

Glossary of Terms:

Air Barrier: Any part of the building shell that offers resistance to air leakage. The air barrier is effective if it stops most air leakage. The primary air barrier is the most effective of the series of air barriers.

Air Changes per Hour: The number of times per hour the air in a defined volume is exchanged with replacement air.

Air Changes per Hour for ASHRAE (ACH_{ASHRAE}): Established by ASHRAE as a minimum outside air infiltration level for homes set at .35 ACH.

Air Changes at 50 Pascals (ACH₅₀): the number of times that the complete volume of a house is exchanged for outside air when a blower door depressurizes the home to 50 Pascals.

Air Change Rate, Natural (ACH_n): Natural air change is expressed in air changes per hour. The 50 pascal air change (ACH₅₀) rate, modified by numerical factors (reflecting wind speed, shielding of the building by external elements, and building's height and size), gives a rough estimate of the natural air change rate.

Air Exchange: The total building air exchanged with the outdoors through air leakage and ventilation.

Ambient CO Level: The measured CO concentration in the CAZ.

Approximate Leakage Area: A rough estimate of the surface area, in square inches, of all the building's air leaks combined into a single hole. It is calculated by dividing CFM₅₀ by 10.

ASHREA: American Society for Heating, Refrigeration and Air Conditioning Engineers, a professional organization that establishes standards for residential, commercial, industrial and institutional buildings. ASHRAE's minimum standard for outside air requirement for residential structures is 15 cfm per person or 0.35 air changes per hour, whichever is larger.

Audit: The process of identifying energy conservation opportunities in buildings.

Annual Fuel Utilization Efficiency (AFUE): A laboratory derived efficiency rating for heating

appliances which accounts for the chimney losses, jacket losses and cycling losses.

Annual Return: The yearly savings divided by the initial cost needed to achieve the savings, expressed as a percent.

Backdrafting: The continuous spillage of combustion gases from the dilution device of a combustion appliance. Or, a reversal of the normal flow through a chimney.

Backer Rod: Polyethylene foam rope used as a backer for caulking.

Band Joist: See Rim Joist.

Barometric Damper: A device located in oil appliance chimneys that performs the same functions as a draft diverter except that it adjusts dilution air to maintain a consistent chimney draft.

Base Pressure: This is the pressure in the CAZ when the house is in a normal state without any exhaust fans operating. This pressure can vary depending on the level of the CAZ within the house. Basements are usually negative and attics can be positive.

Batt: A narrow blanket of fiberglass insulation, often 14.5 or 22.5 inches wide by varying inches thick. They are designed to fit between roof, floor and ceiling joist.

Blower: The squirrel cage fan in a furnace or air handler.

Blower Door: A device that consists of a fan, a removable panel, and gauges used to measure and locate air leaks.

British thermal unit (BTU): The quantity of heat required to raise the temperature of one pound of water on degree Fahrenheit.

Building Cavities: The spaces inside walls, floors and ceilings between the interior and exterior sheathing.

Burner: A device that facilitates the burning of a fossil fuel like gas or oil.

Carbon Dioxide: One of the two main products of complete combustion of a hydrocarbon (the other is water vapor).

Carbon Monoxide: An odorless and poisonous gas produced by incomplete combustion.

Caulking: A mastic compound for filling joints and cracks.

Cellulose Insulation: Insulation, packaged in bags for blowing, made from newspaper or wood waste and treated with a fire retardant.

CFM: Cubic feet per minute.

CFM_{ASHRAE}: Minimum acceptable air infiltration to comply with ASHRAE standard based on 0.35 ACH.

CFM₅₀: The number of cubic feet per minute of air flowing through the fan housing of a blower door when the house pressure is 50 Pascals. This figure is the most common and accurate way of comparing the air tightness of buildings that are tested using a blower door.

Coil: A snakelike piece of copper tubing surrounded by rows of aluminum fins that clamp tightly to the tubing in order to aid in heat transfer.

Combustion Air: Air that provides oxygen for combustion.

Combustion Air Zone (CAZ): Refers to the room where a combustion appliance is operating. CAS may encompass more than one room if there is nature air flow between the rooms.

Combustion Analyzer: A device used to measure steady-state efficiency of combustion heating units.

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Combustion Chamber: The area inside the heat exchanger where the flame burns.

Combustion Efficiency: Synonymous with fuel-burning efficiency or steady-state efficiency. Usually means the latter.

