2.11 Electroluminescence

Electroluminescence, including OLED, is the result of radiative recombination of electrons and holes in a material, usually a semiconductor. The excited electrons release their energy as photons - light. Prior to recombination, electrons and holes may be separated either by doping the material to form a p-n junction (in semiconductor electroluminescent devices such as light-emitting diodes) or through excitation by impact of high-energy electrons accelerated by a strong electric field (as with the phosphors in electroluminescent displays).

Electroluminescent devices are fabricated using either organic (called OLED) or inorganic electroluminescent materials. The active materials are generally semiconductors of wide enough bandwidth to allow exit of the light. The most typical inorganic thin-film EL (TFEL) is ZnS:Mn with yellow-orange emission. Depending on the task and colour of light required other materials could be used.

The most common electroluminescent (EL) devices are composed of either powder (primarily used in lighting applications) or thin films (for information displays.) The basic principles of electroluminescent (EL) light sources are discussed in Chapter 1.3 of this part.

Generally the light sources are made up as panels with a construction similar to that shown in Figure 68.

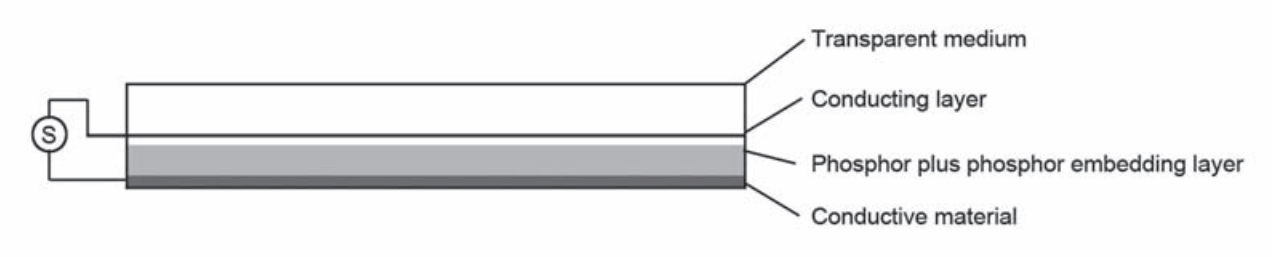

Figure 68
A section through an electroluminescent panel.