

Project Data

Project Name Group 10
 Project Number

Client
 Contact Person
 City/Zip
 Street

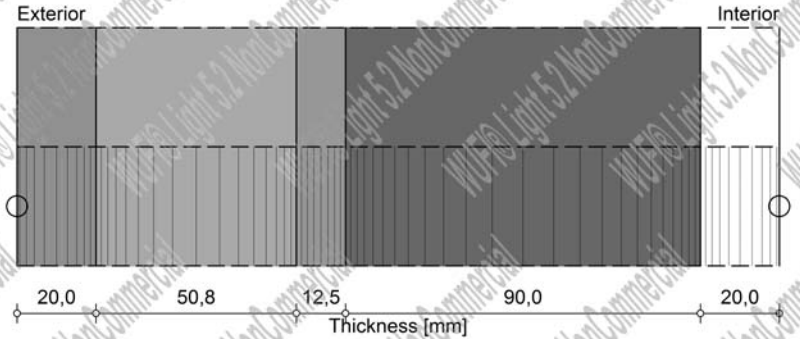
Phone
 Fax
 e-mail

Responsible
 Remarks

Date 5/10/2014

Component Assembly

Case: #1



○ - Monitor positions

Materials :

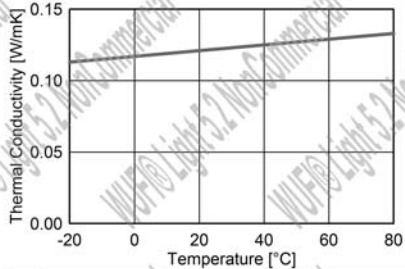
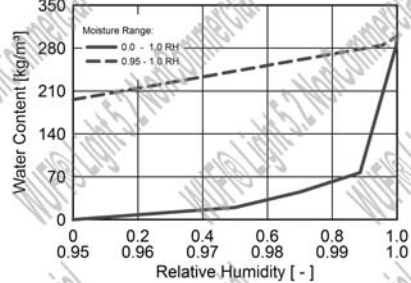
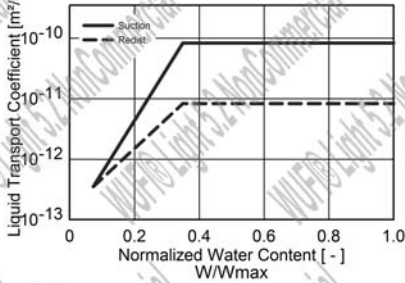
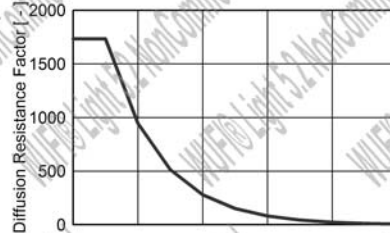
- *Southern Yellow Pine
- *Polyisocyanurate Insulation
- *Oriented Strand Board
- *Softwood
- *Gypsum Plaster

Total Thickness: 0,19 m
 R-Value: 3,36 m²K/W
 U-Value: 0,283 W/m²K

Material : *Southern Yellow Pine

Checking Input Data

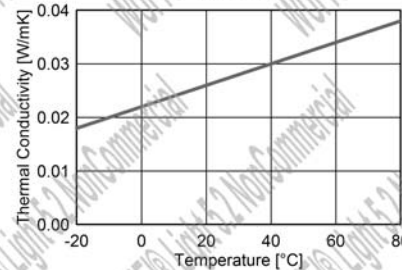
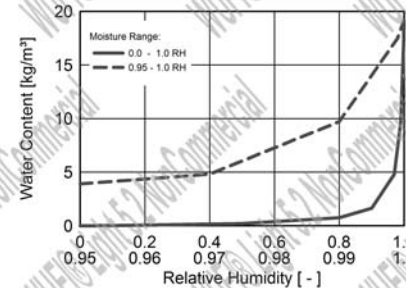
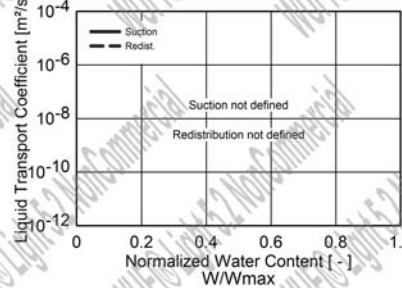
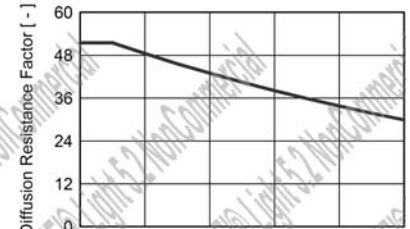
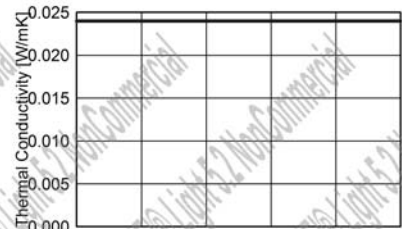
Property	Unit	Value
Bulk density	[kg/m³]	500,0
Porosity	[m³/m³]	0,858
Specific Heat Capacity, Dry	[J/kgK]	1880,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,119
Water Vapour Diffusion Resistance Factor	[-]	1734,1
Reference Water Content	[kg/m³]	62,2
Free Water Saturation	[kg/m³]	300,0
Water Absorption Coefficient	[kg/m²s ^{0.5}]	0,0014
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Polyisocyanurate Insulation

