



CONFORM[®] - Code Compliance

National Building Code of Canada 2010

CONFORM[®] is a pre-finished, permanent formwork for cast-in-place concrete wall construction. A concrete wall with CONFORM consists of a non-combustible concrete wall, an interior face with a combustible finish and an exterior face with a combustible finish that may include polyurethane insulation (CONFORM CF8i). The concrete wall may be a bearing or non-bearing wall and may be steel reinforced concrete or plain concrete.

There are many different types of buildings and occupancies where this wall conforms to the requirements of the 2010 National Building Code of Canada (NBC). The following is a summary of code articles that may be applicable depending on the building type and occupancy. In addition, Nuform has previously conducted code reviews by code consultant, Randal Brown and Associates Ltd. (1) and by fire consultant, Leber Rubes Inc. (2)

Interior Finish Requirements

3.1.12 Flame Spread Rating and Smoke Developed Classification

3.1.12.1 Determination of Ratings

The CONFORM formwork was tested in conformance with CAN/ULC-S102.2 and Flame Spread (FS) is not more than 25 and Smoke Developed Classification (SD) is not more than 350. (3)

The foamed plastic insulation in CONFORM CF8i formwork was tested in conformance with CAN/ULC-S102 and Flame Spread (FS) is not more than 25 and Smoke Developed Classification (SD) is not more than 250. (4)

3.1.13 Interior Finish

3.1.13.2(1) Flame Spread Rating

The CONFORM formwork meets the code requirements of this article, since FS is not more than 25.

3.1.13.6 Corridors

The CONFORM formwork meets the code requirements of this article, since FS is not more than 25.

3.1.13.7 High Buildings

The CONFORM formwork is NOT permitted in high buildings, unless the building is sprinklered, since SD exceeds the maximum smoke developed classification of this article.

3.6.4 Horizontal Service Spaces and Service Facilities

3.6.4.3 Plenum Requirements

The CONFORM formwork is NOT permitted in a concealed space used as a plenum, since SD exceeds the maximum smoke developed classification of this article.

Noncombustible Construction Requirements

3.1.5 Noncombustible Construction

3.1.5.1 Noncombustible Materials

Concrete with PVC cross web of CONFORM was tested in accordance with CAN/ULC-S135 and meets the requirements of this article. (5)

3.1.5.2 Minor Combustible Components

The Building Materials Evaluation Commission of Ontario (BMEC) concluded that PVC cross webs of CONFORM are minor combustible components permitted in noncombustible construction, under this article. (6)

3.1.5.5 Combustible Components for Exterior Walls

The insulated CONFORM CF8i formwork was tested in conformance with CAN/ULC-S134 and meets the requirements of this article. (7)

3.1.5.10(2) Combustible Interior Finishes

The CONFORM formwork meets the requirements of this article, FS not more than 25.

3.1.5.12 Combustible Insulation and its Protection

The insulation of CONFORM CF8i formwork meets the requirements of this article, FS not more than 25.

The exterior insulation of CONFORM CF8i formwork is protected from the adjacent space within the building by the cast-in-place concrete, as required by this article.

If the insulated face of the CONFORM CF8i formwork is exposed to adjacent space in the building, i.e. an insulated exterior wall face that extends below a low roof, it must be protected as noted in article 3.5.1.12(2).

3.1.7 Fire Resistance Ratings

3.1.7.1 Determination of Ratings

A load bearing concrete wall with CONFORM CF6 formwork was tested in conformance with CAN/ULC-S101 and meets the requirements of this article for a 2 hr fire rating. (8)

Based on a CAN/ULC-S101 test, fire consultant, Locke MacKinnon Domingo Gibson & Associates Ltd. (LMDG) determines that walls with CONFORM CF8i formwork meet the requirements for a 2 hr fire rating. (9)

3.1.9 Building Services in Fire Separations and Fire-Rated Assemblies

3.1.9.1 Fire Stopping of Service Penetrations

Fire stopping shall be provided as required and the combustible finish, CONFORM material, shall be removed where any fire stop materials are required to overlap the faces of the concrete wall.

Exterior Finish Requirements

3.2.3 Spatial Separation and Exposure Protection

3.2.3.7 Construction of Exposed Building Face

As per 3.2.3.7(3), the noncombustible cladding requirement of 3.2.3.7(2) are waived for Groups A, B, C, D and Group F Division 3 and for Groups E and Group F Divisions 1 or 2, where the maximum permitted area of unprotected openings is more than 10% of the exposed building face, since the wall assembly with CONFORM formwork complies the requirements of Article 3.1.5.5, when tested in conformance with CAN/ULC-S134.

As per 3.2.3.7(5), the noncombustible cladding requirement of 3.2.3.7(2) are waived for Groups A, B, C, D and Group F Division 3 and for Groups E and Group F Divisions 1 or 2, where the maximum permitted area of unprotected openings is more than 10% but not more than 25% of the exposed building face, since the wall assembly with CONFORM formwork complies the requirements of Article 3.1.5.5, when tested in conformance with CAN/ULC-S134.

3.2.3.8 Protection of Exterior Building Face

As per 3.2.3.8(3), the requirement for protection of foamed plastic insulation of 3.2.3.8(1) is waived, since the insulated CONFORM CF8i formwork complies the requirements of Article 3.1.5.5, when tested in conformance with CAN/ULC-S134.

Structural Requirements

4.3.3 Plain, Reinforced and Pre-stressed Concrete

4.3.3.1 Design Basis for Plain, Reinforced and Pre-stressed Concrete

The cast-in-place concrete wall constructed using CONFORM formwork shall be designed in conformance with standard CSA A23.3 "Design of Concrete Structures", by a Professional Engineer skilled in such designs and licensed to practice under the appropriate legislation.

References:

- (1) BMEC Product Review for Nuform Building Technologies Inc. Stay-in-place Wall Form (CONFORM) for Use in Noncombustible Buildings by Randal Brown & Associates Ltd., RBAL File No. 08-056, November 20, 2009.
- (2) "CONFORM" Compliance with National Building Code of Canada, 2005 Edition and Ontario Building Code 2006 Edition by Leber Rubes Inc., File No. 2006-461, June 23, 2009.
- (3) CAN/ULC-S102.2-07, Surface Burning Characteristics of "RPI 8100 + NF Blend 1101" by Bodycote Testing Group, Report No. 08-002-896(B), December 2, 2008.
- (4) CAN/ULC-S102-07, Surface Burning Characteristics of "FE244 / FE800 (HFC-134a Blown)" Insulation by Exova, Report No. 09-002-946(A), January 20, 2010.
- (5) CAN/ULC-S135, Standard Method of Test for Determination of Degrees of Combustibility of Building Materials using an Oxygen Consumption Calorimeter (Cone Calorimeter), by Underwriters Laboratories Inc., File No. R19435, June 16, 2003
- (6) BMEC Application by Ontario Building Materials Evaluation Commission, BMEC Application No. A2009-08: CONFORM, July 30, 2010.
- (7) CAN/ULC-S134-92, Standard Method of fire Test of Exterior Wall Assemblies by National Research Council of Canada, Report No. B-4115.1 Revised, August 10, 1999
- (8) CAN/ULC-S101-M89, Standard Methods of Fire Endurance Tests of Building Construction and Materials by Underwriters' Laboratories of Canada, File No. CR2598, April 22, 1997.
- (9) Fire Resistance Evaluation - Royal Building Systems™ (CONFORM) by Locke MacKinnon Domingo Gibson & Associates Ltd. (LMDG), File No. 97-172, August 26, 1997.

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