

## **Glossary of Building Terms**

**Air Changes per Hour (ACH)** - An expression of ventilation rates - the number of times in an hour that a home's entire air volume is exchanged with outside air.

**Air Barrier** - Meets ASTM E283 A layer of material resistant to air flow usually in the form of polyolefin (i.e. Typar, Tyvek, and other housewraps). A material which is applied in conjunction with a building component (such as a wall, ceiling or sill plate) to prevent the movement of air through that component.

**Air Barrier System** - The assembly of components used in building construction to create a plane of air tightness throughout the building envelope and to control air leakage.

**Blower Door** - Diagnostic equipment consisting of a calibrated fan, removable panel and gauges, used to measure and locate air leaks.

**Blowing Agent** - A gas or a substance capable of producing a refrigerant gas used in making foamed materials.

**Btu British Thermal Unit** - The amount of energy that is required to raise 1 lb. of water up 1° F

**Btuh** - A rate of energy transfer - can be expressed as Btu's/hour

**Building Envelope** - The external elements walls which includes, floor, ceiling, roof, windows and doors of a building that encloses conditioned space; the building shell.

**Capillary Action** - The movement of liquid within a material against gravity as a result of surface tension.

**CFC (Chlorofluorocarbon)** - Any of various halocarbon compounds consisting of carbon, hydrogen, chlorine, and fluorine, once used widely as aerosol propellants and refrigerants. Chlorofluorocarbons are believed to cause depletion of the atmospheric ozone layer.

**Combustion Efficiency** - A measure of useful heat extracted from a fuel source by an operating heating appliance. For example, a furnace with a combustion efficiency of 60 percent converts 60 percent of the fuel's energy content into useful heat. The rest is lost as exhaust gases.

**Conduction** - Transmission of energy (heat /sound) through a material or from one material to another by direct contact.

Materials with low rates of conductive heat transfer make good insulation.

**Convection** - Transmission of energy (heat /sound) from one place to another by movement of a fluid such as air or water.

**Density** - Determined by the weight expressed in pounds of a cubic foot of spray foam.

**Dew Point** - The temperature at which a vapor begins to condense.

**Diffusion** - The movement of water vapor from regions of high relative humidity (RH) toward regions of lower RH driven by a higher to lower temperature differential.

**Exfiltration** - Uncontrolled leakage of conditioned air from inside the home to the outside.

**Flame Retardant** - A substance which is added to a polymer formulation to reduce or retard the tendency to burn.

**Flame Retarded (Adj.)** - The property of a material to which flame-retardant has been added.

**Flame Spread** - Standard test for determining relative combustibility. The flame spread of a tested material is rated relative to red oak (flame spread = 100).

**Flammability** - Relative ability of a material to support combustion as expressed by its flash point.

**Formaldehyde** - A colorless pungent irritating carcinogen used chiefly in aqueous solutions as a disinfectant and preservative and in chemical synthesis.

**Heat Loss** - Heat that is lost from a building through air leakage, conduction and radiation. To maintain a steady interior temperature, heat losses must be offset by a combination of heat gains and heat contributed by a heating system.

**Heat Recovery Ventilation System** - A mechanical ventilation system that recovers energy from exhausted indoor air and transfers it to incoming air. This system usually incorporates an air-to-air heat exchanger which transfers the heat from exhaust air to the incoming air or vice versa.

**HCFC (Hydrochlorofluorocarbons)** are compounds containing carbon, hydrogen, chlorine and fluorine. They have shorter atmospheric lifetimes than CFC's and deliver less reactive chlorine to the stratosphere where the "ozone layer" is found.

**HFA Propellant**, usually hydrofluoroalkane-134a, used in chlorofluorocarbon-free (CFC-free) aerosol delivery systems.

**HFC (hydrofluorocarbon)** - HFC's have replaced ozone-depleting chlorofluorocarbons (CFC's) in many applications but are powerful greenhouse gases, with 100-year global warming potential of between 140 and 11,700.

**Humidistat** - A humidity sensitive control device that signals the ventilation system to operate if the humidity goes above a preset limit.

**Hydrophobic** - Having no affinity for water; not compatible with water. "Water fearing".

**Infiltration** - Uncontrolled leakage of air into a building through cracks around doors, windows, electrical outlets and at structural joints.

**Insulation** - Materials with low thermal conductivity characteristics that are used to slow the transfer of heat.

**Isocyanate (MDI (diphenyl methane diisocyanate))** - One of a group of neutral derivatives of primary amines ( $R-N=C=O$ ) groups. An essential component (A) of spray foam chemistry.

**Kilowatt-hour (kWh)** - Standard unit for measuring electrical energy consumption-kilowatts per hour.

**Material Safety Data Sheet (MSDS)** - A standard formatted information sheet, prepared by a material manufacturer, describing the potential hazards, physical properties, and procedures for safe use of a material.

