

Study of Residential Attic Fire Mitigation Tactics and Exterior Fire Spread Hazards on Fire Fighter Safety

EMW-2011-FP-00611

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FEMA



Research Study Purpose

The purpose of this study is to increase firefighter safety by providing the fire service with scientific knowledge on the dynamics of attic and exterior fires and the influence of coordinated fire mitigation tactics from full-scale fire testing in realistic residential structures.



Experiments

Attic and Knee Walls Acquired Structures

Attics



Eaves



Walls



Wall Fire Experiment Series

- 8 ft. by 8 ft. wall assemblies with siding, sheathing, studs, insulation, and gypsum wall board were burned.
- For most experiments a 100 kW burner was used to ignite the wall assembly.
- Two experiments used grills for ignition.
- Heat release rate, heat fluxes 6 ft, 12 ft, and 18 ft from the wall, and temperatures under the siding and temperatures in the wall cavity were measured.

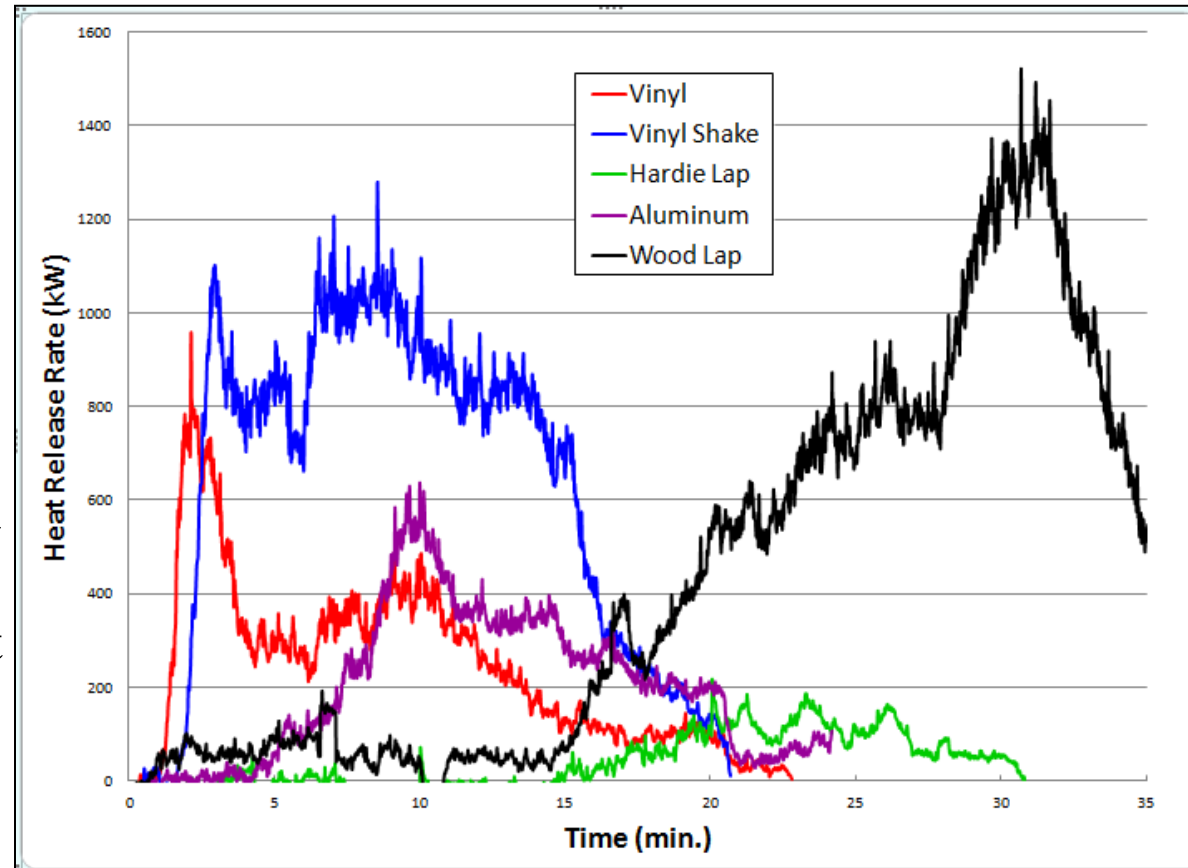


Vinyl Siding/Polystyrene Wall Experiment



Effect of Different Sidings (Preliminary Data)

- 4" Double Vinyl and Vinyl Shake Siding burned the fastest
- The Vinyl shake siding burned longer and had a higher peak HRR as there was more fuel
- Wood Lap siding took about 15 min to get involved then had a large HRR due to a lot of material burning simultaneously.
- Aluminum and Hardie Lap siding burned slower and with smaller HRRs



Effect of Different Sheathings (Preliminary Data)

- The polystyrene burned the fastest, had the highest peak HRR and burned the longest
- Polyisocyanurate had a peak HRR of 750 kW, but the high HRR was not sustained
- OSB burned the slowest and had the lowest peak HRR

