Safe Handling and Application of One-Component Polyurethane Foam Sealant and Adhesive Products
Learning Objectives

• Compare and contrast polyurethane foam with fiberglass and latex
• Outline safe handling and storage of one-component polyurethane foams
• Understand how to use, store and seal GREAT STUFF PRO™ Insulating Foam Sealants and dispensing gun
• Identify how, when and why to use different GREAT STUFF PRO™ products
Benefits of Air Sealing

- Offer your customers enhanced comfort and reduced energy usage by controlling air infiltration and exfiltration
- Energy Savings
- Blocks pests from entering the home
- Blocks unwanted moisture
- Blocks entry of dust and other allergens
- Reduced callbacks
SECTION 1:
Polyurethane Foams vs. Fiberglass and Latex
# Advantages of Polyurethane Foam vs. Fiberglass

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fiberglass Insulation</th>
<th>GREAT STUFF™ PRO™ Gaps &amp; Cracks GREAT STUFF™ PRO™ Window &amp; Door</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Application</td>
<td>&quot;Stuffed&quot; into gaps where it can settle</td>
<td>Precisely sprays into gaps, creating a long-lasting, airtight and water resistant bond to building materials</td>
</tr>
<tr>
<td>Moisture Resistance</td>
<td>Holds moisture that penetrates gaps (e.g. rain, condensation); Over time, moisture can lead to mold growth</td>
<td>Moisture resistant</td>
</tr>
<tr>
<td>Insulation Value</td>
<td>Insulation value can diminish if the insulation settles or becomes wet</td>
<td>Provides effective insulation value and provides an air barrier</td>
</tr>
<tr>
<td>Foam Expansion</td>
<td>Does not expand</td>
<td>Expands to fill gaps; GREAT STUFF PRO™ Window &amp; Door minimal-expanding and low pressure-build is proven not to distort or bow window or door frames</td>
</tr>
<tr>
<td>Installation</td>
<td>Time-consuming to install</td>
<td>Installs in minutes</td>
</tr>
<tr>
<td>Standards</td>
<td>Conforms to ASTM standards</td>
<td>Conforms to ASTM and AAMA standards</td>
</tr>
</tbody>
</table>
Advantages of Polyurethane Foam vs. Latex

Proven Performance

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant passes the moisture test, outperforming latex.

1. The fully cured foam samples were inserted halfway into a beaker filled with purple dyed water.
2. Samples remained submerged for 24 hours.
3. Samples were removed and allowed to dry for seven additional days in a vertical position.
4. Samples were cut along a vertical cross section to assess the amount of absorption, wicking, moisture retention and foam shrinkage.

Latex is depicted on the left and polyurethane foam on the right.
SECTION 2: Safe Handling and Storage
Safe Handling and Storage

- Read and understand the product label instructions carefully before product use.
- Read and understand the Material Safety Data Sheet (MSDS) carefully before use. This information should also be readily available at the application job site for reference.
- Further information is available at: www.sprayfoamadow.com or www.dowgreatstuff.com
Safe Handling and Storage

Flammability and Temperature

- One-component polyurethane foams such as GREAT STUFF PRO™ Insulating Foam Sealants contain isocyanate and a flammable hydrocarbon blowing agent.
- GREAT STUFF PRO™ Gun Cleaner contains acetone and propane.
- GREAT STUFF PRO™ fumes are EXTREMELY FLAMMABLE.
  - Extinguish all sources of ignition
  - Contents under pressure. Do not puncture, incinerate or store at temperatures over 120°F (49°C).
  - Container may burst if left in areas susceptible to high temperatures, such as motor vehicles, near radiators or stoves, or other sources of heat
  - 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. For more information, visit http://www.epa.gov/iaq/homes/hip-ventilation.html
Safe Handling and Storage

Combustibility and Shelf Life

- When cured, these foam products are combustible.
- Will burn if exposed to open flame or sparks from high-energy sources.
- Do not expose to temperatures above 240°F (116°C).
- Store GREAT STUFF PRO™ products in a cool, dry place.
- Can exposure to moisture should be avoided.
- Use products within the recommended shelf life (see bottom of can).
Safe Handling

Contact and Inhalation

• Prevent eye and skin contact.
  o Wear long sleeves, chemical-resistant gloves, and goggles or safety glasses.
  o Foam is extremely sticky and will adhere to most surfaces and skin.
  o Uncured foam dissolves with acetone or GREAT STUFF PRO™ Gun Cleaner, and can also be removed from tools and most hard surfaces with GREAT STUFF™ Work Wipes. Cured foam must be mechanically removed or allowed to wear off in time.