Checking Input Data

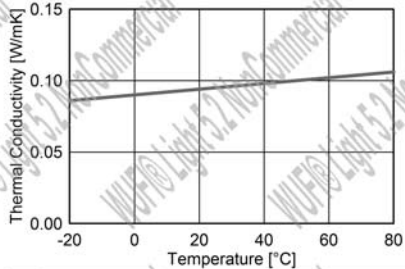
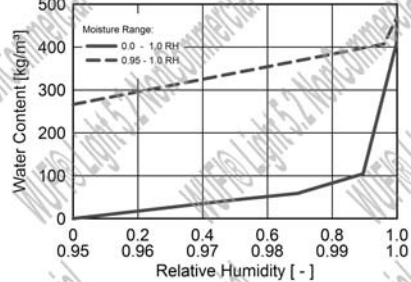
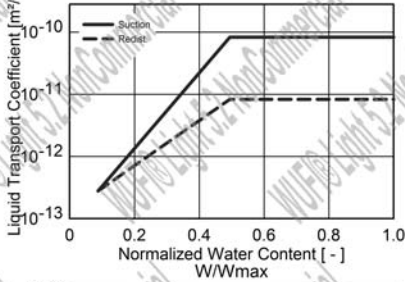
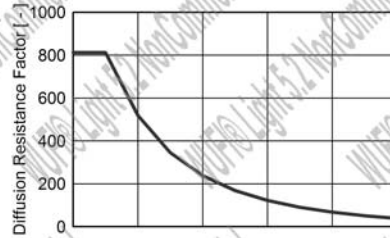
Property	Unit	Value
Bulk density	[kg/m³]	26,5
Porosity	[m³/m³]	0,99
Specific Heat Capacity, Dry	[J/kgK]	1470,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,024
Water Vapour Diffusion Resistance Factor	[-]	51,5
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Oriented Strand Board

Checking Input Data

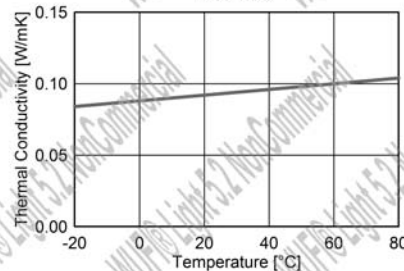
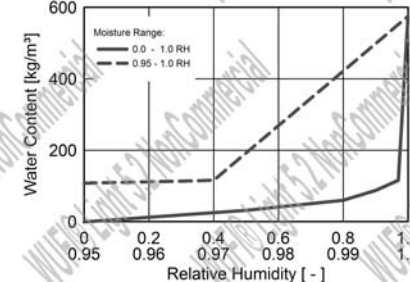
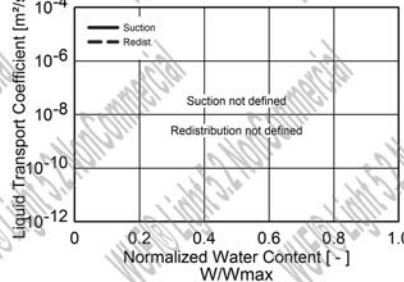
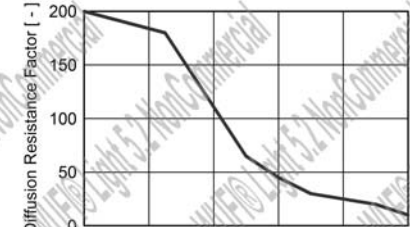
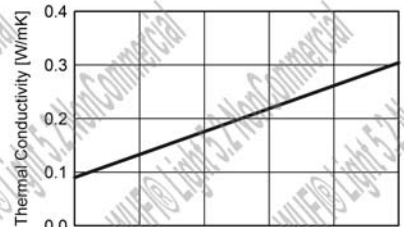
Property	Unit	Value
Bulk density	[kg/m³]	650,0
Porosity	[m³/m³]	0,95
Specific Heat Capacity, Dry	[J/kgK]	1880,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,092
Water Vapour Diffusion Resistance Factor	[-]	812,8
Reference Water Content	[kg/m³]	83,3
Free Water Saturation	[kg/m³]	470,0
Water Absorption Coefficient	[kg/m²s ^{0.5}]	0,0022
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Softwood

