

PRODUCT SELECTOR GUIDE

Performance through innovation





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About Robnor

Robnor Resins is Europe's leading formulator of epoxy and polyurethane resin systems. Established in 1960 Robnor has an excellent reputation for quality, service and support both in the UK and worldwide.

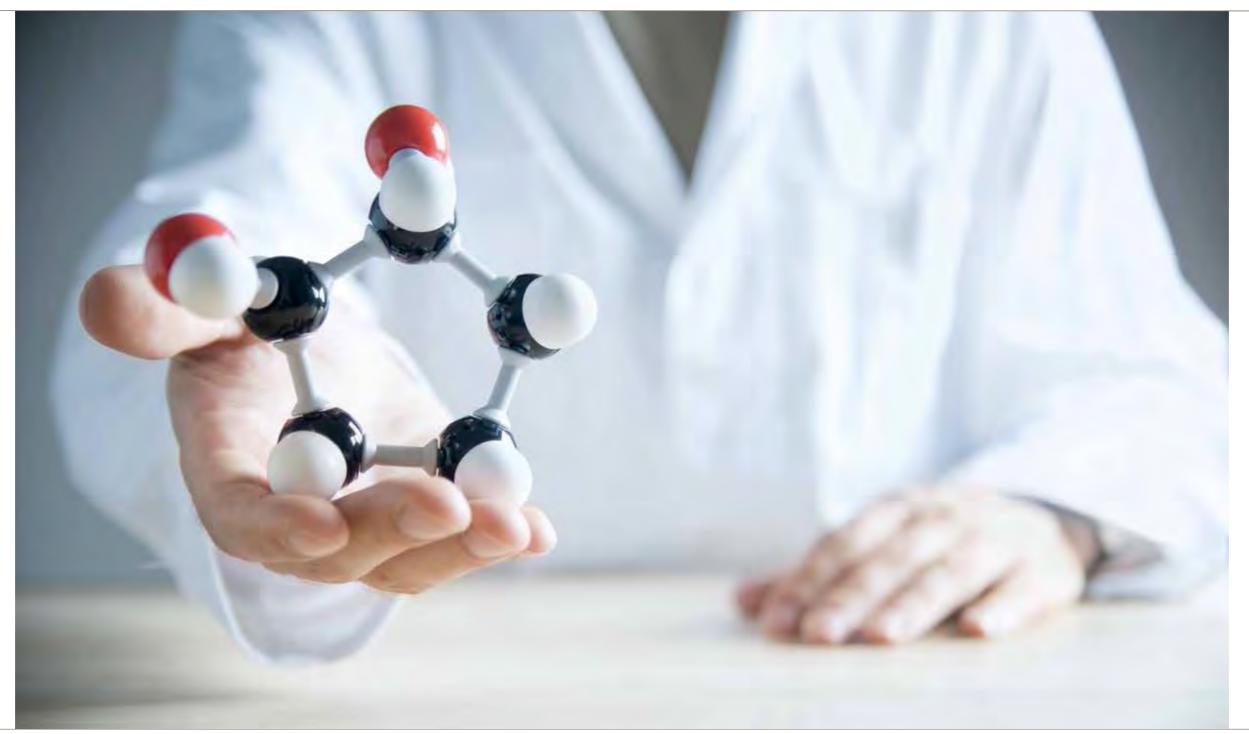
All our products are developed, manufactured and packaged at our European manufacturing facilities in Swindon, UK. Raw materials are sourced from leading brands to complement and enhance our own formulations and provide a comprehensive range of products for all market sectors.

We have a skilled and dedicated work force, with fully trained operators. Our technical team has more than 90 years of formulating and development experience between them.

Robnor offers:

- 60 years of industry experience
- bespoke solutions for all markets
- a fully equipped laboratory
- design and process consultancy expertise
- on site demonstration facilities
- equipment and processing advice

You will find this product selector guide informative and easy to use, and we look forward to your valued custom. 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.



