



# **POLLIMAL<sup>®</sup>**

Unsaturated Polyester Resins



CIECH Resins is a part of CIECH Group, and has been manufacturing resins and crop protection products for over 80 years. Now the company is one of the leaders of the Polish chemical market and an important international player, known for its flagship products POLIMAL® and EPIDIAN®.

Plastics portfolio of CIECH Resins includes epoxy resins, saturated and unsaturated polyester resins, gelcoats, topcoats, phenol-formaldehyde resins, and hardeners.

The broad range of POLIMAL® products includes:

- casting resins for sanitary industry;
- resins for lamination;
- flame retardant resins for railway and automotive sector;
- resins for production of polymer concrete and other mineral casts;
- innovative solutions for infusion and pultrusion;
- resins for production of putties and chemical anchoring;
- resins for gelcoats;
- elastifying resins.

Additionally, CIECH Resins portfolio includes various specialty gelcoats, among others for sanitary, automotive, and marine industries recommended for use with POLIMAL® resins.



## Legend



Construction



Marine



Sanitary



Automotive



Specialty Resins

### Research Method

- 1 – Brookfield, sp.21; rpm.50
- 2 – Brookfield, sp.21; rpm.100
- 3 – Physica, sp.Z-2; rpm.20
- 4 – Brookfield, sp.21; rpm.10
- 5 – Brookfield, sp.21; rpm.20
- 6 – Höppler, 25 °C
- 7 – Brookfield, sp.21; rpm.1

n.m. – not marked

### Symbols / Resins

	Numeric Designations		Letter Designations
10...	orthophthalic	A	low styrene emission (LSE)
106...	orthophthalic neopentyl	B	contains amine accelerator
105...	DCPD modified	L	contains optical whitener
12...	isophthalic, isophthalic neopentyl	S	contains fillers
14...	terephthalic	P/Py	accelerated
15...	elastic	R	with promoter
16...	non-flammable	T	thixotropic
18...	orthophthalic, haberdashery	W	colour curing indicator
19...	THPA based	U	increased UV resistance
		VE	vinylester

### Symbols / Hardeners







Symbol	Cobalt Accelerator 1%	DMA accelerator	Hardener	Resin Type
A	0,4	–	2,0 Luperox® K-1 S	Neutral
A1	1,5	–	2,0 Luperox® K-1 S	Neutral
C	–	–	2,0 Luperox® K-1 S	Accelerated
VE	0,6	1,2	2,0 Luperox® K-1 S	Vinylester
R	–	–	2,0 Luperox® ANS 50 G	Amine
N	1	–	1,1 Luperox® K-1 S	Neutral
S-1	1	–	2,0 Luperox® K-12 G	Vinylester
PTV	–	–	1,0 Luperox® K-1 S	Accelerated
B	1	–	2,0 Luperox® K-1 S	Neutral
1	–	–	3,0 Luperox® ANS 50 G	Amine

**Low Styrene Emission (LSE) Resins for Hand Lay-Up and Spray-Up Application**

Widely used in production of kayaks, boats, tanks, lids, swimming pools, and other goods exposed to constant contact with water.

Suitable for both hand lay-up and spray-up application. Manual method allows for production of various shapes without size restrictions. Spray-up application enables mass production.





We also recommend gelcoat NG Hydro in various shades of white, black (RAL 9005), navy blue (RAL 5004), and grey (RAL 7021).

