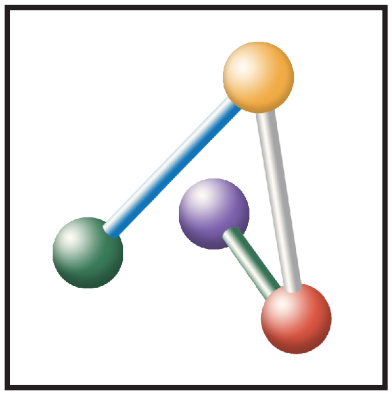
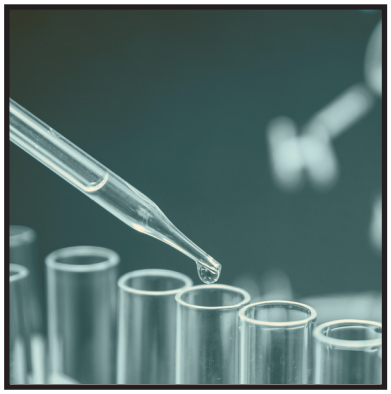
PRODUCT SELECTOR GUIDE

Matronic
ELECTRONIC PRODUCTION TECHNOLOGY






Polyurethanes • Epoxies • Adhesives • Conformal Coatings • Encapsulants • Toll Manufacture

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About Robnor ResinLab

Robnor ResinLab is a formulator of polyurethane and epoxy resin systems which are used across a broad spectrum of industries including transportation, electronics and LED lighting.

Formerly branded as Robnor Resins, our company became Robnor ResinLab in December 2016 after forming a strategic partnership with US resin manufacturer and fellow Ellsworth company, ResinLab.

The core Robnor ResinLab range consists of epoxy and polyurethane adhesives, encapsulants, potting compounds, coatings and pastes. To compliment this product range, we also supply a selection of ancillary products such as cleaning solvents and surface coatings.

As experts in the manufacture of resins, Robnor ResinLab offers a custom formulation service, whereby we can design a bespoke formulation to meet the specific requirements of your application. With our toll blending service, we can also cater to customers who already have an in-house formulation, but require their toll to be blended.

Based in a new 67,000 sq ft state of the art production facility in Swindon, England, Robnor ResinLab is operating more efficiently than ever before. We have a healthy stock of our most popular products, helping to ensure quick turn-around from the time an order is placed to the point of delivery.

Our strict quality control system ensures all products are carefully inspected and tested before being dispatched and all Robnor ResinLab products have 'batch traceability'.

At Robnor ResinLab we are committed to maintaining a high quality standard and we are proud to have been granted ISO 9001:2008 Certification by BSI Quality Assurance.

All Robnor ResinLab products are RoHS, WEEE and REACH compliant.

Visit our website: www.robnor-resinlab.com

Robnor ResinLab Product Selector Guide

We hope you will find the Robnor ResinLab Product Selector Guide informative and easy to use.

The products we have selected in this guide represent our core range of polyurethane and epoxy resin systems to help you find the right solution for your needs. However, if you cannot find your exact requirements please contact our technical team to discuss your application.

bsi. ISO 9001 Quality Management

FM 00860

Epoxy resins for electrical and electronic applications

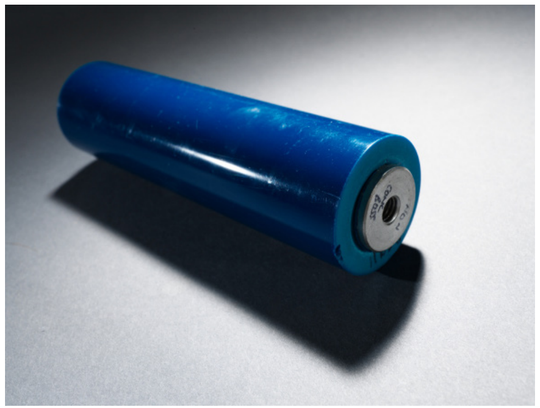
Typical Applications:	Transformers	Capacitors	Power supplies	Control modules	Sensors	PCB encapsulation	Connectors

Robnor ResinLab epoxies are used for electronic and electrical applications requiring the highest protection in the toughest environments such as deep sea, engine management, space and chemical plant equipment.

As an alternative to polyurethanes and silicones, Robnor epoxies offer significantly enhanced adhesion and mechanical support whilst providing thermal transfer, chemical resistance, insulation and dimensional stability.

