|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **A. Product Information** | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Orientation | Fenestration has a Temporary or Site-Built NFRC Label Certificate | SHGC Value from NFRC Label | Non-NFRC Labeled SHGC Information | Exterior Shading Device Type | Exterior Shading SHGC |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **B. Default Solar Heat Gain Coefficient Using Table 110.6-B** | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Orientation | Frame Type | Product | Glazing | Number of Panes | Default Fenestration SHGC |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **C. Non-Rated Site-built Solar Heat Gain Coefficient Calculation Using Equation NA6-2 from Nonresidential Appendix NA6.3** | | | | |
| 01 | Conditioned Floor Area | | |  |
| 02 | 5% of the Condition Floor Area | | |  |
| 03 | Total Allowed Non-Rated Site-Built Fenestration Area | | |  |
| 04 | Proposed Area of Site-Built Fenestration | | |  |
| 05 | 06 | 07 | 08 | |
| Tag/ Identification | Glass Area | Center of Glass (COG) Solar Heat Gain Coefficient | Total Allowed SHGC of the Non-Rated Site-Built Fenestration | |
|  |  |  |  | |
|  |  |  |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| **D. Combined Solar Heat Gain Coefficient Calculation and Shading Device Calculation** | | | |
| 01 | 02 | 03 | 04 |
| Tag/ Identification | *SHGCmax =* | *SHGCmin =* | The Total Combined Adjusted SHGC with Exterior Shading Device (SHGCtotal) |
|  |  |  |  |
|  |  |  |  |

|  |  |
| --- | --- |
| **Documentation Author's Declaration Statement** | |
| 1. I certify that this Certificate of Compliance documentation is accurate and complete. | |
| Documentation Author Name: | Documentation Author Signature: |
| Company: | Signature Date: |
| Address: | CEA/HERS Certification Identification (if applicable): |
| City/State/Zip: | Phone: |
| **Responsible Person's Declaration statement** | |
| I certify the following under penalty of perjury, under the laws of the State of California:The information provided on this Certificate of Compliance is true and correct.I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).  1. That the energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 2. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 3. I will ensure that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. | |
| Responsible Designer Name: | Responsible Designer Signature: |
| Company: | Date Signed: |
| Address: | License: |
| City/State/Zip: | Phone: |

**CF1R-ENV-03-E Instructions**

This worksheet is to be used to determine the total Solar Heat Gain Coefficient (SHGC) value of fenestration in combination with an exterior shading device. This worksheet is to be completed for each different fenestration and exterior shading combination. Total SHGCtotal value in subsection D4 is calculated by choosing the larger of A4, A7, B7 or C7 for SHGCmax and the smaller of A4, A7, B7 or C7 for SHGCmin.

The following rules apply when selecting exterior shading devices:

1. If using this worksheet, a standard bug screen must be assumed for all vertical fenestration unless replaced by another exterior shading device as listed in A6 (and Table S-1 below); only one exterior shading device may be applied to a vertical window.
2. The listed SHGC for bug screens is an area-weighted value that assumes that the screens are only on operable windows. If no exterior shade is selected then assume a SHGC of 0.76 for standard bug screens for all windows.
3. This requirement does not apply to skylights. For skylights the exterior shading SHGC is assumed to be 1.00.
4. When exterior shading devices are applied and the combined total SHGC values do not meet the prescriptive efficiencies for windows or skylights then these windows and skylight must be area-weighted using the CF1R-ENV-02-E. Different shading conditions may also be modeled explicitly in the computer performance method.

The target value for Total SHGCtotal is 0.25 for Climate Zones 2, 4 and 6-16. However, not being able to meet the target value will require calculating the area weighted average (CF1R-ENV-02-E form) with other more efficient windows and skylights.

The resultant Total SHGCtotal value shall be documented prescriptively on the CF1R-NCB-01-E, CF1R-ADD-01-E or CF1R-ALT-01-E in the Fenestration section—attach a completed CF1R-ENV-03-E with submittal. When using the Performance Approach, the program will generate its own CF1R and will include the Total SHGCtotal values.

**A. Product Information**

1. Tag/Identification: User entered value which should equal data given on the other CF1Rs for the same fenestration; provides an identification name or tag name that uniquely identifies the window system. If there is a window schedule the tag name may be given on the plans.
2. Orientation: The direction the fenestration faces.
3. Fenestration has a Temporary or Site-Built NFRC Label Certificate: Indicate Yes or No.
4. SHGC value from NFRC label: Provide the SHGC from the NFRC Label.
5. User selects from list: Table 110.6-B if default SHGC are specified; Equation NA6-2 if site-built center of glass SHGC are specified.
6. User selects from list: Standard Bug Screens, Exterior Sunscreens with Weave 53 x 16/inch, Sunscreens w/Louvers as Wide as Window Openings, Low Sun Angle Louvered Sunscreens, Vertical Roller Shades or Retractable Drop Arm/Combination/Marquisolette and Operable Awnings, Roll Down Blinds or Slats or None (for skylights only).