Technical Team

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Markets

Energy & Utilities

Energy storage Power generation Renewable energy Waste water treatment plants Subsea/offshore Oil refinery Gas exploration Mining Telecoms

Lighting

Capacitors Drives and modules LED

Electronics

Electronics assembly Semiconductor assembly LED assembly

Transportation

Aerospace Agricultural & construction machinery Automotive Marine Speciality vehicles

Epoxy resins for electrical and electronic applications

Robnor 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	РХ672Н	PX900D	PX439F	PX439NL-1	PX700K-1	PX439N	PX804C	PX439XS
Description	Low shrinkage 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 viscosity Flame retardant Good chemical and water resistance Semi-flexible	High thermal conductivity Low shrinkage High adhesion Flame retardant Good chemical and water resistance	High adhesion Low shrinkage Good thermal conductivity Flame retardant Excellent chemical & water resistance	Low shrinkage High adhesion Flame retardant Good chemical and water resistance	Excellent multi-purpose resin	High Tg Excellent chemical & heat resistance
Colour	Clear/Black/White	Clear/Black	Black/Buff	Black	Black	Dark grey	Black	Black/Beige
Mixed Viscosity (mPas @ 25°C)	300	650	2000	3500	6000	7500	9000	12500
Hardness	D80	D90	D65	D85	D80	D90	D80	D90
Specific Gravity	1.10	1.14	1.86	1.64	1.70	1.93	1.70	1.96
Electric Strength	18	22	18	18	18	18	18	20
Thermal Expansion	80-100	65-75	55-65	35-45	40-50	35-45	35-55	30-40
Gel Time (150ml @ RT in minutes)	50	360	360	190	360	240	360	480
Flame Retardant	NO	NO	Meets UL94 V-0	Meets UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0	UL94 V-0
Thermal Conductivity	0.25	0.21	1.05	1.15	1.00	1.20	0.85	1.30
Tg (°C)	50-60	120-140	40-50	80-90	80-100	90-110	60-80	120-145

Robnor materials offer:	Environmental protection	Electrical insulation	Tamper proofing	Thermal shock resistant	Improved
Robnor Resins Ltd are committed to providing high quality material solu	tions to all industries - Additional products are available on red	quest -			

A Robnor Resins Ltd are committed to providing high quality material solutions to all industries - Additional products are available on request To obtain more technical data contact support@robnor.co.uk

ical Applications: Transformers Capacitors Power Supplies Control modules Sensors PCB encapsulation Connect	ors
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d	unit	longevity	and	durability
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Heat transmission

Improved chemical resistance

WEEE, RoHS & REACH compliant

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Polyurethanes for electrical & electronic applications

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	EL125C	EL171LF	EL297C	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	Cost effective Low exotherm High impact strength Good electrical insulation characteristics	Flame retardant Low viscosity High impact strength High adhesion	Excellent water/humidity resistance Flame retardant High thermal conductivity High performance	Long pot life Low embedment stress Easy to use and process Flame retardant	Cost effective Flame retardant Excellent adhesion High thermal conductivity
Colour	Black/Amber/Clear	Black	Black/Red/Off White	Black/Grey/Beige	Black	Black	Black/White	Black/Beige/Red
Mixed Viscosity (mPas @ 25°C)	600	1700	3000	3000	3500	4000	5000	6000
Hardness	A16	A32	D80	A90	D60	A80	A80	A90
Specific gravity	1.02	1.34	1.48	1.3	1.51	1.53	1.47	1.65
Electric Strength	18	19	19	18	26	26	16	16
Thermal expansion	80-100	80-100	60-80	50-75	75-100	60-80	50-75	60-80
Gel time (150ml @ RT in minutes)	30	80	5-7	60	45	195-225	90	40
Flame Retardant	NO	Meets UL94 V-0	Meets UL94 V-0	NO	UL94 V-0	Meets UL94 V-0	Meets UL94 V-0	UL94 V-0
Thermal Conductivity	0.22	0.45	0.8	0.45	0.55	0.85	0.45	0.75
Tg (°C)	-50	-61	-20	-20	-2	-50	-30	-10

Robnor materials offer:

Environmental protection

Electrical insulation

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

Improved unit longevity and durability Heat transmission Improved chemical resistance WEEE, RoHS & REACH compliant
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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
- lower raw material costs
- advantage of joining together dissimilar materials
- ability to join unusual and complex shapes
- less finishing

- weight reductions
- helps prevent water ingress
- extending the life of product
- a stiffer structure
- protection from corrosion
- sound and vibration damping
- easy to use and simple packaging

Product	EL420AR	EL500F	EL628FF	EL629C	PX628FF	PX628H	PX628HV	PX681C	PX774D	PX800CS	PX800F	PX800HD
Features	UV stable Flexible Impact resistant	Thixotropic High toughness Chemical resistant	Thixotropic Flexible Impact resistant	Low viscosity Enhanced elongation and toughness	High adhesion Non-toxic Thixotropic High impact resistant	Thixotropic Semi-rigid Chemical resistant	Thixotropic Heat resistant Chemical resistant	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	A65	A85	D75	D80	D70	A90	D80	D80	D80
Colour	Water white	Beige	Clear/Black	Black	Clear/Black	Amber	Grey	Amber/Black	Black	Translucent	Clear/Black/Off White	Beige/Black
Mix ratio	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 (150ml @ 25°C in minutes)	10	2	5	1.5	5	60	40	60	20	4	2	15
Time to handling strength (150ml @ 25°C)	6 hours	10 minutes	3 hours	120 minutes	3 hours	24 hours	16 hours	16 hours	8 hours	6 hours	10 minutes	2 hours