Commissioning: The process of testing and adjusting building mechanical systems after building construction or as a retrofit measure.

Condense: The coil in an air conditioning system where the refrigerant condenses and releases heat.

Conditioned Air: Heated or cooled air within the building.

Cost Effective: Having an acceptable payback, return on investment or savings to investment ratio.

Depressurize: Cause to have a lower pressure or vacuum with respect to a reference of a higher pressure.

Dew Point: The warmest temperature of an object in an environment where water condensation for the surrounding air would form on that object.

Dilution Air: Air that enters through the dilution device – an opening where the chimney joins to an atmospheric draft appliance.

Direct Vent: A combustion appliance that draws combustion air from outdoors and has a sealed exhaust system. Same as sealed combustion.

Dilution Device: A device used on atmospheric combustion appliances to regulate flow of combustion gases up the chimney and prevent back drafting due to winds. Furnaces and boilers use a barometric damper. Water heaters use draft diverter.

Draft: The pressure in a flue or vent that propels combustion gases out of a building.

Draft Diverter: A device located in gas appliance chimneys that moderates draft and diverts down drafts that could extinguish the pilot or interfere with combustion.

Draft Inducer: A fan that depressurizes the venting system and exhausts combustion products.

Efficiency: The ratio of output divided by input.

Energy: A quantity of heat or work.

Energy Efficiency: Term describing how efficiently a building component uses energy.

Energy Recovery Ventilator (ERV): A ventilator that recovers latent and sensible

energy from the exhaust airstream and imparts it to the incoming air stream.

Envelope: The building shell. The exterior walls, floor and roof assembly of a building. Also sometimes denotes a building cavity or building assembly.

Environmentally Sensitive: A person who is highly sensitive to pollutants, often because of overexposure, is said to be environmentally sensitive.

Evaporator: The heat transfer coil of an air conditioner or heat pump that cools the surrounding air as the refrigerant inside the coil evaporates and absorbs heat.

Exfiltration: Air flowing out of a residence from its conditioned space through the shell.

Fire Barrier: A tested building assembly, designed to contain a fire for a particular time period: typically 1 to 4 hours.

Fire Stop: Framing member designed to stop the spread of fire within a wall cavity.

Firewall: A structural wall between buildings designed to prevent the spread of a fire.

Flashing: Waterproof material used to prevent leakage at the intersections between the roof surface at walls or penetrations.

Floor Joist: The framing members that support the floor.

Flue: A channel within an appliance or chimney for combustion gases.

Flue Gas: Refers to the byproduct of fossil fuel combustion as it is vented through a flue or chimney.

Foamboard: Plastic foam insulation manufactured most commonly in 4' x 8' sheets in thicknesses of ¼" to 3".

Footing: the part of a foundation system that actually transfers the weight of the building to the ground.

Frost Line: The maximum depth of the soil where water will freeze during the coldest weather.

Gable: The triangular section of an end wall formed by the pitch of the roof.

Glazing: Glass installation. Pertaining to glass assemblies or windows.

Heat Gains: Heat that accumulates in homes: this is desirable during the heating season and undesirable during the cooling season.

Heat Loss: The amount of heat escaping through the building shell during some period of time, like a month or a year.

Heat Recovery Ventilator (HRV): A central ventilator that transfers heat from exhaust to intake air.

Heat Rise: The number of degrees of temperature increase that air is heated as it is blown over the heat exchanger. Heat rise equals supply temperature minus return temperature.

Heating Degree Day: Each degree that the average daily temperature is below the base temperature (usually 65 °F) constitutes one heating degree day.

Heat Load: The maximum heating rate needed by a building during the very coldest weather.

Home Heating Index: The number of BTUs of energy used by a home divided by its area in square feet, then divided by the number of heating degree days during the time period.

House Pressure: The difference in pressure between the indoors and outdoors measured by a manometer.

Hydronic: A heating system using hot water or steam as the heat-transfer fluid.

Illumination: The light level measured on a horizontal plane in foot-candles.

Incandescent Lamp: The common light bulb found in residential lamps which heats a filament to produce light.

Inches of water column: Small air pressure differences are measured in inches of water column (IWC) in the American measurement system.

Induced Pressure: The pressure created in the CAZ with reference to the outdoors under a worst case depressurization test.

Infiltration: The inflow of outdoor air into the indoors, which is accompanied by an equal outflow of air from the indoors to the outdoors.

