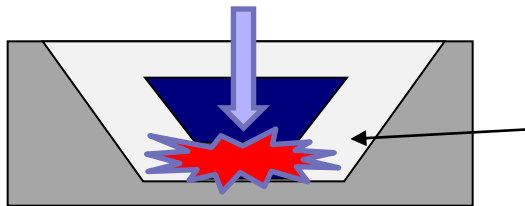


EpiFine ~ Theme of water proof and gas barrier

In LED market, There are silicone encapsulation resins with moisture and sulfide gas attack problems for LED die. EpiFine has gas-barrier character to improve those problems.

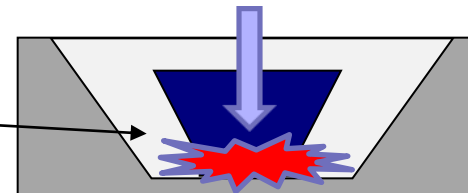
Common Silicone resins

Moisture attacks to lead frame



Caused corrosion

Sulfide gasses attack to lead frame



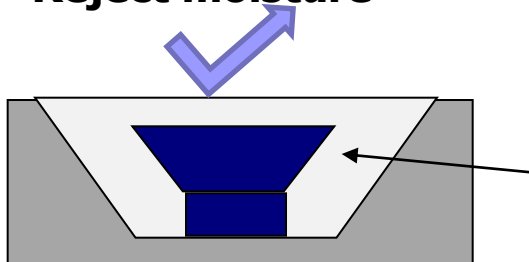
Caused corrosion

Silicone Encapsulation

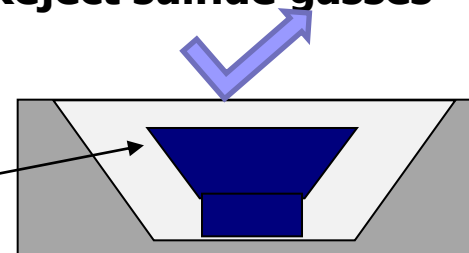
Caused metal corrosion by water vapor permeability
 (40degreeC)g/m²·day100-150 vapor permeability
 cc/m²·day 2,000-30,000 oxygen gas permeability



Reject moisture



Reject sulfide gasses



EpiFine Encapsulation

EpiFine has gas barrier character
 (40degreeC)g/m²·day<0.5 Vapor permeability
 cc/m²·day 2-5 oxygen gas permeability

EpiFine ~Theme of UV resistance

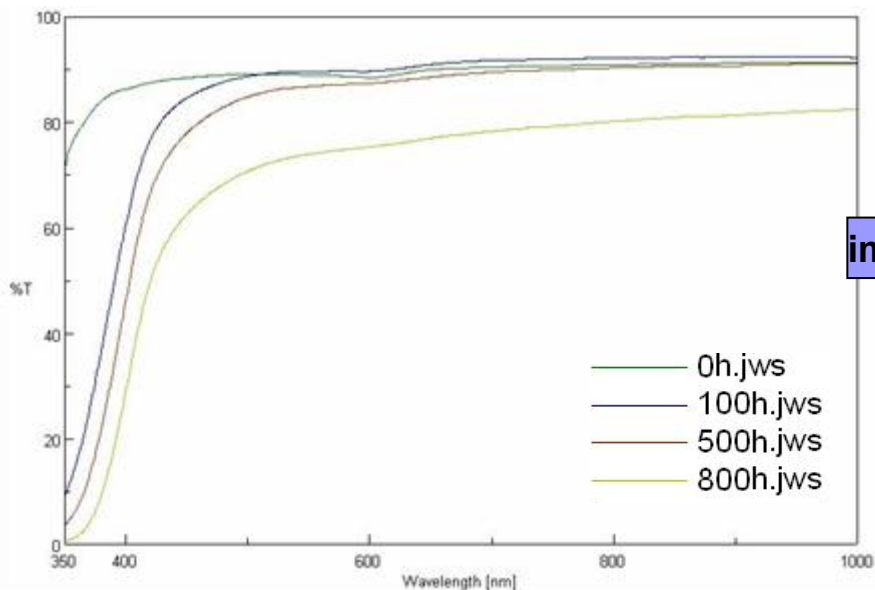
<Light>

high-pressure mercury lamp.

