DDC NEWSLETTER

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We want to express our sadness to the relatives and friends of those people who lost their lives at the NY World Trade Center, the Pentagon and on the Airliners as a result of the September 11th, 2001 terrorist attacks on our country. We also want to praise the NY Police and Fire Departments for their heroic efforts in saving so many people at the loss of many their own. We at DDC will not let the terrorist program of fear stop us in supporting our customers and meeting their needs.

The article on Mercury Lamps from the last few issues is continued below. (article by Bob Donofrio and Bob Eckel

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SEALS CONTIMUED

The knowledge of the operating pressure of the lamp determines the quantity of mercury needed to be introduced into the non-operating lamp. An important point to be noted in the design and operation of a Molybdenum ribbon lamp is that the outer end regions of the seals must not exceed a temperature of 220 deg C no matter what the cold spot temperature is of the bulb proper. Above 200 deg C the exposed "moly" ribbon at the end of the hermetic seal will begin to oxidize leading to a deterioration of the seal and eventual failure of the lamp.

ELECTRODES

As we mentioned before, for the capillary lamp, the electrodes are extensions of the tungsten rod that is part of the hermetic seal. However mercury short arc lamps are more complicated and will be discussed next.

Short Arc Electrodes

a. Cathode.

The cathode of short arc lamps is made from a thoria doped tungsten (usually 2% ThO). The purpose of the thoria is to produce a mono-layer of thorium on the tip of the electrode when the lamp is operating. This thorium lowers the work function of the electrode and allows the electrons to escape from the tip at a lower temperature. The electric field drives the electrons into the arc region thus producing the arc plasma. The electric field drives the ions to the cathode where the heating effect of the collisions causes more electrons to be released thus producing a "self sustained discharge". The electric field also drives the electrons toward the anode. The impinging of the electrons into the anode causes heating of the anode. Since there is no analog to electron emission at the cathode, the anode attains a much higher temperature than the cathode.

b. Anode

The only cooling mechanism available for the anode is conduction and radiation. The radiation is affected by the surface area of the anode and is therefore made significantly larger than the cathode. At times, the designer will use a grooved anode to increase the anode's surface area and improve radiation cooling. Some lamp manufacturers will also apply special coatings to increase the emission thus improving the electrodes ability to radiate. The anode material of choice is pure tungsten because of its high melting temperature and low evaporation rate at high temperatures. Prior to the assembly of the lamp the electrodes (and especially the anode) are vacuum fired (or heated) at as high a temperature as possible to remove any impurities as a result of the manufacture of the electrodes - Tungsten is dirty!.

Symposia of interest.

The Metropolitan Detroit Chapter of the SID will be sponsoring a Symposium on Vehicle Displays Oct 15th and 16th, 2001 in the Detroit Renaissance Center. Information about the Symposium is on the SID web site www.sid.org.