10. Emulsion Processing

The use of nuclear emulsions requires some special purpose facilities at the experiment and at the universities. For E872 the facilities are located at Japanese universities and at Fermilab. The pouring of all full-sized emulsion sheets is done at Kobe University. The sheets are shipped to Fermilab and stored prior to use in a lead-shielded enclosure. The individual sheets are assembled into modules at Fermilab just prior to installation. The modules are built in aluminum fixtures that allow them to be mounted on the precision stand in the beamline. After exposure, the modules must be disassembled, the sheets removed, and marked with a grid pattern of 50μm dots that can be measured at scanning time. These dots, called a "grid print", give an accurate measure of the amount of shrinkage and distortion of the emulsion after it has been developed. This grid printing must take place in a carefully controlled environment which is dark, temperature held to ±1˚C and humidity kept to ±10% of the relative humidity at which is was packed. This was done for the first run in a small extension to the target house surrounding the emulsion area in the beamline.

Development of all bulk type sheets are done in Japan at Nagoya University. All "thin" emulsion sheets, ECC type, are processed at Fermilab in darkroom / drying rooms at the New Muon Lab (NMS).