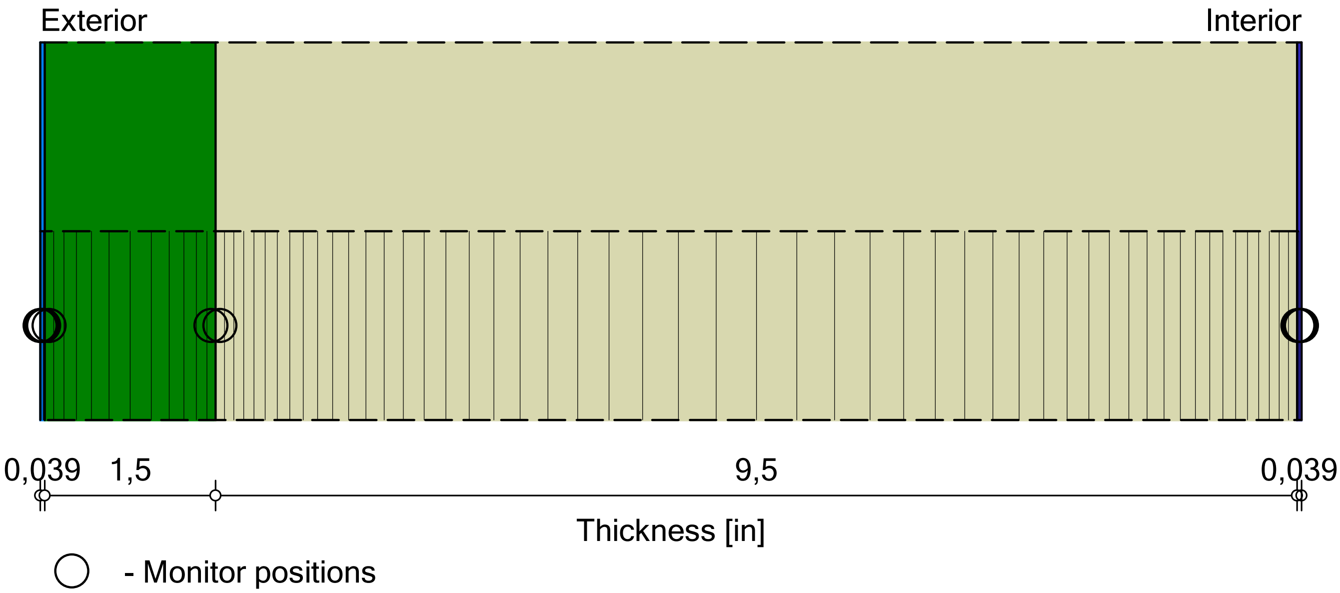
Project Data

Project Name	Maison ULTIMA ECO - Rothoblaas Analysis
Project Number	
Client	LINEAIRE ECO-CONSTRUCTION
Contact Person	François-Laurent Chabot
City/Zip	
Street	
Phone	
Fax	
e-mail	
Responsible	
Remarks	
Date	29/03/2018

Component Assembly

Case: TOITURE 8 CC80 CHANVRE T135



Materials:

- *TRASPIR135 (sd=0,02m)	0,039 in
- *ECO4 SONOclimat 1.5 in	1,5 in
- *Chainvre Insulation Board	9,5 in
- *CLIMACONTROL80	0,039 in

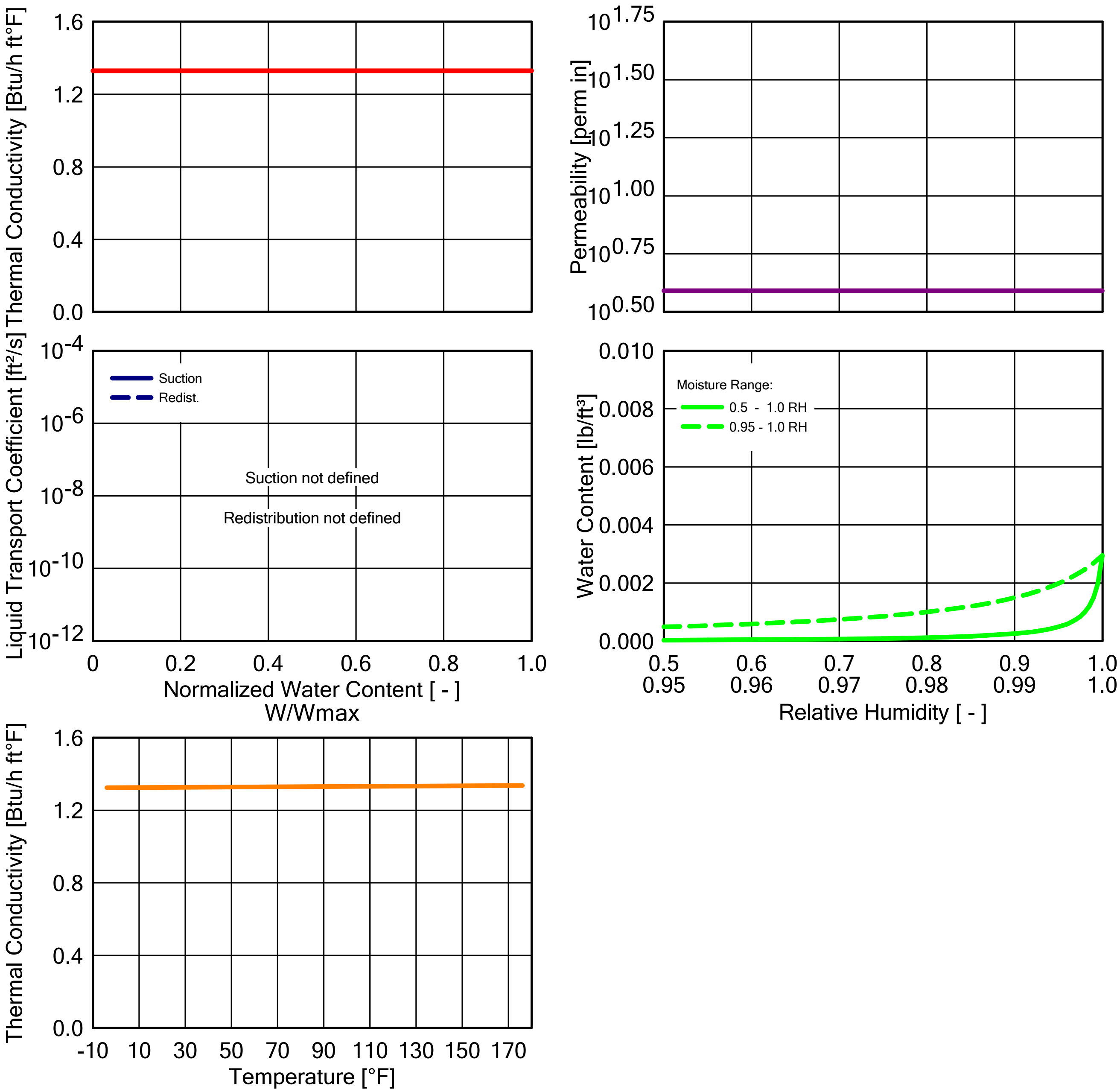
Total Thickness: 11,08 in
R-Value: 37,98 h ft² °F/Btu
U-Value: 0,026 Btu/h ft²°F

WUFI® Pro 5.3

Material: *TRASPIR135 (sd=0,02m)

Checking Input Data

Property	Unit	Value
Bulk density	[lb/ft³]	8,1156
Porosity	[ft³/ft³]	0,001
Specific Heat Capacity, Dry	[Btu/lb°F]	0,5493
Thermal Conductivity, Dry, 50°F	[Btu/h ft°F]	1,3289
Permeability	[perm in]	3,903
Temp-dep. Thermal Cond. Supplement	[Btu/h ft°F²]	0,0000642



