Residential ACM Appendix A

RACM Appendix A – Certification of Alternative Calculation Method

Energy Efficiency Standards for Residential Buildings, Sections 150 to 152

I, _____ (name), certify that this alternative calculation method (compliance program), _____ (name of compliance program), version number _____, dated _____, developed by, _____ (personnel or company), _____ (address) _____ (city, state) _____ (zip), passes all of the compliance software tests and gives results that are reliable and accurate when used for calculating custom budgets and annual energy use estimates to comply with CEC (California Energy Commission) regulations, subject to the fixed and restricted assumptions specified in the *Alternative Calculation Method (ACM) Approval Manual for the 2008 Energy Efficiency Standards for Residential Buildings*, and the fixed and restricted inputs specified in the manuals describing the use of this method (Users Manual and Compliance Supplement thereto). I certify that the calculation of energy use in buildings, following the instructions in the manuals, and using accurate and complete plans and specifications for a building will achieve reliable and accurate energy analysis results with this compliance program. Moreover, the calculations are verifiable when modeling the same building and accurately applying the fixed and restricted assumptions and inputs mentioned above. I further certify that all variables used by the program that are not subject to ready verification in the plans and specifications or that are subject to occupant use are either fixed, carefully restricted, or defaulted in this compliance program.

I also certify that the inputs, default values, and assumptions specified for compliance runs in the manuals, and used in the accompanying application for the CEC residential compliance program approval, are consistent with the inputs, default values, and assumptions specified by the CEC in the *Alternative Calculation Method (ACM) Approval Manual for the 2008 Energy Efficiency Standards for Residential Buildings* for use when generating standard design budgets and annual energy use estimates. I also certify that all specific inputs, variables, and assumptions needed to achieve the accuracy required to pass the capability tests in the *ACM Approval Manual* are either not subject to user variation, are defaulted to the values used for compliance, or are clearly specified as restricted or required inputs in the manuals for the compliance program. In addition, the manuals clearly indicates that an easily verified list of the actual values of any such variables used for performance approach compliance which are subject to programmatic or user variation are to be included with the compliance documentation supplied by a building permit applicant to the enforcement agency. In summary, I also certify that the results of this alternative calculation method as specified in the manuals for the compliance program in conjunction with an accurate and adequate set of plans and specifications for a building are not subject to significant variation by the manipulation of unrestricted user specified inputs that are difficult or impossible to verify.

In certifying the reliability and accuracy of this compliance program, I certify that the results of this compliance program's calculations, algorithms and assumptions are open to inspection by any individual or State entity, that this compliance program may be challenged for its validity and accuracy as specified by the ACM Approval Manual, and that if challenged, I will prepare an adequate response or face possible withdrawal of compliance program approval.

This certification is based upon the tests and requirements specified in the *Alternative Calculation Method (ACM) Approval Manual for the 2008 Energy Efficiency Standards for Residential Buildings,* and upon personal knowledge and experience with the use of this alternative calculation method.

Signed	Date	Title

Space Conditioning Tests (SC)

Complete the unshaded areas of the following forms. An electronic version of this document is available from the CEC.

Test SC00 – Basecase Simulations

Enter the TDV energy for the standard design and the proposed design – values should match.

Test Label	TDV Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SC00A01			
SC00A02			
SC00A03			
SC00A04			
SC00A05			
SC00A06			
SC00A07			
SC00A08			
SC00A09			
SC00A10			
SC00A11			
SC00A12			
SC00A13			
SC00A14			
SC00A15			
SC00A16			
SC00B01			
SC00B02			
SC00B03			
SC00B04			
SC00B05			
SC00B06			
SC00B07			
SC00B08			
SC00B09			
SC00B10			
SC00B11			
SC00B12			
SC00B13			
SC00B14			
SC00B15			
SC00B16			

Test SC01 – Ceiling U-factor vs. South Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		South Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC01A03						
SC01A09						
SC01A11						
SC01A14						
SC01A16						