Note: Default is Standard Bug Screens.

1. Exterior Shade SHGC: This value is auto filled based on the selection in A06 and the referenced value found in Table S-1.

**B. Default Solar Heat Gain Coefficient Using Table 110.6-B**

1. Tag/Identification: Auto-filled from Section A.
2. Orientation: User selects orientation from list: North, East, South or West.
3. Frame Type: User selects fenestration frame type from list: Metal, Non-metal (such as wood or vinyl), or Metal w/Thermal Break.
4. Product: User selects from list: Fixed or Operable.
5. Glazing: User selects from list: Clear (not visibly tinted) or Tinted (visibly tinted).
6. Number of Panes: User selects from list: Single, Double or Glass Block.
7. Default Fenestration SHGC: This value is auto filled based on the selections in B03, B04, B05 and B06 and the referenced values found in Table 110.6-B.

**C. Non-Rated Site-Built Solar Heat Gain Coefficient Calculation Using Equation NA6-2 from Nonresidential Appendix NA6.3**

1. Conditioned Floor Area: User entered Conditioned Floor Area: Indicate the Conditioned Floor Area of the building. This should be the same value found on the CF1R-NCB-01-E, CF1R-ADD-01-E orCF1R-ALT-01-E.
2. 5% of the Condition Floor Area: This value is auto filled based on a calculated value.
3. Total Allowed Non-Rated Site-Built Fenestration Area: This value is auto filled based on a calculated value.
4. Proposed Area of Site-Built Fenestration: User entered value equal to the total area of the site-built fenestration; Note: must be 250 ft2 or less.
5. Tag/Identification: Auto-filled from Section A.
6. Glass Area: User entered Fenestration Area.
7. Center of Glass Solar Heat Gain Coefficient: User entered Center of Glass (COG) Solar Heat Gain Coefficient: Indicate the SHGCc value calculated in accordance with NFRC 200 Section 4.5.1.1 <http://www.nfrc.org/software.aspx>.
8. Total Allowed SHGC of the Non-Rated Site-Built Fenestration: This value is auto filled based on the equation (((Center of glass SHGC x 0.86) + 0.08).

**D. Combined Solar Heat Gain Coefficient Calculation and Shading Device Calculation**

1. Tag/Identification: Auto-filled from Section A.
2. SHGCmax: This value is auto filled based on the maximum SHGC listed in A04, A07, B07 or C07.
3. SHGCmin: This value is auto filled based on the minimum SHGC listed in A04, A07, B07 or C07.
4. The Total Combined Adjusted SHGC with Exterior Shading Device: This value is auto filled based on the equation (((SHGCmax x 0.2875) + 0.75) x SHGCmin)

**TABLE 110.6-B DEFAULT SOLAR HEAT GAIN COEFFICIENT (SHGC)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **FRAME TYPE** | **PRODUCT** | **GLAZING** | **FENESTRATION PRODUCT SHGC** | | |
| Single Pane SHGC | Double Pane SHGC | Glass Block  SHGC |
| Metal | Operable | Clear | 0.80 | 0.70 | 0.70 |
| Fixed | Clear | 0.83 | 0.73 | 0.73 |
| Operable | Tinted | 0.67 | 0.59 | N.A. |
| Fixed | Tinted | 0.68 | 0.60 | N.A. |
| Metal, Thermal Break | Operable | Clear | N.A. | 0.63 | N.A. |
| Fixed | Clear | N.A. | 0.69 | N.A. |
| Operable | Tinted | N.A. | 0.53 | N.A. |
| Fixed | Tinted | N.A. | 0.57 | N.A. |
| Nonmetal | Operable | Clear | 0.74 | 0.65 | 0.70 |
| Fixed | Clear | 0.76 | 0.67 | 0.67 |
| Operable | Tinted | 0.60 | 0.53 | N.A. |
| Fixed | Tinted | 0.63 | 0.55 | N.A. |

