

BUILDING HOUSES

A completed Agriboard house.

from Straw

PANELS MADE FROM WHEAT STRAW MAY REDUCE NEED FOR LUMBER, WHILE HELPING FARMERS AND PRESERVING THE ENVIRONMENT

Straw houses gained a bad reputation in children's fairy tales, but that may soon change in real life thanks to a new company. Last month, Texas-based Agriboard Industries began manufacturing a panelized building system made from com-

pressed wheat straw. According to company officials, Agriboard®, the core material of the system, offers exceptional strength, resists fire, reduces noise, cuts utility bills, costs less than traditional wood frame construction and helps farmers and the environment.

FROM STRAW TO BUILDING MATERIAL

How is wheat straw transformed into a solid, energy-efficient building material? This requires a proprietary, 240-foot-long extrusion mill, fabricated by Raytheon Engineers and Constructors of Englewood, Colo. It's the first mill in the world to produce a 3 5/8-inch-thick panel.

Large square straw bales are fed into the mill. The mill separates the straw into loose fibers, compresses it under intense 400-degree heat and fuses it into one long, solid 4-foot-wide by 5/8-inch board. The mill uses heat and pressure without chemical binders or toxic substances. The board is then wrapped in heavy-duty Kraft paper and cut to pre-determined lengths. Two Agriboard panels are laminated between 7/16-inch oriented strand board, a plywood-type material, to form stress skin panels.

Agriboard panels range in size up to 8 feet wide, 16 feet long, and 8 1/4 inches thick. Interior partition panels, made with a single thickness of Agriboard, are 4 1/2 inches thick. Exterior panels and



An Agriboard house being constructed looks very much like a house built with everyday building materials.

roof panels are twice as thick. Interior and exterior finishes, such as Sheetrock, paneling, brick and siding can be applied directly to the panels.

Agriboard Industries will manufacture and sell complete building shells for single-family and multi-family homes, town houses, apart-

ments and commercial buildings in the Southwest.

ADVANTAGES OF THE ALTERNATIVE

According to company President Barry J. Sullivan, Agriboard offers attractive benefits to builders and homeowners.

“Agriboard buildings respond to builders’ and home buyers’ concerns about the cost, quality and performance of today’s conventional construction, as well as its wasteful use of vital natural resources,” Sullivan said.

One advantage is that Agriboard homes require 65 percent less lumber than wood-frame houses, a savings of up to \$3 per square foot in building a new home. This should attract the attention of builders who seek alternative building materials because of rising lumber costs and increasing restrictions on logging.

Agriboard offers other advantages. The panels’ insulation quality has been tested and rated at R-28 for walls and R-42.8 for ceilings, which means lower utility bills. The panels offer up to a two-hour fire-resistance rating because of their high density. According to research conducted by the National Association of Home Builders and other groups, the Agriboard panel is stronger and quieter than other panel-

iced housing products. Structural tests have shown Agriboard panels to be two to three times stronger than wood-frame construction. Yet Agriboard buildings are competitively priced and can be constructed faster than wood-frame houses.

“Because the building shells are brought in on trucks and bolted together by fewer workers in less time than required for traditional houses, the construction costs are less,” Sullivan said.

RECEIVED \$850,000 FROM USDA

Agriboard panels are made from an abundant, renewable and non-toxic agricultural byproduct. This reduces the need for wood and helps conserve forests, thus helping to preserve the environment.

Farmers will benefit from the sale of byproducts they usually discard, including wheat and rice straw and switch grass. Agriboard Industries estimates it will need 15,000 tons of wheat straw per year for the first few years of production, and 35,000 tons by the seventh year. This will provide \$6 million to Southwest farmers during the next 10 years. More than 750,000 acres of wheat is grown within a 50-mile radius of the company’s Electra, Texas, facility. The benefit to farmers led the U. S. Department of Agriculture’s Alternative Agriculture Research and Commercialization Center to invest \$850,000 in Agriboard Industries.

A 60-YEAR HISTORY

Agriboard is not new. It is the latest advance in a technology that has been developing for more than 60 years.

Straw and other fibrous materials have been used to build homes throughout the world for centuries. In 1934, a Swede named Nils Reiberg developed a system that compressed straw fiber under heat and pressure in an extrusion process. In the 1940s, fiberboard manufacturing plants were established in Norway, Poland, Holland and England. From 1947 to 1961, some 20 fiberboard mills were manufactured and installed throughout Europe, Canada and Australia. These mills produced more than 300 million square feet of fiberboard for commercial and residential buildings. The roof of London’s Heathrow Airport is made of it.

