces dispersing time; enhances degassing and rheology especially in UP-putties.	sb
<b>ADDITOL VXL 6244 N</b>	Salt of a polyadduct	Reduces dispersing time; enhances degassing and rheology especially in UP-putties.	sb

#### Key to the tables

Acid value	DIN, ISO 2114
Chemistry	refers to formulation type
Form of delivery	non-volatile matter DIN, ISO 3251
pH-value	DIN, ISO 976

#### Abbreviations

2K	two component
sb	solvent-borne
BPO	benzoyl-peroxide
Co/CHPO	cobalt/hydro-peroxide
VOC	Volatile organic compounds content

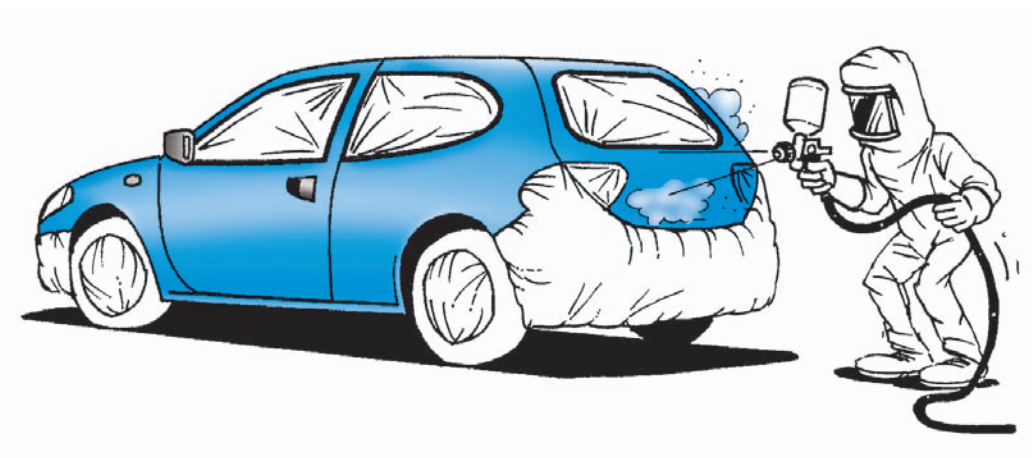


\* **ADDITOL** additives

\* **VIAPAL** unsaturated polyesters

It is foreseen that stricter regulation may take place for the primer surfacer layer and therefore VOC compliant products are being newly developed.

Key features	Flexibility	Hardness	Adhesion	Sandability	Storage stability	Chemistry
Airdrying, highly elastic, medium reactive; in combination with UP 527 for fillers.	●●●●	●	●●●	●	●●●	2K sb
Elastic, reactive.	●●●	●●	●●●●	●●●●	●●●●	2K sb
Medium rigid, highly reactive.	●●	●●●	●●●	●●●●	●●●●	2K sb
Highly elastic, reactive.	●●●	●●	●●●●	●●●	●●●●	2K sb
Airdrying, rigid, highly reactive; in combination with UP 156 for fillers.	●	●●●	●●	●●●	●●●	2K sb
Highly elastic, medium reactive.	●●●●	●	●●●●	●●	●●●●	2K sb



## Liquid Resins

Products	Product description	Form of delivery % solids content	Dynamic viscosity
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### Solvent-borne

<b>MACRYNAL®* SM 513</b>	Acrylic resin	54 in solvent mixture	650–800
<b>MACRYNAL SM 513</b>	Acrylic resin	60 in solvent mixture	2400–4000
<b>MACRYNAL SM 540</b>	Acrylic resin	60 in X	1400–2400
<b>MACRYNAL SM 2708</b>	Acrylic resin	75 in BAC	2500–4500
<b>MACRYNAL VSM 2800</b>	Acrylic resin	70 in BAC	2000–5000
<b>VIALKYD®* AY 120</b>	Acrylic modified alkyd resin	65 in XMPAC	230–620 (50% in X)

### Waterborne

<b>VIACRYL®* VSC 6265 W</b>	Acrylic resin	40 in water	200–1300
<b>VIACRYL VSC 6288 W</b>	Acrylic resin	35 in water	20–90

\* **MACRYNAL** acrylic resins

\* **VIACRYL** acrylic resins

\* **VIALKYD** alkyd resins

### Key to the tables

<b>Acid value</b>	DIN, ISO 2114
<b>Dynamic viscosity</b>	DIN, ISO 3219, 23°C
<b>Form of delivery</b>	non-volatile matter DIN, ISO 3251
<b>Chemistry</b>	refers to formulation type

### Abbreviations

<b>sb</b>	solvent-borne
<b>wb</b>	waterborne
<b>2K</b>	two component
<b>BAC</b>	butyl acetate
<b>XMPAC</b>	xylene/methoxy propyl acetate
<b>X</b>	xylene

OH value [mg KOH/g]	OH % [resin solids]	Key features	Chemistry
120	3,6 %	Fast drying, good sandability.	2K sb
120	3,6 %	Fast drying, good sandability.	2K sb
45	1,4 %	Excellent adhesion to metals.	2K sb
90	2,7 %	Low isocyanate demand, very high solids.	2K sb
145	4,4 %	High reactivity.	2K sb
100	3,0 %	Quick rise in hardness, long potlife.	2K sb
50-70	1,8%	High shear stability, quick set and through-drying.	2K wb
		Rapid curing, excellent sandability.	2K wb