Test SC02 – Wall U-factor vs. West Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		West Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC02A03						
SC02A09						
SC03A12						
SC02A14						
SC02A16						

Test SC03 – Slab Edge losses vs. North Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		North Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC03A12						
SC03A14						
SC03A16						

Test SC04 – Fenestration Type vs. North Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		North Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC04A03						
SC04A09						
SC04A12						
SC04A14						
SC04A16						

Test SC05 – Fenestration Type vs. AFUE

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		AFUE Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC05A03						
SC05A09						
SC05A12						
SC05A14						
SC05A16						

Test SC06 – Exposed Thermal Mass vs. South Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		South Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC06A12						
SC06A14						
SC06A16						

Test SC07 – South Overhangs vs. South Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		South Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC07A03						
SC07A09						
SC07A12						
SC07A14						
SC07A16						

Test SC08 – Building Envelope Sealing vs. Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC08A03						
SC08A09						
SC08A12						
SC08A14						
SC08A16						

Test SC09 – Building Envelope Sealing and Mechanical Ventilation vs. Glass Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Glass Solution (ft²)		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC09A03						
SC09A09						
SC09A12						
SC09A14						
SC09A16						

Test SC10 – Construction Quality vs. AFUE

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		AFUE Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC10A03						
SC10A09						
SC10A12						
SC10A14						
SC10A16						

Test 11 – Cool Roofs/Radiant Barrier vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC11A09						
SC11A12						
SC11A14						

Test 12– Side Fins vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC12A09						
SC12A12						
SC12A14						

Test SC13 – Natural Ventilation vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC13A09						
SC13A12						
SC13A14						

Test SC14 – Roofing Type vs. Attic Ventilation

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC14A09						
SC14A12						
SC14A14						

Test SC15 – Deck Insulation vs. Ceiling Insulation

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC15A09						
SC15A12						
SC15A14						

Test SC16 – SEER vs. AFUE

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC16A03						
SC16A09						
SC16A12						
SC16A14						
SC16A16						

Test SC17 – EER vs. SHGC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC17A03						
SC17A09						
SC17A12						
SC17A14						
SC17A16						

Test SC18 – Duct Leakage vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC18A03						
SC18A09						
SC18A12						
SC18A14						
SC18A16						

Test SC19 – Duct Surface Area vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC19A03						
SC19A09						
SC19A12						
SC19A14						
SC19A16						

Test SC20 – Duct Location vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC20B09						
SC20B12						
SC20B14						

Test SC21 – Buried Ducts vs AFUE

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SEER Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC21A09						
SC21A12						
SC21A14						

Test SC22 – Change HVAC ys. HSPF

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SHGC Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC22A09						
SC22A12						
SC22A14						

Test SC23 – Duct Insulation vs. SEER

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SHGC Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC23A09						
SC23A12						
SC23A14						

Test SC24 – EER vs. SHGC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SHGC Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC24A09						
SC24A12						
SC24A14						

Test SC25 –Charge Indicator Light/Charge Testing vs. SHGC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SHGC Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC25A09						
SC25A12						
SC25A14						

Test SC26 – Airflow Across Evaporator Coil vs. SHGC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SHGC Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC26A09						
SC26A12						
SC26A14						

Test SC27 – Air Conditioner Fan Power vs. SHGC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		SHGC Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC27A09						
SC27A12						
SC27A14						

Test SC28 – Electric Heat vs. Fenestration U-Factor

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
SC28A03						
SC28A09						
SC28A12						

A1. Standard Design Tests (SD)

Test SD00 – Basecase Prototypes

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD00A01					
SD00A02					
SD00A03					
SD00A04					
SD00A05					
SD00A06					
SD00A07					
SD00A08					
SD00A09					
SD00A10					
SD00A11					
SD00A12					
SD00A13					
SD00A14					
SD00A15					
SD00A16					
SD00B01					
SD00B02					

