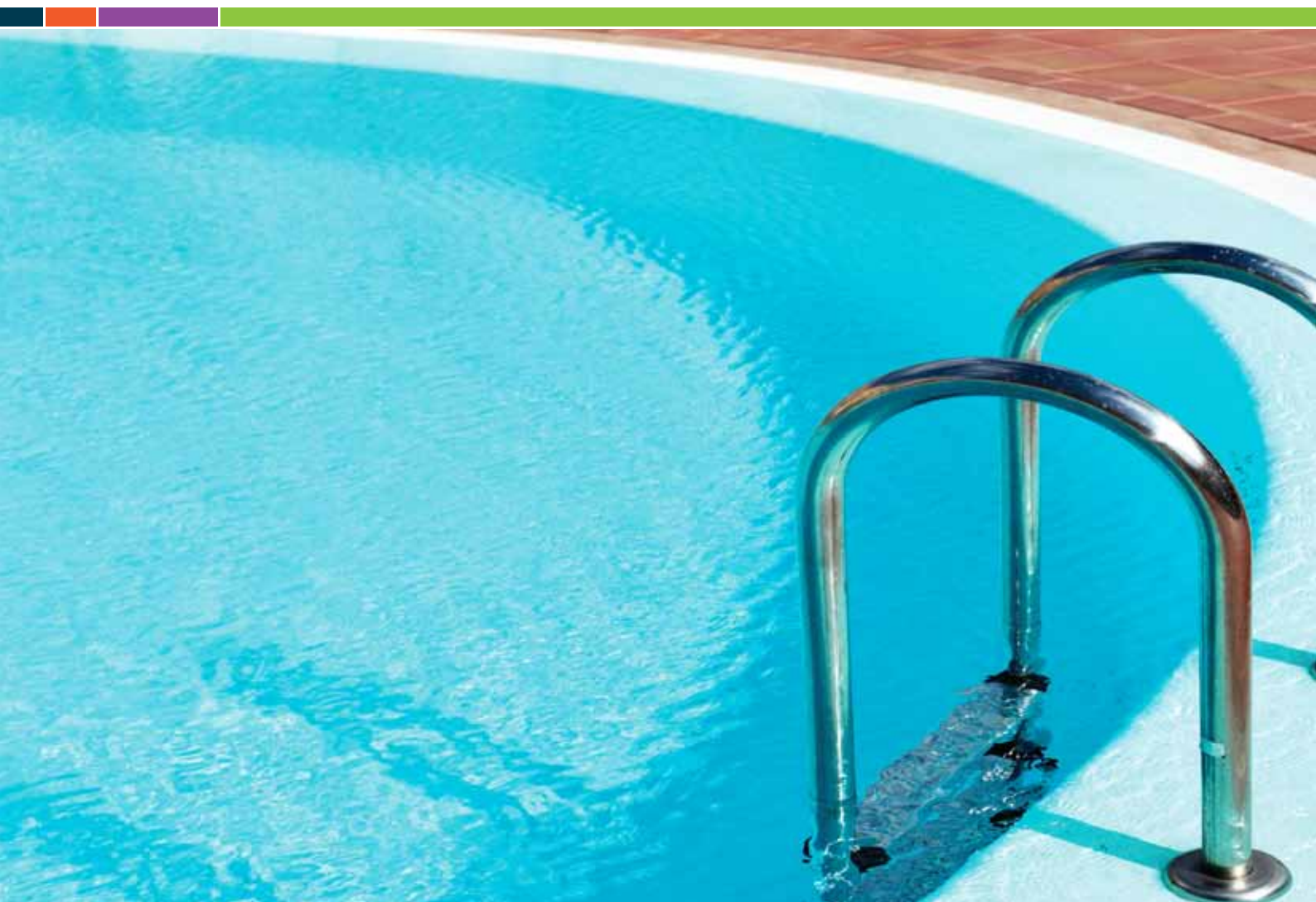


VIAPAL®

UNSATURATED POLYESTER RESINS



FACTS & FIGURES



About us

- Global company with nearly \$1.5 billion in sales
- Resin portfolio that comprises of more than 80% of low VOC and waterborne products
- Broad technology portfolio: liquid coating resins, energy curable resins, powder coating resins, crosslinkers and additives
- Approx. 2000 employees
- More than 2500 customers
- 16 manufacturing facilities
- 13 research and technology centers
- 2 joint ventures
- A myriad of solutions for key coating segments: automotive, industrial, packaging coating and inks, protective, consumer electronics & industrial plastics and specialty architectural