## Additives

Products	Product description
<b>Solvent-borne</b>	
<b>ADDITOL®* XL 180</b>	Phosphoric acid compound.
<b>ADDITOL XL 250</b>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.
<b>ADDITOL XL 270</b>	Modified acrylic copolymer; low molecular weight; FDA approved.
<b>ADDITOL XL 480</b>	Modified acrylic copolymer; low molecular FDA approved.
<b>ADDITOL VXL 6212 N</b>	Urethane modified acrylic polymer, high molecular, cationic.
<b>ADDITOL VXL 6237 N</b>	Wetting/dispersing agent; high molecular; cationic.
<b>ADDITOL VXW 6387</b>	Special fatty acids; amine neutralized; silicone-free.
<b>MODAFLOW** RESIN</b>	Acrylic copolymer, high molecular weight; FDA approved.
<b>MODAFLOW 2100</b>	Acrylic copolymer, low molecular weight; FDA approved.
<b>SANTOSOL** DME-1</b>	Dimethylester mixture.

## Waterborne

<b>ADDITOL XL 180<sup>1</sup></b>	Phosphoric acid compound.
<b>ADDITOL XL 250</b>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.
<b>ADDITOL XW 390</b>	Acrylic resin amine neutralized, fluorinated.
<b>ADDITOL VXW 4926</b>	Special fatty acid esters.
<b>ADDITOL VXW 4973</b>	Mineral oil, waxes.
<b>ADDITOL VXW 6208</b>	Polymer, nonionically stabilised.
<b>ADDITOL VXW 6386</b>	Hydrocarbons, waxes.
<b>ADDITOL VXW 6387</b>	Special fatty acids; amine neutralized; silicone-free.
<b>ADDITOL VXW 6396</b>	Highly fluoro-modified acrylic copolymer; neutralized by amine.
<b>ADDITOL VXW 6500</b>	Degassing polymer, solved in hydrocarbons silicone-free.
<b>ADDITOL VXW 6503</b>	Silicone tenside.
<b>MODAFLOW AQ 3025</b>	Acrylic resin, amine neutralized, silicone-free.

1 = pre-neutralized with amine

\* **ADDITOL** additives

\* **MODAFLOW** resins flow modifier

\* **SANTOSOL** dimethyl esters

### Abbreviations

<b>sb</b>	solvent-borne
<b>wb</b>	waterborne
<b>FDA</b>	Food and Drug Administration
<b>VOC</b>	volatile organic compounds content

## Key features

## Chemistry

Enhances intercoat adhesion.	sb
Reduces dispersing time; enhances flow, gloss and color strength.	sb
Suitable for high gloss systems; prevents floating and sedimentation.	sb
Reduces surface defects; good compatibility; for car-refinish applications.	sb
Similar to XL 260, but improved effectiveness in acrylic systems.	sb
For difficult wettable pigments as well as for pigment concentrates/pastes.	sb
Prevents pigment sedimentation; reduces sagging; improves storage stability.	sb
Highly effective leveling agent; good wetting behaviour; degassing properties.	sb
Highly effective; good compatibility; short incorporation time and fast mode of action.	sb
Slow evaporation with excellent solvency, anti-pinhole.	sb

Enhances intercoat adhesion.	wb
Reduces dispersing time; enhances flow, gloss and color strength.	wb
Excellent wetting and intercoat adhesion; no foam stabilization; crosslinkable.	wb
Quick defoaming/degassing; enhances build-up; crosslinkable.	wb
Very effective, good compatibility, easy to incorporate.	wb
For inorg./org.pigments and pigment concentrates/pastes.	wb
For high quality lacquers; good compatibility. Homogenize well prior to use!	wb
Prevents pigment sedimentation; reduces sagging; improves storage stability.	wb
Excellent leveling and wetting properties; no foam stabilization; good recoatability.	wb
Very good deaerating in forced drying and stoving systems; easy to incorporate; for clear coats.	wb
Excellent substrate wetting; no foam stabilization; good recoatability.	wb
Optimizes flow and gloss; enhances degassing; facilitates pigment wetting.	wb

## Base Coat Solvent-borne and waterborne resins meeting the lowest VOC requirement

Due to VOC legislation, the waterborne base coats are already widely used in the refinish application. It is forecasted that further conversion will take place as 2007 deadline approaches.

Cytec proposes a broad range of conventional resins and additives meeting the base coat layer requirements.

### Liquid Resins

Products	Product description	Form of delivery % solids content	Dynamic viscosity
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#### Solvent-borne

<b>DUROFTAL®* PE 912 SCA</b>	Sca modified oil-free polyester resin.	50 in SNAX	350–1200
<b>VIACRYL®* SC 303</b>	Acrylic resin.	55 in solvent mixture	1700–2600
<b>VIALKYD®* AN 950</b>	Oil-free polyester resin.	70 in X	2300–3100

#### Waterborne

<b>DAOTAN®* VTW 1262</b>	Polyurethane dispersion.	35 in WA	5–50
<b>DAOTAN VTW 6462</b>	Urethane acrylic hybrid.	36 in WA	25–120
<b>VIACRYL VSC 6254</b>	Copolymer of styrene and acrylic esters.	40 in WA	150–700

### Additives

Products	Product description
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#### Waterborne

<b>ADDITOL®* XL 180<sup>1</sup></b>	Phosphoric acid compound.
<b>ADDITOL XL 204</b>	Silicone containing phosphoric acid ester; anionic.
<b>ADDITOL XL 250</b>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.
<b>ADDITOL XW 390</b>	Acrylic resin amine neutralized, fluorinated.
<b>ADDITOL XW 6528</b>	Grinding resin, co-crosslinkable.
<b>ADDITOL VXW 4926</b>	Special fatty acid esters.
<b>ADDITOL VXW 4973</b>	Mineral oil, waxes.
<b>ADDITOL VXW 6208</b>	Polymer, nonionically stabilised.
<b>ADDITOL VXW 6386</b>	Hydrocarbons, waxes.
<b>ADDITOL VXW 6387</b>	Special fatty acids; amine neutralized; silicone-free.
<b>ADDITOL VXW 6396</b>	Highly fluoro-modified acrylic copolymer.
<b>ADDITOL VXW 6500</b>	Degassing polymer, solved in hydrocarbons silicone free.
<b>ADDITOL VXW 6503</b>	Silicone tenside.
<b>MODAFLOW®* AQ 3025</b>	Acrylic resin, amine neutralized, silicone-free.

