



www.daylelaing.com

This glossary of window definitions has been adapted in whole or part from the websites listed at the end of each definition. It is not intended to be a rigorous review of the literature, but a guide to explaining terms in common use.

Air Leakage (AL): measures the rate at which air passes through joints in the window. AL is measured in cubic feet of air passing through one square foot of window area per minute; the lower the value, the less air leakage. Most industry standards and building codes require a maximum AL of 0.3 cf•m/ft². www.energystar.gov AL ranges typically fall between 0.1 and 0.3 and not all manufacturers display this information. www.nfrc.org

Air Space: hermetically sealed space between double or triple glazed windows. Space is typically 3/16" to 3/4" and may include a desiccant to maintain dryness. www.sigmaxwindows.com

Aluminum frames: are strong and durable, but they readily conduct heat. To avoid heat loss and condensation, aluminum frames are required by the National Building Code of Canada to have a thermal barrier inside made from rigid foam, polyurethane or wood, to reduce heat transfer. While aluminum frames are durable and require little maintenance, they have poor insulating properties. Some aluminum frames have mitred joints in the corners, which can allow water to leak into the wall if the joints are not properly sealed or the seals fail. www.cmhc-schl.gc.ca

Apron: horizontal trim board applied to wall under the window sill. It has an esthetic function.

Argon: See Inert Gas Fills

Awning Window: Hinged at the top and opens out from the bottom. With an effective seal, this design minimizes air infiltration. www.cmhc-schl.gc.ca

Casement Window: Hinged on one side and swings open like a door. This design provides the best seal and has the lowest air leakage for a window that opens. www.cmhc-schl.gc.ca Inward swinging casements are French in origin, while outward swinging are English. www.sigmaxwindows.com

Casing: mouldings that surround the window and cover the frame. www.cmhc-schl.gc.ca The gap between the window frame and the wall studs must be caulked to seal the unit and prevent air leakage from around the perimeter of the window.

Clad wood frames: have the advantage of wood's natural insulating qualities, but they require less maintenance. The cladding is usually aluminum or vinyl, available in limited colours. Moisture problems can be reduced if the cladding is applied properly to the wood. If moisture gets trapped between the cladding and the wood, damage and rot can occur unseen. www.cmhc-schl.gc.ca

Coloured glazings: reduce solar heating and provide glare control. This technique is normally only seen in commercial or multi-residential high-rise buildings. **Films** can be purchased to reduce glare from the sun, although glare can also be reduced through plantings outdoors, window awnings or shutters. Tinted films should be applied by a qualified contractor, as the application process requires some skill and special tools. www.cmhc-schl.gc.ca

Condensation: on windows occurs when the surface temperature of the glass (glazing), sash or frame is lower than that of the humid air around it. The moisture vapour in the air changes into liquid water on contact with these cold surfaces. Condensation will often occur at the edge of the glazing because this is where cold air is more likely to seep through. Condensation can reduce the amount of natural light that comes through the window, affecting visibility, and also cause stains, mould and peeling paint on surfaces near the window. www.oee.nrcan.gc.ca

Condensation Resistance: measures how well the window resists water build-up. It is scored on a scale from 0 to 100. The higher the condensation resistance factor, the less build-up the window allows. www.energystar.gov Displaying this information on a label is optional. www.nfrc.org

Double-glazed: windows with two layers of glass separated with a spacer. It is the minimum standard allowed by the National Building Code of Canada. Air trapped between the glass layers provides some insulating value. www.cmhc-schl.gc.ca

Double-hung windows: include offset upper and lower sashes, which can both move up and down in the frame. Both the single and double-hung windows are not as energy-efficient as awning or casement windows, but their appearance may be more appropriate to the style of the house, especially in older homes. www.cmhc-schl.gc.ca

Egress window: a window large enough, as defined by local building codes, for exit or entry in case of an emergency. It is typically required in bedrooms. www.andersonwindows.com

Energy Rating (ER): is calculated using a formula that balances a product's U-value with its potential solar heat gain coefficient (SHGC) and its air-tightness. The ER scale products rate between 0 and 50. The higher the ER number, the better the product's thermal performance and the more energy efficient. www.oeenrcan.gc.ca



