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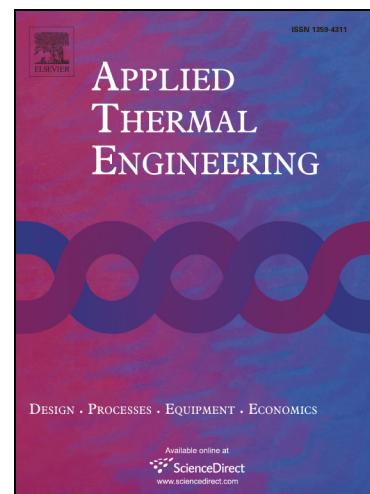
Dongmei Huang, Mingzhen Zhang, Chenning Guo, Long Shi, Lin Peng

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Experimentally investigating the effects of bottom ventilation on the fire behaviors of natural rubber latex foam

Dongmei Huang^{a,b*}, Mingzhen Zhang^a, Chenning Guo^a, Long Shi^c, Lin Peng^{b,d}

^a College of Quality and Safety Engineering, China Jiliang University, Hangzhou, Zhejiang, 310018, China

^b Key Laboratory of Furniture Inspection Technology of Zhejiang Province, Hangzhou, Zhejiang, 310018, China

^c Civil and Infrastructure Engineering Discipline, School of Engineering, RMIT University, Melbourne, VIC 3001, Australia

^d Zhejiang Furniture and Hardware Research Institute, Hangzhou, Zhejiang 310018, China

Characteristics of easy ignition and high spreading risk make bedding materials extremely hazardous in an apartment fire. Typical bedding material, namely natural rubber (NR) latex foam with 6 mm diameter holes, was investigated experimentally in this study. Two ventilation conditions were considered: bottom ventilation (sample bottom was covered by stainless grid allowing air supply, denoted as BV); and normal ventilation (sample bottom was covered by insulation board avoiding air supply, represented by NV). The heat transfer process of the sample under the two ventilation conditions was then analyzed. It was known from experiment that samples under both ventilation conditions show three burning stages: initial growing, full development, and decaying. With sufficient oxygen supply, samples under BV conditions showed a higher hazard than those under NV conditions, accompanied with a longer time period of full development stage, bigger flame spread rate and bottom ignition. Flame spread rates at sample top were about 1.6 mm/s and 1.4 m/s under BV and NV conditions, respectively. Only under BV conditions, sample bottom was ignited at about 157 s through one edge and also with some moving ignition points, while the maximum temperature rose to about 1200 K. However, maximum flame height under BV conditions showed a lower value than those under NV conditions, which is 0.51 m comparing to 0.59 m. The heat transfer mechanism of the sample was investigated, and the relationship of flame spread rate of the sample under both ventilation conditions is

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