

Week 7 Assignment

Task 1

Solar radiation is electromagnetic energy emitted by Sun. It is radiated in the form of electromagnetic waves, including visible and also ultraviolet lights and infrared radiation.

G_{SC} is the solar constant which is a flux density measuring solar irradiance, it is an average of varying value which is 1367 W/m^2 .

The Solar radiation when it goes through atmosphere to reach the Earth's surface is modified in spectral distribution and in total irradiance.

This is happening due to dispersion and absorption phenomena.

Dispersion is molecular and particle scattering.

Absorption of solar radiation is due to the atmospheric components, especially ozone, water and carbon dioxide, which absorb the incident radiation in specific absorption bands which is modifying its energetic spectrum.

Solar radiation depends on:

1. The sun position in the sky
2. The weather condition
3. The site altitude over the sea level
4. Sunshine hours

189.1-2009 - CZ1 - Office

new 1

189.1-2009 - CZ2 - Office

189.1-2009 - CZ3 - Office

189.1-2009 - CZ4 - Office

189.1-2009 - CZ5 - Office

189.1-2009 - CZ6 - Office

189.1-2009 - CZ7-8 - Office

new 1

Exterior Surface Constructions

Walls

Floors

Roofs

ASHRAE 189.1-2009 ExtWall

ExtSlabCa 4in ClimateZc

ASHRAE 189.1-2009 ExtRoof

Interior Surface Constructions

Walls

Floors

Ceilings

Interior Wall

Interior Floor

Interior Ceiling

Ground Contact Surface Constructions

Walls

Floors

Ceilings

ExtSlabCa 4in ClimateZc

ExtSlabCa 4in ClimateZc

ExtSlabCa 4in ClimateZc

Exterior Sub Surface Constructions

Fixed Windows

Operable Windows

Doors

ASHRAE 189.1-2009 ExtWindo

ASHRAE 189.1-2009 ExtWindo

Exterior Door

Glass Doors

Overhead Doors

Skylights

Drag From Library

Drag From Library

Drag From Library

Tubular Daylight Domes

Tubular Daylight Diffusers

Interior Window

Interior Window

Interior Sub Surface Constructions

Fixed Windows

Operable Windows

Doors

Interior Window

Interior Window

Interior Door

Other Constructions

Space Shading

Building Shading

Site Shading

Drag From Library

Drag From Library

Drag From Library

Interior Partitions

Interior Partition

My Model

Library

Edit

Constructions

Air Wall

ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 1

ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 2-5

ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 7-8

ASHRAE 189.1-2009 ExtRoof Metal ClimateZone 6

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 1

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 2

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 3

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 4

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 5

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 6

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 7-8

ASHRAE 189.1-2009 ExtWindow ClimateZone 1

ASHRAE 189.1-2009 ExtWindow ClimateZone 2

ASHRAE 189.1-2009 ExtWindow ClimateZone 3

ASHRAE 189.1-2009 ExtWindow ClimateZone 4-5

ASHRAE 189.1-2009 ExtWindow ClimateZone 6

ASHRAE 189.1-2009 ExtWindow ClimateZone 7-8

Exterior Door

ExtSlabCarpet 4in ClimateZone 1-8

Interior Ceiling

Interior Door

Interior Floor

Interior Partition

Interior Wall

Interior Window

Internal Source Constructions

C-factor Underground Wall Constructions

F-factor Ground Floor Constructions

Window Data File Constructions

USING X2 TOOL WE MAKE NEW WALL BY COPYING EXCISTING AND CHANGING ITS NAME

189.1-2009 - CZ1 - Office

189.1-2009 - CZ2 - Office

189.1-2009 - CZ3 - Office

189.1-2009 - CZ4 - Office

189.1-2009 - CZ5 - Office

189.1-2009 - CZ6 - Office

189.1-2009 - CZ7-8 - Office

new 1

Name

new 1

Exterior Surface Constructions

Walls

Floors

Roofs

ASHRAE 189.1-2009 ExtWall

ExtSlabCa 4in ClimateZc

ASHRAE 189.1-2009 ExtRoof

Interior Surface Constructions

Walls

Floors

Ceilings

Interior Wall

Interior Floor

Interior Ceiling

Ground Contact Surface Constructions

Walls

Floors

Ceilings

ExtSlabCa 4in ClimateZc

ExtSlabCa 4in ClimateZc

ExtSlabCa 4in ClimateZc

Exterior Sub Surface Constructions

Fixed Windows

Operable Windows

Doors

ASHRAE 189.1-2009 ExtWindo

ASHRAE 189.1-2009 ExtWindo

Exterior Door

Glass Doors

Overhead Doors

Skylights

Drag From Library

Drag From Library

Drag From Library

