

## Requirements and Submission Process for Qualified Software

The U.S. Department of Energy (DOE) verifies and maintains the list of software that qualifies for the calculation of the energy and power cost savings for commercial building tax deductions under tax code Section 179D. The software requirements are listed under Internal Revenue Service (IRS) Code §179D (c)(1) and (d) Regulations, Notice 2006-52 Section 6, dated June 2, 2006 as amplified by Notice 2008-40, Section 4. This document provides a complete list of requirements and submission details.

Qualification steps for each version of the software to be listed:

1. Test the software according to ANSI/ASHRAE Standard 140-2007: Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs.
2. Submit test results for all test cases, input files, output files, weather data, modeler reports, and the executable version of the software with which the tests were conducted to DOE and the National Renewable Energy Laboratory (NREL).
3. Submit a document with the software submission requirements listed on page 2. A member of the software development organization must sign the document affirming the claims.
4. NREL will review the submitted materials and coordinate any needed revisions.
5. NREL will verify the satisfactory qualification of the software and will post a notice on the DOE Web site ([www.buildings.energy.gov/qualified\\_software.html](http://www.buildings.energy.gov/qualified_software.html)) indicating the qualification.

Submit the package of information outlined in steps 2 and 3 electronically to [179DSoftware@nrel.gov](mailto:179DSoftware@nrel.gov) and mail it to the following addresses:

Commercial Software List  
Department of Energy  
Office of Building Technologies, EE-2J  
1000 Independence Ave., SW  
Washington, DC 20585-0121

Commercial Software List  
Brent Griffith  
National Renewable Energy Laboratory  
1617 Cole Blvd  
Golden, CO 80401

## Requirements for Qualified Software

Software providers must submit and affirm the truth of the following information to qualify their products as tax deduction software.

*Statements within quotation marks are from the software developer.*

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| 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;  |   |
| (2) The name, email address, and telephone number of the person to contact for further information regarding the software;  |   |
| (3) The name, version, or other identifier of the software as it will appear on the list;   | AAA EnergySoftware, Version 1.0   |
| (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 AAA EnergySoftware 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—  | "The AAA AAA EnergySoftware is fully compliant with ASHRAE 90.1-2001 and meets all of the below requirements."  |
| (i) 8,760 hours per year;   | "The AAA AAA EnergySoftware complies."  |
| (ii) Calculation methodologies for the building components being modeled;   | "The AAA AAA EnergySoftware complies."  |
| (iii) Hourly variations in occupancy, lighting power, miscellaneous equipment power, thermostat setpoints, and HVAC system operation, defined separately for each day of the week and holidays; | "The AAA AAA EnergySoftware complies."  |
| (iv) Thermal mass effects;  | "The AAA AAA EnergySoftware complies."  |
| (v) Ten or more thermal zones;  | "The AAA AAA EnergySoftware complies."  |
| (vi) Part-load performance curves for mechanical equipment;   | "The AAA AAA EnergySoftware complies."  |
| (vii) Capacity and efficiency correction curves for mechanical heating and cooling equipment; and   | "The AAA AAA EnergySoftware complies."  |
| (viii) Air-side and water-side economizers with integrated control.   | "The AAA AAA EnergySoftware complies."  |

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| (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 AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> models this system.”                    |
| (viii) Variable-Air-Volume with 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. | “The AAA AAA <i>EnergySoftware</i> models this system.”                    |
| (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   | “The AAA AAA <i>EnergySoftware</i> complies.”                              |
| (ii) Design load calculations to determine required HVAC equipment capacities and air and water flow rates.   | “The AAA AAA <i>EnergySoftware</i> complies.”                              |
| (e) The software can explicitly model:  |  |
| (i) Natural ventilation.  | “The AAA AAA <i>EnergySoftware</i> models natural ventilation.”            |
| (ii) Mixed mode (natural and mechanical) ventilation.   | “The AAA AAA <i>EnergySoftware</i> models mixed mode ventilation.”         |
| (iii) Earth tempering of outdoor air.   | “The AAA AAA <i>EnergySoftware</i> models earth tempering of outdoor air.” |
| (iv) Displacement ventilation.  | “The AAA AAA <i>EnergySoftware</i> models displacement ventilation.”       |

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| (v) Evaporative cooling.   | “The AAA AAA <i>EnergySoftware</i> models evaporative cooling.”   |
| (vi) Water use by occupants for cooking, cleaning or other domestic uses.  | “The AAA AAA <i>EnergySoftware</i> models water use by occupants.”  |
| (vii) Water use by heating, cooling, or other equipment, or for on-site landscaping.   | “The AAA AAA <i>EnergySoftware</i> 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 AAA AAA <i>EnergySoftware</i> models automatic interior and exterior lighting controls.”   |
| (ix) Daylighting (sidelighting, skylights, or tubular daylight devices).   | “The AAA AAA <i>EnergySoftware</i> models sidelighting, skylights, and tubular daylighting devices.”  |
| (x) Improved fan system efficiency through static pressure reset.  | “The AAA AAA <i>EnergySoftware</i> models improved fan system efficiency through static pressure reset.”  |
| (xi) Radiant heating or cooling (low or high temperature).   | “The AAA AAA <i>EnergySoftware</i> models low and high temperature radiant heating and cooling.”  |
| (xii) Multiple or variable-speed control for fans, cooling equipment, or cooling towers.   | “The AAA AAA <i>EnergySoftware</i> models multiple and variable-speed control for fans, cooling equipment, and cooling towers.”                             |
| (xiii) On-site energy systems (such as combined heat and power systems, fuel cells, solar photovoltaic, solar thermal, or wind). | “The AAA AAA <i>EnergySoftware</i> models on-site energy systems including combined heat and power, photovoltaic systems, and solar water and air systems.” |

Software that cannot explicitly model one or more of the HVAC systems or features in sections 5.c and 5.e of the table can still be listed as qualified software. It cannot, however, be used for 179D analyses of projects that need to model such systems or features. When this is the case, the statement used for the particular requirements should be patterned after the following: “The AAA *EnergySoftware* cannot model system or feature X and shall not be used for projects with this technology.”