Do You Recognize Any of These Issues?

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mold, mildew, musty</td>
<td>Rigid insulation and air sealing in the attic and basement penetrations and attic penetrations and windows and doors, and perimeter and/or knee</td>
</tr>
<tr>
<td>Contribution to reducing carbon footprint</td>
<td>Insulate and air seal attic</td>
</tr>
<tr>
<td>long-term energy savings</td>
<td>Replace old HVAC equipment</td>
</tr>
<tr>
<td>Flexible, moldy, ugly</td>
<td>Insulate and air seal attic</td>
</tr>
<tr>
<td>Pets, dust, allergies</td>
<td>Insulate and air seal attic</td>
</tr>
<tr>
<td>Unavailable space, such as a basement or attic</td>
<td>Insulate and air seal attic</td>
</tr>
</tbody>
</table>

**RIGID INSULATION**

Continuous insulation on exterior walls helps eliminate heat loss through framing. Continuous insulation also improves the structure’s integrity and reduces noise, dust, allergens and pests.

**EXTERIOR INSULATION AND AIR SEALING**

Minimize entry of noise, dust, allergens and pests. Reduce thermal bridging. Thicker, Pays Quicker.

**Long-term energy savings**

Based on 1914 sq. ft. of new insulation/siding installed. Calculations based on standard efficiency of systems, energy costs, amount of existing cavity insulation and thickness of insulation installed. Savings to homeowner: $1,145 a year. Savings to environment: Annually, the U.S. building sector accounts for about 49% of all energy consumption and greenhouse gas emissions. According to a recent survey, 81% state that owning a home is the best long-term investment to make. Learn more at www.insulateyourhome.com.

**The Problem:**

- High energy bills
- Air-leak and visible cracks in home
- High air temperatures
- Low humidity levels
- High utility costs
- Mold, mildew and wood rot
- Thermal bridging
- Noise, dust, allergens and pests
- Unavailable space, such as a basement or attic
- Insulation and air sealing

**The Solution:**

- Insulate and air seal attic
- Replace old HVAC equipment

**Estimated Energy Savings**

<table>
<thead>
<tr>
<th>Product</th>
<th>Estimated Energy Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYROFOAM™ Brand Rigid Foam Insulation</td>
<td>$1,145</td>
</tr>
<tr>
<td>GREAT STUFF™, GREAT STUFF PRO™, ENERFOAM™ and ENERBOND™ sealant</td>
<td>$9,900</td>
</tr>
<tr>
<td>STYROFOAM™ Brand Spray Polyurethane Foam</td>
<td>$5,305</td>
</tr>
</tbody>
</table>

**Form No. 179-06038-0314 CDP**

Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including Dow can give assurance that mold will not develop in any specific system. Dow Polyisocyanurate Insulation or contact your local building inspector. In an emergency, call 1-989-636-4400.

**NOTICE (U.S.):** Changes to the International Residential Code require the installation of a water-resistive barrier (WRB) within most exterior wall assemblies in residential construction. The following Dow insulated sheathing products qualify as a water-resistive barrier:

- THERMAX™ Sheathing
- TUFF-R™ and Super TUFF-R™

**WeatherMate™ Plus Housewraps** have already qualified as water-resistive alternatives to the prescribed felt (see Evaluation Reports NER-593 and NER-640 for approved alternative). Dow陛下®™ Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow.

Follow us at: www.insulateyourhome.com.
Air leaks and moisture intrusion can happen on every level of the home to compromise homeowners’ comfort, increase energy loss and even potentially damage the structure. For new construction and renovation projects, the solution is to insulate and seal air leaks, creating an airtight, moisture-resistant shell from attic to basement/crawl space. Dow’s portfolio of integrated systems and solutions is designed with the whole house – and homeowner – in mind.

Dow insulation, sealants, adhesives, flashings and accessories work together to help provide long-term:

- Comfort
- Energy efficiency
- Indoor air quality
- Durability
- Protection from entry of dirt, allergens and pests

### Sources of Energy Loss*

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Infiltration</td>
<td>38%</td>
</tr>
<tr>
<td>Basement Floor</td>
<td>1%</td>
</tr>
<tr>
<td>Basement Walls</td>
<td>22%</td>
</tr>
<tr>
<td>Frame Walls</td>
<td>17%</td>
</tr>
<tr>
<td>Windows/Doors</td>
<td>17%</td>
</tr>
<tr>
<td>Ceiling</td>
<td>5%</td>
</tr>
</tbody>
</table>

* Sources of Energy Loss are approximate and may vary based on specific home conditions.
Good News
“In 2008, Americans saved more than $19 billion and avoided greenhouse gas emissions equivalent to those of 29 million cars through choices they made with energy-saving measures and energy-efficient homes.”