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 104 AWTP</b> <b>POLIMAL® 104 AWTP-2</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>thixotropic</li> <li>certified for contact with drinking water</li> </ul>	<ul style="list-style-type: none"> <li>production of up to 5 mm thick polyester glass laminates</li> </ul>	ortho	C	250–350 <sup>2</sup>	10–20	120	80	3600	3	90
		<ul style="list-style-type: none"> <li>production of over 5 mm thick polyester glass laminates</li> </ul>				27–35					
 <b>POLIMAL® 1059 AWTP-1</b> <b>POLIMAL® 1059 AWTP-2</b> <b>POLIMAL® 1059 AWTP-3</b>	<ul style="list-style-type: none"> <li>medium elasticity</li> <li>thixotropic</li> <li>Lloyd's Register Certificate</li> <li>low styrene content</li> </ul>	<ul style="list-style-type: none"> <li>production of up to 5 mm thick polyester glass laminates</li> </ul>	dcpd	C	230–290 <sup>2</sup>	22–26	120	70	3700	2	85
		<ul style="list-style-type: none"> <li>production of over 5 mm thick polyester glass laminates</li> </ul>				32–36 40–50					
 <b>POLIMAL® 1094 AWTP-1</b> <b>POLIMAL® 1094 AWTP-2</b> <b>POLIMAL® 1094 AWTP-3</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>thixotropic</li> <li>Lloyd's Register Certificate</li> </ul>	<ul style="list-style-type: none"> <li>production of up to 5 mm thick polyester glass laminates</li> </ul>	ortho	PTV	300–450 <sup>3</sup>	19–26	110	70	4300	2	63
		<ul style="list-style-type: none"> <li>production of over 5 mm thick polyester glass laminates</li> </ul>				25–33 35–45					
 <b>POLIMAL® 122-2 AWTP</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>accelerated</li> <li>increased thermal resistance</li> <li>Lloyd's Register Certificate</li> </ul>	<ul style="list-style-type: none"> <li>production of laminates with increased resistance parameters</li> </ul>	iso	C	240–350 <sup>2</sup>	15–25	120	80	3800	3	90
 <b>POLIMAL® 123 AWTP</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>accelerated</li> <li>elastic</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates</li> </ul>	iso	C	270–340 <sup>2</sup>	15–20	120	70	3300	3	70
 <b>POLIMAL® 143 AWTP-1</b> <b>POLIMAL® 143 AWTP-2</b> <b>POLIMAL® 143 AWTP-3</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>accelerated</li> </ul>	<ul style="list-style-type: none"> <li>production of up to 5 mm thick polyester glass laminates</li> </ul>	tere	1 – C	200–350 <sup>2</sup>	10–20	100	60	3200	2	65
		<ul style="list-style-type: none"> <li>production of over 5 mm thick polyester glass laminates</li> </ul>		2,3 – PTV		20–30 35–45					

<sup>2</sup> Brookfield, sp.21; rpm.100 <sup>3</sup> Physica, sp.Z-2; rpm.20

## Resins for ABS/PMMA Laminates

A range of modified resins created for the sanitary industry. Characterized by great adhesion to ABS/PMMA boards and the possibility of adding over 50% of mineral fillers.





Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 109 AWTP</b>	<ul style="list-style-type: none"> <li>• PMMA</li> <li>• accelerated</li> <li>• thixotropic</li> <li>• low viscosity</li> </ul>	<ul style="list-style-type: none"> <li>• production of polyester glass laminates</li> </ul>	ortho	C	150–200 <sup>2</sup>	6–15	110	70	4300	2	63
 <b>POLIMAL® 109 AWTP S-2</b>	<ul style="list-style-type: none"> <li>• PMMA</li> <li>• accelerated</li> <li>• thixotropic</li> <li>• contains fillers</li> </ul>	<ul style="list-style-type: none"> <li>• production of polyester glass laminates</li> </ul>	ortho	C	300–400 <sup>2</sup>	7–10	110	70	4300	2	63
 <b>POLIMAL® 1090 AWTP</b>	<ul style="list-style-type: none"> <li>• ABS</li> <li>• accelerated</li> <li>• thixotropic</li> <li>• low viscosity</li> </ul>	<ul style="list-style-type: none"> <li>• production of polyester glass laminates</li> </ul>	ortho	C	150–200 <sup>2</sup>	6–15	110	70	4300	2	63
 <b>POLIMAL® 1091 P</b>	<ul style="list-style-type: none"> <li>• PMMA</li> <li>• low viscosity</li> <li>• short gel time</li> </ul>	<ul style="list-style-type: none"> <li>• production of compositions reinforced with glass fiber or mineral fillers</li> </ul>	ortho	C	130–160 <sup>2</sup>	3–8	110	70	4300	2	63
<b>POLIMAL® 1091 PS</b>		<ul style="list-style-type: none"> <li>• whitened version</li> </ul>									