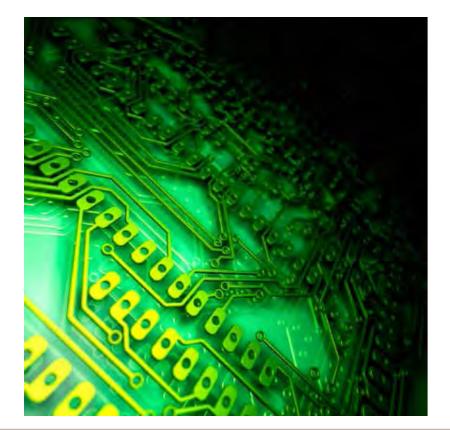


Conformal coatings for electrical & electronic applications

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

Robnor Resins 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	MP313C	MP400C	SC103K	SC103LV	SC123CF	PX821C
Coating type	Polyurethane alkyd	Acrylic	Silicone	Silicone	Silicone alkyd	Ероху
Features	UV trace Antifungal agents Fast drying	UV trace Antifungal agents Fast drying High clarity and gloss	UV trace Antifungal agents Fast drying High clarity and gloss Flame retardant Temperature resistant Thick film protection	UV trace Antifungal agents High clarity and gloss Flame retardant Temperature resistant	UV trace Antifungal agents Fast drying Excellent adhesion High clarity and gloss Flame retardant Chemical resistant	High strength High chemical resistance Thick film protection
Applications	General PCB protection	General PCB protection	Power resistors High voltage capacitors	High performance electronics	High performance electronics	Thermistors High performance electronics
Processing	Dipping Brushing Spraying	Dipping Brushing Spraying	Dipping Brushing	Dipping Brushing Spraying	Dipping Brushing Spraying	Dipping Brushing
Approvals	Meets VS EN IEC 61086			Meets ULV94 V-0	UL94 V-0	
Temperature range (°C)	-50 to 150	-60 to 160	-70 to 300	-70 to 250	-70 to 200	-50 to 150
Dry time (minutes @ 20°C)	< 20	< 20	< 60	< 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	N/A N/A N/A	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 6 hours 4 hours	24 hours 12 hours 4 hours	24 hours 12 hours 4 hours	N/A N/A 24 hours @ 120°C	24 hours 12 hours 4 hours	60 minutes @ 100°C 30 minutes @ 120°C 5 minutes @ 150°C
Solids content (%)	50	40	68	36	38	100
Coating thickness (micron)	30-50	25-40	180-220	25-50	20-30	1000-2000
Electric strength	90	90	90	90	90	14
Thinners	TS109	TS154	TS106	TS106	TS106	N/A
Colours	Amber	Clear	Green	Clear	Amber	Blue
Alternatives		MP400S - Spray applications				PX820C - high thixotropy

Resins for marine and offshore applications

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 and very good chemical resistance and are readily adaptable for the over-moulding of cables. of applications.

Robnor marine systems provide high mechanical Robnor's resin systems are extremely versatile 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

and can be modified to suit your specific applications on request.





Product	EL629CM	EL110H	EL217C	EL266D	EL225D	PX804C	PX439XS
Features	Low viscosity Enhanced elongation and toughness High adhesion Excellent abrasion resistance	Non-toxic Low viscosity Excellent resistance to seawater and aqueous based cleaning chemicals Excellent toughness Abrasion resistant	Excellent abrasion resistance Excellent tear resistance High mechanical strength Medium viscosity	High adhesion Non-toxic Excellent resistance to seawater	Low viscosity High adhesion and toughness High chemical resistance	Excellent multi-purpose resin	High Tg Excellent chemical & heat resistance
Colour	Black	Black	Black	Black	Black	Black	Black
Applications	Rubber repair Connectors and cable joints	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	A65	A68	A78	A80	D60	D80	D90
Gel time (150ml @ RT* minutes)	20	20	120	16	60	360	480
Initial cure de-mould time (hours @ 20°C)	90	24	24	50	24	24	36
Tensile strength (MPa)	12	3.5	21	6	15	50	70
Mixed viscosity (mPas @ 25°C)	1600	600	5000	2500	1000	9000	12500
*RT = 20-25°C							

