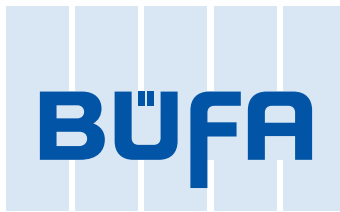


UNSATURATED POLYESTER RESINS





Unlimited. **DSM**



UNSATURATED POLYESTER RESINS

The most often used „representatives“ of the thermoset family are unsaturated polyester resins and vinyl ester resins. Due to their ease of use, very good physical properties, particularly in conjunction with fibre reinforcement, and their never ending possibilities for adapting to changing requirements, finished products made of these plastics make a contribution to our daily lives that we could no longer imagine being without.

Application examples such as buttons, sanitary articles, medical equipment, pipelines, caravans and large size moulded articles such as flue gas scrubbers used in power generating plants or rotor blades for wind power stations are witness to the diversity with which these materials are used.

A great number of other products are also found in application areas such as environmental engineering, vehicle, machine and apparatus construction, the building industry and sanitation market, electronics industry and power engineering, boat and aircraft construction as well as the sport and hobby market.

Whether for spray-up or fan jet processes, hand lay-up, RTM or vacuum processes, for casting or centrifugal casting, pultrusion, filament winding or press moulding, with our extensive range of products we are in a position to offer users a great number of reactive resins we have developed ourselves or have developed in cooperation with our partners.

HAND LAY-UP AND SPRAY-UP

UNSATURATED POLYESTER RESINS

Resin name	Synolite 0175-I-2	Synolite 1408-P-1	Synolite 1408-P-2	Synolite 8388-P-1	OLDOPAL- Lamina- ting resin base 0102	Palatal P 4 TV-28
Product No.	770-0175	770-1408	770-1482	770-8388	020-0102	020-5009
Resin base	DCPD	OP	OP	DCPD	OP	OP
Solid [%]	60	56	56	62	60	55
Viscosity [mPa.s]	315,20 s ⁻¹	215	215	355,20 s ⁻¹	500 s ⁻¹	335
El. at Break [%]	2.5	2,5	2.5	2.2	2	2
Tensile Str. [MPa]	60	70	70	70	70	70
HDT [°C]	95	72	72	85	63	63
LSE	No	Yes	Yes	Yes	No	No
Thix	Yes	Yes	Yes	Yes	Yes	Yes
Curing System	2 % BPO (82°C)	2 % Butanox M-50	2 % Butanox M-50	2 % Butanox M-50	2 % Butanox M-50	1 % Butanox M-50
Gel time [min]	7	25	12	24	30	32
Remarks	Fast fibre and filler wet out, non preaccelerated	Marine, improved general purpose, low exotherm, peroxide indicator, medium to long gel time, DNV approval, preaccelerated	Marine, improved general purpose, low exotherm, peroxide indicator, DNV approval, preaccelerated.	Fast fibre and filler wet out, peroxide indicator, DNV approval, preaccelerated	Boat construction, wets fibres quickly, low exothermic character, also for thick laminates, GL approval	Medium gel time, low exotherm in thick laminates, preaccelerated, Lloyd's approval

Resin name	Palatal U 541 T-01	Palatal U 541 TV-08	Palatal U 569 TV-01	Palatal U 570 TV-01	Palatal U 570 TV-04	OLDOPAL-UP-Resin P 69-TV
Product No.	020-5341	020-5418	020-0569	020-8905	020-0570	700-0069
Resin base	OP	OP	OP	OP	OP	OP
Solid [%]	55	56	58	56	53	57
Viscosity [mPa.s]	345	220	385	480	400	1000
El. at Break [%]	2	2	3.4	2.4	2.4	3,4
Tensile Str. [MPa]	70	70	75	80	80	75
HDT [°C]	63	62	90	90	90	90
LSE	Yes	Yes	Yes	Yes	Yes	No
Thix	Yes	Yes	Yes	Yes	Yes	Yes
Curing System	0.4 % 742-0062 1 % Butanox M-50	2 % Butanox M-50	1.5 % Butanox M-50	1.5 % Butanox M-50	1.5 % Butanox M-50	2 % Butanox M-50
Gel time [min]	29	21	25	23	25	18
Remarks	Marine, improved general purpose, low exotherm non preaccelerated	General purpose, low exotherm, medium to long gel time, preaccelerated, Lloyd's approval	Marine, preaccelerated, fast wet out, for thin laminates	Improved general purpose, very good mechanical properties, preaccelerated	Improved general purpose, very good mechanical properties, low exotherm, preaccelerated	For profiles, pipes and containers as well as boat building and vehicles, preaccelerated

