MICRO-ENCAPSULANTS (COB ENCAPSULANTS)

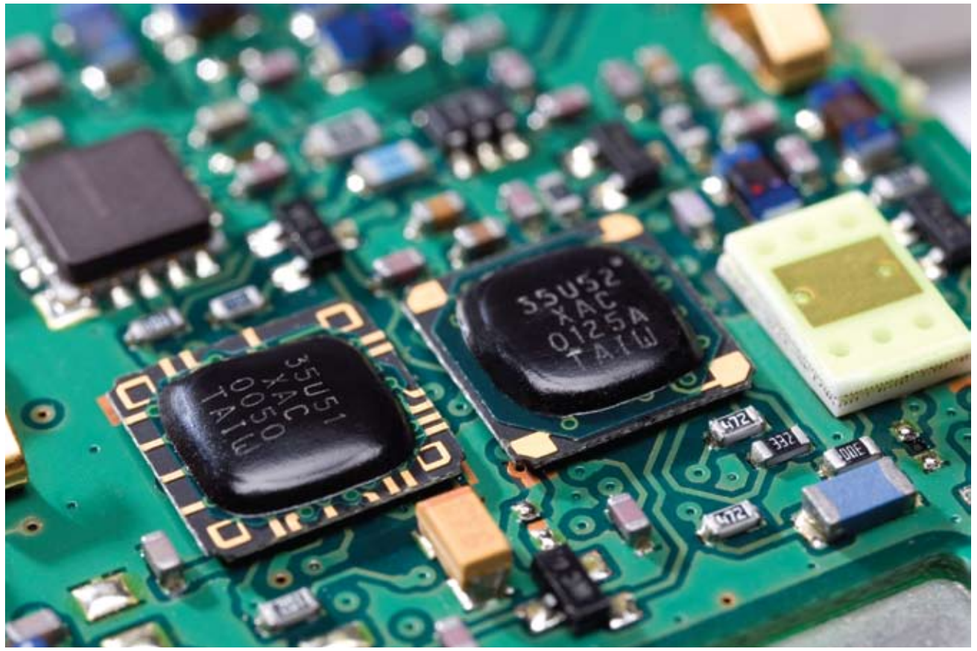
Encapsulants are used to provide environmental protection and add mechanical strength to wire bonded devices. Two different application technologies are employed for the protective encapsulation of wire bonded die:

- Glob top technology requires an encapsulant with a fine-tuned rheology, as the flow capabilities must allow the wires to be covered without the encapsulant flowing beyond the chip.

- Dam and fill technology, where the dam is used to limit the flow of the low viscosity fill material, allowing its use with fine pitch wire leads.

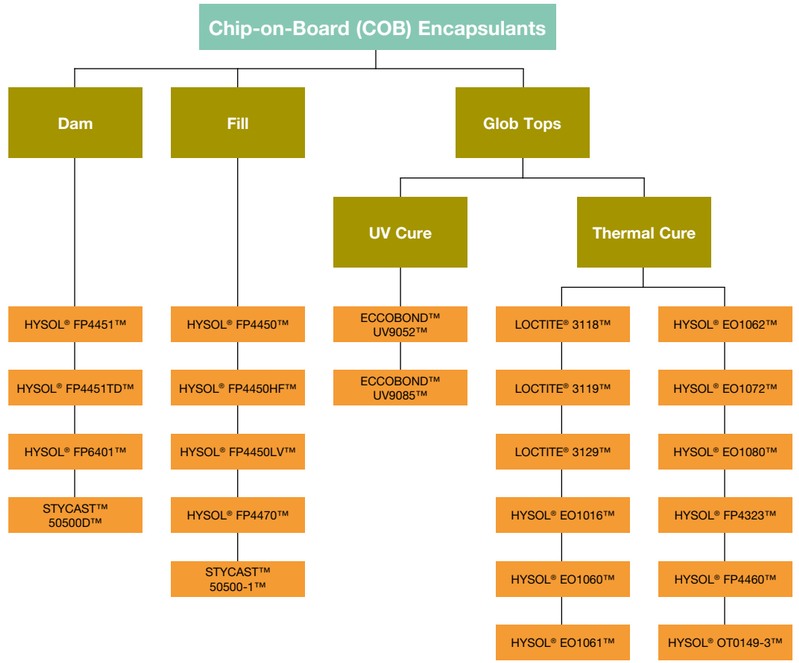
Henkel's Hysol® and Eccobond™ encapsulants are available as either thermal or ultraviolet cure materials and are designed for the highest reliability in that they offer low coefficient of thermal expansion, high glass transition temperature, and low ionic content. These encapsulants have been engineered to provide protection to wire bonds, leads, aluminium and silicon dies from harsh environments, mechanical damage and corrosion.