Under-insulated Homes
Since 2008, energy prices have steadily increased in every sector, especially residential and transportation, according to the U.S. Department of Energy. A house with inadequate insulation and unsealed gaps and cracks can send the homeowner’s utility bills through the roof...and exterior walls, windows, doors, foundation, etc.

Beware of Moisture
Trapped moisture can lead to mold, mildew and wood rot, which can degrade indoor air quality and structural integrity. Dow solutions help keep moisture out of the home.

Thermal Bridging
Studs account for 25% of the wall surface. If continuous insulation is not used, that’s like leaving one wall uninsulated. The wood framing allows significant energy loss known as thermal bridging. Dow rigid foam insulation on exterior walls helps eliminate thermal bridging, reducing potential for condensation and making the home more energy efficient.

Energy Prices, 2000-2008
Average Prices by Sector

<table>
<thead>
<tr>
<th>Year</th>
<th>Transportation</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>2001</td>
<td>22</td>
<td>16</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>2002</td>
<td>24</td>
<td>17</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>2003</td>
<td>26</td>
<td>18</td>
<td>14</td>
<td>8</td>
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<tr>
<td>2004</td>
<td>28</td>
<td>19</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>2005</td>
<td>30</td>
<td>20</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>2006</td>
<td>32</td>
<td>21</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>2007</td>
<td>34</td>
<td>22</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>2008</td>
<td>36</td>
<td>23</td>
<td>19</td>
<td>13</td>
</tr>
</tbody>
</table>

The A List
Air seal for the fastest energy savings. Check out these common applications for GREAT STUFF PRO™ and FROTH-PAK™ insulating foam sealants.**

Attic
- Top of exposed stud cavities
- Plumbing stacks and shafts
- Gas line penetrations
- HVAC duct joints and penetrations
- Attic perimeter

Basement
- Sill plate
- Rim joist
- Headers
- Gas line penetrations
- PVC pipe penetrations
- HVAC duct joints and penetrations
- Central vacuum system piping
- Floor-wall junction

Living Space
- Under baseboards
- Gas line penetrations
- Perimeter of electrical boxes (not inside box)
- Plumbing penetrations
- Perimeter of covered wire and electrical conduit penetrations on exterior walls
- Air/heating vents
- Central vacuum system piping

House Exterior
- Electric, gas, cable and A/C penetrations
- Vent hoods
- Exterior garage walls
- Outside water faucet
- Dryer vent
- Cooling lines from A/C condenser and heat pump penetration into house
- Exterior of bay window/cantilever

Seal Air Leaks
Sealing unwanted air leaks is one of the easiest – and often overlooked – ways to increase a home’s energy efficiency and help protect against moisture intrusion. Insulating foam sealants from Dow are inexpensive and simple to apply for contractors and homeowners alike.

See How Easy

<table>
<thead>
<tr>
<th>Project</th>
<th>Seal rim joist and sill plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>GREAT STUFF PRO™ Gaps &amp; Cracks Insulating Foam Sealant</td>
</tr>
<tr>
<td>Energy Savings</td>
<td>$125 annually</td>
</tr>
<tr>
<td>Payback</td>
<td>2.8 months</td>
</tr>
<tr>
<td>Return on Investment</td>
<td>600%</td>
</tr>
</tbody>
</table>

Kits or Refillables?
The choice is yours. FROTH-PAK™ Foam Insulation and FROTH-PAK™ Foam Sealant products are available in portable, disposable kits or returnable, refillable cylinders. Both types benefit from the INSTA-FLO™ dispensing spray gun and hose assembly with distinct anti-crossover nozzles to help eliminate plugged hoses.

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* Based on heat loss assessment for Climate Zone 5 using ASHRAE calculation methods and U-values.
** Consult the labels/instructions and Material Safety Data Sheets carefully before use.
**Start from the Top**

**Attic Penetrations**
- FROTH-PAK™ Foam Insulation and FROTH-PAK™ Foam Sealant (disposable kits or refillable systems)
- GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant or ENERFOAM™ Professional Foam Adhesive & Sealant
- STYROFOAM™ Brand Spray Polyurethane Foam (SPF) Insulation (MX Series)*

**Can Lights**
Box in can lights with THERMAX™ Sheathing and then seal joint between floor and box with GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant or FROTH-PAK™ Foam Sealant.