<sup>2</sup> Brookfield, sp.21; rpm.100

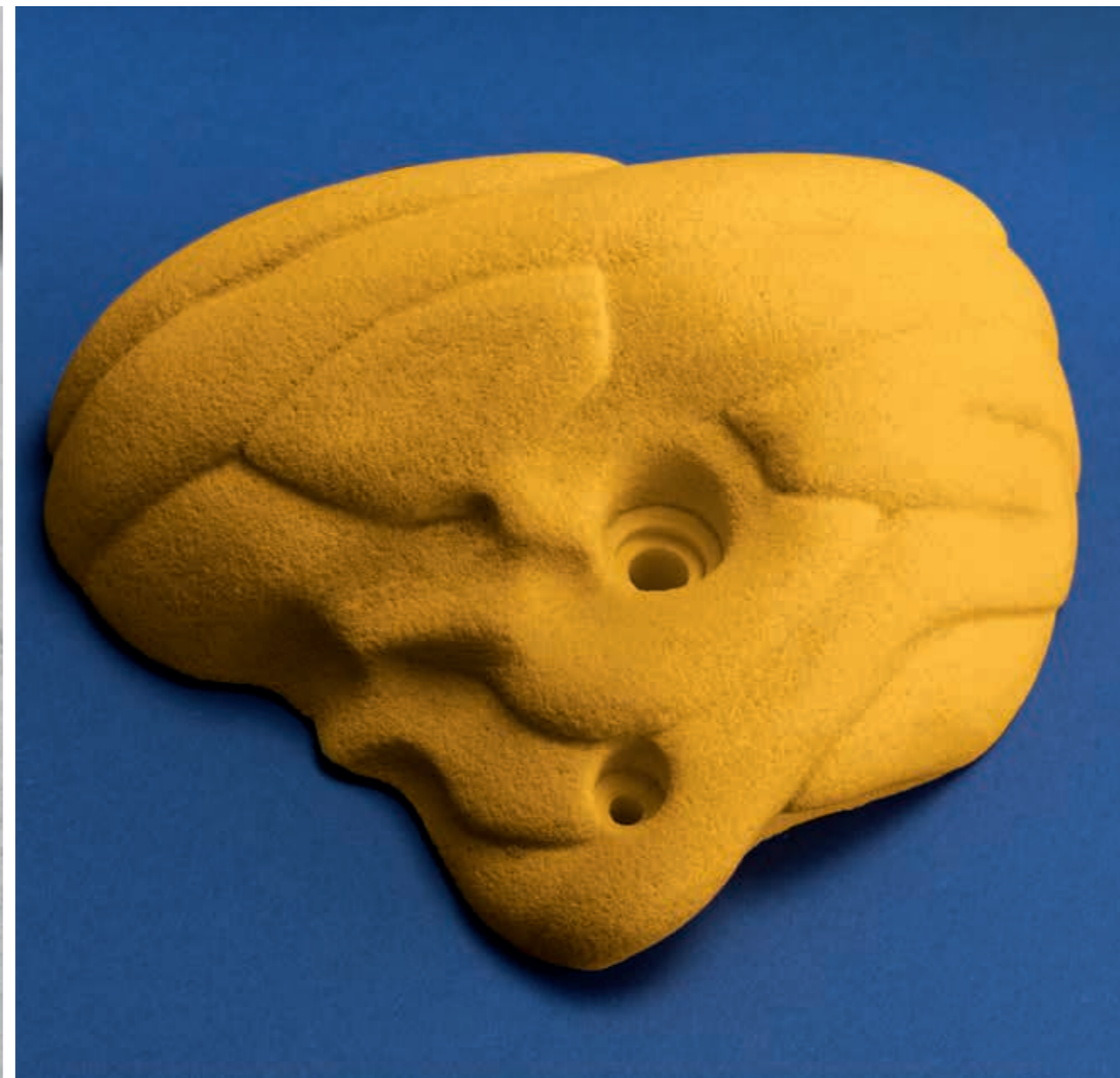
## Casting Resins for Sanitary Ware

Products characterized primarily by good resistance to thermal shocks, low shrinkage, and the possibility of adding mineral fillers. Used in production of bathtubs, washbasins, and shower trays.