1 = pre-neutralized with amine

\* **ADDITOL** additives

\* **DAOTAN** polyurethane resins

\* **DUROFTAL** polyester resins

\* **MODAFLOW** resins flow modifier

\* **VIACRYL** acrylic resins

\* **VIALKYD** alkyd resins

#### Key to the tables

**Dynamic viscosity** DIN, ISO 3219, 23 °C

**Form of delivery** non-volatile matter DIN, ISO 3251

**Hydroxyl value** DIN, ISO 4629

We have also widely developed resins already in use in the waterborne segment. Polyurethane and acrylic resins are offered to the formulators meeting the VOC requirements.



Hydroxyl value [mg KOH/g]	OH value [mg KOH/g]	Key features	Drying speed	Flexibility	Hardness	Appearance	Chemistry
---	---	Improves control of sagging.	n. a.	●●●	●●	n. a.	1K sb
---	---	Good outdoor stability.	●●	●●	●●	●●	1K sb
---	---	High flexibility.	●●	●●●	●●	●●	1K sb
---	---	High flexibility, good shear stability.	●●	●●	●●	●●●	1K wb
---	---	Rapid cure, good wetting properties.	●●●	●●●	●	●●●	1K wb
60	1,8 %	Improves physical drying properties.	●●●	●	●●●	n. a.	1K wb

Key features	Chemistry
Enhances intercoat adhesion.	wb
Prevents floating and Bénard cells; reduces dispersing time.	wb
Reduces dispersing time; enhances flow, gloss and color strength.	wb
Excellent wetting and intercoat adhesion; no foam stabilization; crosslinkable.	wb
High loading capacity for difficult wettable pigments, improve chemical- and corrosion protection.	wb
Quick defoaming/degassing; enhances build-up; crosslinkable.	wb
Very effective, good compatibility, easy to incorporate.	wb
For inorg./org.pigments and pigment concentrates/pastes.	wb
For high quality lacquers; good compatibility. Homogenize well prior to use!	wb
Prevents pigment sedimentation; reduces sagging; improves storage stability.	wb
Excellent leveling and wetting properties; no foam stabilization; good recoatability.	wb
Very good deaerating in forced drying and stoving systems; easy to incorporate; for clear coats.	wb
Excellent substrate wetting; no foam stabilization; good recoatability.	wb
Optimizes flow and gloss; enhances degassing; facilitates pigment wetting.	wb

#### Abbreviations

**1K** one component  
**2K** two component  
**sb** solvent-borne  
**wb** waterborne

**n. a.** not applicable  
**sca** sagging control agent  
**SNAX** solvent naphtha A / xylene  
**VOC** volatile organic compounds content  
**WA** water  
**X** xylene

● low  
 ●● medium  
 ●●● high

# Top and Clear Coat

## High solids resins meeting the lowest VOC requirement

The few newly created body shops in Europe have been moving to 420g/l for clear coat layers. By 2007 this will also apply to existing body shops.

To meet this VOC requirement, Cytec offers a whole range of innovative high solids systems combining the right molecular weight, viscosity and solid content.

### Liquid Resins

Products	Product description	Form of delivery % solids content	Dynamic viscosity	Color index
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#### Solvent-borne

<b>DUROFTAL®* VPI 2801</b>	Oil-free polyester resin	78 in BAC	4000–17000	≤ 70
<b>DUROFTAL VPI 2803</b>	Oil-free polyester resin	78 in BAC	7000–19000	≤ 50
<b>MACRYNAL®* SM 510N</b>	Acrylic resin	54 in solvent mixture	750–1100	≤ 80
<b>MACRYNAL SM 510N</b>	Acrylic resin	60 in solvent mixture	2400–3600	≤ 80
<b>MACRYNAL SM 510N</b>	Acrylic resin	60 in solvent mixture [LGV2]	2300–2800	≤ 80
<b>MACRYNAL SM 510N</b>	Acrylic resin	60 in XMPAC	2500–4000	≤ 60
<b>MACRYNAL SM 510N</b>	Acrylic resin	60 in solvent mixture [LGV4]	2500–4000	≤ 60
<b>MACRYNAL SM 513</b>	Acrylic resin	60 in solvent mixture	2400–4000	≤ 50
<b>MACRYNAL SM 515</b>	Acrylic resin	70 in BAC	3600–6000	≤ 100
<b>MACRYNAL SM 516</b>	Acrylic resin	70 in BAC	7000–11000	≤ 200
<b>MACRYNAL SM 518</b>	Acrylic resin	55 in solvent mixture	4000–7000	≤ 80
<b>MACRYNAL SM 565</b>	Acrylic resin	70 in BAC	2000–4200	≤ 100
<b>MACRYNAL SM 2708</b>	Acrylic resin	75 in BAC	2500–4500	≤ 100
<b>MACRYNAL SM 2810</b>	Acrylic resin	75 in BAC	4500–6000	≤ 100
<b>MACRYNAL SM 2816</b>	Acrylic resin	70 in BAC	7000–11000	≤ 100
<b>MACRYNAL VSM 2800</b>	Acrylic resin	70 in BAC	2000–5000	≤ 100
<b>MACRYNAL VSM 2806</b>	Acrylic resin	75 in BAC	4000–7000	≤ 200
<b>VIACRYL®* SC 121</b>	Acrylic resin	60 in XMPAC	5000–9000	≤ 400
<b>VIACRYL SC 121</b>	Acrylic resin	60 in solvent mixture	3500–5500	≤ 400
<b>VIACRYL SC 370</b>	Acrylic resin	75 in SNA	4200–7000	≤ 100
<b>VIACRYL VSC 1011</b>	Acrylic resin	40 in T	2000–4000	≤ 200
<b>VIACRYL VSC 1016</b>	Acrylic resin	40 in T	500–1000	≤ 200
<b>VIACRYL VSC 1017</b>	Acrylic resin	50 in X	1000–2000	≤ 200
<b>VIALKYD®* VAN 9460</b>	Oil-free polyester resin	80 in BAC	1500–3500	