SD00B03					
SD00B04					
SD00B05					
SD00B06					
SD00B07					
SD00B08					
SD00B09					
SD00B10					
SD00B11					
SD00B12					
SD00B13					
SD00B14					
SD00B15					
SD00B16					
SD00B16					

Test SD01 – Single-Family Slab-on-Grade

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD01C01					
SD01C02					
SD01C03					
SD01C04					
SD01C05					
SD01C06					
SD01C07					
SD01C08					
SD01C09					
SD01C10					
SD01C11					
SD01C12					
SD01C13					
SD01C14					
SD01C15					
SD01C16					

Test SD02 – Single-Family Raised Floor

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD02D01					
SD02D02					
SD02D03					
SD02D04					
SD02D05					
SD02D06					
SD02D07					
SD02D08					
SD02D09					
SD02D10					
SD02D11					
SD02D12					
SD02D13					
SD02D14					
SD02D15					
SD02D16					

Test SD03 – Multi-Family Slab on Grade

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD03E01					
SD03E02					
SD03E03					
SD03E04					
SD03E05					
SD03E06					
SD03E07					
SD03E08					
SD03E09					
SD03E10					
SD03E11					
SD03E12					
SD03E13					
SD03E14					
SD03E15					
SD03E16					

Test SD04 – Equipment Change Heating

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD04E01					
SD04E02					
SD04E03					
SD04E04					
SD04E05					
SD04E06					
SD04E07					
SD04E08					
SD04E09					
SD04E10					
SD04E11					
SD04E12					
SD04E13					
SD04E14					
SD04E15					
SD04E16					

Test SD05 – Equipment Change Cooling

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD05E01					
SD05E02					
SD05E03					
SD05E04					
SD05E05					
SD05E06					
SD05E07					
SD05E08					
SD05E09					
SD05E10					
SD05E11					
SD05E12					
SD05E13					
SD05E14					
SD05E15					
SD05E16					

Test SD06 – Neutral Variable Test: Window Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD06A03					
SD06A09					
SD06A12					
SD06A14					
SD06A16					

Test SD07 – Neutral Variable Test: Wall Area

Label	Space Conditioning TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
SD07A03					
SD07A09					
SD07A12					
SD07A14					
SD07A16					

A2. Additions and Alterations Tests

Test AA01 – Baseline Simulations

Label	TDV Energy (kBtu/ft²/y)		Compliance Software Filenames
	Standard Design	Proposed Design	
AA01E03			
AA01E09			
AA01E12			
AA01E14			
AA01E16			

Test AA02 – Increase Glass

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
AA02E03						
AA02E09						
AA02E12						
AA02E14						
AA02E16						

Test AA03 – New HVAC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
AA03F03						
AA03F09						
AA03F12						
AA03F14						
AA03F16						

Test EA01 – Baseline

Label	TDV Energy (kBtu/ft²/y)		Compliance Software Filenames
	Standard Design	Proposed Design	
EA01E03			
EA01E09			
EA01E12			
EA01E14			
EA01E16			

Test EA02 – Increase Glass

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
EA02E03						
EA02E09						
EA02E12						
EA02E14						
EA02E16						

Test EA03 – New HVAC

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
EA03F03						
EA03F09						
EA03F12						
EA03F14						
EA03F16						

Test EA04 – New Ducts

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
EA04E03						
EA04E09						
EA04E12						
EA04E14						
EA04E16						

A3. Water Heating Tests

Complete the unshaded areas of the following forms. An electronic version of this document is available from the CEC.

Test WH00 – Basecase Simulations

Enter the TDV water heating energy for the standard design and the proposed design – values should match.