These work perfectly with SaniGel – our signature sanitary gelcoat available in various shades of white.





Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 1051 P</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>low viscosity</li> </ul>	<ul style="list-style-type: none"> <li>production of mineral casts</li> </ul>	dcpd	PTV	150–200 <sup>2</sup>	8–10	90	60	3500	1,5	90
		<ul style="list-style-type: none"> <li>increased gel time</li> <li>recommended to use with SaniGel sanitary gelcoat</li> </ul>									
 <b>POLIMAL® SAN 1051 P-2</b>											
 <b>POLIMAL® 1057 P-2</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>low viscosity</li> <li>medium elasticity</li> </ul>	<ul style="list-style-type: none"> <li>production of mineral casts</li> <li>recommended to use with SaniGel sanitary gelcoat</li> </ul>	dcpd	C	150–220 <sup>2</sup>	21–23	90	60	3700	2	70
 <b>POLIMAL® 109-06 P</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>medium reactivity</li> </ul>	<ul style="list-style-type: none"> <li>production of mineral casts</li> </ul>	ortho	C	200–300 <sup>2</sup>	10–18	100	70	4000	2	65

<sup>2</sup> Brookfield, sp.21; rpm.100



### Casting Resins for Solid Surface Applications

These resins offer excellent resistance to aging factors. Characterized by hardness, high resistance to thermal shocks, and UV radiation. Used in production of sinks and washbasins.








Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 125 MP</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>contains methyl methacrylate</li> </ul>	<ul style="list-style-type: none"> <li>production of solid surface goods</li> </ul>	iso/NPG	C	500–600 <sup>1</sup>	10–20	120	70	3600	2,5	85
 <b>POLIMAL® 125 MTP</b> <b>POLIMAL® 125 MTP-0</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>accelerated</li> <li>contains methyl methacrylate</li> </ul>	<ul style="list-style-type: none"> <li>production of solid surface goods</li> <li>decreased gel time</li> </ul>	iso/NPG	–	750–950 <sup>1</sup>	13–18	120	70	3600	2,5	85
 <b>POLIMAL® 127</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>increased UV resistance</li> </ul>	<ul style="list-style-type: none"> <li>production of solid surface goods</li> </ul>	iso/NPG	B	450–650 <sup>4</sup>	8–16	120	70	3600	2,5	85
 <b>POLIMAL® 1061 P</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>high viscosity</li> </ul>	<ul style="list-style-type: none"> <li>production of solid surface goods and artificial marble</li> </ul>	ortho/NPG	C	720–850 <sup>1</sup>	14–16	110	60	3900	2	75

