

EL116L

A very low viscosity, semi-flexible polyurethane resin system, exhibiting high electrical strength, and low shrinkage.

Application

- Coils
- Transformers
- Cable Joints
- PCB potting and encapsulation
- Delicate electronic components

Key Properties

- Very low viscosity
- High electrical insulating characteristics
- UL94 V-0 @ 3mm
- Low embedment stress

Description

- Basic Two-component polyurethane system
- Resin RL116L
- Hardener HL116L

Characteristics of Resin	Value	Unit	Standard
Colour	White Black	Visual	RTM010
Specific Gravity	1.70	-	RTM003
Viscosity	30000	mPa.s	RTM008

Characteristics of Hardener	Value	Unit	Standard
Colour	Brown	Visual	RTM010
Specific Gravity	1.21	-	RTM003
Viscosity @ 25°C	200	mPa.s	RTM008

Characteristics of Mixed System	Value	Unit	Standard
Colour	White Black	Visual	RTM010
Specific Gravity	1.59	-	RTM003
Viscosity @ 25°C	3500	mPa.s	RTM008

Cure Schedule (150ml)	Room Temp	60°C	80°C	100°C	Standard
Working Life (minutes)	20-40				RTM046
Gel Time (minutes)	120-200				RTM015
Light Handling (hours)	24	4	2		-
Full Cure (hours)	48	24	12		-

*RT is defined as 20-25°C

RTM – Details of Robnor Test Methods are available on request

The above are typical values and will vary depending on the cured mass and application. Hotter temperatures may be used for faster cure but will result in higher post cure shrinkage and higher cure exotherm. Experimentation and testing is suggested to avoid side effects.

For maximum properties a post cure may be required – Contact our technical service department for advice.

Processing

Mix ratio by weight 4.65:1

Mix ratio by volume 3.3:1

Electrical Characteristics	Value	Unit	Standard
Volume Resistivity	10×10^{12}	ohm.cm	RTM036
Surface Resistivity	$1.3 - 1.5 \times 10^{11}$	ohm	RTM037
Permittivity	3.9	50 Hz	RTM039
Dielectric strength	16	kV/mm	RTM038
Loss Tangent	0.04	50 Hz	RTM040
Comparative tracking index	>600	V	RTM044

Chemical Characteristics	Thickness	Value	Unit	Standard
Water absorption (Increase in mass) 24hrs @50°C±3°C (Sol Matter Lost)	3.0	0.4 0.5	%	UL 94 - UL746A CSA C22.2 N° 0.17-00
Oxygen Index			%	RTM027
Flammability (3mm)		Approved (follow link below)	UL94 V-0	IEC 60695-11-10
Chemical Resistance				RTM029

Physical Characteristics	Thickness	Value	Unit	Standard
Hardness		85	Shore A	RTM018
Heat Deflection temperature (1.80 MPa)	4.0	89	°C	ISO 75-2
Operating temperature range *		-40 to + 130	°C	RTM024
Thermal conductivity		0.6	W/mK	RTM031
Tensile strength (average)	3.0	4.8	MPa	ISO 527-2
Flexural strength			MPa	ISO 178
Dimensional Stability (24 hours) (168 hours) Conditioning: >40hrs@23±2°C/50±10%25RH	3.0	0.2 0.4	%	UL 94 - UL746A CSA C22.2 N° 0.17-00
Elongation at break		21	%	RTM041
Compressive strength		< 10	MPa	RTM033
Tear Resistance				RTM042
Lap Shear				RTM021
Shrinkage (Volume)		0.6	%	RTM025
Co-efficient of expansion		50-75	ppm/°C	RTM035
Peak Exotherm (150g @ 25°C)		60	°C	RTM023
Flexural strength		70	MPa	RTM034
Tg		80-100	°C	

*(application & geometry dependent)

