The other problem with three-dimensional displays is avoiding glare to the viewer, not from the object but direct from the luminaires. When the object is at eye level or lower and is lit from all sides with the beam angles less than 30 degrees from the downward vertical glare should not occur. Where the object is large and requires the viewer to look upwards, glare is a possibility. This can be dealt with by restricting the directions from which the object is viewed, or using narrower beams for the key-light so that all the light is within the display or lighting from below as long as appearance is not distorted.

13.3.3 Showcase lighting

Glazed showcases are used for displaying rare, valuable and delicate objects while protecting them from damage and theft. Showcases can be small or large; can be viewed from all sides or from a limited number of sides; and can be lit from outside the case or from inside. The problems of showcase lighting are reflections from the glazing, shadows produced by viewers and heat build up in the case.

Reflections from the glazing and shadows caused by viewers are mainly problems with external lighting, particularly when the showcase has a low reflectance (dark) lining. Reflections can be dealt with by tilting or curving the glazing so that a dark surface is reflected or by creating a luminance ratio of 10:1 or greater between the interior and exterior or the showcase. Shadows have to be dealt with by using multiple light sources.

Using carefully aimed interior lighting for the showcase will eliminate problems with reflections from the glazing. Whether shadows occur around and on the objects in the showcase will depend on how the objects are lit and the reflectance of the surfaces in the case. The more directional the lighting and the lower the reflectance of the interior, the more likely it is that shadows will occur around the object.

One form of interior lighting is the light-box on top of the showcase. This can provide soft diffuse light using fluorescent lamps or directional lighting using adjustable spotlights. Light-boxes need to be ventilated to prevent heat build-up and have easy access to the lamps for maintenance. There should be a glass or plastic barrier between any fluorescent lamps in the light-box and the case interior to filter out ultra-violet and infrared radiation. For some tall or narrow showcases, the top lighting will need to be supplemented by lighting from the sides, back or bottom to provide good modelling of objects on the lower shelves and to alleviate shadows. Another form of interior lighting is small spotlights mounted in the corners of the showcase. Fibre-optic lighting has distinct advantages for such an approach. The light source can be mounted outside the showcase thereby avoiding heat build-up and the fibres can be filtered to eliminate ultra-violet and infrared radiation. Further, the fibres can be fitted with different light distribution devices and can be moved around the showcase as required.