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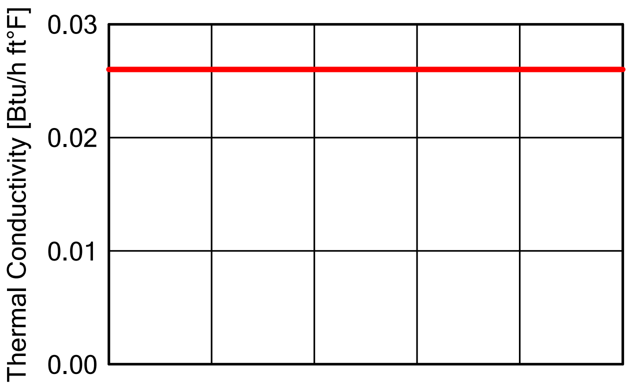
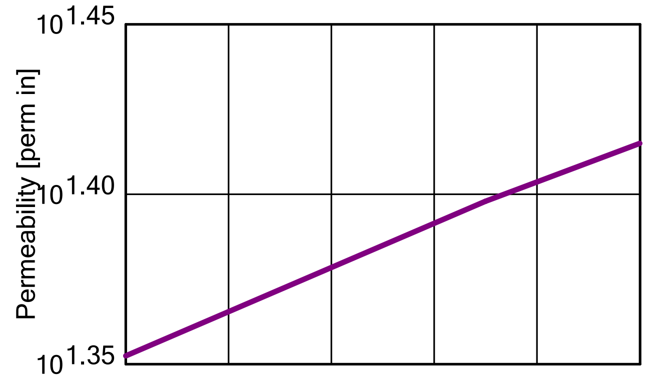
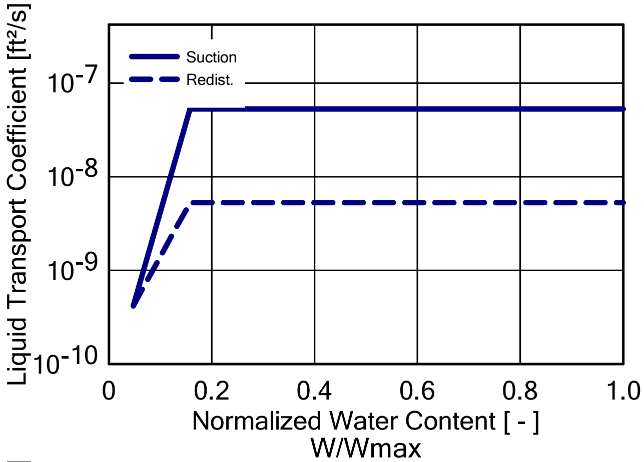
Material: *ECO4 SONOclimat 1.5 in

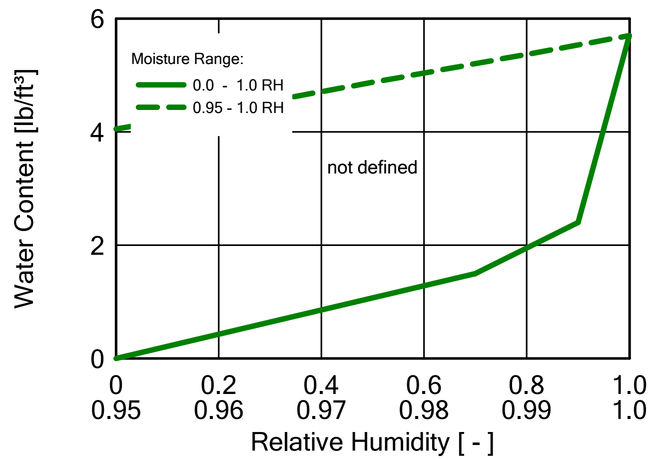
Checking Input Data

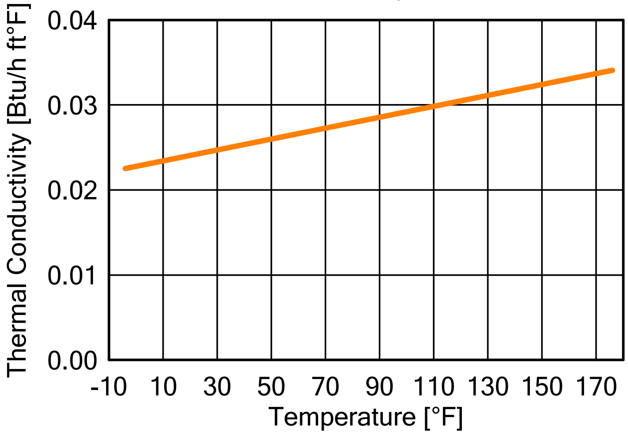
Property	Unit	Value
Bulk density	[lb/ft³]	14,8423
Porosity	[ft³/ft³]	0,95
Specific Heat Capacity, Dry	[Btu/lb°F]	0,449
Thermal Conductivity, Dry, 50°F	[Btu/h ft°F]	0,026
Permeability	[perm in]	22,5175
Reference Water Content	[lb/ft³]	2,8093
Free Water Saturation	[lb/ft³]	9,3642
Water Absorption Coefficient	[lb/in²s^0.5]	0,0000077
Temp-dep. Thermal Cond. Supplement	[Btu/h ft°F²]	0,0000642











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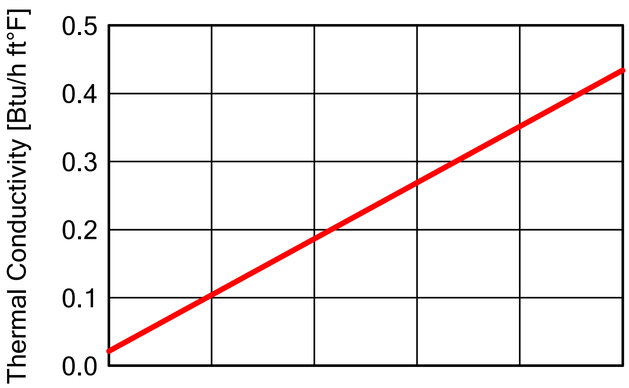
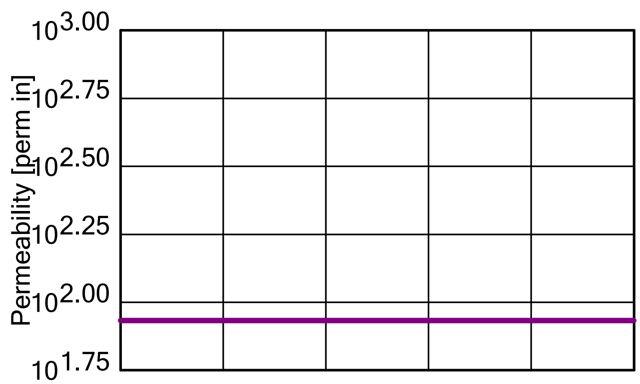
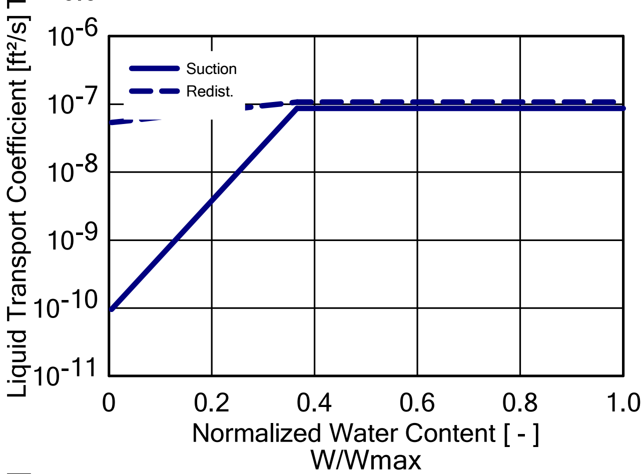
Material: *Chainvre Insulation Board

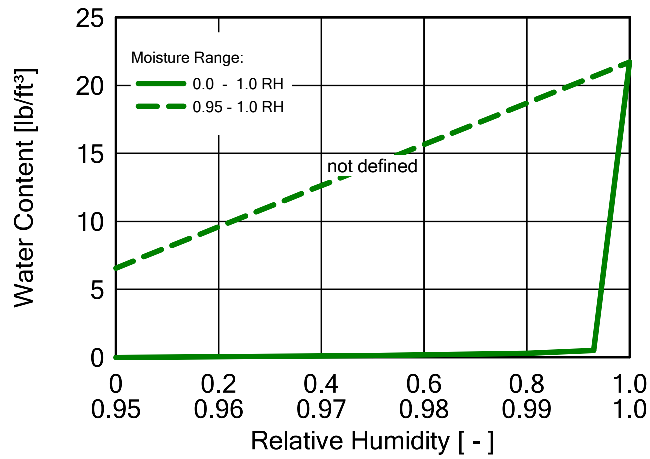
Checking Input Data

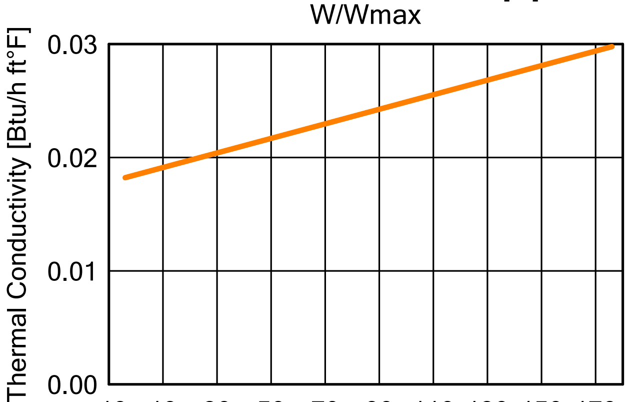
Property	Unit	Value
Bulk density	[lb/ft³]	1,5607
Porosity	[ft³/ft³]	0,95
Specific Heat Capacity, Dry	[Btu/lb°F]	0,406
Thermal Conductivity, Dry, 50°F	[Btu/h ft°F]	0,0217
Permeability	[perm in]	85,8667
Reference Water Content	[lb/ft³]	0,3121
Free Water Saturation	[lb/ft³]	21,7249
Water Absorption Coefficient	[lb/in²s^0.5]	0,0000228
Moisture-dep. Thermal Cond. Supplement	[%/M.-%]	0,5
Temp-dep. Thermal Cond. Supplement	[Btu/h ft°F²]	0,0000642









