



# Electron Beam Accelerator

## Technology and Applications

**Electron Beam Centre (EBC) Kharghar, Navi Mumbai**

The program for development of industrial electron accelerators in-house had been initiated in BARC in the early 1990s. The prime motivation for this initiative was to provide impetus to the R&D activities with an aim to widen the scope of basic research program in BARC. The maiden in-house developed Cockcroft-Walton accelerator of 500 keV capacity was commissioned by BARC at BRIT, Vashi, Navi Mumbai, in 1998.

Subsequently, BARC has established a dedicated facility - Electron Beam Centre (EBC) at Kharghar, Navi Mumbai, to pursue the development of high energy electron accelerators more vigorously and to broaden their industrial applications. Over the years since its establishment, EBC has developed several accelerators to fuel multi-sectoral applications.

### 10 MeV, 3 kW LINAC

The LINAC has a vertical configuration and has applications in multiple domains, including semiconductors, gemstone coloration, polymers and bio-stimulators .

### 1 MeV DC Accelerator

The 1 MeV DC accelerator functions on symmetric Cockroft Walton principle. It was qualified for ruggedness by running the system continuously for 24 hours. The system is operated at 50 kW beam power and experiments on utilizing it for waste water treatment is currently in progress.

### 6 MeV Single Energy and 6/4 MeV Dual Energy Accelerators for Security

The Electron Beam Centre has expanded the scope of electron accelerator program to meet the requirements of national security, especially in the area of cargo scanning applications to address the movement of contraband objects. For this purpose, a compact 6 MeV RF electron Linac has been designed, which has successfully demonstrated its utility by generating high resolution images of large cargoes. The unit has been validated for radiography of bulk metallic structures, and it meets the ANSI standards of imaging and IEC 62523 norms for material contrast.