

What's All the Hype about Hemp?



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Hemp is a natural fiber that can be used in concrete, insulation, furniture, and much more.

Hemp is not new. It has a recorded history going back more than 4,000 years. You may remember hearing that George Washington grew the stuff on his plantation, which he and many others did because, in pre-industrial America, it was a staple cash crop and had many uses like: cloth, sail, rope, netting, paper, and many more. The first drafts of the Declaration of Independence were written on hemp paper, and until the 1890s, most paper in the United States was made from hemp. Hemp was a very common crop in the United States, especially in tobacco-growing states until its cultivation was outlawed in 1937, the same year that cannabis was banned. During WWII, hemp was deemed essential to the war effort and special licenses were granted to grow hemp, but by 1947, hemp was gone. Hemp farmers have been struggling ever since to draw a distinction between industrial hemp, which for all practical purposes, has no psychoactive qualities but many valuable commercial uses, and its close genetic cousin, cannabis (aka marijuana), which is popular with recreational and medical users today.

Game Changer. The 2018 Farm Bill

The 2018 Farm Bill, which was passed this past December, is a sweeping piece of legislation that bolstered farmers with the passage of The Hemp Farming Act, a bipartisan legislation delisting hemp as a controlled substance allowing for hemp cultivation to be reclassified as an agricultural commodity...breathing new life into the farming industry. This gave the green light, or as I've heard, started a gold rush, in a new segment of the agricultural industry. The result: a torrent of new "hemp"-based products that will appear everywhere, especially in the construction industry. Now that hemp is legal, expect to see innovative products hit the marketplace directed toward homeowners, contractors, builders, designers, and architects. Don't get too excited. Hemp is not the answer to all your prayers, but it does have useful properties, which in many ways can substitute what you are using now for faster, better, cheaper.

What We Know about Hemp

Let's start with sustainability. Hemp is a fast-growing, exceptionally strong, non-wood natural plant fiber. It's a weed that can thrive almost anywhere in the world. It's possible to grow two or three crop cycles a year in some places in the United States. Compare that to a 15- to 25-year growing cycle for wood fiber products.

European and Canadian builders have a head start with access to hemp, where they have been using it for years for insulation as a cost-effective substitute for fiberglass, cellulose, or mineral wool. Hemp insulation has many advantages. It has a very long service life — walls opened up in France 50 years after construction showed hemp insulation looking essentially brand new. It's composed mostly of a natural fiber (88% hemp fiber and 12% polyester fiber) with no chemical binders and no VOC off-gassing. It's vapor-permeable and naturally repellant to mold, rodents and insects.

Some builders in Europe and Canada have successfully tinkered with a mix of hemp fibers and lime called "hempcrete," but the wide-scale use of industrial hemp as a concrete substitute has a long way to go in research and development before being adopted in U.S. markets.

Early Innovation

Almost standing alone is one of the early hemp innovators in the United States, a company called Sunstrand LLC, based in Louisville, Kentucky. Organized in 2014, this vertically integrated company is by its own admission "ahead of the curve." Since its founding, the company has acquired special permits allowing them to grow and process hemp in Kentucky. Sunstrand cultivates the plants, processes the plants and has its own in-house product development, manufacturing, and distribution. According to CEO, Trey Riddle, Ph.D., "By 2021, we expect a global demand of over \$3.5 billion for natural fiber composites in the building and construction industry. With Americans importing about \$600 million worth of hemp annually from places like China and Canada, it makes sense to grow hemp locally, where it seems to thrive." Trey emphasized that in addition to thermal properties for insulation, natural hemp fibers can be utilized in railings, molding and trim, decking, door panels, window frames, acoustical ceiling tiles, and many other building materials.

Sunstrand also supplies natural fibers to a range of other industries, including automotive, cosmetics, textiles, electrical



There is a giant opportunity around hemp, and we wouldn't have this opportunity without the passing of the 2018 Farm Bill. Hemp is a rapidly renewable resource that can optimize sustainability, enhance performance, and promote American farming. —Trey Riddle, Ph. D., founder and CEO, Sunstrand LLC.

and electronics, recreation industries and lightweight composites. But now the company is focused on a finished consumer product of its own in the form of a hemp insulation batt.

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The positive environmental impacts of growing the hemp needed to make natural fiber insulation begin as soon as the seeds are planted. As the crops grow, they absorb CO2 from the atmosphere and store it away. Once made into insulation, this carbon is sequestered into the walls, removing it from the environment for the product's lifetime.

Theresa Guerra, a product sales specialist for building materials at Sunstrand, says that the batt is a blend of hemp and kenaf fibers. Hemp is grown locally from seed that Sunstrand supplies. To date, the company has produced enough batts to let local builders try them, but it's still doing final testing and expanding a retail distribution chain.

For the time being, batts are being produced in one size and thickness: 15 1/2 inches x 97 inches and 3 1/2 inches thick. They cost about \$1 per square foot, Guerra said. Sunstrand says that the hemp insulation functions like traditional insulation with excellent thermal and acoustical properties, breathable, "without agitating the skin like fiberglass." The proprietary binder in the blend is fire-, mold-, and fungus-resistant.

Adam Block, the company's vice president for sales and marketing, says that Sunstrand developed the insulation because people were tired of fiberglass and saw only a limited number of alternatives. Asked whether the company was considering expanding its line, Block said that would depend on consumer demand. Sunstrand chose an R-13 batt because it's the most commonly used type. Whether it would be worthwhile investing more money in research and development, engineering, and manufacturing to make other forms of the insulation isn't clear quite yet.

Improving Home Efficiency

In addition to the beneficial environmental impacts that natural fiber insulation provides, it also performs well when compared to other insulating material. Its high thermal mass helps keep the interior temperature of the building stable, reducing the need for a constantly running air conditioning during extreme seasonal months.

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Hemp is a sustainable alternative for wall cavity insulation with price and performance advantages. This is what hemp insulation looks like (L) compared to fiberglass (R).

Natural fiber insulation also reduces the growth of mold inside the walls of your home. This is attributed to the breathability of the material and the resilience of the insulation when exposed to moisture. Hemp can naturally absorb up to 20% of its weight in moisture, causing it to draw out any moisture that could damage the supporting frame structure of the wall. Once the moisture is collected in the insulation, it will gradually evaporate and keep the interior of the walls dry and mold-free.

Noise Reduction. The acoustic properties of the natural fiber insulation help reduce the sounds from nearby noise polluters, making it a great option for buildings located in cities or near busy interstates and highways.

Fire Resistant. Sunstrand's natural fiber insulation is treated with a salt-based fire retardant. This treatment helps reduce the flammability of the material, but also further reduces the development of mold and mildew.

Pest Resistant. Thanks to the same properties that allow hemp to be grown without the use of pesticides, Sunstrand's fiber insulation is naturally pest-resistant. This resistance is improved further by the salt-based treatment discussed above.

Non-Hazardous Work Material. Unlike traditional fiberglass insulation, the need for protective equipment during transportation and installation is significantly reduced. The material can be handled without gloves and does not cause the skin, eye, and respiratory irritation associated with traditional materials.

Sunstrand has also developed a product CoreBoard, which is made with large hemp particles. This offers an alternative to typical substrates used in furniture, cabinetry, wall partitions, decorative panels and more. As the public demands environmental consciousness, more and more government regulations and codes require sustainable building practices. Hemp-based materials contribute to LEED certification and keep structures in line with eco-friendly protocols. Heads up. Since hemp cultivation is just getting started, it may be awhile before you start seeing it in on the shelf at your favorite builder's supply. ☘

For more information about hemp products, contact:

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