

A Study on the Synthetic Resin of Fire Risk Using the Room Corner Test

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Abstract : Synthetic resins are widely used in various fields including electricity, engineering, construction and agriculture. Many of interior and exterior finishing materials for buildings are synthetic resin products. In this study, full-scale fire tests were conducted on polyvinyl chloride, polypropylene and urethane in accordance with the "ISO 9705: Fire test - Full-scale room test for surface products" to measure heat release rate, toxic gas emission and smoke production rate. Based on the tests, fire growth pattern and fire risk were analyzed. Findings from the tests conducted on polyvinyl chloride and urethane are as follows. The total heat release rate and total smoke production rate of polyvinyl chloride were 98.89MW and 5284.41m², respectively and its highest CO₂ concentration was 0.149%. The values obtained from the test with urethane were 469.94 MW, 3396.28 m² and 1.549%. While heat release rate and CO₂ concentration were higher in urethane implying its high combustibility, smoke production rate was 1.5 times higher in polyvinyl chloride. Follow-up tests are planned to be conducted to accumulate data for the evaluation of heat emission and fire risk associated with synthetic resins.

Keywords : synthetic resins, fire test, full-scale test, heat release rate, smoke production rate, polyvinyl chloride, polypropylene, urethane

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