Energy Star® Rating: 3rd party certification recognized by CaGBC. Energy Star qualification is based on U-factor and SHGC ratings only. www.energystar.gov The ENERGY STAR name and symbol are administered and promoted in Canada by Natural Resources Canada and are registered in Canada by the United States Environmental Protection Agency (EPA). www.oeenrcan.gc.ca

Fenestration: An architectural term referring to the arrangement of windows in a wall. www.andersonwindows.com and refers to windows, glazed doors and skylights www.nfrc.org

Fibreglass frames: are light, durable and strong, even in narrow sizes, they have excellent insulating qualities, and do not expand and contract with heat and cold as much as other frames. They are also more expensive. www.cmhc-schl.gc.ca

Frame: is the horizontal and vertical portion that surrounds the sash and on which it is hung. Frames are usually made of the same materials as the sash. Window frames may be manufactured with or without nailing flanges. Frame and sash design and construction are important for both energy efficiency and appearance. Several materials are commonly used: wood, clad wood, aluminum, vinyl and fibreglass. www.cmhc-schl.gc.ca

Glazing (glass): can be a solid sheet of glass, or several panes divided by a mullion. Some glazings are made of tempered glass, to resist breakage, and some are made of laminated glass, which not only reduces breakage, but if the window does break, the glass shards will be too small to cause injury. www.cmhc-schl.gc.ca

Header (Lintel): horizontal beam above the window assembly. It may be made of wood, steel or stone. www.sigmaxwindows.com

Hopper Window: Hinged at the bottom and opens in or out from the top. An effective seal minimizes air infiltration. www.cmhc-schl.gc.ca

Horizontal Slider Windows: Consist of two sashes, one or both of which slide horizontally in the frame. They are the least energy-efficient of the window types and the most prone to air and water leaks. www.cmhc-schl.gc.ca

Inert gas fills: are an innovation that replaces air with **argon** or **krypton** in the area between the panes of glass in a sealed unit. Inert gases have a higher insulating value than air because they are denser and have lower thermal conductivity, resulting in lower heat transmission between the panes of glass. Argon is the most commonly used gas due to its availability and low cost. Gas fills are a cost-effective upgrade over conventional air-filled glazings. www.cmhc-schl.gc.ca Most manufacturers offer inert gas fill in glazed units as an option to increase thermal resistance and reduce heat loss. The gas used is odourless, colourless and non-toxic. Under normal conditions it will remain inside the glazed unit for many years. Argon is the most common gas, but krypton may also be used, especially in triple-glazed products. Krypton gives slightly better performance than argon. As a result, the panes of glass can be closer together. Thus, less of this expensive gas is necessary, and multiple-pane systems are less likely to experience stress breakage. www.oeenrcan.gc.ca

Jamb: vertical member at the side of the window frame. Can be horizontal if referred to as 'Head Jamb'. www.sigmaxwindows.com

Krypton: See Inert Gas Fills



LEED™- Leadership in Energy and Environmental Design: A point-based rating system developed by The U.S. Green Building Council (USGBC) Rating System for Sustainable Development to assess new and existing commercial buildings for a variety of earth-friendly features. www.usgbc.org There is also a Canadian Green Building

Council with chapters across Canada and chapters around the world. www.worldgbc.org CaGBC has different standards for LEED™ due to unique features of Canadian climate. This system has been expanded to include certification for residential homes, existing buildings – operation & maintenance, and neighbourhoods. <http://www.ca gbc.org/>

LEED Accredited Professional (AP): The LEED Professional Credentials (LEED AP and Green Associate) are professional designations for those who have demonstrated a thorough understanding of green building techniques, environmental issues, the LEED program and the certification process. The LEED credentials show differentiation in a growing and competitive industry and allow for varied levels of specialization. <http://www.usgbc.org/>

Low-emissivity (Low-E) coating: consists of a thin layer of metal oxide applied to the exterior face of the interior glazing in a double-glazed window. It allows some sunlight to pass through, but blocks heat from escaping. A double-glazed low-E window provides similar insulation value to that of a triple-glazed unit, but costs less and weighs less. Low-E glazing filters out the sun's ultraviolet (UV) rays, which can fade furnishings and can reduce condensation on the window by keeping the indoor surface of the glass and frame warmer. www.cmhc-schl.gc.ca Windows that have a hard-coat low-e coating and a high Energy Rating (ER) value should be installed on the south and west side of the home – they will add more heat to the home through solar gain than they lose. www.oenrcan.gc.ca