\* **DUROFTAL** polyester resins

\* **MACRYNAL** acrylic resins

\* **VIACRYL** acrylic resins

\* **VIALKYD** alkyd resins

#### Key to the tables

**Color scale (Hazen)** DIN, ISO 6271-1

**Dynamic viscosity** DIN, ISO 3219, 23°C

**Form of delivery** non-volatile matter DIN, ISO 3251

**Hydroxyl value** DIN, ISO 4629



Hydroxyl value [mg KOH/g]	OH % [resin solids]	Key features	Key features					Weather durability	Chemistry
			Drying speed	Flexibility	Hardness	Paint solids content [at spraying viscosity]	Weather durability		
220	6,6 %	For ultra high solids.	●	●●	●●●	●●●●	●●●	2K sb	
180	5,4 %	For ultra high solids.	●	●●	●●●	●●●●	●●●	2K sb	
150	4,5 %	Good outdoor durability.	●●	●●	●●	●	●●●	2K sb	
150	4,5 %	Good outdoor durability.	●●	●●	●●	●	●●●	2K sb	
150	4,5 %	Good outdoor durability.	●●	●●	●●	●	●●●	2K sb	
150	4,5 %	Good outdoor durability.	●●	●●	●●	●	●●●	2K sb	
150	4,5 %	Good outdoor durability.	●●	●●	●●	●	●●●	2K sb	
120	3,6 %	Excellent mechanical properties.	●●●	●	●●●	●	●	2K sb	
150	4,5 %	High gloss, excellent mechanical properties.	●●	●	●●●	●●	●●	2K sb	
150	4,5 %	Good outdoor stability, high gloss.	●●	●●	●●	●●	●●●	2K sb	
155	4,7 %	Fast drying, excellent outdoor stability.	●●●	●●	●●	●	●●●	2K sb	
145	4,4 %	Excellent chemical resistance, high solids.	●●	●	●●	●●●	●●●	2K sb	
90	2,7 %	Low isocyanate demand, very high solids.	●●	●●●	●●	●●●	●●	2K sb	
135	4,1 %	Fast drying, very high solids.	●●●	●	●●●	●●●	●●	2K sb	
150	4,5 %	High reactivity, excellent outdoor stability.	●●●	●●	●●●	●●	●●●	2K sb	
145	4,4 %	High reactivity.	●●	●	●●	●●●	●●	2K sb	
135	4,1 %	High solids content.	●●	●	●	●●●	●●	2K sb	
		Thermoplastic resin.	●●●	●●	●●	●	●●	1K sb	
		Thermoplastic resin.	●●●	●●	●●	●	●●	1K sb	
120	3,6 %	Improving body and gloss.	●	●●●	●	●●	●●	2K sb	
		Thermoplastic resin.	●●●	●●	●●●	●	●●●	1K sb	
		Thermoplastic resin.	●●●	●●	●●●	●	●●●	1K sb	
		Thermoplastic resin.	●●●	●●	●●●	●	●●●	1K sb	
140	4,3 %	High flexibility, good weathering stability.	●	●●●	●	●●	●	2K sb	

#### Abbreviations

**1K** one component  
**2K** two component  
**BAC** butyl acetate  
**LGV2** solvent mixture no. 2  
**LGV4** solvent mixture no. 4  
**n.a.** not applicable

**sb** solvent-borne  
**XMPAC** xylene/methoxy propyl acetate  
**SNA** solvent naphta A  
**T** toluene  
**TC** top coat  
**VOC** volatile organic compounds content  
**X** xylene