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LEGEND :

B = accelerated; **E** = increased storability; **T** = thixotropic; **S** = light stability

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

Gelcoats

Transparent Gelcoats

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
<i>VIAPAL® VUP 4647 BES</i>	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.	52.5 - 56.5	6 - 12 10)	1.5	spray
<i>VIAPAL VUP 4794 BS</i>	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.	52 - 56	13 - 17 10)	1.5	spray
<i>VIAPAL UP 4829 BS</i>	Clear gelcoat based on isophthalic acid/neopentyl glycol resin, acrylic modified, pre-accelerated, thixotropic, high 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.	54 - 58	13 - 17 10)	1.5	spray
<i>VIAPAL GC 4839 BS</i>	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.	46 - 50	13 - 17 10)	2	spray
<i>VIAPAL GC 4863 BS</i>	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.	55 - 59	13 - 19 10)	4	spray

Gelcoats for Boat Building

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
<i>VIAPAL VUP 4750 BE*</i>	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.	65.5 - 69.5	13 - 18 10)	3.5	brush
<i>VIAPAL VUP 4751 BE*</i>	VIAPAL VUP 4750 BE adjusted to spraying consistency.	57 - 61	7 - 12 10)	3.5	spray
<i>VIAPAL VUP 4780 BE*</i>	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.	67 - 71	8 - 18 10)	4.2	brush
<i>VIAPAL VUP 4781 BE*</i>	VIAPAL VUP 4780 BE adjusted to spraying consistency.	59 - 63	10 - 15 10)	4.2	spray

* 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 for Sanitary Applications

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
VIAPAL® VUP 4647 BES	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.	52.5 - 56.5	12 - 20 10)	1.5	spray
VIAPAL UP 4794 BS	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.	52 - 56	13 - 17 10)	1.5	spray
VIAPAL VUP 4780 BE	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.	61 - 71	6 - 12 10)	4.2	brush
VIAPAL VUP 4781 BE	VIAPAL VUP 4780 BE adjusted to spraying consistency.	59 - 63	8 - 18 10)	4.2	spray
VIAPAL GC 4835 B	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.	59 - 63	10 - 15 10)	1.5	spray
VIAPAL GC 4872 B/9352	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.	61 - 65	9 - 17 10)	1.5	spray

Gelcoats for FRP Pools

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
<i>VIAPAL® UP 4839 BS*</i>	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.	58 - 62	12 - 20 10)	2	spray
<i>VIAPAL UP 4833 BE/5115*</i>	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.	62 - 66	14 - 20 10)	4.2	spray
<i>VIAPAL GC 4841 BES/7166*</i>	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.	46 - 50	13 - 17 10)	4.2	spray

Tooling Gelcoats

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
<i>VIAPAL 935 BE</i>	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).	64 - 68	18 - 25 10)	4	brush
<i>VIAPAL 936 BE</i>	VIAPAL 935 BE formulated for spraying. The gelcoat is also available colored: VIAPAL 936 BE/9127 (black).	51.5 - 55.5	16 - 23 10)	4	spray

* 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

Flame Retardant Gelcoat

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
VIAPAL® VUP 4742 B/9018	Highly thixotropic, Co-pre-accelerated UP-resin based on isophthalic acid; spray grade; halogen and antimony trioxide-free; for moulded parts with fire retardant properties; only in combination with the fire retardant VIAPAL laminating resins. Moulded parts based on VUP 4742 B/9018 and VIAPAL VUP 4786 BT/81-30 correspond to French standard NF P 92-501 classification M2.	61 – 65	7 – 17 10)	2.7	spray

Topcoat

Product	Characteristics	Non-volatile content	Gel Time (min)	Elongation at break of pure resin (%)	Application
VIAPAL 960 BE	Highly thixotropic, Co-pre-accelerated UP-resin based on isophthalic acid/neopentyl glycol; for tack-free curing topcoats with high chemical resistance.	61.5 – 65.5	12 – 18 10)	4.2	brush



