

# COLUMBUS BUSINESS FIRST

COVER STORY

## HOW THIS COMPANY KEEPS YOU SAFE

**SEA Ltd. has built a reputation for its forensic analysis. Now it has a new complex where it can wreck stuff before that stuff wrecks consumers.**

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COVER STORY

# SEA INSIDE

## Columbus forensics firm's tests ensure products are safe

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SEA Ltd. isn't a household name even though its work likely touches most households.

The 46-year-old Columbus-based forensic analysis, investigation and product testing firm tends to keep a low profile, but that five-star rollover rating on your car? That's SEA. That holiday candle burning in your living room? Probably tested at SEA. There are doors on side-by-side off-road vehicles thanks to SEA. And that's just the business' past.

"This company was founded on looking at accidents after they happen," CEO Jason Baker said. "Several years ago we saw more opportunity to move upstream into product testing for manufacturers and producers."

The name stands for Scientific Expert Analysis and the bulk of the work is still litigation-related with SEA staff investigating vehicle accidents, potential faulty products and structural collapses, among other incidents. But consumer products work and auto industry research are growing areas of the business.

"Vehicle dynamics, autonomous vehicles, we've been operating in areas like that for years," Baker said. "As that expands, like here in Columbus through the Smart City initiative, we see more opportunities."

Its reach is national with 11 offices across the U.S. and it's making a move into Europe as well, where it sees potential in the marine and energy industries. Baker said SEA staff were recently in Norway looking at a decommissioned oil rig. Here at home, it has a new four-building campus in northeast Columbus – a more than 100,000-square-foot complex on 13 acres that almost doubles the firm's previous space – and is prepped for a future where it can have a bigger hand in issues such as safety and reliability in everything from kitchen appliances to tools to football helmets to passenger vehicles to military equipment.

SEA opened its doors Oct. 6 to clients, potential customers and media to show off its wide range of capabilities from fire investigation to vehicle testing to medical illustration. The following is some of what was on display.

### THE DETAILS

#### SEA LTD.

**Based:** Columbus

**Founded:** 1970

**CEO:** Jason Baker

**Employees:** 257

**Area employees:** 106

**Other offices:** Atlanta, Baltimore, Charlotte, Chicago, Cleveland, Denver, Fort Lauderdale, Houston, St. Louis, Tampa

**2015 sales:** Would not disclose

**Website:** sealimited.com

## How the Durango ignited

Fire investigation is a big part of the SEA business. That's an all-encompassing process that brings in interviews, on-site investigation and sometimes advanced mapping and other techniques depending on the situation. It's a field that touches a lot of what SEA does from electrical and mechanical engineering to laboratory chemists and technicians. This incident was reverse engineered, of course. The fictional story was that the car owner had recently done several upgrades to the 150,000-mile Dodge Durango, including installing new stereo speakers and changing some components of the fuel line. The owner was a smoker. He also left a greasy bag of chips sitting on the dashboard. It was that touch that ignited the blaze with one of the tell-tale signs behind how and where the windshield collapsed.



## The case of the Pop Tart in the toaster

"A lot of cases hinge on whether or not it was a short circuit or thermal melting," said Randy Bills, senior project engineer, of the fire investigation unit.

Case examples included a Mansfield radio station fire that proved to be thermal melting, not a short circuit as the fire department first believed, and a home in Marysville where a child, seeking an evening snack, got a Pop Tart lodged in a toaster. There was no defect with the toaster. The pastry was wedged in and couldn't eject, causing a significant fire – no one was injured. The girl watched Bills excavate the scene and unearth a red plastic mass.

"I know what that is," she told him. "That's the chair I stand on to put my Pop Tarts in the toaster." Further investigation confirmed that unintended confession.



## New, larger auto accident simulator

The sled, as it is called, can simulate vehicle accidents. SEA had this equipment before but it was housed off-site in Plain City because its previous Worthington complex didn't have the room for it. The move to the new facilities let SEA increase the size of its sled by 50 percent, allowing for greater speed while also improving its capabilities. The hydraulic-propelled cable system simulated a low-speed, 11-mph impact. SEA runs these tests for rollovers and to check occupant safety restraints. The system is used for automobiles, forklifts, golf carts and all-terrain vehicles.



## Dummying trauma

"I look at the body," said Doug Morr, biomechanical engineer. "How it moves, how it falls, how it handles a load."

His work is related to personal injuries, causes and mechanical engineering analysis of failures. That includes car accidents, slips and falls, even trauma caused by falling objects. One area that has seen increased work is in sports-related concussions, a hot contemporary topic.

Morr said the company has done product liability work on helmets and has testified in cases on the effectiveness of the gear.



## The tech behind national rollover tests

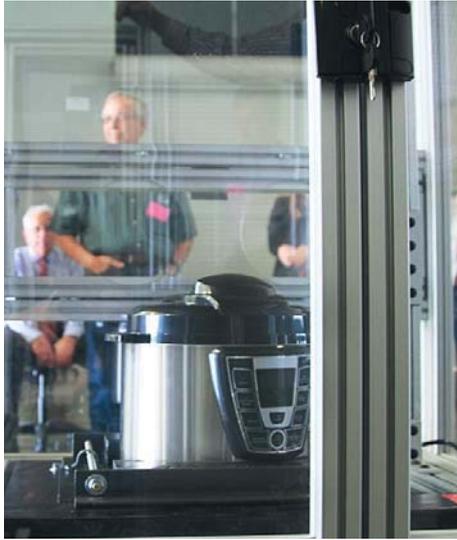
SEA built its first Vehicle Inertia Measurement machine for Ford Motor Co. in 1994. It since has sold five more to General Motors Co., Toyota Motor Corp., Nissan Motor Co., and other vehicle makers in addition to maintaining its own, which is rented out to manufacturers or any other entity looking to measure the center of gravity of a vehicle.

