

Spray Applied Cellulose and Moisture Facts

A Family of four generates between 2 to 5 gallons of moisture per day.

Average 2500 sq ft Building

- Contains: 100 yards of concrete, 10,000 board feet of lumber, 6,000 square feet of drywall, paint and other finishes, adding up to 3,000+ gallons of water released over the first few years of occupancy.
- This size building has 1620 sq ft of 2 x 6 exterior wall, which will take 90 bags or 2,385 lbs of cellulose @10% mc. To spray apply this cellulose @ 40% mc 103 gallons of water will be added. By weight, the spray applied cellulose typically contains much less water than the building materials adjacent to it, i.e. framing lumber and sheetrock.
- All buildings contain significant amounts of construction moisture (i.e. water).

Mold and Decay

- You typically need liquid or free water for mold and decay to grow or spread (i.e. material over its fiber saturation point).
- Better performing insulation systems like cellulose ensure that inside surfaces are above their dew point. Air at its dew point means there is liquid water.
- Water vapor rarely causes problems as long as it stays in a vapor state.
- Spray applied or dense pack cellulose insulation is an air barrier, blocking moist air from entering building cavities and condensing on cold surfaces.

Cellulose Insulation

- Cellulose insulation is hygroscopic, meaning that moisture is dispersed throughout the material, preventing liquid water from accumulating in any one area. Cellulose Insulation also helps to dry out other materials in contact with it. No liquid water, no mold or rot!
- Hysteresis allows the wood fibers in the cellulose insulation to remain at a lower moisture content than the surrounding air, E.G., 50% air RH, 11% cellulose RH.
- Cellulose insulation is able to hold many times its weight in moisture without reaching its fiber saturation point. This capacity allows for seasonal moisture storage, drying, and protection against moisture shocks.
- The boric acid used as a fire retardant also has anti-microbial qualities.

Spray Application

- Since the development of spray application during the early 1980's, hundreds of thousands of homes have been sprayed nationwide.
- Current advances with higher pressure, better water atomization, and more consistent mixing of recycle permit spraying with half the water as before.
- From early "wet spray" to today's slightly damp "spray applied cellulose insulation," we are not aware of a single moisture, mold, or rot problem that has occurred due to the moisture in any cellulose application.
- Applicators look for a mottled wall surface after scrubbing to ensure proper moisture levels.

Drying Time

- National Fiber recommends 24 hours before cover. The interior surface of the cellulose insulation is usually dry to the touch.
- Cellulose can dry very quickly under the right conditions.
- It is not uncommon for the moisture content to drop to 11% after one month
- Propane fired salamander heaters or other unvented combustion heating sources will add moisture and prolong drying of the building.
- Basements or crawl spaces are the cause of many moisture problems, as moisture moves throughout the building. Exterior grading and drainage is critical.

National Fiber's cellulose is the natural choice for insulation.

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Moisture Meters

- Use only calibrated (i.e. accurate) meters for solid or engineered wood and sometimes drywall.
- Pin types are very temperature and density sensitive.
- Non-penetrating types of meters are very density sensitive.
- Moisture meters are most accurate at lower moisture levels, with much variation and error at higher levels.
- Meters are accurate for wood or drywall, but not for insulation, due to its low comparative density.

IAQ

- We have more interior chemicals and pollutants in our homes than ever before.
- Over 40% of homeowners now have allergies.
- A lack of adequate ventilation in tightly constructed buildings can cause air quality and moisture problems.
- Canadian studies have shown that homes with the highest natural leakage had the worst air quality.

Ventilation

- To eliminate moisture buildup and problems, we need to remove moisture at a faster rate than it is coming into the home.
- A 60 cfm fan can remove over 15 gallons of water per day in the winter.
- Better controls will allow for better ventilation; use time delay switches or timers, such as Airetrack.
- A digital moisture gauge is a good tool for determining if ventilation is adequate in a tight home.

Unvented Cathedral Ceilings

- Are basically walls at an angle.
- Do not affect shingle or roof life.
- Can out perform vented assemblies for thermal and fire resistance.
- Work best for 2 x 10 rafter cavities or deeper.

Vapor Barrier

- Not recommended by any cellulose manufacturer.
- Prohibits drying of the wall assembly to the inside, especially during the warmer months.
- Future code offerings are likely to reduce or eliminate the use of vapor barriers, due to problems of summertime condensation in air-conditioned buildings.

Thermal Performance

- R-3.8 per inch.
- For spray applied or dry dense pack, the dense cellulose insulation acts as an air barrier in residential and low rise commercial applications.
- To ensure air barrier performance in loose fill attic applications, additional air sealing is recommended.
- Cellulose insulation will outperform other insulation systems by providing rated R-value and a tighter, more energy efficient thermal envelope.
- Cellulose insulation is unsurpassed in terms of thermal performance, moisture management, fire safety, sound attenuation, and environmental friendliness.
- National Fiber guarantees the work performed by its certified installers against moisture damage caused by our cellulose insulation for the life of the building.
- Cellulose is the best value in insulation today!

If you have any questions or would like to discuss this further, please contact our Technical Manager, Bill Hulstrunk at technical@nationalfiber.com .

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