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Industrial Applications via Novel Compact Electron Beam Accelerator

Electron beam (e-beam) technology provides an efficient, safe and environmentally friendly way to drive chemical reactions. E-beam technology is used in a vast array of industries and common consumer products, with sales eclipsing $2B annually, providing an estimated added value to products of more than $\$\$500Beveryyearworldwide$.

The main processes initiated by electron beam are polymer modification by crosslinking or scission, curing of coatings, decomposition of industrial effluents, or synthesis of new substances. Accelerator technology has applications in water and biosolids treatment, cargo scanning, material modification using electron beams, medical sterilization (X-ray and electron beam), industrial electron-beam driven chemistry, advanced manufacturing, environmental remediation and food sterilization. However, implementation of e-beam technology has been fairly slow due to general lack of knowledge of the technology. Also, applications of conventional e-beam accelerators currently available on the market are limited because they are not energy efficient, take up a large footprint and can be complicated to use and maintain.

Primary author: GRDANOVSKA, Slavica

Presenter: GRDANOVSKA, Slavica

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