

# Storm of Innovations

## Hurricane Hindsight



Photo courtesy of Stanley BOSTITCH.

Dr. Ed Sutt, AKA Dr. Nail, began studying hurricane damage and nail performance in the 1990s.

The editors of *Popular Science* magazine review thousands of new products and technologies annually and select 100 breakthroughs, in ten categories, to present with its “Best of What’s New” award. This year, the magazine chose to honor one product with an overall outstanding “Innovation of the Year” award. Out of the thousands of products tested, the award didn’t go to some tiny, electronic gizmo or a new hybrid vehicle, as you might expect, but rather—to a nail.

While there’s no debating the devastating impact Hurricane Katrina had and continues to have on the Gulf Coast region, it sometimes takes a disaster to spur an industry into action and cause us to rethink things as simple as the common nail.

When used to fasten down roof, floor and wall sheathing, the Hurriquake nail provides up to twice the wind resistance as a common nail and up to 50 percent more resistance to earthquake conditions; thus the name. The nail’s developer, Dr. Ed Sutt, or as his colleagues know him—Dr. Nail, says improvements were made in head-size, plastic collation, and a screw shank was added on the upper portion to fill the gap created by deep ring shank technology. These innovations may seem simple at first glance—something

you might expect a carpenter to realize in a midnight flash of inspiration, but this product’s development technically began in the early- to mid-1990s.

“I look at the Hurriquake as a post-Andrew development,” explained Sutt. He was studying at Clemson University when the Federal government released funds for hurricane research, so he started researching how to make houses more hurricane resistant. *That* was the Hurriquake’s starting point.

“I had the opportunity to go and look at storm damage in the mid-1990s and see the type of damage that occurs, and I discovered that fasteners are really where things begin to fall apart,” says Sutt.

When he began working for his current employer, tool and fastener manufacturer—Stanley BOSTITCH in East Greenwich, R.I., he was able to combine what he learned at Clemson with the company’s extensive background in fastener technology.

“Generation one was on the market in 2002,” Sutt says.

At that time the industry was in a somewhat complacent mode regarding hurricane resistance. “When we launched the high-performing, high-wind fastener, people didn’t really care. That was ten years after the last



by Drew Vass,

assistant editor of SHELTER magazine.

major storm and it wasn't on people's minds," Sutt says.

Then came Hurricane Katrina. "When we made the official launch [of the Hurricane] at the International Builders' Show in January of 2006 in Orlando, Fla., there was a lot of focus on it, because Katrina was fresh on people's minds."

The building industry has reacted with new innovations designed to help and protect us in hurricane conditions. But the recent success of storm-related products isn't limited to new products; a closer look reveals that some of these "new" products have actually been around a while—hiding in the woodwork of our industry. And there may be more factors than just Katrina recently bringing them into full view. As the saying goes, hindsight is twenty-twenty.

## True Conviction

Good timing took a little longer for the Southern Pine Council (SPC). A lot longer in fact.

But no one could be more familiar with Katrina's devastation. Headquartered in Kenner, La., this joint promotional body was motivated post-Katrina to take up its drum and start preaching the benefits of a raised-floor construction system.

"The peer-and-beam construction that we've been promoting for about three years now is a natural example of how water can rise, flow right under a house and then just go away," says Steve Bean, vice president, marketing. "It just breaks your heart to drive down through some of these neighborhoods and see destroyed house after destroyed house and every one of them is sitting right on the ground."

Slab construction involves excavating and pouring concrete directly on the ground where it serves as both a home's foundation and as a sub-floor for the first level. A raised floor system utilizes a wood frame, built on structural piers or a perimeter foundation.

"Although the concept of promoting raised floors goes back well before Katrina, Katrina underlined the importance of it to the degree that we felt we just had to act," says Bean. "So many people were flooded, even right around our building here, which is quite a ways from the lake and river. People got 6 to 12 inches of water in their houses."

"We were very fortunate. Our building is

*continued on page 28*



Companies began thinking about hurricane damage and rethinking product design after Hurricane Andrew in August of 1992.

## HURRICANE HISTORY

### 1992—Hurricane Andrew

This storm began as a tropical wave emerging from the west coast of Africa on August 14. The wave created a tropical depression on August 16, became Tropical Storm Andrew the next day and eventually the most destructive United States hurricane of record.

This category 4 storm made its way across south Florida on August 24, then continued westward into the Gulf of Mexico where it gradually turned north. Hurricane Andrew arrived on the central Louisiana coast August 26, as a Category 3 hurricane.

