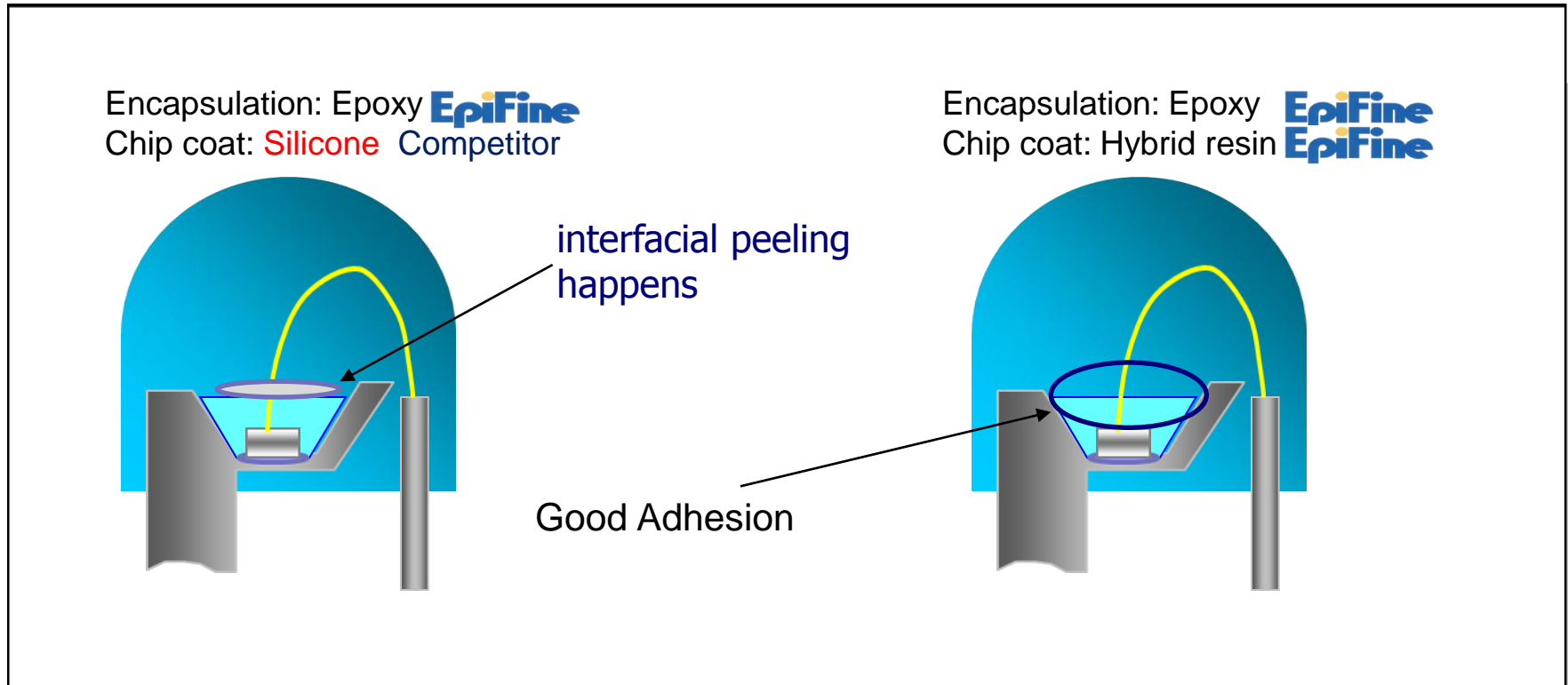


EpiFine ~ Theme of adhesion

Generally, used resins are Encapsulation for Epoxy, Chip coat for silicone. These two resins must have good adhesion to avoid interfacial peeling.



To use Epoxy-Silicone Hybrid resin for chip coat, It realize good adhesion between Encapsulation and chip coat.

EpiFine ~ Theme of Thermal Shock

Generally, LED needs high-resistance to Thermal Shock. We tested reliability.

Test condition : (-40°C × 15min ↔ 110°C × 15min)

Mixing and cure conditions		
EX-0385A/B+ Phosphor	100 : 60 : 10 ~ 50	150°C1H
OT-6002A/B	100 : 100	120°C1.5H + 150°C4H
		Or 120°C1.5H + 170°C4H

Encapsulation / Chip Coat	Competitor resin / EX-0385AB	OT-6002AB / EX-0385AB	
		120°C1.5H+150°C4H	120°C1.5H+170°C3H
Cure condition	120°C1.5H+150°C4H	120°C1.5H+150°C4H	120°C1.5H+170°C3H
Cycle time	Dead /Test lamps	Dead /Test lamps	Dead /Test lamps
0	0/10	0/10	0/10
100	1/10	0/10	0/10
300	5/10	0/10	0/10
500	10/10	0/10	0/10
1,000	10/10	1/10	0/10

Best result

If you use both encapsulation and chip coat by EpiFine, it realizes good result under Thermal shock test.

EpiFine ~ EpiFine products for LAMP LED

Products name : OT-6002A/B , EX-0385A/B

Encapsulation for lamp type

EpiFine Encapsulation Epoxy

UV and Heat resistance, Flexibility
Transparent, Cost performance
EpiFine OT-6002A/B

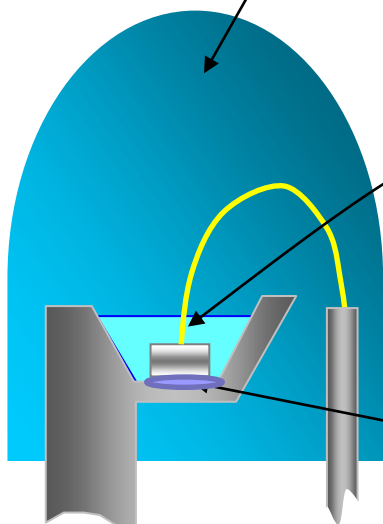
EpiFine Chip coat Hybrid

UV and Heat resistance,
Transparent, Adhesion
EpiFine EX-0385A/B

EpiFine Die attach

UV and Heat resistance,
Transparent, Adhesion
EpiFine EX-0291SH

*under develop



Basis data		OT-6002A/B	EX-0385A/B
Application		Encapsulation	Chip Coat
Resin		Epoxy	Hybrid
Viscosity[25°C]	Resin	4,000 mPa s	7,000 mPa s
	Hardener	150 mPa s	1,000 mPa s
	Mixing	800 mPa s	3,000 mPa s
Gel time		25Min(120°C)	2Min(120°C)
Mixing ratio		100:100	100:60
Cure condition		120°C × 1h(1st)	150°C × 1h
		170°C × 3h(2nd)	
		OT-6002A/B	EX-0385A/B
Tg (°C)		150	150
Thermal expansion	α1	6.5 × 10 ⁻⁵ K	10.0 × 10 ⁻⁵ K
Thermal expansion	α2	17.0 × 10 ⁻⁵ K	17.0 × 10 ⁻⁵ K
Modulus of elasticity		2,900 Mpa	2,000 Mpa
Bending strength		110 Mpa	70 Mpa
Hardness (Shore D)		88.0	84.0
Refraction index [DLine]		1.53	1.49