#Week 7

** Task 1** Provide a summary of the main concepts that went through about solar radiation (formulas are not needed)

** Task 2** Y create a pdf file with screenshots of all of the steps we went through in the second lesson on openStudio and explain briefly the reason behind the use of each step (in your own words!)

Task 1

Solar radiation is electromagnetic energy emitted by the sun from a nuclear fusion reaction that creates electromagnetic energy.

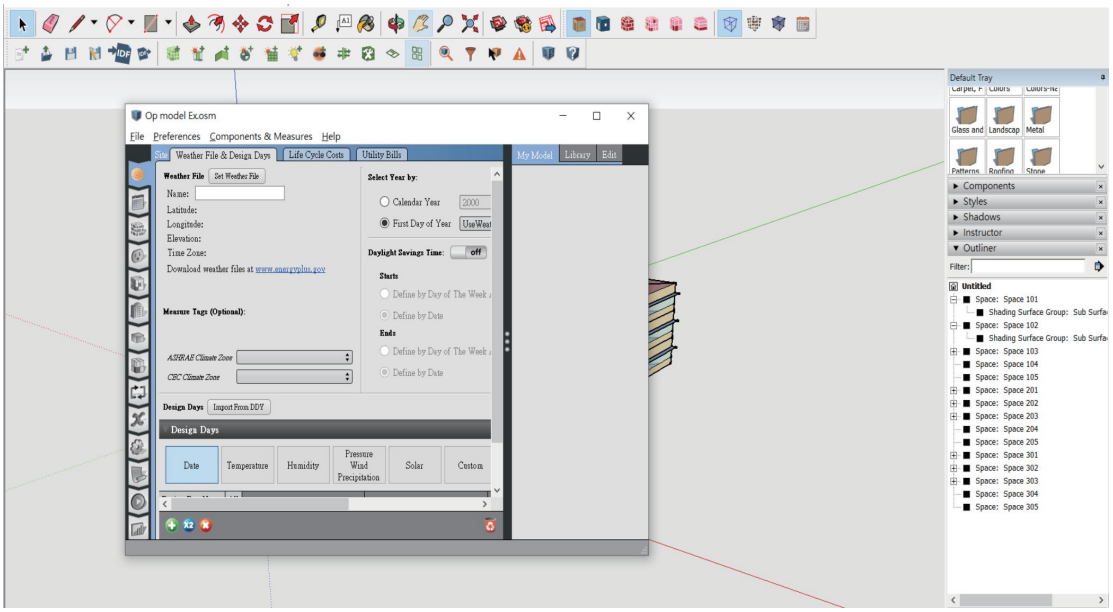
Direct solar radiation (also known as direct iridescence) is the radiation that maintained the direction of incidence.

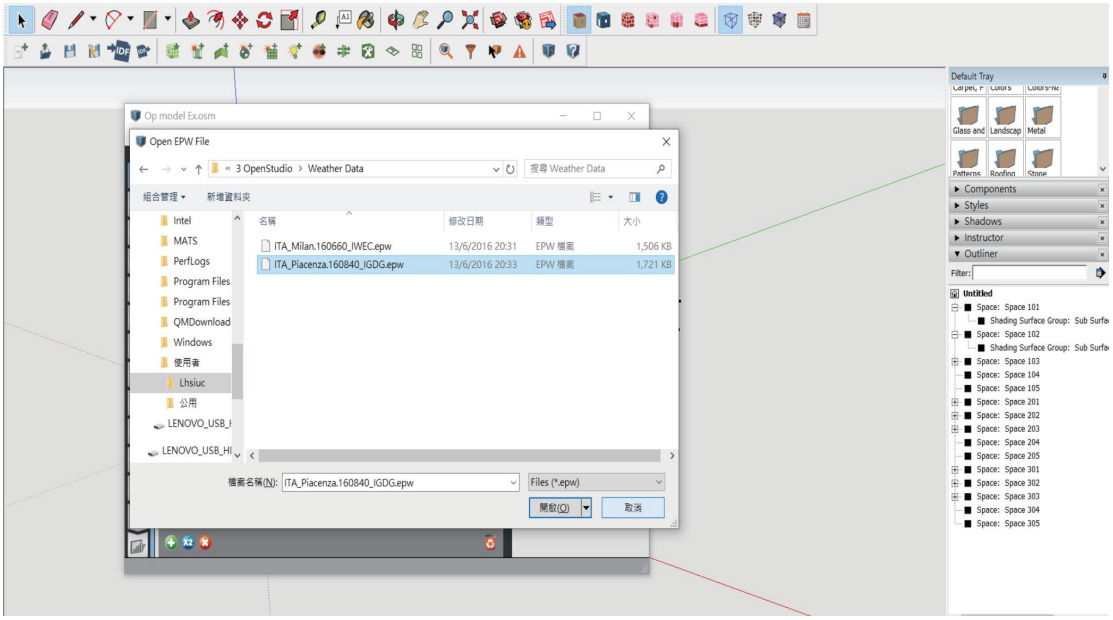
Solar radiation absorption is due to some atmospheric components, especially ozone, water and carbon dioxide