The core range opposite has been formulated to meet international standards for a diverse range of applications.

Robnor epoxies are extremely versatile and can be modified to suit your specific applications on request.



Product	PX672H	PX900D	PX439N/GY	PX439NL-1	PX700K-1	PX804C	PX439XS
Description	High gloss Fast curing High toughness Low viscosity	Low viscosity Long pot life Excellent long-term heat resistance Excellent chemical resistance	High thermal conductivity Low shrinkage High adhesion Approved to UL94-VO Good chemical and water resistance	Low shrinkage High adhesion Flame retardant Good chemical and water resistance	High adhesion Low shrinkage Good thermal conductivity Flame retardant Excellent chemical & water resistance	Excellent multi-purpose resin	High Tg Excellent chemical & heat resistance
Colour	Clear/Black/White	Clear/Black	Dark Grey	Black	Black	Black	Black/Beige
Mixed Viscosity (mPas @ 25°C)	300	650	7500	3500	6000	9000	12500
Hardness	D80	D90	D85	D85	D80	D80	D90
Specific Gravity	1.10	1.14	1.93	1.64	1.70	1.70	1.96
Electric Strength	18	22	18	18	18	18	20
Thermal Expansion	80-100	65-75	35-45	50-60	40-50	35-55	30-40
Gel Time (150ml @ RT in minutes)	50	360	240	190	360	360	480
Flame Retardant	NO	NO	UL94 V-0	Meets UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0
Thermal Conductivity	0.25	0.21	1.20	1.15	1.00	0.85	1.30
Tg (°C)	50-60	120-140	90-110	80-90	80-100	60-80	120-145

Robnor materials offer:	Environmental protection	Electrical insulation	Tamper proofing	Thermal shock resistant	Improved unit longevity and durability	Heat transmission	Improved chemical resistance	WEEE, RoHS & REACH compliant

Polyurethanes for electrical & electronic applications

Typical Applications:	Transformers	Capacitors	Cable joints	Control modules	Sensors	PCB encapsulation	Connectors

Robnor's electrical and electronic polyurethane range offers a comprehensive choice for users who require a varied choice for their application.

Robnor polyurethanes are used in applications requiring economy, toughness, high insulation and thermal impact resistance.

This range can be used as an alternative to epoxy and silicone materials. Robnor polyurethanes can offer lower unit costs and faster production while providing excellent general performance.

The core range opposite has been formulated to meet international standards for a diverse range of applications.

Robnor polyurethanes are extremely versatile and can be modified to suit your specific applications on request.

Product	EL227CL	EL199HP	EL600F	EL125K	EL171LF	EL583C	EL116L	EL171H
Description	Low mixed viscosity Non-toxic, fast curing Low embedment stress Re-enterable	Low viscosity Low embedment stress High resistance to water Re-enterable Flame retardant	Fast curing Flame retardant Low viscosity	Low peak exotherm temperature High impact strength Good electrical insulation characteristics High water resistance	Flame retardant Low viscosity High impact strength High adhesion	Self healing Repairable soft gel Low moisture absorption High water resistance Low viscosity Long usable life	Long pot life Low embedment stress Easy to use and process Flame retardant	Cost effective Flame retardant Excellent adhesion High thermal conductivity
Colour	Translucent	Black	Black/Off White	Beige	Black	Translucent	Black	Black/Beige
Mixed Viscosity (mPas @ 25°C)	600	1700	3000	6000	3500	4000	8	6000
Hardness	A16	A32	D80	A85	D60	Soft gel	A80	A90
Specific gravity	1.02	1.34	1.48	1.30	1.51	0.95	1.47	1.65
Electric Strength	18	19	19	11.5	26	20	16	16
Thermal expansion	80-100	80-100	60-80	50-75	75-100	150-200	50-75	60-80
Gel time (150ml @ RT in minutes)	30	80	5-7	18	45	120-240	90	40
Flame Retardant	NO	Meets UL94 V-0	Meets UL94 V-0	NO	UL94 V-0	NO	UL94 V-0	UL94 V-0
Thermal Conductivity	0.22	0.45	0.8	0.35	0.55	0.25	0.45	0.75
Tg (°C)	-50	-61	-20		-2		-30	-10

Robnor materials offer:	Environmental protection	Electrical insulation	Tamper proofing	Thermal shock resistant	Improved unit longevity and durability	Heat transmission	Improved chemical resistance	WEEE, RoHS & REACH compliant

Structural adhesives and sealants

Robnor's diverse adhesive range for structural bonding offers modern fixing solutions for a wide variety of substrates. The products include a number of working and fixing times. As an alternative fixing method they offer weight savings, improved aesthetics, uniform stress distribution, fast assembly and reduced production costs.