● low  
 ●● moderate  
 ●●● good  
 ●●●● very good

### Additives

Products	Product description
<b>Solvent-borne</b>	
<i>ADDITOL®* XL 123 N</i>	Modified silicone.
<i>ADDITOL XL 180</i>	Phosphoric acid compound.
<i>ADDITOL XL 204</i>	Silicone containing phosphoric acid ester; anionic.
<i>ADDITOL XL 250</i>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.
<i>ADDITOL XL 480</i>	Modified acrylic copolymer; low molecular weight; FDA approved.
<i>ADDITOL XL 6521</i>	Modified block copolymer, high molecular, cationic.
<i>ADDITOL VXL 6212 N</i>	Urethane modified acrylic polymer, high molecular, cationic.
<i>ADDITOL VXL 6237 N</i>	Wetting/Dispersing agent; cationic; high molecular.
<i>ADDITOL VXL 4930</i>	Polyether modified silicone.
<i>ADDITOL VXL 4951</i>	Fluoro modified silicone.
<i>ADDITOL VXL 6501</i>	Silicone containing degassing polymer.
<i>MODAFLOW®* RESIN</i>	Acrylic copolymer, high molecular weight; FDA approved.
<i>MODAFLOW 2100</i>	Acrylic copolymer; low molecular weight; FDA approved.
<i>MODAFLOW 9200</i>	Modified acrylic copolymer; low molecular weight; crosslinkable.
<i>SANTOSOL®* DME-1</i>	Dimethylester mixture.
<b>Waterborne</b>	
<i>ADDITOL XL 123 N</i>	Modified silicone.
<i>ADDITOL XL 204</i>	Silicone containing phosphoric acid ester; anionic.
<i>ADDITOL XL 250</i>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.
<i>ADDITOL XW 390</i>	Acrylic resin amine neutralized, fluorinated.
<i>ADDITOL XW 395</i>	Acrylic resin, amine neutralized, silicone-free, FDA approved.
<i>ADDITOL VXL 4930</i>	Polyether modified silicone.
<i>ADDITOL VXW 4926</i>	Special fatty acid esters.
<i>ADDITOL VXW 4973</i>	Mineral oil, waxes.
<i>ADDITOL VXW 6208</i>	Polymer, nonionically stabilised.
<i>ADDITOL VXW 6386</i>	Hydrocarbons, waxes.
<i>ADDITOL VXW 6387</i>	Special fatty acids; amine neutralized; silicone-free.
<i>ADDITOL VXW 6396</i>	Highly fluoro-modified acrylic copolymer; neutralized by amine.
<i>ADDITOL VXW 6500</i>	Degassing polymer, solved in hydrocarbons silicone-free.
<i>ADDITOL VXW 6503</i>	Silicone tenside.
<i>MODAFLOW AQ 3025</i>	Acrylic resin, amine neutralized, silicone-free.

\* *ADDITOL* additives

\* *MODAFLOW* resins flow modifier

\* *SANTOSOL* dimethyl esters

#### Abbreviations

**sb** solvent-borne

**VOC** volatile organic compounds content

**wb** waterborne

## Key features

## Chemistry

Excellent slip and scratch resistance; degassing; thermostable up to 400 °C.	sb
Enhances intercoat adhesion.	sb
Prevents floating and Bénard cells; reduces dispersing time.	sb
Reduces dispersing time; enhances flow, gloss and color strength.	sb
Reduces surface defects; good compatibility; for car-refinish applications.	sb
High effective for difficult wettable pigments; high gloss; excellent colouristic properties.	sb
Similar to XL 260, but improved effectiveness in acrylic systems.	sb
For difficult wettable pigments as well as for pigment concentrates/pastes.	sb
Highly effective; good spray mist absorption; prevents orange peel, no foam stabilization.	sb
Very effective; prevents foam and blister formation during processing and application.	sb
Highly effective in industrial and 2K-systems, anti-corrosion lacquers, PE- and UV-systems.	sb
Highly effective leveling agent; good wetting behaviour; degassing properties.	sb
Highly effective; good compatibility; short incorporation time and fast mode of action.	sb
Reduces surface defects; excellent compatibility; for high-end applications with excellent gloss.	sb
Slow evaporation with excellent solvency, anti-pinhole.	sb

Excellent slip and scratch resistance; degassing; thermostable up to 400 °C.	wb
Prevents floating and Bénard cells; reduces dispersing time.	wb
Reduces dispersing time; enhances flow, gloss and color strength.	wb
Excellent wetting and intercoat adhesion; no foam stabilization; crosslinkable.	wb
Good wetting; prevents cratering and pin holes; effective against oil contaminations.	wb
Highly effective; good spray mist absorption; prevents orange peel; no foam stabilization.	wb
Quick defoaming/degassing; enhances build-up; crosslinkable.	wb
Very effective, good compatibility, easy to incorporate.	wb
For inorg./org.pigments and pigment concentrates/pastes.	wb
For high quality lacquers; good compatibility. Homogenize well prior to use!	wb
Prevents pigment sedimentation; reduces sagging; improves storage stability.	wb
Excellent leveling and wetting properties; no foam stabilization; good recoatability.	wb
Very good deaerating in forced drying and stoving systems; easy to incorporate; for clear coats.	wb
Excellent substrate wetting; no foam stabilization; good recoatability.	wb
Optimizes flow and gloss; enhances degassing; facilitates pigment wetting.	wb

# 20 | Product Range

Products	Product description	Form of delivery % solids content	Dynamic viscosity
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## Solvent-borne Acrylic

