
GLOSSARY

Weatherization Assistance Program Indiana Field Guide

Glossary of Terms

A

AFUE - Annual fuel utilization efficiency. The efficiency rating of heating appliances achieved in a standardized test.

AGA - American Gas Association.

air barrier - Any part of a structure that offers resistance to flow of air.

air exchange - Total air within a structure exchanged with the outdoor air through leakage and ventilation.

air handler - An enclosure containing a fan that circulates conditioned air in a structure. Typically found in a forced air heating/cooling system.

air infiltration barrier - A material used on a building to restrict air passage while allowing moisture to pass through.

airseal - The act of reducing the air exchange of a building.

ambient - The surrounding conditions.

amp - Ampere. A unit of electrical current flow ($\text{amp}=\text{volt}/\text{ohm}$).

asbestos - A fibrous insulating and fire resistant material found to be carcinogenic. Asbestos is found in building materials of the past; ie: insulation and siding.

ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers.

aquastat - A heating control found on boilers that turn the burner on and off to maintain a predetermined water temperature.

atmospheric combustion appliance - An appliance that vents products of combustion outdoors without mechanical assistance.

B

back drafting - The reversal of normal flue gas flow in a chimney. Usually caused by mechanical ventilation lowering the pressure around the inlet of the chimney.

backer rod - Polyethylene foam rope used as a backer for caulking when a wide gap exists.

balancing damper - A mechanical damper placed in each forced air supply run to balance air flow to a specific register.

band joist - The outermost joist around the perimeter of a flooring or ceiling system.

A construction detail often overlooked during air sealing and insulating.

baseboard - The molding found at the bottom of a wall where the wall meets the floor.

baseload - Energy required to maintain systems other than space heating/cooling.

batt - A blanket of fiberglass insulation made to fit between studs in a wall cavity; 14.5" or 22.5" wide.

bimetal element - A device made of two dissimilar metals expanding and contracting at different rates. This device is formed into a spring or lever typically used to operate a thermostatic switch.

blower - A mechanism to move air.

blower door - A tool used to measure air volumes. It consists of a fan, panel with which to mount the fan in a doorway, and precise gauges to measure the amount of air passing through the fan.

boiler - An appliance that heats water for space heating or DHW. Configuration can be for hot water or steam space heating.

boot - A duct fitting that connects registers to the duct work, or the duct fitting that an air filter is mounted within.

Btu - British thermal unit. The amount of energy required to raise one pound of water one degree Fahrenheit. Approximately the heat produced by one paper match.

burner - The component of a fossil fuel combustion device where air and fuel are mixed and combustion takes place.

bypasses - Unintentional leakage paths which allow air movement between spaces.

C

C - Degree Celsius.

cad cell - Cadmium cell. The flame sensing component used in conjunction with a primary control safety device.

cantilever - A construction detail that protrudes beyond the rest of the structure.

caulk - A flexible material used to fill joints and cracks.

cavity - An area, open or closed, where insulation is to be installed.

CAZ - Combustion appliance zone, where ambient pressure and temperature surround a combustion appliance.

C&T - Clean and tune. The process of cleaning and adjusting a combustion appliance for optimum efficiency.

cellulose insulation - A dry insulating material made of paper or wood waste in a consistency suitable for blowing.

CFM - Cubic feet per minute.

CFM₅₀ - The cubic feet per minute volume of air flowing through a blower door at a house pressure of 50 Pascal. A useful tool in determining the air tightness of a structure.

chimney - The natural draft structure that creates a passage for flue gases to exit a building. Typical chimney materials include; masonry, clay tile or metal.

chimney liner - Metal, clay or tile inner surface that protects the outer support structure from condensation and degradation.

closed blow - Blowing of insulation into an enclosed space.

CO - Carbon Monoxide, odorless, colorless gas that is quite deadly, a product of incomplete combustion due to insufficient oxygen or by the flame impinging on a cool surface.

