RESNET
RESIDENTIAL ENERGY SERVICES NETWORK

Setting the Standards for
Home Energy Efficiency

Standard Revision

MINHERS Interim Addendum 51i

Internal Gains for Energy Rating Reference Homes

Date Approved: June 19, 2020
Effective Date: June 19, 2020
Transition Period: NA
Transition Period End Date: NA
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Organization: RESNET Software Consistency Committee

Purpose:

Addendum 51i is an interim addendum that modifies the requirements of Standard ANSI/RESNET/ICC 301-2019 to provide consistency with changes to Standard 301-2019 for dishwashers, clothes washers and clothes dryers made by Standard 301-2019 Addendum A-2019. It also modifies Equation 4.2-9b in ANSI/RESNET/ICC 301-2019 Addendum A-2019 to fix an error.

ANSI/RESNET/ICC 301-2019 Addendum A-2019, which became effective for voluntary use October 1, 2019 and becomes mandatory on January 1, 2021, modifies the equations for the calculation of energy use and hot water consumption for clothes washers, clothes dryers and dishwashers so as to reflect recent changes to CFR 430 appliance test procedures. The changes were made to Section 4.2.2.5.1 and 4.2.2.5.2 of the standard as related to clothes washers, clothes dryers and dishwashers in both the Energy Rating Reference Home and the Rated Home. However, these approved changes were not reflected in Table 4.2.2(3) of the standard, which addresses internal gains for Energy Rating Reference Homes.

This leads to an internal inconsistency in the Standard that a solution proposed by BSR/RESNET/ICC 301-2019 Addendum B-20xx will rectify. However, Addendum B-20xx will not be completed until several weeks after ANSI approves Standard BSR/RESNET/ACCA 310-20xx that it adopts and software providers need the internal inconsistency fixed now to in order to modify their software and have it accredited. Equation 4.2-9b also needs a small fix. Interim MINHERS Addendum 51i will serve to make the changes essential to HERS accredited software.

Amendment:

Modify MINHERS Section 303.1 as follows and add a new Exception:

303 Technical Requirements

303.1 Applicable Standards

Note:–The RESNET Home Energy Ratings adopt Standards ANSI/RESNET/ICC 301 and ANSI/RESNET/ICC 380 including all of their addenda and normative appendices. See 304 Normative References. Standards 301 and 380 Addenda are effective on the date they are approved by ANSI. The Standards Management Board may establish a Transition Period during which addenda may be used. If a Transition Period is authorized these addenda must be used after a Mandatory Compliance Date designated by the Standards Management Board. If no Transition Period is authorized they must be used beginning on the Mandatory Compliance Date established by the Standards Management Board.

All RESNET Home Energy Ratings conducted in accordance with this Standard shall comply with the provisions of ANSI/RESNET/ICC 301 ~~2014 "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings~~Dwelling and Sleeping Units~~using an Energy Rating Index."~~.

Exceptions

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Exception 7:

Revise coefficients in Table 4.2.2(3) of Standard ANSI/RESNET/ICC 301-2019 for Clothes Dryer (elec), Clothes Dryer (gas), Dishwasher and Clothes Washer as shown in the table below:

Table 4.2.2(3) Internal Gains for Energy Rating Reference Homes[a]

End Use Component	Sensible Gains (Btu/day)			Latent Gains (Btu/day)		
	a	b	c	a	b	c
Residual MELs		7.27			0.38	
Interior lighting	4,253	7.48				
Refrigerator [d]	5,955		168			
TVs	3,861		645			
Range/Oven (elec)[b][d]	2,228		262	248		29
Range/Oven (gas)[b][d]	4,086		488	1,037		124
Clothes Dryer (elec)[b][d]	~~661~~502		~~188~~143	~~73~~56		~~21~~16
Clothes Dryer (gas)[b][d]	~~738~~562		~~209~~159	~~91~~69		~~26~~20
Dishwasher [d]	~~219~~168		~~87~~67	~~219~~168		~~87~~67
Clothes Washer [d]	~~95~~135		~~26~~38	~~11~~15		~~3~~4
General water use	-1227		-409	1,245		415
Occupants [c]			3716			2,884

Notes:

(a) Table values are coefficients for the following general equation:

Gains = a + b*CFA + c*Nbr

where: CFA = Conditioned Floor Area and Nbr = Number of Bedrooms.

(b) For Rated Homes with electric appliance, use (elec) values. For Rated homes with natural gas-fired appliance, use (gas) values

(c) Software tools shall use either the occupant gains provided above or similar temperature dependent values generated by the software where the number of occupants equals the number of Bedrooms and occupants are present in the home 16.5 hours per day.