Base Resins

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
<i>VIAPAL® UP 001/67</i>	O-phthalic acid resin, moulded parts correspond to type 1110 in accordance with DIN 16946, part 2.	medium	850 – 1150 3)	15 – 25 12)	2	90
<i>VIAPAL UP 004/64</i>	O-phthalic acid resin, enhanced dimensional stability at elevated temperature, moulded parts correspond to type 1130 in accordance with DIN 16946, part 2.	high	700 – 900 3)	19 – 35 12)	2	125
<i>VIAPAL UP 303/65</i>	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.	high	800 – 1000 3)	20 – 30 12)	2	130
<i>VIAPAL UP 320/70</i>	UP resin based on orthophthalic acid, low styrene content, very good mechanical properties.	high	1750 – 2350 3)	20 – 30 12)	1.2	135
<i>VIAPAL VUP 4739/65</i>	Isophthalic acid resin, for the manufacture of GR-UP moulded articles, also suitable for formulation of Gelcoats.	medium	980 – 1200 1)	8 – 16 18)	2.4	76
<i>VIAPAL VUP 4714/60</i>	Isophthalic acid/neopentyl glycol resin, very good penetration curing, high deformation resistance in heat, high chemical suitability, good hot water resistance.	medium	600 – 800 1)	5 – 11 18)	3.7	129
<i>VIAPAL VUP 4792 E/66</i>	Isophthalic acid/neopentyl glycol resin, high chemical suitability; fullfills specification of German Lloyd and Lloyds register of shipping.	medium	1080 – 1320 1)	4 – 10 18)	4.2	99
<i>VIAPAL UP 745/56</i>	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.	medium	550 – 750 3)	20 – 30 12)	2	146
<i>VIAPAL UP 495/48</i>	Bisphenol A/fumaric acid resin, high deformation resistance in heat, high chemical suitability, particularly high hydrolysis and alkali resistance; for the construction of chemical facilities and non-corrodible components; moulded parts correspond to type 1140, DIN 16946, part 2.	high	300 – 510 1)	5 – 15 22)	2	140
<i>VIAPAL UP 797/59</i>	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.	medium	350 – 450 3)	9 – 15 18)	2	133
<i>VIAPAL VUP 4652/67</i>	Low viscosity vinyl ester resin on epoxy-novolak 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.	high	240 – 410 1)	13 – 27 24)	3	146

Special Resin Types

Resin for Hand Lay up and Spray-up Technique

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
VIAPAL® VUP 4627 BEMT/56	O-phthalic acid resin, pre-accelerated, thixotropic. Moderate low tension curing even in thick layers. The resin has very good mechanical properties in a hardened state. It can be used universally and is used preferably for car bodies, boats and moulded parts especially if increased impact resistance is required. Certificate of Lloyd's Register of Shipping is available. It contains peroxide indicator.	medium	thix.	11 – 21 10)	2.3	86

Laminating Resins for Barrier Coat

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
VIAPAL VUP 4774 BET/57	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.	high	thix.	17 – 27 10)	4	94
VIAPAL VUP 4714 BET/52	Isophthalic acid/neopentyl glycol resin, pre-accelerated, thixotropic, contains peroxide indicator; increased elongation at break, impact resistance and high HDT.	high	thix.	17 – 28 10)	2	129
VIAPAL UP 4838 BT/63	Vinyl ester resin, based on Bisphenol A; pre-accelerated, thixotropic, supports excellent osmosis resistance as buffer layer resin.	high	200 – 280 3)	30 – 40 8)	3.5	HDT: 97

Foam Resins

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
VIAPAL VUP 4688 BT/66	O-phthalic acid resin, pre-accelerated, together with Luperfoam™ 329 (Arkema) for moulded parts in the foam resin process for longer process times, preferably for thick-walled moulded parts.	high	900 - 1350	approx. 5 min	-	102 (base resin)
VIAPAL UP 4836 BT/66	O-phthalic acid resin, pre-accelerated, together with Luperfoam™ 329 (Arkema) for moulded parts in the foam resin process with short cycle times.	high	1200 – 1500 1)	12 – 16 min	-	102 (base resin)

