



BOOKLET 11: FIRE SAFETY

TECHNICAL GUIDE FOR NORTHERN HOUSING



A chimney fire



TAILORED FOR REMOTE NORTHERN ONTARIO COMMUNITIES





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The story of fire in northern Ontario—Introduction

Fire is arguably the greatest threat involving housing in remote and northern communities. Large forest fires have destroyed entire communities in different parts of Canada. The risk and frequency of these types of devastating events appear to be worsening due to climate change.

Although forest fires have the potential to cause the most destruction to community buildings and housing stock, chimney fires are the greater cause of death in remote northern communities. Generally, the people in a community will notice the smoke of an approaching forest fire and have time to evacuate.

Deaths due to chimney fires commonly occur during the cold months of the year, when people are sleeping, and a wood-burning stove is left burning to keep the house warm through the night. **Unfortunately, statistics show that people living in the north are more likely to be killed in a fire than people in other parts of Canada.**



The consequences of these two different types of fire disasters can be severe, leading to:

- **Widespread loss of community buildings and homes in forest fires (summer).**
- **Tragically, lives lost due to chimney fires (winter).**



A large forest fire



It is critical that fire safety be considered and added into the construction of new housing. The recommendations in this guide help reduce the risk of death due to fire and also the loss of housing stock.



Chimney Fires: contributing factors in the north

The factors that significantly increase the risk and consequences of chimney fires in remote northern communities are:

- Most remote northern communities lack a functioning fire department.
- In the winter, when the risk of chimney fires is greatest, fire trucks often lack a source of unfrozen water that could be used to fight a fire.
- Smoke alarms are often disconnected as they continuously get triggered when wood stoves are opened to load wood and smoke leaks out.
- Wood stoves are kept continuously burning (including through the night when people are sleeping) with softwoods like spruce, readily creating creosote accumulations in chimneys that become a fire hazard once the build-up gets too thick.



A dangerous creosote build-up in a chimney



Burning creosote deposits in a chimney causing the chimney to overheat and glow red hot





Chimney Fires: The tragic results

There are numerous news reports of northern homes catching fire when a wood-burning stove is left burning through the night, while the family sleeps, to keep the house from freezing in the winter months. Tragically, these fires are extremely deadly, as the smoke and fumes from the fire typically expose the occupants in the house to carbon-monoxide poisoning as they sleep, preventing them from waking up.



Fires in northern Ontario homes that spread from chimney fires during winter nights



Chimney Fires: Preventive measures

The following preventive measures will significantly reduce the risk of and consequences from chimney fires. If adopted in remote northern communities, these measures could save numerous lives:

✔ 1) Use non-combustible materials for the construction of the house, such as steel roofing instead of asphalt shingles and wall cladding made of *metal or cement*, instead of vinyl siding (refer to Booklet #7).

✔ 2) Use a heating approach that does not require burning wood at night, such as an oil-burning furnace (refer to Booklet #3).

✔ 3) Run the chimney directly through the wall and up the outside of the house to keep a potential chimney fire outside of the house as much as possible.



✔ 4) Make sure that chimney has a proper cap with spark arrestor wire mesh.





Chimney Fires: Additional preventative measures

- ✓ Have chimneys regularly inspected and cleaned, with creosote deposits removed from chimney in both the spring and fall.



- ✓ Have smoke and carbon-monoxide alarms in each room of the house.



- ✓ Have at least two fire extinguishers mounted and easily assessable at locations close to the wood stove and kitchen.



- ✓ Perform fire drills and fire awareness education in the community.





Forest Fires: Preventive measures

Forest fires are part of the natural life cycle of the boreal forest. The time between naturally occurring fires varies greatly, from as short as 20 years to over 200 years, depending on the region.

Forest fires have the potential to burn through northern communities and destroy all or most of the community's housing. Materials used in house construction matter. There have been cases in which some houses in a community burn and others don't, even though both homes were exposed to similar heat and sparks from a forest fire. The reason is simply that they are built with different materials. Building a house with certain construction materials, such as a metal roof instead of asphalt shingles, greatly reduces the risk of a house catching fire from the airborne sparks of a nearby forest fire. Using metal, cementitious siding or charred wood siding instead of vinyl siding has a similar benefit. These lower-fire-risk materials are discussed further in Booklet #7.



A group of houses (circled in red) destroyed by a forest fire in the summer months



Forest Fires: Preventive measures

In addition to preventive measures in house construction, brush, and tree removal in zones around houses, “fire smarting” is an excellent way to reduce risk from forest fires.

The figure below shows a fire-smarting strategy for three zones, based on the distance from the house.



An example of a fire-smarting strategy promoted by the City of Whitehorse, Yukon



ADDITIONAL RESOURCES

OTHER RELATED GUIDES

- ***The Lure and Lore of Wood***, Yukon Development Corp, Nov. 2002
(www.nrgsc.yk.ca)

Woodstove and wood-burning fireplace safety, Canada Safety Council
(www.canadasafetycouncil.org)
- ***Checklist for Safe Woodburning Stove Installation***, SECURA Insurance
(www.secura.net)

BUILDING CODES & STANDARDS

- ***National Building Code of Canada***, National Research Council Canada
(www.nrc.canada.ca)



This technical booklet was developed to help community decision makers and building officers choose between different technical options in the delivery of residential housing for First Nation communities, in remote northern Ontario.

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