<sup>1</sup> Brookfield, sp.21; rpm.50    <sup>4</sup> Brookfield, sp.21; rpm.10



## Resins for Mineral Casts and Polymer Concrete







Highly reactive resins designed for production of polymer concrete, pipes, bridge cornices, and linear drainage systems. Characterized by good mechanical parameters including compressive strength. These resins can absorb large amounts of mineral fillers, allow for good deaeration and post-curing.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 109-32 K</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• low viscosity</li> </ul>	• production of mineral casts and polymer concrete	ortho	A	230–290 <sup>2</sup>	13–20	100	50	3900	2,5	60
<b>POLIMAL® 109-32 R</b>		• version with promoter									
 <b>POLIMAL® 109-32 PyK</b>	<ul style="list-style-type: none"> <li>• accelerated</li> <li>• low viscosity</li> </ul>	• production of mineral casts and polymer concrete	ortho	C	200–300 <sup>2</sup>	7–15	100	50	3900	2,5	60
 <b>POLIMAL® 143 RP</b>	<ul style="list-style-type: none"> <li>• accelerated</li> <li>• low viscosity</li> <li>• reactive</li> </ul>	• production of mineral casts, polymer concrete, and artificial marble	tere	C	200–230 <sup>2</sup>	13–20	100	60	3200	2	65
 <b>POLIMAL® 144-01</b>	• neutral	• production of mineral casts, especially garden figures	tere	A	250–350 <sup>2</sup>	8–25	120	50	3500	3,5	65
 <b>POLIMAL® 106 R</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• reactive</li> <li>• low viscosity</li> </ul>	• production of polymer concrete	ortho	B	190–240 <sup>2</sup>	3–8	110	75	3700	3,5	85
 <b>POLIMAL® 145-1</b>	<ul style="list-style-type: none"> <li>• low viscosity</li> <li>• meets DIN 16946/2 type 1130 norm</li> </ul>	• production of polymer concrete	tere	A	250–350 <sup>2</sup>	5–12	110	60	3300	2	85
 <b>POLIMAL® 148 RP</b>	<ul style="list-style-type: none"> <li>• accelerated</li> <li>• low viscosity</li> <li>• medium elasticity</li> </ul>	• production of polymer concrete	tere	C	200–300 <sup>2</sup>	4–8	105	60	3500	2	60

<sup>2</sup> Brookfield, sp.21; rpm.100

## RTM/Infusion Resins





Resins designed to laminate elements in closed forms. Characterized by low viscosity, low polymerization peak, and perfect flow, due to which these resins perfectly moisten glass fiber.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 104 N-1 INF</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>increased thermal resistance</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates with infusion and RTM methods</li> </ul>	ortho	C	200–250 <sup>2</sup>	14–24	120	80	3700	3,5	100
 <b>POLIMAL® 1053 P INF</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>long gel time</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates in closed forms with infusion and RTM methods</li> </ul>	dcpd	C	160–180 <sup>2</sup>	40–50	110	60	3060	2,2	65
 <b>POLIMAL® 1058</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>medium reactivity</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates with infusion and RTM methods</li> </ul>	dcpd	A1	150–200 <sup>2</sup>	8–13	80	55	3600	1,5	70
 <b>POLIMAL® 1058 P-1</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>low viscosity</li> <li>medium elasticity</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates in closed forms with infusion and RTM methods</li> </ul>	dcpd	C	150–200 <sup>2</sup>	30–40	80	55	3600	1,5	70
 <b>POLIMAL® VE-11 M</b>	<ul style="list-style-type: none"> <li>meets DIN 53438 class K1 and F1 norm</li> <li>Lloyd's Register Certificate</li> <li>chemically resistant</li> </ul>	<ul style="list-style-type: none"> <li>production of chemically resistant polyester glass laminates</li> </ul>	VE	S-1	300–400 <sup>6</sup>	15–30	130	80	3600	3,5	90
 <b>POLIMAL® VE-3MM P INF</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>chemically resistant</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates with infusion and RTM methods</li> </ul>	VE	C	200–250 <sup>2</sup>	30–40	134	85,5	3720	6,1	105

<sup>2</sup> Brookfield, sp.21; rpm.100 <sup>6</sup> Höppler, 25°C


### Resins for Filament Winding and Centrifugal Casting

Resins with great mechanical parameters used mainly in production of pipes by filament winding or centrifugal casting. Hardened products are characterized by high resistance to static mechanical loads.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 104</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>certified for contact with drinking water</li> </ul>	<ul style="list-style-type: none"> <li>production of glass fiber reinforced goods</li> </ul>	ortho	N	300–400 <sup>2</sup>	14–24	120	80	3600	3	90
<b>POLIMAL® 104 T</b>		<ul style="list-style-type: none"> <li>thixotropic</li> </ul>									
 <b>POLIMAL® 104 N-1</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>certified for contact with drinking water</li> <li>meets DIN 16946 type 1140 norm</li> </ul>	<ul style="list-style-type: none"> <li>production of glass fiber reinforced goods and goods containing mineral fillers</li> </ul>	ortho	N	200–250 <sup>2</sup>	14–24	120	80	3600	3,5	100
 <b>POLIMAL® 1095 P-2</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>elastic</li> </ul>	<ul style="list-style-type: none"> <li>production of glass fiber reinforced goods</li> </ul>	ortho	PTV	300–400 <sup>1</sup>	40–50	135	70	3800	3	70
 <b>POLIMAL® 122-2 T</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>thixotropic</li> </ul>	<ul style="list-style-type: none"> <li>production of glass fiber reinforced goods</li> <li>recommended for filament winding</li> </ul>	iso	A	240–350 <sup>2</sup>	10–20	120	80	3700	3	90