There are many advantages to using adhesives to assemble your products.

- reduced assembly times
- advantage of joining together dissimilar materials
- ability to join unusual and complex shapes
- less finishing

Product	EL420AR	EL500F	EL628FF	EL629DM	PX628FF	PX628H	PX628HV-2	PX681C	PX774D-1	PX800CS	PX800F	PX800HD-1
Features	UV stable Flexible Impact resistant	Thixotropic High toughness Chemical resistant	Thixotropic Flexible Impact resistant	High adhesion Enhanced toughness Excellent abrasion resistance	High adhesion Non-toxic Thixotropic High impact resistant	Thixotropic Semi-rigid Chemical resistant	Excellent Adhesion Thixotropic High Chemical resistance	Liquid Impact resistant Chemical resistant	Thixotropic High impact resistant Flexible Chemical resistant	Thixotropic Impact resistant Chemical resistant	Clear Impact resistant Chemical resistant	Thixotropic Impact resistant Chemical resistant
Applications	Glass sealing & bonding	General bonding & sealing	Rubber to metal bonding	Rubber repair	Rubber to metal bonding	Plastic, GRP & metal	Metal parts & GRP	Plastic, GRP & metal	Rubber to metal bonding	General bonding & sealing	General bonding & sealing	Plastic, GRP & metal Stone masonry Wood
Hardness	A80	D85	A85	A70	A85	D75	D80	D70	A90	D80	D80	D80
Colour	Water white	Beige	Clear/Black	Black	Clear/Black	Amber	Black	Amber/Black	Black	Translucent	Clear/Black/Off White	Beige/Black
Mix ratio (vol)	1:1	1:1	2:1	1:1	2:1	1:1	2:1	1:1	1:2	1:1	1:1	1:1
Working life (minutes)	10	2	5	10	5	60	15	60	20	4	2	15
Time to handling strength	6 hours	10 minutes	3 hours	3 minutes	3 hours	24 hours	16 hours	16 hours	8 hours	6 hours	10 minutes	2 hours

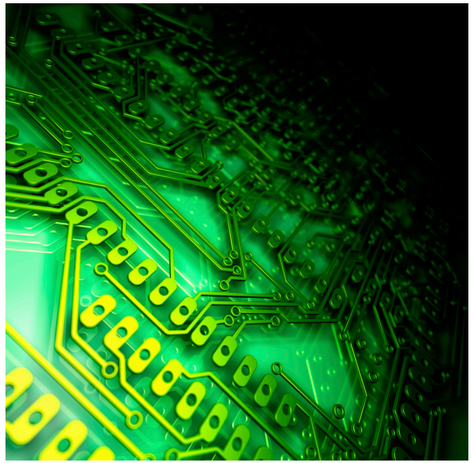
Conformal coatings for electrical & electronic applications

Conformal coatings are designed to protect printed circuit boards and related equipment from their harsh environments.

Robnor ResinLab has a wide range of conformal coatings for use in a diverse range of electronic applications.

The core range opposite has been formulated to meet international standards for a diverse range of applications.

Robnor conformal coatings are extremely versatile and can be modified to suit your specific applications on request.