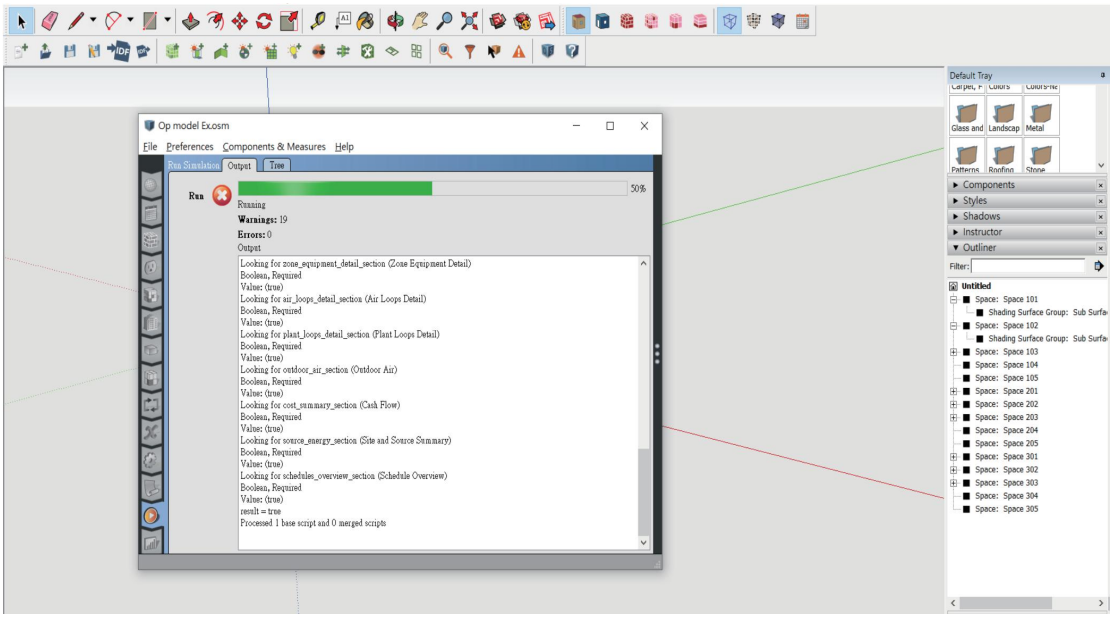
Air mass is the sun to the zenith crosses the minimum thickness of the atmosphere, the sun with an elevated zenith angle crosses a large thickness of the atmosphere.

