

Spray Foam Insulation... Is it Worth the Investment?

I'm often asked, "is spray foam really worth the investment?". Well the correct answer is that every building is different and in order to know for sure, the calculations have to be done. Is spray foam insulation the "best", yes it usually is but sometimes the return on investment may not fit the home owner's desires. To know for sure, you have to do the required Manual J load calculation that was enacted in the Louisiana Energy Code as of January 1st, 2015.

However, to most people all the numbers can be confusing. As a society we would rather see the result in a manner that we can relate to. This is why a local builder, A/C contractor and insulation company worked together to create a "real world" comparison.

They built two homes almost identical in every way. Meaning the two homes were the same floor plan, same windows, facing the same direction but with one difference. House #1 was a conventionally ventilated attic with R30 ceiling insulation while House #2 was built with a spray foam insulated roof creating an encapsulated (unvented) attic.

First you should know, why is spray foam insulation better? Many people think its because it makes the building more **air tight**, which it does... but that's not the biggest benefit. Many think that spray foam has a **better R value**, which it sometimes does... but not always. Open cell foam has a typical R value of R3.5- to-R3.7 per inch while some loose fill insulations can exceed R4 per inch.

The real energy savings comes from the fact that we have relocated the air duct

system from a really hot/cold ventilated attic (Figure 1), to now being inside the thermal boundary of the home (Figure 2). So, now the air duct system is located in an attic that is typically less than 10 degrees different than the living area temperatures. Notice that the "Ducts" went from being the largest heat gain in the building, to one of the least.

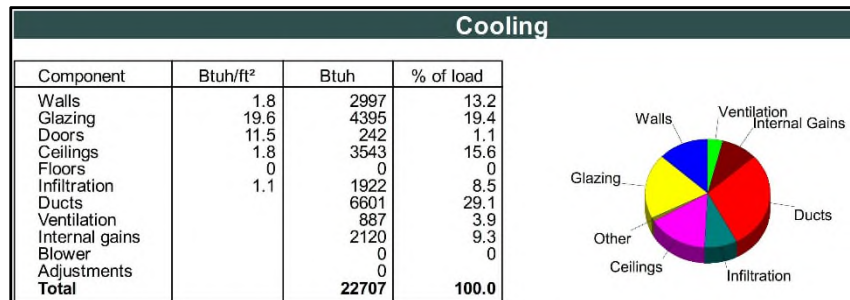


Figure 1 Ventilated attic

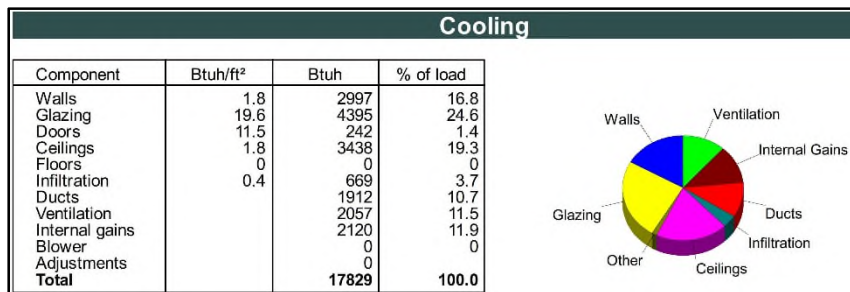


Figure 2 Spray Foam Attic

The Results

So fast forward to a full year later. We pulled the 12-month history of both homes and compared the light bills for these two 1,930 square foot, total electric homes.

Understanding that in 2016-2017 north Louisiana experienced a very mild winter, the summer months experienced the greatest amount of energy savings.

Over the 12-month period, the foam insulated home had used \$416.19 less energy than the conventional insulated home.

Then we did a little math. The additional cost involved for upgrading to the spray foam insulation was \$4,273.00. However, there was some upfront cost savings associated with using the foam. Because of the lowered heat gain, a smaller A/C unit was installed resulting in initial cost savings of \$673.00.

Month	Vented R30 Conventional	Foam House	kw	\$
Oct 16	1528 / \$140.25	1209 / \$110.97	-319	-\$29.28
Nov 16	1063 / \$92.90	719 / \$65.41	-344	-27.49
Dec 16	1112 / \$98.91	900 / \$82.31	-212	-16.60
Jan 17	2245 / \$96.30	2153 / \$92.52	-92	-3.78
Feb 17	1791 / \$151.62	1626 / \$138.72	-165	-12.9
March 17	1488 / \$131.05	1246 / \$111.62	-242	-19.43
April 17	1043 / \$90.10	982 / \$85.52	-61	-4.58
May 17	1089 / \$100.85	474 / \$43.90	-615	-56.95
June 17	1120 / \$111.73	598 / \$59.66	-522	-52.07
July 17	1604 / \$161.51	1140 / \$114.77	-464	-46.74
August 17	1685 / \$161.97	1123 / \$107.95	-562	-54.02
Sept 17	1906 / \$184.29	951 / \$91.94	-955	-92.35
Total	17,674	13,121	-4,553kw	-\$416.19

The net upcharge for the foam was \$3,600.00 divided by a yearly energy savings of \$416.19. This equals to a simplistic Return On Investment (ROI) of approximately 8.6 years.

A few disclaimers must be noted. First of all, even though all of the performance factors in the two homes were tested and commissioned, the one factor that could not be controlled was the occupant's behavior. Meaning, it's not known how the occupants preferred to operate the thermostat settings.

Secondly it must also be noted that typical energy savings are proportional to the size of the home. This suggest that a smaller home would experience lower saving, so it could also be assumed that the larger the home, the greater the potential savings. Again, noting that occupant's behavior can potentially change the outcome.

Finally, in these two homes everything was commissioned to be sized and functioning properly. If you do it right, it works but if you do it wrong... don't expect good results. This is where a licensed building contractor, a reputable A/C contractor and a professional insulation company are well worth the investment.

After all of the politically correct mumbo-jumbo and disclaimers... foam is still better for all the reasons previously stated. In fact, foam insulation is an over-achiever which will consistently outperform it's stated R value. There can be residual benefits to the foam attic as well such making the attic space more usable for storage.

I often tell my clients that my job is to educate them, so that they can make an educated decision. The question now is... is it the best option for you?

Healthy Homes of Louisiana, LLC

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