Fermi National Accelerator Laboratory

TM-1486

Vacuum Deposition Evaporator

Sharon Austin, Eugen Beck, Frank Juravic, and Ron Miksa
Fermi National Accelerator Laboratory
P.O. Box 500, Batavia, Illinois 60510

October 1987

Operated by Universities Research Association Inc. under contract with the United States Department of Energy

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The increased number of experiments requiring photomultplier tubes coated with a wavelength shifter has prompted the Physics Department to build a vacuum evaporator. A vacuum evaporator was constructed from spare parts. The success of coating of PMTs pushed us to attempt coating mirrors, also, for Cherenkov' counters.

The evaporator consists of a vacuum system, stainless steel bell jar, power supplies and resistive coating elements (fig. 1). The vacuum system is a modified leak detector's vacuum system. The top of the original leak detector was replaced with a 1" aluminum jig plate as a surface plate for the bell jar. The bell jar was constructed from stainless steel tubing (18" dia. x 36" h) with two viewing ports at 12" and 18" from base 90 degrees offset. A typical set-up for coating 5" PMTs with p-terphenyl is shown in figure 2. The resistive elements are either molybdium boats or tungsten coils (fig 3). The boats are used to deposit the coating materials that are in powders or crystals, i.e. p-terphenyl or magnesium flouride. The tungsten coils are used to evaporate metal, i.e. aluminum or nickel-chrome. The power supplies are high current, low voltage (fig 4).

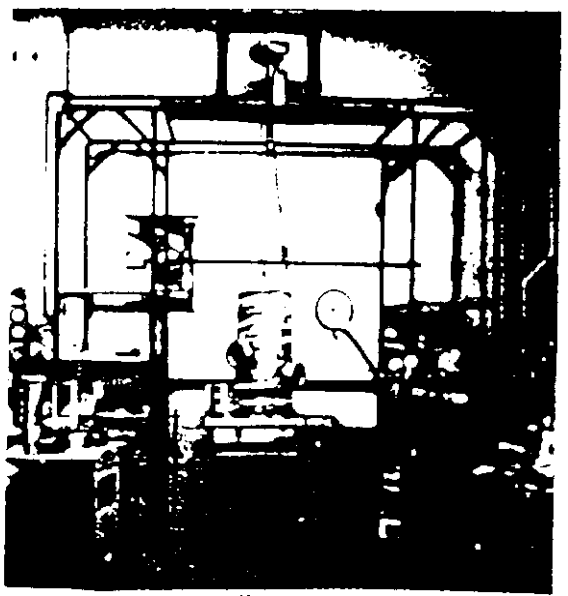

fig. 1
EVAPORATOR

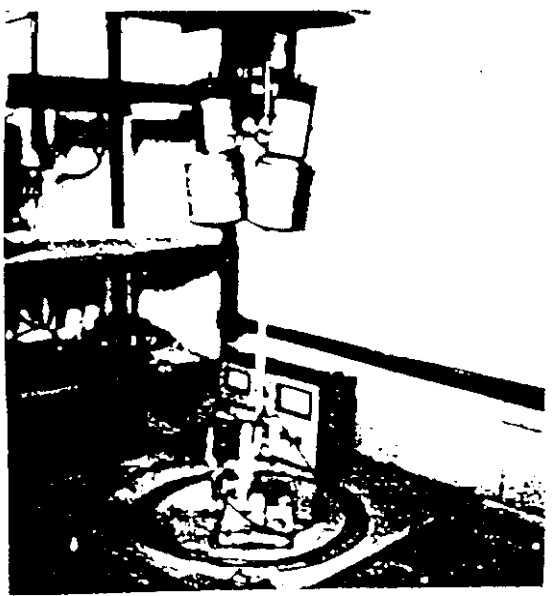

fig. 2
PMT SETUP

The evaporator has been used to coat PMT's for E- 687, E-769. We have coated mirrors for beam-line Cherenkov' counters and experimental coatings of aluminum on resistive polymers for John Huth of CDF. The part can be coated if it fits in the bell jar.

fig. 3
RESISTIVE ELEMENTS

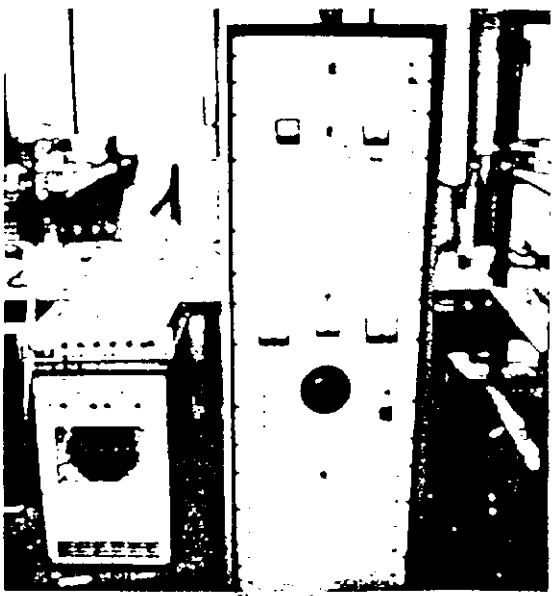

fig. 4
POWER SUPPLIES