<b>MACRYNAL®* SM 510 N</b>	Acrylic resin	54 in solvent mixture	750–1100
<b>MACRYNAL SM 510 N</b>	Acrylic resin	60 in solvent mixture	2400–3600
<b>MACRYNAL SM 510 N</b>	Acrylic resin	60 in solvent mixture [LGV2]	2300–2800
<b>MACRYNAL SM 510 N</b>	Acrylic resin	60 in XMPAC	2500–4000
<b>MACRYNAL SM 510 N</b>	Acrylic resin	60 in solvent mixture [LGV4]	2500–4000
<b>MACRYNAL SM 513</b>	Acrylic resin	54 in solvent mixture	650–800
<b>MACRYNAL SM 513</b>	Acrylic resin	60 in solvent mixture	2400–4000
<b>MACRYNAL SM 515</b>	Acrylic resin	70 in BAC	3600–6000
<b>MACRYNAL SM 516</b>	Acrylic resin	70 in BAC	7000–11000
<b>MACRYNAL SM 518</b>	Acrylic resin	55 in solvent mixture	4000–7000
<b>MACRYNAL SM 540</b>	Acrylic resin	60 in X	1400–2400
<b>MACRYNAL SM 565</b>	Acrylic resin	70 in BAC	2000–4200
<b>MACRYNAL SM 2708</b>	Acrylic resin	75 in BAC	2500–4500
<b>MACRYNAL SM 2810</b>	Acrylic resin	75 in BAC	4500–6000
<b>MACRYNAL SM 2816</b>	Acrylic resin	70 in BAC	7000–11000
<b>MACRYNAL VSM 2800</b>	Acrylic resin	70 in BAC	2000–5000
<b>MACRYNAL VSM 2806</b>	Acrylic resin	75 in BAC	4000–7000
<b>VIACRYL®* SC 121</b>	Acrylic resin	60 in XMPAC	5000–9000
<b>VIACRYL SC 121</b>	Acrylic resin	60 in solvent mixture	3500–5500
<b>VIACRYL SC 303</b>	Acrylic resin	55 in solvent mixture	1700–2600
<b>VIACRYL SC 370</b>	Acrylic resin	75 in SNA	4200–7000
<b>VIACRYL VSC 1011</b>	Acrylic resin	40 in T	2000–4000
<b>VIACRYL VSC 1016</b>	Acrylic resin	40 in T	500–1000
<b>VIACRYL VSC 1017</b>	Acrylic resin	50 in X	1000–2000

\* **MACRYNAL** acrylic resins

\* **VIACRYL** acrylic resins

### Key to the table

**Dynamic viscosity** DIN, ISO 3219, 23 °C

**Form of delivery** non-volatile matter DIN, ISO 3251

● Recommended for use

### Abbreviations

**1K** one component

**2K** two component

**sb** solvent-borne

**wb** waterborne

**BAC** butyl acetate

**LGV 2** solvent mixture no. 2

**X** xylene

**XMPAC** xylene/methoxy propyl acetate

**SNA** solvent naphta A

**T** toluene

Key features	Chemistry	Primer surfacers	Base coat	Clear coat and top coat
Good outdoor durability.	2K sb			•
Good outdoor durability.	2K sb			•
Good outdoor durability.	2K sb			•
Good outdoor durability.	2K sb			•
Good outdoor durability.	2K sb			•
Fast drying, good sandability.	2K sb	•		
Fast drying, good sandability.	2K sb	•		
High gloss, excellent mechanical properties.	2K sb			•
Good outdoor stability, high gloss.	2K sb			•
Fast drying, excellent outdoor stability.	2K sb			•
Excellent adhesion to metals.	2K sb	•		
Excellent chemical resistance, high solids.	2K sb			•
Low isocyanate demand, very high solids.	2K sb	•		
Fast drying, very high solids.	2K sb	•		•
High reactivity, excellent outdoor stability.	2K sb			•
High reactivity.	2K sb	•		
Thermoplastic resin.	2K sb			•
Thermoplastic resin.	1K sb			•
Good outdoor stability.	1K sb			•
Improving body and gloss.	1K sb		•	
Thermoplastic resin.	2K sb			•
Thermoplastic resin.	1K sb			•
Thermoplastic resin.	1K sb			•
Thermoplastic resin.	1K sb			•

# Product Range

(continued)

Products	Product description	Modification/ type	Form of delivery (% solid content for binding) (% active matter for additives)
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## Solvent-borne Acrylic

<b>ADDITOL®* XL 480</b>	Modified acrylic copolymer; low molecular weight; FDA approved.	Additive	70
<b>ADDITOL XL 6521</b>	Modified block copolymer; high molecular, cationic	Additive	
<b>ADDITOL VXL 6212 N</b>	Urethane modified acrylic polymer, high molecular, cationic.	Additive	30
<b>ADDITOL VXL 6237 N</b>	Wetting/Dispersing agent; cationic; high molecular.	Additive	30
<b>MODAFLOW®* RESIN</b>	Acrylic copolymer, high molecular weight; FDA approved.	Additive	100
<b>MODAFLOW 2100</b>	Acrylic copolymer, low molecular weight; FDA approved.	Additive	100
<b>MODAFLOW 9200</b>	Modified acrylic copolymer; low molecular: FDA approved.	Additive	100

## Solvent-borne Alkyd and Polyester

<b>VIALKYD®* AY 120</b>	Acrylic modified alkyd resin	Alkyd	65 in XMPAC
<b>DUROFTAL®* VPI 2801</b>	Oil free polyester resin	Oil-free	78 in BAC
<b>DUROFTAL VPI 2803</b>	Oil-free polyester resin	Oil-free	78 in BAC
<b>VIALKYD AN 950</b>	Oil-free polyester resin	Oil-free	70 in X
<b>VIALKYD VAN 9460</b>	Oil-free polyester resin	Oil-free	80 in BAC
<b>VIAPAL®* UP 192 B</b>	Pre-accelerated unsaturated polyester		65 in styrene
<b>VIAPAL UP 260 B</b>	Pre-accelerated unsaturated polyester		62 in styrene
<b>VIAPAL UP 282 B</b>	Pre-accelerated unsaturated polyester		65 in styrene
<b>VIAPAL UP 298 B</b>	Pre-accelerated unsaturated polyester		61 in styrene
<b>VIAPAL VUP 4738 B</b>	Pre-accelerated unsaturated polyester		65 in styrene
<b>DUROFTAL PE 912 SCA</b>	Sca modified oil-free polyester resin		50 in SNAX
<b>VIAPAL UP 156 E</b>	Unsaturated polyester		68 in styrene
<b>VIAPAL UP 527 E</b>	Unsaturated polyester		68 in styrene
<b>ADDITOL VXL 4992</b>	Modified polyester	Additive	