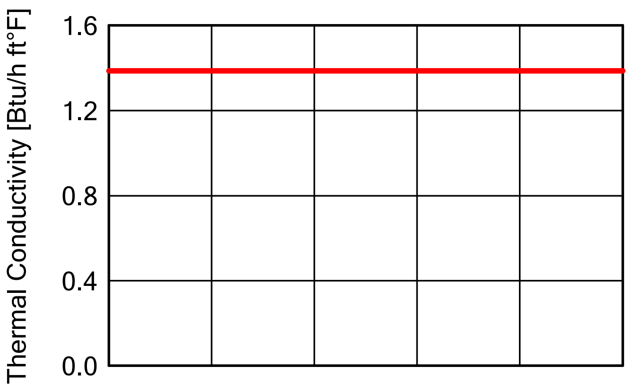


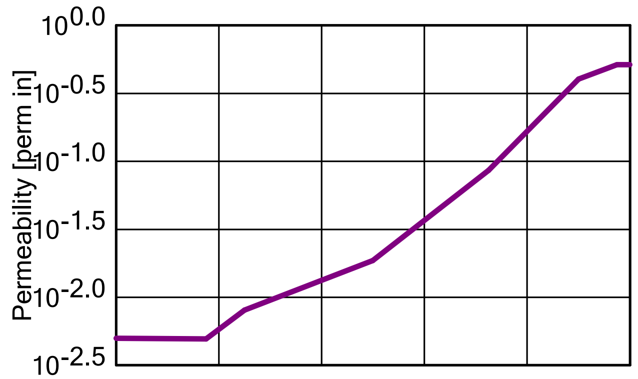
WUFI® Pro 5.3

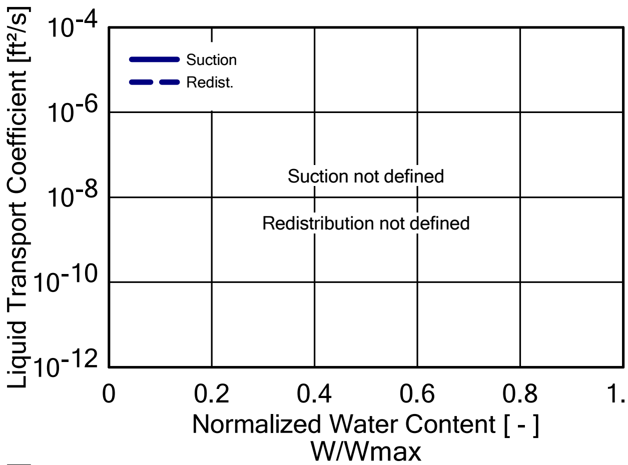
Material: *CLIMACONTROL80

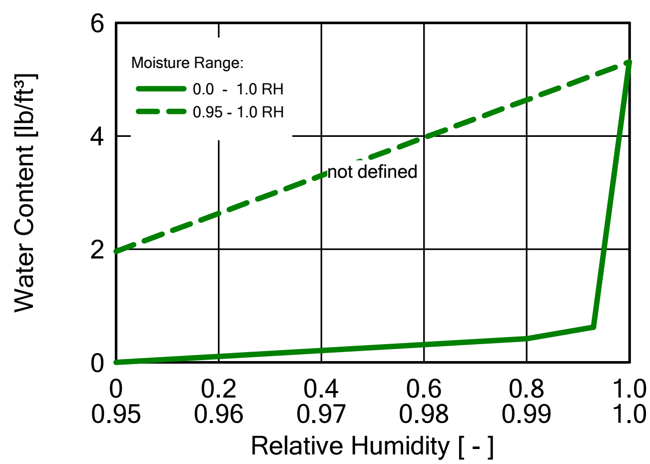
Checking Input Data

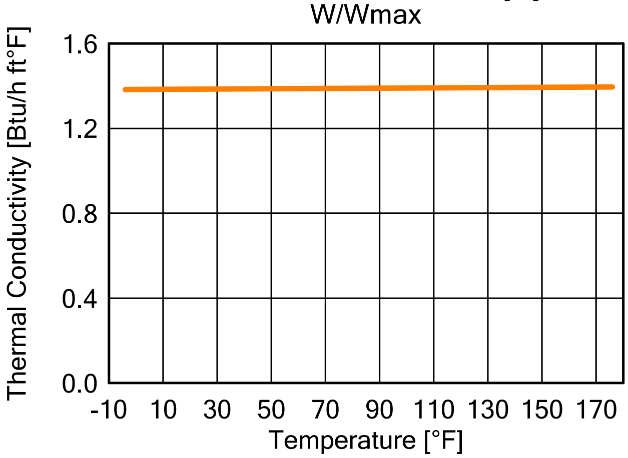
Property	Unit	Value
Bulk density	[lb/ft³]	7,1792
Porosity	[ft³/ft³]	0,086
Specific Heat Capacity, Dry	[Btu/lb°F]	0,5971
Thermal Conductivity, Dry, 50°F	[Btu/h ft°F]	1,3867
Permeability	[perm in]	0,005
Temp-dep. Thermal Cond. Supplement	[Btu/h ft°F²]	0,0000642











Boundary Conditions

Exterior (Left Side)

Location: Quebec; cold year
Orientation / Inclination: North / 40 °

Interior (Right Side)

Indoor Climate: ASHRAE 160P
Heating only; 5,04 °F; 69,98 °F
M.Rate 0,83 lb/h; A.Ch.Rate 0,1 1/h; Vol. 30000,332 ft³
Humidity Ratio Wo -1,0000 lb/lb

Surface Transfer Coefficients

Exterior (Left Side)

Name	Description	Unit	Value
Heat Resistance - includes long-wave radiation	Toiture	[h ft² °F/Btu]	0,297 yes
Permeance	No coating	[perm]	----
Short-Wave Radiation Absorptivity	No absorption/emission	[-]	----
Long-Wave Radiation Emissivity	No absorption/emission	[-]	----
Adhering Fraction of Rain	Depending on inclination o	[-]	1,0
Explicit Radiation Balance			yes
Terrestrial Short-Wave Reflectivity		[-]	0,2
Terrestrial Long-Wave Emissivity		[-]	0,9
Terrestrial Long-Wave Reflectivity		[-]	0,1
Cloud Index		[-]	0,66

Interior (Right Side)

Name	Description	Unit	Value
Heat Resistance	Toiture	[h ft² °F/Btu]	0,7098
Permeance	No coating	[perm]	----

Results from Last Calculation

Status of Calculation

Calculation: Time and Date	14/05/2018 18:00:49
Computing Time	1 min,31 sec.
Begin / End of calculation	01/10/2018 / 01/10/2023
No. of Convergence Failures	0

Check for numerical quality

Integral of fluxes, left side (kl,dl)	[lb/ft²]	0,0 -0,52
Integral of fluxes, right side (kr,dr)	[lb/ft²]	0,0 -0,44
Balance 1	[lb/ft²]	-0,08
Balance 2	[lb/ft²]	-0,08

Water Content [lb/ft²]

	Start	End	Min.	Max.
Total Water Content	0,49	0,42	0,23	0,51

Water Content [lb/ft³]

Layer/Material	Start	End	Min.	Max.
*TRASPIR135 (sd=0,02m)	0,00	0,00	0,00	0,01
*ECO4 SONOclimat 1.5 in	1,95	2,00	1,14	2,16
*Chainvre Insulation Board	0,31	0,21	0,08	0,31
*CLIMACONTROL80	0,42	0,31	0,10	0,42

