

Expression of Interest

CSIR-CEERI invites expression of interest from public and private companies for the transfer of technology of 2.6 MW Magnetron Tube developed by CSIR-CEERI, Pilani.

AVAILABLE TECHNOLOGY

High Power S-Band Tunable Pulse Magnetron

A tunable magnetron with the operating frequency of 2998 MHz having tuning range from 2993 to 3002 MHz and minimum peak power of 2.6 MW has been developed. The magnetron developed is primarily for use in medical LINACs in the country. Complete fabrication, processing, and testing of the tube was done by CSIR-CEERI, Pilani (including machining of anode block through outsourcing).

Design of the Magnetron:

The noticeable physical feature of the magnetron is its rectangular anode block housing cylindrical resonators in circular format. There is integral water cooling channels in the anode block which facilitate efficient heat removal. The magnetron uses cylindrical oxide coated cathode placed concentrically in the anode housing and supported by radial cathode support. The output is also radial. Figure 1 the magnetron prototype developed at CSIR-CEERI.

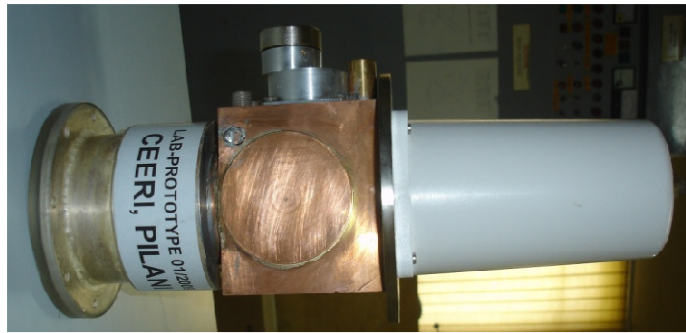


Figure 1: CSIR-CEERI developed 2.6 MW Magnetron

Fabrication, Processing, and Testing:

All the parts of the magnetron tube except the anode block were made in the workshop at CSIR-CEERI Pilani. The anode block machining was done through outsourcing. The tube was assembled and processed using the facilities available in CSIR-CEERI. Table.1 gives the major specifications of the developed magnetron.

Table – 1: Major Specifications

Peak Power Output	2.6 MW
Frequency	2998 MHz
Tuning Range (Minimum)	10 MHz (2993– 3002 MHz)
Cathode	Indirectly Heated
Heater Voltage (Typical)	9.1 V
Heater Current	8.3 A
Peak Anode Voltage (Typical)	45 kV
Peak Anode Current (Typical)	108 A
Magnetic Field	1550 \pm 25 Gauss
Cooling	Water (5 l/min.)

Applications: Radiotherapy and Cargo screening

The magnetron tube is for use as an RF source for 4 – 6 MeV Linacs used in radiotherapy machines for medical applications (cancer treatment). This magnetron tube also finds application in dual energy, mobile, and fixed cargo screening machines used for security checks in border areas, and at airports & harbors.

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