

## 2.5 Metal Halide

Metal halide lamps were developed as a way of improving the performance of high pressure mercury lamps in terms of their colour appearance and light output. They work by introducing the salts of other metals into the arc tube. As each element has its own characteristic spectral line, by adding a mixture of different elements into the discharge it is possible to create a light source with good colour rendering in a variety of colours.

There are a lot of problems with introducing new elements into a discharge. First, the element must be volatile and secondly it should not chemically attack the arc tube. To avoid these problems it has become

common practice to introduce metals into the lamp as metal halides.

Metal halides are generally more volatile than the metals themselves and the metal halides do not attack the arc tube. The metal halide compound breaks up into the metal and halogen ions at the high temperatures in the centre of the discharge and reforms at the lower temperatures near the wall of the tube.

Many different combinations of elements have been used to make metal halide lamps. Depending on combinations of elements together with the spectral output they create the light output and the colour of light will change. See Figures 46, 47, 48, 49, 50, 51.

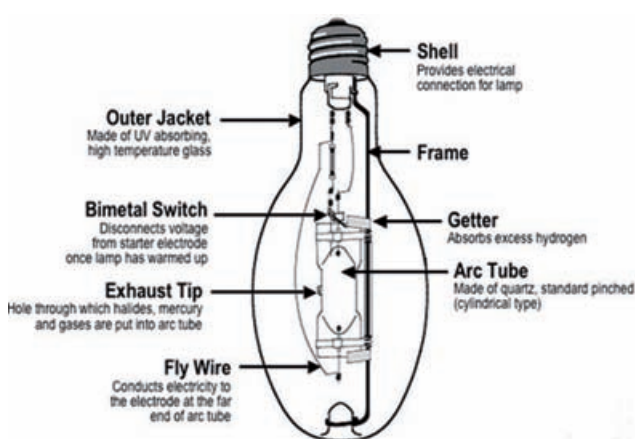


Figure 46  
Construction of metal halide lamp E27.

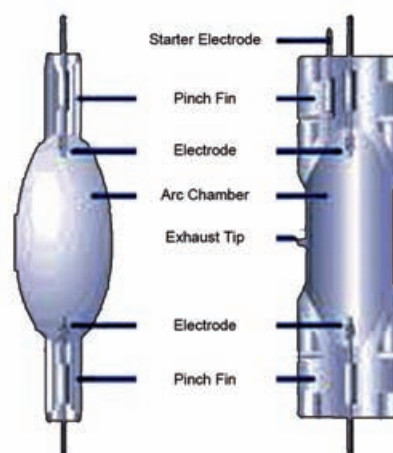


Figure 47  
Arc chamber detail.