Infrared Imaging: A camera that records the energy levels emitted by objects on earth.

Input Rating: The rate at which an energy-using device consumes electricity or fossil fuel.

Insulated Glass: Two or more glass panes spaced apart and sealed in a factory. The void between the panes is either a vacuum or filled with a gas to retard the transfer of heat.

Insulation: Materials with relatively high thermal resistance.

Internal Gains: The heat generated by bathing, cooking and operating appliances that must be removed during the summer to promote comfort.

Intermediate Zone: A zone located between the building's conditioned spaces and outdoors, like a crawl space or attic.

Joist: A horizontal wood framing member that supports a floor or ceiling.

Kilowatt (kW): A unit of electric power equal to 1000 Jules or 3412 BTU's.

Kilowatt-hour (kWh): A unit of electric energy equal to 3600 kilojoules per hour or 3412 BTU's per hour.

Latent Heat: The heat absorbed or released by a substance when it changes state, for instance, from a liquid to a gas.

Lumen: A unit of light output from a lamp.

Low-e: Short for low emissivity, which means the characteristic of a metallic glass coating to resist the flow of radiant heat.

Main Panel Box: The service box containing a main switch and fuses or circuit breakers located inside the home.

Make Up Air: Air supplied to a space to replace exhausted air.

Manifold: A section of pipe with multiple openings.

Manometer: Measuring device for fluid pressures.

Mastic: A thick creamy substance used to seal seams and cracks in building materials.

Minimum ventilation guideline (MVG): The measured blower door air-leakage value below which mechanical ventilation is necessary. Same as the minimum ventilation level (MVL) or building tightness limit (BTI).

Natural Ventilation: Ventilation using only natural air movement, without fans.

Net Free Area: The area of a vent after that area has been adjusted for insect screen, louvers and weather coverings. The net free area is always less than the actual area.

Net Stack Temperature: The difference between the ambient air temperature of the CAZ and the measured stack temperature.

Output: The useful energy that a device produces after accounting for waste involved in the energy transfer.

Packaged Air Conditioner: An air conditioner that contains the compressor, evaporator and the condenser in a single cabinet.

Pascal: A unit of measurement of air pressure. 250 pascals = 1" of water column.

Payback Period: The number of years that an investment in energy conservation will take to repay its cost in energy savings.

Plate: A piece of lumber installed horizontally to which the vertical studs in a wall frame are attached.

Plenum: The piece of ductwork that connects the air handler to the main supply duct.

Polyethylene: Polymer plastic used for vapor barriers, air barriers and foam backer rod.

Polyisocyanurate: A plastic foam insulation sold in sheets similar in composition to polyurethane. Also is a type of spray foam insulation used in new construction to insulate walls and ceilings.

Polystyrene insulation: rigid plastic foam insulation, usually white or blue in color.

Polyurethane: A versatile plastic foam insulation, usually yellow in color.

Pressure: The force encouraging flow by virtue of a difference in some condition between two areas.

Pressure Boundary: An air barrier or plane where the largest blower door induced pressure is found.

Pressure Diagnostics: The practice of measuring air pressures and flow in buildings.

Pressure Pan: A device used to block a duct register, while measuring the static pressure behind it, during a blower door test.

R-value: A measurement of thermal resistance.

Radiant Temperature: The average temperature of objects in a home like walls, ceilings, floors, furniture and other objects.

Radiation: Heat energy, which originates on a hot body like the sun and travels from place to place through the air.

Radon: A radioactive gas that decomposed into radioactive particles.

Rafter: A roof beam that follows the roof's slope.

Rain Screen: The combination of a weather resistant barrier and a space, used to keep wall assemblies dry in climates with high rainfall.

Rater: A person who performs energy audits.

Recovery Efficiency: A water heater's efficiency at actually heating incoming water.

Refrigerant: A special fluid used in air conditioners and heat pumps that heats air when it condenses and cools air when it evaporates.

Register: A grille covering a duct outlet.

Resistance: The property of a material resisting the flow of electrical energy or heat energy.

Return Air: Air circulating back to the furnace from the house, to be heated by the furnace and supplied to the rooms.

Rim Joist: The outer most joists around the perimeter of the floor framing.

Room Heater: A heater located within a room and used to heat that room.

Saturation: Describing vapor and liquid at the phase-change point.

Savings to Investment Ratio (SIR): Measures how many times an energy retrofit pays for itself during its lifetime.

