

Contain IBC Fire Risk Campaign Toolkit



HOW TO USE THIS TOOLKIT

The Fire Protection Research Foundation and National Fire Protection Association developed this toolkit to help you educate others about the risk for dangerous fires caused by improper storage of IBCs containing combustible and flammable liquids. Toolkit contents encourage compliance with NFPA 30 rules published by the National Fire Protection Association to help reduce this risk by providing guidance for proper storing, handling and use of flammable and combustible liquids within storage facilities. Specific materials include:

IBC TALKING POINTS

When entering a warehouse or chemical facility, reference these talking points when explaining the risk and how to reduce it. *(Note: The talking points are for your reference and not for distribution with this toolkit).*

IBC FAQs AND FACT SHEET

The FAQs and fact sheet provide background information on NFPA 30, IBC types and usage, proper ways to store flammable and combustible liquids and the risks associated with improper storage, handling and use.

IBC HAZARD POSTER

This visual tool should be posted in the area of facilities where general information can be found to help employees identify and reduce this risk.

POCKET GUIDE

This miniature pocket guide is designed to fit in a wallet and provides easy reference to the four safety steps for storing and handling IBCs. Distribute it to facility managers and employees. *(Note: print this card double sided, cut to size, and fold once.)*

Share the toolkit contents with people working in warehouses and chemical facilities, and other impacted groups, during site visits, meetings, events, training sessions and other relevant opportunities to engage in person. If you have any questions about the materials – or the broader campaign Contain IBC Fire Risk – contact NFPA at 1 (800) 344-3555 (toll free) or (617) 770-3000.



IBC Campaign Talking Points



ABOUT INTERMEDIATE BULK CONTAINERS

Intermediate bulk containers (IBCs) are often used to ship and store large quantities of combustible or flammable liquids for agricultural, chemical, food or other production purposes. They are made of metal, plastic or a composite of materials.

- Composite IBCs are typically a combination of blow-molded plastic containers in a metal cage or a plastic bag in a corrugated box.

IBCS AND POOL FIRE RISK

When composite IBCs containing combustible or flammable liquids are stored together in warehouses or other facilities, they can cause or contribute to dangerous pool fires. Pool fires can be catastrophic events, capable of destroying buildings where they occur and threatening adjacent buildings.

Pool fires caused by composite IBCs generally have two parts:

1. When IBCs containing flammable or combustible liquids fail, they release large pools of liquids. If ignited, the rapid heat release rates can overtax most fire sprinkler systems.
2. Composite IBCs can be easily breached by exposure to even a small fire. Additionally, once the unit empties, the composite IBC may ignite and contribute to the fire.

RULES TO REDUCE THE RISK (NFPA 30)

NFPA 30 – the Flammable and Combustible Liquids Code published by the National Fire Protection Association – provides rules to reduce hazards associated with storing, handling and using flammable and combustible liquids.

NFPA 30 is enforceable in 32 states under building and fire prevention codes. Occupational Safety and Health



Administration (OSHA) regulations are another potential avenue of enforcement.

Under NFPA 30, only three types of IBCs are permitted in industrial buildings: Metal, rigid plastic and composite – and only liquids with a closed cup flash point of 38 C (100 degrees F) or greater are permitted to be stored in them. However, rigid plastic and composite IBCs must be listed and labeled.

- Unlisted composite IBCs are not permitted for combustible or flammable liquids because they haven't been inspected or certified to provide any fire endurance and have been shown to fail quickly in fires.
- Listed composite IBCs, however, have been designed, built and certified to last in a fire for at least 20 minutes.

Generally, flammable liquids (flash point below 38 C or 100 degrees F) should never be placed in plastic or composite IBCs of any type, listed or unlisted. Combustible liquids should never be placed in an unlisted composite IBC. Additionally, in some cases, other fire properties, such as fire point, may also govern storage requirements. You can learn more about NFPA 30 rules by visiting www.nfpa.org/30.

CAUSING THE RISK

There is limited compliance with NFPA 30 rules governing storage of IBCs containing combustible or flammable liquids:

- Rules governing transport and storage of commodities are misunderstood. U.S. Department of Transportation and United Nations regulations permit shipping of flammable and combustible liquids in IBCs, but these rules don't apply to any commodities in storage – or require fire testing of IBCs.

