



PROTAVIC® ANE 20904

Formerly PROTAVIC® L 900-4

A27864-08-08B

DEFINITION

The solvent free single component adhesive **PROTAVIC® ANE 20904** is an underfill for flip chips up to 5x5 mm on flexible substrates (thin FR4 or BT substrates).

The rheology of the paste allows a good wetting of gaps over 25 µm without bleeding.

The adhesive has been designed for application by dispenser with a long pot life of 8 hours at 20°C.

The curing below 120°C within 10-20 minutes avoid stresses on thin substrates.

The ionic purity is very good to avoid any corrosion problem with the chips.

PRODUCT DESCRIPTION

Appearance	liquid	
Odour	slight	
Colour	black	
Guaranteed specifications	Standard	Method
Cone and plate viscosity (mPa.s) 19/s	20 000 ± 5 000	NFT 51211
Exothermic peak temperature (°C)	150 ± 10	DSC 1
Other information		
Density	1.6 approximately	
Pot life* at 20 ± 5°C	8 hours at 20 ± 5°C	
Curing schedules	2-3 hours at 50°C 60-90 minutes at 75°C 7-15 minutes at 100°C 3-5 minutes at 125°C 50-70 seconds at 150°C A post-curing for 30 hours at 120°C is recommended	
Storage	1 week at -4°C 3 months at -20°C 1 year at -40°C	

* defined as a 100% viscosity increase

APPLICATION PROPERTIES

The viscosity of the **PROTAVIC® ANE 20904** makes the product well adapted to dispensing with a needle over 0.4 mm internal diameter.

In all applications, its high latency at room temperature (more than 8 hours) and the absence of solvent ensure that the product remains at a reasonable constant viscosity and facilitates machine adjustments.

Its high ionic purity also avoid problems of corrosion. It also contributes to the reliability of components during their life.

CONDITIONS OF USE

Keep the packaging out of the refrigerator at least 1-4 hours before dispensing to get a stable viscosity.

The use of **PROTAVIC® ANE 20904** is simplified by the stable viscosity at $20 \pm 5^\circ\text{C}$ which prevents the need for adjustments, over a 8 hours period.

The substrates or components must be free of dust and from oily residues to achieve an optimal adhesion. Avoid contact with chlorinated solvents which could induce pollution and corrosion.

Apply the compound with a micro-dispenser (internal needle diameter over 0.4 mm). Preheating of the needle up to 40°C and the substrate up to 80°C will make the under filling more easy.

Typical curing schedule is 20-30 minutes at 120°C or 2-3 hours at 80°C . Such conditions allow the compound to present optimised thermal and physico-chemical properties. A post curing of 30 minutes at 120°C could be necessary to satisfy tight specifications.

After an appropriate curing, the thermal stability of the underfill reaches 155°C with possibility to withstand 350°C for a few seconds.

TYPICAL PROPERTIES OF THE CURED SYSTEM

The properties given below and summarised in the following tables were obtained after polymerisation for 20 minutes at 120°C in a ventilated oven.

These values given are typical and do not correspond to a guarantee. The user must, in all cases, by his own studies, determine the optimal polymerisation conditions for his own particular application of the **PROTAVIC® ANE 20904**.

1 - PHYSICO-CHEMICAL PROPERTIES

Properties	Methods	Units	Values
Colour	-	-	black
Density	NFT 51063 ISO1675	None	1.6 approx
Shore D hardness	NFT51109 ISO868	None	About 88
Shear strength Al/Al	ISO4587 NFT76107	daN/cm ² Mpa	> 50 > 5.0
Chlorine content	S86005	µg/g	< 10
Sodium content	MIL 883	µg/g	< 100
Potassium content	MIL 883	µg/g	< 50

2 - ELECTRICAL PROPERTIES

Properties	Methods	Units	Values
Breakdown voltage	CEI 243 NFC 26255	kV/mm	> 15
Dielectric constant 100Hz at 20°C	CEI 250 NFC 26230	–	4.5 ± 0.5
Loss factor	CEI 250 NFC 26230	–	< 0.01
Resistivity at 20°C	CEI 93 NFC 26215	ohm.cm	> 10 ⁺¹³

3 - THERMAL PROPERTIES

Properties	Methods	Units	Values
Glass transition temperature	DSC 1*	°C	40-60
Expansion coefficient between -50 and +50°C	TMA 1*	10 ⁻⁶ /°C	35-45
Expansion coefficient between 100 and +250°C	TMA 1*	10 ⁻⁶ /°C	110-120
Thermal conductivity	CTH2	W/(m.K) Btu/ft2.in.F.h	0.5 - 1.0 3-7
Water absorption	ASTM D 570	%	0.2 - 0.3
Decomposition temperature in air by TGA**	TGA 1	°C	> to 370

*** TGA = thermogravimetric analysis : 10°C/min. under low air sweeping

STORAGE CONDITIONS

Store **PROTAVIC® ANE 20904** in its hermetically sealed container, protected from moisture and at a maximum storage temperature of -40°C.

Under these conditions, the maximum period of storage is about 1 year.

At -20°C the shelf life is 3 months.

PRECAUTIONS IN USE

Refer to the attached safety data sheets.

PACKAGING

The **PROTAVIC® ANE 20904** is supplied in 10 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.