**Rooftop**
Securely bond concrete or clay roof tiles with TILE BOND™ Roof Tile Adhesive even in regions with hurricanes and temperature extremes.

**Fill Gaps, Cracks and Penetrations**
Penetrations
Quickly fill and insulate gaps less than 3” with GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant or ENERFOAM™ Professional Foam Adhesive & Sealant.

**Energy Efficiency and Moisture Resistance Down Under**

**Crawl Space Walls**
Cover unvented crawl space walls with:
- STYROFOAM™ Brand WALLMATE™ Insulation
- Foil-faced THERMAX™ Sheathing
- STYROFOAM™ Brand Spray Polyurethane Foam (SPF) Insulation (MX Series)
- FROTH-PAK™ Foam Insulation and FROTH-PAK™ Foam Sealant (disposable kits or refillable systems)

**Interior Basement Walls**
Options for the interior basement wall include:
- STYROFOAM™ Brand Extruded Polystyrene Foam Insulation
- Foil-faced THERMAX™ Sheathing
- THERMAX™ White Finish Insulation for a finished appearance, eliminating need for drywall

**Exterior Basement Walls**
STYROFOAM™ Brand PERIMATE™ Insulation
- Enhances drainage
- Insulates, reducing potential for condensation on interior
- Protects waterproofing membrane

**Frost-Protected Shallow Foundation**
Use of STYROFOAM™ Brand Extruded Polystyrene Foam Insulation allows construction of a much shallower foundation.

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*™ Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow

* STYROFOAM™ Brand Spray Polyurethane Foam should be installed by a trained SPF applicator wearing protective clothing (including long sleeves), gloves, goggles and proper respiratory protection. Consult the instructions and Material Safety Data Sheets carefully before use.

** R means resistance to heat flow. The higher the R-value, the greater the insulating power. **
Cavity Insulation and Non-Insulating Oriented Strand Board (OSB) Aren’t Enough

Rigid foam insulation on exterior walls provides thermal protection across the entire wall, including wood framing. Eliminate air leaks through wall studs by covering the exterior wall with insulation boards from Dow that feature:

- High, long-term R-value**
- Exceptional moisture resistance
- Excellent compressive strength
- Durability

Rigid foam insulation on exterior walls provides thermal protection across the entire wall, including wood framing. Eliminate air leaks through wall studs by covering the exterior wall with insulation boards from Dow that feature:

- High, long-term R-value**
- Exceptional moisture resistance
- Excellent compressive strength
- Durability

Exterior Walls

Thicker means more thermal protection, so exceed the building code whenever possible with:

- STYROFOAM™ Brand Extruded Polystyrene Foam Insulation
  - STYROFOAM™ Brand Tongue and Groove
  - STYROFOAM™ Brand Residing Board
- Seal seams with WEATHERMATE™ Construction Tape.

Interior Wall CAVITIES

Two-component, spray-applied foam insulation creates a monolithic barrier for protection against water and air infiltration. Dow solutions include:

- STYROFOAM™ Brand Spray Polyurethane Foam Insulation (MX Series)
- FROTH-PAK™ Foam Insulation and FROTH-PAK™ Foam Sealant (disposable kits or refillable systems)

Seal Windows and Doors

Window Sills

WEATHERMATE™ Sill Pan, with integrated corners, conforms to window openings for protection against water seepage.

Window/Door Openings

Use WEATHERMATE™ Flashings with butyl rubber adhesive for a durable, water-resistant seal at window and door openings.

Interior Window Framing

Insulate and seal windows/doors with minimal-expanding polyurethane foam proven not to bow window and door frames when applied properly.

Rim Joists

Options to air seal or air seal and insulate rim joists:

- Use GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant or ENERFOAM™ Professional Foam Adhesive & Sealant to picture-frame or outline where the edges meet the wood studs and sill plate.
- Install cut-to-fit pieces of Dow rigid foam insulation and use GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant or ENERFOAM™ Professional Foam Adhesive & Sealant to picture-frame or outline where the edges meet the wood studs and sill plate.
- Fill in the rim joist cavities with FROTH-PAK™ Foam Insulation.
- Apply STYROFOAM™ Brand Spray Polyurethane Foam (SPF) Insulation (MX Series).

Sill Plate

Flexible STYROFOAM™ Brand SILL SEAL Foam Gasket reduces air infiltration between concrete foundation and sill plate.