In Florida, Andrew produced a 17-foot storm surge near the landfall point and storm tides of at least 8 feet reached portions of the Louisiana coast. This hurricane also produced a killer tornado in southeastern Louisiana and is responsible for 23 deaths in the United States and three in the Bahamas. It caused \$26.5 billion in damage in the United States—\$1 billion in Louisiana and the rest in south Florida. Damage in the Bahamas was estimated around \$250 million.

### 2005—Hurricane Katrina

Hurricane Katrina proved to be one of the most devastating hurricanes in U.S. history and the deadliest since the Palm Beach-Lake Okeechobee hurricane of September 1928. Damages are estimated at \$75 billion in the New Orleans area and along the Mississippi coast, making it the costliest U.S. hurricane on record.

This storm was responsible for approximately 1200 deaths, including about 1000 in Louisiana, 200 in Mississippi and seven in southern Florida. It caused catastrophic damage in southeastern Louisiana and southern Mississippi. The storm surge created damage extending several miles inland along the Mississippi coast, causing total destruction of many structures. Similar damage also occurred in parts of southeastern Louisiana, southeast of New Orleans. The surge was responsible for breached levees in the New Orleans metropolitan area, flooding much of the city and its eastern suburbs. This storm also caused wind and water damage in Miami-Dade and Broward counties.



# Storm of Innovations

## What's the Motive?

Is increased public awareness enough to catapult the industry into an impact-resistant, storm-proof era? If not, where does the added push come from?

Just as the lending industry paddled its way into one last wave with creative lending terms recently, building product manufacturers began announcing early into a slowing housing economy they would begin foraging for market share with more distinctive products and innovations.

Impact-resistant doors and windows have been around since long before Hurricane Katrina. But there's no denying, especially for anyone who attended this year's International Builders' Show (IBS) in Orlando, Fla., that these sorts of products and techniques have taken center-stage lately. So what does this mean? Are companies capitalizing on misfortune? Or are they simply reacting to a series of disastrous events and rethinking product design?

"One of the things that occurred in all of these storms, people were allowed to use storm shutters and even plywood, but what occurred was, with vacation homes, no one was there to put up shutters. So that's what we were really looking at—what can we provide our customers, that will not require them to climb up a ladder and install plywood, or go back into dangerous conditions when they should be evacuating, that still provides an aesthetically pleasing style," says Ken Flint, business manager, vinyl products for MW Windows & Doors.

raised about 5 feet off the ground," Bean says.

"The builders and designers who made this structure had a lot of foresight and the water just flowed under our building and right out. If we had power and phones, we could have come right back to work within two days."

Richard Kleiner, director, treated markets says it doesn't take a storm as catastrophic as Katrina to put some families under water.

"Post war, the slab took over the foundation market and the community has suffered for it ever since," says Kleiner. "Although Katrina was a major disaster, we're in an area in Louisiana between Baton Rouge and New Orleans where we get about 60 inches of rain fall a year, so any time the area gets major rainfall, a lot of these pumps can't keep up. A lot of these slab homes have actually ended up with two to three feet of water in them," Kleiner says.

The first floor in a raised system can be elevated to a desired level by adding courses of brick and block, or increasing the form height for concrete.

"If these homes had been built two to three feet above the ground, thousands would have been saved in Katrina," Bean explains.

Both men explained that public awareness has sky rocketed after Katrina. SPC conducted a focus group about a month prior to talking with **SHELTER** and Kleiner said they were amazed at how informed the group was about styles and construction methods.

Although MW Windows & Doors, headquartered in Rocky Mount, Va., featured its Classic Series of Impact Windows and Patio Doors at IBS this year, it's by no means a Johnny-come-lately.

"MW's Classic series was introduced about five years ago. We were looking at impact windows and were actually selling them before Katrina, but we were just introducing the Classic product at that time," says Ken Flint, business manager, vinyl products. "Katrina may have focused people's attention [on impact windows], but the ball was rolling ever since at least Hurricane Andrew."

In August 1992, Hurricane Andrew left 60 dead, 23,200 homes destroyed and 514,403 homes damaged. As a result, the South Florida Building Code (SFBC) was developed

and in 1993 became the first building code in the United States to mandate windborne debris protection. Hurricanes have been around as long as the Earth and glass-paned windows date back to the pharaohs of Egypt, but it was Andrew that made people realize window failure was about more than just water intrusion and broken glass. New impact windows are not only designed to resist damage from airborne debris, but also to resist damage and failure from over-pressurization.

