

## Air Barrier Requirements in Canadian Building Codes and Standards

*Disclaimer: This technical bulletin does not include all information required to complete a design of a construction/air barrier project using the sections/articles summarized below. Consult the appropriate code or standard for all the required information to complete a through design analysis.*

### **2011 National Energy Code for Buildings**

#### **3.2.4. Air Leakage**

##### **3.2.4.1. General**

1) The *building envelope* shall be designed and constructed with a continuous air barrier system comprised of *air barrier assemblies* to control air leakage into and out of the *conditioned space*.

##### **3.2.4.2. Opaque Building Assemblies**

1) All *opaque building assemblies* that act as environmental separators shall include an *air barrier assembly*.

##### **3.3.4.9. Proposed Building Envelope Annual Energy Consumption Calculation**

6) Air leakage shall be set at a constant value of  $0.25 \text{ L}/(\text{s}\cdot\text{m}^2)$  of gross above-ground wall and roof areas. (See A-8.4.3.4.(3) in Appendix A.)

### **2010 National Building Code of Canada**

#### **Section 5.4. Air Leakage**

##### **5.4.1. Air Barrier Systems**

###### **5.4.1.1. Required Resistance to Air Leakage**

(See Appendix A.)

1) Where a building component or assembly separates interior conditioned space from exterior space, interior space from the ground, or environmentally dissimilar interior spaces, the properties and position of the materials and components in those components or assemblies shall be such that they control air leakage or permit venting to the exterior so as to

- a) provide acceptable conditions for the *building* occupants,
  - b) maintain appropriate conditions for the intended use of the *building*,
  - c) minimize the accumulation of condensation in and the penetration of precipitation into the *building* component or assembly,
  - d) control heat transfer to roofs where ice damming can occur,
  - e) minimize the ingress of airborne radon from the ground with an aim to controlling the indoor radon concentration to an acceptable level, and
  - f) not compromise the operation of *building* services.
- 2) Except as provided in Sentence (3), an air barrier system shall be installed to provide the principal resistance to air leakage.
- 3) An air barrier system is not required where it can be shown that uncontrolled air leakage will not adversely affect any of
- a) the health or safety of building users,
  - b) the intended use of the building, or
  - c) the operation of building services.

#### 5.4.1.2.

### Division B

#### Air Barrier System Properties

- 1) Except as provided in Sentence (2), materials intended to provide the principal resistance to air leakage shall
- a) have an air leakage characteristic not greater than  $0.02 \text{ L}/(\text{s}\cdot\text{m}^2)$  measured at an air pressure difference of 75 Pa, or
  - b) conform to CAN/ULC-S741, "Air Barrier Materials - Specification." (See Appendix A)
- 2) The air leakage limit specified in Sentence (1) is permitted to be increased where it can be shown that the higher rate of leakage will not adversely affect any of
- a) the health or safety of the building users,
  - b) the intended use of the building, or
  - c) the operation of building services. (See Appendix A)
- 3) The air barrier system shall be continuous
- a) across construction, control and expansion joints,
  - b) across junctions between different building assemblies, and
  - c) around penetrations through the building assembly.
- 4) The structural design of air barrier systems installed in assemblies subject to air pressure loads shall comply with Article 5.1.4.1. and Subsection 5.2.2.

## **CAN/ULC-S741**

This standard provides the requirements and test methods for air barrier materials used in building applications.

The test method involves measuring the airflow through representative samples of the material for a range of differential pressures, and calculating an assigned air leakage characteristic of the material at a reference pressure difference ( $\Delta P$ ) of 75 Pa. The test methods for air barrier materials in this standard do not include consideration of the means of attachment.

The requirements for the air leakage characteristic of air barrier components and air barrier accessories were not considered in the development of this standard.

CAN/ULC-S741 and the American standard ASTM E2178 are near-identical.

## **CAN/ULC-S742**

This standard sets out criteria for specification of air barrier assemblies that may be used in design specification documents or in manufacturer's product literature.

This standard provides the requirements and test methods for an air barrier assembly used in applications for both low-rise and high-rise buildings.

The test methods described in this standard involve measuring the air leakage rate of a representative test specimen of an air barrier assembly before and after exposure to wind pressure loading cycles and then determining an air leakage rate at a reference pressure difference (DP), based on the measurements.

This standard sets minimum performance requirements for the air leakage rate of air barrier assemblies based on levels of air leakage rate and wind pressure loading.

CAN/ULC-S742 and the American standard ASTM E2357 are near-identical.