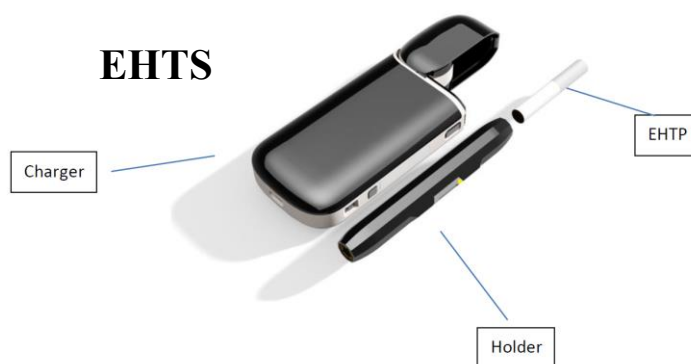


Philip Morris International (PMI) has developed a patented Electrically Heated Tobacco System (EHTS) that heats a specifically designed tobacco product (Electrically Heated Tobacco Product or EHTP). The EHTP contains tobacco<sup>1</sup> material in the form of a plug that undergoes a controlled heating process to produce a tobacco vapor (aerosol). The tobacco is only heated and is not burnt as happens in a lit cigarette.



PMI retained Professor Osamu Fujita to assess whether a used EHTP could cause fire when discarded in either trash receptacles, forest or grass-land area. Professor Fujita is a faculty member in the Division of Mechanical and Space Engineering at Hokkaido University, Japan. He is an expert in the field of combustion and an international leader in microgravity combustion research. His work covers a wide area of combustion research including: ignition and flame spreading, catalytic combustion, soot formation, high temperature combustion, combustion in microgravity, electric and magnetic field effects on combustion, biofuels, and combustion diagnostics. He is the Vice President of the Combustion Society of Japan and a member of the board of directors of the International Combustion Institute.

Professor Fujita reviewed the operation of, and analyzed experimental data on, the EHTS provided by PMI (that included data generated by independent analytical laboratories), and carried out numerical calculations to assess whether a used EHTP could cause fire if discarded in a trash (garbage) receptacle, forest or grass-land area.

Prof. Fujita used well established classical ignition theory calculations together with the experimentally measured temperatures of the tobacco material in the EHTP provided by PMI. He focused on the ignition limits of paper, textile and polyurethane foam to represent the main components of municipal solid waste, and of wood, leaves and grass powder to represent forest and grassland cases, respectively.

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<sup>1</sup> The EHTP does not contain tobacco cut-filler (tobacco leaf cut in small pieces) found in cigarettes and pipe tobacco. All of the tobacco in the EHTP is reconstituted (cast-leaf) tobacco made from tobacco powder, water, glycerin, guar gum and cellulose fibers.

Based on his assessment, Professor Fujita issued an expert opinion that concludes that there is no risk of fire if an EHTP, used as intended inside the heating holder part of the EHTS under the standard operating conditions of the device, is discarded in trash receptacles, or in forest and grassland areas.

Professor Fujita's expert opinion is based on the following findings from his assessment:

- For the three different compositions of solid waste assessed; paper, textiles and polyurethane foam, the critical temperature for ignition of these materials are significantly above the tobacco temperature attained in the EHTP during EHTS operation.
- For the two materials representing forest; wood and leaf, the critical temperature for ignition is significantly above the tobacco temperature attained in the EHTP during EHTS operation.
- For the case of grass-land, the critical temperature for ignition is significantly above the tobacco temperature attained in the EHTP during EHTS operation.