Checking Input Data

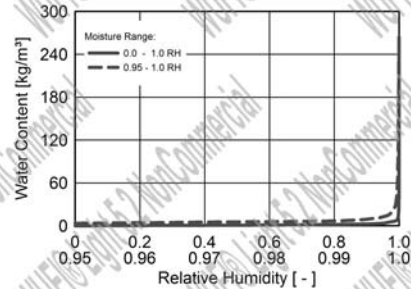
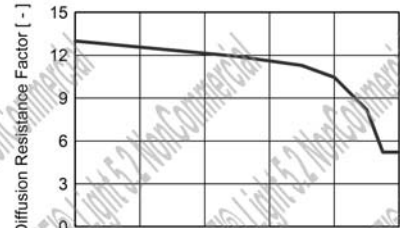
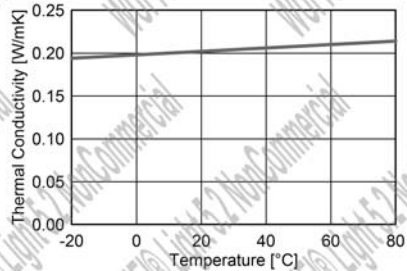
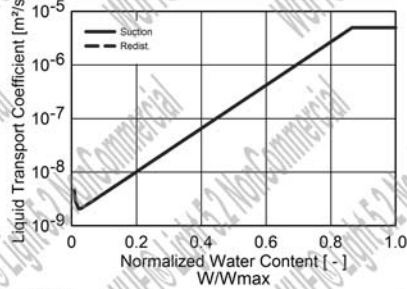
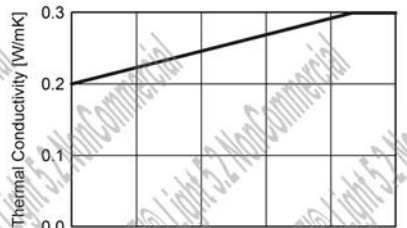
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Bulk density	[kg/m³]	400,0
Porosity	[m³/m³]	0,73
Specific Heat Capacity, Dry	[J/kgK]	1500,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,09
Water Vapour Diffusion Resistance Factor	[-]	200,0
Moisture-dep. Thermal Cond. Supplement	[%/M.-%]	1,3
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Gypsum Plaster

Checking Input Data

Property	Unit	Value
Bulk density	[kg/m³]	1721,0
Porosity	[m³/m³]	0,305
Specific Heat Capacity, Dry	[J/kgK]	850,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,2
Water Vapour Diffusion Resistance Factor	[-]	13,0
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Boundary Conditions

Exterior (Left Side)

Location: Chicago; cold year
Orientation / Inclination: Horizontal / 90 °

Interior (Right Side)

Indoor Climate: EN 15026
Normal Moisture Load

Surface Transfer Coefficients

Exterior (Left Side)

Name	Description	Unit	Value
Heat Resistance - includes long-wave radiation	External Wall	[m²K/W]	0.0526 yes
Sd-Value	No coating	[m]	----
Short-Wave Radiation Absorptivity	No absorption/emission	[-]	----
Long-Wave Radiation Emissivity	No absorption/emission	[-]	----
Adhering Fraction of Rain	According to inclination an	[-]	0,7
Explicit Radiation Balance			no

