Auto-Sealing New Home Leaks with Aerosols

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ABSTRACT

Residential tightness requirements have become more stringent in recent years, requiring builders to develop new strategies for addressing air leakage in their homes. This paper describes the results of a Building America project focused on integrating a new technology for automating the building envelope sealing process in new homes. The newly commercialized AeroBarrier technology uses an aerosol-based method to simultaneously measure, locate, and seal leaks in a building remotely.

This project is providing the research needed to successfully integrate aerosol envelope sealing into the home building process. The project team is working directly with builders in California and Minnesota to identify the best stages for incorporating aerosol sealing, from the perspectives of cost, performance, and seamless integration into the construction process. The cost of the aerosol sealing and resulting house tightness are compared to similar group of houses using conventional sealing methods. In addition to producing tighter houses, some conventional sealing methods can be eliminated or reduced to further improve cost effectiveness.

During the first round of installations on nine homes the average tightness achieved was 0.96 ACH50 (before drywall was installed in the homes) compared to an average tightness of 3.69 ACH50 for homes at the same stage of construction but not treated with AeroBarrier. Also, for performance attics in California the aerosol sealing approach sealed homes 56% tighter than open-cell spray foam, providing the builder with the flexibility to apply a lower cost insulation strategy.

Introduction

In many parts of the country house envelopes are notoriously leaky with unintended air infiltration that results in additional space heating and cooling equipment loads. While voluntary codes and standards for envelope tightness have existed for decades, only recently have these codes become a requirement. Current manual methods for sealing house leaks, even when diligently applied, can fall short of the ultimate tightness goal due to unrecognized leakage pathways.

The aerosol envelope sealing technology developed by the Western Cooling Efficiency Center (WCEC) at UC Davis uses an automated approach to produce extremely tight envelopes. The process involves pressurizing the building for an hour or two while applying an aerosol sealant “fog” to the building interior (see Figure 1). As air escapes the building through leaks in the envelope, the sealant particles are carried to the leaks where they impact and stick, sealing the leaks. All openings that are not intended to be sealed are blocked with tape or plastic (e.g. exhaust ducts, door seams, and open plumbing connections). Depending on the condition of the building during application, horizontal surfaces such as floors and countertops may need to be covered with plastic to protect them from sealant that settles during the process. There is usually no noticeable deposition on vertical surfaces or on the underside of horizontal surfaces. A standard blower door fan is used to pressurize the house, and also provides real-time feedback.
and a permanent record of the sealing that occurred. The technology is, therefore, capable of simultaneously measuring, locating, and sealing leaks in a house.

![Diagram showing the progression of the sealing process](image1.png)

Figure 1. The images in this schematic diagram show the progression of the sealing process from the start (left) to the end (right).

At the start of the project, this AeroBarrier technology was just beginning to be commercialized. The current version of the sealing equipment used for the single-family homes in this project is shown in Figure 2. The goal of this on-going project is to provide builders with guidelines to successfully integrate aerosol envelope sealing into the home building process. The project team is working directly with builders to identify the best stages for incorporating aerosol sealing, from the perspectives of cost, performance, and seamless integration into the construction process. The cost of the aerosol sealing and resulting house tightness will be documented and compared to a similar group of houses using conventional sealing methods. In addition to producing tighter houses, conventional sealing methods will be evaluated to determine if they can be eliminated or reduced to further improve cost effectiveness. A step-wise, iterative process is being used with four builders in Minnesota and California so that lessons learned from the first houses can be applied to later ones.

![Equipment images](image2.png)

Figure 2. AeroBarrier sealing equipment.
Background

Current state-of-the-art methods for envelope air sealing are all manual, relying on contractor personnel to visually identify and manually seal leaks individually. The achieved air-tightness levels can be highly variable, and are based on the time allotted and the vigilance and experience of the individual contractor that performs the work. In addition, it is common for air-tightness verification to be performed by a different contractor after the sealing and most, or all, of the construction is complete. This provides limited opportunity for feedback on the effectiveness of the air sealing, making it difficult for the sealing contractor to ensure that a specific level of tightness has been achieved. If the house tightness is greater than acceptable, additional sealing at later stages of construction is more expensive and may not be possible or effective.

