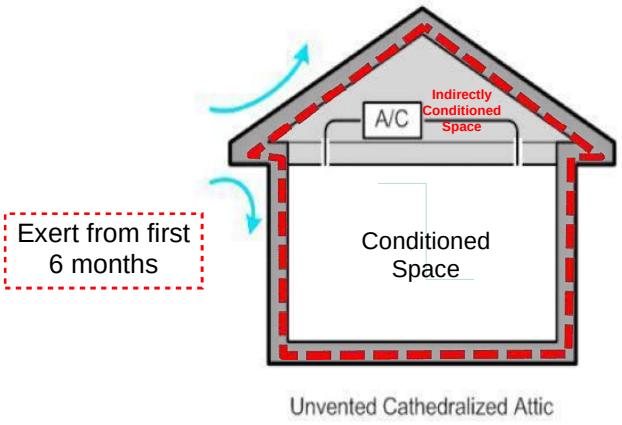
Healthy Homes of Louisiana, LLC
Po Box 3127
West Monroe, La. 71294

Monitoring the temperature and relative humidity in both the living space and the attic in three foam insulated homes for a full year.



Unvented Cathedralized Attic

What should we expect?

Doesn't it make sense that the "conditioned space" (or living space) would be cooler and dryer than the "indirectly conditioned space" (the attic) during the summer months when the ac is in operation?

Properly sized AC and ***controlled ventilation***

Case Study 3 – Commissioned

Monroe, La.
1,128 sq ft – 4 occupants
9,588 cb ft
3Br 2 Bth

<u>Foam Insulated</u> w/controlled ventilation

1) 5" Flex FAV into the HVAC return air cavity
2) a recirculation mode on thermostat
3) 25cfm of continuous ventilation in one bathroom

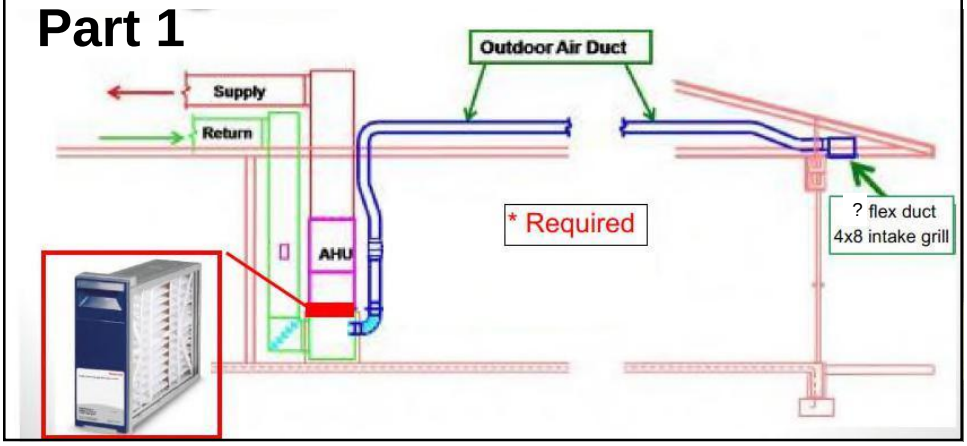
Building Tightness 0.92 ACH_{50}
Duct tightness 76cfm / 7%
Air flow balanced and certified
Manual J 1.3 tons
AC Installed 2.0 ton

**** Stove hood not vented to outside!**

So what is
"controlled ventilation" ?

Consist of two parts

Part 1



Part 2

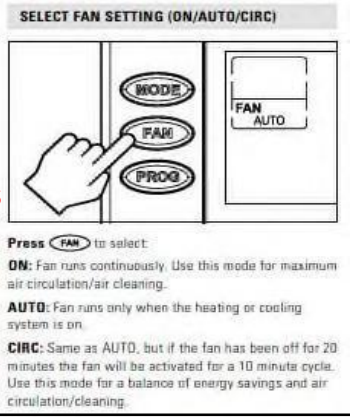
Exhaust Ventilation

Continuous

Intermittent
or
Controlled

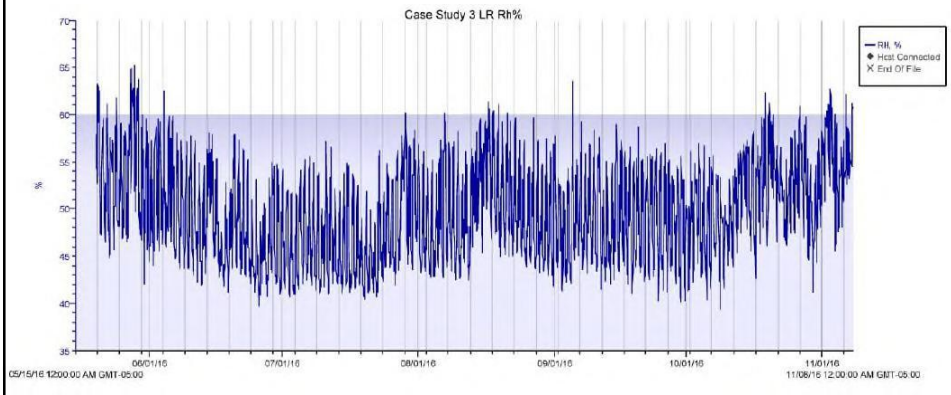
And/or

Thermostat fan controls



* I specify both in every foam house I design in the hot humid climate.