Hybrid Resins

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
VIAPAL® VUP 4805 B/64-15	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.	high	95 - 130 2)	15 32)	3.4	121
VIAPAL UP 4844 B/61	Polyester/polyurethane hybrid resin on neopentyl glycol base, pre-accelerated. Always processed together with a suitable di-Isocyanate. Very fast curing, surface cures tack free. Impregnates reinforcing materials very fast and can be loaded with a high proportion of mineral filler for the production of low shrink moulded parts.	high	160 3)	60 32)	5.1	HDT: 76

Cast Resin, Pure Resin

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
VIAPAL UP 223 BS/65	O-phthalic acid resin, specially pre-accelerated light stabilized; cast resin for the production of crystal clear components.	medium	600 - 800 3)	25 - 35 6)	2.5	80

Putty Resins for the Stone Industry

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
VIAPAL UP 455 B/65	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.	high	700 - 920 1)	2 - 6 29)	1.9	102
VIAPAL VUP 4706 B/65	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.	high	690 - 920 1)	6 - 12 32)	1.9	102
VIAPAL VUP 4788 B/65	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.	high	740 - 850 1)	5 - 6 28)	2.0	102

Special Resin Types

Styrene-free Resin

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
<i>VIAPAL® VUP 4822</i>	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.	medium	2700 - 3700 1)	4 - 7 30)	0.8	-

Solid Surface Resins

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
<i>VIAPAL VUP 4714 BET/52</i>	Isophthalic acid/neopentyl glycol resin, pre-accelerated, thixotropic, contains peroxide indicator; increased elongation at break, impact resistance and high HDT.	medium	600 - 800 1)	5 - 11 18)	3.7	129
<i>VIAPAL UP 4777 B/63</i>	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).	high	800 - 1200	17 - 21 6)	2.6	91

Flexible Resins

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
<i>VIAPAL UP 130/65</i>	Isophthalic acid resin, high strain at break, high impact strength; for flexibilizing of rigid types of VIAPAL resin.	low	550 - 750 3)	10 - 16 12)	60	50
<i>VIAPAL UP 179 MT/57</i>	Low styrene emission, thixotropic; tack-free curing, tough elastic; in combination with polyester surface tissue for seamless linings (e.g. roof top coatings).	medium	thix.	25 - 35 32)	100	50

Paste Resin

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
<i>VIAPAL VUP 4787</i>	UP-resin, monomer-free, odourless; very good storage stability, can absorb a high level of pigment; for the production of color pastes.	-	550 - 850 1)	10 - 20 22)	-	-

Flame Retardant Resins

Product	Characteristics	Reactivity	Viscosity mPa.s	Gel Time (min)	Elongation at break (%)	Glass Transition Temperature (°C)
<i>VIAPAL® UP 797/59</i>	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.	medium	350 – 4500 3)	9 – 15 18)	2	133
<i>VIAPAL VUP 4786 BT/81-30</i>	Polyester/polyurethane hybrid resin, pre-accelerated. Always processed together with a suitable di-isocyanate. Thanks to a considerably low level of styrene emission, it has outstanding features of very fast curing, tack-free surface and low shrinkage, thus short production time compared to unsaturated polyester resins. Does not contain halogen or antimony trioxide. Used for the production of self-extinguishing components that correspond to German DIN 5510 T2 (classification S4-SR2-ST2). Moulded parts correspond to French standard NF P 92-501 (classification M2) and NF X 70-100 & NF X 70-702 (classification F1).	high	thix.	25 - 35 32)	0.4	127

Additives

Product	Characteristics
<i>ADDITOL™ VXT 6228</i>	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.
<i>ADDITOL VXL 5918</i>	10% inhibitor solution for prolonging the gel time of UP resin formulation.
<i>VIAPAL ZUP 4617/50</i>	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.
<i>Paraffin solution 24/3%</i>	3% solution of paraffin in aromatic mixture.

Color Pastes

VIAPAL® Color Pastes

Inorganic and/or organic pigments in a monomer-free UP-resin, excellent light and weather fastness.

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

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

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