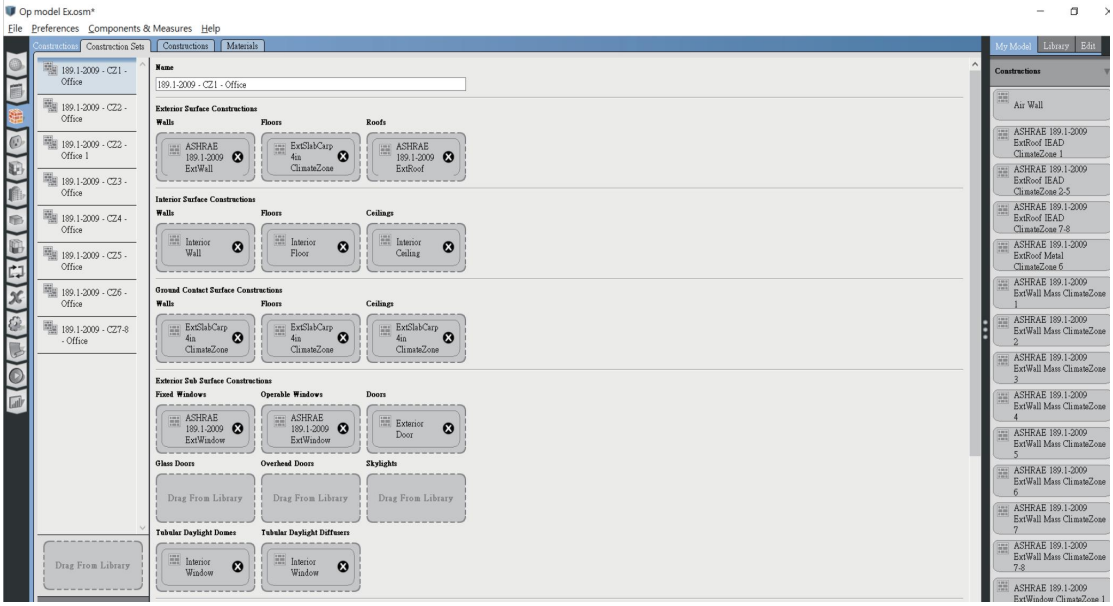
Solar radiation available on the Earths surface for conversion in other energy forms (such as solar electrical energy) depends on: the suns position, the weather condition, the site's sea level, and the daylight hours.