Product Code	MP400C-1	MP313C	SC103K	SC123CF	PX821C
Coating type	Acrylic	Polyurethane alkyd	Silicone	Silicone alkyd	Epoxy
Features	UV trace Antifungal agents Fast drying High clarity and gloss Excellent adhesion	UV trace Antifungal agents Fast drying	UV trace Antifungal agents Fast drying High clarity and gloss Flame retardant Temperature resistant Thick film protection	UV trace Antifungal agents Fast drying Excellent adhesion High clarity and gloss Flame retardant Chemical resistant	Thixotropic High strength High chemical resistance Thick film protection
Applications	General PCB protection	General PCB protection	Power resistors High voltage capacitators	High performance electronics	Thermistors High performance electronics
Processing	Dipping Brushing Spraying	Dipping Brushing Spraying	Dipping Brushing	Dipping Brushing Spraying	Dipping Brushing
Approvals		Meets VS EN IEC 61086		UL94 V-0	
Temperature range (°C)	-60 to 160	-50 to 150	-70 to 300	-70 to 200	-50 to 150
Dry time (minutes @ 20°C)	20	< 20	< 60	< 20	N/A
Initial cure time @ RT Initial cure time @ 60°C Initial cure time @ 80°C	60 minutes 20 minutes 5 minutes	60 minutes 20 minutes 5 minutes	120 minutes 40 minutes 20 minutes	60 minutes 20 minutes 5 minutes	30 minutes @ 100°C 20 minutes @ 120°C 5 minutes @ 150°C
Full cure time @ RT Full cure time @ 60°C Full cure time @ 80°C	24 hours 12 hours 8 hours	24 hours 6 hours 4 hours	Requires post cure 12 hours 4 hours	24 hours 12 hours 4 hours	60 minutes @ 100°C 30 minutes @ 120°C 5 minutes @ 150°C
Solids content (%)	27	40	68	38	100
Coating thickness (micron)	25-90	25-90	200-500	20-60	2800-3500
Electric strength	90	90	90	90	14
Thinners	TS154	TS109	TS106	TS106	N/A
Colours	Clear	Amber	Green	Amber	Blue

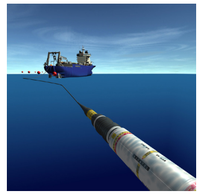
Resins for marine and offshore applications

Typical Applications:	Sonar	Umbilicals	Over moulding	Connectors	Cable joints	Deep sea electronics

Robnor epoxy and polyurethane resins feature a range of shore hardness resin systems that are used for applications requiring excellent resistance to seawater, high abrasion resistance, very good chemical resistance and are readily adaptable for the over-moulding of cables.

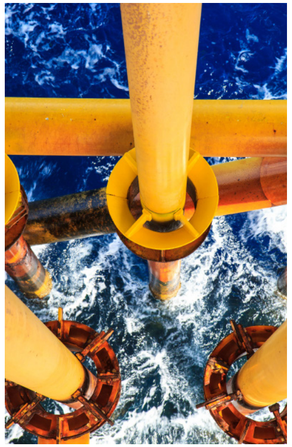
Robnor marine systems provide high mechanical strength, low shrinkage and excellent adhesion with very good high temperature, chemical and water resistance.

This range of epoxy and polyurethanes are designed for use in extreme environments associated with marine and offshore industries. The core range below has been formulated to meet international standards for a diverse range of applications.



Product	EL110H	EL217C	EL266D	EL225D	PX804C	PX439XS
Features	Non-toxic Low viscosity Excellent resistance to seawater and aqueous based cleaning chemicals Abrasion resistant	Excellent abrasion resistance Excellent tear resistance High mechanical strength Medium viscosity Excellent toughness	Good adhesion Non-toxic Excellent resistance to seawater	Low viscosity High adhesion and toughness High chemical resistance	Excellent multi-purpose resin	High Tg Excellent chemical and heat resistance
Colour	Black	Black	Black	Black	Black	Black
Applications	High frequency applications Cable joints & sonar devices	Cable Jointing Hand held tool handles Abrasion resistant liners	High voltage In-shore and off-shore cable jointing	Encapsulation of both surface and sub sea electrical and electronic units	Encapsulation of deep sea electrical and electronic devices	Encapsulation of deep sea electrical and electronic devices
Cured hardness	A68	A78	A80	D60	D80	D90
Gel time (150ml @ RT* minutes)	20	120	16	60	360	480
Initial cure de-mould time (hours @ 20°C)	24	24	50	24	24	36
Tensile strength (MPa)	3.5	21	6	15	50	70
Mixed viscosity (mPas @ 25°C)	600	5000	2500	1000	9000	12500

*RT = 20-25°C



Robnor materials offer:	Environmental protection	High adhesion	Tamper proofing	Abrasion resistant	Improved unit longevity and durability	Mechanical support	Excellent sea water resistance	WEEE, RoHS & REACH compliant

Filter and screen bonding resin systems

Typical Applications:	Filter housings	End caps	Plastic fabrication	Metal fabrication	Vibration damping	Assembly sealing and bonding

Robnor's high performance polyurethane adhesives are used for applications requiring high impact resistance, high toughness, a faster cure time and high adhesion to ABS.

Robnors filter and screen bonding range also includes a number of high performance epoxy adhesives that provide high mechanical strength, excellent adhesion to a wide variety of substrates, high heat and chemical resistance with a varied range of cure times available.