**Mold** - Fungal growths often resulting in deterioration of organic materials, especially under damp conditions.

**Mycotoxin** - Any poisonous substance produced by a fungus.

**Organic** - Compounds containing carbon.

**Overspray - (1) Airborne spray loss of polyurethane foam. (2) Undesirable depositions of airborne spray loss.**

**Perm - A unit of water vapor transmission defined as 1 grain of water vapor per square foot per hour per inch of mercury pressure difference (1 inch mercury = 0.49 psi). Metric unit of measure is  $\text{ng/m}^2 \text{ s Pa}$ . 1 perm =  $55 \text{ ng/m}^2 \text{ s Pa}$ .**

**Permeability** - The time rate of water vapor transmission through unit area of a material of unit thickness induced by unit vapor pressure difference between two specific surfaces, under specified temperature and humidity conditions.

**pH** - A measure of acidity/alkalinity of aqueous mixtures. A measure of pH 7 is neutral, lower is more acidic; higher is more alkaline.

**PSI** - Pounds per square inch.

**Radiation** - Transfer of energy (heat/sound) from one object to another through an intermediate space. Only the object receiving the radiation, not the space is heated. The heat is in the form of low frequency, infrared, invisible, light energy, transferring from a "warm" object to a "cold" object. It is known as the "black body effect."

**Relative Humidity** - The ratio expressed as a percentage of the amount of moisture air actually contains to the maximum amount it could contain at that temperature.

**R** - A unit of measurement of resistance to heat flow in  $\text{hr. ft}^2 \text{ }^\circ \text{F/BTU.in}$ .

**RSI** - A unit of measurement of resistance to heat flow in  $\text{m}^2 \text{ }^\circ \text{C/W}$  per 25 mm.  $R = 0.176 \text{ RSI}$ .

**Resin** - Component B in spray foam chemistry. This component is mixed with the A component to form Icynene<sup>®</sup>.

**Retrofit** - The modification of an existing building or facility to include new systems or components.

**Standard Testing** - Laboratory test methodology for determining relative properties of materials at specific conditions.

**Thermostat** - Temperature sensitive control device that signals a heating or cooling system to operate if the temperature in the building reaches a preset limit.

**Thermal Barrier** - A material applied over Icynene<sup>®</sup> Insulation designed to slow the temperature rise of the foam during a fire situation and delay its involvement in the fire.

**Thermal Bridge** - A thermally conductive material which penetrates or bypasses an insulation system; such as a metal fastener or stud.

**Thermal Resistance (R)** - An index of a material's resistance to heat flow. See R and RSI.

**Thermal Shock** - A building material's reaction to rapid changes in temperature.

**Thermography** - A building energy diagnostic technique using an infrared camera for locating areas of temperature differential in a building.

**U-Value** - Overall thermal conductance. U value is equal to the inverse of the sum of the R-values in a system ( $U = 1 / R \text{ total}$ ).

**Vapor Diffusion Retarder/Barrier** - A layer of moisture resistant material usually which controls moisture diffusion (defined as less than 1 perm) to prevent moisture build up in the walls.

**Viscosity** - The thickness or resistance to flow of a liquid. Viscosity generally decreases as temperature increases; application temperatures of spray foam components are specified in part, to control viscosity at the spray gun.

**Volatile Organic Compounds (VOC)** - Any compound containing carbon and hydrogen or containing carbon hydrogen in combination with other elements.

### **Acronyms**

**AISI** - American Iron & Steel Institute

**ALA** - American Lung Association

**ANSI** - American National Standards Institute

**ASE** - Alliance to Save Energy

**ASHRAE** - American Society of Heating, Refrigerating and Air-Conditioning Engineers

**ASTM** - American Society for Testing and Materials

**BETEC** - Building Environment & Thermal Envelope Council

**BOCA** - Building Officials and Code Administrators International, Inc.

**CABO (ICC)** - Conference of American Building Officials (International Code Council)

**CCMC** - Canadian Construction Materials Centre

**CSA** - Canadian Standards Association

**DOE** - U.S. Department of Energy

**EPA** - Environmental Protection Association  
**EEBA** - Energy and Environmental Building Association  
**EERE** - Energy Efficiency and Renewable Energy Clearing House (DOE program)  
**FSEC** - Florida Solar Energy Center

**IAQA** - Indoor Air Quality Association  
**IBACOS** - Integrated Building And Construction Solutions  
**IBC** - International Building Code  
**ICBO** - International Conference of Building Officials

**ICC** - International Code Council  
**LEED** - Leadership in Energy & Environmental Design

**NAHB** - National Association of Home Builders  
**NAHBRC** - NAHB Research Center  
**NBC** - National Building Code of Canada  
**NEAT** - Novel Environmental Advanced Technology  
**NER** - National Evaluation Report  
**NES** - National Evaluation Service, Inc.  
**NIBS** - National Institute of Building Sciences  
**NIST** - National Institute of Standards and Technology  
**NRC** - National Research Council of Canada  
**ORNL** - Oak Ridge National Laboratory  
**SBCCI** - Southern Building Codes Congress International  
**USBIC** - Sustainable Buildings Industry Council

**UBC** - Uniform Building Code  
**UL** - Underwriters Laboratories  
**ULC** - Underwriters' Laboratories Canada

**USGBC** - United States Green Building Council