(d) When any of these appliances associated with a Rated Home is located in Unrated Heated Space, Unrated Conditioned Space or otherwise outside of and away from the Dwelling Unit, the Internal Gains associated with that appliance shall be excluded from both the Reference and Rated Homes.

Add the following reference to Section 304 Normative References:

ANSI/RESNET/ICC 301-2019, "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings welling and Sleeping Units using an Energy Rating Index.", including addenda and normative appendices.

Revise Equation 4.2-9b in Section 4.2.2.5.2.9 Dishwashers of ANSI/RESNET/ICC 301-2019 Addendum A-2019 as shown below:

4.2.2.5.2.9 Dishwashers. Dishwasher annual energy use for the Rated Home shall be determined in accordance with Equation 4.2-9a and shall be based on the dishwasher located within the Rated Home, with the highest kWh/y. If no dishwasher is located within the Rated Home, a dishwasher in the nearest shared kitchen in the building shall be used only if available for daily use by the occupants of the Rated Home.

$$\textbf{dWkWh/y = dWkWh/cyc * dWcpy} \qquad \textbf{(Equation 4.2-9a)}$$

where:

dWkWh/y = dishwasher annual electric use excluding water heater energy use

dWkWh/cyc = [(GHWC * 0.5497/ Gas$ - LER * Elec$ * 0.02504 / Elec$) / (Elec$ * 0.5497 / Gas$ - 0.02504)] / 208

GHWC = Labeled annual cost when used with a gas water heater

Gas$ = Labeled price of gas in $/therm

LER = Labeled dishwasher Energy Rating using electric water heater in kWh/y

Elec$ = Labeled price of electricity in $/kWh

dWcpy = dishwasher cycles per year = (88.4 + 34.9*Nbr)*12/dWcap

Nbr = Number of bedrooms in Rated Home

dWcap = Dishwasher capacity where Standard = 12 and Compact = 8

And the change (Δ) in daily hot water use (GPD – gallons per day) for dishwashers shall be calculated in accordance with Equation 4.2-9b.

$$\textbf{ΔGPD}_{\textbf{DW}} \textbf{= refDWgpd - rateDWgpd} \qquad \textbf{(Equation 4.2-9b)}$$

where:

refDWgpd = [(88.4+34.9*Nbr)*8.16] / 365

rateDWgpd = (LER - ~~kWh/cyc~~dWkWh/cyc*208) * 0.02504 * dWcpy / 365

For dishwashers where an Energy Guide label is not available, dishwasher inputs from Table 4.2.2.6.2.9 shall be used.

Table 4.2.2.6.2.9 Default Dishwasher Inputs

Default Dishwasher Energy Guide Label Data				
Energy Guide Label Information	ENERGY STAR Defaults		NAECA minimum	HERS Reference
Dishwasher Size	compact	standard	standard	standard
Annual Energy kWh/y (LER)	203	270	307	467
Annual Gas Hot Water Cost ($/y)	$14.20	$22.23	$22.32	$33.12
Electricity Price ($/kWh)	$0.12	$0.12	$0.12	$0.12
Gas Price ($/therm)	$1.09	$1.09	$1.09	$1.09
Label Cycles per Year (LCY)	208	208	208	208

For the purpose of adjusting the annual dishwasher energy consumption for calculating the Rating, EUL_{LA} shall be adjusted by ΔEUL_{DW}, which shall be calculated as the annual dishwasher energy use derived by the procedures in this section minus the annual dishwasher energy use derived for the Energy Rating Reference Home in Section 4.2.2.6.1, converted to MBtu/y, where MBtu/y = (kWh/y) / 293 or (Therms/y) / 10, whichever is applicable.

For the purpose of adjusting the daily hot water use for calculating the Rating, the daily hot water use change shall be 'ΔGPD_{DW}' as calculated above.

When a Dwelling Unit has no in-unit dishwasher and no shared dishwashers are available in the building for daily use of the Rated Home occupants, the energy and hot water use of the Rated Home dishwasher shall be the same as the Energy Rating Reference Home in accordance with Section 4.2.2.6.1.

For dishwasher energy use, total Internal Gains in the Rated Home shall be modified by 60 percent of the dishwasher ΔEUL_{DW} converted to Btu/day as follows: $\Delta EUL_{DW} * 10^6 / 365$. Of this total amount, 50 percent shall be apportioned to sensible Internal Gains and 50 percent to latent Internal Gains.

Internal Gains shall not be modified for dishwashers located outside the Rated Home.