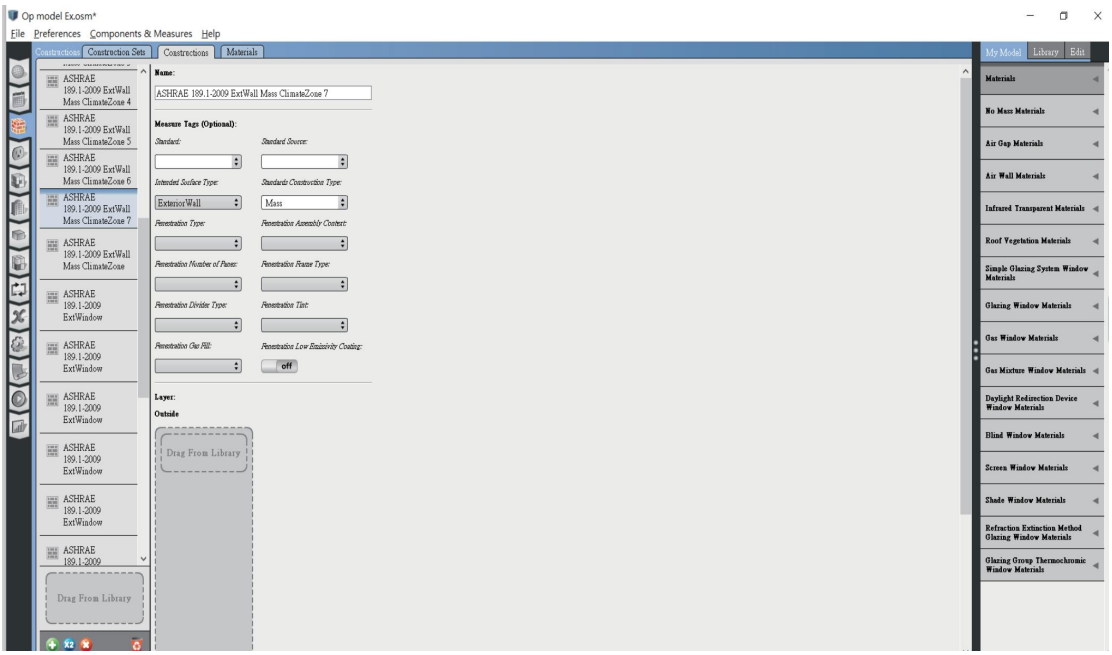
Task 2

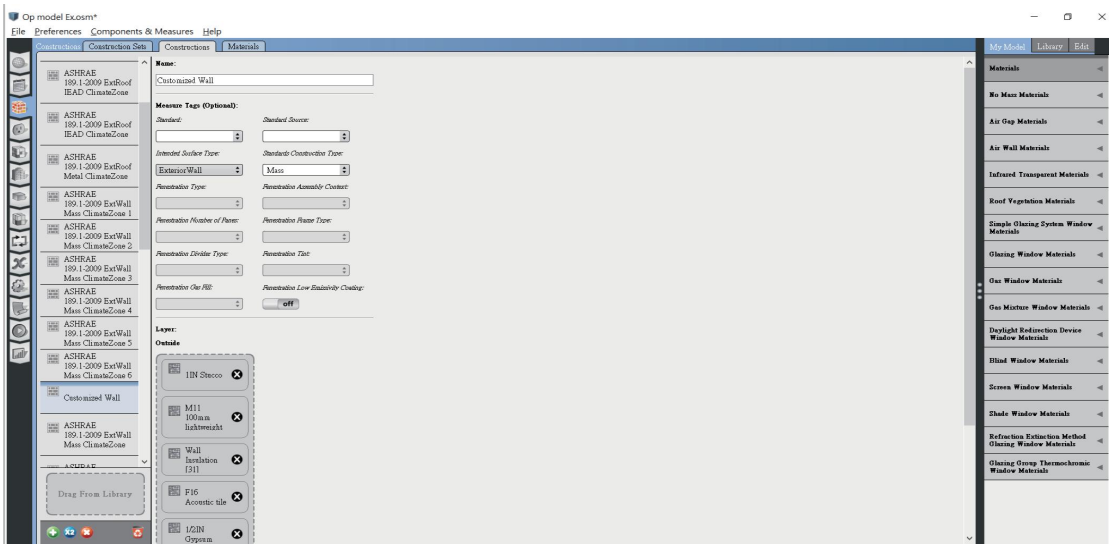

Op model Ex.osm
File Preferences Components & Measures Help
Site Weather File & Design Days Life Cycle Costs Utility Bills
My Model Library Edit
Weather File Set Weather File
Name:
Latitude:
Longitude:
Elevation:
Time Zone:
Download weather files at www.energyplus.gov
Measure Tags (Optional):
ASHRAE Climate Zone
CEC Climate Zone
Select Year by:
Calendar Year
First Day of Year
Daylight Savings Time:
off
Starts
Define by Day of The Week
Define by Date
Ends
Define by Day of The Week
Define by Date
Design Days
Import From IDD
Design Days
Date
Temperature
Humidity
Pressure Wind Precipitation
Solar
Custom
Default Tray
Glass and
Landscap
Metal
Patterns
Roofing
Stone
Components
Styles
Shadows
Instructor
Outliner
Filter:
Untitled
Space: Space 101
Shading Surface Group: Sub Surfa
Space: Space 102
Shading Surface Group: Sub Surfa
Space: Space 103
Space: Space 104
Space: Space 105
Space: Space 201
Space: Space 202
Space: Space 203
Space: Space 204
Space: Space 205
Space: Space 301
Space: Space 302
Space: Space 303
Space: Space 304
Space: Space 305