CO₂ - Carbon Dioxide, a product of combustion that can be used, along with the stack temperature, to derive a combustion appliance's efficiency.

coefficient of heat transmission (U value) - The amount of heat that will pass through a square foot of material in one hour per degree Fahrenheit (Btu's/hr/ °F).

coil - A heat transmission devise typically consisting of copper pipe fitted with crimped on aluminum fins to aid in heat transfer.

combustion - Burning mixture of air and fossil fuel.

combustion air - Air supplied for the combustion of fuel in a combustion appliance.

combustion analyzer - A diagnostic tool used to determine the combustion efficiency of a fossil fuel burning appliance.

combustion appliance - Any fuel burning (gas, oil, wood, coal) device such as a range, furnace, space heater, water heater, or boiler.

combustion chamber - The area of a combustion appliance where burning of the fuel air mixture takes place.

condensate - Moisture that has changed state from vapor to a liquid.

condense - The change of state from a vapor to a liquid.

condenser - The outdoor section of an air conditioner that transfers heat to the outdoor air.

conditioned - A space within a building envelope that is heated or cooled to the occupants desired temperature.

conduction - The transfer of energy (heat or electrical) from molecule to molecule in a solid material.

construction detail - Components of a building; ie: fire stop, band joist, rim joist, header, etc.

convection - The transfer of heat through movement of air, steam or water.

cooling load - Worst case heat gain of a structure from external as well as internal energy sources. Air conditioning would then be sized according to this load.

crawl space - The space under a floor bounded by the foundation walls when a cellar is not present and the building does not set on a concrete slab.

D

damper - A mechanical valve that controls the volume of air within a heating/cooling duct.

degree days - A measurement of temperature difference between indoors and outdoors multiplied by time. It is often used in estimating fuel requirements of a building.

delta - Greek letter Δ representing difference, as in T.

delta T - The difference in temperature between the cold and warm side of a surface.

density - Weight of an object per unit of volume.

design temperature - Outdoor extremes of temperatures used in modeling a building for heating and/or cooling loads. Also indoor temperatures used in determining heating and cooling loads.

dew point - The temperature where water vapor will condense on an object.

diagnostic smoke - A chemical, neutral temperature smoke designed as an aid in determining the flow of air.

dilution air - Air introduced into flue gas through a draft diverter or barometric damper.

distribution system - Pipes or duct work originating from the heating appliance used to move heat to the conditioned space.

DHW - Domestic hot water.

DOE - Department of Energy.

draft - The negative pressure of a chimney. Draft is needed to move products of combustion from the appliance to the outdoors.

draft diverter - A device on a vented gas appliance used to introduce dilution air into the flue, and to help mitigate any spikes of down drafts from affecting pilot or main burner operation.

drywall - Gypsum wallboard used on interior surfaces of buildings. A fire resistant material.

dry bulb temperature - Temperature of air measured by a standard thermometer.

duct - A passage for conditioned and return airflow in a forced air heating/cooling system. Typically made from sheet metal, fiberglass duct board or flexible poly tubing.

duct tape - a versatile flammable coated cloth tape. A poor material to use in heating/cooling airsealing because the adhesive loses its ability to adhere with time and when exposed to heat.

E

EER - Energy efficiency ratio.

efficiency - A ratio of output divided by input.

energy conservation measures - Retrofit or repairs made on a structure in order to lower energy usage.

energy efficiency - A ratio of energy output divided by input. A term of how effectively a device converts energy into a usable output.

envelope - The shell of a building, exterior walls, roof, floors or foundation wall.

EPA - Environmental Protection Agency

evaporator - The indoor section of an air conditioner that transfers heat from conditioned room air to the refrigerant.

excess air - Additional air introduced into the combustion process that is not needed for complete combustion of the fuel/air mixture.

expansion device - An orifice or other restrictive device separating high pressure from low pressure sides of an air conditioning or heat pump appliance.

exfiltration - Air moving out of the conditioned space.

F

F - Degrees Fahrenheit temperature.

fan control - The control, bi-metal or electronic timer, that turns the indoor blower of the heating appliance on and off.

fiberglass - An insulating material made from spun glass.

fire stop - A construction detail of wood or metal that will control the spread of fire in a wall cavity.

flammable - A material that will support combustion.

flashing - Sheet metal or sheet aluminum material used to prevent moisture penetration in roof valleys or at roof or wall intersections. Also used in conjunction with other materials to air seal bypasses.

floor joist - A framing member made of solid wood or laminated wood used to support the floor of a structure.

flue - The passage for combustion gases to exit from the combustion appliance to the outdoors.

foam board - Foam insulation formed typically into 4' X 8' panels.

foundation - The bearing structure supporting the weight of a building.

fpm - Feet per minute.

friable - Insulation material that crumbles easily and likely to be airborne when disturbed.