### Resins for Relining

Resins designed for wetting of glass fiber and felt elements e.g. sleeves used in pipe repairs. Cured materials are characterized by very good chemical, thermal, and water resistance.






Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 129 T</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>neutral</li> </ul>	<ul style="list-style-type: none"> <li>renovation of pipes with relining method</li> </ul>	iso/NPG	B	3500–6000 <sup>7</sup>	10–20	140	80	3500	2	80

<sup>1</sup> Brookfield, sp.21; rpm.50 <sup>2</sup> Brookfield, sp.21; rpm.100 <sup>3</sup> Brookfield, sp.21; rpm.1



## Flame Retardant Resins





Designed for production of structural and decorative elements, casings, and covers, mainly in automotive industry. Together with non-flammable specialized gelcoats, these products meet international fire safety and electrical equipment norms.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 104 TS</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>halogenated</li> <li>contains fillers</li> </ul>	<ul style="list-style-type: none"> <li>production of fire resistant polyester glass laminates</li> <li>thixotropic</li> </ul>	f.r.	A	400–600 <sup>1</sup>	10–20	120	80	3600	2,3	95
 <b>POLIMAL® 1601 P</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>thixotropic</li> <li>laminate based on POLIMAL® 1601 P and Gelcoat 1600P meets EN 45545 norm: R1 product requirement, HL2 fire hazard level</li> </ul>	<ul style="list-style-type: none"> <li>production of fire resistant polyester glass laminates by hand lay-up or spray-up application method</li> <li>recommended to use with Gelcoat 1600 P</li> </ul>	f.r.	C	600–900 <sup>5</sup>	20–35	50	35	n.m.	0,7	90
 <b>POLIMAL® 1602 APyS</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>halogenated</li> <li>low styrene emission</li> </ul>	<ul style="list-style-type: none"> <li>production of fire resistant polyester glass laminates</li> </ul>	f.r.	C	220–280 <sup>2</sup>	10–20	70	40	3600	1,5	100
 <b>POLIMAL® 1604 TS</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>thixotropic</li> </ul>	<ul style="list-style-type: none"> <li>production of fire resistant polyester glass laminates</li> </ul>	f.r.	A	550–650 <sup>4</sup>	30–40	120	67	4100	2,3	94
 <b>POLIMAL® 1608 PS</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>halogen-free</li> <li>laminate based on POLIMAL® 1608 PS and Gelcoat 1608 P/P sp/FP meets DIN 5510 - S4/R2/ST2 and NF P 92-501-M2 norms</li> </ul>	<ul style="list-style-type: none"> <li>production of fire resistant polyester glass laminates</li> <li>recommended to use with Gelcoat 1608 P/P sp/FP</li> </ul>	f.r.	C	500–800 <sup>5</sup>	10–20	60	40	6000	0,8	100

<sup>1</sup> Brookfield, sp.21; rpm.50 <sup>2</sup> Brookfield, sp.21; rpm.100 <sup>4</sup> Brookfield, sp.21; rpm.10 <sup>5</sup> Brookfield, sp.21; rpm.20 n.m. – not marked