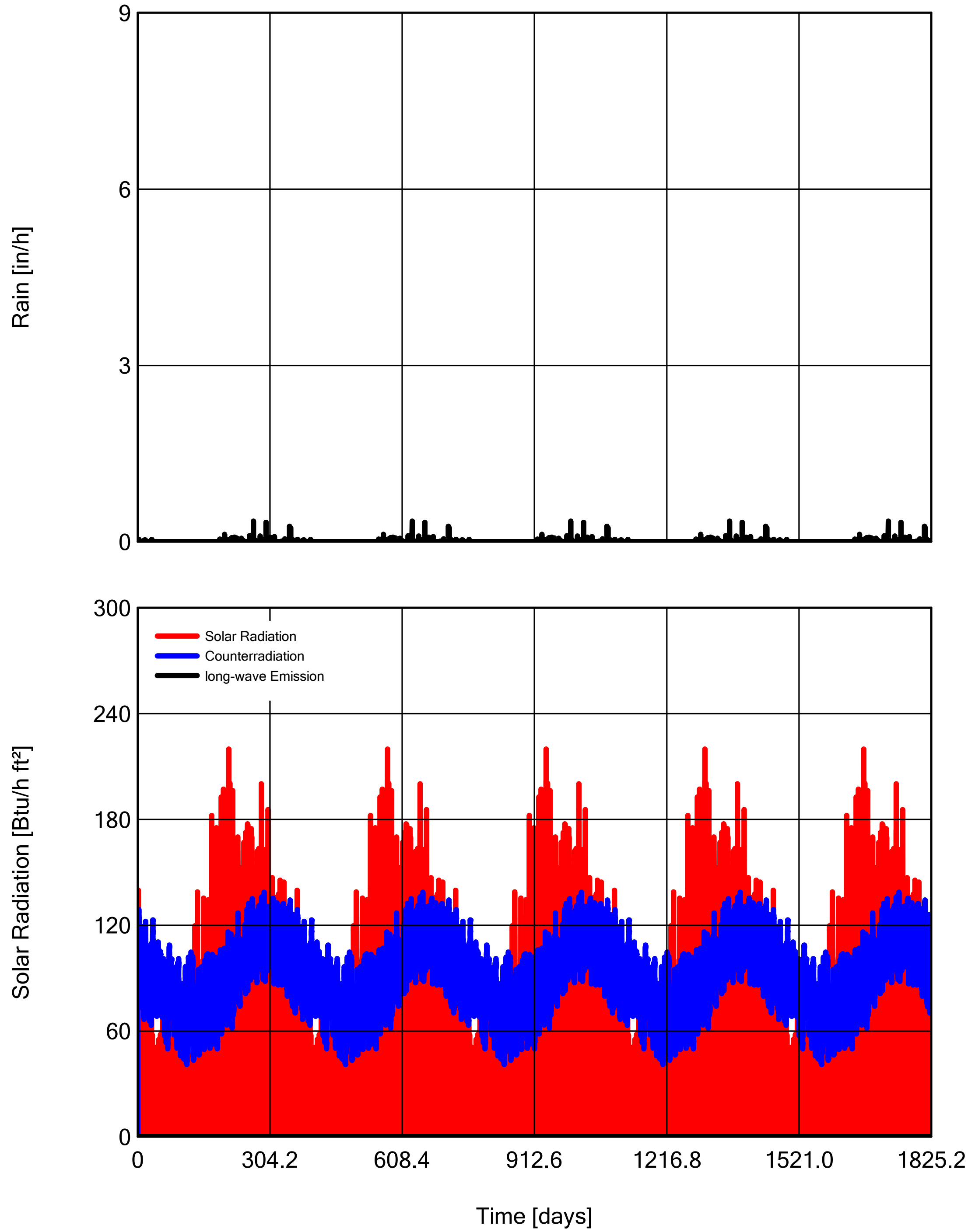
Time Integral of fluxes

Heat Flux, left side	[Btu/ft²]	-34242,79
Heat Flux, right side	[Btu/ft²]	-34228,32
Moisture Fluxes, left side	[lb/ft²]	-0,51
Moisture Fluxes, right side	[lb/ft²]	-0,44

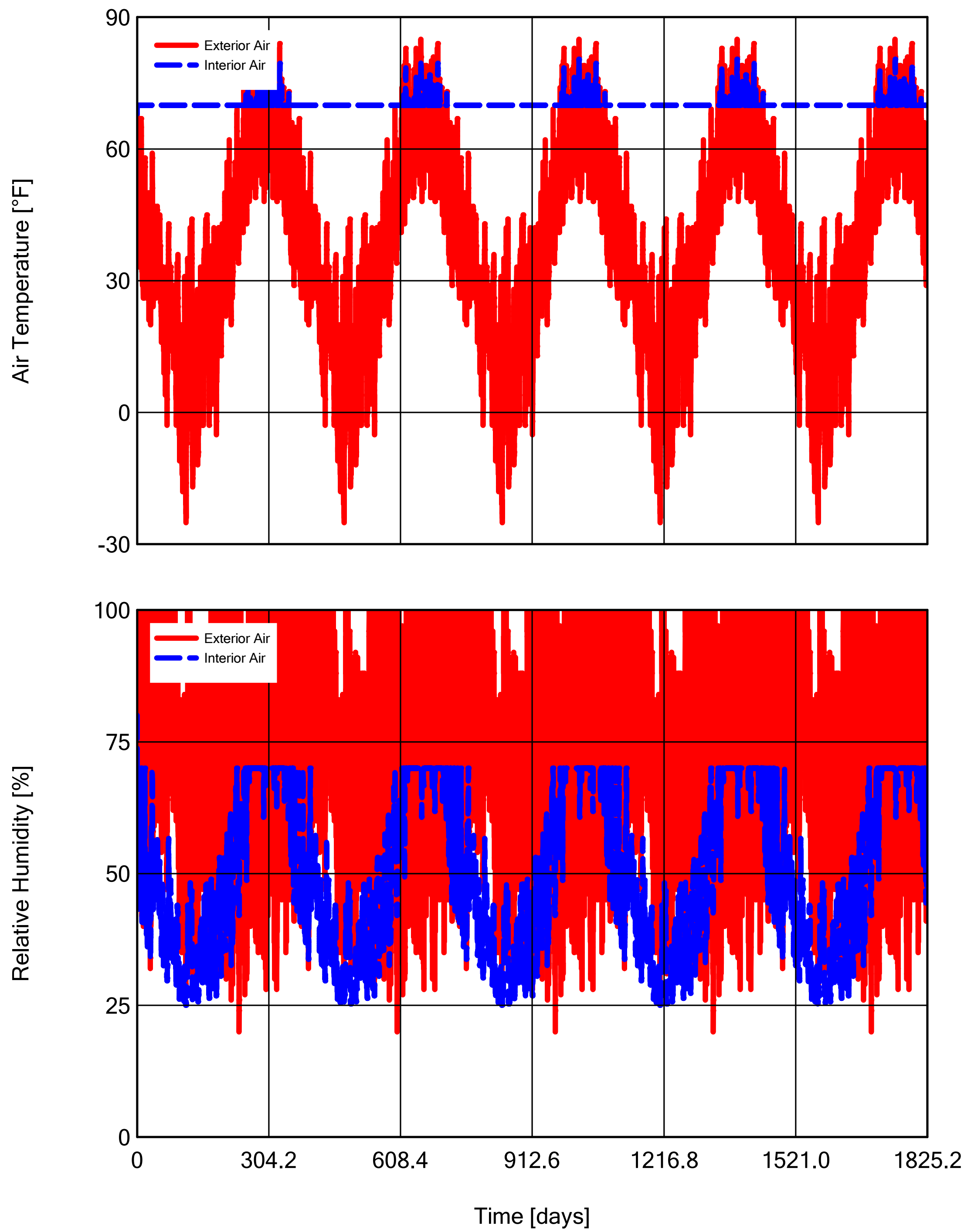
Hygrothermal Sources

Heat Sources	[Btu/ft²]	0,0
Moisture Sources	[lb/ft²]	0,0
Unreleased Moisture Sources (due to cut-off)	[lb/ft²]	0,0