Development of Aerosol Envelope Sealing Method

Aerosol sealing has been used successfully for residential duct sealing for 15 years, where it has been shown to seal duct leaks with a width of up to 5/8.” A similar technology has been developed for sealing leaks in the walls, ceiling, etc. of buildings. Initial proof-of-concept testing of the aerosol envelope sealing process showed excellent results, sealing 40 in² of leakage in a small scale enclosure in less than 10 minutes (Harrington and Modera 2012). The proof-of-concept testing also showed that higher building pressure and higher sealant injection rates led to more sealant deposited in and around leaks.

Subsequent field demonstration projects showed the viability of the technology in larger spaces and practical application in real buildings. A number of demonstrations in single-family new construction homes showed the ability to seal 60% to 85% of available building leakage in less than two hours of sealant injection (Harrington and Springer 2015). The homes ranged in size from 600 ft² to 3,000 ft² with the estimated cost for installation well under $0.50 per square foot. The time required for setup, sealing, and cleanup was closely tracked for installations in large new single-family homes, and it was determined that each installation required an average of 11 person-hours to complete. It is reasonable to assume that with experienced personnel and commercialized equipment, the time required could be reduced to two contractors over four hours.

A demonstration sealing project of four multifamily new construction units showed that the process was capable of sealing at least 80% of the air leaks in less than two hours (Maxwell, Burger, and Harrington 2015). Sound transmission tests on three units showed little change in attenuation after sealing for low frequencies, but the attenuation was typically 4 to 12 dB for frequencies above 500 Hz. This shows another benefit of reduced inter-unit air leakage – reduced noise transmission that produces improved occupant comfort.

Aerosol Envelope Sealing Benefits

The primary benefit of aerosol envelope sealing is to achieve a tighter house envelope. Some builders are motivated by new or more stringent energy code and housing program tightness requirements that they aren’t meeting with their current practices. For example, results from Maryland compliance measurements show that 52% of the houses did not meet the 3
ACH50 energy code tightness requirement (see Figure 3\(^1\)). These results indicate that mainstream contractors are often unable to seal houses to a required tightness level of 3 ACH50. The results from other states show a higher level of compliance. However, the tightness criteria for those states ranges from 5 to 7 ACH50, and a high fraction of the houses that were evaluated had a leakage of greater than 3 ACH50. This indicates that there is significant potential for tighter houses with better sealing methods. It is expected that aerosol sealing can provide tighter houses with little modification to current construction practices. For builders who are achieving their tightness goals, aerosol sealing may be able to eliminate the cost and hassle of some manual sealing while producing even tighter houses more reliably.

![Figure 3. Distribution of measured envelope tightness of Maryland houses included in DOE compliance study.](image)

Aerosol sealing has the potential to not only reduce labor and material costs for conventional sealing, but also contractor training and quality control for assuring that target house tightness values are achieved. Reducing the need for skilled or experienced labor would help reduce concerns regarding the availability of properly trained laborers. In addition, the house tightness is continually monitored so crews can confirm when a tightness target has been met and stop sealing when it is no longer necessary. Finally, a reliably tighter house can allow mechanical contractors to confidently install right-sized heating, cooling, and dehumidification equipment.

**Methodology**

The project team is using an iterative approach with four builders to develop aerosol envelope sealing guidelines. The process for each builder is shown in Figure 4. First, a leakage assessment is performed for two to three houses for each participating builder so that the project

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\(^1\) Data downloaded from: https://www.energycodes.gov/compliance/residential-energy-code-field-study
team is familiar with their current air sealing practices (Step A). If the builder does not have experience with the aerosol sealing process, a demonstration is performed on one of their houses (Step A). Then the team meets with the builder to review findings and identify two sealing options (Step B). The selection considers: (1) feasibility and cost of house preparation; (2) possible interference with construction sequence; (3) difficulty with identifying and sealing large leaks that would negatively impact aerosol sealing; (4) ability of aerosol to be transported to likely leakage sites; (5) likelihood that aerosol sealant will be disturbed during the remainder of construction or after construction is complete; and (6) likelihood that additional leaks will be created after aerosol sealing, that would be better to seal with the aerosol. The two protocols or options target a different phase of construction or modification of the current sealing method.

Each of the two sealing options is being applied to two to three houses (Step C). The sealing results are reviewed with the builder, and the team consults with them to identify an updated sealing option (Step D). This option is applied to a second round of sealing on two to three more houses (Step E). The experience from all the sealing will be used to identify best sealing practices that are based on the type of construction and builder’s sealing goals. This process has been used with a large production builder in Minnesota and the experience from that work has helped inform the sealing with the first builder participating in California. As the house envelope sealing is progressing with the first builders in the two states, a second set of builders is going through a slightly streamlined process. In all, a total of at least 26 houses will be sealed by the project.

