

# Standard Practice for the Installation of Sprayed Cellulosic Wall Cavity Insulation

*Cellulose wall cavity spray insulation is rapidly growing in popularity among new home builders and buyers. This guide is a general outline of the methods and practices that have been found to result in satisfactory cellulose wall spray installations.*



---

**applegateinsulation**

**800-627-7536**

**[www.ApplegateInsulation.com](http://www.ApplegateInsulation.com)**

## 1.0 SCOPE

1.1 This recommended practice covers the application of Sprayed Cellulosic Wall Cavity Insulation (SCWCI) into wood/steel framed cavities of single, multi-family dwellings, and commercial buildings.

1.2 SCWCI is limited to vertical enclosed or covered applications.

1.3 When installing SCWCI materials it is essential that the guidelines of the manufacturer be followed. This Standard Practice is not intended to supersede local, state or federal codes.

1.4 This Standard Practice assumes that the installer possesses a good working knowledge of the applicable codes and regulations, safety practices, tools, equipment, and methods necessary for the proper installation of SCWCI materials. It also assumes that the installer understands the fundamentals of residential construction that affects the installation of insulation materials.

## 2.0 PURPOSE

2.1 This Standard Practice is to be used only as a practice guide and is not intended to supplant or override instructions provided by the Applegate representative for specific jobs. This recommended practice was prepared after consulting with the Technical Committee of Insulation Contractors Association of America (ICAA), numerous manufacturers, and the Department of Housing and Urban Development, Use of Materials Bulletin No. 80.

## 3.0 APPLICABLE DOCUMENTS

### 3.1 ASTM Standards

C-168-02 *Standard Terminology Relating to Thermal Insulating Materials*

C-739 *Standard Specification for Cellulosic Fiber (Wood Base) Loose Fill Thermal Insulation*

C-755-02 *Standard Practice for Selection of Vapor retarders for Thermal Insulation*

C-1149-02 *Standard Specification for Self-Supported Spray Applied Cellulosic Thermal/Acoustical Insulation*

C-1015 *Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation*

E-241 *Standard Guide for Limiting Water-Induced Damage to Buildings*

## 4.0 DEFINITIONS

4.1 *Overspray* - that portion of material from a spray pattern not filling or adhering to intended substrates.

4.2 *Spray Nozzle* - a nozzle with a liquid atomizing unit attached to a hose for intermixing fibers and liquid. These nozzles can have various numbers and configurations of spray tips.

4.3 *Wall Scrubber* - a tool, with a rotating brush, that grooms the insulation level with the face of the studs.

## PRELIMINARY INSPECTION

5.1 An inspection of the building is essential prior to installation. Special considerations to the following areas are very important.

5.1.1 All voids around windows and doors should be sealed to stop air infiltration. Various materials such as foam backer rod or spray foam are available for this purpose.

See Note 1.

Note 1 - Avoid use of expanding foams around windows. Some windows (vinyl, aluminum framed) may warp, preventing them from operating. Additionally, some window manufacturers will not honor warranties if foam is used, even if the foam is non-expanding.

5.1.2 Seal all vertical plumbing and electrical penetrations through both top and bottom plates of all walls according to local, state or federal codes.

5.1.3 It is best to cover finished areas including windows, doors, fireplaces, etc. It is faster to protect finish surfaces than to clean them later. 2 or 4 mil. Polyethylene sheeting works well.

5.1.4 Protect electrical boxes and other boxes on walls that are being sprayed, until the spraying is completed. Duct tape works well.

5.1.5 If recycling the SCWCI, a clean work area is important. Objects such as nails, wood, wire, etc., could damage the machine. Sweep these from the floor before starting to spray the SCWCI.

## 6.0 EQUIPMENT

6.1 The insulation shall be applied with spray application machines, spray nozzles, and other necessary equipment, in accordance with equipment manufacturer's instructions.

6.2 Semi-spiral hose shall be used. This hose allows the material to tumble and stay in the air stream.

6.3 A pump capable of 200 to 300 pounds per square inch (PSI) at a flow rate of 1 1/2 - 4 gallons per minute (GPM) is needed. Diaphragm pumps have been found to be adequate. They are very forgiving and supply a constant pressure.