However, many producers and customers falsely believe a container approved for shipping these liquids is also approved for storing them. This is not the case. NFPA 30 rules limit the types of IBCs allowed in buildings and also set limits on the liquid types permitted in them.

- Warehouse or facility personnel responsible for accepting or storing goods are often unaware of the fire hazard caused by IBCs. As a result, improper storage and potentially dangerous conditions often go unrecognized.

FOUR STEPS TO RECOGNIZE THE RISK AND COMPLY WITH NFPA 30

Those responsible for storing combustible and flammable liquids can determine NFPA 30 compliance by following four basic steps:

- Determining if the IBC is in or will eventually enter a protected facility – one with increased levels of sprinkler or other protections defined by NFPA 30.
- Identifying the flashpoint of the liquids to be stored.
- Identifying if the IBC is metal, plastic or composite, and if it is composite, checking to see if the IBC is listed and labeled.
- Determining if the IBC material is appropriate for storage of its contents.

It is important, however, to always look beyond the flash point and also assess the chemical composition of the liquids contained in the IBC to better determine the fire risk posed.

REDUCING THE RISK

The Fire Protection Research Foundation with funding from the Property Insurance Research Group in coordination with NFPA and the insurance industry are working together on an awareness campaign to help reduce the risk created by improper storage of IBCs containing combustible or flammable liquids. This effort includes:

- Educating impacted groups on what they can do to ensure safe storage.
- Encouraging those responsible for storing combustible and flammable liquids to:
 1. Check their facilities, operations and procedures for NFPA 30 compliance.
 2. Correct any composite IBC hazards.

Everyone can help reduce this risk by following steps on the Contain IBC Risk website. Visit www.nfpa.org/ibc to learn more and make the commitment to safe storage.

Intermediate Bulk Containers (IBCs) General FAQs



WHAT IS NFPA 30?

NFPA 30 is the Flammable and Combustible Liquids Code published by the National Fire Protection Association. The code provides safeguards to reduce the hazards associated with the storage, handling and use of flammable and combustible liquids. NFPA 30 is the law in most states.

WHERE IS NFPA 30 THE LAW?

NFPA 30 is enforceable under building and fire prevention codes in the following states: Ala., Ariz., Ark., Calif., Colo., Conn., Fla., Hawaii, Iowa, Ill., Ind., Kan., Ky., Mass., Maine, Mich., Minn., Mo., Mont., N.D., Neb., N.J., N.M., Nev., Ohio, Ore., R.I., Texas, Utah, Va., Vt. and Wis. It is also enforceable in several local jurisdictions. Other avenues of enforcement may include Occupational Safety and Health Administration (OSHA) regulations.

WHAT IS AN INTERMEDIATE BULK CONTAINER (IBC)?

Intermediate bulk containers are closed shipping vessels with a liquid capacity from 450 up to 3,000 L (119 to 793 gallons). They are intended for storing and transporting liquids defined in the Code of Federal Regulations and the United Nations' *Recommendations on the Transport of Dangerous Goods*, which include combustible and flammable liquids.* These rules, however, do not require any fire testing of IBCs.

WHAT TYPES OF IBCS ARE COMMONLY USED?

IBCs can be constructed of metal, plastic or a composite of materials. Composite IBCs are commonly a combination of blow-molded plastic containers in a metal cage or a plastic bag in a corrugated box.

WHAT TYPES OF IBCS ARE ALLOWED BY NFPA 30?

NFPA 30 only permits three types of IBCs in an industrial building. Metal, rigid plastic and composite. Only liquids with a closed cup flash point of 38 C (100 degrees F) or greater



are permitted to be stored in these containers. However, the composite IBCs must be listed and labeled. The complete rules on what types of IBCs are allowed in buildings can be found in Chapter 9 of NFPA 30 (visit www.nfpa.org/30 to access the chapters for free).

WHAT IS THE FIRE HAZARD OF A COMPOSITE IBC?

