

VIAPAL®

Unsaturated polyester resins



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LRA007-EMEA-0319



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Facts & Figures

- Global company with over €2.1 billion in sales
- Broad technology portfolio: liquid coating resins, energy curable resins, powder coating resins, crosslinkers and additives, composites and construction materials
- Approximately 4000 employees
- Customers in more than 100 countries
- 33 manufacturing facilities
- 23 research and technology centers
- 5 ventures
- Extensive range of solutions for key coating segments: automotive, industrial, packaging coating and inks, protective, industrial plastics and specialty architectural

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

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Introduction

allnex is a leading producer of liquid coating resins and additives (LRA). The LRA business provides a comprehensive range of products with its core technologies including: Alkyds, Acrylics, Epoxies, Polyesters, Polyurethane Dispersions and Additives for use in water borne, solvent borne and solvent free paint and coatings. Our products lend themselves

to be used in multiple end-user segments including Automotive OEM, Vehicle Refinish, Marine & Protective, High End Metal Finishes, Decorative and Construction. With research and development and technical facilities located on five continents, we offer innovative solutions to fulfill technical and regulatory requirements around the world.



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LEGEND

- B accelerated
- E increased storability
- T thixotropic
- S light stability



Gelcoats

Product	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application	Characteristics
Transparent Gelcoats					
GELCOAT 920 B	63 - 67	11 - 17 ¹⁰⁾	4.5	brush	Clear gelcoat based on isophthalic acid resin, preaccelerated, thixotropic; for moulded parts with good sea water resistance.
GELCOAT 921 B	54 - 58	13 - 21 ¹⁰⁾	4.5	spray	VIAPAL® GC 920 B adjusted to spraying consistency.
GELCOAT VUP 4647 BES	52.5 - 56.5	6 - 12 ¹⁰⁾	1.5	spray	Clear gelcoat based on isophthalic acid/neopentyl glycol resin, specially pre-accelerated, thixotropic, light stabilized; for the production of sanitary and other parts, suitable for indoor use.
GELCOAT VUP 4794 BS	52 - 56	13 - 17 ¹⁰⁾	1.5	spray	Clear gelcoat based on isophthalic acid/neopentyl glycol resin, specially pre-accelerated, thixotropic, light stabilized. Suitable for production of polymer marble and polymer concrete articles. Optically clear film, good surface hardness, very low yellowing tendency, very good warm water and chemical resistance, suitable for outside use.
GELCOAT UP 4829 BS	54 - 58	13 - 17 ¹⁰⁾	1.5	spray	Clear gelcoat based on isophthalic acid/neopentyl glycol resin, acrylic modified, pre-accelerated, thixotropic, light stabilized. Suitable for production of polymer marble and polymer concrete articles. Optically clear film, good surface hardness, very low yellowing tendency, very good warm water and chemical resistance, suitable for outside use.
GELCOAT UP 4839 BS	46 - 50	13 - 17 ¹⁰⁾	2	spray	Clear gelcoat based on isophthalic acid/neopentyl glycol resin, acrylic modified, pre-accelerated, thixotropic, light stabilized. Suitable for production of polymer marble and polymer concrete articles. Optically clear film, good surface hardness, very low yellowing tendency, very good warm water and chemical resistance, suitable for pool production or other outside use, increased HDT.
VIAPAL® GC 4863 BS	55 - 59	13 - 19 ¹⁰⁾	4	spray	Clear gelcoat for outside application with outstanding weather and UV resistance, high resistance against yellowing, optimum film clarity. Gelcoat based on specifically developed neopentyl glycol resin, highly thixotropic, pre-accelerated, light stabilized modified with acrylic monomer.
Gelcoats for Boat Building					
GELCOAT VUP 4750 BE*	65.5 - 69.5	13 - 18 ¹⁰⁾	3.5	brush	Highly thixotropic, specially pre-accelerated UP-resin based on isophthalic acid; brush grade; to be used only after mixing with VIAPAL color pastes. Excellent processing properties: rapid de-aeration, fast curing, high color stability.