Despite its effectiveness, agricultural

fiberboard never gained widespread acceptance during those years. Energy was still cheap, as were materials such as plywood, gypsum board, fiberglass and other types of paneling.

In 1979, while researching core materials for structural insulated panels, Sullivan met Sven Jonsson, who worked with Reiberg. In 1980, Sullivan formed Tetrattech Building Systems and contracted Jonsson to design and engineer an extrusion mill to produce the world’s first 3-inch-thick compressed agricultural fiber core panel. From 1980 to 1984, Tetrattech’s mill, based in Carrollton, Texas, produced fiberboard panels for homes and other buildings in the United States,

Jamaica and Nigeria. Tetrattech constructed several fiberboard homes in Dallas and Austin.

A failing economy shut down Tetrattech in the mid 1980s. However, today's increased environmental awareness

Agriboard panels are made from an abundant, renewable and non-toxic agricultural byproduct. This reduces the need for wood and helps conserve forests, thus helping to preserve the environment.

combined with higher lumber prices and advances in fiberboard technology persuaded Sullivan to re-enter the business in 1993. His new company, Agriboard Industries, obtained a \$5.6 million financing package earlier this year. Investors include Benefit Life Insurance Company of Dallas, private investors and the U.S. Department of

Agriculture's Alternative Agricultural Research and Commercialization Center. The company's 80,000-square-foot facility is based in Electra, Texas, 160 miles east of Dallas.

CONTRACTS ARE SIGNED

Sullivan is convinced Agriboard's time has come. The product has generated national and international media interest. The response from Texas builders and contractors has been "very warm," according to Bill Thompson, vice president of marketing.

"We've had excellent meetings with many builders, and we've already signed contracts worth \$7.5 million to construct two apartment buildings in Austin, Texas," Thompson said.

Thompson has received 2,000 inquiries and many letters of intent from builders and real estate developers nationwide. The company will market Agriboard to builders, architects, home buyers and buyers of commercial build-

ings. Thompson sees the growing "green market" of environmentally conscious home buyers as another strong market for Agriboard. Market research published in Automated Builder magazine shows that panelized housing continues to capture an increasing share of the U.S. housing market—from 35 percent in 1988 to 39 percent in 1994.

INTEREST IS WIDESPREAD

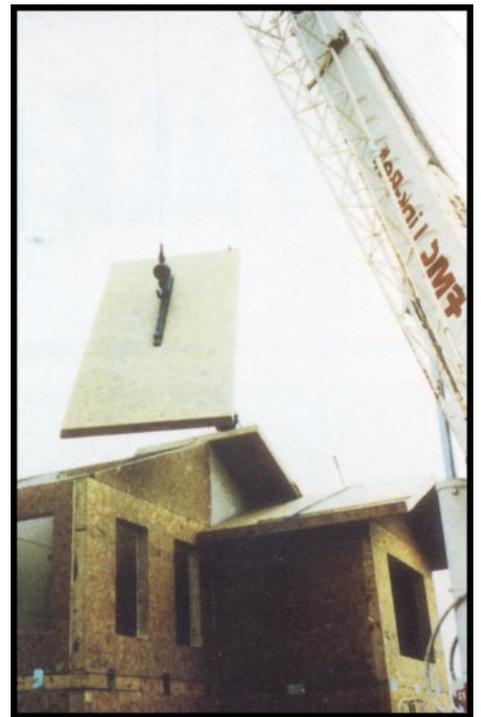
"We've received many inquiries from all over the world, from China and Japan to Hungary, Australia and Argentina," Thompson said.

Initially, Agriboard Industries plans to market its building system within a 500-mile radius of its Electra plant, an area with a population of more than 38 million. Future plans call for international expansion; the company has received letters of intent from buyers in China, Japan, Vietnam, Mexico, Bolivia, Argentina, Hungary, Russia,

Germany, India, Pakistan, Burma and Australia.

While he is encouraged by the interest generated by Agriboard, Thompson said the most important response comes from people who live in the first test homes built in the 1980s.

“The electric bills are low,” said Floyd Johnson of Austin, who’s lived in an Agriboard home since 1983. “It doesn’t take much to cool the house and keep



An Agriboard roof panel being lifted into place.

it cool. I love it. We’ll probably never find another home like it. Both the design and materials are great.”

“From a thermal standpoint, the house is very heat and cold resistant,” said Bob Kryzak of hi Agriboard house in Coppell, Texas. “I live near the airport, and you can hardly hear the aircraft because of the nature of the building. I always kid people and tell them I live in a straw house. They think I’m joking, but most people are just amazed.” 🗨️