## Resins for Pultrusion

Low viscosity resins with excellent mechanical parameters. Characterized by very good glass fiber wetting. Due to their durability and flexibility these resins are recommended for production of FRP composite rods. Thermal cure only.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 1059-00</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>low styrene content</li> </ul>	<ul style="list-style-type: none"> <li>production of pultruded polyester glass composites</li> </ul>	dcpd	B	500–1000 <sup>5</sup>	10–20	100	70	3400	2,5	70
 <b>POLIMAL® 122-2</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>meets DIN 16946 type 1140 norm</li> </ul>	<ul style="list-style-type: none"> <li>production of pultruded polyester glass composites</li> </ul>	iso	B	400–500 <sup>1</sup>	10–20	120	80	3700	3	90
 <b>POLIMAL® 122-2 LP</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>contains an anti-shrink component</li> </ul>	<ul style="list-style-type: none"> <li>production of pultruded polyester glass composites</li> </ul>	iso	B	600–800 <sup>1</sup>	10–20	120	80	3700	3	90
 <b>POLIMAL® 2701</b>	<ul style="list-style-type: none"> <li>neutral</li> <li>reactive</li> <li>meets DIN16946 type 1130 norm</li> </ul>	<ul style="list-style-type: none"> <li>production of pultruded polyester glass composites, mineral profiles, pipes, tanks</li> </ul>	ortho	C*	900–1200 <sup>5</sup>	20–40	100	65	3660	1,4	110

\* – system with 2% of Luperox® K-3 <sup>1</sup> Brookfield, sp.21; rpm.50 <sup>5</sup> Brookfield, sp.21; rpm.20




## Gelcoat Resins

Designed for further production of gelcoats. Characterized by very good elasticity, high resistance to UV, and great impact strength.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 1076</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• medium reactivity</li> </ul>	<ul style="list-style-type: none"> <li>• production of gelcoats</li> </ul>	ortho	A	450–700 <sup>1</sup>	10–20	123	68	3400	3	75
 <b>POLIMAL® 122-1</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• elastic</li> <li>• increased thermal and water resistance</li> <li>• Lloyd's Register Certificate</li> </ul>	<ul style="list-style-type: none"> <li>• production of gelcoats, top-coats, and laminates</li> </ul>	iso	B	800–1100 <sup>5</sup>	10–20	130	75	3500	4,5	80
 <b>POLIMAL® 125</b>	<ul style="list-style-type: none"> <li>• medium elasticity</li> <li>• increased thermal and water resistance</li> <li>• Lloyd's Register Certificate</li> </ul>	<ul style="list-style-type: none"> <li>• production of gelcoats</li> </ul>	iso/NPG	A	600–1000 <sup>5</sup>	10–20	110	75	3600	3	85

## Elastifying Resins

Used as a component to improve elasticity of rather rigid composite materials, such as polymer concrete, putties, as well as laminates and forms.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 150</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• elastic</li> </ul>	<ul style="list-style-type: none"> <li>• improves elasticity of rigid resins</li> </ul>	ortho	A	300–400 <sup>6</sup>	30–40	n.m.	12	40	82	n.m.
 <b>POLIMAL® 153</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• elastic</li> <li>• medium reactivity</li> </ul>	<ul style="list-style-type: none"> <li>• improves elasticity of rigid resins</li> </ul>	adypin	B	300–350 <sup>1</sup>	17–25	n.m.	10	45	67	n.m.
 <b>POLIMAL® 193</b>	<ul style="list-style-type: none"> <li>• neutral</li> <li>• elastic</li> <li>• tetrahydrophthalic</li> </ul>	<ul style="list-style-type: none"> <li>• improves elasticity of rigid resins</li> </ul>	THPA	B	550–650 <sup>1</sup>	10–15	n.m.	20	n.m.	60	n.m.