When composite IBCs containing combustible or flammable liquids are stored together in warehouses or other facilities, they can cause dangerous pool fires. These fire hazards have two components:

- 1. Release of combustible and flammable liquids.**
When IBCs containing flammable or combustible liquids fail, they can release a large pool of these liquids. If ignited, the extreme heat release rates can overtax most fire sprinkler systems. This hazard exists regardless of how the IBC is constructed.
- 2. Composite IBCs can be easily breached and then the IBC itself contributes to the fire hazard.**
Composite IBCs can be easily breached by exposure to even a small fire. Additionally, once the unit is emptied, the composite may ignite and contribute to the liquid pool. Pool fires caused by composite IBCs can be catastrophic events and are capable of destroying the building where the event occurs. A spreading pool fire can also threaten adjacent buildings.

HOW BIG OF A PROBLEM IS THIS?

While there have only been a few fires that were caused or escalated by this hazard, those fires have led to the complete destruction of the buildings involved. It also

*See: Title 49, Code of Federal Regulations, Parts 100 through 199 and Part 6 of the United Nations' Recommendations on the Transport of Dangerous Goods.

must be recognized that this hazard might be found in any community with industrial, manufacturing or warehouse operations. Of the dozens of composite IBCs on the market, there is currently only a very small fraction of listed and labeled composite IBCs in use. The vast majority of composite IBCs that are used to store combustible or flammable liquids are creating a serious hazard.

DOES NFPA 30 PROVIDE A “PROTECTED STORAGE” OPTION FOR COMPOSITE IBCS?

Chapter 16 of NFPA 30 provides protection criteria for palletized and rack storage of composite IBCs. However, the IBCs must be listed and labeled.

HOW CAN YOU IDENTIFY A LISTED AND LABELED COMPOSITE IBC?

NFPA 30 recognizes IBCs that have successfully passed testing to standards listed in Chapter 2 as acceptable listed IBCs and requires all listed units to be clearly labeled by the listing agency to confirm they meet the criteria set in the standard.

HOW ARE COMPOSITE IBCS NOT IN COMPLIANCE WITH NFPA 30 GETTING INTO PROTECTED FACILITIES?

U.S. Department of Transportation (DOT) and United Nations regulations permit the shipping of combustible liquids and some flammable liquids in many types of IBCs. However, transportation regulations do not require IBCs to be fire tested and DOT has no jurisdiction over commodities in storage. Yet, many producers and customers alike believe that a shipping container approved by DOT is also approved for storage in a warehouse. This is not the case. NFPA 30 rules limit the types of IBCs allowed in buildings and also set limits on the liquid types permitted in them. Additionally, warehouse or facility personnel responsible for accepting or storing goods are often unaware of the serious fire hazard created by composite IBCs containing combustible and flammable liquids. As a result, improper storage and potentially dangerous conditions often go unrecognized.

HOW AND WHY SHOULD WAREHOUSES COMPLY WITH NFPA 30?

It is not only the law in most parts of the United States, but it also reduces the risk that catastrophic pool fires will destroy a building. Risk can be reduced by following the four steps of compliance:

- **One: Determine whether the IBC is in or will eventually enter a protected facility.**
- **Two: Identify the liquids to be stored.**
- **Three: Identify the IBC material.**
- **Four: Determine if the IBC material is appropriate for storage of its contents in the protected facility.**



HOW MUCH SAFER IS A LISTED COMPOSITE IBC COMPARED TO ONE THAT IS UNLISTED?

Listed Composite IBCs have been designed, built and certified to last in a fire for at least 20 minutes. Unlisted composite IBCs have not been inspected or certified to provide any fire endurance and have been shown to fail quickly in a fire.

WHAT IS BEING DONE TO FIX THIS PROBLEM?

There is currently an ongoing public education effort aimed at decreasing the pool fire risk posed by composite IBCs. Groups, and individuals who have the ability to help reduce this risk will be encouraged to take several steps in making a commitment to safe storage. Tailored information is available for container manufacturers, chemical manufacturers, code and fire officials, warehouse owners, managers and staff, insurance representatives, procurement and supply chain specialists, risk managers and firefighters. Generally these steps include: education, identification and correction.

Intermediate Bulk Containers (IBCs) General Fact Sheet



INTERMEDIATE BULK CONTAINERS

Intermediate bulk containers are closed shipping vessels with a liquid capacity from 450 up to 3,000 L (119 to 793 gallons). They are intended for storing and transporting liquids defined in the Code of Federal Regulations and the United Nations' *Recommendations on the Transport of Dangerous Goods*, which include combustible and flammable liquids.* These rules, however, do not require any fire testing of IBCs.