Concrete is a poor insulator.

A 7” thick slab of poured concrete has the same R-value as a pane of glass (r=1.5).
**Tools and Cleanup**

PRO Series Dispensing Guns
Choose from four excellent foam dispensing guns for GREAT STUFF PRO™ products. Restartable, pinpoint control and no post-dispensing foam drip for less foam waste.

<table>
<thead>
<tr>
<th>Nozzle Type</th>
<th>Output</th>
<th>Coverage Area</th>
<th>Description</th>
</tr>
</thead>
</table>
| Caulking     | Low    | Controlled bead size | • Designed for precisely controlled output  
• Use for tight areas  
• Minimizes overspray and waste |
| NS Cone/ Spray | Medium | Small         | • Cylindrical spray pattern  
• Fills voids and cavities |
| Fan/ Spray   | Medium | Wide area     | • Designed for flat applications – walls, roofs and ceilings  
• Use to smooth out orange peel or textured finish |
| Pour         | High   | Large volume  | • Designed for filling large cavities (slow rise formulation recommended)  
• Use in hidden cavity applications |

**Gun Cleaner**
Keep both the inside and outside of dispensing guns clean and in top condition with GREAT STUFF PRO™ Gun Cleaner with gun adapter or red spray nozzle attachments.

**INSTA-FLO™ Dispensing Gun and Nozzles**
The INSTA-FLO™ dispensing spray gun features anti-crossover nozzles specially designed to help eliminate chemical crossover in FROTH-PAK™ systems, making an accurate and economical application of spray foam easier. These nozzles, an industry favorite, feature:
- **Patented nozzle design** – helps eliminate plugged hoses
- **Several nozzle types** – offer a variety of outputs and spray patterns
- **Side wing design** – provides quick gun attachment
- **Clear dispensing tips** – easily identify used nozzles
- **Tapered design** – improves mixing for enhanced foam quality

**Adhere Subfloor and Drywall**
Bond subfloors, drywall, paneling and foam panels with GREAT STUFF PRO™ Wall & Floor Adhesive or ENERBOND™ Professional Foam Adhesive for a fast-grab tack and high-strength bond. For easy application, use the PRO Series 14XL foam dispensing gun with a 40” long barrel and guide tip for added accuracy.

**Air Sealing Around the Home**
For smaller or application-specific uses, try GREAT STUFF™ Insulating Foam Sealants with straw dispensers.
Do You Recognize Any of These Issues?

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>odors</td>
<td>Mold, mildew, musty</td>
</tr>
<tr>
<td>Ice dams</td>
<td>Rigid insulation and air sealing</td>
</tr>
<tr>
<td>temperature</td>
<td>Insulate and air seal attic penetrations</td>
</tr>
<tr>
<td>and uneven room temperature</td>
<td>Air seal around wall perimeter and/or knee</td>
</tr>
<tr>
<td>sealing</td>
<td>Insulate and air seal attic</td>
</tr>
<tr>
<td></td>
<td>Air seal and insulate under siding, in attic</td>
</tr>
</tbody>
</table>

According to a recent survey, homeowners save $1,900 per year on average. (1) Yearly Energy Sector accounts for 36% of all energy consumed and greenhouse gas emissions. (2)

STYROFOAM™ Brand Spray Polyurethane Foam contains isocyanate, hydrofluorocarbon blowing agent and polyol. Read the instructions and Material Safety Data Sheets carefully before use. Wear protective clothing (including long sleeves), gloves, goggles or safety glasses, and proper respiratory protection. Do not breathe vapor or mist. Use only with adequate ventilation. It is recommended that applicators and those working in the spray area wear respiratory protection. Increased ventilation is effective, use a positive-pressure, air-supplying respirator (air line or self-contained breathing apparatus).

STYROFOAM™ Brand Extruded Polystyrene Foam Insulation

WEATHERMATE™ Plus Housewraps have already qualified as water-resistive alternatives to the prescribed felt (see Evaluation Reports NER-593 and NER-640 for approved alternative).

Estimated Energy Product Estimated to Save

$743  UP327 STYROFOAM™ Brand Extruded Polyisocyanurate Foam Insulation $11,145
$60  FROTH-PAK™ STYROFOAM™ Brand Spray Polyurethane Foam Insulation $9,900
$60  GREAT STUFF PRO™ Gun Cleaner $9,900
$559  GREAT STUFF™, GREAT STUFF PRO™, ENERFOAM™ and ENERBOND™ sealant and adhesive products $8,385

CAUTION: When cured, these products are combustible and will burn if exposed to open flame or sparks from high-energy sources. Do not expose to temperatures above 240ºF (116ºC). For more information, consult MSDS, call Dow at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400. When air sealing buildings, ensure that combustion appliances, such as furnaces, water heaters, wood burning stoves, gas stoves and gas dryers are properly vented to the outside. See website: http://www.epa.gov/iaq/homes/hip-ventilation.html.