G

gelling - Gelatin like substance that fuel oil turns into when exposed to cold temperatures.

GFI - Ground fault circuit interrupter, a device that opens an electrical circuit when the current in the hot and neutral conductors become imbalanced, preventing a shock.

glazing - The glass panel inset into a window.

H

Hartford loop - A safety device on a steam boiler consisting of piping on the condensate return side. The return pipe rises above the water-line before dropping and entering the boiler at the return tapping.

head pressure - The high side pressure of an air conditioning or heat pump appliance.

Heating Degree Days - The average temperature for a day (24 hours) subtracted from the base temperature of 65°F.

heat pump - A refrigerant based appliance with the ability to move heat in more than one direction. Heating provided in the winter and cooling in the summer.

HDD - Heating Degree Days

heat anticipator - The resistive device in a thermostat that is adjustable to prevent excessive temperature swing in a conditioned space.

heat exchanger - The device that transfers heat from one media to another.

heat loss - The heat that is radiated or lost through air infiltration. Usually identified with a time dimension of hour, month or year.

heating load - The amount of heat in Btu's/time period, lost through a building shell at design outdoor temperature and predetermined indoor temperature.

high density insulation - Insulation installed at 1 pound of insulation per square foot of wall area.

high limit - A safety control used to shut off the burner in a heating appliance should the temperature or pressure of the heated media (air, water, steam) become too high.

house pressure - The difference between indoor and outdoor pressures of a dwelling as measured by a magnahelic or manometer.

humidistat - A control that opens or closes with change in humidity. Used to control humidifiers, air to air heat exchanger, fans or dehumidifiers.

HVAC - Heating, ventilating and air conditioning.

hydronic - A heating appliance using water as a heat transfer media.

I

IAQ - Indoor Air Quality

ID - Indoors

incandescent lamp - A standard light bulb creating light and heat by electrical energy flowing through a tungsten ribbon in an inert gas atmosphere.

inches of water - A unit of pressure measurement. The distance a vertical column of water in a specific diameter tube can be pushed.

incomplete combustion - Combustion where fuel is only partially consumed. Most typically found with inadequate air supply per volume of fuel.

indoor air - Air that is located within the thermal boundary.

infiltration - The flow of air into a building.

infrared imaging - An image of temperature difference of objects through the use of an infrared camera.

input rating - The gross energy rating of a heating appliance. The amount of energy consumed in Btu's.

insulation - A material used to reduce thermal movement.

intermittent ignition - An ignition device in a heating appliance that only operates upon the call for heat.

internal load - The heat gain of a structure by internal components, people, lighting, refrigerators, freezers, etc.

interstitial bypass - A passage for air to flow within a structure's framing. Plumbing chases, balloon framing, electrical and heating chases are typical examples.

J

joist - A horizontal structural framing member that supports a ceiling or floor.

K

kilowatt - An electrical unit of measure equal to 3412 Btu per hour. 1000 watts.

kilowatt hour - 3412 Btu

kneewall - A short weight bearing wall typical of those found in the second floor of a Cape Cod style house.

knob & tube - Older type of house wiring that had individual conductors strung between porcelain knobs screwed to framing members and through holes lined with porcelain tubes.

L

lamp - A device, electrical or fossil fuel, used to generate light.

LBL - Lawrence Berkeley Laboratory

limit control - A safety control that turns the burner off when the upper operating temperatures or pressures have been reached.

LP - Liquefied petroleum. Bottled gas blend of propane and butane.

low water cutoff - A safety control typically found on a steam heating appliance that shuts off the burner in the event that water falls below a prescribed level.

lumen - A unit of light output from a lamp.

M

magnahelic - A mechanical measuring device used to determine pressures.

makeup air - Outdoor air that is introduced into a structure typically to compensate for air exhausted from the structure by combustion appliances and exhaust fans.

manifold - A main section of pipe having branches. Header and return manifolds in hydronic heating system are where zones branch off. Burner manifolds have individual burners branching off from the gas valve.

