



TECHNOLOGY NOTE

Use for the Synchro-cyclotron

W19 RADIATION-RESISTANT MATERIALS

Radiation-resistant materials have to be used inside and near the Synchro-cyclotron because of the very high level of radioactivity produced when the accelerator is in operation. Materials used inside the accelerator must be compatible with use in a vacuum of order 10^{-6} Torr.

1) Microswitches to be used in vacuum

These microswitches are developed in collaboration with Crouzet (France). They consist of a standard "Bruch" mechanism mounted on micaver with a ceramic actuator. The separately available levers are mounted to the microswitch according to the application. The outgassing rate is 2×10^{-6} Torr ℓ /sec. After an irradiation of 10^8 rads the units showed no sign of mechanical or electrical deterioration.

2) Cables

Cables and coaxial cables are constructed with glass fibre and polyimide insulation. The development was done in collaboration with Huber and Suhner (Herisau, Switzerland). These cables are suitable for use in vacuum.

No deterioration was found after an irradiation of 10^8 rads.

3) Coaxial connectors

Standard connector types are fitted with polyimide dielectrics. The development took place in collaboration with Huber and Suhner.

The principal characteristics are:

BNC 50 Ω matched UHF not matched

Bandwidth: BNC, d.c. 10 GHz
UHF, d.c. 1 GHz

Test voltage: $V_p = 1$ kV

Max. temperature 400°C

Rad. resistance better than 10^9 rads.

Further information can be obtained from K. Gase, MSC Division, CERN.