

Experimental study of the combustion process on the surface of wood construction materials

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Infrared thermography (IRT) is becoming a commonly used technique to nondestructively inspect and evaluate wood structures [1]. Based on the radiation emitted by all objects, this technique enables the remote visualization of the surface temperature without making contact using a thermographic device [2, 3].

A number of laboratory experiments on estimation of fire-hazardous properties of various types of wood construction materials (plywood, chipboard, and oriented strand board) were carried out using a scientific infrared (IR) camera JADE J530SB. Use of noncontact method in estimation of the fire-hazardous properties of wood construction materials allowed one to obtain a temperature field distribution on the sample surface after seat of fire exposure [4-5].

Experimental investigations included simulated cases of firebrands, on the one hand, formed during a wildfire and gathered on a roof and corners of buildings, near fences or got inside the premises causing the ignition, on the other hand, burning front from the ground fire effects on objects made of wood construction materials treated with various fire retardants. Furthermore, a method for the fast analysis of fire-hazardous properties for fire retardants, depending on consumption, the species of wood and the source of fire (a layer of plant fuels, firebrands of pine bark and pine branches) were developed.

In the Large Aerosol Chamber of of the Center for Collective Use (CCU) "Atmosphere", preliminary experiments were carried out on a "Firebrand Shower" model exposure, which is naturally occurring firebrands with some types of construction materials (chipboards). The exposure of the samples to flow of firebrands was provided using a firebrand generator of own original design. The database of the main fire-hazardous characteristics for construction materials would become a key factor in the prediction of fire hazard during wildland-urban interface fires. Moreover, the results would be used in creation of building regulations and refinement available one for residential and industrial facilities.

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References

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