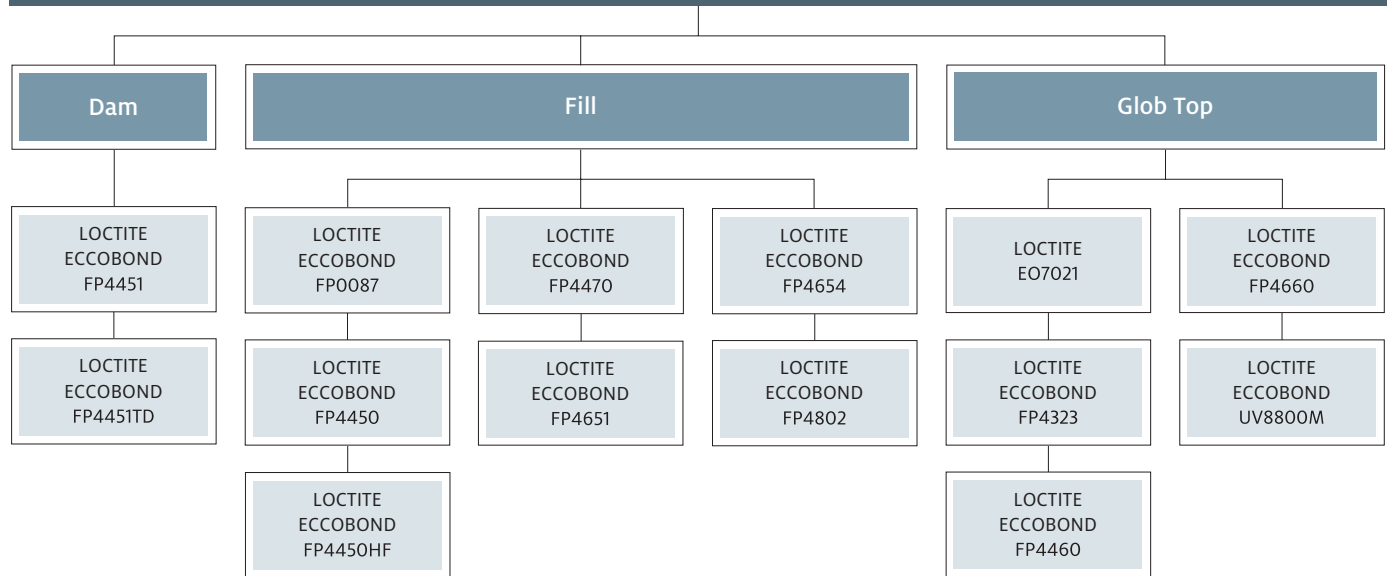


## Henkel Solutions for Laminate Packaging Encapsulants

### ENCAPSULANTS FOR WIREBOND LAMINATE PACKAGING





# Henkel Solutions for Laminate Packaging Encapsulants

PRODUCT	DESCRIPTION	KEY ATTRIBUTES	APPLICATION	VISCOSITY AT 25°C (cP)	GLASS TRANSITION TEMPERATURE, T <sub>g</sub> (°C)	CTE, BELOW T <sub>g</sub> (ppm/°C)	RECOMMENDED CURE
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## Dam

LOCTITE ECCOBOND FP4451	Epoxy dam encapsulant	<ul style="list-style-type: none"> <li>Stable and consistent thixotropy with minimal slumping</li> <li>Excellent pressure pot performance on live devices up to 500 hr.</li> <li>Designed for use with fill encapsulant LOCTITE ECCOBOND FP4450</li> <li>Oven cure</li> </ul>	BGA and memory	860,000 at 4 rpm	155	22	30 min. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND FP4451TD	Epoxy dam encapsulant	<ul style="list-style-type: none"> <li>Ionically clean</li> <li>High thixotropy with high height to width aspect ratio (0.7)</li> <li>Excellent chemical resistance and thermal stability</li> <li>Designed for use with fill encapsulant LOCTITE ECCOBOND FP4450</li> <li>Oven cure</li> </ul>	BGA and memory	300,000 at 20 rpm	150	21	30 min. at 125°C + 90 min. at 165°C

