The FM Global Research Campus

FIRE TECHNOLOGY LABORATORY
> A 108,000-ft² (10,000-m²) facility with a 33,600-ft² (3,120-m²) large-burn lab

> Two 80 x 80 ft. (24 x 24 m) movable ceilings designed to go as high as 60 ft. (18.3 m), replicating the increased warehouse heights being constructed today and allowing storage configurations ranging in height from 5 ft. (1.5 m) to 55 ft. (16.8 m).

> A 20-megawatt, 35-ft. (11-m) diameter fire products collector (FPC), and three smaller FPCs for small- and intermediate-scale testing

Fire begins when an ignition source connects with combustible material in the presence of oxygen. The formula is easy to grasp, but the science of fire dynamics is anything but simple. At the Fire Technology Laboratory, we continue to advance the understanding of fire and its effect on different types of material, measure the heat-release rate from different configurations of material, and determine combustibility and protection requirements for different commodities produced and used by our clients.

Covering 108,000 square feet (10,000 square meters), FM Global’s Fire Technology Laboratory is the centerpiece of the Research Campus and the largest facility of its type in the world. The laboratory’s scale allows researchers to replicate a warehouse-size fire that can cause structural failure of a building without sprinkler protection in a matter of minutes. Moreover, because multiple fire tests can be conducted every day, clients don’t have to wait long for research results.

At left: A corrugated board commodity is tested under the 20-megawatt calorimeter, currently the largest calorimeter of its type in the world. Above: 1. Samples of unexpanded plastic, a standard commodity used for research and testing. 2. Cartons of the test product are prepared for a fire test. 3 and 4. A storage rack fully engulfed in flames, and being extinguished at the end of a test.
> Humidity control system for better control of moisture content and the conditioning of products and material prior to fire tests

> Five building material fire-test laboratories

> Closed-loop water system for continuous cleaning and recycling; water tanks and pumps capable of replicating any facility conditions

> State-of-the-art environmental controls. Entire facility serviced by the most environmentally friendly technology available and the most sophisticated air-handling systems

Through this full-scale testing, our researchers develop innovative and cost-effective property loss prevention solutions that protect our clients’ facilities and will ultimately minimize the threats of downtime, supply chain interruption and loss of market share. The laboratory, equipped with two 80 x 80-foot (24 x 24-meter) movable ceilings designed to simulate the trend in increased warehouse heights, also features several smaller labs for intermediate- and small-scale burn testing, enabling FM Global researchers to study a much broader range of commodities and storage arrangements.

The large-burn lab’s advanced humidity control system ensures test consistency, circulating up to 104,000 ft³/min (49 m³/s) of air and removing up to one ton (900 kilograms) of water per hour. In addition, the lab’s adjacent staging area provides a steady stream of pre-conditioned fire test commodities to the area beneath the movable ceilings as well as the 20-megawatt fire products collector. All of these features combine to produce the most accurate test results in the shortest amount of time. The research conducted here provides clients from the world’s leading industries the chance to see their worst-case fire scenarios put to the test.

At left: Full-scale fire tests, like the one shown here, have contributed greatly to the knowledge and success of automatic sprinklers. In a recent 10-year period, the average fire loss at adequately sprinklered locations was 5.7 times smaller than at locations where sprinklers were needed, resulting in significant loss savings for FM Global clients. Above: 1. A high-clearance test is conducted in the large-burn lab to determine the effects of a fire when a commodity is stored under a high ceiling. 2 and 3. A simulated three-dimensional rack-storage test of alcohol in intermediate bulk containers (IBCs) is conducted for research purposes—to help develop protection requirements for IBC storage.