



Notes on Fire Protection of Exterior Walls in Reference to the National Building Code

This document draws out some of the main points from the NBC regarding fire protection of exterior walls incorporating combustible components, claddings or cladding elements. Foamed plastic insulations, which typically have flame spread ratings between 200 and 500 (depending upon the type), cannot be left exposed anywhere on the interior or exterior of a building. For exterior applications, foamed plastics used as part of an exterior wall must be tested to, and comply with, the full scale fire test CAN/ULC-S134. Materials must comply with CAN/ULC-S102 "Standard for Surface Burning Characteristics of Building Materials and Assemblies" in preference to ASTM E84 "Standard for Surface Burning Characteristics of Building Materials".

There are a number of provisions within the NBC that relate to fire protection of exterior walls incorporating combustible components, claddings or cladding elements.

Section 3.1.5.5. addresses the protection of combustible components of exterior walls from external fire attack. Section 3.1.5.5. 'Combustible Components for Exterior Walls' require exterior non-loadbearing wall assemblies that include combustible components are permitted to be used in a building required to be of noncombustible construction provided that:

- (a) the building is (i) not more than 3 storeys in height, or (ii) sprinklered throughout,
- (b) the interior surfaces of the wall assembly are protected by an approved thermal barrier and
- (c) the wall assembly satisfies specific criteria when subjected to testing in conformance with CAN/ULC-S134, "Fire Test of Exterior Wall Assemblies."

Conversely, 3.1.5.12. addresses the protection of combustible insulation within the wall, or used as an interior finish, from interior fire spread. Section 3.1.5.12. applies to combustible insulation and its protection. Foamed plastics having a flame-spread rating of not more than 500 may be allowed in a building required to be of noncombustible construction when protected by an approved thermal barrier.

Section 3.2.3.7. applies to minimum construction requirements for exposing building faces based on the occupancy classification of the building. The fire resistance ratings which are required will depend on the area of unprotected openings as a percentage of the exposed building face and the spacial separation to adjacent structures.

Section 3.2.3.8. states that foamed plastic insulation used in exterior walls greater than 3 storeys where the maximum area of unprotected openings is permitted to be greater than 10% must be protected by a minimum thickness of 25 mm concrete or masonry or pass a modified version of the CAN/ULC-S101 fire endurance test, as well as other performance requirements.

British Columbia Code Appeal Board

Recent rulings from the British Columbia, Building and Safety Standard Branch, Building Code Appeal Board (BCAB) #1682 confirms that Sections 3.1.5.5. and 3.1.5.12. of the code are separate and distinct and that foamed plastic insulation must conform to the provisions of both sections. BCAB #1683 confirms that where an exposed building face is permitted to have 100% unprotected openings the provisions of Section 3.2.3.8. still apply in addition to the requirements of Section 3.2.2.7.

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The performance of exterior walls during fire exposure is a critical element of building construction. Steel, concrete, masonry, gypsum and stone wool are the materials of choice when fire performance and the presence of combustible materials within the building envelope are of concern.

Roxul stone wool insulation offers a noncombustible option and provides the maximum resistance to fire; a vital component of high performance fire barrier and exterior wall systems.

Parameter	ROXUL® Mineral Wool	Polyurethane and Polyisocyanurate	Extruded Polystyrene (XPS)
Flame Spread - CAN/ULC-S102	0	350	200
Smoke Developed - CAN/ULC-S102	0	200	500
Contains fire retardants	no	yes	yes
Combustibility - CAN/ULC-S114	noncombustible	combustible	combustible
Behavior during fire exposure	stays in place	burns	melts and burns
Melting temperature °F	2150	ignites at 490	220
Auto ignition temperature °F	none	490	600
Maximum Use Temperature °F	1200	250	165