

CASE STUDY

HTL

HOW PHANTOM
CAMERAS HELP CAPTURE
HIGH-SPEED "IMPACT OF
EXPLOSION" TESTING ON
GLAZING SYSTEMS AND
BUILDING COMPONENTS.

About HTL

HTL is a premier testing services company specializing in architectural building components and assemblies. HTL operates three facilities in North America, which provide a variety of testing and evaluation solutions to building products companies throughout the world. Delivering a unique blend of engineering consultation, state-of-the-art services, and a user-friendly testing environment, HTL's core services include, but are not limited to, hurricane, blast, air, water, structural, roof and security testing. All test methods that HTL provides adhere to national standards, such as ASTM, AAMA, WDMA and UL. HTL corporate headquarters is located in Riviera Beach, FL. For more information on all HTL service offerings, visit www.htltest.com, or call **561-881-0020**.



Impact of a Hurricane

WHEN IT'S TOO FAST TO SEE, AND TOO IMPORTANT NOT TO®

The next time you enter a building, pause and take a look up at the structure. Hundreds, if not thousands of windows may cover the outside of the facility or it may be highlighted by an ornate design of brick and stone. Your first thought may be that you are about to enter a beautiful building. Most likely, you are not even going to think about how the building would react to the fierce winds of a hurricane or a bomb blast.

Luckily, manufacturers of the individual building components do that for you. They recognize that for new construction or retrofitting offer the highest performance possible in resisting extreme environmental conditions and explosions.

In order to substantiate the performance of building components, manufacturers turn to HTL, a premier testing services company specializing in architectural building components and assemblies. With the help of Vision Research and its high-speed Phantom digital imaging systems, HTL opens a new dimension for its clients and allows them to see the performance of their products in the face of controlled explosions, at hundreds of thousandths of a second.

With three facilities in North America, located in Florida, Georgia and Texas, HTL provides its clients with some of the world's most sophisticated and state-of-the-art testing environments. HTL's facilities are user-friendly, allowing its customers to witness testing first hand, and operate under the highest security possible,

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- Steven Samuels,
Operations Manager

which is critical to government and other sensitive projects. HTL's Lubbock, Texas, location is the company's newest facility and specializes in blast-resistant testing for window glazing systems used for new construction and retrofit applications under full-scale blast loading. One of the country's leading sites for blast testing, HTL's Lubbock facility will celebrate its two-year anniversary this October and is still one of the few sites in the United States where manufacturers, architects and others can witness full-scale arena blast testing of glazing products.

Since September 11th, 2001, blast testing has become a key performance factor of building components and window glazing systems, as manufacturers, structural engineers and architects strive to create and utilize the most blast-resistant glass possible to protect the building, and more importantly those inside, from random acts of terrorism and bomb explosions. HTL utilizes the Vision Research Phantom v4.2 high-speed digital camera during full scale blast testing to analyze the blast wave interaction with different mediums, such as windows, glazing systems, walls and various other construction products.

With the Phantom v4.2, HTL is able to record full-scale explosions and capture the impact of blast waves on test subjects at up to 2,100 pictures-per-second (pps) at the camera's full-resolution of 512 x 512 pixels. For even faster frame rates, HTL has the ability to record explosions at an astonishing 90,000 pps, by reducing the image size to 32 x 32 pixels. By reducing the image size, the data from the sensor can be moved more rapidly to memory resulting in higher speeds. The videos that HTL captures are used by their clients for scientific research and to help develop safer and higher performing blast resistant products. Should the product fail during the blast, the videos can be used to help pinpoint where failures occur and make the necessary adjustments. Additionally, the high-speed videos are also highly useful for marketing purposes, as they allow their clients to give a visual demonstration of their product resisting a live blast.

Steven Samuels, Operations Manager for HTL says “The images produced using traditional film based high-speed cameras were OK, however, over time film simply became outdated as digital imaging surpassed the traditional format by leaps and bounds, offering far superior performance, versatility and reliability. In contrast to film, a high-speed digital camera provides an instant image, without having to wait for film processing, as well as faster frame rates, reaching well above the 1,000 pictures-per-second mark.”

Added Samuels, “When the decision was made to upgrade to digital, HTL considered several high-speed cameras and each were evaluated as part of a rigorous selection process to determine which would best meet our needs and which would yield the best results in such an extreme environment. The performance of the Phantom v4.2, its rugged design and the level of customer

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*Phantom v4.2
High-speed Digital Camera*

About Vision Research:

Vision Research designs and manufactures high-speed digital imaging systems used in applications including defense, automotive, engineering, science, medical research, industrial manufacturing and packaging, sports and entertainment, and digital cinematography for television and movie production.

The Wayne, N.J.-based company prides itself on the sensitivity, high-resolution and image quality produced by its systems, robust software interfaces, and reliability and versatility of its camera family – all which continue to stand as benchmarks for the high speed digital imaging industry.

Vision Research digital high-speed cameras add a new dimension to the sense of sight, allowing the user to see details of an event *when it's too fast to see, and too important not to*[®]. For additional information regarding Vision Research, please visit www.visionresearch.com.

Vision Research is a business unit of the Materials Analysis Division of AMETEK Inc., a leading global manufacturer of electronic instruments and electromechanical devices.

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service provided by the Vision Research staff were unsurpassed, and both were key factors as to why HTL decided to choose their camera for our high-speed image capture applications.”

When filming the blast testing of glazing systems or building components, adequate lighting is a challenge. Tests are typically filmed from within a blast reaction chamber, and explosives are placed and detonated outside, creating an unbalanced lighting environment. The performance of the Phantom v4.2's CMOS image sensor allows HTL to capture outstanding image quality in the harsh lighting conditions in which the camera is used. All of Vision Research's digital cameras utilize the company's own, proprietary CMOS sensors, which have been exclusively designed for high-speed use to balance sensitivity, speed and resolution. Additionally, unlike a CCD sensor, CMOS will not “bloom” (creating fringes of light around very bright objects in an image), and the Vision Research sensors used in their Phantom cameras are totally immune from multi-panel imaging artifacts associated with many older generation high speed sensors.

“The quality of the high-speed video that HTL is able to capture during blast testing is invaluable,” said Samuels. “The videos allow us to better estimate deflections off of the building materials as well as to help pinpoint weaknesses in blast resistant systems, especially in a failure situation. We continue to learn from our testing methods and translate these learning's to better products designed to protect people during an explosion. Vision Research's Phantom v4.2 allows HTL to better analyze and understand failures in systems and work with our clients to help better the components used in construction.”

The Phantom v4.2 high-speed digital camera from Vision Research allowed HTL to drastically improve the services that it offers to current and potential clients as well as to build upon and enhance its levels of customer satisfaction. “Reliability, better images, and faster frame rates all helped our business. Allowing our clients to view the data immediately is a plus with customer satisfaction.”

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An **AMETEK** Company