

Instructions for WS-3R

The following explains how to calculate solar heat gain coefficients on WS-3R. The number of each item below corresponds to the appropriate item on WS-3R.

Enter either:

- 1a. For products with NFRC testing and labels, enter the product's labeled SHGC as #1a. $SHGC_{fen}$

OR

- 1b. Enter the default $SHGC_{fen}$ from Table 116-B of the Standards corresponding to the fenestration characteristics described in entries 1c, 1d, 1e, and 1f. Entries for 1c, 1d, 1e, and 1f are only needed if 1b is entered for $SHGC_{fen}$.

If 1b is entered, then:

- 1c Describe the Frame Type [metal, metal w/thermal break, or non-metal (non-metal includes both vinyl and wood)].
- 1d The Product Type (operable or fixed);
- 1e The glazing type (tinted or uncoated). Note that tints or coatings that cannot be easily observed by the building official must be classified as "uncoated;" that is, tints must be easily visible to the naked eye.
- 1f Single or double pane glazing.
- 2 For skylights mounted on a roof surface, enter "Y," otherwise enter "N." A skylight is fenestration mounted at a slope less than 60° from the horizon.

In a performance compliance, select *standard* or *draperies*. This is the only available choice and some compliance tools will eliminate this choice altogether.

- 3 Describe the exterior shading device in the space provided (e.g., roll down awning). List $SHGC_{Exterior\ Shade}$, the SHGC of the exterior shade with 1/8" clear single pane glass and metal framing, from Table S-1. If a single window or skylight has multiple exterior shades (i.e., shade screens and awnings) use the one shading device with the lower SHGC.

If no exterior shade is proposed, assume standard bug screens with a SHGC of 0.76 (or a SHGC of 1.00 for horizontal glazing). This applies to the full area of fixed fenestration products as well as operable.

- 4 Calculate $SHGC_{Shade\ Open}$ using values from Items 3 and either 1a or 1b. The result is the combined SHGC of the fenestration product and exterior device with the interior *shade open*.

FENESTRATION – MAXIMUM ALLOWED AREA WORKSHEET

WS-4R

Project Title

Date

FENESTRATION PRODUCTS – NEW CONSTRUCTION- NEW BUILDINGS

Use this table for new building construction to account for total building % of fenestration.

A	B	C	D	E	F	G
#/Type/Pos. (Front, Left, Rear, Right, Skylight)	Orientation	Total Fenestration, West Facing Area (ft ²)	Total Fenestration for N, S, E Orientations Area (ft ²)	CFA (ft ²)	Total Percent of West Facing Fenestration ¹ (C/E) x 100%	Total % of Fenestration ² Including West (D/E) x 100% + F
	North					
	South					
	East					
	West					
	Totals					

1) If west facing area exceeds 5% of CFA in climate zones 2, 4, and 7-15, the performance approach must be used.

2) If total percent of fenestration exceeds 20% including West facing orientations then performance approach must be used. West facing area includes skylights tilted to the west or tilted in any direction when the pitch is less than 1:12 for Package D only.

FENESTRATION PRODUCTS – NEW CONSTRUCTION- ADDITIONS

✓ ☐ Less than 100 ft², ☐ Less than or Equal to 1000 ft², ☐ Greater 1000 ft²

A	B	C	D	E	F	G	H
#/Type/Pos. (Front, Left, Rear, Right, Skylight)	Orienta- tion	Proposed Addition's CFA ^{1, 2, 3}	Proposed Addition's Fenestration Area (ft ²) ⁴	Fenestration Area Removed to make way for Addition (ft ²) ²	Total Area Added Fenestration ² (D - E)	Total % of West Facing Fenestration ² (G/C) x 100%	Total % of Fenestra- tion ^{2, 3, 4} (F/C) x 100%
	North						
	South						
	East						
	West ⁴						
	Total						

1) Additions ≤100 sf are allowed to install up to 50ft² of fenestration and are exempt from the 5% west facing and 20% maximum total area limits and shall meet the U-factor and SHGC requirements of Package D. See Table 8-2 in the Residential Manual. Note: Leave columns E, F, G, H, and I blank.

2) Additions ≤1,000 ft², the maximum net allowed fenestration is 20% and may be increased additionally to by the amount of glazing removed in the wall that separates the addition from the existing house. However, the total West facing fenestration can not exceed 5% of the proposed addition's CFA including skylights orientated in any direction and tilted with a pitch of < 1:12. Column G can not exceed 5% and Column H can not exceed 20%.