GELCOAT VUP 4751 BE*	57 - 61	7 - 12 ¹⁰⁾	3.5	spray	VIAPAL VUP 4750 BE adjusted to spraying consistency.
GELCOAT VUP 4780 BE*	67 - 71	8 - 18 ¹⁰⁾	4.2	brush	Highly thixotropic, specially pre-accelerated, UP-resin based on isophthalic acid/neopentyl glycol; brush grade; to be used after mixing with VIAPAL color pastes. Excellent processing properties; rapid de-aeration, fast curing, high color stability.
GELCOAT VUP 4781 BE*	59 - 63	10 - 15 ¹⁰⁾	4.2	spray	VIAPAL VUP 4780 BE adjusted to spraying consistency.
Gelcoats for Sanitary Applications					
GELCOAT VUP 4647 BES	52.5 - 56.5	12 - 20 ¹⁰⁾	1.5	spray	Highly thixotropic, specially pre-accelerated, light stabilized UP-resin based on isophthalic acid/ neopentyl glycol; spray grade for gelcoats on synthetic marble/onyx tiles and sanitary ware; extraordinary bright color and very high resistance to cold/warm water with elevated thermal stress conditions.
GELCOAT UP 4794 BS	52 - 56	13 - 17 ¹⁰⁾	1.5	spray	Isophthalic acid/neopentyl glycol resin, acrylic modified, pre-accelerated, very thixotropic, light stabilized. As non-colored gelcoat on polymer marble and polymer concrete articles. Optically clear film, good surface hardness, very low yellowing tendency, very good warm water and chemical resistance, suitable for outside use.
GELCOAT VUP 4780 BE	61 - 71	6 - 12 ¹⁰⁾	4.2	brush	Highly thixotropic, specially pre-accelerated, UP-resin based on isophthalic acid/neopentyl glycol; brush grade; to be used after mixing with VIAPAL color pastes. Excellent processing properties; rapid de-aeration, fast curing, high color stability.
GELCOAT VUP 4781 BE	59 - 63	8 - 18 ¹⁰⁾	4.2	spray	VIAPAL VUP 4780 BE adjusted to spraying consistency.
VIAPAL GC 4835 B	59 - 63	10 - 15 ¹⁰⁾	1.5	spray	Gelcoat, based on isophthalic acid/neopentyl glycol resin pre-accelerated; very thixotropic, also colored (with VIAPAL color pastes) available. Excellent processing properties; very good de-aeration, fast curing after gelification, excellent thermo shock behaviour.
VIAPAL GC 4855 B/9376	62 - 66	10 - 15 ¹⁰⁾	1.5	spray	Gelcoat, based on isophthalic acid/neopentyl glycol resin pre-accelerated; highly thixotropic, also available in various colors (with VIAPAL color pastes). Considerably increased scratch resistance. Excellent processing properties; has very good de-aeration and fast curing after gelation, excellent thermo shock behavior. Current color shade on request. This color 9376 (white) is used as a sample.
VIAPAL GC 4872 B/9352	61 - 65	9 - 17 ¹⁰⁾	1.5	spray	Gelcoat based on isophthalic acid/neopentyl glycol resin, pre-accelerated, thixotropic, also colored (with VIAPAL color pastes) available. Excellent processing properties; very good de-aeration, fast curing after gelification, excellent thermo shock behaviour. Only colored available, current color shade on request. This color 9352 (white) is used as an example.
Gelcoats for FRP Pools					
GELCOAT UP 4839 BS*	58 - 62	12 - 20 ¹⁰⁾	2	spray	Clear gelcoat, Isophthalic acid/neopentyl glycol resin, acrylic modified, pre-accelerated, thixotropic, light stabilized. Optically clear film, good surface hardness, very low yellowing tendency, very good warm water and chemical resistance, suitable for pool production.
GELCOAT UP 4833 BE/5115*	62 - 66	14 - 20 ¹⁰⁾	4.2	spray	Isophthalic acid/neopentyl glycol resin, pre-accelerated; very thixotropic. Excellent processing properties: very good de-aeration, fast penetration curing, particularly high color stability, suitable for swimming pools. Only colored available, current color shade on request. This color 5115 (light blue) is used only as an example.
VIAPAL GC 4841 BES/7166*	46 - 50	13 - 17 ¹⁰⁾	4.2	spray	Newest generation gelcoat for pool manufacturing. Based on isophthalic acid/neopentyl glycol resin, pre-accelerated, very thixotropic. Excellent processing properties: very good de-aeration, fast penetration curing particularly high color and gloss stability. Only colored available, current color shades on request. This color 7166 (light gray) is used only as an example.

* for best osmosis resistance the use of at least 1 laminate layer barrier coat resin VIAPAL UP 4838 BT/63 directly behind the gelcoat is recommended.