The machine, which resembles a large balancing table, has handled more than 20,000 tests and since 2003 is the National Highway Traffic Safety Administration's choice to handle vehicle rollover tests. So when you see your vehicle has a 5-star rollover rating, that test was conducted at SEA.

While the on-site machine handles vehicles up to 10,000 pounds, SEA also built one for the U.S. Army that can test vehicles up to 100,000 pounds and a machine that can test suspension systems on vehicles up to that size as well. The facility also has a smaller machine that can find the center of gravity of individuals and aids in accident investigation.

Another SEA-created contraption is a "tilt table" (pictured above) used to find the angles at which a vehicle, in this instance an ATV, will tip over. The machine can tilt in all four directions. The vehicle lab area also includes separate, private viewing rooms in cases where lawyers are on site to watch a process. Prosecution gets one room, while the defense takes the other.

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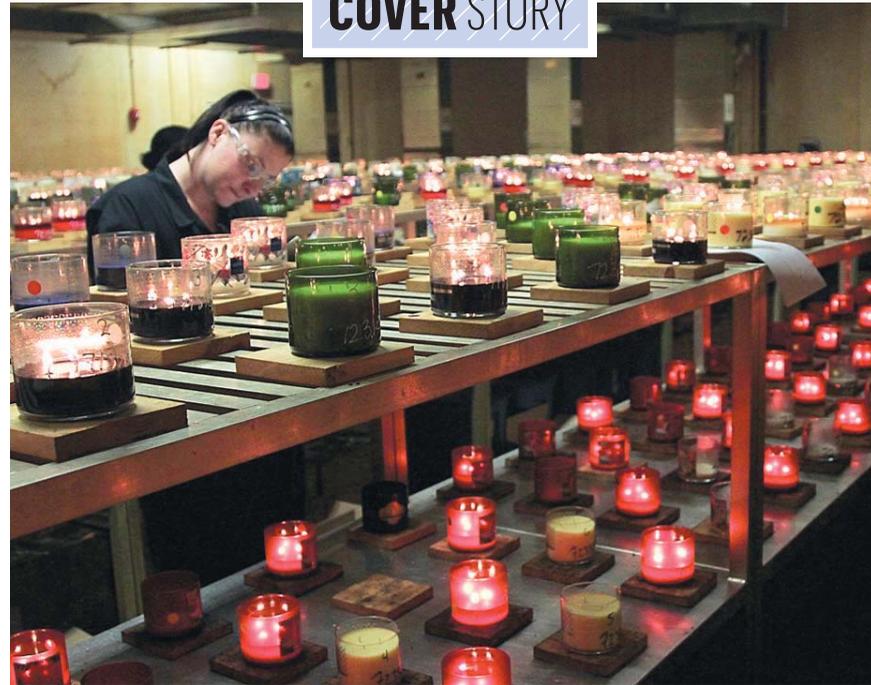


## Keeping pressure cookers closed

Much of SEA's work historically has been investigating potential product failures after the fact. A bigger push in recent years has been made into product testing and heading off issues before any occur. In this specialized case, Jason Mattice, project engineer in biomechanics and mechanical engineering, was testing how much force is needed to open a pressure cooker while it's still working.

"We don't want something like this happening and it winds up causing injuries or property damage," he said.

A grinder power tool was set up in another station to test the stress it could endure.



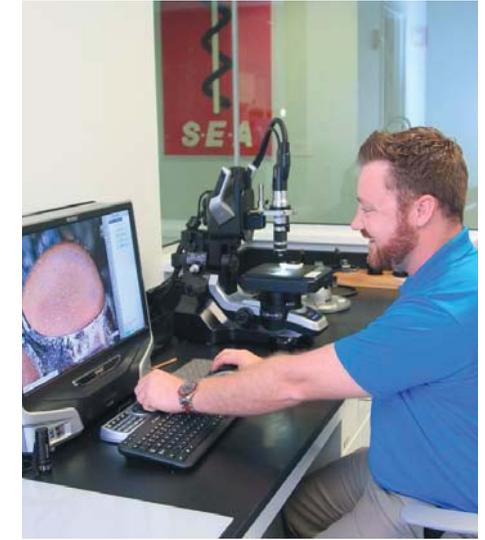
## Testing at the speed of business

One of SEA's biggest lines of business is candle testing. In the move to the new headquarters, the candle business got a dedicated lab separate from the rest of the facility. The work isn't a slow burn, but rather quick turn. The batches tested at SEA are ones right on the verge of leaving a retailer's distribution center.

"We need to get the data to clients because these need to go out," said Brent Curkendall, candle lab supervisor. "They need restocked, so it can't sit in the distribution center for more than a day."

The report tackles four key factors – flame height, which must be below three inches; container breakage; "flash overs" when vapors ignite; and wick remnants falling off and burning.

"We burn to the instructions on the label," he said, pointing out the label on the bottom of the candles. "If a customer is doing everything right, we need to make sure it works."



## Laboratory for fabric, paint, lead

The corporate laboratory started as support for the fire investigations but expanded to allow for product testing work, too. That includes garments – a laboratory manager ignited a swath of flannel for a demonstration. The assorted labs in the division test everything from lead amounts in consumer products to fabric and paint analysis related to accidents. It looks at metals and other materials, searching for possible failures, with one of its many tools being an advanced imaging system that can enhance to the point of showing the grooves and textures of materials that otherwise seem flat to the eye or touch.