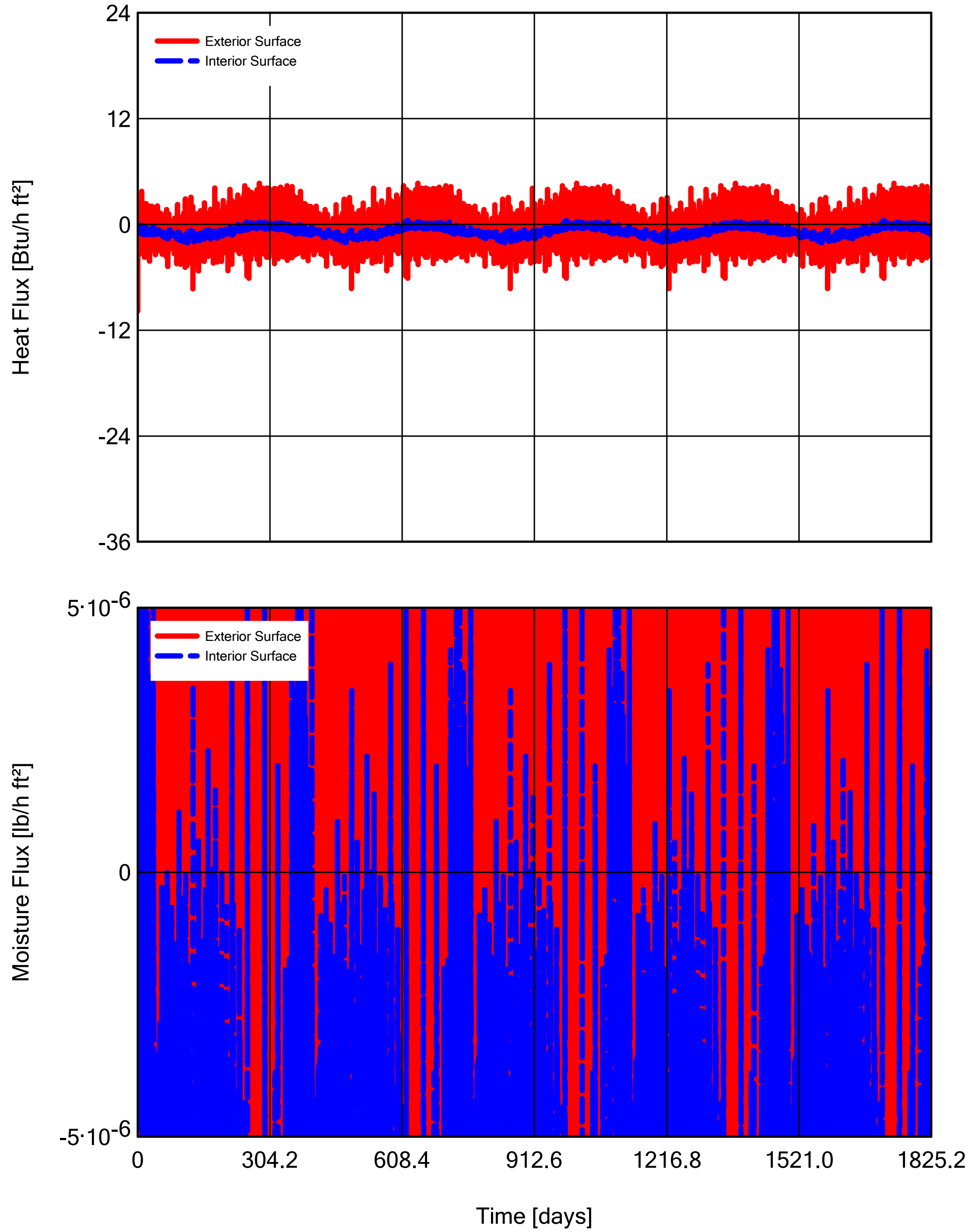
Rain, Radiation (Exterior Climate)



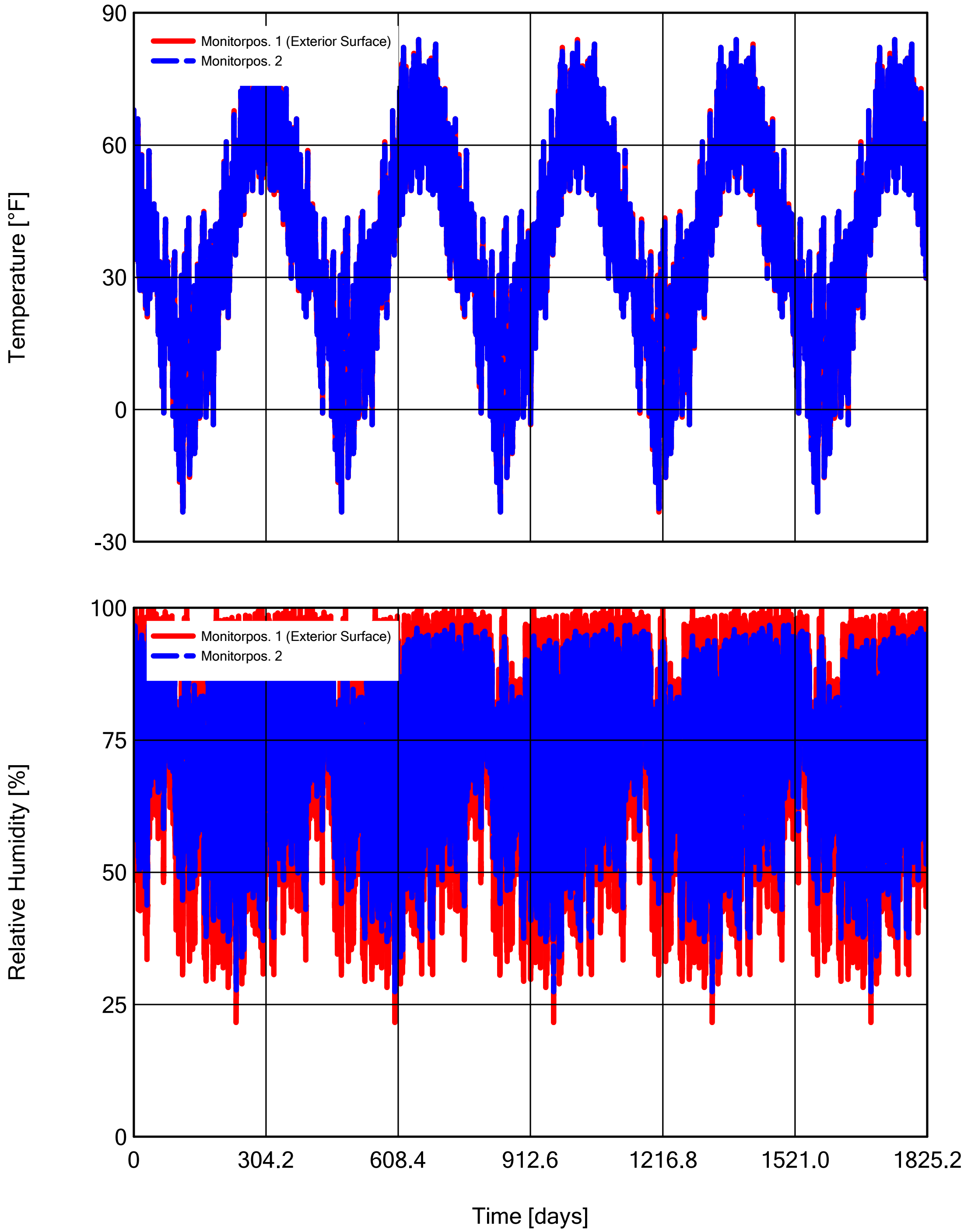
Air Temperature, RH (Exterior, Interior)