Resin name	OLDOPAL-UP-Resin 8388 white	OLDOPAL-UP-Resin L 424-T	OLDOPAL-UP-Resin L 425-T	OLDOPAL-UP-Resin L 425-TV	OLDOPAL-VE-Lamina- ting resin base A 430	OLDOPAL-UP-Resin white ACR
Product No.	700-0127	700-0424	700-0425	700-0426	700-0463	700-0541
Resin base	DCPD	IP/NPG	IP	IP	BPA/VE	OP
Solid [%]	62	50	58	56	56	55
Viscosity [mPa.s]	355,20 u/min	1350	1500	1100	1500	220
El. at Break [%]	3	4,4	4,6	4,6	6,1	2
Tensile Str. [MPa]	66	85	90	90	95	70
HDT [°C]	70	107	93	93	105	63
LSE	Yes	No	No	No	No	Yes
Thix	Yes	Yes	Yes	Yes	Yes	Yes
Curing System	2 % Trigonox 44B	1 % 742-0062 2 % Trigonox 61	1 % 742-0062 2 % Butanox M-50	2 % Butanox M-50	0.5 % 742-0062 2 % Butanox LPT-IB 94	2 % Butanox M-50
Gel time [min]	18	13	62	25	14	22
Remarks	Marine, white, preaccelerated. ABS reinforcement	Marine, for high chemical and hydrolytic loads, non preaccelerated	Marine, containers, Pipes for elevated chemical and mechanical loads, tooling, non preaccelerated	Marine, containers, Pipes for elevated chemical and mechanical loads preaccelerated	For high chemical, mechanical and hydrolytic loads, for relining, containers and chemical industry, non preaccelerated	PMMA-reinforcement, white, preaccelerated

CASTING APPLICATIONS AND FILLED

Resin name	Synolite 0328-A-1	Synolite 0562-A-1	Synolite 0564-X-1
Product No.	770-0328	770-5621	770-0564
Resin base	OP	OP	OP/NPG
Solid [%]	64	66	65
Viscosity [mPa.s]	490	1300	1150
El. at Break [%]	1,6	1.9	2.5
Tensile Str. [MPa]	56	67	80
HDT [°C]	55	67	70
LSE	No	No	No
Thix	No	No	No
Curing System	1 % Butanox M-50	2 % Butanox M-50	1 % Butanox M-50
Gel time [min]	21	10	12
Remarks	Very low colour clear casting resin, low reactive, pre-accelerated, can also be used as an embedding resin	Artificial marble and onyx, very low colour, special preacceleration	Solid surface, very low colour, special preacceleration, contains acrylic

Resin name	Palatal P 61-02	Palatal P 4-01	Palatal P 5-01
Product No.	020-5755	020-0004	020-0005
Resin base	OP	OP	OP
Solid [%]	60	63	64
Viscosity [mPa.s]	350	580	750
El. at Break [%]	2	2	2.2
Tensile Str. [MPa]	65	70	70
HDT [°C]	85	63	64
LSE	No	No	No
Thix	No	No	No
Curing System	0,5 % 742-0062 +1 % Butanox M-50	0,4 % 742-0062 1 % Trigonox 44B	0,4 % 742-0062 1 % Trigonox 44B
Gel time [min]	22	20	20
Remarks	Polymer concrete, low viscous, high reactive, non preaccelerated	General purpose; also for polymer concrete and synthetic marble, non preaccelerated, Lloyd's approval	General purpose, for GRP-mouldings with good mechanical properties, non preaccelerated