Electrical Characteristics	Thickness	Value	Unit	Standard
Volume Resistivity Conditioning: >48hrs@23±2°C/50±10%25RH Conditioning: >96±2hrs@35±1.0°C/90±2%25RH	0.75	2.27E14 4.22E13	Ohm.cm	UL 94 - UL746A CSA C22.2 N° 0.17-00
Surface Resistivity		1.3 – 1.5 x 10 ¹¹	ohm	RTM037
Permittivity		3.9	50 Hz	RTM039
Dielectric strength (avg) Conditioning: >48hrs@23±2°C/50±10%25RH Conditioning: >96±2hrs@35±1.0°C/90±2%25RH	0.75	25.1 17.7	kV/mm	UL 94 - UL746A CSA C22.2 N° 0.17-00
D495 (s) (PLC) Conditioning: >40hrs@23±2°C/50±10%25RH	3.0	193 4	s	UL 94 - UL746A CSA C22.2 N° 0.17-00
HWI (s) (PLC) Conditioning: >40hrs@23±2°C/50±10%25RH	3.0	120 0	s	UL 94 - UL746A CSA C22.2 N° 0.17-00
HAI (arcs) (PLC) Conditioning: >48hrs@23±2°C/50±10%25RH	3.0	150 0	s	UL 94 - UL746A CSA C22.2 N° 0.17-00
HVAR (s) (PLC) Conditioning: >40hrs@23±2°C/50±10%25RH	3.0	300 0	s	UL 94 - UL746A CSA C22.2 N° 0.17-00
HTVR (mm/min) (PLC) Conditioning: >40hrs@23±2°C/50±10%25RH	3.0	0.00 0	mm/min	UL 94 - UL746A CSA C22.2 N° 0.17-00
GWIT	3.0	850	°C	IEC 60695-2-13
GWFI	3.0	960	°C	IEC 60695-2-12
Loss Tangent		0.04	50 Hz	RTM040
Comparative tracking index		>600	V	IEC 60112

Approvals	
RoHS compliant	Yes
UL94 V-0	http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/showpage.html?name=QMFZ2.E76072&ccnshorttitle=Plastics+-+Component&objid=1073830268&cfqid=1073741824&version=versionless&parent_id=1073827222&sequence=1
REACH (SVHC concentration)	Refer to SDS

Packaging

EL116L is available in Bulk, Twinpacks & Kits

Availability

Available through sales@robnor.co.uk

Twinpacks - Part Numbers

EL116L/BK/100	EL116L/BK/500
EL116L/BK/250	EL116L/BK/1000

Twinpacks are pre-weighed resin and hardener components contained in a tough flexible film, separated by a removable clip and rail. Once the clip and rail is removed the resin and hardener is thoroughly mixed within the bag and is immediately ready for use. Mixing will normally take ~ 2 minutes due to the viscosity; but pay special attention to the corners. Twinpacks are ideal for small to medium production runs, prototyping and on-site or field use. The twinpack weight/volume may also be tailored to a specific size on request.

For further details please visit www.robnor-resinlab.com

Bulk Materials - Part Numbers

RL116L/BK/1KG	HL116L/NC/848.5G
RL116L/BK/8KG	HL116L/NC/1KG
RL116L/BK/25KG	HL116L/NC/5KG
RL116L/WT/8KG	HL116L/NC/25KG

Both resin and hardener are supplied in 5kg, 25kg and 200ltr drums and fully evacuated and ready for use. Care should be taken to ensure when mixing the resins air is not entrained in the mixture. If this is unavoidable the mixed resin and hardener should be re-evacuated before dispensing. The bulk resin and hardener materials can be dispensed from suitable dispensing machinery, details provided by Fluid Research on request.

Kits & Sets - Part Numbers

EL116L/BK/25KGKIT	EL116L/BK/4.85KGSET
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Kits and Sets are provided in separate containers to the correct ratio.

In Kit form, pour the contents of the smaller container into the large container and use it as a mixing vessel.

Stir well using an appropriate mixer until homogeneous.

Note: Incomplete mixing will be characterised by erratic or partially incomplete cure even after extended time periods.

Cleaning

All equipment contaminated with mixed material should be cleaned before the material has hardened.

TS130 is a suitable non-flammable cleaning agent, although other solvents may be found suitable.

TS130 will also remove cured material provided it can soak for several hours.

Storage and Shelf Life

12 months at 25°C - Specialty packaging may be less.

Bulk containers should be inverted every two to three weeks to reduce the accumulation of the fillers on the bottom of the containers.

Isocyanates are sensitive to moisture and should be kept in their original container or in a volume tank under dry nitrogen blanketing.

Many isocyanates are prone to dimerization, the formation of a white precipitate. Products with minor amounts of this precipitate normally cure to full properties.

Storage at 20 +/- 5°C (60°F to 86°F) is recommended to ensure full shelf life.

Inventory should be rotated on a FIFO (first in, first out) basis.

Health and Safety

Please refer to RL/HL116L Health and Safety data or our Technical Service Department for individual/specific advice.

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The results and information above does not constitute a specification and is given in good faith and without warranty. The information is derived from test/or extrapolations believed to be reliable and is quoted for guidance only. The product is offered for evaluation on the understanding the customer satisfies himself that the product is suitable for the intended application by proper evaluation and testing.

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