

Abstract Submitted
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Electron Beam Irradiation of Personal Protective Equipment (PPE). MIN HUANG, MD KAMRUL HASAN, MATT PHARR, DAVID STAACK, SURESH D. PILLAI, Texas AM University, NATIONAL CENTER FOR ELECTRON BEAM RESEARCH COLLABORATION, PLASMA ENGINEERING AND DIAGNOSTICS LABORATORY TEAM, EXPERIMENTAL SOLID MECHANICS LABORATORY TEAM — Given the pandemic of COVID-19, the healthcare market and the supply chain of PPE have been challenged all over the world. N95 Respirators, surgical masks and clothing gowns are most consumed and in serious shortage. To sterilize and reuse PPE is becoming an effective way to ease the poor situation. Electron beam has been used frequently with 4.5% share in the global market. From this perspective, N95 Respirators (3MTM), Surgical mask, AAMI Gown, Activgard Gown, and polypropylene and polyester have been utilized as research objects. Doses (25kGy-200kGy) and irradiation medium (air, argon) have been varied to research irradiated samples mechanical and protective performance. Wettability testing, Yellowness Index (YI), SEM, and tensile testing have been utilized to research irradiated PPE. Hydrostatic Pressure and Impact Penetration testing have been used to study the liquid barrier performance of AAMI gown. So far, the results of all testings showed an ignorable difference in samples irradiated with sterilized level dose (15kGy-30kGy), while hydrostatic pressure and impact penetration testing shows samples irradiated with 200kGy appear to fail. Both the results from tensile testing of N95 Respirator and gown showed a decrease in mechanical performance.

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