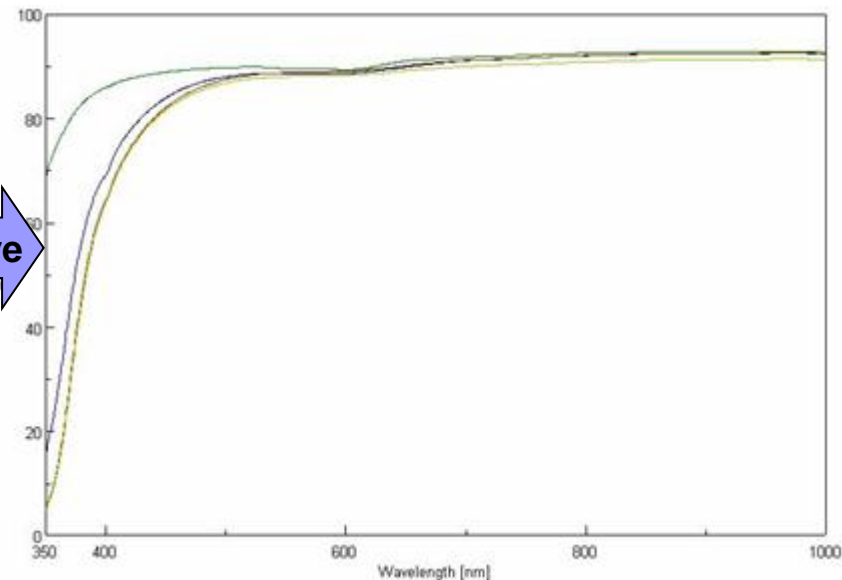
<aim>

To check whether transmittance will change or not.

《common resin》



《Hybrid resin》



improve

After exposing, Transmittance down + strength down → Emission trouble , Resin strength down

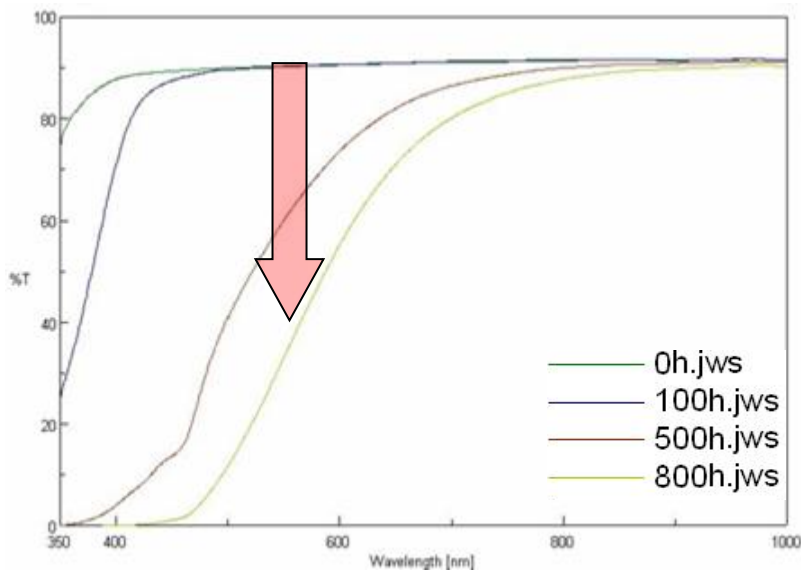
To improve UV resistance, To make LED long life.

