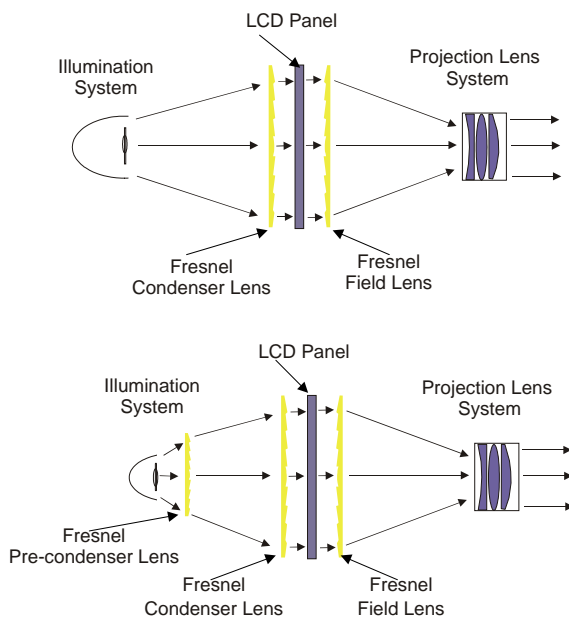


Field and Condenser Lenses For Single Panel LCD Applications



Fresnel Field and Condenser Lenses

Single panel projectors led the LCD projection revolution. Today, some of the world's lowest priced and best selling projector designs still contain the single panel configuration. Single panel projectors contain multiple microstructured optical components. Fresnel condenser lenses are used to collect and collimate light into the LCD panel, and field lenses focus the LCD image to the projection lens system.



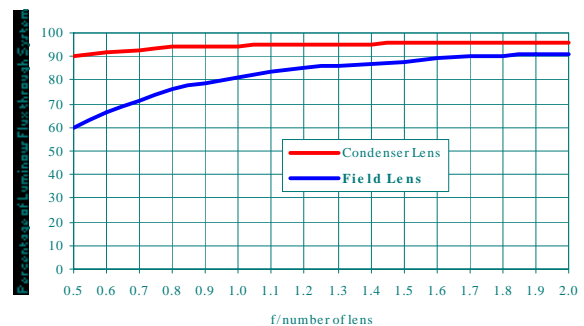
Fresnel Parameters	Input Lens	Output Lens
F-number's	as small as f/0.5	as small as f/0.8
Facet Pitch **	0.2 mm to 0.5 mm	0.1 mm to 0.25 mm
Materials	Acrylic or Polycarbonate	Acrylic
Thickness	1.0 mm to 3.0 mm	
Max. Temperatures	Acrylic 65° C; Polycarbonate 95° C	

** Facet Pitch will vary depending upon the pixel pitch of the LCD panel

Field lenses are typically used as output lenses and are also referred to as collectors. Condenser lenses are typically used as input lenses and are also referred to as collimators. A field lens has a collimated source and focuses output rays to a point. A condenser lens has a point source and a collimated output.

Fresnel lenses can be designed to be very fast to allow for very compact systems with maximum light output. Antireflective treatments (including our Moth-eye Antireflective Microstructure™ and AR coatings) are readily available to enhance the performance of these lenses.

Below is a chart illustrating the comparison of transmission of luminous flux, total power, through various Fresnel lenses as a function of the f/number.



Flux is directly proportional to the total energy through a lens. The f/number is the focal length divided by the diagonal of the lens. Both lenses were measured with their grooves facing the long conjugate.