Interior (Right Side)

Name	Description	Unit	Value
Heat Resistance	External Wall	[m²K/W]	0.125
Sd-Value	No coating	[m]	----

Results from Last Calculation

Status of Calculation

Calculation: Time and Date	5/10/2014 2:31:27 PM
Computing Time	4 min,25 sec.
Begin / End of calculation	1/1/2012 / 1/1/2013
No. of Convergence Failures	0

Check for numerical quality

Integral of fluxes, left side (kl,dl)	[kg/m ²]	0,77 -1,62
Integral of fluxes, right side (kr,dr)	[kg/m ²]	0,34 0,93
Balance 1	[kg/m ²]	-2,12
Balance 2	[kg/m ²]	-2,12

Water Content [kg/m²]

	Start	End	Min.	Max.
Total Water Content	7,76	5,62	5,62	7,76

Water Content [kg/m³]

Layer/Material	Start	End	Min.	Max.
Southern Yellow Pine	62,20	62,00	43,66	81,24
Polyisocyanurate Insulation	0,76	0,54	0,52	1,20
Oriented Strand Board	83,25	52,28	52,28	83,25
Softwood	60,00	40,99	40,99	60,00
Gypsum Plaster	1,77	0,63	0,63	1,77

Time Integral of fluxes

Heat Flux, left side	[MJ/m ²]	-116,06
Heat Flux, right side	[MJ/m ²]	-114,82
Heat Sources	[MJ/m ²]	0,0
Moisture Fluxes, left side	[kg/m ²]	-0,86
Moisture Fluxes, right side	[kg/m ²]	1,28
Moisture Sources	[kg/m ²]	0,0
Clipped Moisture Sources	[kg/m ²]	0,0

Project Data

Project Name Group 12

Project Number

Client

Contact Person

City/Zip

Street

Phone

Fax

e-mail

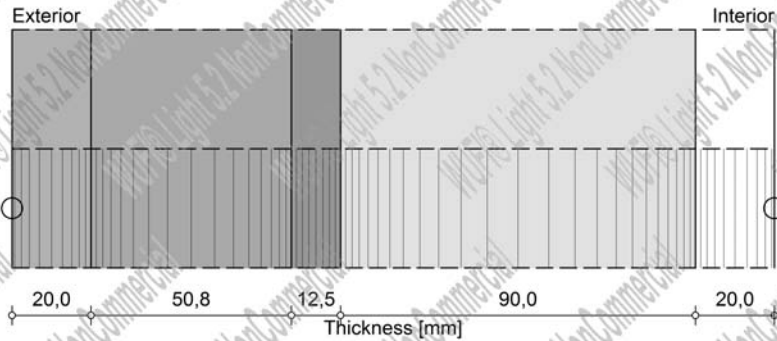
Responsible

Remarks

Date 5/10/2014






Component Assembly

Case: #1



○ - Monitor positions

Materials :

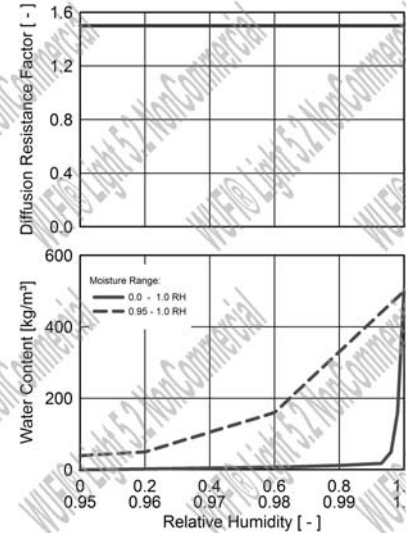
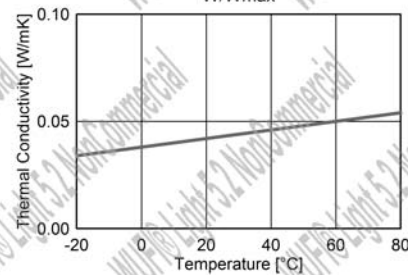
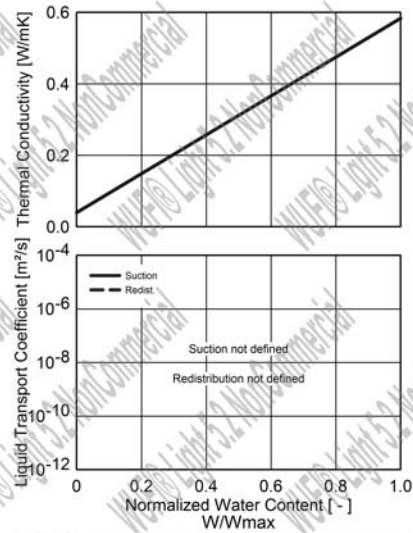
-  - *Cellulose Fiber (heat cond.: 0,04 W/mK)
-  - *Polyisocyanurate Insulation
-  - *Oriented Strand Board
-  - *Cellulose Insulation
-  - *Gypsum Plaster