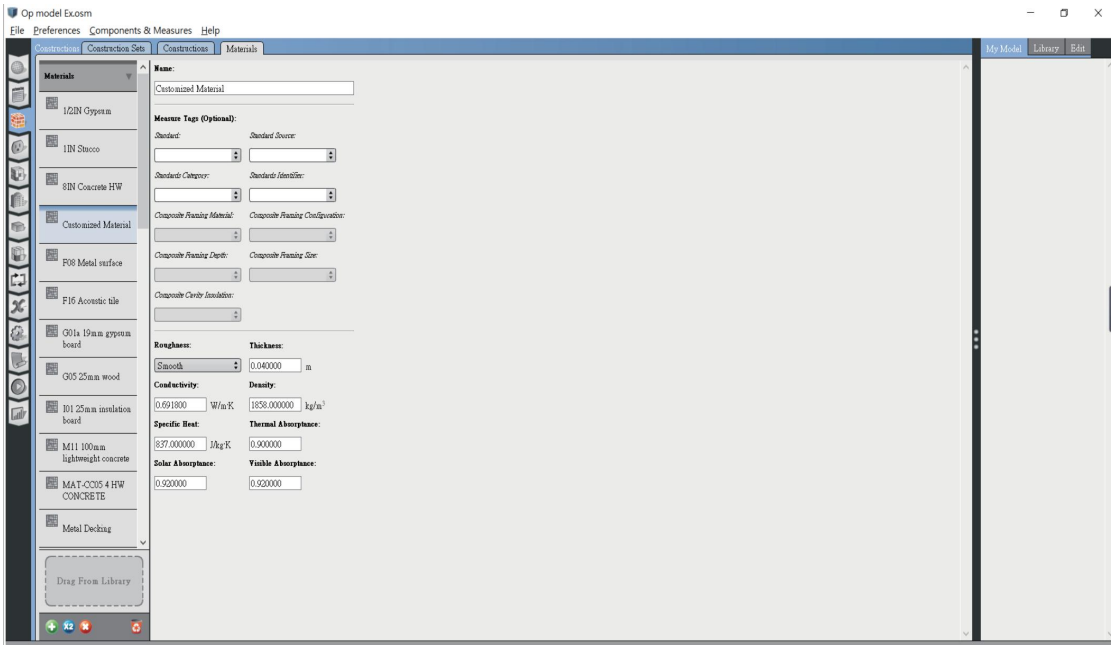

Op model Ex.osm
Open EPW File
3 OpenStudio › Weather Data
搜尋 Weather Data
組合管理
新增資料夾
名稱
修改日期
類型
大小
ITA_Milan.160660_IWEC.epw 13/6/2016 20:31 EPW 檔案 1,506 KB
ITA_Piacenza.160840_IGDG.epw 13/6/2016 20:33 EPW 檔案 1,721 KB
Intel
MATS
PerfLogs
Program Files
Program Files
QMDownload
Windows
使用者
Lhsiuc
公用
LENOVO_USB_I
LENOVO_USB_HI
檔案名稱(N): ITA_Piacenza.160840_IGDG.epw
Files (*.epw)
開啟(O)
取消
Default Tray
Glass and
Landscap
Metal
Patterns
Roofing
Stone
Components
Styles
Shadows
Instructor
Outliner
Filter:
Untitled
Space: Space 101
Shading Surface Group: Sub Surfa
Space: Space 102
Shading Surface Group: Sub Surfa
Space: Space 103
Space: Space 104
Space: Space 105
Space: Space 201
Space: Space 202
Space: Space 203
Space: Space 204
Space: Space 205
Space: Space 301
Space: Space 302
Space: Space 303
Space: Space 304
Space: Space 305

