An elliptical reflector with a point light source at one focus will ensure that the reflected rays all pass through the second focus (Figure 4.4) Elliptical reflectors in trough form are widely used for tubular fluorescent luminaires.

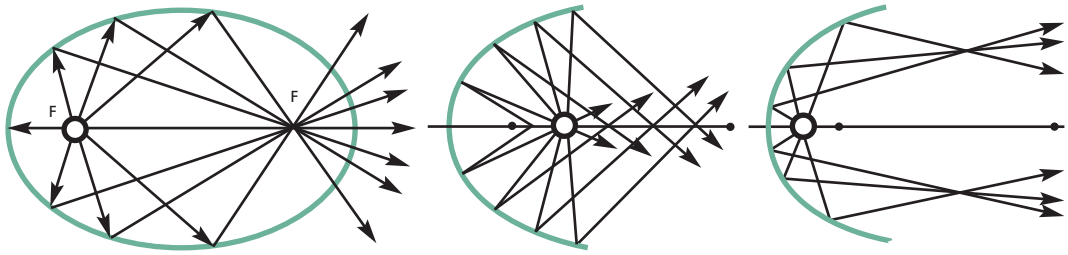

Figure 4.4 Elliptical reflectors showing the change in light distribution as the point light source is moved relative to the first focus (F)

Spread reflectors are deliberately distorted specular reflectors. They can be circular, parabolic or elliptical in cross section and spherical or cylindrical in form. The distortion takes the form of modulating the specular surface of the reflector by hammering (peening) to produce a regular array of dimples, or by etching or brushing the surface. The advantage of this distortion is that it smears out variations in light distribution caused by inaccuracies in the manufacture of the reflector and the size of the light source. Spread reflectors are used where a well-defined but even light distribution is required.

Diffuse reflectors are the opposite of specular reflectors. Unlike a specular reflector, the shape of a diffuse reflector has only a small effect on the light distribution. Diffuse reflectors are used where there is a need to redirect light with a very wide beam.

Many different materials are used in reflectors. Typical values of reflectance for these materials are given in Table 4.1.

Refractors

Refractors control light distribution by turning the incident light ray through a desired angle following Snell's Law. This can be done using either prisms or lenses. For luminaires using large area light sources, such as a fluorescent lamp, multiple prisms are moulded in a transparent material, usually acrylic or polycarbonate plastic. The number, location, angle of incidence and shape of the different types of prism determine the light distribution. For luminaires using a point light source a lens can be used. The position and shape of the lens determines the light distribution.