**House Assessments**

The envelope air leakage assessment includes quantitative air leakage tests and qualitative air leakage diagnostics (Step A). The assessment is being conducted before and after aerosol envelope sealing to assess the impact of the sealing. The assessment is repeated after construction is complete to determine the impact the final stages of construction had on envelope leakage. In addition, assessments are performed on control houses with a similar floor plan and

Figure 4. Iterative approach to evaluate aerosol sealing options.
construction type as the aerosol sealed houses, to evaluate the level of tightness and remaining leaks for houses with conventional sealing. The control house assessments are conducted at the same stage of construction as when the aerosol sealing is performed and after construction is complete. Finally, various methods are used to evaluate the cost of any conventional sealing that is eliminated for the aerosol sealed houses, and the staff time and material costs will be tracked for the aerosol sealing — this provides an estimate of the net cost of the aerosol envelope sealing.

A whole house envelope leakage test is the primary method for quantifying the house tightness. The measurement is conducted using a multi-point procedure with RESNET standards applied for establishing the house setup (e.g. temporary sealing of ventilation system ducts). Guarded zone leakage tests are being used for a subset of the houses to measure the leakage between the house and an attached garage. The leakage of individual, isolated sites located on a flat surface are being measured by placing an air flow metering device over the area during a whole house depressurization leakage test. This method has been used for past projects to measure the leakage of a variety of sites, including plumbing penetrations, duct penetrations, recessed light cans, and electric outlet boxes.

The visual inspections qualitatively evaluate the tightness of the house air barrier. The inspection includes the use of a smoke puffer to help estimate the relative magnitude of the air leakage. A checklist of common leakage sites has been developed to guide the inspection process and provide structure to the results. The visual inspection checklist is based on the Air Leakage section of the EPA ENERGY STAR Rater Field Checklist (EPA ENERGY STAR 2015). An infrared (IR) scan is being used to assist in the identification of significant envelope air leaks. The IR scan is conducted from the house interior as a two-step process. For the first step of the process the scan of the interior surface of the envelope documents thermal anomalies from variations in insulation and significant air leakage from wind and stack effects. The scan is then repeated with the house depressurized 15 to 25 Pa by a test fan. In colder weather, interior surfaces that are colder than observed during the initial scan indicate air leakage.

Results and Discussion

Minnesota Houses

House Assessments and Demonstration Sealing

The initial house assessments and first round of aerosol sealing (Step A-C) has been completed for the first Minnesota builder. A qualitative assessment of air sealing details was based on experience from previous work with this builder and visual inspections of one house at the rough-in stage of construction, and a second house at the pre-drywall stage. There was an overall high quality of air sealing. The level of quality for the sealing components on the checklist was excellent (18), acceptable (2), or not applicable (5). Only the sealing of the attic access panel was considered to be poor2. This qualitative assessment was consistent with the air leakage test results from HERS rater reports of four other houses. The tightness of those houses ranged from 1.2 to 1.5 ACH50. The average tightness was 1.31 ACH50 or 56% below the State of Minnesota code requirement of 3.0 ACH50. Since this builder is already achieving house

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2 Sealing is accomplished by the texture coat being applied to the ceiling. If someone were to use the access panel, that sealing would be broken. The code requires the attic hatch to be weatherstripped.
tightness levels well beyond code requirements, the benefit of using aerosol sealing would be to more reliably produce tighter houses and save costs by eliminating some current sealing methods. For much of Minnesota there are utility new home construction programs that provide higher incentives for higher modelled energy savings. A reduction in the house tightness from 1.5 to 0.5 ACH50 typically produces a 6% higher space heating savings and a $500 increase in the incentive from gas utilities. This builder is also interested in evaluating whether a reliably tighter envelope could reduce the size of the heating and cooling systems and result in installation cost savings.

A successful demonstration of the AeroBarrier sealing (Step A) was completed for both Minnesota builders. The exterior enclosure of the first builder’s house was largely complete, but the insulation, drywall, and rim joist spray foam had not been installed and much of the air sealing had not been performed. There were some large gaps around the electrical and duct penetrations between the house and garage that had to be sealed with can foam prior to the aerosol sealing. The initial house leakage was approximately 2,200 cfm50 after 2.5 hours of sealing that was reduced by 84% to 358 cfm50 or 0.64 ACH50. The second builder’s house had drywall in place and the construction was nearly complete. The house tightness started at 419 cfm50 and was reduced by 50% to 209 cfm50 or 0.35 ACH50.