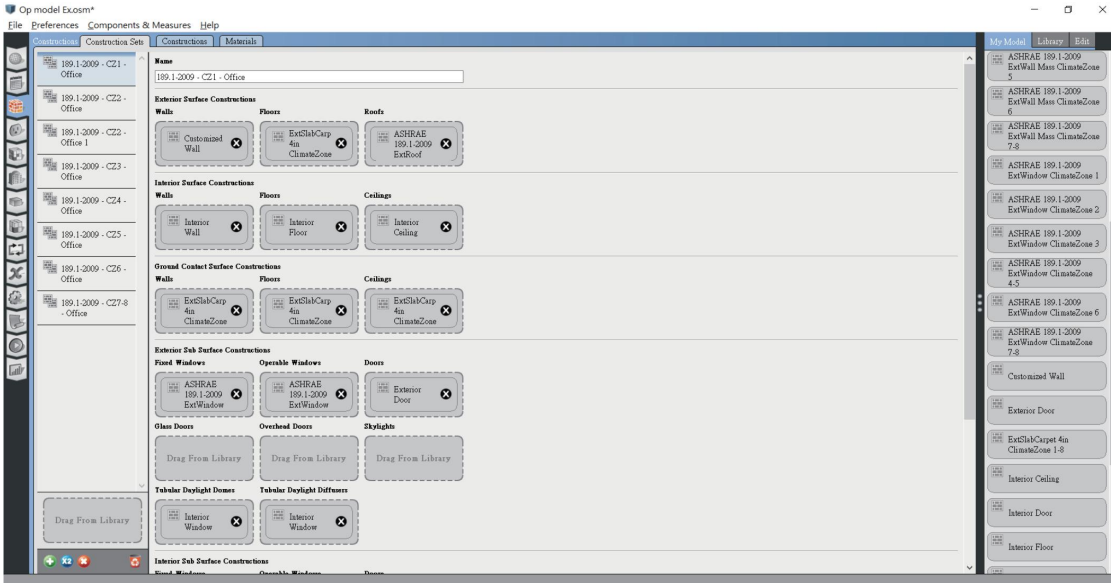

Op model Ex.osm
File Preferences Components & Measures Help
Run Simulation Output Tree
Run
50%
Running
Warnings: 19
Errors: 0
Output
Looking for zone_equipment_detail_section (Zone Equipment Detail)
Boolean, Required
Value: (true)
Looking for air_loops_detail_section (Air Loops Detail)
Boolean, Required
Value: (true)
Looking for plant_loops_detail_section (Plant Loops Detail)
Boolean, Required
Value: (true)
Looking for outdoor_air_section (Outdoor Air)
Boolean, Required
Value: (true)
Looking for cost_summary_section (Cash Flow)
Boolean, Required
Value: (true)
Looking for source_energy_section (Site and Source Summary)
Boolean, Required
Value: (true)
Looking for schedules_overview_section (Schedule Overview)
Boolean, Required
Value: (true)
result = true
Processed 1 base script and 0 merged scripts
Default Tray
Glass and
Landscap
Metal
Components
Styles
Shadows
Instructor
Outliner
Filter:
Untitled
Space: Space 101
Shading Surface Group: Sub Surfa
Space: Space 102
Shading Surface Group: Sub Surfa
Space: Space 103
Space: Space 104
Space: Space 105
Space: Space 201
Space: Space 202
Space: Space 203
Space: Space 204
Space: Space 205
Space: Space 301
Space: Space 302
Space: Space 303
Space: Space 304
Space: Space 305


Op model Ex.osm*
File Preferences Components & Measures Help
Constructions
Construction Sets
Constructions
Materials
189.1-2009 - CZ1 - Office
189.1-2009 - CZ2 - Office
189.1-2009 - CZ2 - Office 1
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
Drag From Library
Name
189.1-2009 - CZ1 - Office
Exterior Surface Constructions
Walls
ASHRAE 189.1-2009 ExtWall
Floors
ExtSlabCarp 4in ClimateZone
Roofs
ASHRAE 189.1-2009 ExtRoof
Interior Surface Constructions
Walls
Interior Wall
Floors
Interior Floor
Ceilings
Interior Ceiling
Ground Contact Surface Constructions
Walls
ExtSlabCarp 4in ClimateZone
Floors
ExtSlabCarp 4in ClimateZone
Ceilings
ExtSlabCarp 4in ClimateZone
Exterior Sub Surface Constructions
Fixed Windows
ASHRAE 189.1-2009 ExtWindow
Operable Windows
ASHRAE 189.1-2009 ExtWindow
Doors
Exterior Door
Glass Doors
Drag From Library
Overhead Doors
Drag From Library
Skylights
Drag From Library
Tubular Daylight Domes
Interior Window
Tubular Daylight Diffusers
Interior Window
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
ASHRAE 189.1-2009 ExtWall Mass ClimateZone 7-8
ASHRAE 189.1-2009 ExtWindow ClimateZone 1