6.4 There are many nozzles to use and various configurations. Nozzles should be 2", 2 1/2", or 3" to facilitate good volume of material. Most have two spray tips. Either way, the control of fiber to water ratio must be consistent. The liquid pressure line must be rated to handle the pressures that the pump is delivering.

6.5 A wall scrubber should be used for removing excess material from the wall and cleaning the face of the stud. This does a superior job and will quickly pay for itself in labor savings.

6.5.1 When using a wall scrubber refer to the manufacturer or supplier for recommendations of safe and correct use of the wall scrubber.

6.6 Large commercial vacuums may be used to aid in the recycling process (see Section 9). Some machines have vacuum systems attached that blend the recycled cellulose. Otherwise, vacuum systems may be added to machines.

6.7 Other items include:

6.7.1 Water Tank

6.7.2 Shovels, Brooms, Trash Cans (for recycle)

6.7.3 Staple Gun and Poly

6.7.4 Stiff Kitchen Broom

## 7.0 EQUIPMENT SETUP

7.1 The blower machine may be mounted in a truck or trailer to be positioned at the job site as close to a door as practicable to make recycling easier and increase production. An alternative is to take a small machine into the building in a central location. This works very well when spraying in cold weather.

7.2 The pump should be positioned so it may operate according to manufacturer's recommendations. Some larger gas machines have the pump mounted to the blower machine and powered by the gas engine.

7.3 At the job site pull the hose to the farthest point you will insulate. Extend the hose no longer than necessary (100' min.) having as few bends as possible. Next, pull the water line out along the insulation hose. Temporarily attach the water line to the last ten or twelve feet of insulation hose helps avoid tangles while moving around the work area.

7.4 Connect the blower hose to the nozzle loosely, for easier direction of the nozzle. It is best not to tape the nozzle to the hose.

7.5 Adjust the blower machine and pump according to equipment manufacturer's recommendations. Refer to manufacturer's recommendations for the correct pressure settings for the nozzle in use. Normally the liquid to fiber ratio should be 0.3 to 0.4 pounds of water per pound of fiber. This ratio should give you about 30% moisture in the initially installed product. Specific recommendations from Applegate Insulation must be followed. Liquid flow tests should be made periodically to ensure a proper liquid to fiber ratio. In order to install SCWCI at the proper density, these procedures should be followed.

## 8.0 TECHNIQUES OF SPRAYING

8.1 The angle of spray is an absolutely essential part of spraying and must become a habit. A straight or downward angle of approximately 5 to 10 degrees and about 2 to 4 feet away from the wall gives a layering effect. When spraying layers upon layers, the cavity becomes one solid mass, with no inner voids and giving it structural integrity. To fill the very top, under the plate, turn the nozzle angle up and step in a little closer to pack the insulation against and into the top of the cavity. After the top portion is almost full step back and level out the nozzle to finish the cavity.

Be careful not to over fill the top portion of the wall cavity. The cavities under windows, soffits, etc. must be treated the same as the top plate.

8.2 Filling the cavity to the proper thickness comes with experience. Wiping off the stud to get a better idea of the actual thickness in the cavity, will help in learning to judge the thickness of over spray and help to keep it to a minimum. A smooth and steady movement of the nozzle will also help to decrease the amount of over spray. Many new applicators have problems with fall out. There are three principles to know about fall out:

8.2.1 The thicker the wall, the greater the amount of weight pulling on the sprayed insulation. Excess weight could cause insulation to fall out of place. Therefore it is very important to know the fiber to water ratio and keep it consistent. The thicker the walls the more important this becomes.

8.2.2 The wider the distance between studs, the less surface area the sprayed material has to attach itself. 16" OC (on center) are much more forgiving than 24" OC stud spacing. Framing with 2x8, 24" OC can be successfully sprayed with the right equipment and material, and technique.

8.2.3 The angle of the nozzle and the velocity of the material are the two most important factors to reduce fall out. The sprayed insulation must hit the substrate and stay. This can only be achieved with the proper angle. If the angle is not correct the material will tend to deflect or slide off the studs and substrate. This can be mastered with practice and training.