Resin name	OLDOPAL- UP-Resin 105	OLDOPAL- UP-Casting compound V	OLDOPAL P 50-01
Product No.	700-0105	700-0259	710-5001
Resin base	OP	Flexible UP	OP
Solid [%]	63	79	58
Viscosity [mPa.s]	850	19.000	330
El. at Break [%]	2	not specified	2.3
Tensile Str. [MPa]	70	not specified	75
HDT [°C]	63	not specified	63
LSE	No	No	No
Thix	No	No	No
Curing System	0,5 % 742-0064 2 % Trigonox 61	2 % Butanox M-50	0,4 % 742-0062 1 % Trigonox 44B
Gel time [min]	8	8	17
Remarks	Polymer concrete, non preaccelerated	General purpose casting compound, preaccelerated	For Resin injection, polymer concrete, synthetic marble, non preaccelerated

RTM/RESIN INFUSION/VACUUM INJECTION

Resin name	Synolite 1967 series	Palatal P 80-02	OLDOPAL P 80-21	Atlac 580	Daron XP 45-A-2	OLDOPAL- Injection Resin V
Product No.	770-1967	020-0080	710-0423	780-0580	780-4502	700-5000
Resin base	DCPD	OP	OP	BPA VEU	VEU Hybrid	OP
Solid [%]	63	63	55	53	69	75
Viscosity [mPa.s]	170	345	160	450	200	1000
El. at Break [%]	2.2	4.2	4.2	4.2	2.5	3
Tensile Str. [MPa]	70	80	80	83	70	60
HDT [°C]	85	108	108	115	220	100
Remarks	Fast wet out, improved surface quality, DNV approval for light craft boat, non preaccelerated	High reactive resin, non preaccelerated	High reactive, low viscous resin, non preaccelerated	High temperature and chemical resistance, non preaccelerated	Very high temperature and chemical resistance, very good compatibility with glass and carbon fibres, non preaccelerated	Complete system

APPLICATIONS WITH CHEMICAL RESISTANCE

Resin name	Palatal A 410-01	OLDOPAL-UP-Resin L 424-T	OLDOPAL-UP-Resin Base A 430-01/T	OLDOPAL-VE-Resin TV	Atlac 430	Atlac 580 ACT
Product No.	020-0410	700-0424	700-0052	700-0597	020-0430	780-5800
Resin base	IP/NPG	IP/NPG	BPA/VE	EN/VE	BPA/VE	BPA/VEU
Solid [%]	57	50	58-60	60-62	62	51
Viscosity [mPa.s]	1200	1350	1600	900	470	550 (20 s ⁻¹)
El. at Break [%]	4,4	4,4	6,1	3-4	6.1	4.2
Tensile Str. [MPa]	85	85	95	90	95	83
HDT [°C]	107	107	105	140	105	115
Remarks	High chemical resistance, tanks, pipes, adhesion on hard PVC, non preaccelerated	Marine for high chemical and hydrolytic loads, thixotropic, non preaccelerated	For high chemical, mechanical and hydrolytic loads, for relining, containers and chemical industry, thixotropic, non preaccelerated	High resistance to temperature and chemicals, not pre-accelerated	High temperature and chemical resistance, non preaccelerated	High temperature and chemical resistance, preaccelerated, thixotropic

Resin name	Atlac 590	Atlac E-nova FW 1045	Atlac E-nova FW 2045	Atlac E-nova MA 6325		
Product No.	780-0590	780-1045	780-2719	780-6325		
Resin base	EN/VE	BPA/VEU	BPA/VEU	BPA/VEU		
Solid [%]	64	60	60	66		
Viscosity [mPa.s]	250	400	425	1500		
El. at Break [%]	3-4	5-6	3,5	2-3		
Tensile Str. [MPa]	90	85	90	70		
HDT [°C]	140	125	145	110		
Remarks	High temperature and chemical resistance, non preaccelerated	High temperature and chemical resistance, non preaccelerated	High temperature and chemical resistance, non preaccelerated	Marine, swimming pool. For high chemical and hydrolytic loads, thixotropic, preaccelerated		