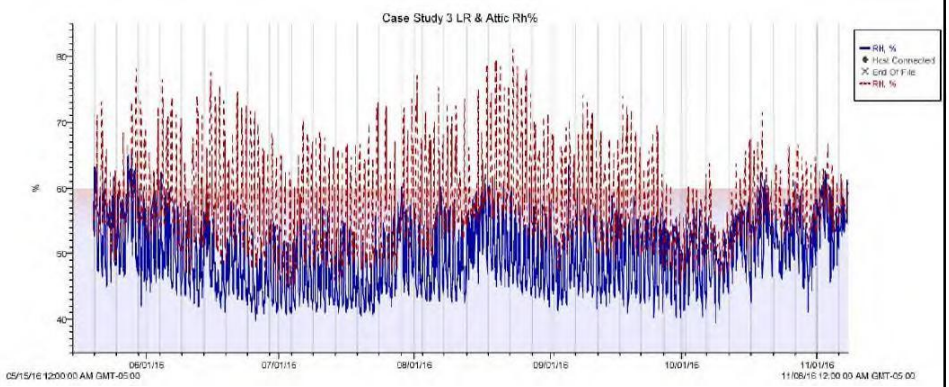
Case Study 3 – Commissioned
Proper AC size and controlled ventilation
Livingroom Rh%
From May thru November 8st



Averaged 50%Rh High 65%Rh Low 39%Rh

Just can't get any better than this!

Case Study 3 – Commissioned
Proper AC size and controlled ventilation
And how did this affect the foam attic?
Rh%
May thru November 8th

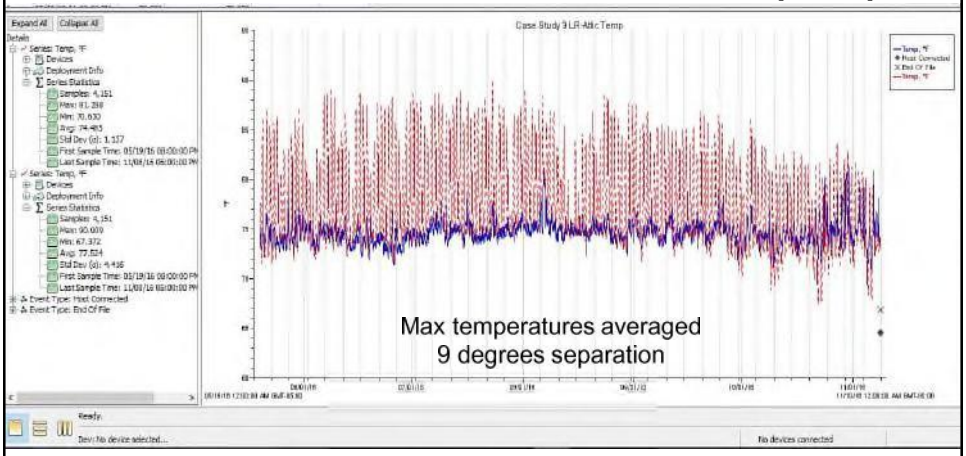


	LR	Attic
Average	50%	56%
High	65%	81%
Low	39%	44%

And as expected, the "indirectly conditioned space " (or attic) is only slightly higher than the living space below. **Lesson learned? Properly control the environment below and the attic will take care of itself!

Case Study 3 – Commissioned
Proper AC size and controlled ventilation
Livingroom – Attic
Temp Comparison
May thru November 2016

Typical thermostat setting
Day – 76degrees
Night - 72 degrees



Case Study 3
Monroe, La.
11 month energy usage before and after

Month	2015	2016		
Jan	1485	1358		
Feb	1639	1704		
Mar	1855	1276		
Apr	939	947		
May	956	921		
June	983	1264		
July	1659	1336		
Aug	1633	1204		
Sept	1155	1142		
Oct	1134	1302		
Nov	913	1110		
Dec				
Total	14,351	13,564	<787kw>	

Even after adding
1) the continuous exhaust fan,
2) 5" FAV to air return and
3) recirculation mode on HVAC fan,

we still used less electricity than the 11 month period prior to repairs being completed.

