Installing Cellulose as High-Density Wall Insulation

1. *Select siding to be removed.* High-density installation can save time because less siding is removed compared with the two-hole, low-density method. Select a course of siding that is at a comfortable height above the ground.

2. *Remove siding.* Just about all siding can be removed and replaced successfully, including wood, vinyl, metal, asbestos, and stucco.

3. *Drill sheathing.* Drill with a low speed 1/2" drill (400 to 600 rpm) using a 2-1/8" self-feed bit. Angle hole for easier insertion of tube.

4. *Locate blockage in all cavities.* Driller should find all holes side to side and close to hole. Tube person should find blockages up and down.

5. *Block all bypasses.* Use foam, vent chutes, tin, poly bags filled with fiberglass, or blow tightly with cellulose.

6. *Prepare for blowing insulation.*

- Always start with the tube clean.
- 1-1/4" internal diameter vinyl tube is recommended. Use summer and winter grades.
- For a through-the-fan, cellulose-only blower.
  - Start with air gate wide open.
- For a truck-mount or positive-displacement blower.
  - Start with feed gate totally closed and set air level where it won't blow off interior wall finish.

7. *Blow wall insulation.* Start with normal wall. Put tube all the way into cavity — upward first — until you feel a block at the end. Identify the block; is it the top plate, a fire stop, or a diagonal brace? (Some installers like to put marks on their fill hoses every foot so that it can be used as a crude tape measure.) Turn on the blower and time the fill. When the material flow starts to backup, pull the tube out one foot. Fill until the material starts to back up again. Then pull the tube out a foot again. Continue until you reach the hole with the tube. Now push the tube all the way down in the hole and fill upward. It is a good idea to hold a rag, glove, or piece of fiberglass around the tube where it goes into the hole; this reduces dust and cellulose spillage. Cavities under windows are filled the same way, except there is on upper part to do. For small spaces above windows and doors, use the a fill nozzle instead of a tube.

- For cellulose-only blower:
  - Pull the tube out one foot at a time as the cellulose packs and stops flowing.

- Close the air gate to pack tight an 8 foot high cavity in 2 - 4 minutes. Drill more holes during wait.
- Highest skilled person should drill holes.

- For positive-displacement blower:
  - As the cavity fills and wall starts to pack, switch off the feeder and allow the air to run.
  - Open the feed gate slowly.
  - Pack an 8' cavity in 1-1/2 to 2 minutes.
  - Highest skilled person should run blower.

8. *Monitor the density of the insulation.* Start with three eight foot high cavities, 16" o.c. and one 30 lb. bag of cellulose. If you are blowing right, a 30 lb. bag should run out just before you're done with the third bay. It is a good idea to calculate the density of insulation for the first few bags in order to check that all the equipment is operating as it should. Install one or two bags in an area where you can determine the cubit feet of wall volume. If you know the cubic feet and pounds of cellulose installed, you can determine the pounds per cubic feet. Make necessary adjustments and then continue with the wall blowing. If conditions change, calculate the density again. *Calculating the installed density is a very important part of installing high-density wall insulation; become familiar with this calculation* (you can get density calculation forms at www.karg.com/insulationdensity.htm).

- The cellulose should be so tight in the wall that your fingers won't go through when you push them into the filled hole.
- The target is 1 lb./ft^2 of gross wall area or 3.25 to 3.75 lb./ft^3 density.
- Redo the cavity if it is not tight enough.

9. *Investigate overfilling.* If the cavity isn't filling up after 2 minutes, have a look inside.

10. *Prepare to blow into remaining smaller cavities.* Blow around all windows and doors.

11. *Explore hidden connections and bypasses.*
Examples include enclosed porches, dropped soffits, stair areas, etc. Use zone pressure testing methods to diagnose connections.

12. *Plug holes and replace siding.* Put a small piece of fiberglass into each hole to prevent wicking of moisture from the outside. Replace the siding.

13. Inspect and correct any defects.

Note: This high-density installation method allows cellulose to be installed in walls that already have fiberglass in them. Try to get the tube between the fiberglass and the inside surface of the exterior sheating, then blow the wall as instructed above.