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
WH00C01			
WH00C02			
WH00C03			
WH00C04			
WH00C05			
WH00C06			
WH00C07			
WH00C08			
WH00C09			
WH00C10			
WH00C11			
WH00C12			
WH00C13			
WH00C14			
WH00C15			
WH00C16			
WH00E01			
WH00E02			
WH00E03			
WH00E04			
WH00E05			
WH00E06			
WH00E07			
WH00E08			
WH00E09			
WH00E10			
WH00E11			
WH00E12			
WH00E13			
WH00E14			
WH00E15			
WH00E16			

Test WH01 – Gas Storage vs. Electric Storage Water Heater

Label	Water Heating TDV Energy (kBtu/ft²/y)		SSF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH01C03						
WH01C09						
WH01C12						
WH01C14						
WH01C16						
WH01E03						
WH01E09						
WH01E12						
WH01E14						
WH01E16						

Test WH02 – Gas Storage vs. Electric Instantaneous Water Heater

Label	Water Heating TDV Energy (kBtu/ft²/y)		SSF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH02C03						
WH02C09						
WH02C12						
WH02C14						
WH02C16						
WH02E03						
WH02E09						
WH02E12						
WH02E14						
WH02E16						

Test WH03 – Pipe Insulation on All Lines

Label	Water Heating TDV Energy (kBtu/ft²/y)		EF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH03C03						
WH03C09						
WH03C12						
WH03C14						
WH03C16						

Test WH04 – Recirculation Control

Label	Water Heating TDV Energy (kBtu/ft²/y)		EF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH04E03						
WH04E09						
WH04E12						
WH04E14						
WH04E16						

Test WH05 –Large Gas Storage Water Heater

Label	Water Heating TDV Energy (kBtu/ft²/y)		AFUE Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH05E03						
WH05E09						
WH05E12						
WH05E14						
WH05E16						

Test WH06 – Recirculation Piping Insulation

Label	Water Heating TDV Energy (kBtu/ft²/y)		EF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH06E03						
WH06E09						
WH06E12						
WH06E14						
WH06E16						

Test WH07 – Number of Water Heaters

Label	Water Heating TDV Energy (kBtu/ft²/y)		EF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH07C03						
WH07C09						
WH07C12						
WH07C14						
WH07C16						

Test WH08 – Pump Controls

Label	Water Heating TDV Energy (kBtu/ft²/y)		EF Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
WH08E03						
WH08E09						
WH08E12						
WH08E14						
WH08E16						

A4. Water Heating Neutral Variable Tests (WD)

Test WD00 – Basecase

Label	Water Heating TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
WD00C01					
WD00C02					
WD00C03					
WD00C04					
WD00C05					
WD00C06					
WD00C07					
WD00C08					
WD00C09					
WD00C10					
WD00C11					
WD00C13					
WD00C14					
WD00C15					
WD00C16					
WD00E01					
WD00E02					
WD00E03					
WD00E04					
WD00E05					
WD00E06					
WD00E07					
WD00E08					
WD00E09					
WD00E10					
WD00E11					
WD00E12					
WD00E13					
WD00E14					
WD00E15					
WD00E16					

Test WD01 – Increase House Size to 2500ft^2

Label	Water Heating TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
WD01C03					
WD01C09					
WD01C12					
WD01C14					
WD01C16					

Test WD02 – Increase House Size to 3500ft^2

Label	Water Heating TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
WD02C03					
WD02C09					
WD02C12					
WD02C14					
WD02C16					

Test WD03 – Increase Recirculation Piping Length

Label	Water Heating TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
WD03D03					
WD03D09					
WD03D12					
WD03D14					
WD03D16					

Test WD04 – Change Recirculation Pipe Location

Label	Water Heating TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
WD04D03					
WD04D09					
WD04D12					
WD04D14					
WD04D16					

Test WD05 – Change to Individual Water Heaters

Label	Water Heating TDV Energy (kBtu/ft²/y)			Compliance Software Filenames	
	Proposed Design Custom Budget	Standard Design Equivalent Custom Budget	Standard Design Equivalent Proposed Design	Proposed Design	Standard Design Equivalent
WD05D03					
WD05D09					
WD05D12					
WD05D14					
WD05D16					

A5. Optional Capabilities Tests (OC)

Test OC01 – Dedicated Hydronic Heating

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC01A03						
OC01A09						
OC01A12						
OC01A14						
OC01A16						

Test OC02 – Combined Hydronic, Gas Water Heater.