• Do not breathe vapor or mist.
  o Use in well-ventilated area.
  o Applicator can choose to wear a respirator for additional protection.
  o For additional EH&S guidelines, refer to The Center for Polyurethane Industry site at www.polyurethane.org
SECTION 3:
How to Use GREAT STUFF PRO™ Products
Dow offers two ways to dispense GREAT STUFF PRO™ foam: reusable straw or gun

- Gun-applied cans are recommended for:
  - Energy performance contractors
  - Insulation contractors
  - General contractors

- Reusable straw-applied cans are best suited for the Pro who infrequently performs small air sealing projects.
Straw Applied Foam Video
Gun Applied Foam Video
Preparing the Surface

- Cover surfaces around work area where accidental spray might occur
- Do not spray GREAT STUFF PRO™ products into large voids like behind tub or shower wall surrounds or inside hot tubs
- Surface where applied should be free of dust, grease, oil, wax, and release agents
Temperature and Humidity

- Do not expose to high temperatures
- Best results are obtained when:
  - Can contents are 70⁰F - 75⁰F (21⁰C - 24⁰C) prior to dispensing
  - Apply when temperatures are between 32⁰F - 100⁰F / 0⁰C - 38⁰C (optimum temperature 60⁰F - 90⁰F / 15⁰C - 32⁰C)
  - When using GREAT STUFF™ Window and Door, apply when temperatures are between 40⁰F - 100⁰F (4⁰C - 38⁰C)
  - Relative humidity >50%
  - Diameter of foam bead should not exceed 3" (75 mm)
1. Shake foam can vigorously for 1 minute before dispensing and between uses.

2. Invert can and screw onto adaptor of the foam tool. Don’t cross thread the can. Point the gun tip away from yourself during assembly and removal. Screw until finger tight – do not overtighten. If product does not flow easily, do not force product from can.

3. Adjust flow control screw on back of foam applicator tool to open position.
   • Immediately press trigger to fill the foam tool with foam while dispensing into an appropriate waste receptacle
   • Use flow control screw on foam applicator to adjust bead size
GREAT STUFF PRO™ Gaps & Cracks Insulating Foam Sealant:
Fill rough opening only 1/3 full to allow for proper expansion.

GREAT STUFF PRO™ Window & Door Insulating Foam Sealant:
Fill rough opening only 50% full to allow for proper expansion. Overfilling might buckle some substrates.

GREAT STUFF PRO™ Wall & Floor Adhesive:
Mechanical fasteners must also be used in all applications; assemblies must be under pressure to enable adhesive to aggressively bond to the materials.

GREAT STUFF PRO™ Gun Cleaner:
Test surfaces thoroughly before application; acetone will dissolve most coatings and affect finishes and dyes.
Gun Use and Re-Use

1. Keep can inverted during use.

2. When can is empty, replace with another can and continue job.
   - Mechanical valve lets you take can off gun anytime.
   - Always clean foam from the gun adaptor and top of the can before attaching foam can to gun.
   - If gun adaptor and/or top of can are not clean before mounting a new can, you could end up with the can glued to the gun adaptor.
   - Use GREAT STUFF PRO™ Gun Cleaner (flush gun barrel with 1/2 can of gun cleaner).
Storage and Cleaning

Storage

1. Foam can may be stored with dispensing gun attached for up to 30 days
   - Always leave a can of foam on the foam dispensing gun with the flow control closed
   - Periodic cleaning of gun is recommended
2. Foam can may be stored without gun attached
   - Mechanical valve lets you take can off gun anytime
   - Always clean adaptor and top of the can of foam with GREAT STUFF PRO™ Gun Cleaner before foam cures; top of can must be clean before attaching can of foam to gun
Cleaning

1. **Never Leave a Foam Dispensing Gun Without a Can of Foam Attached Unless** gun has been thoroughly cleaned with GREAT STUFF PRO™ Gun Cleaner.

