

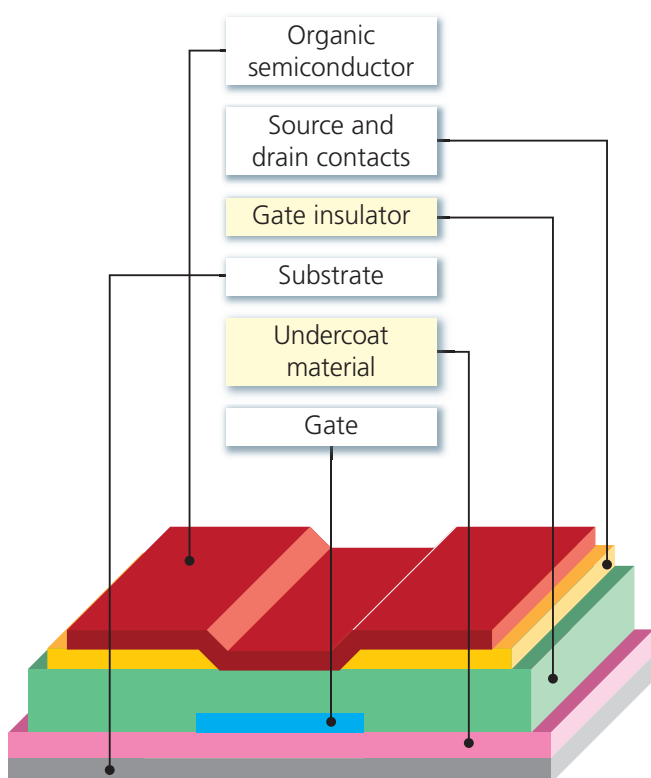
Insulator Materials for Electronic Device Applications

General aspects of material properties

- Insulator material applied to organic devices such as organic thin film transistors
- Applied from a solution process
- Patternable by using photo patterning processes (I-line)
- High thermal stability
- Used as either over-coat for interlayer applications or as insulators
- Good adhesive property to metal and flexible substrate

Example application:

insulator for bottom gate transistor devices

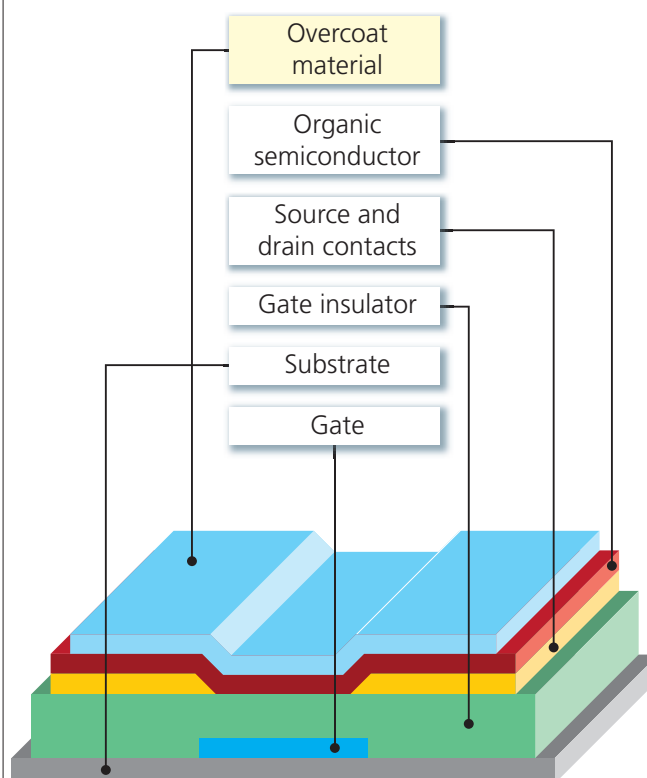


Gate insulator

- 1 Thermo setting type
- 2 Photo sensitive type (resist): → Negative & positive tones
- 3 Sputtering durability type (thermo setting)
- 4 Surface modifying material (thermo setting)

Example application:

overcoat material applied to a bottom gate device architecture



Overcoat materials for interlayer

Undercoat materials for planarizing and adhesive layer

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TECHNICAL SPECIFICATIONS

	ORG series (thermo set type)	PGI series (photo sensitive type)
Coating process	Spin coating / Slot die coating	Spin coating / Slot die coating
Processing condition	Curing process: 150-220° C for 30 min – 1 hr in nitrogen	I-line (365 nm); 600 → 1200 mJ/cm ² Curing process: 150-220° C for 30 min – 1 hr in nitrogen
Film roughness	Ra <1 nm, Rmax <5 nm	Ra <1 nm, Rmax <5 nm
Leakage	1x10 ⁻⁸ A/cm ² @ 4.8 MV/cm (t=544 nm)	1x10 ⁻⁸ A/cm ² @ 2.7 MV/cm (t=400 nm)
Dielectric constant	Variable from 2.6 to 3.8	Variable from 2.6 to 3.8
Chemical durability	Durability to metal etchants (acids), organic solvents (PGMEA, 2-heptanone)	Cured films show durability to metal etchant (acidic), organic solvents (PGMEA, 2-heptanone). <1% thickness loss when immersed for 2 min
Thermal stability	>230° C	>230° C
Contact angle	Tunable from 47 to 95°	Tunable from 47 to 95°

Key technology features:

- High stability materials suitable for electronic device applications
- Processable from solution
- Thermal cure or UV cure options available
- Photopatternable materials with a range of dielectric constant ranges
- Dielectric breakdown properties of 4.8 MV/cm demonstrated
- Good adhesive property to metal and flexible substrates.