

Personal Protective Equipment and Fire

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Personal protective equipment (PPE) is worn by healthcare workers to protect themselves from getting infected from the patients. The component of PPE as well as the nature of the material used for PPE is dictated by the disease and its mode of transmission. Coronavirus disease-2019 (COVID-19) infection being an aerosol-transmitted infection mandates PPE consisting of gowns or coveralls, head cover, goggles, mask or face shield, gloves, and rubber boots. The stringent standards mandate that coveralls and gowns should be efficient in protecting from exposure to biologically contaminated solid particles and chemical hazards.¹ The guidelines from the Ministry of Health and Family Welfare, India, in accordance with WHO state that "the fabric that cleared/passed 'Synthetic Blood Penetration Resistance Test' (ISO 16603) and the garment that passed 'Resistance to penetration by biologically contaminated solid particles' (ISO 22612:2005) may be considered as the benchmark specification to manufacture Coveralls."^{1,2} Hence, coveralls for COVID-19 prevention kit are commonly made from high-density polyethylene formed into a nonwoven fabric that allows heat and sweat to leave the suit while preventing liquids and aerosols from entering it.³ The disposable gowns are typically made of polypropylene, polyester, or polyethylene, whereas the reusable ones carry cotton/polyester blends.³

While the material used for PPE ensures protection from viral infections, being inflammable, it does not so from fire. One such fire incident has already been reported in a COVID-19 patient-caring hospital. Media reports claimed the blaze spreads after a staff member's PPE kit caught fire. The paramedic staff whose PPE had caught fire while saving the patient sustained 21% burns needing hospitalization.⁴ In quick succession, another incident of fire is reported in a COVID-19 center, the details of which are awaited.⁵ The inciting event in these incidences may be preventable, but nevertheless considering the compromised vision and hearing in PPE that affect early detection, communication, and response in incidents of fire; it hints to additional consideration of choosing fire-resistant material for PPE. Nomex or flame-resistant cotton may be used for flame-resistant coveralls or aprons.⁶ By varying the fiber type, bonding process and fabric finish can change the properties of the material; these fire-resistant materials can be made to be liquid and aerosol resistant as well.³

To conclude, safety concerns may necessitate the material of PPE in COVID-19 care settings to be fire resistant in addition to being liquid and aerosol resistant.

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