"The point in these windows isn't to prevent broken glass, you conduct DP rating tests on a window once the glass has been broken. But when a window gives up and tears loose, pressure fluctuations for wind occur and that's how a roof gets lifted off. The key is keeping a window from giving way," Flint says.

He says this trend is partly fueled by public awareness, but also by requirements. "It's not just public awareness. As different states start enforcing these guidelines we'll see that there's more required all the way up the east coast and across into Mississippi, Louisiana and Texas," he says.

With an expanding market, he says MW is obviously excited about the outlook. In fact, at this point, the company won't even *think* about a new product line without considering impact features.

"Now days, as we develop new products, we do it keeping the ability to make it an impact product in mind," he says.

## Dragged In ... but Not Kicking and Screaming

ODL didn't get in on the impact bandwagon with its decorative blinds to capitalize on misfortune; the decorative door glass, skylights and window producer got in because it *had* to. When impact-resistant glass became the norm in hurricane-prone areas, the Zeeland, Mich.-based company had to completely redesign its doorglass blinds to accommodate.

"We had developed products about a year before Katrina, but adoption was pretty slow outside of the state of Florida," says Scott Spence ODL's product manager, clear door-glass, integral treatments.

Spence admits that Katrina had a major impact on demand though, and agrees that

the industry tends to be reactive.

“About nine months prior to Katrina, ironically enough, the National Hurricane Conference was in New Orleans, so we set up a booth there,” Spence says. “There wasn’t really a push at that time to introduce product. Nine months later, everybody was saying, ‘Wait a minute, maybe we should be introducing codes and putting products in place instead of worrying about how we’re going to *react* to these situations.’”

Spence confirms that there’s more to the equation than just heightened awareness. He says companies are under tremendous pressure these days to constantly be innovative. While the industry has had somewhat of a knee-jerk reaction to Katrina and a slower market, he says it’s also a matter of changing times.

“I think we’re seeing a cycle now where companies are scrambling, trying to secure more market share in a down turn, so creativity and ingenuity are coming out of that, but also I think companies have an ongoing awareness now days. They know they have to be creative even when business is good,” he says.

Everything is accelerating and companies have to keep up, according to Spence. “When we sit back and watch product life cycles that are shorter, everybody’s getting smarter in how they develop products and how quickly they can fulfill them,” he says.

## Bullet-Proof Timing

Not every storm-resistant innovation can be attributed to Andrew or Katrina, or even hurricanes in general. Long before Katrina, multi-national chemicals and health care company—Dupont™ began developing its StormRoom™ with Kevlar®. In fact, market manager Gary Burnett says, “After the tragic [tornadoes] in Oklahoma in 1999, FEMA began developing guidelines to help protect people against tornadoes.” Knowledge of hurricanes played a part in its development, but the science of Kevlar® and FEMA guidelines prompted DuPont to begin the initial research and development.

According to Burnett, recent interest and the product’s appearance at this year’s IBS aren’t all about capitalizing on perfect timing.

“It is the DuPont culture of innovation and science that continues to develop new



ways to protect people and help solve problems before they start,” he says. “Before [its development], DuPont had over a decade’s worth of experience in extreme weather protection starting with the rebuilding efforts following Hurricane Andrew and the development of hurricane codes and hurricane protective windows.”

**SHELTER** asked Burnett, “Who serves as the target buyer?”

“A target buyer is a homeowner that is concerned for the safety of his or her family in the event of a severe wind event,” he says.

So it’s only natural that following a storm like Katrina, and really a string of storms in recent years, that the public’s interest would be heightened.

“Homeowners who have experienced an extreme weather event are typically the people that fully understand the benefits of a storm shelter,” Burnett says.

And a modern storm room doesn’t have the eccentric reputation of an old bomb shelter. In fact, the version on display at IBS was actually outfitted as a modern closet, as an example of how consumers can integrate design and style. According to Dupont, many customers are realizing that its storm rooms can actually be outfitted as a bath, or even an attractive wine cellar. Now there’s a storm room worth being stuck in!

The alignment of Katrina with the tail-end of a housing boom may have done miracles for impact resistance and building product innovations in general. If it’s possible for a catastrophe to have a positive effect, this may be it for the building industry. 

Dupont’s StormRoom™ with Kevlar® can be incorporated into a house’s design and function just like any room, or even outfitted as a wine cellar or bath.