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HOW-TO'S OF BLOWING CELLULOSE INSULATION INTO AN ATTIC

Preparation is ALWAYS a key factor in completing a project successfully. Although we often say that blowing cellulose "is not rocket science", rockets do not launch successfully unless the requirements are known, understood and met. In your home or business, the HVAC conditioned air will exit into and out of the ceiling, wall, window & door areas. This air movement is known as "air infiltration". As the interior conditioned air escapes it is replaced with outside unconditioned air. This ongoing cycle is referred to as "air turns". The number of air turns is proportional to how often your heat/cooling system operates to maintain the desired interior temperature. Therefore, installing a thermal insulation barrier (blanket) that reduces air turns is a must in order to have a comfortable energy efficient home. Following are basic methods for machine blowing cellulose insulation into an attic.

1) BLOWING CELLULOSE OVER EXISTING INSULATION

Climate Chamber Tests performed at Oak Ridge National Laboratory on R-30 loose-fill *fiberglass* proved that when *fiberglass* is subjected to frigid temperatures down to -18 degrees F the rated R-value is reduced up to 50% (R-15). Continued testing had a 2" blanket of cellulose blown on top of the same *fiberglass*. The fiberglass combined with the cellulose then increased to an R-38. When this combination was again subjected to a -18 degrees F the combined R-value held at an R-38. The improvement was a result of cellulose virtually eliminating air movement thru the FG. Air flow temperatures above and/or below 75 degrees F will reduce the FG's R-value. This effect on FG is scientifically documented. The Dept. of Energy (DOE) recommends a total attic R-value window of R-30 to R-60 depending upon the geographical area one lives in the US. See www.energystar.gov reference Recommended Levels of Insulation.

Determining how many bags..... Generally a 2" blanket of additional cellulose over existing insulation is not enough to reinsulate an attic to an energy efficient total R-value level. A standard method is to *estimate* how much R-value you currently have and subtract from a *total desired R-value* to establish the additional R-value needed. Compare the numbered difference to the insulation's coverage-factor sheet, located on the bag, which indicates how many bags min. are needed per selected R-values per each 1000 sq.ft. of attic area. Also indicates install and settled thickness.

NOTE: Base the existing insulation's total R-value on the same type insulation's current advertised R-value per inch times the existing insulation's height in inches. Consider devaluing existing insulation's total R-value up to 25% based on age and condition.

2) BLOWING CELLULOSE INSULATION IN A NEWLY CONSTRUCTED HOME OR ADDITION

Determine the total *desired R-value* based on where you live. Calculate the sq.ft. area and refer to the Mfrs. Coverage-Factor Sheet on the bag to determine how many bags, based on the desired R-value, are needed per each 1000 sq.ft. of attic area. The initial installed height will also be indicated per R-value.

3) THE BLOWING TECHNIQUE CAN EFFECT THE AMOUNT OF SETTLING

The *lofting technique* of positioning the outlet of the hose to an approximate 15 degrees upward blowing angle will add more fluff to the insulation vs. the *directional technique* of aiming the hose outlet downward. The added fluff from lofting the insulation from the hose to the attic floor will allow each bag to cover more area, whereas blowing downward will reduce the amount of settling but will generally consume a little more insulation. Aiming and blowing downward is often required due to interference from the attic's structural design, such as numerous factory designed trusses.

4) CALCULATING ATTIC BAGS NEEDED USING BAG'S COVERAGE-FACT SHEET

EXAMPLE: (using Regal Green 40)

- Desired R-value = R-49, w/bag's fact sheet indicating 80 bags per 1000 sq.ft. area (w/framing)
- Actual attic sq.ft. area = 30' W x 60' L = 1800 sq.ft. attic area
- Actual # of bags needed = $80 \times 1.8 = 144$ bags (Note: $1000 \times 1.8 = 1800$)
- Install height as per fact sheet = 14.5 inches above ceiling floor
- Final settled thickness = 13.1 inches (many weeks after initial blow-in)
- Remember this is based on the MINIMUM # of bags.....a few more may be needed
- Recommend purchasing 5-10% more bags, you can return excess bags you don't use

5) CALCULATING ATTIC BAGS NEEDED WHEN MFRS. FACT SHEET IS NOT APPLICABLE

Divide desired R-value by 3.8 (R-value rating per each settled inch) to establish total settled inches of insulation needed to achieve desired R-value. Multiply attic's total sq.ft. area times the number of settled inches of insulation desired and divide by 12 to give you total cubic feet for same area. Multiply area's total cubic feet times 1.61 lbs. (per fact sheet: 1.61 = # of lbs. of cellulose per sq.ft. @ R-49), which = total cellulose wt. required. Divide total wt. by the advertised wt. of each bag to determine the total number of bags needed. You may want to consider purchasing 5-10% more bags for "overblow".

Regal offers 3 different sized bags of dry blown cellulose insulation:

- Regal Green 40 @ 20 lbs/bag
- Regal Max Pack 44 @ 23 lbs./bag
- Regal Professional 50 @ 25 lbs./bag

EXAMPLE INFORMATION NEEDED:

- | | |
|--------------------------------|---|
| * Total R-value desired = R-49 | * Area sq.ft. = 1800 |
| * R-value/inch = 3.8 | * Bag wt. = 20 lbs. (Regal Green 40) |
| * Given Formula Value = 12 | * Advertised design density (wt.) @ R-49 = 1.61 lbs./cu.ft. |

EXAMPLE CALCULATION

- Divide 49 by 3.8 = 13.1 settled inches needed...(installed height advertised @ 14.5")
- Multiply 1800 by 13.1 and divide by 12 = 1965(total cubic ft.)
- Multiply 1965 by 1.61 = 3164 lbs.....(cellulose needed)
- Divide 3164 by 20 = 158bags needed...(consider 5 % additional for overblow)

Note: formula does not take into account area consumed by ceiling joists. With joists = less bags.

- 6) Excluding very high humidity coastal areas of the U.S. and commercial buildings generating high amounts of moisture within, moisture managing capability of cellulose insulation does not require a vapor barrier (subject to local building codes).
- 7) Standard dry blown cellulose insulation, when blown in, will create dust particles which are not considered hazardous by government standards.
- 8) HVAC ductwork should be covered with an adequate layer of cellulose insulation. Check for leaks prior to adding insulation.
- 9) Caution should be exercised when insulating over non-IC rated recessed light fixtures so as not to trap heat emitted by the fixture. Blowing over IC rated light fixtures is acceptable based on government certification required of the light fixture manufacturer.
- 10) Proper ventilation of an attic is essential. Care should be taken to prevent obstruction of all attic ventilation fixtures.