Manual D - A nationally accepted duct sizing method developed by ACCA, (Air Conditioning Contractors of America).

Manual J - A nationally accepted heating/cooling load calculation method developed by ACCA, (Air Conditioning Contractors of America).

manometer - A device used to measure pressure differences.

mastic - A thick fluid material that solidifies when exposed to air used to seal ductwork and other materials from air flow.

MMBTU - One million British thermal units.

moisture migration - Movement of moisture through barriers or openings.

N

natural ventilation - Air flow in and out of building by natural means. No mechanical fan assist.

NFPA - National Fire Protection Association, publisher of fire and associated codes.

nozzle - An orifice used to meter fuel oil in a combustion appliance.

O

O₂ - Oxygen molecule.

OD - Outdoors

ohm - Ohms. A unit of electrical resistance (ohms=volts/amps).

open blow - Blowing insulation into an open or unconstricted area.

OSHA - Occupational Safety and Health Administration

orifice - A hole that provides restriction to flow of a gas or liquid. A gas orifice will meter the amount of natural or LP gas to the burners.

output capacity - The net Btu capacity (useful capacity) of a combustion appliance after flue, radiation and other miscellaneous losses.

P

Pa - Pascal, a unit of pressure.

panned return - Sheet metal attached to floor joists to create a passage for return air in a forced air heating/cooling system.

partition wall - A wall that divides the interior of a structure.

passive ventilation - Ventilation that occurs with no mechanical means.

payback period - Investment divided by dollars of energy savings. Gives the length of time for the investment to realize a zero net dollars based upon energy dollars saved by the measures.

plenum - Enclosure for conditioned air found at the inlet and outlet of a furnace for the termination or origin of ductwork.

polyethylene - A plastic sheathing material used in sealing passages of air flow.

polystyrene - A ridged plastic foam board insulating material. Useful to insulate locations of high moisture.

power venting - Utilization of a blower and smoke pipe to directly vent products of combustion to the outdoors, bypassing a conventional chimney.

ppm - Parts per million

pressure - The force created by a moving fluid or gas.

pressure boundary - The primary air barrier of a building.

pressure diagnostics - The science of measuring air flow within a building. Useful in determining magnitude and location of air infiltration and venting problems of combustion appliances.

pressure pan - A tool used to block a forced air register while measuring the air pressure delivered by the duct system.

pressure trol - An operating control used to maintain pressure in a steam boiler.

primary air - Combustion air that is mixed with fuel inside of the burner.

primary control - The flame sensing safety control for an oil burning appliance.

psychrometric - The science of air, moisture and heat, and their relationship.

R

R value - A number designation of a materials ability to resist flow of heat. Higher numbers translate to higher resistance. (equals 1/U)

radiation - Transfer of heat energy through air.

radon - A radioactive gas that can infiltrate buildings through the foundation.

recessed lighting - Light fixtures that are flush with the ceiling.

register - A wooden or metal grille that directs the flow of air into a room from the forced air ductwork.

relamping - The act of replacing lamps to lower energy usage while maintaining the lumens of output.

relative humidity - The percentage of moisture in a volume of air as a relation to the total amount that volume can hold before the moisture begins to condense out.

relay - An electro-mechanical switching Device.

resistance - Friction to the flow energy, heat or electrical.

retrofit - The operation of updating a structure to higher standards.

return air - Conditioned air that is circulated back into the forced air heating or cooling appliance.

reversing valve - The component in a heat pump allowing it to reverse modes of evaporator and condenser.

R.H.- Relative humidity

rim joist - The outer joist around the perimeter of a building.

S

saturation - The point of air becoming 100% R.H.. The point at which the addition of more moisture will cause condensation to begin.

SEER - Seasonal energy efficiency ratio

secondary air - Combustion air that is introduced to the fuel/air mixture outside of the burner.

sealed combustion - A combustion appliance that draws combustion air from the outdoors and expels combustion gases directly outdoors by an induced draft blower.

shell - The exterior envelope of a building consisting of walls, roof, foundation or floors.

shingle - An exterior weather protection component for the roof or sidewall.

