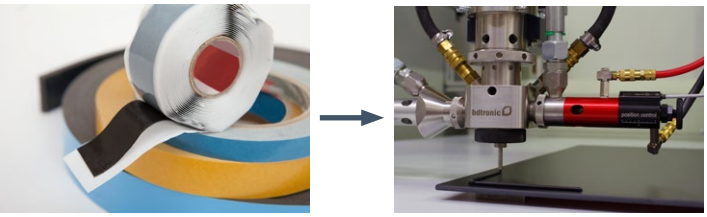
DOWSIL™ UV-curable Black Silicone Adhesives

Applications

- In display materials or modules
  - Using difficult heat cure resin
  - Because several display materials are distorted or melted
  - UV curable resin is necessary to prevent it
- UV curable Black Adhesives can replace black shielding tape, UV-heat, and UV-RT products

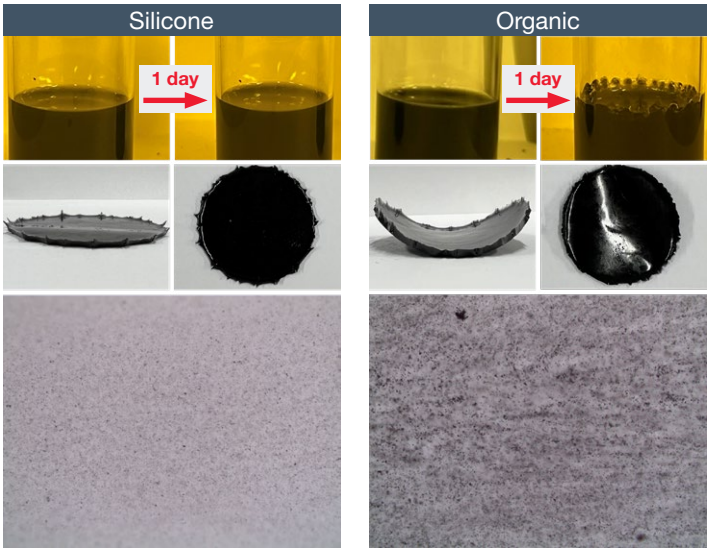


UV curable Black Adhesives	
Advantages	Reduce process time
	Mechanization is possible
	Thermal deformation of the material can be prevented
Applications	Black side seal (replace to black tape)
	Black gap fill resin
	Electrically conductive ink
	EMI shielding effect
	Etc.

Silicone vs organic

- UV curable and fast cure at low intensity of energy
- Low viscosity to fill thin gaps
- Low deformation (Low shrinkage)
- High thixotropy (>2.0)
- Deep curable and High OD

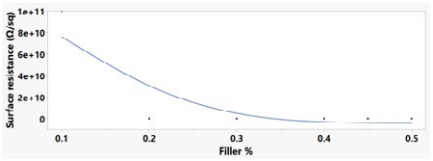
	Silicone	Organic
Phase separation	X	O
Shrinkage	X	O
Dispersibility	X	O
Filler aggregate	X	O

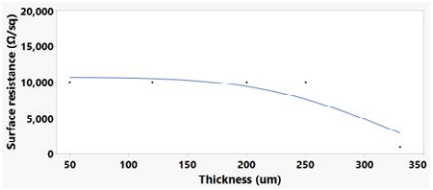


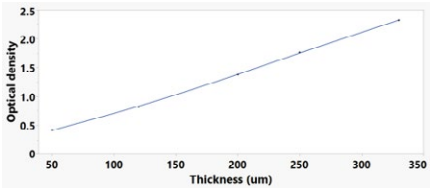
UV-curable Black Adhesive can be tuned to fit various application needs

Tunability of UV-curable silicone electrically conductive adhesive

		Electrically Conductive Adhesive		
	Properties	XX-5236	XX-5140 (deep curable)	XX-5550
1	Cure type	UV single cure	UV HT or UV single	UV single cure
2	Cure condition	UV 5J @ 365 or 405 nm	UV 5J @ 365 or 405 nm + 1 hour or UV 5J @ 365 or 405 nm + 75°C, 20 min	UV 5J @ 365 or 405 nm
3	Cure depth	320 um	400 um	200 um
4	Viscosity (mPa.s)	28,300 @ 0.5 rpm 8,127 @ 5 rpm	42,400 @ 0.5 rpm 21,000 @ 5 rpm	46,000 @ 0.5 rpm 11,900 @ 5 rpm
5	Thixotropy index	3.5	2.0	3.9
6	Optical density	2 @ 300 um	0.9 @ 300um	1.85 @ 30um
7	Color	Black	Black	Black
8	Surface resistance (Ω/sq)	10^3	10^4	10^5

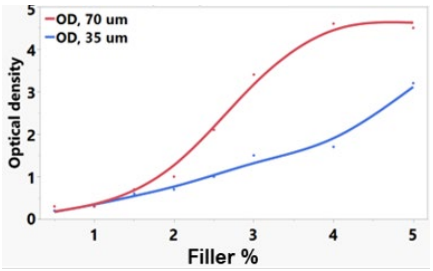


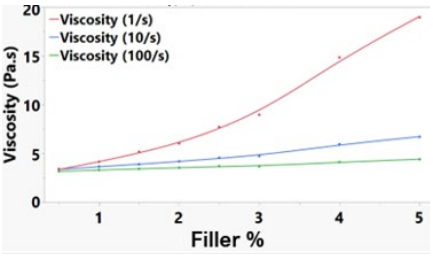


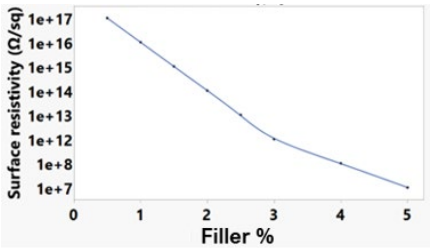


Tunability of UV-curable silicone electrically conductive adhesive

		High OD		
	Properties	XX-2100	XX-2210	XX-9015TH
1	Cure type	UV Single cure	UV Single cure	UV Single cure
2	Cure condition	UV 5J @ 365 or 405 nm	UV 5J @ 365 or 405 nm	UV 5J @ 365 or 405 nm
3	Cure depth	400 um	50 um	100 um
4	Viscosity (mPa.s)	4,800 @ 0.5 rpm 3,500 @ 5 rpm	25,400 @ 0.5 rpm 9,200 @ 5 rpm	14,700 @ 0.5 rpm 5,900 @ 5 rpm
5	Thixotropy index	1.4	2.7	2.5
6	Optical density	2.6 @ 400 um	3.8 @ 35 um	2.4 @ 35 um 4.8 @ 70 um
7	Color	Black	Black	Black
8	Surface resistance (Ω/sq)	Insulative	Insulative	Insulative







Summary

- It is cured after UV irradiation, immediately
- Fillers are dispersed better in silicone than organics, and low deformed after cure
- UV curable Black Adhesives are controllable in the surface resistance, optical density ,and cure depth to applications
  - Surface resistance (Ω/sq): Insulative to 103
  - Optical density: Clear to > 4

Images: dow_40265133554, dow_68810023957

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