



A Literature Review of the State-of-Art in Fire Protection of Mid-Rise Wood Buildings Under Construction

<https://research.thinkwood.com/en/permalink/catalogue1949>

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Organization: National Research Council of Canada

Year of Publication: 2016

Country of Publication: Canada

Format: Report

Material: Light Frame (Lumber+Panels)

Application: Wood Building Systems

Topic: Fire
 Site Construction Management

Keywords: Mid-Rise
 Construction

Language: English

Research Status: Complete

Online Access: Free

Resource Link

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Numerical Modelling of Water Mist Systems in Protection of Mass Timber Residential Buildings

<https://research.thinkwood.com/en/permalink/catalogue2681>

Author: Elsagan, Nour
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Publisher: National Research Council Canada

Year of Publication: 2020

Country of Publication: Canada

Format: Report

Material: CLT (Cross-Laminated Timber)

Application: Rooms

Topic: Fire

Keywords: Sprinklers
Fire Suppression
Exposed Timber
Water Mist Systems

Language: English

Research Status: Complete

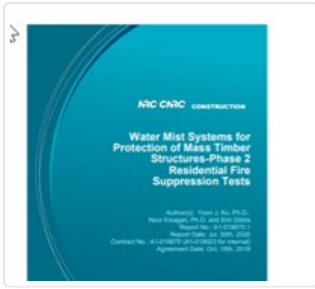
Summary:

"This report presents the findings from a simulation parametric study to investigate the use of water mist systems for a residential compartment fire involving exposed mass timber structures. The fire and suppression models were first validated against experimental data obtained from the NRC fire tests that were conducted under the same project. Seventeen simulations were conducted using Fire Dynamic Simulator (FDS) software. The following parameters were investigated: effect of fuel arrangement and location on fire severity in exposed wood compartment, effect of different finishing on fire severity in compartment, fire and suppression in open space vs compartment, effectiveness of water mist systems in fire suppression in compartments with different finishing. The results show the effectiveness of the water mist system in suppressing the fire in exposed wood compartments where a high heat release is expected due to the high fuel load"--Executive summary, page iv.

Online Access: Free

Resource Link

<http://publications.gc.ca/pub?id=9.890599&sl=0>



Water Mist Systems for Protection of Mass Timber Structures - Phase 2 Residential Fire Suppression Tests

<https://research.thinkwood.com/en/permalink/catalogue2682>

Author: Ko, Yoon
Elsagan, Nour
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Publisher: National Research Council Canada

Year of Publication: 2020

Country of Publication: Canada

Format: Report

Material: CLT (Cross-Laminated Timber)

Application: Rooms

Topic: Fire
Moisture

Keywords: Sprinklers
Water Mist Systems
Fire Suppression

Language: English

Research Status: Complete

Summary:

"As an alternative option to conventional sprinkler system, water mist systems are considered for the protection of timber buildings because they use much less amounts of water compared to sprinkler systems. The effectiveness of high pressure water mist (HPWM) and low pressure water mist (LPWM) systems was investigated in comparison to sprinkler systems for a residential fire scenario involving mass timber structures. The most distinct characteristic of the HPWM and LPWM systems was fine water droplets generated from the nozzles, which demonstrated effective smoke cooling in the room. Although the water spray rate of the HPWM was four times lower than that of the sprinkler system, the water mist systems effectively control the fire and maintained the room tenable. Most systems (HPWM, LPWM and sprinklers) tested in this study did not prevent fire damage on the CLT walls, but the HPWM system with a wide spray angle demonstrated rapid fire suppression and protection of the CLT walls. In all tests, a large water pool formed on the floor, which appeared proportional to the total water spray discharge in each test, and the moisture contents measured on the surface and bottom edges of the CLT panels indicated that water can penetrate into the interface between the floor and the wall in a typical CLT assembly"--Executive summary, page 1.

Online Access: Free

Resource Link

<http://publications.gc.ca/pub?id=9.889965&sl=0>