Mullion: vertical member between window units. www.sigmawindows.com

Muntin: is a secondary frame that holds the window-panes in the sash. www.cmhc-schl.gc.ca Also called a windowpane divider or a grille. www.andersonwindows.com

National Fenestration Rating Council (NFRC): is a third-party non-profit organization that sponsors certified rating and labeling to help consumers compare the performance of windows, doors, and skylights. ENERGY STAR® enables consumers to easily identify NFRC-certified products with superior energy performance. www.energystar.gov The National Fenestration Rating Council (NFRC) energy performance label helps determine how well a product will perform the functions of helping to cool the building in the summer, warm the building in the winter, keep out wind, and resist condensation. By using information on the label, builders and consumers can compare products, and make informed decisions about the windows, doors, and skylights. It lists the manufacturer, describes the product, provides a source for additional information, and includes ratings for one or more energy performance characteristics. All energy performance values on the label represent the rating of windows/doors as whole systems (glazing and frame). www.nfrc.org

Rail: horizontal member of the window sash. www.sigmawindows.com

R-Value: measures thermal resistance and is the reciprocal of U-Value, which is the preferred measurement for windows. $R=1 \div U$ www.cmhc-schl.gc.ca

Sash: Windows come either fixed or operable (openable). Fixed windows do not open. Operable windows have a sash, which is a unit assembly of stiles and rails for holding the glass that moves when the window opens. They are available in a variety of sliding or hinged models. The sash can be made of wood, vinyl, metal or fiberglass and should make a tight seal with the frame when the window is closed. www.cmhc-schl.gc.ca

Sill: horizontal member at the bottom of the window frame. www.sigmawindows.com

Single-hung window: include one fixed sash (usually the top one) and one that moves up and down in the frame. www.cmhc-schl.gc.ca

Solar Heat Gain Coefficient (SHGC): measures the fraction of solar energy transmitted and tells you how well the product blocks heat caused by sunlight. SHGC is measured on a scale of 0 to 1; values typically range from 0.25 to 0.80. The lower the SHGC, the less solar heat the window transmits. www.energystar.gov

Spacer bars: are located around the perimeter of a sealed glazing unit to provide uniform separation between the panes of glass. They were typically made of aluminum, but spacers made of less conductive materials are now available. A high-performance/warm-edge spacer can increase the energy efficiency of a window, provided that the frame is made of an insulating material and not metal. www.cmhc-schl.gc.ca Low-conductivity spacers can improve the thermal performance of a low-e, gas-filled window, door with a window, or skylight by as much as 20 percent. These better spacers also keep the inside glass warmer around the edges, reducing thermal stresses on the glass and reducing the likelihood of condensation in cold weather. www.oee.nrcan.gc.ca

Spectrally Selective Glass: tinted or coated glass that have special properties to block or re-radiate sun energy to reduce solar heat gain coefficient through windows. It may have low-e coatings. www.nfrc.org

Stile: vertical member of the window sash.

Thermal Barrier (Break): aluminum frames and sashes must be designed with significant thermal breaks to reduce heat loss by conduction. www.oee.nrcan.gc.ca A low-conductive material is placed between the inner and outer aluminum material of the frame.

Thermal Bridge: is created when materials that are poor insulators come in contact, allowing heat to flow through the path created. Insulation around a bridge is of little help in preventing heat loss or gain due to thermal bridging; the bridging has to

be eliminated, rebuilt with a reduced cross-section or with materials that have better insulating properties, or with an additional insulating component (a thermal break). www.wikipedia.org

Tilt-and-turn (dual-action) windows: Swing from the side or pivot from the middle. Others pivot from both the bottom (like a hopper) and the side (like a casement). This allows for cleaning the outside of the window from the inside of the house and can be a valuable feature if a window is in a location where it's difficult to get at from the outside. Be sure to have an effective weather seal for this type of window. www.cmhc-schl.gc.ca

