CONSUMER UPDATE
INSULATION EFFECTIVENESS BULLETIN

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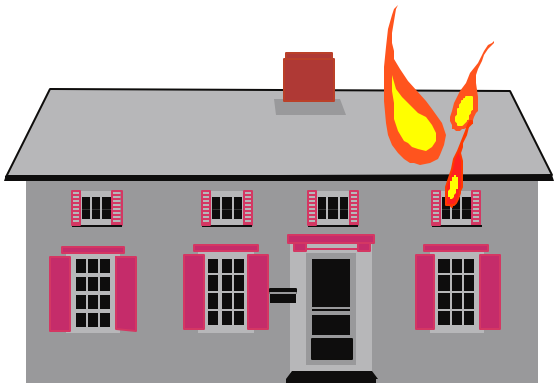
#2

Straight talk about building insulation and fire

Cellulose is the safest and best insulation commonly used in light construction. This is a problem for those selling insulation products that are not as safe and are much less effective. Somehow, they must convince buyers to accept inferior performance. Some sellers of inferior insulation try to do this by frightening buyers.

Maybe you have heard stories about insulation and fire safety. They all have the same theme: "Our material is 'safe insulation,' but their product burns and is the cause of many fires." You may have assumed this is information from an authoritative source.



It isn't. These stories come from the glass industry, a small group of companies selling insulation products that can't compete with cellulose in performance or safety. Here's the truth about insulation and fires.

"Insulation Fires"

Based on the negative marketing activities of some insulation producers you might conclude that cellulose insulation is one of the leading causes of fires in the U.S. and Canada. This is the first big distortion. "Insulation fires" account for less than one half of one percent of all fires. That is, out of every 200 fires, insulation *of any type* may have something to do with the start of one of them.

The actual figures may be much lower. In Florida in 1990 "insulation fires" amounted to three-tenths of one percent of fires. That's less than one fire out of 300.

What's burning?

The most authoritative and comprehensive study of "insulation fires" was conducted in California after allegedly non-conforming cellulose insulation was found in several hundred homes that were insulated under a community weatherization program. This caused concern, because about 2.5 million California homes had been insulated — most of them with cellulose — under weatherization programs.

Interestingly, the number of residential fires in California decreased significantly during the period when cellulose insulation was being installed in millions of California homes. Still, California utilities, the state fire marshal, and the California Bureau of Home Furnishings wanted to investigate the fire risk of insulation.

Since the key area of concern was attics, the California Task Force used the state fire marshal's computer data base of fire incident reports to isolate fires that started in attics. It further refined this by having the computer identify residential attic fires in which insulation was the first material to burn. The computer found about 160 fires that fit this profile in the 11-year period from 1974 through 1984. This is 0.009% — nine-thousandths of one percent — of all fires. That's one fire out of every 10,000.

This figure raises important questions, because "insulation fires" apparently represent about one half of one percent of all fires — 50 fires in 10,000 — in California and throughout the nation. If only one fire in 10,000 starts in attic insulation, where do the other 49 "insulation fires" start?

The only other location where a significant number of insulation fires can start is walls. Cellulose is often found in attics — especially in California — but, until recently, it was seldom installed in walls. Kraft paper-faced glass batt insulation is widely used in walls.

It would appear that for every "insulation fire" that starts in the area where cellulose is commonly used, 49 "insulation fires" start in areas where paper-faced glass batts are usually found.

In a letter to CIMA dated February 28, 1995, an official of the California Bureau of Home Furnishings reported more recent data. The letter said, in part:

Since 1985 the incidents of fires in California originating in insulation reported to our State Fire Marshal's Office has declined from 700 to 400 incidents per year. . . . Our Fire Marshal's Office has also

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attempted to record incidents of insulation fires where cellulose could be identified as the material first ignited. Identified cellulose fires averaged only 7 per year since 1985 and are declining in recent years. . . . . There are an estimated 3 million homes in California which have cellulose installed.

Consider the implications of this information. In California 400 to 700 fires "start in insulation" every year. Seven, or fewer, of these "insulation fires" — 2%, or less — start in cellulose, in spite of the fact that about 40% of the homes in California have cellulose insulation. And makers of other insulation claim that cellulose is a fire hazard!