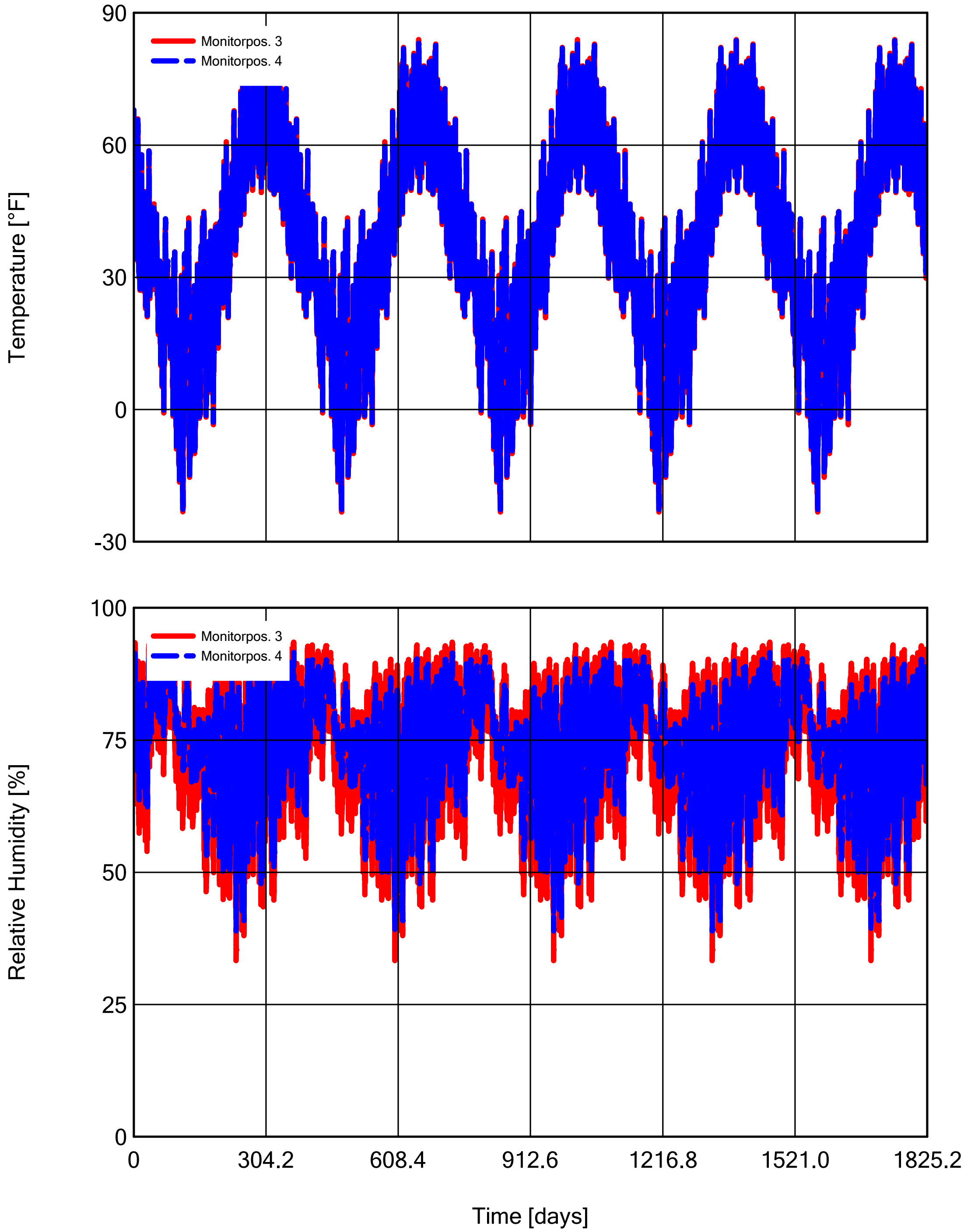
Heat, Moisture Fluxes



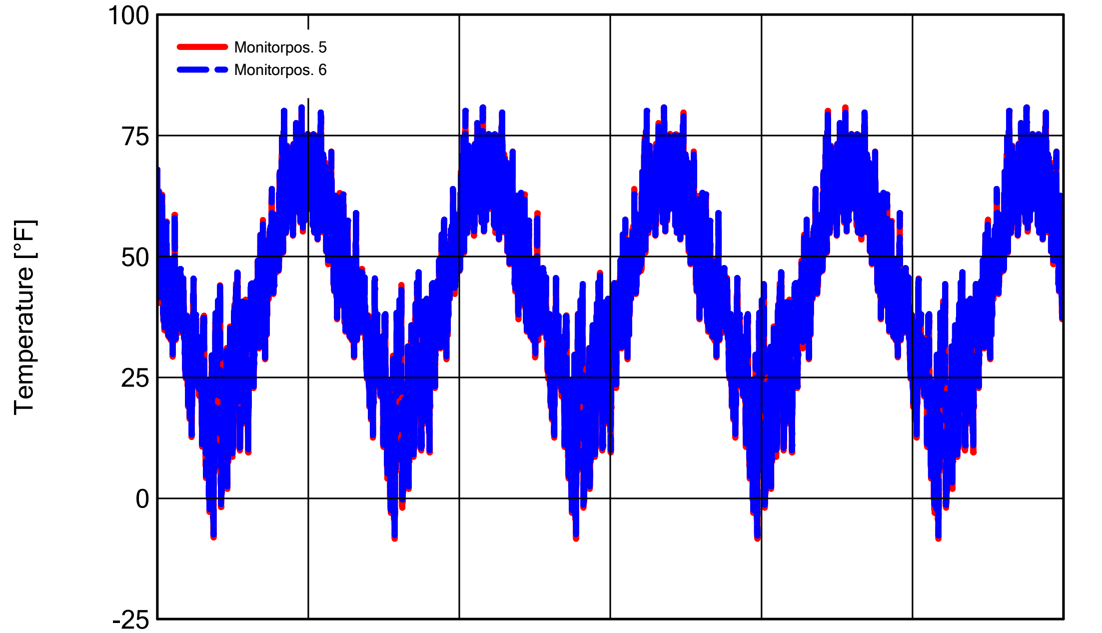
Temperature, RH (Monitor Position1, 2)

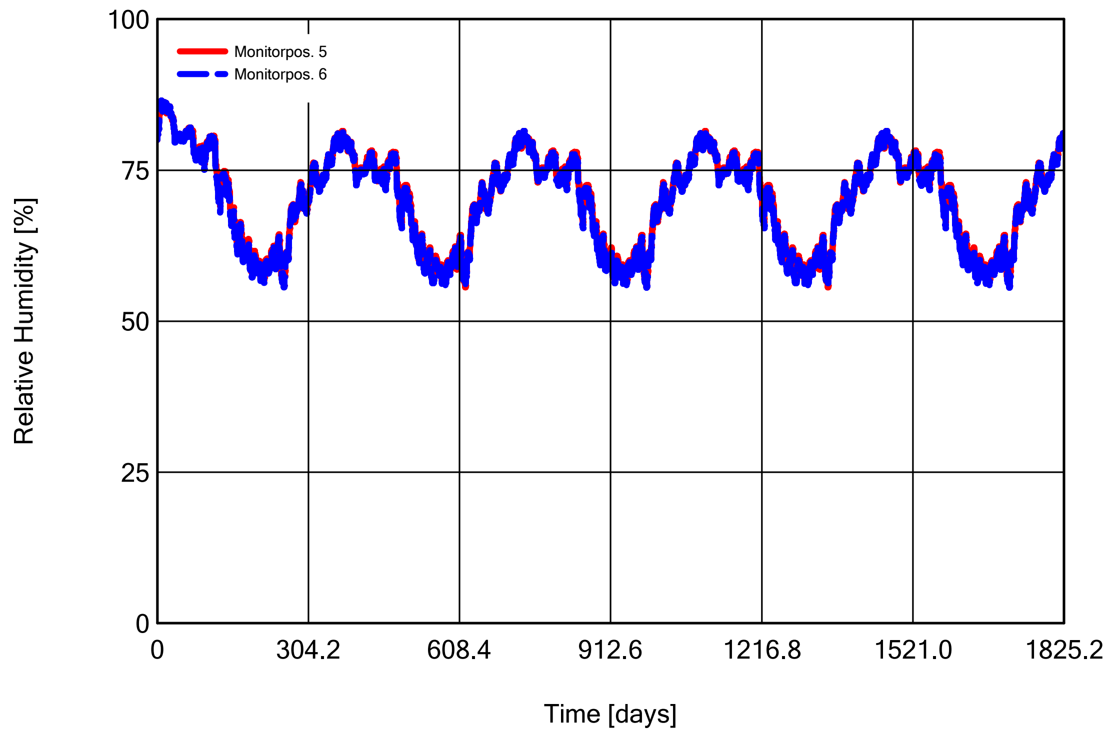


Temperature, RH (Monitor Position3, 4)