2. **Clean gun periodically with GREAT STUFF PRO™ Tool Cleaner.**
   - Never leave a can of cleaner on the gun. Cleaner left on the gun will dry out the lip seals inside the gun and cause the gun to leak foam from the trigger/handle.
   - Over-cleaning the gun will shorten gun life.
   - Wipe end of gun clean with GREAT STUFF™ Work Wipes or rub end of tool on soft wood to free tip from foam (never use sharp object on end of gun).
   - Dispense gun contents into waste receptacle until gun is clear of foam.
   - To prevent spray back when removing cleaner from gun, continue to pull trigger while unscrewing cleaner from gun.
Gun Cleaning Video

http://www.youtube.com/embed/QPKvTmhHQ8?autoplay=1
SECTION 4:
Troubleshooting
Troubleshooting

ISSUE: Foam shrinks and pulls off substrate

SOLUTIONS:

1. Address environmental conditions
   - Temperature too cold: Warm can by bringing into conditioned space so that contents readily mix when shaken and dispense with high yield.
   - Humidity: GREAT STUFF™ Insulating Foam Sealants are moisture-cured. If ambient conditions are < 50% relative humidity, spritz area with a mist bottle, then reapply foam to fill gap missed the first time.

2. Build product up if gap is too large
   - If gap is larger than recommended for filling in a single pass, apply foam at recommended bead size, build foam volume via additional application after first bead is tack-free.

3. Ensure clean work surface
   - If debris is contaminating the work area and prohibiting foam from adhering to substrate, clean the work surface.
Troubleshooting

ISSUE: Clogged gun
SOLUTION: Gun cleaner
- Unscrew dispensing gun from the can, flush with GREAT STUFF PRO™ Gun Cleaner, and reattach can to gun.

ISSUE: Bad foam
SOLUTIONS:
1. Ensure temperature and humidity are within recommendations.
2. Shake can for a minimum 30 seconds. The chemicals are viscous and must be thoroughly mixed.
3. Verify foam is within recommended shelf life.

ISSUE: Over applied/expanded foam
SOLUTIONS:
1. Fill gap 30-50% to allow foam to expand.
2. Tuck soft foam into gap without breaking air seal.
3. If foam is too hard to tuck into gap, trim foam with serrated blade.
SECTION 5:
When to and Why Use GREAT STUFF PRO™ Products
## Code Status and Industry Recognition

### Key Industry Recognition, Test Methods and Results

<table>
<thead>
<tr>
<th>GREAT STUFF PRO™ Insulating Foam Sealants</th>
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</thead>
<tbody>
<tr>
<td><strong>ICC-ES Code Report ESR 1961 2006 IBC</strong> and 2006 IRC</td>
<td>Evaluated for compliance to building code</td>
</tr>
<tr>
<td><strong>UL File R13655 Modified E84 tunnel</strong></td>
<td>UL fire rated for caulking and sealants</td>
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<table>
<thead>
<tr>
<th>GREAT STUFF PRO™ Window &amp; Door</th>
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<tbody>
<tr>
<td><strong>ASTM E2112 (Annex A)</strong></td>
<td>Standard Practice for Installation of Exterior Windows, Doors, and Skylights</td>
</tr>
<tr>
<td><strong>AAMA 812-04 (American Architectural Manufacturers Association)</strong></td>
<td>Evaluated in accordance with ASTM E2112 (Annex A) using Standard Practice for Assessment of Single Component Aerosol Expanding Foams for Sealing Rough Openings of Fenestration Installations</td>
</tr>
<tr>
<td><strong>ASTM E283 Rate of Air Leakage Test</strong></td>
<td>ATI (Architectural Testing Inc.)</td>
</tr>
<tr>
<td><strong>ASTM E331 Water Penetration Test of Exterior Windows</strong></td>
<td>ATI</td>
</tr>
<tr>
<td><strong>ASTM E547 Cyclic Method for Water Penetration Testing of Windows at High and Low Air and High Water Test Pressure</strong></td>
<td>ATI</td>
</tr>
</tbody>
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### Estimated ROI of Energy Efficient Products

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Est. Yearly Savings</th>
<th>ROI (in years)</th>
<th>Estimated Lifespan</th>
<th>Savings Over Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREAT STUFF™ (6-10 cans) for picture-framing rim joist only – replace existing batt insulation</td>
<td>$28</td>
<td>$72</td>
<td>4 months</td>
<td>50 years</td>
<td>$3,600</td>
</tr>
<tr>
<td>Replacing lighting with CFLs (min 3/hr/day usage) $1.25 bulb x40</td>
<td>$50</td>
<td>$100</td>
<td>6 months</td>
<td>5 years</td>
<td>$500</td>
</tr>
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</table>
GREAT STUFF PRO™ Gaps & Cracks
Insulating Foam Sealant