EpiFine ~Theme of heat resistance

<Condition>

To heat epoxy resin in 150°C oven

《 common resin 》

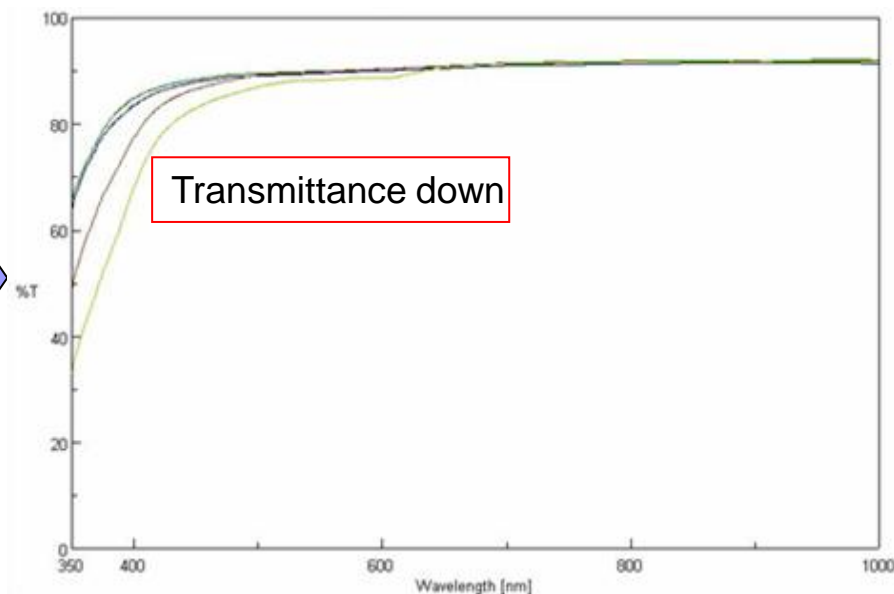


<aim>

To check whether transmittance will change or not.

《 Hybrid resin 》

improve



Transmittance down → short of heat-resistance, oxidation resistance, Emission trouble

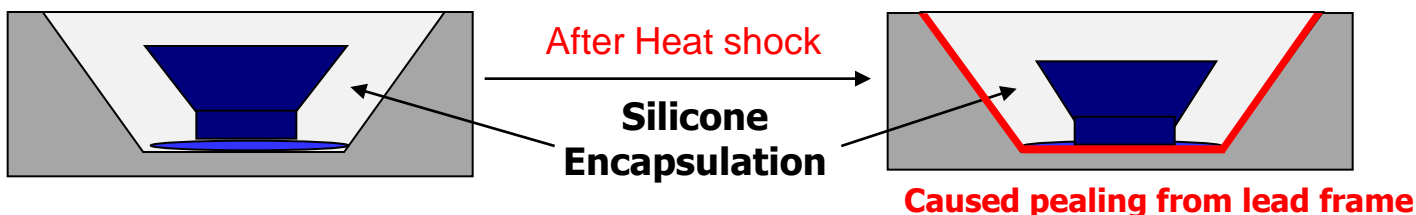
To improve Heat resistance, To make LED long life.

EpiFine ~ Theme of adhesion

Common silicone resin causes peeling from reflector because not having good adhesion to PPA.
Also causes dust attachment by tack character.

< PPA/PPA Adhesion test >

▪ Common silicone resin



Causes peeling not much adhesion. (PPA/PPA > 5Kg/N)
Also causes dust attachment by tack character.

EpiFine



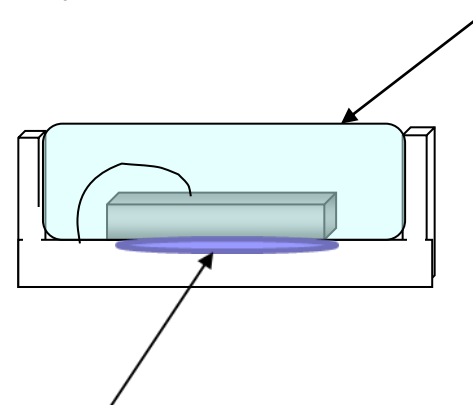
EpiFine has strong adhesive performance with PPA reflector.
(PPA/PPA > 12Kg/N)

EpiFine ~ Hybrid EpiFine for SMD LED

Product name : OT-7002A/B

| Basis data | | OT-7002A/B |
|-------------------------------|------------|-----------------------------|
| Appearance | Resin | Transparent slightly yellow |
| | Hardener | Transparent slightly yellow |
| Viscosity[25°C] | Resin | 4,760 mPa s |
| | Hardener | 2,720 mPa s |
| | Mixing | 4,100 mPa s |
| Gel time (150 degrees) | | 4Min(150°C) |
| Mixing ratio | | 100:60 |
| Cure condition | | 150°C×300分 |
| | | OT-7002A/B |
| Tg (°C) | | 132 |
| Thermal expansion | $\alpha 1$ | $10.0 \times 10^{-5} K$ |
| Thermal expansion | $\alpha 2$ | $17.5 \times 10^{-5} K$ |
| Modulus of elasticity | | 2100 MPa |
| Bending strength | | 80 MPa |
| Hardness (Shore D) | | 85.0 |
| Water absorption 1hr@100°C | | 0.6 |
| Refraction index [DLine] | | 1.490 |

EpiFine Encapsulation for SMD
 UV and Heat resistance, Flexibility
 Water proof, Gas barrier, Transparent,
 EpiFine OT-7002A/B



EpiFine Die attach
 UV and Heat resistance,
 Transparent, Adhesion
 EpiFine EX-0291SH
 *under develop