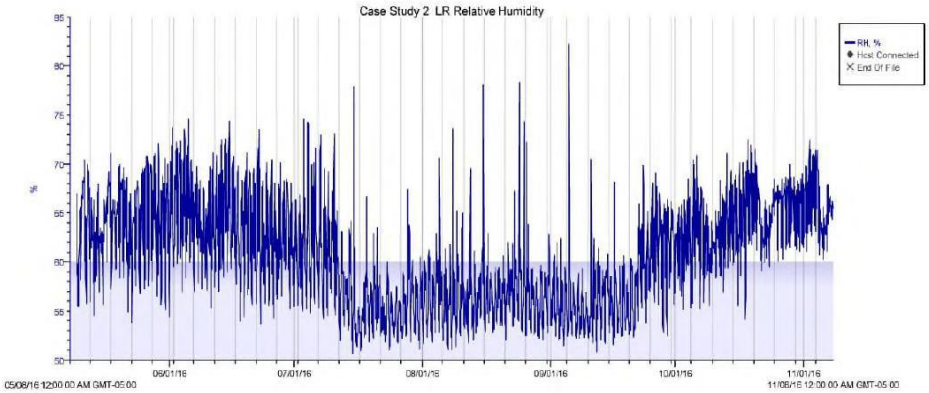
Case Study 2 – No controlled ventilation

Ok….
We got the ac right but missing the "controlled ventilation"

West Monroe, La.
2,889 sq ft – 4 occupants
28,893 cb ft
3Br 3Bth
Foam Insulated **5" Flex FAV to air return**
Building Tightness 1.96 ACH_{50}
Duct tightness 62cfm / 2%
Air flow balanced and certified
Manual J **2.6 tons**
AC Installed **3.0 ton**

Case Study 2 – No controlled ventilation

Livingroom Rh%
From May thru November 8th



Averaged 60%Rh High 80%Rh Low 50%Rh

* Homeowner turned thermostat to 80 during day and 72 at night

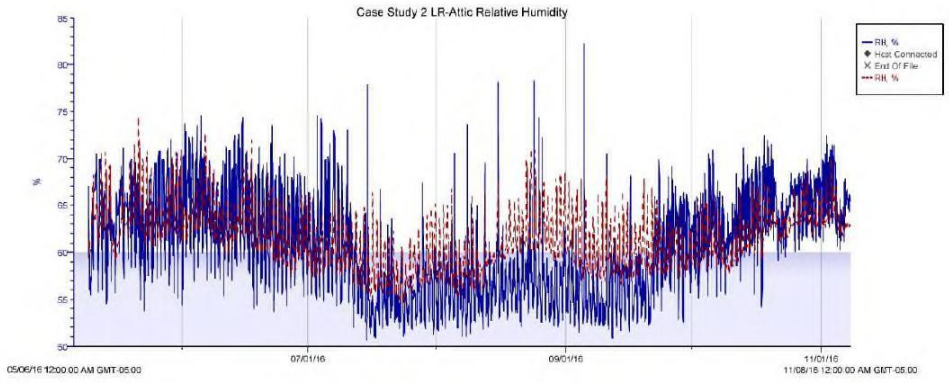
You can see the difference in the indoor Rh% during the "shoulder seasons" when the ac in not operating under a load. Without the recirculation mode on the thermostat, if the ac nor the heat is operating, then we have no fresh air ventilation. The proper thermostat was added shortly after downloading this data. We will post the results in May 2017.... Maybe sooner. I just can't keep a secret!

Case Study 2 – No controlled ventilation

And how did this affect the foam attic?

Rh%

May thru November 8th



LR		Attic	
Average	60%	Average	61%
High	80%	High	74%
Low	50%	Low	54%

To reiterate... when the ac in under it's load, then we are controlling the living space and the attic follows. However, during the shoulder season when the indoor Rh% increase, the attic equalizes with the living space so... where is the attic humidity coming from? I would contend, the living space !!

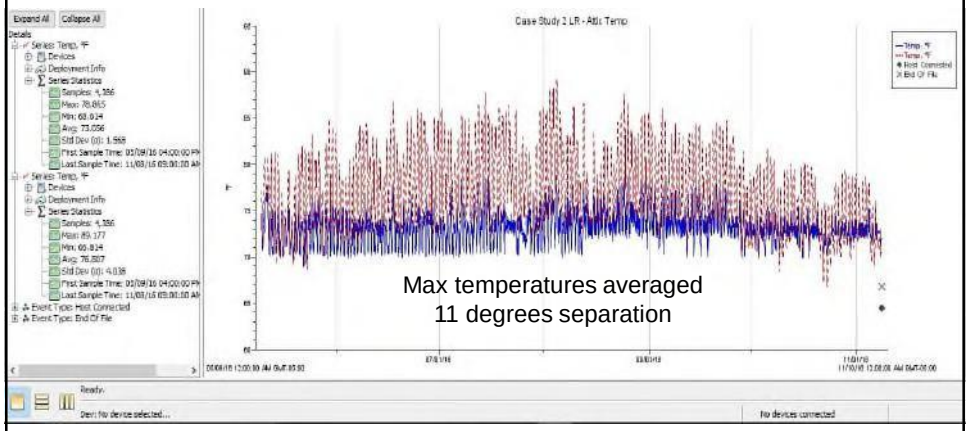
Case Study 2 – No controlled ventilation