Gelcoats

Product	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application	Characteristics
Tooling Gelcoats					
GELCOAT 935 BE	64 - 68	18 - 25 ¹⁰⁾	4	brush	Highly thixotropic, Co-pre-accelerated UP-resin, brush grade; for resilient gelcoats with high resistance to aromatic solvents (styrene) particularly as gelcoat for glassfiber reinforced UP moulds. Used together with buffer resin VUP 4774 BET/57. The gelcoat is also available colored: VIAPAL® 935 BE/9127 (black).
GELCOAT 936 BE	51.5 - 55.5	16 - 23 ¹⁰⁾	4	spray	VIAPAL 935 BE formulated for spraying. The gelcoat is also available colored: VIAPAL 936 BE/9127 (black).
Topcoat					
TOPCOAT 960 BE	61.5 - 65.5	12 - 18 ¹⁰⁾	4.2	brush	Highly thixotropic, Co-pre-accelerated UP-resin based on isophthalic acid/neopentyl glycol; for tack- free curing topcoats with high chemical resistance.



Base Resins

Product	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)	Characteristics
VIAPAL® UP 140/70	medium	400 - 490 ¹⁾	22 - 32 ¹²⁾	4	34	Unsaturated polyester resin, good strength and high elasticity
VIAPAL UP 262 S/66	medium	880 - 1120	7 - 16 ¹⁸⁾			UP resin based on iso-phthalic acid stabilized against UV radiation. Increased elongation at break, low exothermic temperature, high impact strength and good chemical resistance. Highly flexible.
VIAPAL UP 156 E/68	medium	530 - 760 ³⁾	11 - 15 ¹⁸⁾	1.1		Low viscous unsaturated polyester, in conjunction with VIAPAL® UP 527 E/68 for spray fillers for automobile repair or for wood varnishes. High flexibility and bending strength, high oversteering tolerance, excellent storage stability and sanding properties.
VIAPAL UP 303/65	high	800 - 1000 ³⁾	20 - 30 ¹²⁾	2	130	O-phthalic acid resin, enhanced dimensional stability at elevated temperature and enhanced impact strength; moulded parts correspond to type 1140 in accordance with DIN 16946, part 2. The resin has a low peak temperature.
VIAPAL UP 320/70	high	1750 - 2350 ³⁾	20 - 30 ¹²⁾	1.2	135	UP resin based on orthophthalic acid, low styrene content, very good mechanical properties.
VIAPAL UP 450 E/66	high	960 - 1090 ¹⁾	8 - 14 ¹²⁾		102	UP-resin based on ortho-phthalic acid extended shelf life. Good mechanic, thermal and chemical properties.
VIAPAL UP 530/66	medium	650 - 900 ¹⁾	8 - 12 ¹²⁾			Styrene solved, unsaturated polyester resin; can be hardened tack-free in contrast to conventional UP resins without air closing substances in all coat thicknesses after addition of peroxides and accelerators. The hardened top coat is scratch resistant and colourless.
VIAPAL VUP 4714/60	medium	600 - 800 ¹⁾	5 - 11 ¹⁸⁾	3.7	129	Isophthalic acid/neopentyl glycol resin, very good penetration curing, high deformation resistance in heat, high chemical suitability, good hot water resistance.
VIAPAL VUP 4792 E/66	medium	1080 - 1320 ¹⁾	4 - 10 ¹⁸⁾	4.2	99	Isophthalic acid/neopentyl glycol resin, high chemical suitability; fulfills specification of German Lloyd and Lloyds register of shipping.
VIAPAL UP 4800 E/65	medium	1000 - 1400 ¹⁾	4 - 10 ¹⁸⁾	4.2	99	Isophthalic glycol resin, high chemical suitability: good external durability
VIAPAL UP 745/56	medium	550 - 750 ³⁾	20 - 30 ¹²⁾	2	146	Terephthalic acid/neopentyl glycol resin, good resistance to chemicals and very high dimensional stability at elevated temperature. Corresponds to type 1130 in accordance with DIN 16946, part 2.
VIAPAL UP 797/59	medium	350 - 450 ³⁾	9 - 15 ¹⁸⁾	2	133	HET acid/neopentyl glycol resin, high deformation resistance in heat, very good chemical resistance, flame resistant according to ASTM E-84-98. Moulded parts correspond to type 1130 according to DIN 16946, part 2.
VIAPAL UP 4848/71	high	240 - 410 ¹⁾	13 - 27 ²⁴⁾	3	146	Low viscosity vinyl ester resin on epoxynovolak base; extraordinary good chemical resistance, enhanced dimensional stability at elevated temperature. Approval of BAM, Berlin, for lining of tanks for storage of aircraft fuel and petrol according to DIN 51600 and DIN 51607. Approval of Lloyd's Register of Shipping.