Transom (operable): upper window unit which can be opened for ventilation. www.sigmawindows.com

Triple-glazed: windows with three layers of glass, or two layers with a low-emissivity (Low-E) film suspended between them. The additional layer and air space give triple glazing better insulation value than that provided by double glazing. This is a good choice where there are extremes in weather and temperature. They can help reduce sound transmission where outside noise is a problem, but because the sash is heavier it may be more difficult to operate than a double-glazed window. www.cmhc-schl.gc.ca

U-Value: measures the rate of thermal transfer and tells you how well the window assembly insulates. It includes conductance and heat transfer due to convection and radiation. U-factor values generally range from 0.25 to 1.25 and are measured in Btu/h•ft²•°F. The lower the U-factor, the better the window insulates. It is the inverse of R-value. www.energystar.gov , www.nfrc.org Neither the U- or R-value account for heat energy from the sun (solar gain) See SHGC. www.oee.nrcan.gc.ca

Visible Transmittance (VT): measures the amount of light the window lets through. VT is measured on a scale of 0 to 1; values generally range from 0.20 to 0.80. The higher the VT, the more light you see (daylighting). www.energystar.gov

Vinyl frames: are available in two types. 1) Extruded vinyl frames incorporating internal air cavities. 2) Reinforced inner structure of another material –wood or metal. Wood is preferable because it has better insulating qualities than metal. Vinyl frames are very durable, and have low maintenance. They can resist moisture, termites, corrosion and air pollutants. Vinyl windows provide “good” insulating properties, if the cavities in the sash and frame are insulated. www.cmhc-schl.gc.ca

Vinyl (PVC) Issues: Synthetic thermoplastic polymer made from vinyl chloride, PVC has been used extensively in window frames. PVC releases dioxin and other persistent organic pollutants when produced, used or burned. <http://archive.greenpeace.org/toxics/pvcdatabase/bad.html> PVC is a known human carcinogen and it affects cardiovascular, hepatic and immunological systems, according to the Agency for Toxic Substances & Disease Registry. <http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=51>

Weatherstripping: provides a seal between the window-frame and the operable sash. It is used to prevent air leakage, and enhanced window performance. There are 2 types: **Wiper or brush-type seals** (sometimes called “mohair”) are more common in sliding windows, and wear out more quickly due to the type of window operation. They are also more likely to be used for exterior weather seals, and can tear easily if the window is opened when the seals are embedded in ice or frost.

Compression seals (sometimes called “bulb”) can crack if the seal wall is too thin or the window is operated during very cold weather. Weatherstripping is generally the most vulnerable component in an operable window, as it receives the most wear and tear. The seals should be checked annually for signs of wear or damage, and replaced as necessary. www.cmhc-schl.gc.ca

Window fog: means the seal around the perimeter of the glass has been broken and condensation is forming. Spacers can incorporate a dessicant that absorbs moisture from the trapped air space between the glass, preventing condensation. www.cmhc-schl.gc.ca

Wood frame: has high insulating properties and can be painted or stained any colour. It requires ongoing maintenance to prevent moisture damage. www.cmhc-schl.gc.ca

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Dayle Laing, B.A.Sc. in Consumer Studies, Dip. Interior Design, LEED Accredited Professional, taught Interior Design at Sheridan College for 19 years. Her paper, “The Greening of Healthcare: Fabrics used in Health Care Facilities” was published in the Journal of Green Building, Fall 2011, and the scientific poster and abstract were presented at an Inflammopharmacology Conference at Cambridge University in July, 2011. She presented this research at the EcoCare healthcare conference in London, Ontario in October, 2010. Three of her seminars are accredited by IDCEC for continuing education credits for Interior Designers across North America. Dayle was keynote speaker at Earth Matters Day at Sunnybrook Health Sciences Centre in 2011. In the past, Dayle had a successful career in sales and sales management in the pharmaceutical industry. Her clients include corporations for speaking engagements and consultation on their issues of

sustainability. For more information about how Dayle can help you with your requirements, please contact the office at 905-846-3221 or info@daylelaing.com



We motivate people to select the '**coolest shade of green**' for beautiful sustainable interior design that enhances their body, mind & spirit.

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