\* **ADDITOL** additives

\* **DUROFTAL** polyester resins

\* **MODAFLOW** resins flow modifier

\* **VIALKYD** alkyd resins

\* **VIAPAL** unsaturated polyesters

### Key to the table

**Dynamic viscosity** DIN, ISO 3219, 23 °C

**Form of delivery** non-volatile matter DIN, ISO 3251

**Chemistry** refers to formulation type

● Recommended for use

Dynamic viscosity	Key features					
		Chemistry	Putties	Primer surfacer	Base coat	Clear coat and top coat
–	Reduces surface defects; good compatibility; for car-refinish applications.	sb		●		●
–	High effective for difficult wettable pigments; high gloss; excellent colouristic properties.	sb				●
–	Similar to XL 260, but improved effectiveness in acrylic systems.	sb		●		●
–	For difficult wettable pigments as well as for pigment concentrates/pastes.	sb		●		●
–	Highly effective leveling agent; good wetting behaviour; degassing properties.	sb		●		●
–	Highly effective; good compatibility; short incorporation time and fast mode of action.	sb		●		●
–	Reduces surface defects; excellent compatibility; for high-end applications with excellent gloss.	sb				●
230–620 (50 % in X)	Quick rise in hardness, long potlife.	2K sb		●		
4000–17000	For ultra high solids.	2K sb				●
7000–19000	For ultra high solids.	2K sb				●
2300–3100	High flexibility.	1K sb			●	
1500–3500	High flexibility, good weathering stability.	2K sb				●
320–420 (1)	Elastic, reactive.	2K sb	●			
450–670 (1)	Medium rigid, highly reactive.	2K sb	●			
460–710 (1)	Highly elastic, reactive.	2K sb	●			
460–690 (1)	Rigid, highly reactive.	2K sb	●			
500–690 (1)	Highly elastic, medium reactive.	2K sb	●			
350–1200	Improves control of sagging.	1K sb			●	
530–760 (1)	Airdrying, highly elastic, medium reactive; in combination with UP 527 for fillers.	2K sb	●			
630–950 (1)	Airdrying, rigid, highly reactive; in combination with UP 156 for fillers.	2K sb	●			
–	Reduces dispersing time; enhances degassing and rheology especially in UP-putties.	sb	●			

#### Abbreviations

<b>1K</b>	one component
<b>2K</b>	two component
<b>sb</b>	solvent-borne
<b>wb</b>	waterborne
<b>BAC</b>	butyl acetate
<b>FDA</b>	Food and Drug Administration
<b>X</b>	xylene
<b>sca</b>	sagging control agent
<b>XMPAC</b>	xylene/methoxy propyl acetate
<b>SNAX</b>	solvent naphta A, xylene

# Product Range

(continued)

Products	Product description	Modification/ type	Form of delivery (% solid content for binding) (% active matter for additives)
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## Other solvent-borne systems

<b>ADDITOL®* XL 180</b>	Phosphoric acid compound.	Additive	98
<b>ADDITOL XL 204</b>	Silicone containing phosphoric acid ester; anionic.	Additive	55
<b>ADDITOL XL 250</b>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.	Additive	55
<b>ADDITOL XL 270</b>	Modified silicone; amine neutralized.	Additive	55
<b>ADDITOL XL 123 N</b>	Modified silicone.	Additive	50
<b>ADDITOL VXL 4930</b>	Polyether modified silicone.	Additive	40
<b>ADDITOL VXL 4951</b>	Fluoro-modified silicone defoamer.	Additive	20
<b>ADDITOL VXL 6501</b>	Silicone containing degassing agent.	Additive	10
<b>ADDITOL VXL 6244 N</b>	Salt of a polyadduct.	Additive	70
<b>ADDITOL VXW 6387</b>	Special fatty acids; amine neutralized; silicone-free.	Additive	60
<b>SANTOSOL®* DME-1</b>	Dimethylester mixture.	Additive	

## Waterborne Acrylic

<b>ADDITOL XW 390</b>	Acrylic resin amine neutralized, fluorinated.	Additive	50
<b>ADDITOL XW 395</b>	Acrylic resin, amine neutralized, silicone-free, FDA approved.	Additive	58
<b>ADDITOL VXW 6208</b>	Polymer, nonionically stabilised.	Additive	50
<b>ADDITOL VXW 6396</b>	Highly fluorinated modified acrylic copolymer.	Additive	55
<b>MODAFLOW AQ 3025</b>	Acrylic resin, amine neutralized; silicone-free.	Additive	25
<b>VIACRYL®* VSC 6265 W</b>	Acrylic resin.		40 % in water
<b>VIACRYL VSC 6288 W</b>	Acrylic resin.		35 % in water