Special Resin Types

Product	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)	Characteristics
Laminating Resins for Barrier Coat						
VIAPAL® VUP 4774 BET/57	high	thix.	17 – 27 ¹⁰⁾	4	94	UP resin, pre-accelerated, thixotropic; enhanced strain at break and impact strength, very good resistance against styrene and UP-resin; for barrier laminates of GR-UP moulds in combination with VIAPAL 935 BE Gelcoat resp. VIAPAL® 936 BE Gelcoat.
VIAPAL VUP 4714 BET/52	high	thix.	17 – 28 ¹⁰⁾	2	129	Isophthalic acid/neopentyl glycol resin, pre-accelerated, thixotropic, contains peroxide indicator; increased elongation at break, impact resistance and high HDT.
VIAPAL UP 4838 BT/63	high	200 - 280 ³⁾	30 - 40 ⁸⁾	3.5	HDT: 97	Vinyl ester resin, based on Bisphenol A; pre-accelerated, thixotropic, supports excellent osmosis resistance as buffer layer resin.
Hybrid Resins						
VIAPAL VUP 4805 B/64-15	high	95 - 130 ²⁾	15 ³²⁾	3.4	121	Polyester/polyurethane hybrid resin on neopentyl glycol base, pre-accelerated. Always processed together with a suitable di-Isocyanate. Very low viscosity, very fast curing after gelification, surface cures tack free. Impregnates reinforcing materials very fast, can be loaded with high proportions of mineral fillers for the production of low shrink moulded parts
VIAPAL VUP 4759 BT/70	high	630-850 ²⁾	120-140 ²⁾		127	Unsaturated thixotropic polyester resin; 2 component.
Cast Resin, Pure Resin						
VIAPAL UP 223 BS/65	medium	600 - 800 ³⁾	25 – 35 ⁶⁾	2.5	80	O-phthalic acid resin, specially pre- accelerated light stabilized; cast resin for the production of crystal clear components.
Putty Resins for the Stone Industry						
VIAPAL UP 455 B/65	high	700 - 920 ¹⁾	2 - 6 ²⁹⁾	1.9	102	Orthophthalic acid resin, special accelerator and inhibitor system; after addition of dibenzoyl peroxide, rapid and good curing, bright color in cured state; for manufacture of putties and adhesives for the stone industry.
VIAPAL VUP 4706 B/65	high	690 – 920 ¹⁾	6 – 12 ³²⁾	1.9	102	Orthophthalic acid resin, special accelerator and inhibitor system; after addition of dibenzoyl peroxide, rapid and good curing even in thin layer, bright color in cured state; for manufacture of putties and adhesives for the stone industry.
VIAPAL VUP 4693 E/68	high	680 - 900 ¹⁾				Air-drying, unsaturated polyester resin: short gelling time, light colour, high elasticity; excellent adhesion on wood, hardboard, chipboard, plastic and metal.
Styrene-free Resin						
VIAPAL VUP 4822	medium	2700 - 3700 ¹⁾	4 – 7 ³⁰⁾	0.8		Air-drying, unsaturated, medium reactive, hard polyester resin. Can be used as sole binder for styrene-free or styrene-poor, clear and pigmented paints as well as spraying fillers. The curing of VIAPAL VUP 4822 is effected in the usual way with a cobalt/ketone-peroxide system.
Solid Surface Resins						
VIAPAL VUP 4792E/66	medium	1080 – 1320 ¹⁾	4 - 10 ¹⁸⁾	4.2	99	Isophthalic acid/neopentyl glycol resin, high chemical suitability; fulfills specification of German Lloyd and Lloyds register of shipping.
VIAPAL UP 4777 B/66	high	800 – 1200	17 – 21 ⁶⁾	2.6	91	Isophthalic acid/neopentyl glycol resin, pre-accelerated; acrylic modified, low tension curing bright color in cured form, very good warm water resistance. In combination with aluminium trihydrate for manufacture of "densified marble" (solid surface).
Flexible Resins						
VIAPAL UP 130/65	low	550 – 750 ³⁾	10 – 16 ¹²⁾	60	50	Isophthalic acid resin, high strain at break, high impact strength; for flexibilizing of rigid types of VIAPAL resin.
Paste Resin						
VIAPAL VUP 4787		550 - 850 ¹⁾	10 - 20 ²²⁾			UP-resin, monomer-free, odourless; very good storage stability, can absorb a high level of pigment; for the production of color pastes.
Flame Retardant Resins						
VIAPAL UP 797/59	medium	350 – 4500 ³⁾	9 – 15 ¹⁸⁾	2	133	HET-acid/neopentyl glycol resin, high dimensional stability at elevated temperature, good resistance to chemicals, fire retardant. Transparent moulded parts correspond to type 1130 in accordance with DIN 16946, part 2.