Robnor materials offer:

Environmental protection

High adhesion

Tamper proofing

Abrasion resistant

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

Improved unit longevity and durability

Mechanical support

Excellent sea water resistance

WEEE, RoHS & REACH compliant

Filter and screen bonding resin systems

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	EL125CF	EL600F	PX439XF	PX628FD	PX628H	PX800CS
Туре	Polyurethane	Polyurethane	Ероху	Ероху	Ероху	Ероху
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	Cost effective Fast curing Low shrinkage	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	Natural beige/ Black	Black/Cream/Red	Black/Buff	White	Natural beige	Clear amber
Working life (150ml minutes @ 20°C)	5	3	30	25	70	4
Light handling strength (@ 25°C)	1 hour	1 hour	24 hours	24 hours	48 hours	6 hours
Minimum cure time (hours)	2	2	24	12	24	1
Full cure time (hours)	48	48	72	96	72	12
Shore hardness	A80	D80	D86	D85	D75	D80
Flame retardancy	No	Yes	Yes	No	No	No
Mix ratio (volume)	3.8:1	3:1	5.7:1	2:1	1:1	1:1
Operating temperature (°C)	-50 to 120	-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
Related products	EL171FH Flame retardant				PX192HD Cost effective	

ical Applications:	Filter Housings

End Caps

Vibration damping



LED encapsulating resins

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



Product	EL171LF	EL420HD	EL420LV	EL4200F	PX439XS	PX774D
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	Good	Excellent	Excellent	Excellent	Good	Good
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
Approvals RoHS WEEE REACH compliant	YES	YES	YES	YES	YES	YES

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



Fluid Research mix and dispense equipment

Fluid Research Limted (formerly Liquid Control Ltd) provides resin mixing solutions and is the recommended machine provider for Robnor Resins Ltd.

For 40 years Fluid Research Ltd has been a market leader in the design and manufacture of precision single component dispensing and multi- component metering, mixing and dispensing equipment for liquid and paste resin systems.

Their depth of knowledge and understanding for processing materials such as epoxies, polyurethanes, silicones, etc. and their detailed consideration for their customers dispensing application

needs, ensures the equipment they manufacture will be fit for purpose for many years. From table top machines for developmental projects to bespoke, large volume production, fully automated machines, a unique product offering.

Fluid Research has a reputation as a 'Total Solution' provider of products that are designed for un-compromised accuracy, longevity and ease of use.

From project inception through to completion their dedicated approach for unique solution provision with full technical support is unsurpassed.



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material.

Mix and dispense technology

The Fluid Research range of machines are designed to meter and mix a wide variety of mulitple or single component resin systems. Each machine is designed to dispense the specified material to the correct ratio and with accurately controlled shots or beads of

The range includes both piston and geared pump metering technology, either electric or pneumatic.

Fluid Research will be introducing the progressive pump technology to the UK in 2014. Suitable for single or multi-component applications. Fluid Research pumps are precision made in the UK and are available in two styles and eight models.

Each machine is custom built to suit individual requirements, therefore each enquiry is dealt with by one of our engineers who will discuss in detail the various options available before finalising your specific requirements.

Simplicity of operation and maintenance make the machines reliable and easy to operate.

For your mix and dispense needs contact Fluid Research directly or through your Robnor Resins Area Sales Team member.

Environmental Policy Statement

In pursuit of its mission to be Europe's leading manufacturer, formulator and distributor of epoxy and polyurethane resins, Robnor acknowledges the impact its operations have on the environment both locally and globally. In recognition of our environmental commitment we have, therefore, embarked on the phased implementation of an environmental management system with the ultimate aim of ISO 14001 compliance.

The day to day operations of Robnor will affect the environment in a number of ways and we wish to minimise any negative impacts wherever and whenever possible.

Robnor Resins is committed to continuous improvement, pollution prevention and the reduction of our environmental impact.

Robnor is pleased to be leading the way within its industrial sector and will:

- Comply with all relevant environmental legislation
- Minimise waste, especially hazardous waste; and whenever possible recycle materials and dispose of all waste through safe and responsible methods.
- Maximise our water and energy efficiency by planned maintenance and the use of energy efficient equipment.
- Conserve resources through efficient use and careful planning.
- Minimise the environmental impact by careful storage, packing and transfer of our products.

Through our policy we will encourage ideas and participation from all staff and communicate these ideas through memoranda, newsletters, management minutes and discussion groups. The board is responsible for policy development, coordination and evaluation of performance; and with the full participation of senior management will review performance and set targets annually to reduce our environmental impact.

ROBNORRESI



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