



# PROTAVIC® PNE 30273

Formerly PROTAVIC® L 127-3

A 28893-08-02 B

## DEFINITION

A solvent-free, single component resin with low linear expansion and high ionic purity for protecting semi-conductor silicon crystals.

Its good fluidity enables it to flow at 20°C into cavities about 1 mm in width.

The glass transition temperature is over 150°C, which helps to improve the thermal shock resistance, for example in the case of alternators diodes for cars.

## PRODUCT DESCRIPTION

Appearance	liquid	
Odour	faint	
Colour	black	
<b>Guaranteed specifications</b>	<b>Standards</b>	<b>Methods</b>
% Ash residue	72 ± 2	TGA 1
Plane cone viscosity (mPa.s)	9 000 - 3 000	NFT 51211 at 25°C
<b>Significant value (for guidance)</b>		
Density	1.8 approx.	
<b>Other information</b>		
Pot life time at 20 ± 2°C	24 hours	
Possible curing	30-40 minutes at 125°C 5-10 minutes at 150°C 1-2 minutes at 175°C Post-curing for 4 h at 160-205°C is recommended in all cases.	
Storage stability	3 months below -20°C 1 year below -40°C	
% viscosity increase after 8 hours at 20 ± 2°C	+ 10	

## APPLICATION PROPERTIES

The consistency of **PROTAVIC® PNE 30273** coating resin has been designed for application by micro-dispenser.

The rheology allows good wetting of surfaces in contact with the resin and also good adhesion. It is possible to fill cavities less than 1 millimetre in size.

Adjusting the automatic dispensers is made easier by the fact that the viscosity of the product remains stable for one day at 18-22°C.

One must take care however not to leave the product, after dispense, in contact with moist air for longer than 1 to 2 h. Although not strongly hygroscopic, the **PROTAVIC® PNE 30273** resin shows a slight drop in glass transition in the presence of moisture. It is therefore preferable to cure as quickly as possible after applying the product or storing in a dry atmosphere.

We recommend removing the **PROTAVIC® PNE 30273** resin from the freezer 30 to 60 minutes before it is due to be used in order for it to reach a temperature of between 18 and 22°C.

### METHOD OF USE

The **PROTAVIC® PNE 30273** resin is supplied frozen and ready for use. It can be supplied in syringes designed to fit on the microdispenser, which has the advantage of avoiding handling operations which encourage the entrainment of air bubbles.

When the product is supplied in pots, the resin should preferably be degassed for 15 minutes under a vacuum of less than 1 mm of mercury. In the absence of stirring, during the vacuum treatment, provide a container which is at least six times higher than the initial height of resin.

### PHYSICO-CHEMICAL PROPERTIES

Properties	Methods	Units	Typical values
Density at 20°C	NFT 51201	g/cm <sup>3</sup>	1.8
Shear strength at 20°C	NFT 76107	MPa daN/cm <sup>2</sup>	> 5.0 > 50
Flexing resistance at 20°C	NFT 51001	MPa daN/cm <sup>2</sup>	70 - 80 700 - 800
Flexing modulus at 20°C	NFT 51001	MPa daN/cm <sup>2</sup>	11 000 - 12 000 110 000 - 120 000
Shore D hardness	NFT 51109	--	80 - 90
Chlorine content	S 86005	mg/kg	< 20
Sodium content	MIL-STD-883	mg/kg	< 20
Potassium content	MIL-STD-883	mg/kg	< 20

Optimum application is provided by means of a pneumatic dispenser and needles with an internal diameter of between 0.5 and 1.5 mm.

The product can be cured at temperatures from 125°C for a period of at least 30 minutes, but post-curing for 1-2 h at 150-205°C is recommended in order to achieve optimum protection of a silicon crystal.

In order to minimize shrinkage, it is recommended that the product should be cured at a constant temperature of 110°C for 1-2 h before raising it to the final curing temperature.

### TYPICAL PROPERTIES OF THE CURED SYSTEM

The properties set out below were obtained after curing for 1 h at 110°C + 4 h at 160°C.

They were determined following measurements carried out in the laboratory over a small number of tests.

They are values given by way of guidance, and do not constitute a guarantee. It will be for the user, in all cases, to carry out his/her own tests to determine whether the **PROTAVIC® PNE 30273** resin can be used for the particular application which he/she has in mind.

## ELECTRICAL PROPERTIES

Properties	Methods	Units	Typical values
Dielectric rigidity	NFC 26255	kV/mm	> 15
Dielectric constant at 100 HZ and 20°C	NFC 26230	--	5.0 ± 0.5
Electrical dissipation factor at 100 HZ and 20°C	NFC 26230	--	< 0.01
Transverse resistivity	NFC 26215	mΩ.cm	> 10 <sup>+13</sup>

## THERMAL PROPERTIES

Properties	Methods	Units	Typical values
Glass transition temperature Tg	DSC 1*	°C	160 - 170
Coefficient of linear expansion from -50 to +100°C	TMA 1*	10 <sup>-6</sup> /°C	17 - 20
Coefficient of linear expansion from 200 to 250°C	TMA 1*	10 <sup>-6</sup> /°C	55 - 65
Thermal conductivity	CTH 2	W/(m.K)	> 0.70
Decomposition temperature	TGA 1*	°C	> 350
Linear shrinking	NFT 51401	%	< 0.15
Temperature content	Thermal impact > 2 000	°C	-65 to 150

\* Thermo-analysis chain Mettler TA 3 000.

### FIELD OF USE

The **PROTAVIC® PNE 30273** single-component, high purity insulating resin has been developed for protecting semi-conductors in the field of alternators diodes, MCM, chip carriers, hybrid circuits, chip on board applications and diodes.

Its coefficient of linear expansion of 18.10<sup>-6</sup>/°C and its glass transition temperature of over 160°C gives it good resistance to thermal shocks.

The high ionic purity guarantees good reliability of the semi-conductor. The same is true of the

adhesion on different substrates which offers optimum protection against external agents (moisture, dust, etc.).

### PRECAUTIONS IN USE

Refer to the enclosed safety data sheet.

### PACKAGING

The **PROTAVIC® PNE 30273** resin is supplied in 1 000 g cartridges.

*The information contained in this data sheet corresponds to the present state of our knowledge ; it is intended for your guidance but we are not bound by it since we are not in a position to exercise control over the manner in which our products are used. Moreover, the attention of the user is drawn to the risks that could possibly occur should a product be used for an application other than that for which it is intended.*