Additives

Product	Characteristics
ADDITOL® VXT 6228	Very viscous solution of thermoplastics in styrene. Low shrink additive for reducing shrinkage of UP resins. In combination with very reactive VIAPAL types for the production of moulded parts in the hot-press (SMC/ BMC) and pultrusion process as well as for polymer concrete. Addition quantity approx. 20 - 30% (max. 40%) referring to resin.
ADDITOL VXL 5918	10% inhibitor solution for prolonging the gel time of UP resin formulation.
VIAPAL® ZUP 4617/50	Wetting agent and emulsifying additive, reduces the separation between UP resin and the low-shrink component. Reduces the viscosity of filled systems and enhances flow properties. Improves color homogeneity in low shrink adjustments for pultrusion applications. Addition quantity approx. 1% referring to resin.
Paraffin solution 24/3%	3% solution of paraffin in aromatic mixture.
VIAPAL Color Pastes	Inorganic and/or organic pigments in a monomer-free UP-resin, excellent light and weather fastness.

Color Pastes

Following RAL color pastes are available short term. Other shades are on request

● FP 1001	● FP 5003	● FP 7000	○ FP 9001
● FP 1002	● FP 5004	● FP 7001	○ FP 9002
● FP 1003	● FP 5005	● FP 7004	○ FP 9003
● FP 1004	● FP 5010	● FP 7005	○ FP 9010 OEP
● FP 1006 OEP	● FP 5012	● FP 7011	
● FP 1007	● FP 5013	● FP 7012	● FP 9011
● FP 1012	● FP 5014	● FP 7015	
● FP 1013	● FP 5015	● FP 7016	○ FP 9016
● FP 1014	● FP 5017	● FP 7021	○ FP 9018
● FP 1015	● FP 5018	● FP 7022	
● FP 1018	● FP 5021	● FP 7023	
● FP 1020	● FP 5024	● FP 7024	
● FP 1021		● FP 7030	
● FP 1023	● FP 6001	● FP 7031	
● FP 1024	● FP 6002	● FP 7032	
	● FP 6005	● FP 7033	
● FP 2002	● FP 6009	● FP 7035	
● FP 2003	● FP 6010	● FP 7036	
● FP 2004	● FP 6011	● FP 7037	
● FP 2011	● FP 6016	● FP 7038	
	● FP 6017	● FP 7040	
● FP 3000	● FP 6018	● FP 7043	
● FP 3001	● FP 6019		
● FP 3002	● FP 6021	● FP 8001	
● FP 3003	● FP 6022	● FP 8003	
● FP 3004	● FP 6026	● FP 8007	
● FP 3005	● FP 6027	● FP 8011	
● FP 3009	● FP 6029	● FP 8014	
● FP 3020		● FP 8016	
		● FP 8017	
● FP 4005		● FP 8023	

Viscosity measured at 23 °C with cone and plate:

¹⁾ shear rate 25 s⁻¹ ³⁾ shear rate 500 s⁻¹

For curing conditions please see technical instructions:

6) 1,0 MEKP ²²⁾ 2,0 MEKP/3 Co1/0,8 DMA 10
8) 1,5 MEKP ²⁴⁾ 2,0 MEKP/3 Co1/1 DMA 10
10) 2,0 MEKP ²⁸⁾ 2 BP50-P
12) 2,0 MEKP/0,3 Co1 ²⁹⁾ 3,5 BP-P
18) 2,0 MEKP/1 Co1 ³⁰⁾ 3,0 MEKP
20) 2,0 MEKP/2 Co1 ³²⁾ special curing