SIR - Savings to investment ratio. The amount of energy saved by a measure divided by the investment or cost of that measure. The higher the number, the more cost effective the work.

smoke pipe - The vent connection from the furnace thimble to the chimney. Also referred to as vent connector.

smoke spot - A diagnostic test used in determining the combustion cleanliness of an oil appliance. A predetermined volume of air is drawn through a test paper. The resulting soot residue is compared to a numbered sample chart.

space heating - Warming of the living area to comfortable levels.

spillage - Flow of flue gases from the flue to the area around the combustion appliance. May normally happen in a cold chimney until it warms.

SSE - Steady state efficiency

stack effect - The natural flow of air through bypasses in a structure typically originating from low in the building into the attic.

steady state - The point at which a heating/cooling appliance has reached it's nominal operating parameters.

suction pressure - The low pressure side of an air conditioning/heat pump appliance.

supply air - Air that has been heated or cooled and is about to be distributed to the conditioned space.

T

T - Temperature

tempered - A space not having direct heating or cooling, but receiving some benefit via radiation from ducts, pipes and through boundaries of the conditioned space.

temperature drop - The difference in temperature between return air entering an air handler and supply air leaving the plenum.

temperature rise - The difference in temperature between return air entering a furnace and supply air leaving the plenum.

thermal boundary - A surface separating the heated part of a building from the outdoors or unheated parts, where insulation should be placed.

therm - Unit of energy equal to 100,000 Btu, used to reduce the numerical amount of Btu's.

thermal break - A material of low thermal conductance placed between two materials with high conductive properties.

thermocouple - A bimetal electrical generator used to keep the safety valve in a combination gas valve open.

thermodynamics - The science of heat.

tracer gas - A gas that can be detected and used to locate air leakage or movement.

transitional zone - An area of a building that is normally at outside pressures, but may have some interaction with the inside of the structure.

U

U - U Value. Thermal conductance of a material, how much heat transfers through one square foot area cross section in one hour with one degree difference in temperature on opposite surfaces of the cross section, the inverse of R (1/R).

unconditioned space - A zone within a building that is not intentionally heated or cooled.

unvented combustion appliance - A combustion appliance where products of combustion are not vented to the outdoors; ie: stoves, and kerosene heaters.

V

vapor barrier - A material that prevents the passage of moisture.

vent - The series of piping from a combustion appliance used to remove byproducts of combustion from the structure.

vent connector - The portion of venting pipe from the appliance thimble to the chimney connection. Also called smoke pipe.

vent damper - A mechanical or thermal actuated damper in the flue used to reduce of cycle heat loss from the flue.

ventilation - Movement of air by natural or mechanical means into or out of the conditioned space. Moisture control, temperature levels, IAQ and combustion draft are some factors in determining proper ventilation levels.

venting - Removal of combustion gases from the appliance to the outdoors.

VOC - Volatile organic compounds. Toxic chemicals found in paints and other materials.

volt - Voltage. A unit of electrical force. (volt=ampXohm)

W

watt - An electrical unit of measure equal to 3.4 Btuh.

w.c. - Water column, (unit of pressure), inches of water that could be supported.

weatherization - The process of retrofitting a structure to decrease energy use, address health and safety concerns, increase durability, and increase comfort for the occupants.

weatherstrip - Gaskets used in construction to reduce infiltration.

wet bulb temperature - Temperature of the air taken with a dampened thermometer or sling psychrometer that takes into consideration relative humidity of the air.

winter mode - Configuration of the structure as typically found in the winter months; exterior doors and windows closed, external venting closed, forced air registers open.

workscope - A detailed listing of measures and repairs to be performed on a structure derived from the energy auditor's inspection.

worst case depressurization - The configuration that produces the greatest negative pressure in the structure.

WRT - With respect to. A convention used when measuring pressure differences to distinguish which zone is at a higher pressure. The high pressure port on a manometer reads the assumed higher pressure WRT the lower. If the reading is negative, the assumption is wrong. If more than one zone is being compared to another, all the readings can be done WRT to the same zone. For instance the cellar and attic are both done WRT the living area. This allows the data to be tabulated more easily.

Wx - Weatherization

Z

zone - A physical area that can be isolated and has its own dynamics.