



## TECHNOLOGIES

### ➤ DIE ATTACH

- ELECTRO-CONDUCTIVE
- NON ELECTRO-CONDUCTIVE
- B- STAGEABLE

### ➤ DAM & FILL, GLOB TOP ENCAPSULANTS

## ADVANTAGES

Low modulus, Low Tg for thin die applications

High thermal conductivity

Spacer versions available for controlled bondline

Fast cure, low modulus, non-bleed

Improved bondline control , alternative to film adhesives

High Tg , Low CTE materials for improved thermal cycling performance

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## ➤ DIE ATTACH

### Typical Application

The die attach process involves affixing silicon die or chips to a lead frame or other substrate with adhesive, either electrically conductive, or dielectric. PROTAVIC offers a range of adhesive pastes specifically designed for this application. The die attach materials have been designed, using different chemistries depending the end application and requirements. Our portfolio for die attach includes epoxies, acrylics, polyimides, as well as hybrids. As such, we can offer high thermally conductive die attach adhesives, very fast curable adhesives, flexible die attach adhesives with low E-modulus, etc.

Our portfolio also covers B-stageable materials, which are an alternative for traditional dispensible die-attach adhesives, and are a economical alternative to expensive film adhesives.

ELECTRO-CONDUCTIVE PROTAVIC®	CHEM.	VISCOSITY AT 5 RPM (mPa.s)	ELECT. RESIST. (MΩ.CM)	TG (°C)	STORAGE COND.	POT LIFE AT 20±2°C	CURING SCHEDULES	CTE (ppm / °C)	YOUNG MODULUS
<a href="#">PROTAVIC® ACE 30032</a>	Epoxy.	8000	0.1	80/100	6 months@-20°C	1 day	60 min @ 150°C	100	
<a href="#">PROTAVIC® ACA 20510</a>	Acrylic	10000	0.1	37	6 months@-40°C	> 1 day	30 min @200°C		4,6 Gpa@25°C 0.8 Gpa@100°C 1.8 Gpa@150°C
<a href="#">PROTAVIC® ACE 34560</a>	Epoxy	19000	0.0064	140	6 months@-20°C	2 days	70 min@80°C 20 min@130°C	44	3090MPa@25°C 438MPa@250°C
<a href="#">PROTAVIC® ACE 24530</a>	Epoxy	9175	0.35	78	1 year@-40°C	1 day	15 min @175°C	50	2615MPa@25°C 222MPa@250°C
<a href="#">PROTAVIC® ACE 24814</a>	Epoxy	7800	0.06	93	1 year @-0°C	2 days	15 min @175°C	65	4815MPa@25°C 595MPa@100°C 274MPa@250°C
<a href="#">PROTAVIC® ACE 14070</a>	Epoxy	10000	0.088	75	1 year@-40°C	1 day	50 sec @200°C (in-line snap cure oven)	63	2339MPa@25°C
<a href="#">PROTAVIC® ACE 14050</a>	Epoxy	7864	0.114	78	1 year@-40°C	36 hrs	72 sec @200°C (in-line snap cure oven) 30min@175°C	58	1294MPa@25°C 160MPa@250°C
<a href="#">PROTAVIC® ANH 20142</a>	Hybrid	off white	8500		1 year@-20°C	1 day	30 min@ 150°C 15 min@ 175°C	25 max	
<a href="#">PROTAVIC® ANE 30100</a>	Epoxy	black	7000	110	6 months@-20°C	7 days	60 min@ 120°C	30 max	
<a href="#">PROTAVIC® ANE 10713</a>	Epoxy	opalescent	11000	110	6 months@5°C	1 month	10 sec @170°C 40 sec @150°C	25 max	7 Gpa@25°C 2.5 Gpa@100°C 1 Gpa@150°C
<a href="#">PROTAVIC® ANE 24054</a>	Epoxy	black	11500	43	6 months@-20°C	1 day	30 min @150°C	20 max	2480MPa@25°C 26MPa@150°C 36MPa@250°C

## B-Stageable epoxy for die attach

B-STAGEABLE PROTAVIC®	CHEM.	COLOR	VISCOSITY AT 5 RPM (mPa.s)	TG (°C)	STORAGE COND.	POT LIFE AT 20±2°C	CURING SCHEDULES	HEGMANN FINENESS (micron)	YOUNG MODULUS
PROTAVIC® BCE 20240	Epoxy	silver	25000	65	1 year@0°C	1 month	30min@90°C +30 min@ 180°C		2.7GPa @25°C 0.28GPa@250°C
PROTAVIC® BNE 20220	Epoxy	black	30000	63	1 year@0°C	1 month	30min@90°C +30 min@ 180°C	30 max	



### ➤ DAM/FILL & GLOB TOP

#### Typical Application

Dispensing a high-viscosity dam followed by a low-viscosity fill, will create a completed encapsulated package for your CSP, BGA and/or other semiconductor component. Dam-and-Fill materials improve the reliability of the package, and help in reducing warpage. As such, the components will resist to physical thermal stress, as well as improve resistance against moisture and chemicals.

Glob Top encapsulants have the same purpose as Dam & Fill materials. Where Dam & Fill encapsulants are typically used for larger die applications, Glob Top encapsulants are used in case of smaller chips. Our range covers materials with high Tg and low CTE.

DAM/FILL GLOB TOP PROTAVIC®	FUNCTION	CHEM.	VISCOSITY AT 5 RPM (mPa.s)	TG (°C)	CTE (ppm/°C)	CURING SCHEDULES	POT LIFE	STORAGE
PROTAVIC® PNE 30252	Dam	Epoxy	105000 at 2rpm	140 -150	24	20 min @ 150°C	1 day	3 months @-20°C
PROTAVIC® PNE 30270	Glob Top	Epoxy	70000	125	20	30-40 min @ 125°C 1-2 min @ 175°C	5 days	3 months @-20°C
PROTAVIC® PNE 30273	Fill	Epoxy	22000	160- 170	20	30-40 min @ 125°C 1-2 min @ 175°C	24Hrs	3 months @-20°C
PROTAVIC® PNE 90595	Dam	Epoxy	16000	24	140 -150	30 sec @ 120MW/cm <sup>2</sup> UVA	5 days	6 months @5°C
PROTAVIC® PNE 90295	Fill	Epoxy	2700	57	125	30 sec @120MW/cm <sup>2</sup> UVA	24 hrs	6 months @5°C
PROTAVIC® PTS 46313	Dam	Silicone	8000	below 0°C		30 min @ 125°C	24 hrs	1 year @-40°C