Formulated from epoxy, polyurethane, acrylate (UV curable) and silicone chemistries, these systems have proven reliability for electronic insulation. Henkel encapsulants offer excellent elevated temperature stability and thermal shock resistance, outstanding electrical insulation at both room and elevated temperatures, minimal shrinkage and low stress during cure, as well as excellent chemical resistance. Our encapsulants have been designed to offer high throughput and low-cost assembly processes.



ASSEMBLY
MATERIALS

MICRO-ENCAPSULANTS
(COB ENCAPSULANTS)



CHIP-ON-BOARD – DAM MATERIALS

PRODUCT	DESCRIPTION	CURE SCHEDULES	FLOW SPEED	VISCOSITY (cPs)	Tg (°C)	CTE α_1 (ppm/°C)	% FILLER
HYSOL® FP4451™	Industry standard damming material for BGAs.	30 min. @ 125°C 90 min. @ 165°C	N/A	900,000	145	24	72
HYSOL® FP4451TD™	Tall dam version of FP4451™ for applications requiring a taller, narrower dam. Ionically cleaner also.	30 min. @ 125°C 90 min. @ 165°C	N/A	300,000	150	21	73
HYSOL® FP6401™	High purity, liquid flexible damming material.	30 min. @ 165°C	N/A	300,000	0	77	9
STYCAST™ 50500D™	For protection of wire bonds, consider this high purity material as either a dam or a glob top.	2 hrs. @ 150°C	N/A	125,000	70	80	75

CHIP-ON-BOARD – FILL MATERIALS

HYSOL® FP4450™	Industry standard fill material for dam and fill or cavity down BGAs.	30 min. @ 125°C 90 min. @ 165°C	Medium	50,000	155	22	73
HYSOL® FP4450HF™	High flow version of FP4450LV™ using synthetic filler for use in fine wire and low alpha application.	30 min. @ 125°C 90 min. @ 165°C	Very High	32,000	160	19	73
HYSOL® FP4450LV™	Low viscosity, high purity, low stress liquid encapsulant.	30 min. @ 125°C 90 min. @ 165°C	Not Tested	35,000	160	18	72.5
HYSOL® FP4470™	High adhesion version of FP4450™ for 260°C L3 JEDEC performance.	30 min. @ 125°C 90 min. @ 165°C	High	48,000	148	18	75
STYCAST™ 50500-1™	For protection of wire-bonded ICS, consider this flowable material for a fill.	1 hr. @ 150°C	High	35,000	140	20	75

ASSEMBLY MATERIALS

MICRO-ENCAPSULANTS (COB ENCAPSULANTS)

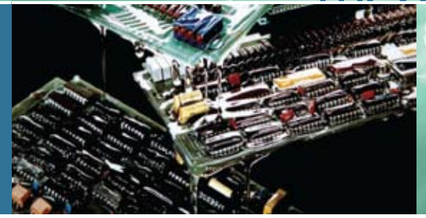
GLOB TOP MATERIALS – UV CURE

PRODUCT	DESCRIPTION	CURE SCHEDULES	VISCOSITY (cPs)	Hardness after UV & Moisture Cure (Shore D)	STORAGE TEMP
ECCOBOND™ UV9052™	A one-component, dual cure (UV & moisture) adhesive designed as a lead encapsulant.	5 sec. using a 300 W/in D bulb Moisture cure @ ambient temperature	6,400	<30	-20°C
ECCOBOND™ UV9085™	Designed as a faster curing, high thixotropic adhesive that gives good flow control and adhesion for a thick bondline.	5 sec. using a 300 W/in D bulb	40,000	<50	0°C to +4°C