IBCs can be constructed of metal, plastic or a composite of materials. Composite IBCs are commonly a combination of blow-molded plastic containers in a metal cage or a plastic bag in a corrugated box.

PLASTIC (NONMETALLIC) IBCS INCREASE FIRE RISK

When composite IBCs containing combustible or flammable liquids are stored together in warehouses or other facilities, they can cause dangerous pool fires. These fire hazards have two components:

1. Release of combustible and flammable liquids.

When IBCs containing flammable or combustible liquids fail, they can release a large pool of these liquids. If ignited, the extreme heat release rates can overtax most fire sprinkler systems. This hazard exists regardless of how the IBC is constructed.

2. Composite IBCs can be easily breached and then the IBC itself contributes to the fire hazard.

Composite IBCs can be easily breached by exposure to even a small fire. Additionally, once the unit is emptied, the composite may ignite and contribute to the liquid pool. Pool fires caused by composite IBCs can be catastrophic events and are capable of destroying the building where the event occurs. A spreading pool fire can also threaten adjacent buildings.



NFPA 30 RULES REDUCE THE RISK

NFPA 30 – the Flammable and Combustible Liquids Code published by the National Fire Protection Association – provides safeguards to reduce the hazards associated with the storage, handling and use of flammable and combustible liquids. The code is enforceable under building and fire prevention codes in the following states: Ala., Ariz., Ark., Calif., Colo., Conn., Fla., Hawaii, Iowa, Ill., Ind., Kan., Ky., Mass., Maine, Mich., Minn., Mo., Mont., N.D., Neb., N.J., N.M., Nev., Ohio, Ore., R.I., Texas, Utah, Va., Vt. and Wis. It is also enforceable in several local jurisdictions. Other avenues of enforcement may include Occupational Safety and Health Administration (OSHA) regulations.

NFPA 30 only permits three types of IBCs in an industrial building. Metal, rigid plastic and composite. Only liquids with a closed cup flash point of 38 C (100 degrees F) or greater are permitted to be stored in these containers. However, the composite IBCs must be listed and labeled. The complete rules on what types of IBCs are allowed in buildings can be found in chapter 9 of NFPA 30 (visit www.nfpa.org/30 to access the chapters for free).

Unlisted composite IBCs have not been inspected or certified to provide any fire endurance and have been shown to fail quickly in a fire. Listed composite IBCs, however, have been designed, built and certified to last in a fire for at least 20 minutes, and can be used for storing liquids with a closed cup flash point of 38 C (100 degrees F) or greater.

Of the dozens of composite IBCs on the market, there is currently only a very small fraction of listed and labeled composite IBCs in use. The vast majority of composite IBCs that are used to store combustible or flammable liquids are creating a significant hazard.

*See: Title 49, Code of Federal Regulations, Parts 100 through 199 and Part 6 of the United Nations' Recommendations on the Transport of Dangerous Goods.

MISUNDERSTOOD RULES CREATE LIMITED COMPLIANCE

U.S. Department of Transportation (DOT) and United Nations regulations permit the shipping of combustible liquids and some flammable liquids in many types of IBCs. However, transportation regulations do not require IBCs to be fire tested and DOT has no jurisdiction over commodities in storage. Yet, many producers and customers alike believe that a shipping container approved by DOT is also approved for storage in a warehouse. This is not the case. NFPA 30 rules limit the types of IBCs allowed in buildings and also set limits on the liquid types permitted in them.

Additionally, warehouse or facility personnel responsible for accepting or storing goods are often unaware of the serious fire hazard created by composite IBCs containing combustible and flammable liquids. As a result, improper storage and potentially dangerous conditions often go unrecognized.

FOUR STEPS TO RECOGNIZE THE RISK AND COMPLY WITH NFPA 30

One: Determine whether the IBC is in or will eventually enter a protected facility.

A protected facility is defined in NFPA 30. Requirements include, but are not limited to, increased levels of sprinklers or other protections, depending on the hazards to be protected against.

