Technical Data Sheet
July 2021

PX439XS

A rigid, thermally conductive epoxy resin with excellent heat resistance and dimensional stability

Application

- Power supplies
- Encryption devices
- Security encapsulation
- Deep sea electronics
- High voltage capacitors

Key Properties

- High electrical insulating characteristics
- High dimensional stability
- Low shrinkage
- Approved to UL94 V-0 @ 6.4mm
- Excellent chemical & heat resistance
- Does not contain halogens or heavy metals

Description

- Basic — Two-component epoxy system
- Resin — RX439XS
- Hardener — HX439XS

Physical Data (approx. – values)	**Resin**	**Hardener**	**Composite**
Colour	Black	Amber	Black
Specific Gravity	2.04	0.94	1.83
Viscosity (mPas) @ 25°C	90000-120000	60-90	5500-10000

Cure Schedule	**Working Life**	**Gel Time**	**Light Handling**	**Full Cure**
Temperature	(minutes)	(minutes)	(hours)	(hours)
RT	40	120-300	36	168
60°C	20	35	8	16
80°C	10	-	4	8
100°C	-	-	2	4

*RT is defined as 20-25°C
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 8.55: 1

Mix ratio by volume 3.96: 1

Typical Properties (16h @ RT + 2h @100°C)	**Result**	**Unit**
Peak Exotherm (150ml @ RT)	40	°C
Shrinkage (Volume)	3.17	%
Thermal conductivity	1.3	W/mK
Operating temperature range	-60 to +200	°C (application & geometry dependent)
Dielectric strength	20	kV/mm
Volume Resistivity	5.2×10^{14}	Ωcm
Surface Resistivity	1.7×10^{15}	Ω
Hardness	90	Shore D
Flame retardant	6.4mm	UL94 V-0
Tensile strength	35	MPa
Deflection Temperature	120	°C
Co-efficient of thermal expansion (T<Tg)	30 - 40	ppm/°C
Loss Tangent	0.025	@ 1KHz
Permittivity	4.17	@ 1KHz
Compressive strength	105	MPa
Comparative tracking index	>850	V (Method IEC 60112)
Water absorption (30 days @ RT)	0.66	%
Elongation at break	1-3	%
Flexural strength	52.8	MPa
Flexural Modulus	3.6	GPa
Glass transition temperature	125	°C

Approvals	
RoHS compliant	Yes
UL94 V-0	E76072
REACH (SVHC concentration)	Refer to SDS

Packaging

PX439XS is available in Bulk, Twinpacks, kits and sets

Availability

Available through distribution and www.robnor-resinlab.com sales@robnor.co.uk

Twinpacks - Part Numbers	
PX439XS/BK/050	PX439XS/BK/500
PX439XS/BK/100	PX439XS/BK/1000
PX439XS/BK/250	

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 has been removed the resin and hardener can be thoroughly mixed within the bag and is immediately ready for use. Mixing will normally take ~ 3 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. Twinpacks will show a separation of ingredients within the resin side. This is perfectly normal and in fact illustrates the advantage of twinpacks, in that the separation which does occur gets remixed back into suspension when the pack is mixed.

Twinpacks stored between 15° and 25°C will have a shelf-life of 12 months.

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

Bulk Materials - Part Numbers	
RX439XS/BK/5KG	HX439XS/NC/1KG
RX439XS/BK/25KG	HX439XS/NC/2.5KG
RX439XS/BK/200KG	HX439XS/NC/5KG
	HX439XS/NC/20KG

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 and Sets - Part Numbers	
PX439XS/BK/5KGKIT	PX439XS/BK/1KGSET
PX439XS/BK/10KGKIT	PX439XS/BK/2KGSET
PX439XS/BK/20KGKIT	PX439XS/BK/27KGSET

Kits and Sets are provided in separate containers to the correct ratio.
In Kit form, pour the contents of the smaller container into the larger container and use it as a mixing vessel.
Stir well using an appropriate mixer until homogeneous.
All filled resin products will show filler separating to some degree and this filler must be re-mixed back into suspension prior to removing any material. Failure to do this will upset the ratio of reactive products and can lead to incorrect cure.
With all Resin systems, the cooler the storage the thicker the resin, and this increase in viscosity reduces the separation.
Conversely storage at elevated temperatures above 25°C will exacerbate the sedimentation.
Resin and hardener supplied in Bulk, Kits, or Sets will have a shelf-life of 24 months from date of manufacture

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

Shelf-life and Storage

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

Many epoxy resin systems are prone to crystallization as epoxy resin is a super-cooled fluid. This condition may give the product a gritty or grainy appearance (or hazy in clear products). Products in this state will not usually cure to normal and expected properties. In extreme cases it may appear solid and cured. Fluctuating temperatures (within 5 to 50 °C) aggravate this phenomenon. Heating the individual component to 50 to 60 °C while stirring can usually restore products to original state. Storage at 25 +/- 10 °C is optimum for most products
Some epoxy systems are prone to settling due to high filler content and should be inverted every two to three weeks to reduce the accumulation of the fillers on the bottom of the containers.

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

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.

Health and Safety

Please refer to RX/HX439XS Health and Safety data or our Technical Service Department for individual/specific advice.

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The results and information above do 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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