Livingroom – Attic

Temp Comparison

May thru November 2016

Typical thermostat setting
Day – 75degrees
Night - 70 degrees



Max temperatures averaged
11 degrees separation

Case Study 1 – Oversized Ac and NO fav

Just how bad can it get?

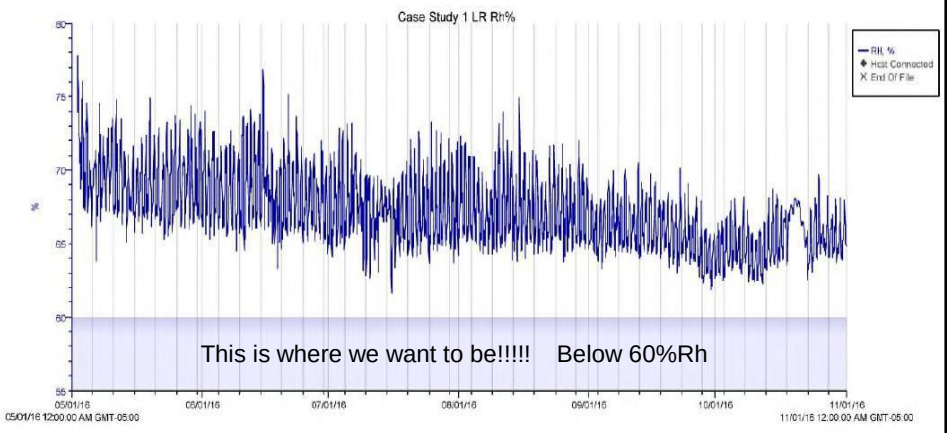
West Monroe, La.
1,862 sq ft – 2 occupants
19,662 cb ft
3 Br 2 Bth

Foam Insulated	**No FAV**
Building Tightness	0.82 ACH_{50}
Duct tightness	167cfm / 9%
Unbalanced air flow	
Manual J	2.5 tons
AC Installed	**4.0 ton !!!!**

***Stove not vented to outside**
***Bath exhaust vents not working properly**

Case Study 1 – Oversized AC and NO fav

Livingroom Rh%
From May 1st thru November 1st

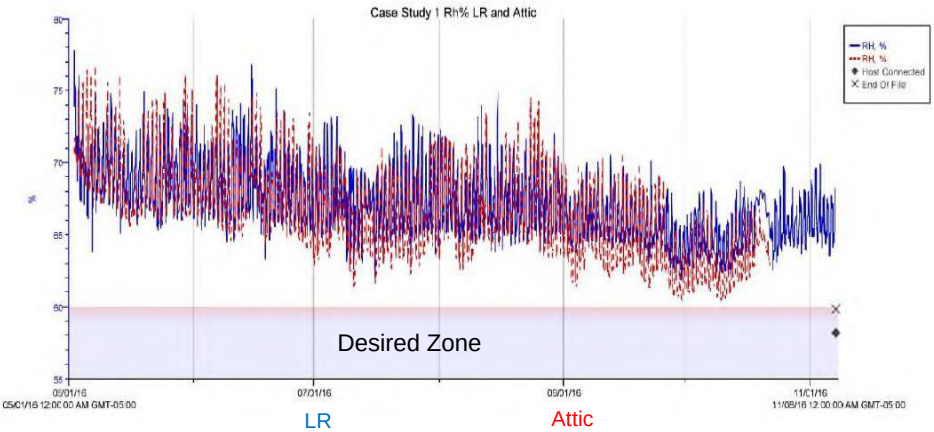


Averaged 67%Rh High 78%Rh Low 62%Rh

This is definitely not what we want! We were finally allowed to add the continuous ventilation, stat with recirculation mode and the ac unit is to be downsized to meet the load as required.... stay tuned!

Case Study 1 – Oversized AC and NO fav

And how did this affect the foam attic?
Rh% in both LR and Attic
May thru November 8th



LR		Attic	
Average	67%	Average	67%
High	78%	High	77%
Low	62%	Low	60%

Again, the attic equalizes with the living space below when it's not being managed properly. So, the living space is feeding the attic, the attic is not feeding the living space.

Case Study 1 – Oversized AC and NO fav

Livingroom – Attic
Temp Comparison
May thru November 2016

Typical thermostat setting
Day – 72 degrees
Night - 67 degrees