

# Low Reflective Touch Panels



## Reduce reflectivity and improve visibility with Gunze's patented technology

An ideal choice for applications operating in direct sunlight and where power consumption is critical:

- Mobile Computing
- Aerospace Equipment
- Medical Equipment
- Military Equipment

## Benefits of Gunze Low Reflective Touch Panels

- Enhanced visibility even in direct sunlight
- Patented polarization technology reduces reflection and improves visibility
- Anti-reflective films available for greater transparency and reduced reflectivity
- 4H-9H films available for added durability



## Gunze low reflective touch panels provide a solution for direct lighting.

### Low Reflectivity

Light reflection is one of the major factors that can considerably lessen the visibility of LCDs. As a pioneer in the touch panel industry, Gunze has developed a proprietary Indium Tin Oxide (ITO) low-reflective layer that improves touch panel transparency. The ITO layer allows light to pass through the horizontal surfaces with little or no reflection.

### Reflection Reduction Methods

Gunze low-reflective touch panels employ anti-reflection film and polarization to minimize reflection.

### Anti-Reflection Film

Surface light reflection is lowered by a layer of anti-reflective (AR) film composed of multiple transparent materials, each of which has a different light reflection rate. The film coherently adds an amplitude of light reflection at the film boundaries, reducing touch panel light reflection by as much as 10%. AR film reduces reflection by controlling the amplitude and phase of light waves.

*Note: Coherency is a condition in which the wave phases of light waves synchronize with each other.*

### Polarization

In addition to AR film, Gunze touch panels utilize polarization, which reduces reflection even more. A polarizer is a type of light isolator that reduces reflective light from inside the touch panel.

*Note: An optical isolator is a component of a light element circuit that has a pair of input/output terminals. It is a passive optical component that passes light only in a designated direction, letting light in with minimal loss while greatly reducing output light.*

Materials such as glass that are optically equiangular and therefore have no complicative light refraction are covered with the polarizer, which replaces the standard polytephthalate (PET) layer. Gunze's innovative resin-based light refracting material offers superior reflection reduction.

### Circular Type Polarizer

The circular polarizer converts certain linear light waves (such as 550 nm) to circular light.

A linear polarizer and  $1/4$  retardation sheet form an adhesive layer. Linear light and circular light can be combined in a clockwise or counterclockwise direction, crossing each other squarely, with one type of crossing being transparent while the other is not.

Light from inside the touch panel is absorbed by the circular polarizer. Because the transparency of light absorbed by the polarizer is reduced,

*The premier source for analog resistive touch panels.*

## Learn more about other Gunze USA touch panel solutions

Along with low reflective touch panels, Gunze USA provides film-glass, tough, and LCD integrated touch panels. Configurations in 4-wire, 5-wire and 8-wire are available in custom designs, as well as in a range of cost-effective standard models. To learn more about Gunze USA touch panel solutions, call 512-990-3400 or visit [www.gunzeusa.com](http://www.gunzeusa.com)

## About Gunze USA

Gunze is one of the world leaders in resistive touch panel manufacturing. Gunze USA is a division of Gunze Limited, Japan, a multibillion-dollar company and the largest manufacturer of resistive touch panels in the world, employing over 8,000 people who work together to achieve international leadership through innovation.

Gunze USA works with OEMs and system integrators to design both standard and custom touch panel solutions. In addition, the company manufactures a wide variety of standard panels and total interface solutions for consumer electronics, industrial, automotive, medical, mobile, and POS/retail kiosk applications.

the circular polarizing sheet attached to the surface of the LCD has a  $1/4$  retardation rate, enabling the required transparency.

## Layered Anti-Reflective Film

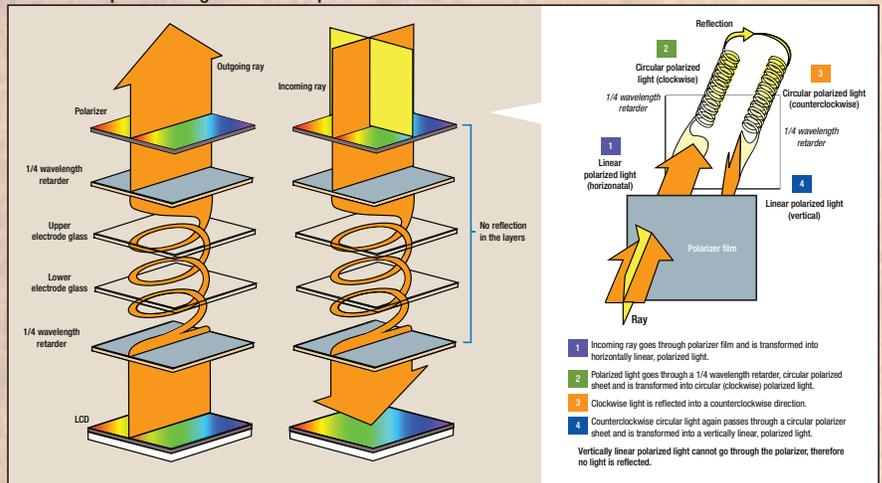
Anti-reflection (AR) treatment to the surface of the touch panel is a highly effective means of reducing light reflection.

A single layer of AR film affects only a narrow range of visible light waves; multiple layers of AR film prevent light reflection in a broad range of light waves.

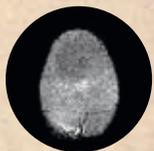
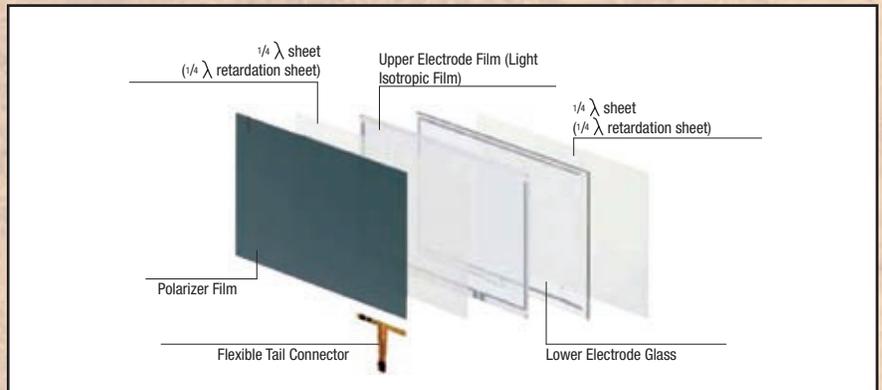
Gunze's AR technology now makes it possible to manufacture touch panels with low reflection that are also highly durable and that can utilize both pen and finger input.

Gunze's AR technology prevents light reflection on the surface, with a high transparency rate. With standard touch panels, the AR coating is placed on the upper electrode film. With low reflective touch panels, the AR coating is on the polarizer.

Transition of polarized light in circular polarizer structure



Circular Polarized Cross-Section



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