



## Building Technologies Program

### Tax Deduction Qualified Software

#### DesignBuilder version 3.0.0.105

On this page you'll find information about the DesignBuilder version 3.0.0.105 [qualified computer software](http://www.buildings.energy.gov/qualified_software.html) ([www.buildings.energy.gov/qualified\\_software.html](http://www.buildings.energy.gov/qualified_software.html)), which calculates energy and power cost savings that meet federal tax incentive requirements for commercial buildings.

Date Documentation Received by DOE: 16 March 2012

*Statements in quotes are from the software developer.*

Internal Revenue Code §179D (c)(1) and (d) Regulations Notice 2006-52, Section 6 requirements as amplified by Notice 2008-40, Section 4 requirements.	
(1) The name, address, and (if applicable) web site of the software developer;	Design Builder Software Ltd. Place Chambers 41 London Rd. Stroud, Glos, GL5 2AJ, UK <a href="http://www.designbuilder.gov">http://www.designbuilder.gov</a>
(2) The name, email address, and telephone number of the person to contact for further information regarding the software;	Dr. Andy Tindale andy.tindale@designbuilder.co.uk +44(0)1453 755500
(3) The name, version, or other identifier of the software as it will appear on the list;	DesignBuilder Version 3.0.0.105
(4) All test results, input files, output files, weather data, modeler reports, and the executable version of the software with which the tests were conducted; and	Provided to DOE
(5) A declaration by the developer of the software, made under penalties of perjury, that—	"On behalf of the DesignBuilder Software Ltd development team I certify the following:"
(a) The software has been tested according to ANSI/ASHRAE Standard 140-2007 Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs;	"The software has been tested according to ANSI/ASHRAE Standard 140-2007 Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs."
(b) The software can model explicitly—	"DesignBuilder v3.0.0.105 is fully compliant with ASHRAE 90.1-2001 and meets all of the below requirements."
(i) 8,760 hours per year;	"The DesignBuilder software complies."
(ii) Calculation methodologies for the building components being modeled;	"The DesignBuilder software complies."
(iii) Hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat setpoints, and HVAC system	"The DesignBuilder software complies."

operation, defined separately for each day of the week and holidays;	
(iv) Thermal mass effects;	"The DesignBuilder software complies."
(v) Ten or more thermal zones;	"The DesignBuilder software complies."
(vi) Part-load performance curves for mechanical equipment;	"The DesignBuilder software complies."
(vii) Capacity and efficiency correction curves for mechanical heating and cooling equipment; and	"The DesignBuilder software complies."
(viii) Air-side and water-side economizers with integrated control.	"The DesignBuilder software can model air-side economizers with integrated control but cannot yet model water-side economizers and shall not be used for projects with this technology"
(c) The software can explicitly model each of the following HVAC systems listed in Appendix G of Standard 90.1-2004:	
(i) Packaged Terminal Air Conditioner (PTAC) (air source), single-zone package (through the wall), multi-zone hydronic loop, air-to-air DX coil cooling, central boiler, hot water coil.	"The DesignBuilder software models this system."
(ii) Packaged Terminal Heat Pump (PTHP) (air source), single-zone package (through the wall), air-to-air DX coil heat/cool.	"The DesignBuilder software models this system."
(iii) Packaged Single Zone Air Conditioner (PSZ-AC), single-zone air, air-to-air DX coil cool, gas coil, constant-speed fan.	"The DesignBuilder software models this system."
(iv) Packaged Single Zone Heat Pump (PSZ-HP), single-zone air, air-to-air DX coil cool/heat, constant-speed fan.	"The DesignBuilder software models this system."
(v) Packaged Variable-Air-Volume (PVAV) with reheat, multi-zone hydronic loop, air-to-air DX coil, VAV fan, boiler, hot water VAV terminal boxes.	"The DesignBuilder software models this system."
(vi) Packaged Variable-Air-Volume with parallel fan powered boxes (PVAV with PFP boxes), multi-zone air, DX coil, VAV fan, fan-powered induction boxes, electric reheat.	"The DesignBuilder software models this system."
(vii) Variable-Air-Volume (VAV) with reheat, multi-zone air; multi-zone hydronic loop, air-handling unit, chilled water coil, hot water coil, VAV fan, chiller, boiler, hot water VAV boxes.	"The DesignBuilder software models this system."
(viii) Variable-Air-Volume with	"The DesignBuilder software models this system."

parallel fan powered boxes (VAV with PFP boxes), multi-zone air, air-handling unit, chilled water coil, hot water coil, VAV fan, chiller, fan-powered induction boxes, electric reheat.	
(d) The software can—	
(i) Either directly determine energy and power costs or produce hourly reports of energy use by energy source suitable for determining energy and power costs separately; and	"Energy and power costs must be calculated in a spreadsheet or similar based on fuel consumptions exported from DesignBuilder."
(ii) Design load calculations to determine required HVAC equipment capacities and air and water flow rates.	"The DesignBuilder software complies."
(e) The software can explicitly model:	
(i) Natural ventilation.	"The DesignBuilder software models natural ventilation either through a simple scheduled approach or detailed integrated airflow model which accounts for wind and stack pressure induced flows through openings and cracks in the building fabric. Window and vent opening areas can be controlled based on the interior and exterior temperature differences."
(ii) Mixed mode (natural and mechanical) ventilation.	"The DesignBuilder software models concurrent and zoned mixed mode ventilation systems and provides controls for seasonal changeover."
(iii) Earth tempering of outdoor air.	"The DesignBuilder software does not model earth tempering of outdoor air."
(iv) Displacement ventilation.	"The DesignBuilder software models displacement ventilation."
(v) Evaporative cooling.	"The DesignBuilder software cannot model evaporative cooling and shall not be used for projects with this technology."
(vi) Water use by occupants for cooking, cleaning or other domestic uses.	"The DesignBuilder software cannot model water use by occupants for cooking, cleaning or other domestic uses and shall not be used for projects with this technology."
(vii) Water use by heating, cooling, or other equipment, or for on-site landscaping.	"The DesignBuilder software models water use by heating, cooling, and other equipment as well as for on-site landscaping."
(viii) Automatic interior or exterior lighting controls (such as occupancy, photocells, or time-clocks).	"The DesignBuilder software models automatic interior and exterior lighting controls based on occupancy, photocells or schedules."
(ix) Daylighting (sidelighting, skylights, or tubular daylight devices).	"The DesignBuilder software models sidelighting and skylights integrated with the energy simulation. Tubular daylight devices can be modelled in the DesignBuilder Radiance software and the daylight impact approximated in simulation based on these results."
(x) Improved fan system efficiency through static pressure reset.	"The DesignBuilder software cannot model static pressure reset and shall not be used for projects with this technology."
(xi) Radiant heating or cooling (low	"The DesignBuilder software models low temperature radiant

or high temperature).	heating and cooling. High temperature heating system can be modeled through the DesignBuilder "Compact HVAC" radiant heating option"
(xii) Multiple or variable-speed control for fans, cooling equipment, or cooling towers.	"The DesignBuilder software models multiple and variable-speed control for fans, cooling equipment, but for cooling towers, only constant speed fans are supported."
(xiii) On-site energy systems (such as combined heat and power systems, fuel cells, solar photovoltaic, solar thermal, or wind).	"The DesignBuilder cannot model combined heat and power, photovoltaic systems, and solar water and air systems and shall not be used for projects with this technology."

Date Posted: 16 March 2012

Tax Deduction Qualified Software — [www.buildings.energy.gov/qualified\\_software.html](http://www.buildings.energy.gov/qualified_software.html)