

The Propane Problem: How the COVID-19 Pandemic Impacted the Demand for Propane

By Kelly Carr, Chief Inspector Andrew Dushynskiy and Chief Inspector Jesus Martinez

Strict fire code requirements and diligent enforcement efforts have long been applied to the storage, handling and use of propane in New York City. Ordinarily, propane as a fuel source is not authorized for space heating in any setting. The COVID-19 state of emergency unexpectedly altered this framework when restaurants were temporarily authorized to use propane-fueled heaters in outdoor dining areas. This concession increased the demand for propane, creating some second-order effects for the Bureau of Fire Operations and the Bureau of Fire Prevention.

Minutes before midnight on December 21, 2020, in the midst of the spiraling pandemic, a truck carrying more than 300 20-pound propane containers struck a jersey barrier and overturned while exiting the westbound Long Island Expressway at Queens Boulevard. Four minutes after receiving the alarm, Engine 324 arrived and observed an overturned truck that was heavily involved in fire, with flames as high as the roof level of a nearby high-rise multiple dwelling in Lefrak City. Responding members heard and felt a BLEVE every few seconds, causing a chaotic scene with airborne propane containers aflame. These projectiles struck the exposed building and posed an imminent danger to the residents of Lefrak City and the motorists trapped in their vehicles on the highway. This was a career fire, even for veteran FDNY members.

Firefighters from Engine 324 stopped their rig east of the fire. Initially, they were unable to get close enough to apply water from their deck pipe because of the severity of the BLEVEing cylinders. At around the same time, Engine 287, which was instructed by Battalion 46 to travel east in the westbound lane, arrived and stretched a 2.5-inch hand-line. In a daring operation, members used the hard cover of the jersey barrier to advance their hose-line close enough to apply water to the towering inferno, extinguishing most of the fire and cooling the containers enough to prevent further BLEVEs. This allowed Engine 324 to advance within the

range of its deck gun and simultaneously stretch an additional hand-line. The quick actions of these engine companies and swift decision-making by Battalion 46 saved the night, protecting life and property. Incredibly, the driver of the vehicle refused medical aid.

Just one month later, two Bureau of Fire Prevention inspectors from the Illegal Conversion Task Force arrived at a Brooklyn warehouse for a routine reinspection on an active violation order. Upon arrival, the pair found more than 900 propane containers. A majority of the 20-pounders were stored in a loading dock alongside an illegal wooden split-mezzanine area where large amounts of combustible material were also stored. The inspectors promptly notified Brooklyn Dispatch, and Engine 205 and Battalion 32 responded to the location. In lieu of confiscation by the Haz-Mat Unit, two propane vending companies retrieved and transported 904 containers from the premises. Meanwhile, a fire marshal from the Special Investigation Unit interviewed the authorized person in charge, who was arrested and charged with reckless endangerment in the second degree.


Images from these two incidents are unnerving but not surprising. It has been reported that a propane



BFP inspectors discovered the unsafe and unlawful storage of more than 900 propane containers at a Brooklyn warehouse in January 2021. Photo credit: Joe Rogers

emergency warranting a fire department response is reported nearly every day in the United States.¹ The number of propane incidents in New York City resulting in death, injury or property damage is relatively low. In large part, this is due to comprehensive regulation of the storage, handling and use of propane in New York City, paired with a Bureau of Fire Prevention that aggressively inspects and enforces these requirements.²

Propane is a type of liquefied petroleum gas (LPG). It is flammable and can be readily ignited by a spark. If confined or exposed to fire, propane poses an explosion hazard. Propane is heavier than air, which means it accumulates in



“Cylinder” or “Container”?
This 20-pound container of propane is commonly referred to as a cylinder. In the context of compressed gases, fire codes in New York City and elsewhere typically refer to this item by a defined term: container.

low places where people and ignition sources are present. Many in the fire service are too young to remember some of the most devastating propane explosions nationally and even here in New York City. For instance, on a July morning in 1987, three two-story buildings were leveled in the Borough Park section of Brooklyn after a worker reportedly dropped a 20-pound propane container down a basement stairwell at a plumbing supply store. The leaking gas ignited; the resulting explosion killed four people and injured 35. Images from the day are scarce, but the news reports are startling. One witness compared the scene to London during World War II.³

Devastating propane explosions have occurred elsewhere, resulting in firefighter LODDs and civilian deaths, including in Kingman, Arizona in July 1973 and Buffalo, New York in December 1983. There are many others.

