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METHODS FOR DENSEPACKING EXISTING SIDEWALLS WITH CELLULOSE INSULATION

This how-to article points out various methods for dense packing existing sidewalls. Depending upon the method used, one or more injection holes must be bored into each wall cavity to accommodate the delivery hose reducer nozzle. Decide whether the insulation is to be blown dry through the interior side of the sidewall or the exterior side. The exterior application can be more difficult and you may want to hire a professional installer based on the complexity of the type of exterior siding/sheathing already in place. Excluding how to penetrate the exterior siding of the building the following blowing methods apply to both inside and outside applications.

Multi-hole method: **When blowing 8 ft. sidewalls you should have an entry hole at the bottom of each cavity (18"- 24" up from floor level) and another hole at the top of each cavity (12" down from the ceiling), which initially serves to let the machine's forced air pressure escape from the wall cavity as it is filling. Lack of venting can cause damage to the wall's interior/exterior wall covering. The o.d. size of the reducer nozzle's outlet determines the boring size of the entry holes. Holes should be spaced no more than 5' apart. 9 ft. sidewalls require a third hole located midway between both top and bottom entry holes. Taller walls will need additional entry holes, *spaced 4-5 ft. apart*. ALWAYS begin blowing into the bottom hole first. Approximately two-thirds the way up the wall and before the wall cavity is completely filled the cavity will stop taking insulation thru the bottom inlet. When this occurs, the sound of the blower will decrease and material will stop flowing thru the hose. Either shut off the machine and transfer hose or cover outlet with hand and quickly transfer the nozzle to the next hole above. Initially some dust/product will escape thru the top hole(s) but it should be minimal. A partial covering of the upper hole(s), will restrict the cellulose dust from exiting. Blowing 2 x 4 x 8 ft. cavities will generally take less than 1 minute to fill per each cavity.**

Another multi-hole method **is done using a flexible (semi-rigid) tube attached to the outlet end of a reducer nozzle with hose clamps. Implement/ heavy equipment type hydraulic hose can be used. Professional installers use a 1 ¼" clear hose available from insulation supply companies. Called a "feeder tube", the i.d. of the tube should match the o.d. of the reducer nozzle's outlet. With entry holes bored 1 ft. below ceiling and 1 ft. above floor level, probe the feeder tube into the bottom hole and begin blowing pushing the hose upwards into the cavity as insulation fills to the top. The intent is to keep the feeder tube's outlet buried within and below the rising upper level of insulation. Once you've reached the top continue blowing retracting the tube's outlet downward until the outlet end is about to exit the bottom injection hole. Turn off the machine or place palm of hand over tube's outlet and insert into the adjacent cavities' bottom hole. Investigate the many methods for patching the entry holes. When blown from the outside, entry holes can be plugged with plastic or wooden plugs. Note: the purpose of the top hole is to allow air pressure from the machine to exit the wall cavity.**

1-hole method: **Attach a flexible (semi-rigid) tube attached to the outlet end of a reducer nozzle with hose clamps. Implement/ heavy equipment type hydraulic hose can be used. You will need enough hose to reach the bottom of the wall cavity. Bore an entry hole approximately 12" below the top of the wall. The bored entry hole's diameter should be at least 50% larger than the o.d. size of the feeder tube hose. The larger opening releases the machine's air pressure when blowing into the same entry hole. Lower the hose down to the bottom of the cavity and begin blowing while slowly retrieving the hose as the cavity fills upwards to the top. Again, the intent is to keep the tube's outlet partially buried in the insulation as it is rising. Refer to the bag's coverage chart and/or perform the calculations below to determine how many bags are needed and whether you are injecting enough insulation into each sidewall cavity.**

Using either method, a minimum density of 3.0 lbs. of insulation per cu.ft. is required to eliminate settling of the insulation. However, normally you will achieve closer to a 3.5 lbs. pcf +/-, which is approximately 17% more than the bag's coverage chart indicates.