This range of epoxy and polyurethanes are designed for use in extreme environments. The core range opposite has been formulated to meet international standards for a diverse range of applications.

Robnor epoxy and polyurethanes are extremely versatile and can be modified to suit your specific applications on request.

Product	EL125K	EL600F	PX439XS	PX628FD	PX628H	PX800CS
Type	Polyurethane	Polyurethane	Epoxy	Epoxy	Epoxy	Epoxy
Application	Air filters	Air & Fuel filters	Fuel filters Screens Sieves Chemical filters	Fuel filters Screens Sieves Chemical filters	Fuel filters Screens Sieves Chemical filters	Fuel filters Screens Sieves Chemical filters
Features	Low Exotherm High impact strength Electrical insulation High water resistance	Fast curing Fuel resistant High Strength	High gloss Chemical resistant High strength	High gloss Chemical resistant High strength	Long working life Chemical resistant High strength High adhesion	Fast curing High gloss Chemical resistant High adhesion
Colour	Beige	Black/Cream/Red	Black/Buff	White	Natural beige	Clear amber
Working life (150ml minutes @ 20°C)	10	3	30	25	70	4
Light handling strength (@ 25°C)	12 hours	1 hour	24 hours	24 hours	48 hours	6 hours
Minimum cure time (hours)	2	2	24	12	24	1
Full cure time (hours)	168	48	72	96	72	12
Shore hardness	A85	D80	D86	D85	D75	D80
Flame retardancy	No	Yes	Yes	No	No	No
Mix ratio (vol)	3.75:1	3:1	5.7:1	2:1	1:1	1:1
Operating temperature (°C)	-40 to 100	-40 to 140	-40 to 200	-40 to 160	-50 to 120	-40 to 120
Density	1.3	1.48	1.88	1.5	1.01	1.1
Mix viscosity (mPas @ 25°C)	3000	3000	60000	Thixotropic	Thixotropic	120000

LED encapsulating resins

Robnor LED encapsulation resins offer:	Environmentally friendly solutions	Easy processing	UV stability	Good thermal conductivity
	Stability at high temperatures	Excellent adhesion	High clarity	Scratch & mark resistant

Robnor ResinLab offer a wide selection of materials for LED assembly and protection.

The use of Robnor LED materials enhance the longevity and performance of LEDs by reducing thermal stress protection from the environment.

Robnor LED materials are easy to use and process as well as having excellent adhesion.

The Robnor LED range is mercury free.

The core range opposite has been formulated to meet international standards for a diverse range of applications.

Robnor ResinLab's resin systems are extremely versatile and can be modified to suit your specific applications on request.

Product	EL171LF	EL420HD	EL420LV	EL420OF	PX439XS	PX774D-1
Features	Low viscosity Cost effective	High clarity Long term UV stability Low viscosity Scratch & mark resistant	Low viscosity Long term UV stability High clarity Scratch & mark resistant	Long term UV stability Low viscosity Opalescent Scratch & mark resistant	Thermal endurance Thermal conductivity High hardness	High adhesion Thermal and mechanical Shock resistant
Application	Power supplies Modules Drivers Ballasts	Tracks Arrays Luminaries	Tracks Arrays Luminaries	Tracks Up lights Assemblies	Power supplies Modules Drivers	Bonding & sealing Tracks Components Frames
Mixed density	1.51	1.09	1.11	1.1	1.96	1.01
Mixed viscosity (mPa @ 25°C)	3500	1700	900	600	12500	Thixotropic
Working life (150ml minutes @ 25°C)	15	30	10	20	40	20
Full cure time (hours @ 25°C)	72	72	48	48	168	16
Cure time (@ 80°C)	10 minutes	2 hours	1 hour	2 hour	8 hours	2 hours
Mixed colour	Black	Water clear	Water clear	Opalescent	Black/Beige	Black
UV stability		Excellent	Excellent	Excellent		
Shore hardness	D60	D75	A75	D30	D90	A90
Temperature range (°C)	-40 to 130	-55 to 120	-55 to 120	-55 to 120	-60 to 200	-55 to 140
Flame retardancy	UL94 V-0	NO	NO	NO	UL94 V-0	NO
Thermal conductivity (W/mK)	0.55	0.21	0.21	0.21	1.3	0.25
Alternatives	EL171C - lower cost EL600F - white/faster curing				PX439N - lower temp rating PX804C - general purpose	EL628FF - lower cost EL420AR - clear