Tubular Daylight Domes

Tubular Daylight Diffusers

Interior Window

Interior Window

Interior Sub Surface Constructions

Fixed Windows

Operable Windows

Doors

Interior Window

Interior Window

Interior Door

Other Constructions

Space Shading

Building Shading

Site Shading

Drag From Library

Drag From Library

Drag From Library

Interior Partitions

Interior Partition

Drag From Library

My Model

Library

Edit

Constructions

Air Wall

ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 1

ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 2-5

ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone 7-8

ASHRAE 189.1-2009 ExtRoof Metal ClimateZone 6

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 1

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 2

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 3

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 4

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 5

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 6

ASHRAE 189.1-2009 ExtWall Mass ClimateZone 7-8

ASHRAE 189.1-2009 ExtWindow ClimateZone 1

ASHRAE 189.1-2009 ExtWindow ClimateZone 2

ASHRAE 189.1-2009 ExtWindow ClimateZone 3

ASHRAE 189.1-2009 ExtWindow ClimateZone 4-5

ASHRAE 189.1-2009 ExtWindow ClimateZone 6

ASHRAE 189.1-2009 ExtWindow ClimateZone 7-8

Exterior Door

ExtSlabCarpet 4in ClimateZone 1-8

Interior Ceiling

Interior Door

Interior Floor

Interior Partition

Interior Wall

Interior Window

Internal Source Constructions

C-factor Underground Wall Constructions

F-factor Ground Floor Constructions

Window Data File Constructions

DRAG AND DROP

File

Preferences

Components & Measures

Help

Constructions

Construction Sets

Constructions

Materials

Constructions

Air Wall

ASHRAE 189.1-2009 ExtRoof IEAD

ASHRAE 189.1-2009 ExtRoof IEAD

ASHRAE 189.1-2009 ExtRoof IEAD

ASHRAE 189.1-2009 ExtRoof Metal

ASHRAE 189.1-2009 ExtWall Mass

ASHRAE 189.1-2009 ExtWall Mass

ASHRAE 189.1-2009 ExtWall Mass

ASHRAE 189.1-2009 ExtWall Mass

ASHRAE 189.1-2009 ExtWall Mass

ASHRAE 189.1-2009 ExtWall Mass

NEW

ASHRAE 189.1-2009 ExtWall Mass

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

ASHRAE 189.1-2009 ExtWindow

Exterior Door

ExtSlabCarpet

Drag From Library

Name:

NEW

Measure Tags (Optional):

Standard:

Standard Source:

Intended Surface Type:

Standards Construction Type:

Fenestration Type:

Fenestration Assembly Context:

Fenestration Number of Panes:

Fenestration Frame Type:

Fenestration Divider Type:

Fenestration Tint:

Fenestration Gas Fill:

Fenestration Low Emissivity Coating:

off

Layer:

Outside

Drag From Library

Inside

My Model

Library

Edit

Materials

No Mass Materials

Air Gap Materials

Air Wall Materials

Infrared Transparent Materials

Roof Vegetation Materials

Simple Glazing System Window Materials

Glazing Window Materials

Gas Window Materials

Gas Mixture Window Materials

Daylight Redirection Device Window Materials

Blind Window Materials

Screen Window Materials

Shade Window Materials

Refraction Extinction Method Glazing Window Materials

Glazing Group Thermochromic Window Materials

NOW WE GO IN TAB CONSTRUCTION, MAKE NEW WALL BY COPYING EXISTING AND CHANGE ITS NAME AND ALSO DELETE LAYERS

AFTER THAT WE ADD LAYERS FROM OUTSIDE TO INSIDE



Materials

1/2IN Gypsum

NEW

1IN Stucco

8IN Concrete HW

F08 Metal surface

F16 Acoustic tile

G01a 19mm gypsum board

G05 25mm wood

I01 25mm insulation board

M11 100mm lightweight concrete

MAT-CC05 4 HW CONCRETE

Metal Decking

Metal Roofing

Roof Insulation [18]

Roof Insulation [21]

Roof Insulation [25]

Roof Insulation [26]

Roof Membrane

Wall Insulation [31]

Wall Insulation [35]

Wall Insulation [36]

Wall Insulation [37]

Wall Insulation [40]

Wall Insulation [42]

Wall Insulation [44]

No Mass Materials

Air Gap Materials

Simple Glazing System Window Materials

Glazing Window Materials

Name:

NEW

Measure Tags (Optional):

Standard:Standard Source:

Standards Category:Standards Identifier:

Composite Framing Material:Composite Framing Configuration:

Composite Framing Depth:Composite Framing Size:

Composite Cavity Insulation:

Roughness:Thickness:

Conductivity:Density:

Specific Heat:Thermal Absorptance:

Solar Absorptance:Visible Absorptance:

OUR NEW MATERIAL

Drag From Library