The visual inspections (Step A) were also used to determine that half of the air leakage components could be sealed by the AeroBarrier process. This was based on an understanding of how each building component was currently sealed, whether the component air leaks would be accessible during the AeroBarrier process, and whether the leakage gaps would be small enough to be sealed by the AeroBarrier process. The focus was on components being sealed by caulk or can foam including: junction of interior partition wall with exterior wall; sill plate; top plate; electric boxes on exterior walls; and plumbing, piping, and electrical penetrations. After meeting with the builder (Step B) it was decided that for half of the houses all of the conventional sealing would be performed (e.g. option 1), and for the other half the polyethylene sheets on exterior walls and air-tight electric boxes would be eliminated (e.g. option 2). The vapor retarder function of polyethylene sheets would be replaced by low-perm paint on the interior surface of the drywall. Based on the success of the demonstration aerosol sealing, it was decided that all houses would be AeroBarrier sealed after the rim joists were spray foamed and prior to drywall. Interior poly sheets were to be caulked and stapled to the second floor ceilings so that there was a complete air barrier.

House AeroBarrier Sealing

In the fall of 2017 four Twin Cities metropolitan area houses were sealed by AeroBarrier for the first builder (Step C). The two houses in Blaine and Eagan were aerosol sealed prior to wall insulation. The starting envelope leakages were 3.81 and 3.78 ACH50 respectively, and those were reduced by 72% and 82% to 1.05 and 0.67 ACH50 (see Figure 5). The electric wire and most plumbing penetrations from the house to the attic would typically be sealed with can foam. That foam sealing was not performed for the Blaine house prior to the aerosol sealing. When can foam was used to seal the electrical and plumbing penetrations to the attic, the house leakage only decreased by 15 cfm50. That indicates that the aerosol sealing effectively sealed electrical and plumbing penetrations. In addition, the gaps between the sheathing/top plate, sheathing/bottom plate, bottom plate/subfloor, and vertical framing were sealed (see Figure 6). While these gaps were typically narrow, there are hundreds of feet of these gaps in each house, which suggests that the total leakage area could be significant.
Batt insulation had been installed in the exterior walls of the Plymouth and Lakeville houses. The project team removed much of the insulation from the Lakeville house prior to aerosol sealing and portions were removed from the Plymouth house. The wall insulation resulted in longer sealing times and leakier houses. The Plymouth and Lakeville houses started with leakages of 2.87 and 2.82 ACH50, respectively, and those were reduced by 46% and 66% to 1.55 and 0.97 ACH50. It is evident that the wall insulation acts as a filter for the aerosol sealant and should not be in place over any potential leakage areas. In addition, the poly sheets on the ceiling came loose at two of the houses. The process of securing the sheets needs to be more robust. Finally, there air compressors used for the sprayers, malfunctioned in three of the houses, which reduced the number of sprayers and extended the sealing times.

![Figure 5. Pre-sealing, post-sealing, and end of construction envelope air leakage test results for two demonstration, four sealed, and two control houses.](image)

While there were numerous minor glitches in the sealing process, the tightness of the four houses was 48% to 78% below the code requirement of 3.0 ACH50. This was achieved prior to the installation of the interior poly sheets over the exterior walls and sealing of the electric boxes — indicating that the required house tightness can be achieved without the interior poly, with the application of low perm paint satisfying the vapor barrier code requirement. This builder did not eliminate any of their sealing practices for these four houses, but they have tentatively agreed to not use interior poly on exterior walls for the second round of houses (Step E) (as long as the local code officials approve of this application.

The house assessments and air leakage tests were repeated at the end of construction (green bars in Figure 5). Three of the houses sealed with AeroBarrier were 69% to 73% below the code requirement of 3.0 ACH50. The garage of the fourth house was being transformed into a sales office. It was not possible to measure the air leakage of the house without including that area, and the garage had not been included in the pre- and post-sealing leakage measurements.
For the two houses that were sealed when wall insulation was not present (Blaine and Eagan), the leakage rate was decreased by 14% and increased by 37% between the aerosol sealing and the end of construction. An infrared and visual leak inspection did not identify any large leaks to explain the increase in leakage for the Eagan house (increased from 409 to 560 cfm50). For the Plymouth house that had wall insulation in place at the time of sealing, the air leakage at the end of construction was 47% lower than the leakage measured after sealing; that was anticipated, since it appeared that the wall insulation was filtering the movement of sealant to leaks at the exterior walls. At the end of construction three of the houses with AeroBarrier sealing were 39% to 45% tighter than the two control houses that were not sealed.