GLOB TOP MATERIALS – THERMAL CURE

PRODUCT	DESCRIPTION	POT LIFE @ 25°C	CURE SCHEDULES	VISCOSITY (cPs)	Tg (°C)	CTE α_1 (ppm/°C)	FILLER TYPE	STORAGE TEMP
LOCTITE® 3118™	Image sensor adhesive, white.	2 weeks	20 min. @80°C 60 min. @ 60°C	16,000 to 50,000	45	40	Calcium Carbonate	-40°C
LOCTITE® 3119™	Image sensor adhesive.	1 week	20 min. @ 80°C 60 min. @ 60°C	10,000 to 38,000	110	65	Calcium Carbonate	-15°C
LOCTITE® 3129™	Image sensor adhesive.	3 weeks	10 min. @ 80°C 30 min. @ 60°C	100,000	41	45	Calcium Carbonate	-15°C
HYSOL® EO1016™	UL94V-0 encapsulant for smartcards and watch ICs. Non-abrasive filler allows for grinding if necessary.	3 months	20 min. @ 150°C	60,000	126	46	Calcium Carbonate	4°C
HYSOL® EO1060™	Low glob formulation for lower CTE and lower ionic than EO1016™ content for more demanding applications.	25 days	4 - 6 hrs. @ 125°C	20,000	125	40	Calcium Carbonate	4°C
HYSOL® EO1061™	Medium glob formulation for lower CTE and lower ionic than EO1016™ content for more demanding applications.	25 days	4 - 6 hrs. @ 125°C	50,000	125	40	Calcium Carbonate	4°C
HYSOL® EO1062™	High glob version of EO1061™.	25 days	4 - 6 hrs. @ 125°C	160,000	125	40	Calcium Carbonate	4°C
HYSOL® EO1072™	One-component, high performance epoxy encapsulant with high Tg and low extractable ionics.	30 days	5 min. @ 140°C	100,000	135	43	Calcium Carbonate	4°C
HYSOL® EO1080™	Low CTE version of EO1016™.	3 months	20 min. @ 150°C	60,000	121	35	Silica	4°C
HYSOL® FP4323™	High purity liquid epoxy encapsulant for Chip-on-Board (plastic substrate) and plastic PGA applications.	2 days	3 hrs. @ 170°C	220,000	174	28	Silica	-40°C
HYSOL® FP4460™	High purity, low stress glob top semiconductor encapsulant with improved moisture resistance and working life compared to earlier versions.	2 days	3 hrs. @ 150°C	420,000	171	20	Silica	-40°C
HYSOL® OT0149-3™	Clear glob top material with good adhesion to any substrate.		1 hr. @ 90°C + 3 hrs. @ 120°C		150			

ASSEMBLY MATERIALS



PCB PROTECTION

While Henkel is providing the leading materials used inside advanced packages and on sophisticated assemblies, we also deliver next-generation Loctite® and Eccocoat™ brand conformal coating materials to ensure superior product protection. Many applications expose printed circuit boards (PCBs) to harsh environments and Henkel is committed to delivering materials that provide extraordinary environmental and thermal cycling protection.

Our advanced conformal coating materials protect PCBs from thermal shock, moisture corrosive materials, and a variety of other adverse conditions to ensure long product life cycles in harsh marine, automotive, aerospace and consumer electronics applications. We also keep the environment top of mind with every formulation, which is why Henkel has migrated to solvent-free, low-VOC materials and processes. Loctite® and Eccocoat™ conformal coatings are available in solvent-free and fast cure materials, enabling process efficiency and environmental responsibility.