Despite these tragedies, it is tempting to minimize the hazards of propane. After all, many people in NYC safely and lawfully use and store one or two 20-pound containers of propane for their barbecue grills. The Fire Code also authorizes the use of propane at construction sites for curing and drying purposes during the heating season (beginning Oct. 15 and ending May 30). By and large, until recently, there were few other lawful uses in NYC. Most notably, now and before the pandemic, mobile food units are authorized to use propane for cooking. Mobile food units are defined by the NYC Health Code and include food trucks, pushcarts and stands. Those equipped with LPG containers for cooking purposes are limited to two LPG containers. Mobile food units that are not motor vehicles are limited to no more than 20 pounds per container. Mobile food units that are motor vehicles are limited to 100 pounds per container.

Not Business as Usual

In response to the COVID-19 pandemic, the City of New York established the Open Restaurants program in June 2020. The program allowed participating restaurants, bars and other establishments to set up outdoor dining areas on public sidewalks and roadways. As cooler weather approached, the New York City Fire Code was modified by Mayoral Emergency Executive Order No. 153 (EEO 153) to allow the temporary use of outdoor heaters fueled by propane in these and other outdoor dining areas.



Borough Park, Brooklyn, New York; July 21, 1987 | Photo credit: The New York Times

Issued on October 14, 2020, EEO 153 specified who was eligible to use propane-fueled heaters: Open Restaurants program participants and restaurants with outdoor dining areas on private property. Restaurants were not authorized to use propane as of right. In all cases, restaurants were required to comply with Fire Department Guidance: Comfort Heating of Restaurant Patrons in Outdoor Dining Areas (FDNY Guidance), which was issued simultaneously with EEO 153.

Developing the FDNY Guidance

The FDNY Guidance was prepared by the Bureau of Fire Prevention (BFP) in coordination with the Office of the Mayor. It was challenging to develop standards for the safe use, handling, storage and transportation of propane for a new program with more than 10,000 eligible participants, thousands more anticipated and no precedent. Given the novel use of propane for comfort heating, there was no existing framework to authorize, inspect or enforce Fire Department requirements related to the heaters, or for the storage, handling and use of the propane associated with them. The NYC environment's unique characteristics and inadequate propane storage infrastructure, as well as the Fire Department's limited ability to regulate the transportation of hazardous materials, posed additional obstacles.

A combination of current regulations, national standards and requirements of other NYC agencies were incorporated into the FDNY Guidance, including the following key points:

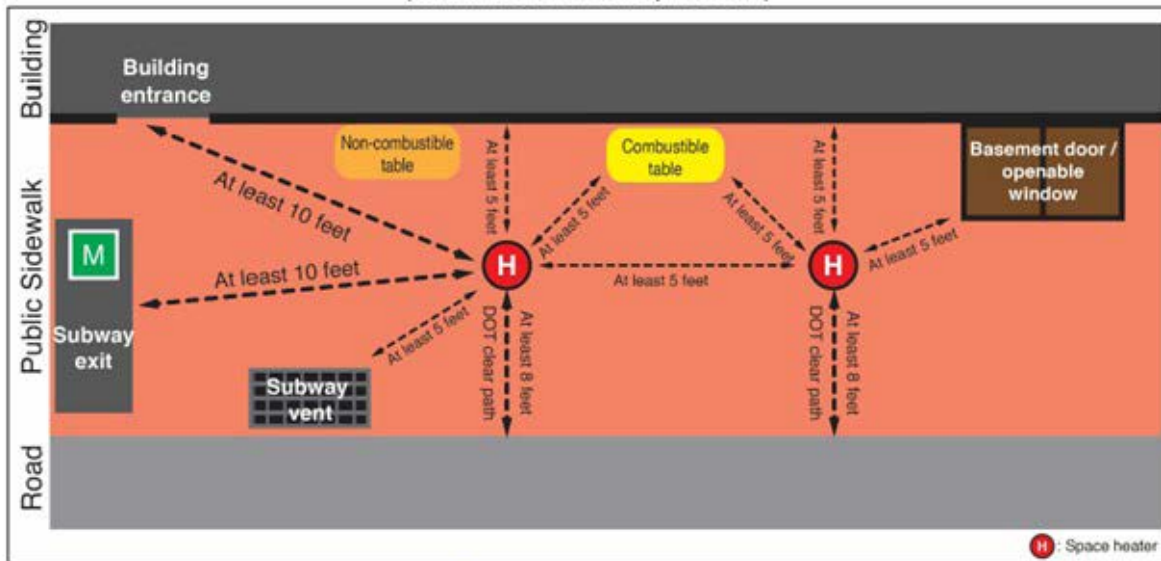
- Regardless of the size of the propane containers used with the heaters, the