CAUTION: This product is combustible and shall only be used as specified by the local building code with respect to flame spread classification and to the use of a suitable thermal barrier. For more information, consult MSDS, call Dow at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400.

CAUTION: This product is combustible. Protect from high heat sources. A protective barrier or thermal barrier may be required as specified in the appropriate building code. For more information, consult MSDS, call Dow at 1-866-583-2583.

Retrofit with Exterior Insulation

Protect Your Investment Long Term

Whether it’s new construction or a renovation project, a well-insulated and sealed home is better able to maintain structural integrity and indoor air quality. Homeowners also enjoy:

• Cost-saving energy efficiency
• Comfort, free from drafts
• Peace of mind
• Less work for the HVAC system, possibly even requiring a smaller unit
• Contribution to reducing carbon footprint or sustainability

According to a recent survey, 81% state that owning a home is the best long-term investment to make. (3)

Thicker Pays quicker

High energy bills

Abnormal quiet, drafty rooms

rising humidity

High utility costs

Dust, dirt, allergens

Hidden space, such as a basement or attic

Cost to environment:

Actual energy costs to the U.S. building sector accounts for about 45% of all energy consumed and greenhouse gas emissions. (2)

Cost to homeowner:

$1,900 per year on average. (1)

Cost to investor:

Insulation more than pays for itself in long-term energy savings.

Increased energy efficiency

High Costs of Heating and Cooling

Thicker Pays quicker

$9,900

$8,385

$9,900

$11,145

$743

$60

Comfort by Dow.
Below are some of the signs that a home simply is not functioning efficiently, which can negatively impact the occupants’ comfort level. Do you recognize any of these issues? Luckily, these issues can likely be addressed with the simple solutions below.

### Do You Recognize Any of These Issues?

- Pests, dust, allergens
- Odors
- Ice dams
- Temperature and uneven room temperature
- Hot spots/cold spots
- High energy bills
- Air seal and insulate

---

**Retrofit with Exterior Insulation**

If renovation of an older home includes re-siding, consider exterior insulation for adding significant insulation to exterior walls.

- Cost to homeowner: $1.55 per sq. ft., on average.
- Cost to environment: Annual U.S. building sector accounts for about 41% of all energy consumption and greenhouse gas emissions.

---

**Costs to homeowner:**

- $743 (R-7.5) STYROFOAM™ Brand Rigid Foam Insulation
- $9,900 (R-12.5) STYROFOAM™ Brand Rigid Foam Insulation
- $8,395 (R-12.5) STYROFOAM™ Brand Rigid Foam Insulation

---

**Savings to homeowner:**

- $1,145
- $9,900
- $8,395

---

**Savings to environment:**

- According to a recent survey, about 41% of all energy consumption and greenhouse gas emissions can stem from one use of CO₂ emissions during the average life of a building.

---

**Estimated Energy Savings**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Estimated Energy Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5&quot; (R-7.5) STYROFOAM™ Brand Rigid Foam Insulation</td>
<td>$1,145</td>
</tr>
<tr>
<td>9.5&quot; (R-12.5) STYROFOAM™ Brand Rigid Foam Insulation</td>
<td>$9,900</td>
</tr>
<tr>
<td>11.5&quot; (R-12.5) STYROFOAM™ Brand Rigid Foam Insulation</td>
<td>$8,395</td>
</tr>
</tbody>
</table>

---

**Comfort by Dow**

Insulation and Air Seawall Overview • United States

---

**The Problem:**

**Main Costs of Heating and Cooling**

<table>
<thead>
<tr>
<th>Source</th>
<th>Estimated Energy Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY STAR, architecture2030.org</td>
<td>$660</td>
</tr>
<tr>
<td>Learn more at <a href="http://www.insulateyourhome.com">www.insulateyourhome.com</a>.</td>
<td>$660</td>
</tr>
</tbody>
</table>

---

**Savings to homeowner:**

- $9,900

---

**Savings to environment:**

- According to a recent survey, about 41% of all energy consumption can stem from one use of CO₂ emissions during the average life of a building.