



# IBHS Research Center

## Overview

In 2010, the Insurance Institute for Business & Home Safety (IBHS) created a unique, state-of-the-art, multi-risk applied research facility on a 90-acre parcel of land in Chester County, South Carolina, about 45 minutes south of the Charlotte Douglas International Airport. The Research Center is a quantum leap forward for building science because it enables researchers to for the first time test full-scale one- and two-story residential and commercial building specimens and systems. Testing programs involve highly realistic replications of real-world, potentially disastrous events, such as high winds, wind-driven rain, hail, and wildfires.

The lab's ability to completely engulf full-scale 1,200 sq. ft. to 2,400 sq. ft. buildings in various types of realistic "storms" allows holistic testing of building systems in ways that have never been possible before. This facility is a tangible, very public demonstration of the property insurance industry's deep commitment to reducing and preventing losses that disrupt the lives of millions of home and business owners each year.

IBHS' scientific research already has influenced residential and commercial structural design and construction, and will continue to do so for decades to come. The U.S. experienced \$24 billion in insured catastrophe losses in 2016, which included 15 individual events with losses exceeding \$1 billion each. Given the staggering losses expected from Hurricanes Harvey and Irma in 2017, there is an urgent need for the applied science solutions being developed by IBHS – the savings realized as a result of these solutions will "pay for" the lab many times over.

The large test chamber is an exceptionally large, specially designed wind tunnel; it is 145 ft. wide by 145 ft. long, with a clear interior height of 60 ft. The test chamber's dimensions, long-span steel structure, and 105 nearly 6-ft. diameter fans at the end of a contraction inlet combine to create proper aerodynamic flows and gust structure that enable researchers to create realistic Category 1, 2 and 3 hurricanes, extra-tropical windstorms, wind-driven rain conditions, and strong thunderstorm frontal winds. The test chamber contains a custom-built 55-ft. diameter turntable so that complete rotation of structural specimens can be done remotely during testing.



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- Wholly funded by the property insurance industry
- Focus on catastrophe-related issues, with residential and commercial roofs, which are the first line of defense against most natural hazards
- Transparent, objective research methodology
- Coordination and partnerships with manufacturers, trade groups, government agencies, academic institutions and other research organizations
- Campus includes large lab, small lab, exhibit area, meeting facility and office space, as well as outdoor specimen construction and aging area

## Capabilities

- One-story and two-story buildings and structures can be subjected to a variety of realistic hazards, including high-speed (up to 130 mph) gusty winds, wind-driven rain, wind-driven hail, and wildfire ember attacks
- Pressures and forces at numerous locations on the surface or throughout the structure of a building can be precisely measured to better define both loads on components/systems and how loads are transmitted through the structure to its foundations
- Displacement and deformation of building components and systems when exposed to various wind-related events can be measured to evaluate structural resistance
- Benchmark data for use in evaluating/improving current test methods and standards is being produced and disseminated
- Durability and resiliency of sustainable building technology is being investigated, with particular emphasis on evaluating the potential for particular technologies to reduce or increase property losses

## Among other things, IBHS research outputs will

- Demonstrate effectiveness and affordability of better-built structures
- Through the use of compelling video of testing, demonstrate to residential and commercial building owners and other stakeholders the benefits of choosing to build better and stronger
- Enhance property risk modeling by strengthening the critical relationship between theoretical and actual building performance
- Provide a scientific basis for improving the quality of building products and components in practical applications
- Increase availability of reliable, affordable retrofit options for existing homes and businesses
- Strengthen and improve building codes and land use policies
- Establish clear, scientifically sound benchmarks for disaster-resistant construction
- Improve current product and system testing standards
- Develop prescriptive guidance on loads for components and structures unique to energy production systems being incorporated in building design and construction

For further information:

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