Total Thickness: 0,19 m
 R-Value: 5,01 m²K/W
 U-Value: 0,193 W/m²K

Material : *Cellulose Fiber (heat cond.: 0,04 W/mK)

Checking Input Data

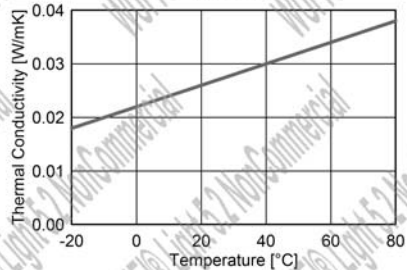
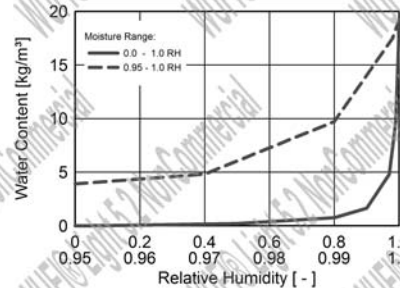
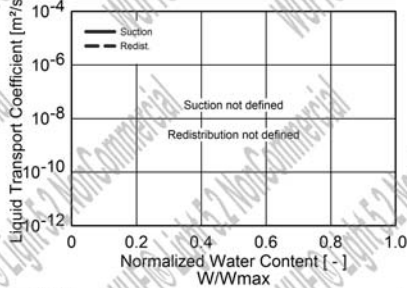
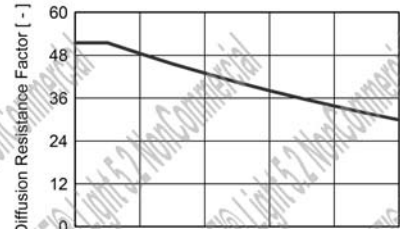
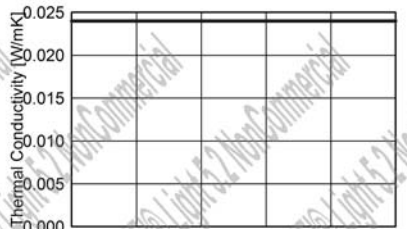
Property	Unit	Value
Bulk density	[kg/m ³]	70,0
Porosity	[m ³ /m ³]	0,95
Specific Heat Capacity, Dry	[J/kgK]	2500,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,04
Water Vapour Diffusion Resistance Factor	[-]	1,5
Moisture-dep. Thermal Cond. Supplement	[%/M.-%]	1,0
Temp-dep. Thermal Cond. Supplement	[W/mK ²]	0,0002



