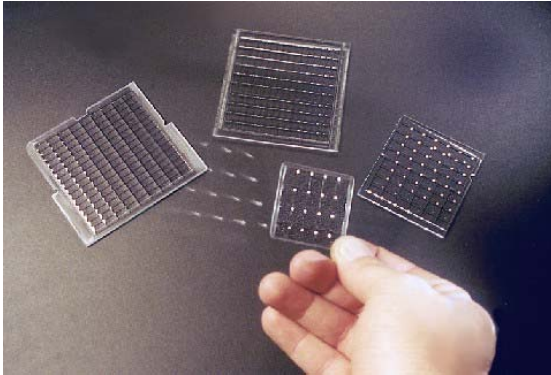


Light Integrators for Projection Displays



Light Integrator Arrays

Microstructured optics are a family of essentially flat devices which manage light through small precise features on one or both surfaces. Circular Fresnel lenses are one type of microstructured optic commonly used in projection displays. Fresnels are used as field and condenser lenses in overhead projectors and single panel LCD projectors.

With improved manufacturing processes and new polymers now available, plastic microstructured optics can be used for even a wider range of optical components in projection displays.

Over the years, one factor limiting the application of molded plastic optics has been their relatively low resistance to continuous high operating temperatures. New families of high temperature optical grade thermoplastic polymers having a refractive index of ~ 1.5 and an Abbe value of ~ 56 are now available.

These high temperature materials are compatible with Fresnel Optic's High Precision Molding (HPM) process. Applications include light integrators for LCD projectors and condenser lenses close to the light source in the projection system. In practice, plastic integrators produced in our HPM process have improved efficiency over molded glass counterparts. HPM also produces very low stress, which means low birefringence in polarization sensitive applications.

Using Reflexite proprietary materials, cast thin-film lens arrays are also possible. Examples are depixelating films for direct view LCD displays and lenslet arrays for increasing aperture ratio in transmissive LCD panels.

Features of both our HPM and casting processes are:

Nominal Properties	HPM Process	Casting Process
Thickness Range	1 mm to 3 mm	< 25 μ to 1 mm
Max. Temperature	150° C	200° C
Lenslet Sizes	< 10 μ to > 15 mm	
Fill Factors	> 90%	

Specialized coatings (including mirror, hot mirror and AR coatings) and surface treatments (including Moth-eye Antireflective Microstructure) are also available to enhance the performance of lens arrays.