Two: Identify the liquids to be stored.

Determine if liquids stored or being received are NFPA 30 Class I (flammable – flash point 100 F), NFPA 30 Class II (combustible – flash point 100 F up to 140 F) or Class III (combustible – flash point 140 F and higher).

Three: Identify the IBC material.

Identify if the IBC is metal, plastic or composite, and if the latter, if it is listed and labeled.

Four: Determine if the IBC material is appropriate for storage of its contents in the protected facility.

Determine if any of the Class I liquids are stored or being received in composite IBCs. If so, switch to metal IBCs. Determine if any of the Class II or Class III liquids are stored or being received in unlisted IBCs. If so, you can comply with NFPA 30 by switching to listed composite or metal IBCs.

Generally, flammable liquids (flash point below 38 C or 100 degrees F) should never be placed in a plastic IBC of any type, listed or unlisted. Combustible liquids should never be placed in an unlisted plastic IBC. Additionally, in some cases, other fire properties, such as fire point, may also govern storage requirements. Those responsible for the storage of combustible and flammable liquids should always look beyond the flash point and also assess the chemical composition of the liquids contained in the IBC to better assess the fire risk posed.



REDUCE THE RISK BY MAKING A COMMITMENT TO SAFE STORAGE

The Fire Protection Research Foundation with funding from the Property Insurance Research Group in coordination with NFPA and the insurance industry are working together on an awareness campaign to help reduce the risk created by improper storage of IBCs containing combustible or flammable liquids. This effort includes the following activities:

- Educate impacted groups – container manufacturers, chemical manufacturers, code and fire officials, warehouse owners, managers and staff, insurance representatives, procurement and supply chain specialists, risk managers and fire fighters – on what they can do to ensure safe storage.
- Encourage those responsible for storage of combustible and flammable liquids to:
 1. Check their facilities, operations and procedures for NFPA 30 compliance.
 2. Correct any composite IBC hazards.

Everyone can help reduce this risk by following steps at www.nfpa.org/ibc to make a commitment to safe storage. Here you can learn more about the issue and find tailored information for container manufacturers, chemical manufacturers, code and fire officials, warehouse owners, managers and staff, insurance representatives, procurement and supply chain specialists, risk managers and fire fighters.

CHECK THE FOLLOWING TO REDUCE THE INTERMEDIATE BULK CONTAINER (IBC) FIRE RISK

| One. | Two. | Three. | Four. |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>IBC in protected facility?</p> <p>One that uses increased sprinkler and protections defined by NFPA 30.</p> | <p>What liquid type is stored in the container?</p> <p>Class I FLP <100°F</p> <p>Class II FLP 100°-140°F</p> <p>Class III FLP >140°F</p> <p>Check MSDS</p> | <p>Identify IBC material.</p> <p>Metal, plastic or composite? Check if listed and labeled.</p> | <p>Is IBC appropriate for its contents?</p> <p>Class I: Should not be used in composite or plastic IBCs. Use metal IBC.</p> <p>Class II or III: Should not be used in unlisted IBCs. Use listed composite or metal IBC.</p> |

Always look beyond flashpoint to fully assess the fire risk.



**Contain
IBC Fire
Risk**



THE
FIRE PROTECTION
RESEARCH FOUNDATION
Research in support of the NFPA mission

Find out more at www.nfpa.org/ibc.

Sponsored by the Fire Protection Research Foundation
and Property Insurance Research Group

Hazardous liquids
in IBCs can kill.

PROTECT YOURSELF



There's no simple way to prevent quick-moving chemical fires. But, you can make facilities storing chemicals safer with these steps.

ONE

Determine if the Intermediate Bulk Container (IBC) is in a protected facility.

One that uses increased sprinkler and protections defined by NFPA 30

TWO

Identify stored liquid flashpoint.

Class I (flammable): <100°F

Class II (combustible): 100-140°F

Class III (combustible): >140°F

THREE

Identify if the IBC is metal, plastic or composite.

If composite, check if it's listed and labeled

FOUR

Determine if IBC material is appropriate for its contents.

Class I liquids should not be used in composite or plastic IBCs

Class II/III liquids should not be used in unlisted composite IBCs



Find out more at www.nfpa.org/ibc.

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