CONTINUOUS LAMINATION / SHEETING

Resin name	Synolite 6811-N-1	Palatal P 69-02	Palatal P 61-01	OLDOPAL P 4 L-21	
Product No.	770-6811	020-0069	020-5018	710-0421	
Resin base	DCPD	OP	OP	OP	
Solid [%]	63	66	64	63	
Viscosity [mPa.s]	150	700	800	560	
El. at Break [%]	not specified	3,4	2,4	2	
Tensile Str. [MPa]	60	75	85	70	
HDT [°C]	79	90	90	62	
Remarks	General purpose, low viscosity, light stabilized. High light transmission in cured laminates, non preaccelerated	High reactive, DIN 1140 type, non preaccelerated	High reactive, medium viscous, non preaccelerated	General purpose, continuous sheets, non preaccelerated, light stabilised	

PRESS MOULDING

Resin name	Palatal P 4-01	Palatal P 5-01	Palatal P 61-01	Palatal P 61-02	Atlac 590
Product No.	020-0004	020-0005	020-5018	020-5755	780-0590
Resin base	OP	OP	OP	OP	ENV/E
Solid [%]	63	64	64	60	64
Viscosity [mPa.s]	580	750	800	350	245
El. at Break [%]	2	2,2	2,4	2,8	3-4
Tensile Str. [MPa]	70	70	85	85	90
HDT [°C]	63	64	90	90	140
Remarks	General purpose, non preaccelerated, Lloyd's approval	General purpose, for GRP-mouldings with good mechanical properties, non preaccelerated	High reactive, medium viscous, DIN 1140 type, non preaccelerated	Polymer concrete, low viscous, high reactive, non preaccelerated	Chemical resistance and high temperature, non preaccelerated

FURTHER SPECIAL APPLICATIONS

Resin name	Synolite 2710-U-2	Palatal P 51-01	Palatal E 240-02	Palatal K 775 V-2	Palatal P 92 I-04
Product No.	770-2710	020-0051	020-2402	020-0775	710-0092
Resin base	THP	THP	THP	BPA/VE	IP/NPG
Solid [%]	67-71	64-67	60-63	61	54
Viscosity [mPa.s]	350-550	900-1100	300-370	450	700
El. at Break [%]	56	7	75	6.1	5,6
Tensile Str. [MPa]	9	75	19	95	85
HDT [°C]	not specified	84	not specified	105	107
Remarks	Flex resin, excellent adhesion properties, good sandability, amine preaccelerated, for fillers	Non preaccelerated blending resin, with very good surface cure, BPO carrier in 2-component systems, for fillers	Non preaccelerated flexible resin for spray putties with Co-CHP cure system, for fillers	Dowel resin with high chemical resistance, preaccelerated	Light cure, improved chemical resistance, thickenable, preaccelerated

FURTHER SPECIAL APPLICATIONS

Resin name	Palatal P 97 IL-01	OLDOPAL UP-Resin A 410-I			
Product No.	020-9701	700-0410			
Resin base	OP	IP/NPG			
Solid [%]	63	52			
Viscosity [mPa.s]	500	850			
El. at Break [%]	2	4,4			
Tensile Str. [MPa]	70	85			
HDT [°C]	63	107			
Remarks	General purpose, continous sheets, UV-curing, preaccelerated	Chemical resistance UV-curing			

FILAMENT WINDING

Resin name	Palatal A 400-01	Palatal A 410-01	Palatal P 4-01	Palatal P 69-02	Atlac 382 (A)	Atlac 382 powder/flakes	Atlac 4010 (A)
Product No.	020-5507	020-0410	020-0004	020-0069	780-0382	780-3821	780-4010
Resin base	IP	IP/NPG	OP	OP	BPA	BPA	BPA
Solid [%]	65	57	63	66	50	100	50
Viscosity [mPa.s]	1000	1200	580	700	610	solid	410
El. at Break [%]	4.6	4.4	2	3.4	2.1	not specified	4.2
Tensile Str. [MPa]	90	85	70	75	62	62	61
HDT [°C]	93	107	63	90	120	120	90
Remarks	Tanks and containers, high reactive, DIN 1140 type, non preaccelerated, Lloyd's approval	Chemical resistance, adhesion on hard PVC, DIN 1140 type, non preaccelerated	Low reactive, DIN 1120 type, non preaccelerated, Lloyd's approval	High reactive, DIN 1140 type, non preaccelerated	Chemical resistance (amine preaccelerated)	Chemical resistance, solid version to be dissolved by users; exceptional shelf life	Chemical resistance (amine preaccelerated)

