

秸秆纤维墙体结构高温性能和火灾温度场研究 Research in High Temperature Performance and Fire Temperature Field of Straw Fiber Composite Material

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关键词: 秸秆纤维轻质墙体 高温性能 火灾 温度场 模型

摘要: 以秸秆纤维轻质墙体为研究对象, 分析其结构和组成及其对材料高温性能的影响; 通过TG-FTIR分析, 研究了高温作用下的秸秆纤维墙体材料的物理化学变化过程。在上述基础上, 针对该种新型建筑材料进行了烧失量实验, 利用DRS2.6数据回归分析软件, 建立了火灾温度-烧失量的一元回归模型。同时, 以200mm厚的秸秆纤维外墙保温板为例, 在ISO9705标准火灾实验间对温度-烧失量回归模型进行了校验。结果表明: 回归方程准确可信, 可用于火灾后各部位的温度变化情况、起火原因的认定和灾后强度评估。Straw fiber wall structure is a new structural system with properties of lightweight and energy-saving, heat preservation and sound isolation. Firstly, the impact of chemical component, structure on basic thermal performance such as activation energy, heat productivity, heat release rate was studied in details. Secondly, the chemichysics reaction in high temperature were studied through TG-FTIR experiment. Finally, the linear stepwise regression model about fire temperature and loss on ignition was established based on loss on ignition experiment and DRS2.6 software analysis system. Furthermore, a 200mm thickness straw fiber external thermal insulation plate was chosen and burned in independent designed ISO9705 standard fire test room in order to verify the accuracy of the regression model. The results show that the model is correct and can be applied to the real engineering computation and assessment.

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