

Proposed Change 2173

Code Reference(s):	NBC25 Div.B 3.6.4.3.(1) (first printing)
Subject:	Building Fire Safety
Title:	Requirements for Certain Discrete Products Installed in Plenums
Description:	This proposed change adds CAN/ULC-S142:2016, "Standard Method of Fire Test for Heat and Visible Smoke Release for Discrete Products", as a test method for these discrete stand-alone, non-continuous products installed in concealed spaces used as plenums.
Related Code Change Request(s):	CCR 1793

This change could potentially affect the following topic areas:

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| ☐ Division A | ☒ Division B |
| ☐ Division C | ☒ Design and Construction |
| ☐ Building operations | ☐ Housing |
| ☒ Small Buildings | ☒ Large Buildings |
| ☒ Fire Protection | ☐ Occupant safety in use |
| ☐ Accessibility | ☐ Structural Requirements |
| ☐ Building Envelope | ☐ Energy Efficiency |
| ☐ Heating, Ventilating and Air Conditioning | ☐ Plumbing |
| | ☐ Construction and Demolition Sites |

Problem

Clause 3.6.4.3.(1)(a) of the National Building Code of Canada (NBC) requires materials located within certain concealed spaces used as plenums to have a flame-spread rating not more than 25 and a smoke developed classification not more than 50, with certain exceptions. Where the ratings cannot be determined using the test methods described in CAN/ULC-S102, "Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies," as required by Article 3.1.12.1., Sentence 3.6.4.3.(1) provides other testing requirements by type of component.

The term "discrete products," as used in CAN/ULC-S142:2016, "Standard Method of Fire Test for Heat and Visible Smoke Release for Discrete Products," refers to stand-alone, non-continuous products that are not installed in a continuous manner. These products cannot be tested using the tunnel equipment referenced in CAN/ULC-S102.

Sentence 3.6.4.3.(1) does not currently include requirements for these discrete products. As a result, discrete products that are tested in conformance with CAN/ULC-S142 do not have a clear acceptance pathway; this proposed change addresses the gap in the NBC.

Justification

CAN/ULC-S102 requires test specimens that are large, continuous, and approximately 0.5 m to 0.6 m in width and 7.32 m in length. Many components placed in concealed plenum spaces cannot be tested using this method due to their geometry, mass, type of installation, or inability to be fabricated into continuous tunnel-test specimens.

By contrast, CAN/ULC-S142 was developed specifically to evaluate the fire performance of discrete products that are not suitable for testing in conformance with CAN/ULC-S102. The test method described in CAN/ULC-S142 exposes products to a 60 kW ignition source and measures heat release and smoke production using oxygen-consumption calorimetry. Acceptable products must exhibit a peak heat release rate of 100 kW or less, a maximum normalized optical density of 0.5 or less, and an average normalized optical density of 0.15 or less. These thresholds demonstrate that discrete products conforming to CAN/ULC-S142 can limit the severity and effects of fire within a plenum in a manner consistent with the intent of the NBC.

To clarify the acceptance of discrete products installed within concealed spaces used as plenums, this proposed change includes a reference to CAN/ULC-S142 to align the Code with the requirements specified in the standard.

PROPOSED CHANGE

[3.6.4.3.] 3.6.4.3. Plenum Requirements

- [1] 1)** A concealed space used as a *plenum* within a floor assembly or within a roof assembly need not conform to Sentence 3.1.5.18.(1) and Article 3.6.5.1., provided
- [a] a) all materials within the concealed space have a *flame-spread rating* not more than 25 and a smoke developed classification not more than 50, except for
 - [i] i) tubing for pneumatic controls,
 - [ii] ii) optical fibre cables and electrical wires and cables with *combustible* insulation, jackets or sheathes that are used for the transmission of voice, sound or data and conform to Sentences 3.1.4.3.(2) and 3.1.5.21.(2),
 - [iii] iii) totally enclosed non-metallic raceways with an FT6 rating, when tested in accordance with Sentence 3.1.5.23.(2), in *buildings* required to be of *noncombustible construction* or in *buildings* or parts of *buildings* permitted to be of *encapsulated*

- mass timber construction, and*
- [iv] iv) totally enclosed non-metallic raceways with an FT4 rating, when tested in accordance with Clause 3.1.5.23.(1)(a), in *buildings* permitted to be of *combustible construction*, and
 - [v] --) discrete stand-alone, non-continuous products that are not installed in a continuous manner, when tested in accordance with CAN/ULC-S142, "Standard Method of Fire Test for Heat and Visible Smoke Release for Discrete Products," and
- [b] b) the supports for the ceiling membrane are of *noncombustible* material having a melting point not below 760°C.

Impact analysis

No significant additional cost impacts are anticipated. The proposed change would clarify the appropriate acceptance pathway for discrete, stand-alone, non-continuous products that are not installed in a continuous manner and therefore may not be appropriately tested using CAN/ULC-S102.

For discrete products, CAN/ULC-S142 is considered a more suitable test method than CAN/ULC-S102, because it better reflects the product configuration and intended installation conditions. This approach is consistent with the industry position that such products should be evaluated using a test method that is technically appropriate to how they are used in buildings. Manufacturers are not expected to incur significant additional expenses to demonstrate compliance, as the proposed change would clarify the applicable test method.

The proposed change would also reduce project costs by providing a clear compliance pathway and avoiding unnecessary redesign, substitution or uncertainty regarding the use of discrete products in certain concealed spaces, where testing in accordance with CAN/ULC-S102 is not applicable. Benefits would include improved clarity for design professionals, manufacturers, and authorities having jurisdiction (AHJs), as well as more consistent application of fire safety requirements.

Enforcement implications

No additional enforcement resources are expected as a result of this proposed change. AHJs would continue to ensure that these discrete products comply with the applicable referenced standard for their intended applications. This proposed change simply specifies the correct test method to be applied, without impacting the enforcement process or the responsibility of AHJs to verify compliance with the referenced standard.

Who is affected

This proposed change may affect a wide range of stakeholders involved in design, specification, manufacture, approval and construction; including, but not limited to, designers, specifiers, manufacturers, building owners, contractors and building officials.

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

[3.6.4.3.] 3.6.4.3. (**[1]** 1) [F02-OS1.2]