# Lindsay Osborne

Title:

The Effects of Floor Area and Opening Area on the Development of Fires in Residential Dwellings

Abstract:

Upholstered furniture fires are responsible for a significant number of deaths in residential dwellings in Canada. How total floor area, total opening area, and flammability of upholstered furniture affect and shape the fire growth profile, time to major events, and tenability levels are assessed in this thesis. The scope of this project includes computational fluid dynamics modeling (using FDS) of two-storey single-family detached homes and townhomes focusing on living room and bedroom fires. The results show that increasing the amount of opening area in a room results in an increase in peak heat release rates, an increase in the time to flashover in detached homes, little or no effect on fire safety device activation, and no increase in available safe egress time (ASET) based on tenability criteria.

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