permit requirements of the Fire Code were imposed to enable the Department to perform a safety inspection of each site by a Department representative.

- Connection and disconnection of propane containers and the placement of heaters were required to be performed under the personal supervision of a certificate of fitness holder, and the heaters could not be left unattended at any time. These provisions helped ensure the proper placement and operation of propane-fueled heaters.
- EEO 153 and the FDNY Guidance prohibited placement of propane-fueled heaters on any roadway to prevent a vehicle's impact during an accident.
- The installation of the heaters under any structure required a site assessment by a Department representative.
- In developing the clearance requirements, the current provisions of the Fire Department rules related to the location of mobile food carts with propane containers to vital exposures were used. Although some of the clearances were reduced to facilitate outdoor dining, the clearance requirements were aligned with national standards.
- The maximum size propane container that could be used with a heater was 20 pounds. No container larger than one pound was allowed within any building or structure.
- Storage of propane containers in any capacity exceeding one pound was allowed only in an approved storage facility, meaning a location that had been issued a Fire Department permit for storage. Nonetheless, a restaurant

LOCATION OF SPACE HEATERS

(minimum clearances requirements)



Note: Examples of combustible tables: wood/plastic tables; examples of non-combustible tables: metal tables.

Note: Tabletop use of one-pound propane heaters is allowed, including on combustible tables, but only if designed for such use and recommended by the manufacturer.

Note: The 8-foot clearance on sidewalk does not apply to private property.

owner was allowed to store a limited number of one-pound containers on the premises. This approach provided flexibility for the restaurant owner to choose the best available option.

- In cases where no approved storage was available, all containers greater than one pound were required to be removed from the restaurant premises at the close of business each day. Consistent with national standards, an individual could transport up to 90 pounds of propane in a private vehicle.⁴

BFP developed a “Practical Summary” of the FDNY Guidance, summarizing key requirements and clarifying how to obtain the required certificate of fitness and permits. The summary was translated into 10 languages and shared among city agencies and industry stakeholders who assisted in educating restaurants. The summary was also hand-distributed by BFP inspectors.

The lawful placement of propane-fueled heaters was demonstrated by the graphic above, which incorporated minimum clearance requirements and the eight-foot “clear path” adjacent to the curb required by the NYC Department of Transportation for Open Restaurants participants.

Creating a New Certificate of Fitness

The FDNY Guidance required a

restaurant owner or employee using a propane-fueled heater to obtain a certificate of fitness. BFP’s Public Certification Unit rapidly developed study materials and an examination, and it created a new certificate of fitness: T-93 Supervision of Storage, Handling, and Use of Propane Containers and the Portable Space Heaters in Outdoor Dining. The T-93 incorporated requirements from existing certificates of fitness related to connection and disconnection of propane containers to and from the heater, as well as requirements for supervision of the heater itself.

Not only did the Public Certification Unit develop the new certificate of fitness in record time, but it also offered a new

What is a “Certificate of Fitness?”

A certificate of fitness is a written statement issued by the Fire Department to a person who has passed a Fire Department examination or is otherwise qualified to perform a duty that can be performed in New York City only by a person holding the certificate. The Fire Code may require a “C of F” (or “COF”) to manufacture, store, handle, use, maintain, inspect, test or transport certain materials; conduct certain operations; or operate certain facilities. BFP’s Public Certification Unit offers more than 100 types of COFs, each requiring either general supervision or personal supervision of the material, operation or facility. Most COFs are valid for three years.

way to acquire one. For the first time, the Fire Department offered applicants the option of an online examination in addition to the traditional, in-person method.

Training Inspectors and Firefighters

Bureau of Fire Prevention personnel are trained extensively on requirements and regulations for propane. Members routinely perform scheduled, permit-based inspections, as well as task force response inspections. However, just as there was no existing framework governing the use of propane-fueled heaters associated with outdoor dining, there was no training module for it either.