• Fills gaps and cracks up to 1"
• High yield product
  o Replaces 4-8 quart tubes of caulk (26 oz size)
• Expands to take the shape of cracks and voids
• Forms an airtight and water resistant bond to:
  o Wood
  o Metal
  o Masonry
  o Glass
  o Most plastics
• Quick cure time
• Trim in 1 hour or less; tack-free in 5-10 minutes
• Reduces labor – shoot and cut in less than 1 hour
Gaps and Cracks Video

http://www.youtube.com/embed/1DYUVcINF70?autoplay=1
GREAT STUFF PRO™ Window & Door Insulating Foam Sealant

• For use around windows and doors
• Durable, airtight and water-resistant bond to:
  o Vinyl
  o Wood
  o Metal surfaces
• Reduces the potential for moisture damage in frame openings
• Expands to take the shape of cracks and voids forming an airtight barrier
• Reduces pathway where insects can enter
• Tack-free within 5-10 minutes
• Trims within 1 hour
• Fully cured in 12 hours
• UL fire rated for caulking and sealants
• Freeze/thaw stable
• 21% of all air infiltration occurs through openings around windows and doors
• Costs only $2.10 to add GREAT STUFF PRO™ Window & Door to average window

<table>
<thead>
<tr>
<th>Product</th>
<th>Retail Price</th>
<th>Total Cost/Window (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREAT STUFF PRO™ Window &amp; Door</td>
<td>$14.70</td>
<td>$2.10</td>
</tr>
</tbody>
</table>

(1) Figures based on average window size 32"w x 52"h. Actual cost per window will vary depending on size.
Window and Door Video

http://www.youtube.com/embed/MRh7YZtwxWE?autoplay=1
GREAT STUFF PRO™ Wall & Floor Adhesive

- Excellent bonding to:

<table>
<thead>
<tr>
<th>Plywood</th>
<th>Particleboard</th>
<th>Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSB</td>
<td>Rigid foam insulation</td>
<td>Masonry</td>
</tr>
<tr>
<td>Lumber</td>
<td>Drywall</td>
<td>Tile</td>
</tr>
</tbody>
</table>

- Quick cure - Full cure 7 days
- Tack-free < 20 min (75°F, 50% RH)
- Ability to reduce drywall nail pops and floor squeaks
- Freeze/thaw stability
- Exceptional bonding power on damp, dry and frozen lumber
- Application temperature 32°F-100°F
- Try this product with PRO 14XL gun and save your back!

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http://www.youtube.com/embed/xrm_ci4QszQ?autoplay=1
Where to Use GREAT STUFF PRO™
Products

Attic
• Top of exposed stud cavities
• Attic hatch frame (outer perimeter)
• Plumbing stacks and shafts
• HVAC duct joints and penetrations

Living Space
• Air/heating vents
• Perimeter of covered wire and electrical conduit on exterior walls
• Plumbing and perimeter of electrical box penetrations
• Under baseboards
• Gas line penetration
Where to Use GREAT STUFF PRO™
Products

**Basement**
- Rim joist
- Sill plate
- Headers
- Floor-wall junction
- HVAC duct joints and penetrations
- PVC pipe penetrations

**House Exterior**
- Electric, gas, cable and A/C penetrations
- Vent hoods
- Garage walls
- Outside water faucet
- Dryer vent
- Cooling line from A/C condenser and heat pump penetration
- Exterior of bay window/cantilever
PRO Series Foam Dispensing Guns

• Provides precise control for filling, sealing and insulating gaps and cracks, and window and door framing
• Easy to vary bead size
• No post-dispensing drip
• Minimize waste dramatically
• Restart up to 30 days
• Extended barrel for long reach applications
• Four models available: 13, 14, 14XL and 15
Application Tools Video

http://www.youtube.com/embed/MRh7YZtwxWE?autoplay=1
GREAT STUFF PRO™ Application Tools

GREAT STUFF PRO™ Gun Cleaner

• Easy care and clean up

• Dissolves and removes uncured polyurethane foam from dispensing guns and hard surfaces

• Works with most foam applicator tools
Cleaning Video

http://www.youtube.com/embed/QPKv
vTmhHQ8?autoplay=1
www.sprayfoam@dow.com or www.dowgreatstuff.com

Technical Support: 1-866-583-BLUE (2583)
Sales Information: 1-800-232-2436