<sup>1</sup> Brookfield, sp.21; rpm.50 <sup>5</sup> Brookfield, sp.21; rpm.20 <sup>6</sup> Höppler, 25°C n.m. – not marked






### Resins for Putties

Fast curing resins designed for excellent wetting of mineral fillers. Cured putties are durable and easy to process.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 101-37 B</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>medium elasticity</li> </ul>	<ul style="list-style-type: none"> <li>production of surface fillers and putties</li> </ul>	ortho	R	320–480 <sup>1</sup>	4–8	87	40	2500	10	45
 <b>POLIMAL® 1055-5B</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>elastic</li> </ul>	<ul style="list-style-type: none"> <li>production of surface fillers and putties</li> </ul>	dcpd	R	350–500 <sup>1</sup>	5–10	70	n.m.	n.m.	15	45

### Resins for Adhesive Cartridges




Resins designed for production of fast-setting adhesive cartridges for mining and construction industries. High stability in contact with accelerators and fillers ensures durability of the final product.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® 144-5B</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>medium elasticity</li> </ul>	<ul style="list-style-type: none"> <li>production of fast-setting adhesive cartridges</li> </ul>	tere	R	300–400 <sup>1</sup>	2,5–5	100	60	3500	2	75

<sup>1</sup> Brookfield, sp.21; rpm.50 n.m. – not marked



### Chemically Resistant Resins

Resins designed for production of elements requiring high corrosion and aging resistance. Laminates made of those resins protect the surface against a wide spectrum of aggressive media, weather conditions, temperature, and UV radiation. Recommended for production of cisterns, tanks, boats, and other goods exposed to constant contact with salt water.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® VE-2MM</b>	<ul style="list-style-type: none"> <li>epoxy based</li> <li>increased thermal resistance</li> <li>medium reactivity</li> </ul>	<ul style="list-style-type: none"> <li>production of chemically resistant compositions reinforced with glass fiber and/or mineral fillers</li> </ul>	VE	VE	300–400 <sup>2</sup>	15–35	130	75	3500	3,5	95
 <b>POLIMAL® VE-2MM T</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>epoxy based</li> <li>increased thermal resistance</li> </ul>	<ul style="list-style-type: none"> <li>production of chemically resistant compositions reinforced with glass fiber and/or mineral fillers</li> </ul>	VE	VE	700–1300 <sup>4</sup>	15–35	130	75	3500	3,5	95
 <b>POLIMAL® VE-2MM TP</b>	<ul style="list-style-type: none"> <li>thixotropic</li> <li>accelerated</li> <li>medium reactivity</li> </ul>	<ul style="list-style-type: none"> <li>production of chemically resistant compositions reinforced with glass fiber and/or mineral fillers</li> </ul>	VE	VE	250–350 <sup>2</sup>	20–30	130	75	3500	3,5	95

### Shrink-Free Tooling Resins

Resins designed for production of polyester glass molds, glass fiber reinforced laminates, and vinyl ester barrier layers. Characterized by high mechanical parameters, durability, good chemical and thermal resistance as well as low polymerization shrinkage.

Product	Properties	Applications	Type	Curing System	Viscosity [mPa·s]	Gel Time [mins]	Flexural Strength [MPa]	Tensile Strength [MPa]	Tensile Modulus [MPa]	Elongation at Break [%]	HDT [°C]
 <b>POLIMAL® T104 WTP LP</b> <b>POLIMAL® T104 WTP LP-1</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>thixotropic</li> <li>contains fillers</li> </ul>	<ul style="list-style-type: none"> <li>basic resin</li> <li>production of polyester glass laminates and forms</li> <li>minimal polymerization shrinkage (&gt;1%)</li> </ul>	ortho	C	750–1200 <sup>5</sup>	15–30	55	36	4500	52	85
 <b>POLIMAL® TVE-2 WTP</b>	<ul style="list-style-type: none"> <li>accelerated</li> <li>thixotropic</li> <li>does not contain fillers</li> </ul>	<ul style="list-style-type: none"> <li>production of polyester glass laminates and forms</li> <li>barrier layers</li> <li>shrink-free resin</li> </ul>	VE	C	500–600 <sup>1</sup>	15–40	135	80	3500	40	100

<sup>1</sup> Brookfield, sp.21; rpm.50 <sup>2</sup> Brookfield, sp.21; rpm.100 <sup>4</sup> Brookfield, sp.21; rpm.10 <sup>5</sup> Brookfield, sp.21; rpm.20