The Bureau of Fire Prevention’s Training Unit, with guidance from and in collaboration with the Code Development Unit, rapidly created a training module based on the FDNY Guidance, applicable provisions from the Fire Code and Fire Department Rules, and NFPA 58-2008.

Additionally, real-world conditions discovered by the BFP Illegal Conversion Task Force (ICTF)—specifically, unlawful storage, handling and use of propane and associated heaters—were valuable components of the training module. ICTF provided inspection reports, enforcement actions and photos of temporary outdoor heating appliances utilizing propane. Incorporating such information into the train-

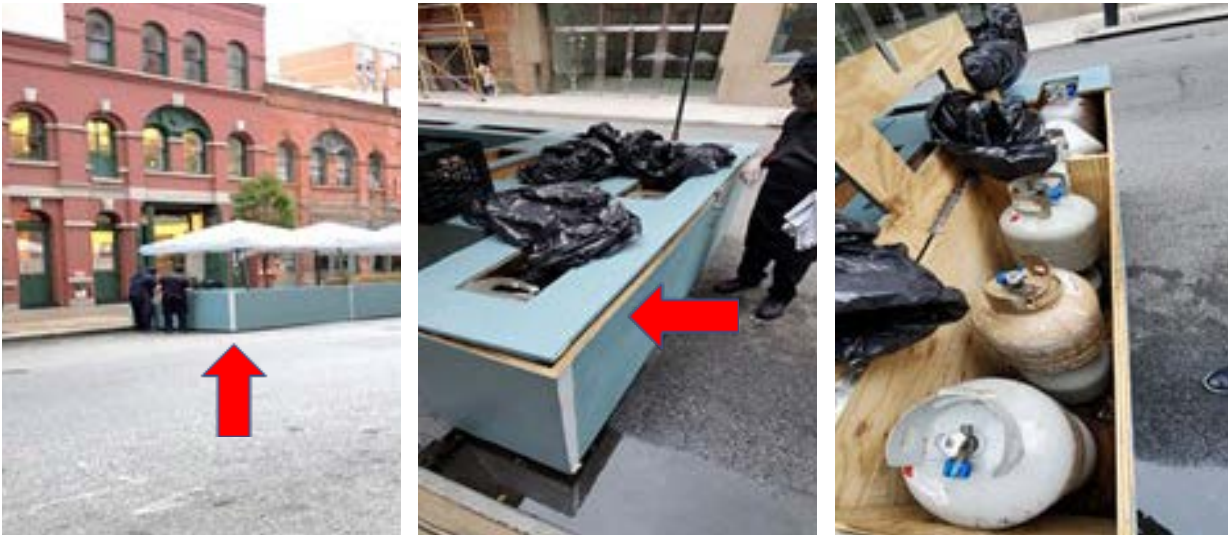


Figure 1 | Photo credit: Joe Rogers



Figure 2 | Photo credit: Joe Rogers

ing module was critical in that it provided a clear understanding of the hazards posed not only to Fire Department personnel, but also to the building occupants themselves, including residents, restaurant staff, patrons and pedestrians.

The training module focused on the following areas:

- Protocols for issuance of a site permit (e.g., required documents, administrative processes)
- Allowable locations of propane heaters.
- Storage, handling and use of propane heaters and containers
- Transportation of propane containers.
- Supervision of propane containers and heaters
- Enforcement protocols

Overall, as of the time of this article, the training module was delivered to more than 200 inspectors and 35 firefighters designated to perform site inspections.

Additionally, live training from the field was delivered via video conferencing by members of the Remote Tactical Unit and a member of the BFP Training Unit. This live training was invaluable in providing field personnel with real-time conditions associated with the use of propane for comfort heating in outdoor dining areas.

FDNY Customer Service Center

Day in and day out, the Fire Department's Customer Service Center (CSC) serves as the main point of contact for public inquiries, complaints, FDNY Business and referrals. Since its inception in October 2018, the CSC has received more than 20,000 phone calls and 18,000 emails. Its small staff played an outsized role in the successful implementation of the FDNY Guidance. CSC received, routed and responded to documentation from restaurants applying for permits to use propane-fueled heaters.