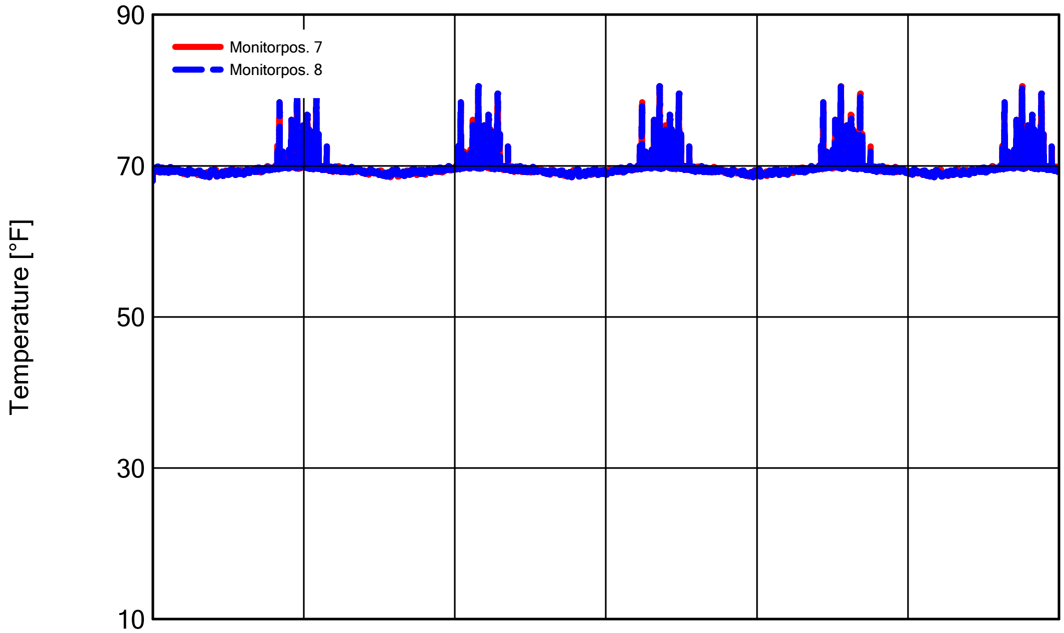


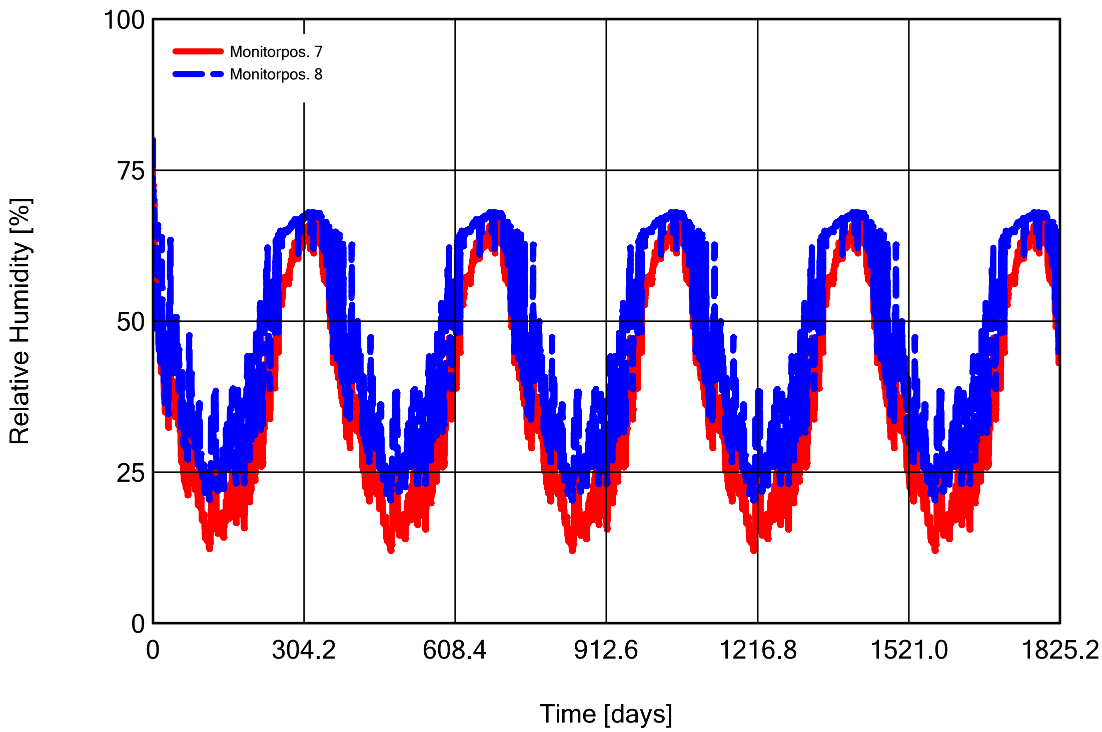
Temperature, RH (Monitor Position5, 6)



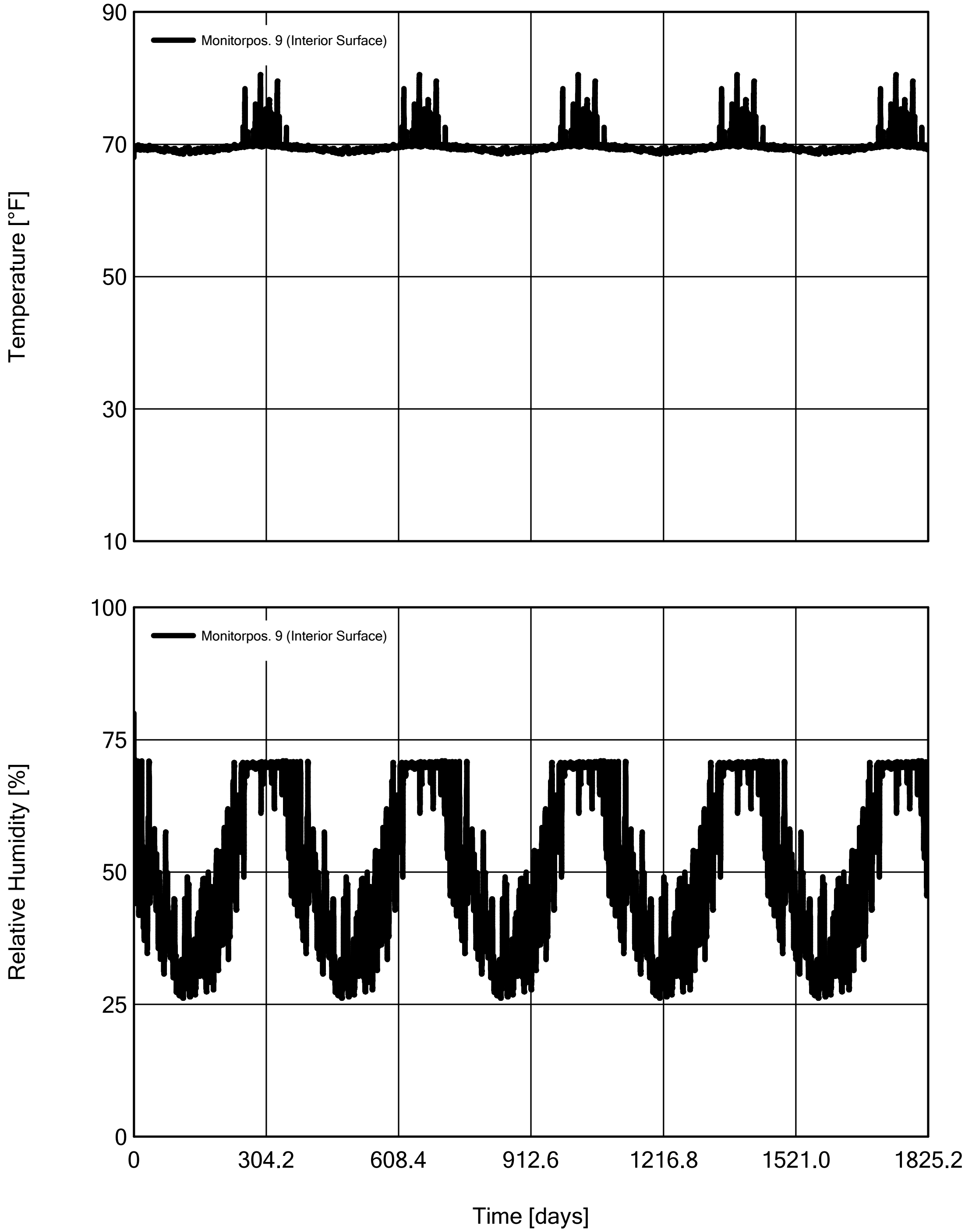


Temperature, RH (Monitor Position7, 8)