Material : *Polyisocyanurate Insulation

Checking Input Data

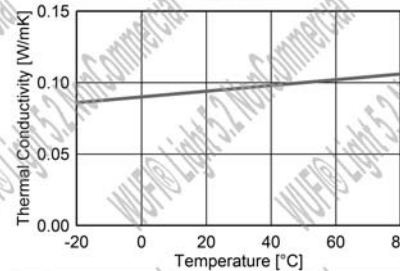
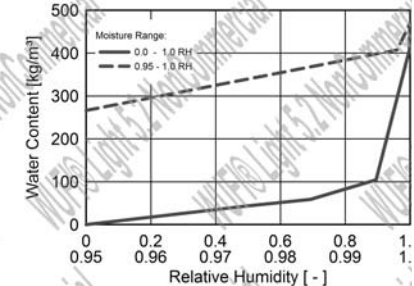
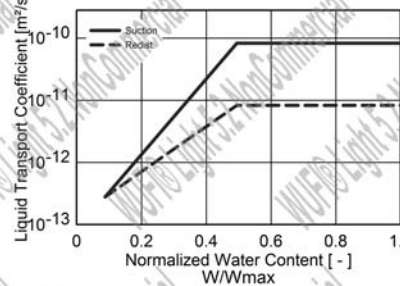
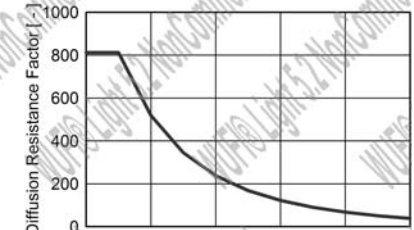
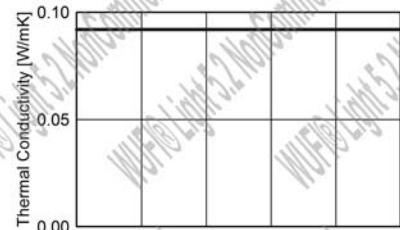
Property	Unit	Value
Bulk density	[kg/m³]	26,5
Porosity	[m³/m³]	0,99
Specific Heat Capacity, Dry	[J/kgK]	1470,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,024
Water Vapour Diffusion Resistance Factor	[-]	51,5
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Oriented Strand Board

Checking Input Data

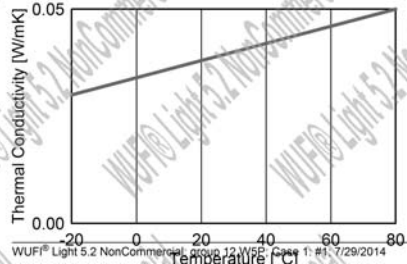
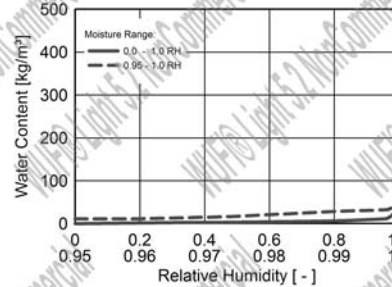
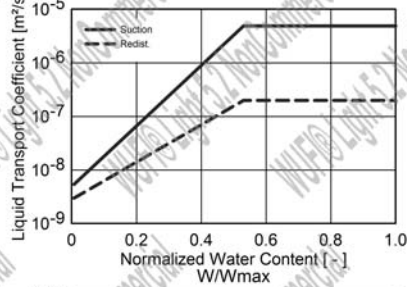
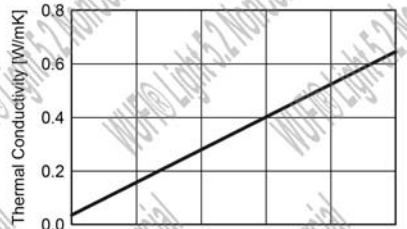
Property	Unit	Value
Bulk density	[kg/m³]	650,0
Porosity	[m³/m³]	0,95
Specific Heat Capacity, Dry	[J/kgK]	1880,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,092
Water Vapour Diffusion Resistance Factor	[-]	812,8
Reference Water Content	[kg/m³]	83,3
Free Water Saturation	[kg/m³]	470,0
Water Absorption Coefficient	[kg/m²s ^{0.5}]	0,0022
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Cellulose Insulation