8.4 Interior finish may be installed when the insulation is sufficiently dry, having a measured moisture content of 20% or less.

## 9.0 RECYCLING

9.1 When recycling, the material must be mixed properly or problems are likely to occur. If mixed improperly the wall cavity insulation may be inconsistent, leading to instability, which may cause insulation to fall out of the wall cavity. There are advantages and disadvantages to using the recycling method.

9.2 Advantages of recycling:

9.2.1 When recycling the material, all of the insulation is used, therefore there is very little waste. This also reduces the need for disposing of the excess material.

9.2.2 Carefully adjust moisture or fiber volume when the recycling method begins. The recycled material adds pre-moistened product with the dry product. Adjusting the water pressure or changing the spray tips, will help maintain the same moisture percentage throughout the job.

9.3 Disadvantages of recycling:

9.3.1 Machine damage and down time are the most crucial items to consider. This can occur when foreign objects such as nails, wood, and other objects go through or get stuck in the machine.

9.3.2 The recycling method can be more time-consuming. Normally there is need for approximately 3 persons to each crew. This is a minimum; larger jobs may require a crew of 4. The type of machine can also factor in how much recycle material can be used. This can slow down the process and cause an over supply of recycled material. It is critical that the right equipment be used.

9.3.3 Mixing the recycled with the dry product is very important and can make or break the best sprayers. The material must be blended consistently.

## 10.0 SEVERE WEATHER SPRAYING

10.1 SCWCI can be applied successfully in freezing or high-humidity conditions. Always consult Applegate Insulation for recommendations on spraying in severe climates and conditions.

10.2 Heating the building while spraying may be necessary in extremely cold temperatures.

10.2.1 If the material doesn't bond to studs and sheathing, it may be necessary to temporarily heat the building. In below freezing temperatures, the entire spray system can freeze up. The most vulnerable is the pressure hose and the nozzle. The pump and the inlet pump hose can also freeze.

10.2.2 SCWCI may take longer to dry in colder conditions. It may be necessary to use supplemental electric heat until moisture content measures 20% or less. Heaters using gasses such as kerosene, natural gas or fuel oil should not be used as these types of heaters may add moisture to the air. Whenever heat is used, it is imperative that you make provisions to ventilate the moisture outside the structure.

10.2.3 In most scenarios, is not necessary to heat the building after the spraying is completed. It is much more important to open all the windows and allow for free air changes

10.3 In high-humidity conditions, it may be necessary

20% or less.

## 11.0 SPECIAL AREAS

11.1 SCWCI is excellent for sound control. It can be used in walls between rooms and other areas that require sound control. Consult Applegate Insulation for the recommendations of the type of sound control that is needed for each configuration.

## 12.0 VAPOR RETARDERS

12.1 Consult local or state building codes about the use of vapor retarders if applicable.

## 13.0 PRECAUTIONS AND LIMITATIONS

13.1 Heaters and recessed light fixtures must not be covered by the insulation. Local or Federal codes should be followed if applicable. It is recommended that a minimum of 3 inches of air space be maintained between any fixture and the blocking.

13.2 Cold air returns and combustion air intakes for hot air furnaces must not be blocked or the insulation should not be installed in a manner which would allow it to be drawn into the system.

13.3 Insulation should not be allowed to contact chimneys or flues with temperatures in excess of 180 degrees. A minimum of 3 inches of air space should be maintained with blocking used to retain the insulation.

13.4 This insulation is not recommended for filling the cavities of masonry walls.

13.5 Consult the manufacturer about using SCWCI below grade or ground level because of moisture considerations.

13.6 This insulation is to be used in the temperatures range of -50° F. to 180° F.

13.7 It is recommended that the installer wear a dust mask.



**applegateinsulation**

1000 Highview Drive  
Webberville, MI 48892  
(800) 627-7536

[www.ApplegateInsulation.com](http://www.ApplegateInsulation.com)

Serve the LORD with fear, and rejoice with trembling. (Psalm 2:11)

Copyright 2008 Applegate Holdings, LLC