Glossary of Passive House Terms and Units used in the Certified Passive House Designer Course

Prepared by Passive House Academy, June 2024

Symbol	Unit	Description
A	ft²	Area
AF	Unitless	Annuity factor
A_{TFA}	ft²	Treated floor area
A_{Window}	ft²	Gross window area
A_{Frame}	ft²	Frame area
A_{Glass}	ft²	Glazing area
A_{50}	in^2	Equivalent leakage area used for airtightness testing
C	$	Annual energy saving from energy efficiency
C_{air}	Btu/(ft³F)	Heat carrying capacity of air: a constant, 0.018 Btu/(ft^3F)
e	Unitless	Fraction of air changes per hour at normal or 'resting' atmospheric pressure
EA_{gross}	ft²	Gross envelope area measured to external dimensions
$EA_{internal}$	ft²	Envelope area measured to internal dimensions for blower door q_{50} calculation
f_t	Unitless	Reduction factor for weighting of temperature difference
g or SHGC	Unitless	Fraction of solar energy transmission through glazing
$G_{1\ or\ 2}$	Btu/(hr.ft^2)	Solar radiation available in 2 weather conditions used for heat load
G	kBtu/(ft².yr)	Global radiation – will vary with location and orientation
G_t	(kFh)/yr	Heating degree hours
i	Unitless	Interest rate used in economic calculations (written as a decimal)
i_{real}	Unitless	'Real' interest rate used in economic calculations (written as a decimal)
i_{add}	$	'Additional' investment costs for energy saving measures
$\vartheta_{Supply,max}$	°F	Maximum supply air temperature: 125.6 °F
$\vartheta_{Supply,min}$	°F	Minimum supply air temperature: approximately 62 °F
L	ft	Length (e.g. of a linear thermal bridge)
L_{glass} or L_{Spacer}	ft	Length around perimeter of glass
$L_{install}$	ft	Length around perimeter of window
n	Unitless	Duration in years of a mortgage or loan
n_{50}	$^1/_h$ or h^{-1}	Air change rate @ 50 Pa pressure
$n_{V,system}$	$^1/_h$ or h^{-1}	Number of ventilation air exchanges per hour at normal setting
$P_{air\ heating}$	Btu/hr	Max heat load deliverable by supply air
PE	kBtu/(ft².yr)	Non-renewable primary energy demand

PER	kBtu/(ft².yr)	Primary energy renewable demand
PER_{VPHC}	kBtu/(ft^2.yr)	Primary energy renewable demand for frost-protection ventilation pre-heating coil
P_H (absolute)	Btu/hr	Total heat load for project
P_H (specific)	Btu/(hr.ft²)	Heat load per ft^2
P_T	Btu/hr	Transmission losses through planar elements (heat load)
$P_{T\text{-}TB}$	Btu/hr	Transmission losses through thermal bridges (heat load)
$P_{V\text{-}Infill}$	Btu/hr	Ventilation infiltration losses (heat load)
$P_{V\text{-}ERV}$	Btu/hr	ERV Ventilation losses (heat load)
P_S	Btu/hr	Solar gain (heat load)
P_i	Btu/hr	Internal heat gains (heat load)
P_{elec}	W	Electric power of the ERV fans + controls
PV	$	Present value of energy savings over the lifetime of the borrowing
P_{saved}	$/kWh or $/kBtu	Price of a saved kWh or KBtu
PVF	Unitless	Present value factor
P_{VPHC}	Btu/hr	Power of the ventilation pre-heating coil
$Q_{H\ (absolute)}$	kBtu/yr	Total space heating demand for project
$Q_{H\ (specific)}$	kBtu/(ft^{2}yr)	Space heating demand per ft^2
Q_T	kBtu/yr	Transmission losses through planar elements (space heating demand)
$Q_{T\text{-}TB}$	kBtu/yr	Transmission losses through thermal bridges (space heating demand)
$Q_{V\text{-}Infil}$	kBtu/yr	Ventilation infiltration losses (space heating demand)
$Q_{V\text{-}ERV}$	kBtu/yr	ERV Ventilation losses (space heating demand)
Q_S	kBtu/yr	Solar gains (space heating demand)
Q_i	kBtu/yr	Internal heat gains (space heating demand)
q_i	Btu/(hr.ft^2)	Specific internal heat gains per ft^2 TFA (different defaults for different project types)
q_{50}	CFM/ft^2	Air permeability @ 50 Pa pressure
r per inch	(hr.ft^2.F)/Btu.in	Thermal resistivity per inch
r	Unitless	Inflation rate used in economic calculations
r	Unitless	Reduction factor for solar gains
R	$	Residual value of efficiency improvements after borrowing has been repaid
R-value	(hr.ft².F)/Btu	Thermal Resistance or an assembly
R_{si}	(hr.ft².F)/Btu	Internal surface film resistance
R_{se}	(hr.ft².F)/Btu	External surface film resistance
RT	kh/yr	Running time for ventilation pre-heating coil (thousands of hours per year)
T_{ETA}	°F	Temperature of extract air
T_{EHA}	°F	Temperature of exhaust air
T_{ODA}	°F	Temperature of outdoor air
T_{SUP}	°F	Temperature of supply air

t_{Heat}	kh/yr	Length of the heating period (thousands of hours per year)
ΔT or Δt	°F	Temperature difference (between interior & exterior, or either side of ERV post-heater)
TFA	ft^2	Treated floor area
U-value	$Btu/(hr.ft^2.F)$	Heat transfer coefficient (U-value) or thermal transmittance
U_{Frame} or U_f	$Btu/(hr.ft^2.F)$	Heat transfer coefficient of the window frame
$U_{Glazing}$ or U_g	$Btu/(hr.ft^2.F)$	Heat transfer coefficient of the window glazing
U_W	$Btu/(hr.ft^2.F)$	Heat transfer coefficient of the window (uninstalled)
$U_{W,installed}$	$Btu/(hr.ft^2.F)$	Heat transfer coefficient of the installed window
$V_{airflow}$	CFM	Ventilation airflow rate
V_V	ft^3	Ventilation Volume (=TFA x 8.2ft)
V_{n50}	ft^3	Net internal air volume for airtightness test
V_{gross}	ft^3	Gross building volume to external dimensions
W_{50}	$ft^3/(hr.ft^2)$	Air permeability expressed per square foot of floor area
Z	$	Annual maintenance costs for energy efficiency measures
Ψ	Btu/(hr.ft.F)	Linear thermal bridge coefficient
$\Psi_{Install}$	Btu/(hr.ft.F)	Linear thermal bridge coefficient of the window installation detail
Ψ_{Spacer} or Ψ_{glass}	Btu/(hr.ft.F)	Linear thermal bridge coefficient of the spacer bar or glazing edge
X	Btu/hr.F	Point thermal bridge coefficient (this is not the English letter 'X' but the Greek letter 'chi')
η_{ERV}	Unitless	ERV heat recovery efficiency (this is not the English letter 'N' but the Greek letter 'eta')
η	Unitless	Utilization factor for free heat (this is not the English letter 'N' but the Greek letter 'eta')