Checking Input Data

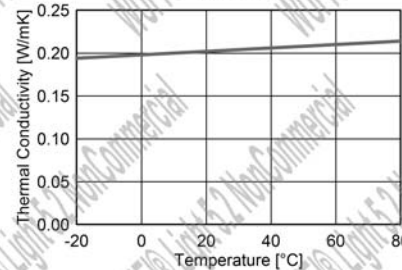
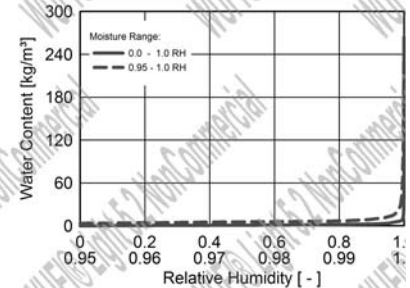
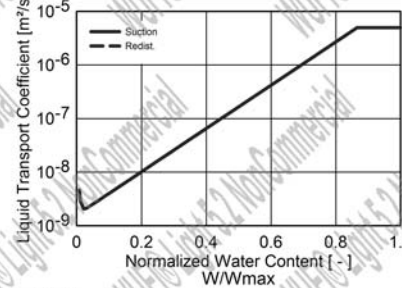
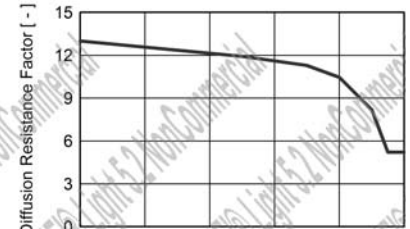
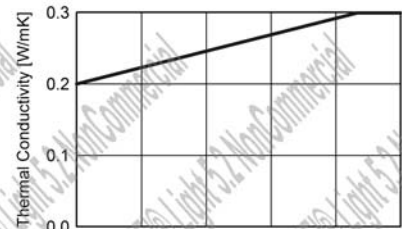
Property	Unit	Value
Bulk density	[kg/m³]	55,0
Porosity	[m³/m³]	0,93
Specific Heat Capacity, Dry	[J/kgK]	2544,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,036
Water Vapour Diffusion Resistance Factor	[-]	2,0
Reference Water Content	[kg/m³]	6,6
Free Water Saturation	[kg/m³]	494,0
Water Absorption Coefficient	[kg/m²s ^{0.5}]	0,56
Moisture-dep. Thermal Cond. Supplement	[%/M.-%]	1,0
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Material : *Gypsum Plaster

Checking Input Data

Property	Unit	Value
Bulk density	[kg/m³]	1721,0
Porosity	[m³/m³]	0,305
Specific Heat Capacity, Dry	[J/kgK]	850,0
Thermal Conductivity, Dry ,10°C	[W/mK]	0,2
Water Vapour Diffusion Resistance Factor	[-]	13,0
Temp-dep. Thermal Cond. Supplement	[W/mK²]	0,0002



Boundary Conditions

Exterior (Left Side)

Location: Chicago; cold year
Orientation / Inclination: Horizontal / 90 °

Interior (Right Side)

Indoor Climate: EN 15026
Normal Moisture Load

Surface Transfer Coefficients

Exterior (Left Side)

Name	Description	Unit	Value
Heat Resistance - includes long-wave radiation	External Wall	[m²K/W]	0.0526 yes
Sd-Value	No coating	[m]	----
Short-Wave Radiation Absorptivity	No absorption/emission	[-]	----
Long-Wave Radiation Emissivity	No absorption/emission	[-]	----
Adhering Fraction of Rain	According to inclination ar	[-]	0,7
Explicit Radiation Balance			no

Interior (Right Side)

Name	Description	Unit	Value
Heat Resistance	External Wall	[m²K/W]	0.125
Sd-Value	No coating	[m]	----

Results from Last Calculation

Status of Calculation

Calculation: Time and Date	7/29/2014 7:42:14 PM
Computing Time	0 min,5 sec.
Begin / End of calculation	1/1/2012 / 1/1/2013
No. of Convergence Failures	0

Check for numerical quality

Integral of fluxes, left side (kl,dl)	[kg/m²]	0,0 -0,04
Integral of fluxes, right side (kr,dr)	[kg/m²]	0,02 0,08
Balance 1	[kg/m²]	-0,14
Balance 2	[kg/m²]	-0,14

Water Content [kg/m³]

	Start	End	Min.	Max.
Total Water Content	1,95	1,81	1,79	1,95

Water Content [kg/m³]

Layer/Material	Start	End	Min.	Max.
*Cellulose Fiber (heat cond.: 0,04 W/	12,00	10,70	8,58	12,00
*Polyisocyanurate Insulation	0,76	0,71	0,71	0,78
*Oriented Strand Board	83,25	85,39	83,24	85,39
*Cellulose Insulation	6,59	5,26	5,26	6,59
*Gypsum Plaster	1,77	0,80	0,78	1,77

Time Integral of fluxes

Heat Flux, left side	[MJ/m²]	-1,46
Heat Flux, right side	[MJ/m²]	-1,04
Heat Sources	[MJ/m²]	0,0
Moisture Fluxes, left side	[kg/m²]	-0,04
Moisture Fluxes, right side	[kg/m²]	0,1
Moisture Sources	[kg/m²]	0,0
Clipped Moisture Sources	[kg/m²]	0,0