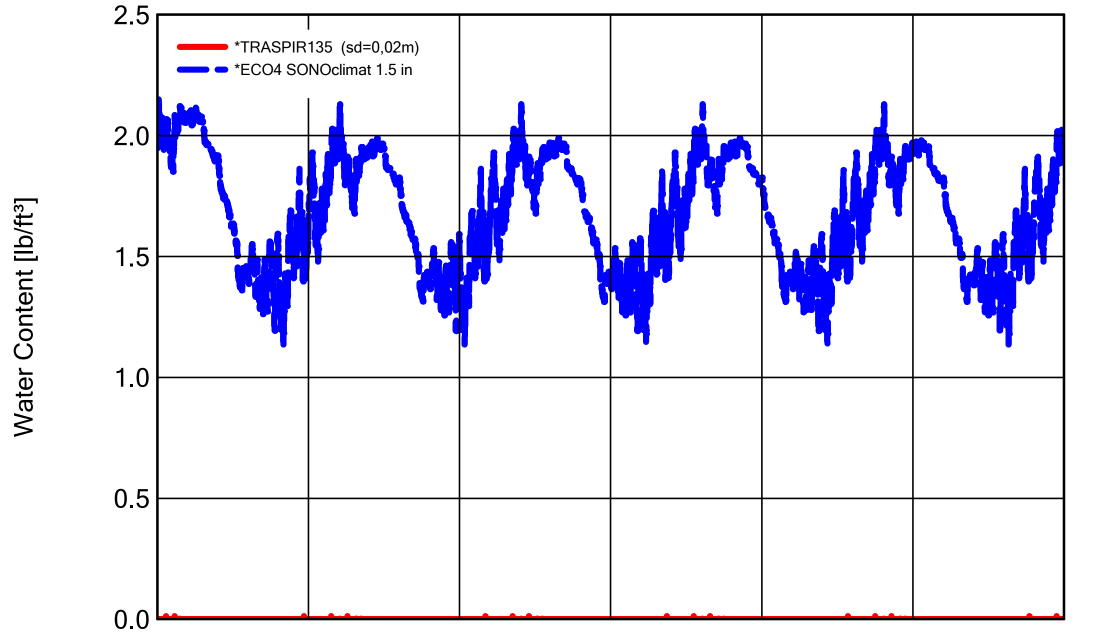


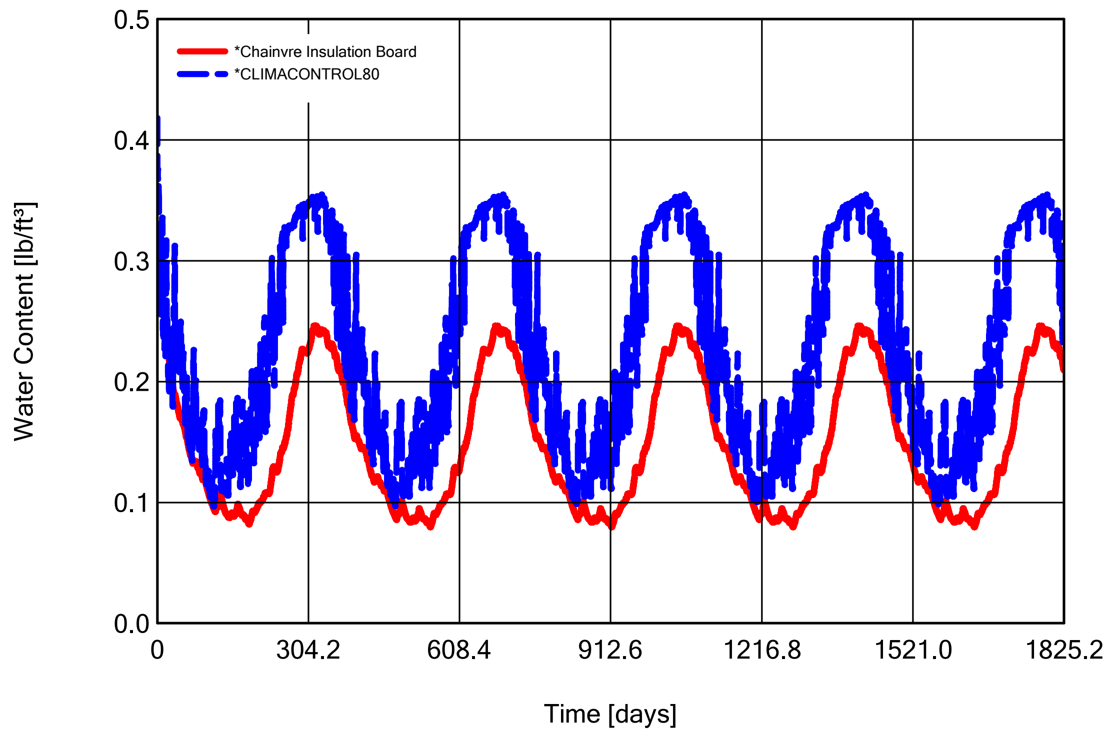


Temperature, RH (Monitor Position9)

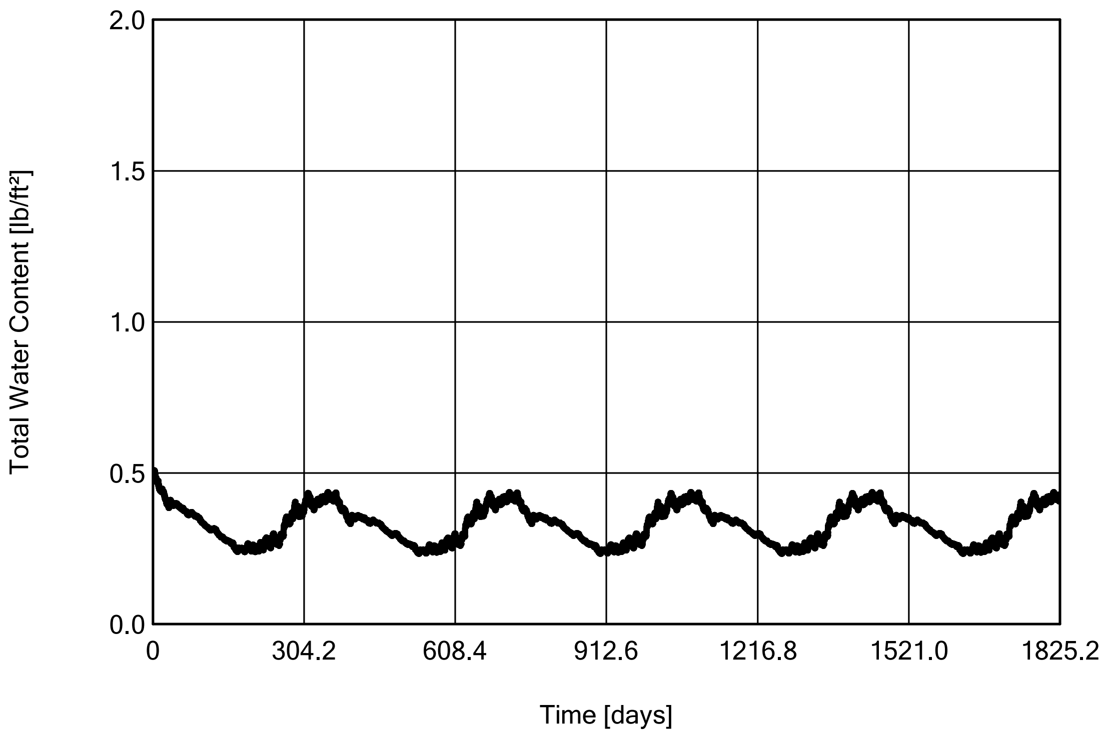


Water Content of Individual Materials

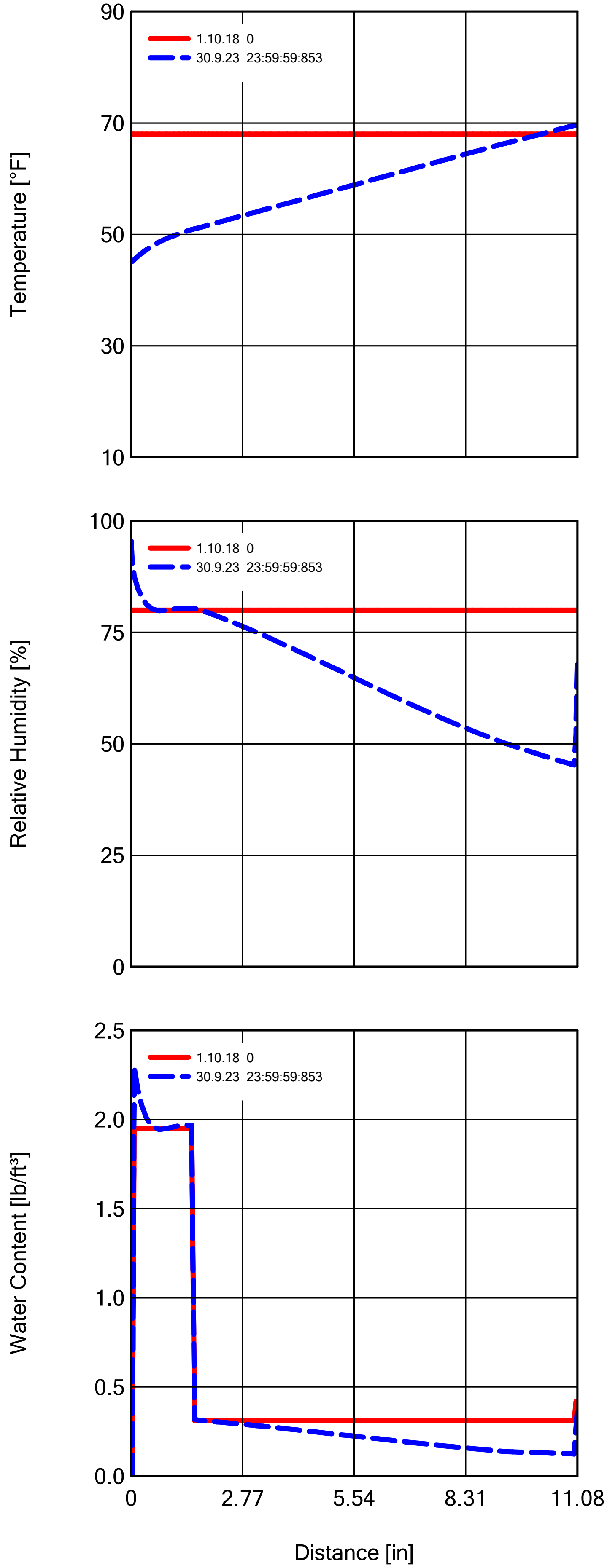




Total Water Content in Construction



Profiles


90
70
50
30
10
Temperature [°F]
1.10.18 0
30.9.23 23:59:59:853
100
75
50
25
0
Relative Humidity [%]
1.10.18 0
30.9.23 23:59:59:853
2.5
2.0
1.5
1.0
0.5
0.0
Water Content [lb/ft³]
1.10.18 0
30.9.23 23:59:59:853
0
2.77
5.54
8.31
11.08
Distance [in]