\* **ADDITOL** additives

\* **MODAFLOW** resins flow modifier

\* **SANTOSOL** dimethyl esters

\* **VIACRYL** acrylic resins

### Key to the tables

**Form of delivery** non-volatile matter DIN, ISO 3251

**Chemistry** refers to formulation type

● Recommended for use

### Abbreviations

**sb** solvent-borne

**wb** waterborne

**1K** one component

**2K** two component

**FDA** Food and Drug Administration

Dynamic viscosity	Key features	Chemistry	Putties	Primer surfacer	Base coat	Clear coat and top coat
	Enhances intercoat adhesion.	sb		●		●
	Prevents floating and Bénard cells; reduces dispersing time.	sb				●
	Reduces dispersing time; enhances flow, gloss and color strength.	sb		●		●
	Suitable for high gloss systems; prevents floating and sedimentation.	sb		●		
	Excellent slip and scratch resistance; degassing; thermostable up to 400 °C.	sb				●
	Highly effective; good spray mist absorption; prevents orange peel, no foam stabilization.	sb				●
	Very effective; prevents foam and blister formation during processing and application.	sb				●
	Highly effective in industrial and 2K-systems, anti-corrosion lacquers, PE- and UV-systems.	sb				●
	Reduces dispersing time; enhances degassing and rheology especially in UP-putties.	sb	●			
	Prevents pigment sedimentation; reduces sagging; improves storage stability.	sb		●		
	Slow evaporation with excellent solvency, anti-pinhole.	sb		●		●
	Excellent wetting and intercoat adhesion; no foam stabilization; crosslinkable.	wb		●	●	●
	Good wetting; prevents cratering and pin holes; effective against oil contaminations.	wb		●	●	●
	For inorg./org.pigments and pigment concentrates/pastes.	wb		●	●	●
	Excellent leveling and wetting properties; no foam stabilization; good recoatability.	wb		●	●	●
	Optimizes flow and gloss; enhances degassing; facilitates pigment wetting.	wb		●	●	●
200 – 1300	High shear stability, quick set and through-drying.	2K wb		●		
20 – 90	Rapid curing, excellent sandability.	2K wb		●		

Products	Product description	Modification/ type	Form of delivery (% solid content for binding) (% active matter for additives)
<b>Waterborne Polyurethane</b>			
<i>DAOTAN</i> <sup>®*</sup> <i>VTW 1262</i>	Polyurethane dispersion.		35 in WA
<i>DAOTAN</i> <i>VTW 6462</i>	Urethane acrylic hybrid.	Acrylic	36 in WA
<b>Other Waterborne systems</b>			
<i>ADDITOL</i> <sup>®*</sup> <i>XL 123 N</i>	Modified silicone.	Additive	50
<i>ADDITOL</i> <i>XL 180</i> <sup>1</sup>	Phosphoric acid compound.	Additive	98
<i>ADDITOL</i> <i>XL 204</i>	Silicone containing phosphoric acid ester; anionic.	Additive	55
<i>ADDITOL</i> <i>XL 250</i>	Phosphoric acid ester, neutralized by amine; anionic; low molecular.	Additive	55
<i>ADDITOL</i> <i>VXL 4930</i>	Polyether-modified silicone.	Additive	40
<i>ADDITOL</i> <i>VXW 4926</i>	Special fatty acid esters.	Additive	100
<i>ADDITOL</i> <i>VXW 4973</i>	Mineral oil, waxes.	Additive	
<i>ADDITOL</i> <i>VXW 6386</i>	Hydrocarbons, waxes.	Additive	100
<i>ADDITOL</i> <i>VXW 6387</i>	Special fatty acids; amine neutralized; silicone-free.	Additive	60
<i>ADDITOL</i> <i>VXW 6500</i>	Degassing polymer, solved in hydrocarbons silicone-free.	Additive	100
<i>ADDITOL</i> <i>VXW 6503</i>	Silicone tenside.	Additive	50
<i>VIACRYL</i> <sup>®*</sup> <i>VSC 6254</i>	Copolymer of styrene and acrylic esters.		40 in WA

1 = pre-neutralized with amine

\* *ADDITOL* additives

\* *DAOTAN* polyurethane resins

\* *VIACRYL* acrylic resins

#### Key to the tables

**Form of delivery** non-volatile matter DIN, ISO 3251

**Chemistry** refers to formulation type

● Recommended for use

#### Abbreviations

**sb** solvent-borne

**wb** waterborne

**1K** one component

**2K** two component

**WA** water

Dynamic viscosity	Key features	Chemistry	Putties	Primer surfacer	Base coat	Clear coat and top coat
5–50	High flexibility, good shear stability.	1K wb			●	
25–120	Rapid cure, good wetting properties.	1K wb			●	
–	Excellent slip and scratch resistance; degassing; thermostable up to 400 °C.	wb				●
–	Enhances intercoat adhesion.	wb		●	●	
–	Prevents floating and Bénard cells; reduces dispersing time.	wb		●	●	●
–	Reduces dispersing time; enhances flow, gloss and color strength.	wb		●	●	●
–	Highly effective; good spray mist absorption; prevents orange peel; no foam stabilization.	wb				●
–	Quick defoaming/degassing; enhances build-up; crosslinkable.	wb		●	●	●
–	Very effective, good compatibility, easy to incorporate.	wb		●	●	●
–	For high quality lacquers; good compatibility. Homogenize well prior to use!	wb		●	●	●
–	Prevents pigment sedimentation; reduces sagging; improves storage stability.	wb		●	●	●
–	Very good deaerating in forced drying and stoving systems; easy to incorporate; for clear coats.	wb		●	●	●
–	Excellent substrate wetting; no foam stabilization; good recoatability.	wb		●	●	●
150–700	Improves physical drying properties.	1K wb			●	

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