

Evaluation of the Fire Propagation Characteristics of Thermoplastics

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Abstract : Consisting of organic compounds, plastic ignites easily and burns fast. In addition, a large amount of toxic gas is produced while it is burning. When plastic is heated, its volume decreases because its surface is melted. The decomposition of its molecular bond generates combustible liquid of low viscosity, which accelerates plastic combustion and spreads the flames. Radiant heat produced in the process propagates the fire to increase the risk of human and property damages. Accordingly, the purpose of this study was to identify chemical, thermal and combustion characteristics of thermoplastic plastics using the fire propagation apparatus based on experimental criteria of ISO 12136 and ASTM E 2058. By the experiment result, as the ignition time increased, the thermal response parameter (TRP) decreased and as the TRP increased, the slope decreased. In other words, the large the TRP was, the longer the time taken for heating and ignition of the material was. It was identified that the fire propagation speed dropped accordingly.

Keywords : fire propagation apparatus (FPA), ISO 12136, thermal response parameter (TRP), fire propagation index (FPI)

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