CSC was also the central point of intake for complaints received from a variety of sources, and its staff coordinated with the LPG Task Force in the Bureau of Operations to address many of the complaints related to unlawful storage.

Unlawful Propane Storage

Firefighters and inspectors encountered unlawful storage of propane associated with outdoor dining areas. In some of the most egregious incidents, 20-pound containers of propane were found on roadways, concealed by planters and/or other objects designed to provide vehicle impact protection (Figure 1).

Other infractions included placement too close to buildings, under coverings (such as awnings and scaffolding) and within fully enclosed areas. Cages containing 20-pound containers were also observed on sidewalks (Figure 2).

Looking Ahead

A propane-related fire or explosion is a low-probability/high-consequence event. Our Fire Code and regulations are strong, but recent incidents and the experience of BFP inspectors lead us to conclude there is widespread noncompliance related to propane, particularly with regard to storage. The use of propane for comfort heating in outdoor dining areas was a temporary condition, but the problems associated with propane storage will persist. BFP inspectors and the LPG Task Force in the Bureau of Operations will continue to engage and educate authorized users of propane about proper storage, handling and use. The Fire Department will continue its aggressive regulation of propane and, where

appropriate, support the criminal prosecution of offenders. Most importantly, all members should remain vigilant about the hazards associated with propane and follow all Department procedures and protocols when propane is encountered in the field. ■

References

1. U.S. Chemical Safety and Hazard Investigation Board. (2008). Investigation Report: Little General Store – Propane Explosion (Report No. 2007-04-I-WV, p. 52).
2. The storage, handling and use of propane is regulated by Chapter 38 of the New York City Fire Code (which incorporates NFPA 58 Liquefied Petroleum Gas Code) and 3 RCNY 3809-01 Liquefied Petroleum Gases.

3. <https://www.washingtonpost.com/archive/politics/1987/07/22/4-die-in-brooklyn-propane-explosion/97a69b2f-37b6-46ea-b8ca-cee6a6827d4c/>
4. This quantity derives from NFPA 58. This aspect of the standard was helpful because the Department's authority to regulate the transport of hazardous materials has been diminished on the basis of federal preemption.

June 2021 Update: Propane is no longer a lawful heating option in NYC outdoor dining areas

As of the date of this publication, propane-fueled heaters are no longer allowed in outdoor dining areas for any purpose. Mayoral Emergency Executive Order No. 200, dated May 12, 2021, revoked all permits allowing the use of propane-fueled heaters in outdoor dining areas, effective June 1, 2021. All propane-fueled heaters must be removed from outdoor dining areas. Heaters that have been disconnected from propane containers may be stored elsewhere at the premises associated with outdoor dining areas.

No restaurant has been authorized to store propane containers in excess of one pound. If stored lawfully, up to 12 one-pound containers are allowable for purposes of food-warming and browning. One-pound containers are not allowed to be stored at the premises for purposes of comfort heating.



About the Authors

Kelly Carr serves as Deputy Code Development Counsel in the Bureau of Fire Prevention. Along with other members of the Code Development Unit, Ms. Carr is responsible for the periodic review and revision of the New York City Fire Code. She leads special projects and new initiatives in support of the Bureau's mission, and she has been instrumental in managing the Bureau's response to the COVID-19 pandemic. Ms. Carr holds a Juris Doctor from SUNY Buffalo and is admitted to the practice of law in the State of New York. She joined the Fire Department in February 2018.



Chief Inspector Andrew Dushynskiy joined the FDNY in 2004 and currently serves as the Director of Code Implementation in the Code Development Unit of the Bureau of Fire Prevention. Previously, he served as a Deputy Chief Inspector in the High Rise Unit, where he oversaw the operation of multiple task force inspection programs. Andrew also served for 12 years in various units of the Bureau of Fire Prevention. Before joining the FDNY, Dushynskiy worked for three years as a Fire Protection Specialist in the Bureau of Operations in the Department of State Emergency Services of Ukraine.



Chief Inspector Jesus Martinez joined the FDNY in 2006 and currently serves as the Director of Training for the Bureau of Fire Prevention, to which he was appointed in 2019. CI Martinez previously served as a Chief Inspector in the District Office Organization, which performs inspections of hazardous operations and facilities, including the storage, handling and use of LPG. He also served two years in BFP's Code Development Unit. Chief Inspector Martinez is presently in the 2021 FDNY FOMI class.