3) Additions >1,000 ft², must meet Package D requirements. See Table 8-2 and Table 151-C in Appendix B of the RM or use Performance Approach.

4) The 5% west orientation restrictions are only for Climate zones 2, 4, and 7-15; for Climate Zones 2, 4 and 7-15 enter **zero** (0) in column E.

FENESTRATION PRODUCTS: ALTERATIONS

Use this table for alterations to an existing building where fenestrations products (windows) are being removed and/or added.

A	B	C	D	E	F	G	H	I
Existing CFA (ft ²)	Existing Orientation	Existing Area (ft ²)	Removed Orientation	Removed Area (ft ²)	Proposed Installed Orientation	Proposed Installed New Area (ft ²)	Total Net Fenestration (ft ²) (C-E+G)	Total % of Fenestra-tion ^{1, 2} (H/A) x 100% Max of 20%
	North		North		North			
	South		South		South			
	East		East		East			
	West		West		West			
	Total		Total		Total			

1) When 50 ft² or more of fenestration area is added to an existing building, then the fenestration must meet the requirements of Package D.

2) The area requirement for the total fenestration area for the whole building, including the added fenestration, must not exceed 20%. Otherwise, the Performance Approach must be used. See Section 8.3.3 in the RM for further details.

RESIDENTIAL KITCHEN LIGHTING WORKSHEET**WS-5R**

Project Title _____

Date _____

At least 50% of the total rated wattage of permanently installed luminaires in the kitchen must be in luminaires that are high efficacy luminaires as defined in Table 150-C. Luminaires that are not high efficacy must be switched separately.

Kitchen Lighting Schedule. Provide the following information for all luminaires to be installed in kitchens.

Luminaire Type	High Efficacy?	Watts	x	Quantity	=	High Efficacy Watts	or	Other Watts
_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	x	_____	=	_____	or	_____
_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	x	_____	=	_____	or	_____
_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	x	_____	=	_____	or	_____
_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	x	_____	=	_____	or	_____
_____	Yes <input type="checkbox"/> No <input type="checkbox"/>	_____	x	_____	=	_____	or	_____
Total: A:						B:		
COMPLIES IF $A \geq B$								Yes <input type="checkbox"/> No <input type="checkbox"/>

Rules for Determining Residential Kitchen Luminaire Wattage**Screw Base Sockets §130(c) 1**

(Not containing permanently installed ballasts) The maximum relamping rated wattage of the luminaire, as listed on a permanent factory-installed label (luminaire wattage is not based on type or wattage of lamp that is used).

Permanently or Remotely Installed Ballasts §130(c) 2

The operating input wattage of the rated lamp/ballast combination based on values published in manufacturer's catalogs based on independent testing lab reports.

Line Voltage Track Lighting (90 through 480 volts) §130(c) 3

1. Volt-ampere (VA) rating of the branch circuit(s) feeding the tracks;
2. For tracks equipped with an integral current limiter, the higher of;
 - The wattage (or VA) rating of an approved integral current limiter controlling the track system or
 - 15 watts per linear foot of the track; or
3. For tracks without an integral current limiter, the higher of;
 - 45 W per linear foot of the track or
 - The total wattage of all of the luminaires included in the system.

Low Voltage Track Lighting (less than 90 volts) §130(c) 4

Rated wattage of the transformer feeding the system, as shown on a permanent factory-installed label

Other Lighting §130(c) 5

(Lighting systems that are not addressed in §130 (c) 1-4) The maximum rated wattage, or operating input wattage of the system, listed on a permanent factory installed label, or published in manufacturer's catalogs, based on independent testing lab reports.

*EXAMPLE***RESIDENTIAL KITCHEN LIGHTING WORKSHEET****WS-5R**

Project Title _____

Date _____

Kitchen Lighting Schedule. Provide the following information for all luminaires to be installed in kitchens.

Luminaire Type	High Efficacy (y/n)	Watts	x	Quantity	=	High Efficacy Watts	or	Other Watts
CFL-1	Yes	26	x	5	=	130	or	_____
MR-16	No	55	x	2	=	_____	or	110
_____	_____	_____	x	_____	=	_____	or	_____
_____	_____	_____	x	_____	=	_____	or	_____
_____	_____	_____	x	_____	=	_____	or	_____
Total: A:						B:		
COMPLIES IF $A \geq B$								Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>