

BC BUILDING CODE INTERPRETATION COMMITTEE

A joint committee with members representing
AIBC, EGBC, BOABC

File No: 18-0108

INTERPRETATION

Page 1 of 2

Interpretation Date:	May 18, 2021
Building Code Edition:	BC Building Code 2018
Subject:	Fire Protection of Structural Steel in a Fire Separation
Keywords:	Fire-Resistance Rating, Fire Separation
Building Code Reference(s):	3.1.7.1.(1), 3.1.8.1.(1)

Question:

Where a structural steel member with sprayed fire protection material is in the plane of a fire separation, with the steel member and the fire separation requiring the same fire-resistance rating, can the steel member be considered as part of the fire separation? For example, if a fire-sprayed steel beam is located at the top of a framed wall and is parallel to the wall, can the beam maintain the continuity of the fire separation?

Interpretation:

No, unless the steel member has been tested as part of the fire separation, including the temperature rise requirements.

The fire-resistance rating of fire separations is determined in accordance with CAN/ULC-S101 "Fire Endurance Tests of Building Construction and Materials". For a non-loadbearing fire separation, the failure criteria related to temperature rise on the unexposed surface are a maximum spot temperature rise of 180 °C and maximum average temperature rise of 140 °C.

For a loadbearing structural steel member such as a beam exposed to the floor area, the failure during fire testing is typically determined by structural failure. This generally occurs when the steel has lost at least 40% of its initial strength, typically when the steel has reached a temperature of at least 550 °C.

For the example of a beam with sprayed fire protection material, the sprayed material would have been tested to limit the temperature rise of the steel and thereby delay its structural failure. However, the structural failure temperature of the steel is much higher than the



Patrick Shek, P.Eng., CP, FEC, Committee Chair

The views expressed are the consensus of the joint committee with members representing AIBC, EGBC and BOABC, which form the BC Building Code Interpretation Committee. The Building and Safety Standards Branch, Province of BC and the City of Vancouver participate in the committee's proceedings with respect to interpretations of the BC Building Code. The purpose of the committee is to encourage uniform province wide interpretation of the BC Building Code. These views should not be considered as the official interpretation of legislated requirements based on the BC Building Code, as final responsibility for an interpretation rests with the local *Authority Having Jurisdiction*. The views of the joint committee should not be construed as legal advice.

BC BUILDING CODE INTERPRETATION COMMITTEE

A joint committee with members representing
AIBC, EGBC, BOABC

File No: 18-0108

INTERPRETATION

Page 2 of 2

failure temperature on the unexposed side of the fire separation under the beam. If the beam is at the top of a fire separation wall, only one side of the beam would be exposed to a fire. If the beam is sprayed on all sides, the higher temperature at the steel would not be the same as the temperature on the unexposed side of the sprayed material on the steel. However, unless the sprayed beam has been tested as part of the fire separation, it could not be confirmed that this temperature rise complied with the criteria for a fire separation. Alternatively, subject to agreement with the authority having jurisdiction, it may be possible to conduct a heat transfer analysis to estimate the temperature on the unexposed side of the sprayed material on the beam.



Patrick Shek, P.Eng., CP, FEC, Committee Chair

The views expressed are the consensus of the joint committee with members representing AIBC, EGBC and BOABC, which form the BC Building Code Interpretation Committee. The Building and Safety Standards Branch, Province of BC and the City of Vancouver participate in the committee's proceedings with respect to interpretations of the BC Building Code. The purpose of the committee is to encourage uniform province wide interpretation of the BC Building Code. These views should not be considered as the official interpretation of legislated requirements based on the BC Building Code, as final responsibility for an interpretation rests with the local *Authority Having Jurisdiction*. The views of the joint committee should not be construed as legal advice.