## Fill

LOCTITE ECCOBOND FP0087	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>Low stress and high flow with reduced warpage and cracking</li> <li>Low CTE</li> <li>Excellent thermal shock and moisture resistance</li> <li>Halogen-free</li> <li>Oven cure</li> </ul>	Stress-sensitive devices and severe automotive environments	20,000 at 20 rpm	175	18	1 hr. at 125°C + 1 hr. at 180°C
LOCTITE ECCOBOND FP4450	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>Low stress and relatively high flow</li> <li>Good moisture resistance and excellent chemical resistance</li> <li>Excellent pressure pot performance on live devices up to 500 hr.</li> <li>Oven cure</li> </ul>	Automotive, BGA, memory, COB, SiP and SmartCard	43,900 at 20 rpm	155	22	30 min. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND FP4450HF	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>Excellent chemical, corrosion and moisture resistance</li> <li>High thermal stability</li> <li>Very high flow and fine filler (max. particle size 25 µm)</li> <li>Oven cure</li> </ul>	Automotive, BGA, memory, COB, SiP and SmartCard	32,000 at 20 rpm	164	21	30 min. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND FP4470	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>MSL3 260°C capable</li> <li>High reliability</li> <li>Excellent flow good for fine pitch wires and deep cavities</li> <li>260°C reflow capability for Pb-free applications</li> <li>Oven cure</li> </ul>	BGA, CSP and full array on low temperature co-fired ceramic (LTCC)	42,000 at 10 rpm	148	18	30 min. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND FP4651	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>Low stress</li> <li>Low CTE</li> <li>Easy to dispense</li> <li>Excellent chemical resistance and thermal stability</li> <li>Oven cure</li> </ul>	Automotive, BGA, memory, COB, SiP, SmartCard and chip array ceramic packages	130,000 at 20 rpm	150	11	1 hr. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND FP4654	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>Fine filler</li> <li>Low stress and low CTE</li> <li>Excellent chemical resistance and thermal stability</li> <li>Jettable</li> <li>Oven cure</li> </ul>	MEMS and chip array ceramic packages	32,000 at 20 rpm	146	13	30 min. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND FP4802	Epoxy fill encapsulant	<ul style="list-style-type: none"> <li>MSL2 260°C capable</li> <li>Low warpage</li> <li>Excellent flow good for fine pitch wires and deep cavities</li> <li>Oven cure</li> </ul>	BGA, CSP and full array on low temperature co-fired ceramic (LTCC)	80,000 at 10 rpm	50	20	60 min. at 120°C + 120 min. at 165°C

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### Glob Top

LOCTITE ECCOBOND FP4323	Epoxy glob top encapsulant	<ul style="list-style-type: none"><li>• Low CTE for improved thermal cycling</li><li>• Thixotropic</li><li>• Excellent moisture and chemical resistance</li><li>• Oven cure</li></ul>	COB and plastic PGA	220,000 at 2 rpm	174	28	4 hr. at 150°C
LOCTITE ECCOBOND FP4460	Epoxy glob top encapsulant	<ul style="list-style-type: none"><li>• Low stress and high flow</li><li>• Improved work life</li><li>• Good pressure pot performance with low shrinkage</li><li>• Excellent moisture and chemical resistance</li><li>• Oven cure</li></ul>	Automotive, BGA, memory, COB, SIP and SmartCard	300,000 at 10 rpm	173	20	3 hr. at 150°C
LOCTITE ECCOBOND FP4660	Epoxy/anhydride glob top encapsulant	<ul style="list-style-type: none"><li>• Low stress</li><li>• Excellent chemical resistance and thermal stability</li><li>• Jettable</li><li>• Oven cure</li></ul>	CSP and low stress applications	120,000 at 5 rpm	135	13	30 min. at 125°C + 90 min. at 165°C
LOCTITE ECCOBOND UV8800M	Epoxy glob top encapsulant	<ul style="list-style-type: none"><li>• Good pressure pot performance with low shrinkage</li><li>• Excellent surface cure with adhesion to a wide range of substrates</li><li>• Accurate dispensing with excellent shape control</li><li>• UV cure</li></ul>	CSP, BGA and SmartCard	2,500 – 4,000 at 5 rpm	29	41	2 sec. at 100 mW/cm <sup>2</sup>
LOCTITE EO7021	Epoxy glob top encapsulant	<ul style="list-style-type: none"><li>• One component</li><li>• Fast oven cure at moderate temperatures</li></ul>	CSP, BGA and SmartCard	17,000 at 5 rpm	125	67	1 hr. at 120°C

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