California Houses

The AeroBarrier sealing (Step C) was completed by Aeroseal staff on August 29-30, 2017, for houses located at a housing community in Lodi, CA. Building America project team members, Curtis Harrington and Daniel Reif, were present and performed pre and post-AeroBarrier air leakage testing and building preparation activities for Option 2. Four homes were sealed, two using Option 1 and two using Option 2 (described below). The homes were all two stories, designed with a sealed attic, and ranged in size from 2,030-2,570ft².
Option 1

AeroBarrier sealing for Option 1 occurred after open-cell spray foam was installed at the rim joist and below the roof deck (see Figure 7). No additional sealing was performed prior to the AeroBarrier installation. The pre-sealing results showed air leakage of 4.39 and 3.47 ACH50 for the two homes during this stage of construction.

The AeroBarrier sealing was very successful. The overall time to seal each home, including prep and cleanup, was about 3 hours. The leakage at the start of the sealing was between 1,200-1,500 cfm50. Figure 8 shows the sealing profile for both sealing demonstrations under Option 1. There were slight differences in the time required for sealing and the starting leakage rate, which is likely due to differences in the floorplan for the homes. The AeroBarrier reduced the leakage in both cases by about 75%, bringing them down to 1.11 and 0.95 ACH50, which is roughly 80% below the California requirement of 5 ACH50.
Option 2

AeroBarrier sealing for Option 2 occurred before open-cell spray foam was installed and represents the first opportunity to seal the homes, since the building shell is largely complete. Some manual sealing prior to installing AeroBarrier was required to block larger penetrations that would not be sealed efficiently with the aerosol. The time and materials required to perform that sealing were documented. There were also some issues coordinating the sealing demonstrations with the home builder that led to some additional gaps at the eaves of the home that would normally have been blocked prior to the AeroBarrier installation.

Besides the additional sealing at the eaves, which would typically not be necessary if the exterior foam were installed, there was also manual sealing of other large penetrations. In the first house the pre-sealing effort was focused on penetrations that would clearly not seal appropriately with the aerosol technology, while in the second house more care was taken to seal gaps that were easily identifiable (could see daylight penetrating). The time required and materials used are outlined in Table 1.

Table 1. Time and materials used to manually seal homes prior to AeroBarrier installation.

<table>
<thead>
<tr>
<th>Stage/Option</th>
<th>Lot</th>
<th>Sealing Penetrations</th>
<th>Sealing Gap at Eaves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Time for Manual Sealing (person-hrs.)</td>
<td>Cans of Foam Used</td>
</tr>
<tr>
<td>Before Foam</td>
<td>23</td>
<td>1.5</td>
<td>3</td>
</tr>
<tr>
<td>Before Foam</td>
<td>24</td>
<td>4.5</td>
<td>6</td>
</tr>
</tbody>
</table>

After the two pre-sealing efforts the leakage of the homes was 15.14 ACH50 and 9.01 ACH50 for lot 23 and 24 respectively. Clearly the additional manual sealing effort resulted in improved initial air tightness with an increased cost. Ultimately, the additional cost of manual sealing will need to be compared to the AeroBarrier sealing performance differences and cost.

The AeroBarrier sealing was also very successful at this stage of construction. The sealing injection time increased from the sealing under Option 1, requiring 2-3 hours to complete. The overall time to seal each home, including prep and cleanup, was about 4-5 hours.
Due to slight changes in the manual pre-sealing efforts in each building the leakage at the start of
the sealing was around 5,800 CFM50 in one case, and about 3,000 CFM50 in the other. Figure
10 shows the sealing profile for both sealing demonstrations under Option 2. The leakage
measured with the AeroBarrier equipment did not produce the same result as the unencumbered
blower door used in the pre and post-measurements, but the general sealing trend holds, showing
faster sealing rates at the beginning of the installation that slows as the process goes on. The
AeroBarrier reduced the leakage in both cases by about 85%, bringing them down to 2.15 and
1.43 ACH50 before spray foam installation was installed, which is roughly 60-70% below the
California requirement of 5 ACH50.