Op model Ex.osm*
File Preferences Components & Measures Help
Constructions Construction Sets Constructions Materials
My Model Library Edit
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
ASHRAE 189.1-2009 ExtWall Mass ClimateZone
ASHRAE 189.1-2009 ExtWindow
Drag From Library
Name:
ASHRAE 189.1-2009 ExtWall Mass ClimateZone 7
Measure Tags (Optional):
Standard:
Standard Source:
Intended Surface Type:
ExteriorWall
Standards Construction Type:
Mass
Penetration Type:
Penetration Assembly Content:
Penetration Number of Panes:
Penetration Frame Type:
Penetration Divider Type:
Penetration Tint:
Penetration Gas Fill:
Penetration Low Emissivity Coating:
off
Layer:
Outside
Drag From Library
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


Op model Ex.osm*
File Preferences Components & Measures Help
Constructions Construction Sets Constructions Materials
My Model Library Edit
ASHRAE 189.1-2009 ExtRoof IEAD ClimateZone
ASHRAE 189.1-2009 ExtRoof Metal ClimateZone
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
Customized Wall
ASHRAE 189.1-2009 ExtWall Mass ClimateZone
Drag From Library
Name:
Customized Wall
Measure Tags (Optional):
Standard:
Standard Source:
Intended Surface Type:
ExteriorWall
Standards Construction Type:
Mass
Penetration Type:
Penetration Assembly Content:
Penetration Number of Panes:
Penetration Frame Type:
Penetration Divider Type:
Penetration Tint:
Penetration Gas Fill:
Penetration Low Emissivity Coating:
off
Layer:
Outside
1IN Stucco
M11 100mm lightweight
Wall Insulation [31]
F16 Acoustic tile
1/2IN Gypsum
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


Op model Ex.osm
File Preferences Components & Measures Help
Constructions Construction Sets Constructions Materials
My Model Library Edit
Materials
1/2IN Gypsum
1IN Stucco
8IN Concrete HW
Customized Material
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
Drag From Library
Name:
Customized Material
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:
Smooth
Thickness:
0.040000
m
Conductivity:
0.691800
W/m·K
Density:
1858.000000
kg/m³
Specific Heat:
837.000000
J/kg·K
Thermal Absorptance:
0.900000
Solar Absorptance:
0.920000
Visible Absorptance:
0.920000


Op model Ex.osm*
File Preferences Components & Measures Help
Constructions
Construction Sets
Constructions
Materials
189.1-2009 - CZ1 - Office
189.1-2009 - CZ2 - Office
189.1-2009 - CZ2 - Office 1
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
Drag From Library
Name
189.1-2009 - CZ1 - Office
Exterior Surface Constructions
Walls
Customized Wall
Floors
ExtSlabCarp 4in ClimateZone
Roofs
ASHRAE 189.1-2009 ExtRoof
Interior Surface Constructions
Walls
Interior Wall
Floors
Interior Floor
Ceilings
Interior Ceiling
Ground Contact Surface Constructions
Walls
ExtSlabCarp 4in ClimateZone
Floors
ExtSlabCarp 4in ClimateZone
Ceilings
ExtSlabCarp 4in ClimateZone
Exterior Sub Surface Constructions
Fixed Windows
ASHRAE 189.1-2009 ExtWindow
Operable Windows
ASHRAE 189.1-2009 ExtWindow
Doors
Exterior Door
Glass Doors
Drag From Library
Overhead Doors
Drag From Library
Skylights
Drag From Library
Tubular Daylight Domes
Interior Window
Tubular Daylight Diffusers
Interior Window
Interior Sub Surface Constructions
My Model
Library
Edit
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
Customized Wall
Exterior Door
ExtSlabCarpet 4in ClimateZone 1-8
Interior Ceiling
Interior Door
Interior Floor