Resin name	Atlac 430	Atlac 490-05C	Atlac 580	Atlac 590	Atlac-E-nova FW 1045	Atlac E-nova FW 2045	
Product No.	020-0430	780-0490	780-0580	780-0590	780-1045	780-2719	
Resin base	BPA-VE	TP	BPA-VEU	VE-EN	BPA-VEU	BPA-VEU	
Solid [%]	62	54	53	64	60	60	
Viscosity [mPa.s]	470	500	450	250	400	425	
El. at Break [%]	6.1	2.1	4.2	3-4	5-6	3.5	
Tensile Str. [MPa]	95	60	83	90	85	90	
HDT [°C]	105	125	115	140	125	145	
Remarks	Chemical resistance and high temperature, non preaccelerated, Lloyd's approval	Chemical resistance, gasoline storage, preaccelerated	Chemical resistance and high temperature, non preaccelerated, Lloyd's approval	Chemical resistance and high temperature, non preaccelerated	Chemical resistance and high temperature, non preaccelerated	Chemical resistance and high temperature, non preaccelerated	

PULTRUSION

Resin name	Synolite 0175-N-1	Palatal P 6-01	Palatal P 69-02	Palatal P 51-01	Palatal A 400-01
Product No.	770-1751	020-0006	020-0069	020-0051	020-5507
Resin base	DCPD	OP	OP	THP	IP
Solid [%]	60	65	66	65	65
Viscosity [mPa.s]	380,100 s ⁻¹	1050	700	1000	1000
El. at Break [%]	2.5	2.8	3.4	7	4,6
Tensile Str. [MPa]	60	90	75	75	90
HDT [°C]	95	104	90	84	93
Remarks	High reactive, outstanding filling and pigmentation, improved surface quality, non preaccelerated	High reactive resin, DIN 1140, non preaccelerated	High reactive resin, DIN 1140, non preaccelerated	Very good surface cure, non preaccelerated	High reactive resin, DIN 1140, non preaccelerated, Lloyd's approval

Resin name	OLDOPAL P 58-01	Palapreg P 0423-02	Palapreg H 1080-01	Daron XP 45-A-2	Palapreg P 17-02
Product No.	710-0058	770-0423	770-1080	780-4502	020-0017
Resin base	OP/THP	MA	Thermo plastic	VEU hybrid	OP
Solid [%]	66	65	39	69	65
Viscosity [mPa.s]	1000	1300	4500	200	1400
El. at Break [%]	5	1.7	not specified	2.5	1.7
Tensile Str. [MPa]	85	55	not specified	70	60
HDT [°C]	107	145	not specified	220	140
Remarks	Containers, Pipes, Profiles and Press moulding, non preaccelerated	High reactive resin for high surface quality applications with low profile additive (class A), non preaccelerated	„Low Profile“ additive for SMC, preaccelerated	Very high temperature and chemical resistance, very good compatibility with glass and carbon fibres, non preaccelerated	Highly resistant to temperature, highly reactive resin for good surface quality with an LS or LP additive

LOW STYRENE CONTENT

Resin name	Synolite 5540-X-1				
Product No.	770-5540				
Resin base	INSERT				
Styrene Content [%]	27-28,5				
Solid [%]	71,5-73				
Viscosity [mPa.s]	360-525				
El. at Break [%]	2.5				
Tensile Str. [MPa]	71				
HDT [°C]	90				
Remarks	General Purpose resin. High solid (70 %), reduced styrene emission in dynamic phase of spray up reduced to up to 35 %. Complies to DIN 16946/2 Type 1140, non preaccelerated				

Abbreviations Base resins

BPA	=	Bisphenol A	AA	=	Adipic Acid
VE	=	Vinyl ester	THP	=	Tetrahydrophthalic Acid
VEU	=	Vinyl ester Urethane	DCPD	=	Dicyclo Pentadiene
EN	=	Epoxy Novolac	LSE	=	Low Styrene Emission
OP	=	Orthophthalic	TP	=	Terephthalic
IP	=	Isophthalic	PG	=	Propylene Glycol
NPG	=	Neopentyl Glycol			
MA	=	Maleic acid			