Banned in Canada

In Canada fire incidents were among the factors that resulted in the withdrawal of paper-faced batt insulation from the market. Today such batts, which are among the most commonly-used forms of insulation in the U.S., are no longer sold in Canada.

Paper-faced batts are not fire retardant and they are not covered by the same stringent flammability standards that apply to cellulose insulation. Cellulose insulation, whether installed in walls or ceilings, is required by federal law to meet a surface burning standard most authorities regard as equivalent to a Class I flame spread rating. To qualify as a Class I material, insulation must have a flame spread of 25 or lower as determined by ASTM Standard E-84. Most cellulose products have flame spread ratings well under 25. A famous testing laboratory has measured the flame spread of paper-faced glass batts at approximately 2,000.

Assuring an abundant oxygen supply

Frightening as the flame spread characteristics of paper-faced batts may be, the principal hazard of glass fiber insulation in a fire situation isn't the flammability of the facing. It's the unrestricted supply of oxygen fiber glass assures will be available to burning framing lumber.

Fiber glass has a wide open structure that is all but transparent to fire and air, and it quickly softens and melts as the fire intensifies. When fire occurs in or spreads into a wall insulated with fiber glass the insulation provides little resistance to the flames and the oxygen that supports them. Wall cavities become convection chambers that literally pump oxygen to the fire. Anyone who has ever built a fire in a fireplace has seen this principle in action.

When walls are insulated with cellulose the scenario is quite different. Cellulose is dense material that is relatively impervious to flames and gases . Because of this, and the fire retardance of the material, fire does not spread as readily into cellulose-insulated walls or ceilings. Walls insulated with cellulose don't become draft chambers that deliver oxygen to burning framing members. Cellulose greatly restricts the amount of oxygen available to support combustion in insulated assemblies; fiber glass assures an abundant oxygen supply.

This is why in several demonstrations cellulose-insulated buildings have retained structural integrity much longer than buildings with fiber glass. In the most famous demonstration, the ceiling of a fiber glass-insulated structure collapsed 20 minutes after the fire was ignited. The ceiling of a cellulose-insulated structure remained intact for 70 minutes.

In less then two hours the fiber glass structure burned to the ground. After three hours all four walls of the cellulose structure were standing, and the fire had burned out. When the walls were opened there was surprising little damage to the framing lumber.

Cellulose resists fire better

In 1994 researchers at the National Fire Laboratory of theNational Research Council Canada put scientific authority behind the burn demonstrations. After an extensive research program that tested the actual fire performance of insulated walls the NRCC scientists reported:

The fire resistance performance of an assembly with glass fibre insulation in the wall cavity was slightly lower than that of a non-insulated assembly.

The installation of cellulose fiber in the wall cavity provided an increase in the fire resistance performance of 22% to 55% compared to a non-insulated assembly.

Tests conducted for CIMA by Omega Point Laboratories in1999 showed that cellulose insulation is so fire-resistant it is safe to install electrical boxes as close at 3 1/2 inches to each other on opposite sides of fire-rated walls. The new ICC codes accept this, while continuing to require a separation of 24 inches in fiber glass-insulated walls.

These tests indicate that in a fire situation cellulose may give building occupants more time to reach safety and fire fighters more time to mitigate damage.

What's the real issue?

In a home insulated to Model Energy Code standards with cellulose, insulation represents only 5% to 7% by weight of the wood-based materials. Cellulose is always fire retardant. The other 93% to 95% are wood products that are seldom fire retardant. Why the focus on the 5% to 7% that is fire retardant? "Insulation fires" are less than one-half of one percent of all fires. Why do you hear so much about "insulation fires"?

Fire statistics, demonstration burns, and research indicate that fiber glass performs worst under actual fire conditions. Why is cellulose represented as a "fire hazard"?

It's simple. When compared with cellulose, fiber glass has no benefits that can be marketed. Fiber glass decreases fire safety, and may cause cancer and sick building syndrome. Most significantly, cellulose outperforms fiber glass as insulation material by a wide margin -- 26 to 38 percent in a study by Colorado University. Glass insulation can only be sold by creating fear of the superior alternative.

Cellulose. . .it's naturally safer insulation!