Scale: Dissolved minerals that precipitate inside boilers and storage tanks.

Sealed Combustion: A combustion appliance that draws combustion air from outdoors and has a sealed exhaust system. Same as direct vent.

Seasonal Energy Efficiency Ratio (SEER): A measurement of energy efficiency for the central air conditioners. The SEER is computed by dividing cooling capacity, measured in BTUH, by the watts.

Sensible Heat: The heat absorbed by a substance which raises its temperature.

Service Wires: The wires coming from the utility transformer to the service equipment of the building.

Shading Coefficient (SC): A decimal describing how much solar energy is transmitted through a window opening, compared to clear single glass, which has an SC of 1.0.

Sheathing: A structural sheeting, attached on the top of the framing, underneath the siding and roofing of a building.

Shell: The building's exterior enclosure, walls, floor and roof of a building.

Soffit: The underside of a roof overhang or a small lowered ceiling, as above cabinets or a bathtub.

Solar Gain: Heat from the sun that is absorbed by a building and contributes to the need for cooling.

Solar Heat Gain Coefficient (SHGC): The ratio of solar heat gain through a window to the incident of solar heat. It includes both transmitted heat and absorbed and reradiated heat.

Solar Transmittance: The percent of total solar energy transmitted by a material.

Space Conditioning: Heating, cooling or ventilation of an indoor space.

Space Heating: Heating the living spaces of the home.

Spillage: Spillage is a temporary flow of combustion gases through a dilution device when a furnace or boiler starts.

Split System Air Conditioner: An air conditioner that has the condenser and compressor outdoors and the evaporator indoors.

Stack Effect: The draft established in a building from air infiltration low and exfiltrating high.

Stack Draft: The measured pressure in the stack under SSE conditions.

Standing Losses: Losses from a hot water storage tank through its shell.

Steady State Efficiency (SSE): The efficiency of a heating appliance, after an initial start-up period, that measures how much heat crosses the heat exchanger. The steady state efficiency is measured by a combustion analyzer.

Supply Air: Air that has been heated or cooled and is then moved through the ducts and out the supply registers of a home.

Therm: A unit of energy equaling 100,000 BTU's or 29.3 kilowatt-hours. Ten therms equals one dekatherm (dkt)

Thermal Barrier: A material that protects materials behind it from reaching 250 °F during a fire. Drywall is a 15 minute thermal barrier.

Thermal Boundary: A line or plane where insulation and air barrier(s) exist in order to resist thermal transmission and air leakage through or within a building shell.

Thermal Bridging: Rapid heat conduction resulting from direct contact between very thermally conductive materials

Thermal Envelope: The space defined by thermal boundaries that is being heated or cooled by the building's appliances.

Thermal Resistance: Same as R-value, expressing a material's ability to retard heat flow.

Thermal Transmittance: Expressed as U-factor, thermal transmittance is heat flow by conduction, convection and radiation through a non-uniform layered building component like a wall.

Truss: A lightweight, rigid framework designed to be stronger than a solid beam of the same weight.

U-factor: The amount of heat that will flow through a square foot of building cross-section experiencing a temperature difference of 1 °F.

Unconditioned Space: An area within the building shell that is not intentionally heated or cooled.

Underlayment: Sheeting installed to provide a smooth, sound base for a finished material.

Vapor Barrier: A material that retards the passage of water vapor.

Vapor Diffusion: The flow of water vapor through a solid material.

Vent Connector: The vent pipe carrying combustion gases from the appliance to the chimney.

Vent Damper: An automatic damper powered by heat or electricity that closes the chimney while a heating device is off.

Ventilation: The movement of air through an area for the purpose of removing moisture, air pollution or unwanted heat.

Venting: The removal of combustion gases by a chimney or other type of combustion vent.

Vermiculite: A heat expanded mineral used for insulation, sometimes contains asbestos.

Weatherization: The process of reducing energy consumption and increasing comfort in buildings by improving energy efficiency of the building.

Weep Holes: Holes intentionally made for the purpose of allowing water to drain out of an area in a building. Weep holes at the bottom of a masonry wall to allow moisture to drain.

Worst Case Depressurization Test: A test of a heating appliance's ability to draft when all other exhaust appliances are operating. Exhaust appliances include bathroom fans, cloth dryers, house fans, air conditioners and other combustion appliances.

Zone: A room or portion of a building separated from other rooms by an air barrier, not usually an effective air barrier.