IMPORTANT: *Always use 50' of primary delivery hose minimum.*

IMPORTANT: *Always inject insulation into lowest hole first*

The "bottom-up" blowing procedure will eliminate settling by doing what is called "dense packing", which is achieving sufficient wt. per cu. ft. to eliminate settling in an enclosed cavity. Please observe the number of bags that are listed on the bag's coverage chart, which is calculated based on a 1000 sq.ft. sidewall area. The number of Regal bags needed for a sidewall project are listed on the bag's chart and are based on a 3.0 lbs. density per cu.ft. Again, most installations achieve an average of 3.5 lbs. per cu.ft. It is critical that you install cellulose at this minimum density amount but it's not necessary to blow more than 4.0 lbs. per cu. ft. Less than 3 lbs. and you will most likely have a settling of the product, which will create an area void of insulation in each cavity.

IF BAG'S SIDEWALL FACT / COVERAGE CHART IS NOT APPLICABLE

To calculate # of bags per cavity, *if bag's fact/coverage chart info. is not applicable* due to non-standard dimensions, use the following formula:

(Pre-determine interior dimensions of a single side wall cavity and convert to inches)

1) **Multiply Height (in.) x Width (in.) x Depth (in.) & divide by 1728 = *cu.ft. of single cavity.***

2) **Multiply cu.ft. of single cavity x 3.5 lbs. = *total lbs. of cellulose needed to fill cavity.***
   3.0 lbs. pcf is min. weight required for eliminating settling of insulation.
   NOTE: If cavity depth is more than 5.5", a higher wt. per cu.ft. should be considered, but no more than 4.0 lbs. per cu.ft. is necessary when calculating.

3) **Divide total lbs. per single cavity by mfr.'s wt. per bag = *bag(s) needed per cavity.***
   NOTE: Regal Green 40 @ 20 lbs…Regal MaxPack 44 @ 23 lbs…Regal Pro 50 @ 25 lbs.

4) **Multiply # of bags per cavity times # like remaining cavities = *TOTAL BAGS NEEDED***

Example:

- **Multiply 96" x 14.5" x 3.5" divided by 1728 = 2.82 cu.ft. per cavity**
- **Multiply 2.82 cu.ft. x 3.5 lbs. pcf = 9.87 lbs. of cellulose needed for single cavity**
- **Divide 9.87 by 20 (Regal Green 40 sq.ft. bag) = .49 or 49% of 1 bag to fill 1 cavity.**
- **50 cavities x .49% = 24.7 BAGS NEEDED based on 3.5 lbs. pcf.**

BUT CONSIDER: Sidewall coverage chart numbers are based on 3.0 lbs. pcf. Again, this is a minimum amount to keep the insulation from settling. It is difficult for the hose operator to control and achieve a 3.0 lb. pcf density per cavity due to the velocity of most machines. Most installers will end up achieving an average of 3.5 lb. density pcf in conventional designed wall cavities. Therefore, if the cavity width or depth dimensions are larger than conventional size cavities, using the above formula, you should consider using more than 3.5 lbs pcf in the above 2nd step of the Example to determine "bags needed".

IMPORTANT: *Blowing consistency is important.*

TRIAL & ERROR: Once you have blown a series of cavities, compare the actual # of bags used with your calculations to see how much density you are actually installing vs. your target density. Densities of 3.0-4.0 lbs. pcf would be correct compared to less than 3.0 lbs. pcf, which could allow for settling of the insulation. Blowing in at more than 4.0 lbs. pcf is not a problem except for having to use more bags than necessary, which increases your investment of the project.

NOTE: The 3.5 lbs. indicated above is 17% more than the 3.0 lbs. pcf numbers indicated on the product's coverage chart. Consider increasing the charts indicated bags per 1000 sq.ft. area by 17%.

VERY IMPORTANT: *When using Regal's Predator II machine for sidewalls: you must use Restrictor plate when using reducer nozzle. Also use a minimum of 50 ft. of delivery hose and maximum of 100 ft.*

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