**TABLE S-1**

|  |  |  |
| --- | --- | --- |
| **Exterior Shading Device** | | **SHGC*Exterior Shade*** |
| 1 | Standard Bug Screens | 0.76 |
| 2 | Exterior Sunscreens with Weave 53 x 16/inch | 0.30 |
| 3 | Louvered Sunscreens w/Louvers as Wide as Openings | 0.27 |
| 4 | Low Sun Angle (LSA) Louvered Sunscreens | 0.13 |
| 5 | Vertical Roller or Shades or Retractable or Drop Arm/Marquisolette or Operable Awnings | 0.13 |
| 6 | Roll Down Blinds or Slats | 0.13 |
| 7 | None (for skylights only) | 1.00 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **A. Product Information** | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Orientation | Fenestration has a temporary or Site-built NFRC label certificate | SHGC value from NFRC label | Non-NFRC labeled SHGC information | Exterior Shading Device Type | Exterior Shading SHGC |
| <<User entry >> | <<User entry >> | <<User select from following:  Yes or No>> | <<if cell A03 = yes, then user inputs value. Allow A04 nonnegative decimal value. If cell A03 = no then A04 = N/A>> | <<if cell A03 = Yes then A05 = N/A, else user selects Table 110.6-B or Calculated Using Equation NA6-2 >> | <<User selects from the following list:  Standard Bug Screens,  Exterior Sunscreens with Weave 53 x 16/inch,  Louvered Sunscreens w/Louvers as Wide as Openings,  Low Sun Angle (LSA) Louvered Sunscreens,  Vertical Roller or Shades or Retractable or Drop Arm/Marquisolette or Operable Awnings  Roll Down Blinds or Slats,  None (for skylights only)>> | << value depends on what is selected in cell A06.  If A06 = Standard Bug Screens, SHGC = 0.76. If A06 =  Exterior Sunscreens with Weave 53 x 16/inch, SHGC = 0.30.  If A06 = Louvered Sunscreens w/Louvers as Wide as Openings, SHGC = 0.27. If A06 =  Low Sun Angle (LSA) Louvered Sunscreens, SHGC = 0.13.  If A06 = Vertical Roller or Shades or Retractable or Drop Arm/Marquisolette or Operable Awnings, SHGC = 0.13. If A06 =  Roll Down Blinds or Slats, SHGC = 0.13. If A06 = None (for skylights only), SHGC = 1.00>> |
|  |  |  |  |  |  |  |

<<If Column A05 contains entry = Table 110.6-B then display this section; else display section header and standard section does not apply message>>

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **B. Default Solar Heat Gain Coefficient Using Table 110.6-B** | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Orientation | Frame Type | Product | Glazing | Number of Panes | Default Fenestration SHGC |
| <<values should come from Section A for fenestration that has Table 110.6-B in A05>> | <<User selects N, E, S, or W>> | <<user selects from the following list: Metal, Non-metal, or Metal w/Thermal Break>> | <<User selects from following:  Fixed or Operable>> | << User selects from following:  Clear or Tinted>> | <<User selects from the following list:  Single Pane, Double Pane, Glass Block>> | << calculated value from Table 110.6-B of the standards based on information provided in cells B03, B04, B05, B06>> |
|  |  |  |  |  |  |  |

<<If Column A05 contains entry = Equation NA6-2 then display this section; else display section header and standard section does not apply message>>

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **C. Non-Rated Site-built Solar Heat Gain Coefficient Calculation Using Equation NA6-2 from Nonresidential Appendix NA6.3** | | | | |
| 01 | Conditioned Floor Area | | | << User entry >> |
| 02 | 5% of the Condition Floor Area | | | <<=(Cell C01 x .05)>> |
| 03 | Total Allowed Non-rated site-built Fenestration Area ( | | | << min of C02 or 250>> |
| 04 | Proposed Area of site-built Fenestration | | | <<user input, non negative decimal <= C03; if greater than C03, display message “Proposed site-built Fenestration exceeds allowable area” do not proceed>> |
| 05 | 06 | 07 | 08 | |
| Tag/ Identification | Glass Area | Center of Glass (COG) Solar Heat Gain Coefficient | Total Allowed SHGC of the Non-Rated Site-Built Fenestration | |
| <<values should come from Section A for fenestration that has Calculated Using Equation NA6-2 in A05>> | <<User entry, nonnegative decimal >> | <<User entry, non negative decimal>> | << = ((C07 x 0.86)+0.08) >> | |
|  |  |  |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| **D. Combined Solar Heat Gain Coefficient Calculation and Shading Device Calculation** | | | |
| 01 | 02 | 03 | 04 |
| Tag/ Identification | *SHGCmax =* | *SHGCmin =* | The total combined adjusted SHGC with exterior shading device; (SHGCtotal) |
| <<should match what was entered in Section A>> | << =max ofcell A04, A07, B07, C08>> | << = min of A04, A07, B07, C08>> | <<-= (((0.2875 x D02)+0.75)xD03) |
|  |  |  |  |