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC02A03						
OC02A09						
OC02A12						
OC02A14						
OC02A16						

Test OC03 – Combined Hydronic, Electric Resistance Water Heater.

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC03A03						
OC03A09						
OC03A12						
OC03A14						
OC03A16						

Test OC04 – Combined Hydronic, Heat Pump Water Heater.

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC04A03						
OC04A09						
OC04A12						
OC04A14						
OC04A16						

Test OC05 – Control Vent Crawlspace

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		AFUE Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC05B03						
OC05B 09						
OC05B 12						
OC05B 14						
OC05B 16						

Test OC06 – Zonal Control

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		AFUE Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC06A03						
OC06A09						
OC06A12						
OC06A14						
OC06A16						

Test OC07 – Attached Sunspace

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		AFUE Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC07A03						
OC07A09						
OC07A12						
OC07A14						
OC07A16						

Test OC08 – Exterior Mass Walls

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Wall R-Value Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC08A03						
OC08A09						
OC08A12						
OC08A14						
OC08A16						

Test OC9 – Gas Absorption Cooling

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC09A03						
OC09A09						
OC09A12						
OC09A14						
OC09A16						

Test OC10 – Evaporatively-cooled Condensing Unit

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC10A06						
OC10A09						
OC10A12						
OC10A14						

Test OC11 – Ice Storage DX Air Conditioning Unit

Label	Space Conditioning TDV Energy (kBtu/ft²/y)		Fenestration U-Factor Solution		Compliance Software Filenames	
	Passing Case	Failing Case	Passing Case	Failing Case	Passing Case	Failing Case
OC10A09						
OC10A12						
OC10A14						

A6. Solar Systems Tests (SS)

Test SS01 – Solar System with Electric Backup

Enter the TDV space conditioning energy for the standard design and the proposed design – values should match.

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS01A03			
SS01A09			
SS01A12			
SS01A14			
SS01A16			

Test SS02 – Solar System with Gas Backup

Enter the TDV space conditioning energy for the standard design and the proposed design – values should match.

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS02A03			
SS02A09			
SS02A12			
SS02A14			
SS02A16			

Test SS03 – Basecase Simulations

Enter the TDV water heating energy for the standard design and the proposed design – values should match.

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS03F01			
SS03F02			
SS03F03			
SS03F04			
SS03F05			
SS03F06			
SS03F07			
SS03F08			
SS03F09			
SS03F10			
SS03F11			
SS03F12			
SS03F13			
SS03F14			
SS03F15			
SS03F16			

Test SS04– Collector Orientation

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS04F03			
SS04F09			
SS04F12			
SS04F14			
SS04F16			

Test SS05– Collector Slope

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS05F03			
SS05F09			
SS05F12			
SS05F14			
SS05F16			

Test SS06– Collector Performance

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS06F03			
SS06F09			
SS06F12			
SS06F14			
SS06F16			

Test SS07– Collector Area

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS07F03			
SS07F09			
SS07F12			
SS07F14			
SS07F16			

Test SS08– Storage Tank Size

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS08F03			
SS08F09			
SS08F12			
SS08F14			
SS08F16			

Test SS10– Circulation Pump

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS10F03			
SS10F09			
SS10F12			
SS10F14			
SS10F16			

Test SS11– Freeze Control

Test Label	TDV Water Heating Energy (kBtu/ft²/y)		Compliance Software Filename
	Standard Design	Proposed Design	
SS11F03			
SS11F09			
SS11F12			
SS11F14			
SS11F16			