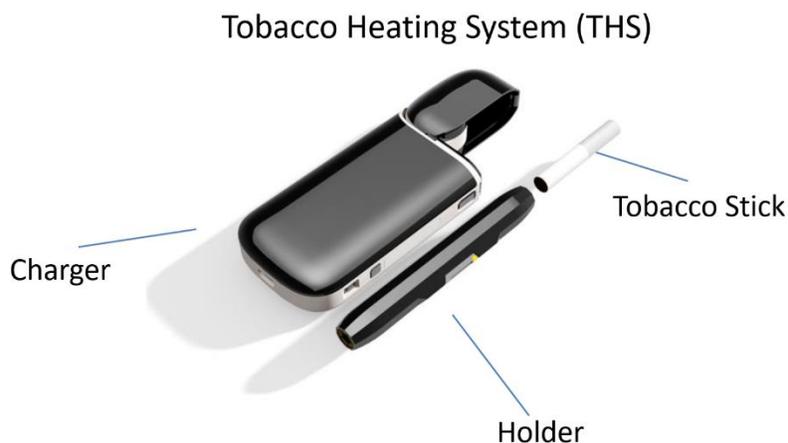


Philip Morris International (PMI) has developed a Tobacco Heating System<sup>1</sup> (THS) that heats a specially designed Tobacco Stick. The Tobacco Stick contains tobacco<sup>2</sup> material in the form of a plug that undergoes a controlled heating process to produce a tobacco vapor (aerosol). The tobacco is only heated and is not burnt as happens in a lit cigarette.



PMI retained Professor Osamu Fujita to review a report<sup>3</sup> provided by PMI on the functioning of the THS Devices<sup>4</sup> and the measures taken by PMI to ensure compliance with applicable market regulations in respect to product safety. The PMI report assessed device safety of the THS Holder and Charger and their components using standard testing procedures and safety standards. More specifically, Professor Fujita was asked to assess the fire safety aspects of the THS Devices when functioning as designed.

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 President of the Combustion Society of Japan and a member of the board of directors of the International Combustion Institute.

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<sup>1</sup> The Tobacco Heating System (THS), also referred to as Electrically Heated Tobacco System (EHTS), is commercialized under the name IQOS.

<sup>2</sup> The Tobacco Stick does not contain tobacco cut-filler (tobacco leaf cut in small pieces) found in cigarettes and pipe tobacco. All of the tobacco in the Tobacco stick is reconstituted (cast-leaf) tobacco made from tobacco powder, water, glycerin, guar gum and cellulose fibers.

<sup>3</sup> The report is referred to as the “PMI THD Device safety report” in this summary

<sup>4</sup> In this summary, THS Devices specifically relates to the Charger and Holder of IQOS version 2.4.

Professor Fujita reviewed the functioning of the THS Devices and analyzed the evidence on product safety (including fire safety). His key findings are summarized below:

1. **General product safety assessment:** Professor Fujita concluded that the findings and safety assessments of the THS Devices reported in the Device Safety report can be regarded as valid, as all tests were performed appropriately and in-line with standard testing procedures and safety standards, and that critical tests were commissioned by third party institutions to ensure objectivity.
2. **Battery safety:** The batteries used in the THS Devices (Charger and Holder) adhere to IEC, UL, UN, and IATA safety standards<sup>5</sup>. Additional battery safety tests have been conducted successfully, and the device designs incorporate protection circuitry to prevent sudden rises in temperature and various other safety mechanisms. Based on the above, Professor Fujita confirmed that the batteries in the THS Devices have been sufficiently verified. Professor Fujita highlights the importance of continually monitoring and tracing any phenomena occurring in the market place related to the functioning of the devices.
3. **Material fire safety:** Professor Fujita opined that it is highly unlikely that any of the materials in the THS Device would ignite under normal usage conditions, as all materials are confirmed to be highly non-flammable based on UL and IEC standards<sup>5</sup>.
4. **Component and system certifications:** Professor Fujita confirmed that all components and systems have been shown to meet major international standards (including IEC, EN, UL, UN, etc.)<sup>5</sup>.
5. **Safety tests critical to fire safety, (*including tests in a combustible gas mixture environment, flammability tests of materials, tests of the suitability of transporting batteries in aircrafts, battery temperature rise tests, etc.*):** Based on the low flammability characteristics of the housing materials used in the THS Holder and Charger devices, and the fact that when the Heater was operated under an explosive atmosphere (a near stoichiometric ethylene-air mixture) did not ignite the combustible gas, Professor Fujita pronounced that it is highly unlikely that the THS Holder device will act as an ignition source under regular usage conditions.

Based on his review and assessment of the product safety tests performed by third parties, including tests conducted under extreme conditions, Professor Fujita opined that as long as the THS devices function as designed, the fire safety aspects of the devices have been sufficiently verified and that the risk of the Holder acting as an ignition source (even under an explosive atmosphere) is extremely low.

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<sup>5</sup> IEC (International Electrotechnical Commission), UL (Underwriters Laboratories), UN (United Nations), IATA (International Air Transport Association), EN (European Standards)