



PROTAVIC® ATE 10120

Formerly PROTAVIC® I 3612 SC

A 27867-08-08 B

DEFINITION

The **PROTAVIC® ATE 10120** is a solvent-free, single-component, electrically insulating, thermo-conducting adhesive for mounting components on a substrate when the bond does not need to be electrically conductive.

The product is easy to apply since no mixing is involved and its rheology makes it suitable for application by microdispenser or screen printing on automatic machines. At 20°C, the machine pot life is 12 hours.

Adhesion on gold-plated silicon and on the metals and ceramics used in electronics is very good and comparable to that of the best silver-filled adhesives.

The reactivity of the **PROTAVIC® ATE 10120** is in the region of 1 min. at 150°C, which enables it to be used for the insulating bonding of silicon crystals on heat-sensitive substrates.

PRODUCT DESCRIPTION

Nature	1-component electrically insulating epoxy adhesive	
Appearance	liquid	
Odour	ethereal	
Colour	white	
Guaranteed specification	Standard	Method
Plane cone viscosity at 25°C (mPa.s)	10000 ± 4000	NFT 51211
Significant value (for guidance)		
% Filler content at 900°C	34 approx.	
Other information		
Density	1.6	
A 50 % increase of the viscosity at 20 ± 5°C	1 month	
Possible curing cycles	60-90 minutes at 75°C 7-15 minutes at 100°C 3-5 minutes at 125°C 1-2 minutes at 140°C • post-curing for 30 min. at 150°C is recommended in all cases.	
Storage	3 months at +4°C 1 year at -20°C 1 year at -40°C	

APPLICATION PROPERTIES

The rheology of the **PROTAVIC® ATE 10120** adhesive has been designed for application by microdispenser, pad or screen printing.

In all these applications, the long pot life and absence of solvent ensure that the product remains at a reasonably constant viscosity and facilitates machine adjustments.

However, curing remains very quick just little as a few minutes at 140-150°C.

After curing, the **PROTAVIC® ATE 10120** adhesive sticks well on all types of substrate as well as showing thermal stability up to around 350°C for a few seconds.

The product's good thermal conductivity and high ionic purity prevent overheating and corrosion respectively, thereby contributing towards the reliability of the system.

METHOD OF USE

In order to obtain a non-porous adhesive joint, treatment under a vacuum of 1 mm of mercury for 15 mn is desirable when the product is not supplied in a syringe which can be fitted directly onto the dispenser.

In the absence of stirring, provide a container which is at least six times higher than the initial height of the mixture.

– Surfaces to be stuck should be clean and free from dust or grease. Use a flame or solvent vapours if possible. Avoid chlorinated solvents which encourage corrosion.

– Apply the adhesive with :

- a microdispenser,
- a metal screen printing screen with a mesh size between 140 and 325,
- a pad
- a spatula.

- Cure according to one of the curing cycles which is compatible with the component, the substrate and the manufacturing conditions.

In practice, cycles of 20 minutes at 100°C and 1-2 minutes at 140°C are widely used.

The following post-curings are recommended :

- 2-3 hours at 100°C
- 1-2 hours at 125°C
- 30 min.-1 hour at 150°C

TYPICAL PROPERTIES OF THE CURED SYSTEM

The properties mentioned below were obtained after curing for 1h at 150°C.

They were determined following measurements carried out in the laboratory in 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® ATE 10120** adhesive can be used for the particular application which he/she has in mind.

1 - PHYSICO-CHEMICAL PROPERTIES

Properties	Methods	Units	Typical values
Colour	--	--	white to pale grey
Density at 20°C	NFT 51201	g/cm ³	1.6
Shear strength	NFT 76107	daN/cm ² MPa	> 50 > 5.0
Ionic chlorine content	S 86005	µg/g	< 10
Sodium content	MIL 883 - 5011	µg/g	< 50

The product can be applied either by micro-dispenser, screen printing or pad. The fine particle size enables layers of adhesive to be applied which are only 25 microns thick (1 mil).

The very high reactivity enables curing to take place on-line within a few tens of seconds at temperatures of over 150°C.

This reactivity also enables bonding to take place in the presence of heat-sensitive materials (polyester, PVC, etc.).

PRECAUTIONS IN USE

Refer to the attached safety data sheets.

PACKAGING

The **PROTAVIC® ATE 10120** is supplied in 25 g and 100 g flasks or in 5 or 15 g syringes.

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.

2 - ELECTRICAL PROPERTIES

Properties	Methods	Units	Typical values
Dielectric strength	NFC 26255	kV/mm	> 15
Dielectric coefficient at 100 HZ and 20°C	NFC 26230	--	4.0 ± 0.5
Electrical dissipation factor at 100 HZ and 20°C	NFC 26230	--	< 0.01
Transverse resistivity	NFC 26215	ohm.cm	> 10 ⁺¹³

3 - THERMICAL PROPERTIES

Properties	Methods	Units	Typical values
Glass transition temperature Tg	DSC 1*	°C	70-80°C
Coefficient of linear expansion between -50 and +50°C	TMA 1*	10 ⁻⁶	50-60
Coefficient of linear expansion between 100 and 250°C	TMA 1*	10 ⁻⁶	150-160
Thermal conductivity	CTH 2	W/(m.K)	> 1.0
Decomposition temperature	TGA 1*	°C	> 350
Weight loss between 25 and 100°C		%	0.06
Weight loss between 25 and 200°C		%	0.20
Weight loss between 25 and 300°C		%	1.24

* Mettler TA 3000 thermo-analysis sequence

APPLICATIONS

The **PROTAVIC® ATE 10120** insulating and thermo-conductive adhesive has been specially developed for mounting high level integration logical circuits on lead frames.

Thermal conductivity reaches 1 W/(mK), which is only a little below the values obtained with adhesives with a 70 % silver content (2.5 to 3.5 W/(mK)).

The shear strength is comparable with that of silver-filled resins and values of over 3 daN/mm² at 90°C can be obtained on a circuit stuck onto its substrate.

The high ionic purity avoids problems of corrosion and ageing. It therefore contributes towards the reliability of systems which use the **PROTAVIC® ATE 10120**.