



# Kaltech Industries Building Explosion

New York, New York April 25, 2002

On April 25, 2002, an explosion in a mixed-use commercial building in downtown Manhattan injured 36 people, including 14 members of the public and six firefighters. Thirty-one of the injured were treated in hospitals, including four who required intensive care.

The explosion originated in the building's basement, which was occupied by Kaltech Industries Group, a commercial sign manufacturer that used hazardous chemicals to etch and clean metal signs. Kaltech shared the building on 19th Street in Chelsea with service firms, professional offices, and other businesses.

Building tenants were not informed about the hazards of Kaltech's operations. "We were absolutely unaware that there was anything in the basement," one tenant later told the Board. "I only knew that I worked next to a sign shop."

On April 25, Kaltech workers were consolidating various containers of liquid hazardous waste for shipment off-site. Just prior to the explosion, two workers had completed pumping the contents of several 15-gallon storage containers, called carboys, into 55-gallon plastic drums. Moments after the workers completed transferring the liquids and left the area, a vigorous chemical reaction began in one of the drums. Workers described a hissing sound rising to a jetting noise as liquid spewed from the container.

Seconds later there was an explosion, which appeared to one witness as a fiery red bubble. Falling debris caused most of the injuries, trapping some people who were later rescued by firefighters. The blast caused extensive damage to the building, blowing out portions of the elevator shaft, destroying the center stairwell, and collapsing a wall in the mezzanine. Windows and broken chunks of the building façade fell to the sidewalk, and 19th Street had to be closed for the next two weeks. Kaltech's owners suspended operations and eventually transferred company assets to Beyond Signs Inc., a firm controlled by relatives.

## VIOLENT REACTION OF NITRIC ACID

Workers told CSB investigators that the last carboy they pumped into the 55-gallon plastic drum was unique because it was metal, while the others were plastic. The worker in charge mistakenly assumed that all the carboys, plastic and metal, contained spent etching solution. Investigators later found the metal carboy near where the explosion originated.

A sample from that carboy was identified as nitric acid, a strong oxidizer and corrosive that is incompatible with most organic substances. Several of the plastic carboys nearby contained residues of lacquer thinner, evidently mixed with spent etching solution.



The explosion blew out windows up to the fifth floor and showered the street below with building debris.

Lacquer thinner contains flammable chemicals like acetone and toluene, and when it contacts concentrated nitric acid, a spontaneous chemical reaction can occur generating heat and gas. CSB investigators concluded that just such a reaction occurred at Kaltech.

Kaltech owners and employees said they could not recall using nitric acid, and investigators found no company records indicating purchases of the chemical. CSB found it likely that the nitric acid, which can be used in some metal etching processes, had been obtained at one time and subsequently forgotten, left in an unlabeled container.

## HAZARDOUS WASTE CONTAINERS NOT LABELED

Not only did the metal carboy of nitric acid have no label indicating the chemical's dangerous properties, most other waste containers were also unlabeled. Kaltech employees did not know the identity of the materials, their hazards, or their compatibility with each other. CSB concluded that that labeling would have helped prevent the accident by informing workers of the need to keep incompatible reactive materials separated. Any unlabeled waste container should be tested to determine its contents, the CSB said.

The city's Community Right-to-Know Law, state hazardous waste regulations, and federal workplace safety regulations all require that containers with hazardous materials be clearly labeled. However, the New York City Fire Prevention Code has no similar provisions, and it does not require the separation of incompatible materials.

**WORKERS NOT TRAINED ON HAZARDS**

The Board found that Kaltech had no organized training program, and workers received no formal instruction on the hazards of the materials they were expected to handle or package for disposal.

U.S. Occupational Safety and Health Administration (OSHA) regulations require employers to inform and train workers about the hazards of chemicals in the workplace. Likewise, federal hazardous waste laws require waste generators like Kaltech to conduct formal training — either in the classroom or on-the-job — for all personnel involved in disposal operations.

The New York City Fire Prevention Code does not mirror these requirements. While the code has a permitting process for companies that store corrosive or flammable materials, it does not require that employees be given hazardous materials safety information or training. For example, the code does not mandate that Material Safety Data Sheets (MSDSs) be provided to workers on site.

**GOVERNMENT INSPECTIONS WERE INEFFECTIVE**

The New York City Fire Department conducted periodic inspections of Kaltech and issued citations for minor violations. Department officials said that they were unaware that the company stored and handled flammable and corrosive materials in the basement, and inspectors only visited the aboveground portions of the business. Even if a complete inspection had been done, fire inspectors would have lacked authority under the code to correct all the safety deficiencies that led to the accident.

The New York State Department of Environmental Conservation administers the state's hazardous waste

**NEW YORK CITY'S FIRE CODE**

Although it has been amended periodically, the New York City Fire Prevention Code has never undergone a comprehensive review or revision since 1918. The code does not incorporate recent developments in hazardous materials safety, such as chemical identification, labeling, worker training, and separation of incompatible materials. In recent years, other U.S. cities — plus all New York jurisdictions except New York City — have moved to adopt model fire codes: modern, comprehensive, regularly updated codes developed by the National Fire Protection Association or other code councils. Under the model codes, a business that plans to use hazardous materials must first submit an acceptable management plan explaining how chemical risks will be controlled.

program. The department inspects only two percent of all regulated facilities annually. Kaltech was never inspected during its ten years of operation, despite the company's status as a large-quantity hazardous waste generator located in a densely populated neighborhood.

Although OSHA inspected Kaltech after the accident and cited the company for 36 serious violations, OSHA inspectors had never visited the facility during the previous decade.

**RECOMMENDATIONS**

In approving the report on September 30, 2003, the CSB issued a variety of safety recommendations to prevent future accidents.

**To the Mayor and Council of New York City:**

Because New York City conducts more than 100,000 inspections of the city's hazardous chemical users every year, an up-to-date fire code would be a vital tool for preventing chemical accidents. The Board therefore recommended that the Mayor and the City Council revise the Fire Prevention Code in order to better control the storage and use of hazardous materials.

Such materials should be labeled, workers should be trained in handling them, and incompatible chemicals should be separated. Businesses should be required to submit a hazardous materials inventory and management plan prior to obtaining permits.

The Board also recommended that mixed-use buildings be required to develop hazardous materials safety plans, to be shared with the occupants. The Board further requested that the fire department and city environmental authorities establish a program to exchange information about hazardous chemicals stored at businesses.

**To the New York State Department of Environmental Conservation:**

The CSB recommended that the state increase inspections of hazardous waste generators located in mixed-occupancy buildings within densely populated areas.

**To Kaltech Industries and Beyond Signs Inc.**

The CSB recommended that the companies label and characterize all hazardous materials and provide employees with information and training about the chemicals they work with.

*Published October 2003*

**NOTICE:**

The CSB is an independent federal agency charged with investigating industrial chemical accidents and hazards. The CSB determines the root causes of accidents and issues safety recommendations to industry, labor, and other government agencies. CSB Investigation Digests are not intended to substitute for the official, Board-approved reports, which can be obtained from the agency's web site, [www.csb.gov](http://www.csb.gov). The web site also has complete, up-to-date information on the implementation status of all CSB safety recommendations. Comments or suggestions, please write to [info@csb.gov](mailto:info@csb.gov).