Another leakage test on each home was performed after the spray foam installation to
determine the additional sealing due to the insulation. After spray foam the measured air leakage
of the homes were 1.25 and 1.06 ACH50, representing an additional leakage reduction of 42%
and 26% respectively. This result is only slightly higher than the result for using AeroBarrier
after the spray foam installation under Option 1.

![Leakage profile graph](image)

Table 2 and Figure 11 provide a summary of all of the AeroBarrier sealing results for the
first round of tests for the homes in Lodi, CA. Overall, nearly 10,000 CFM50 of air leakage was
sealed in 8 hours of total injection time over two days. The average air tightness achieved was
1.09 ACH50 before drywall was installed in the homes. A final air leakage test will be performed
once the houses are complete, and compared to other homes that did not receive the AeroBarrier
treatment.

Table 2. Summary of AeroBarrier sealing results

<table>
<thead>
<tr>
<th>Stage/Option</th>
<th>Floor Area (ft²)</th>
<th>Volume (ft³)</th>
<th>Pre-Seal CFM50</th>
<th>Pre-Seal ACH50</th>
<th>Post-Seal CFM50</th>
<th>Post-Seal ACH50</th>
<th>% Reduction</th>
<th>After Foam CFM50</th>
<th>After Foam ACH50</th>
<th>% Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>After Foam</td>
<td>2569</td>
<td>23121</td>
<td>1690</td>
<td>4.39</td>
<td>429</td>
<td>1.11</td>
<td>75%</td>
<td>483</td>
<td>1.25</td>
<td>42%</td>
</tr>
<tr>
<td>/Option 1</td>
<td>2032</td>
<td>22215</td>
<td>1286</td>
<td>3.47</td>
<td>351</td>
<td>0.95</td>
<td>73%</td>
<td>352</td>
<td>1.06</td>
<td>26%</td>
</tr>
<tr>
<td>Before Foam</td>
<td>2569</td>
<td>23121</td>
<td>5836</td>
<td>15.14</td>
<td>828</td>
<td>2.15</td>
<td>86%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/Option 2</td>
<td>2223</td>
<td>20007</td>
<td>3005</td>
<td>9.01</td>
<td>477</td>
<td>1.43</td>
<td>84%</td>
<td></td>
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</tbody>
</table>

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Conclusions

The AeroBarrier installations were all very effective at sealing air leaks in the homes. The average tightness achieved was below 1 ACH50, which is well below the California and Minnesota energy code requirements of 5 ACH50 and 3 ACH50, respectively. Furthermore, the air leakage was assessed prior to completion of the homes, and in many cases prior to drywall being installed. This project demonstrated the ability to seal homes at various stages of construction, including before and after drywall is installed, allowing the process to be applied in a multitude of situations.

The five houses sealed for the first Minnesota builder had an average air leakage of 0.98 ACH50 after sealing, and before the polyethylene sheet and drywall was installed — that is 50% tighter than the average leakage of the two control houses at the end of construction. This indicates that the required house tightness can be achieved without the interior poly, with the application of low perm paint satisfying the vapor barrier code requirement. Eliminating the poly sheeting and air tight electrical boxes, along with increased utility incentives, may more than offset the added cost of the AeroBarrier sealing. A comprehensive analysis of the cost tradeoffs will be completed in the future.

For the homes sealed in California, both Options seem like an appropriate time to perform the sealing in houses built with sealed attics. Houses sealed after the spray foam was applied to the roof deck (Option 1) were quicker to seal and required less preparation than housed sealed before the spray foam was applied (Option 2). However, it was demonstrated that Option 2 provided better air sealing results than open cell spray foam insulation, allowing the builder to potentially use less expensive alternatives to insulate homes that are sealed with AeroBarrier. It will depend on the overall cost savings of alternative insulation methods to ultimately decide which option should be pursued in the future.

The AeroBarrier process not only produced tight homes, but also demonstrated a potential opportunity to save costs on construction of homes. A review of the standard air-sealing efforts performed by builders in the U.S. show several areas where efforts can be reduced or eliminated when applying AeroBarrier. By reducing other sealing work, builders can: 1) minimize material used for sealing a building, since AeroBarrier only applies material where leaks are present; 2) reduce the possibility of redundant sealing (e.g. sealing on both external and internal wall surfaces), while assuring a continuous air barrier is applied; and 3) reduce the number of trades involved in the air sealing process.
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