U.S. Fire Administration / National Fire Academy

Coffee Break Training

Topic: Composite Intermediate Bulk Containers (IBCs)

Learning Objective: *The student shall be able to explain the limitations of composite Intermediate Bulk Containers (IBCs) used for indoor storage of flammable and combustible liquids.*

Composite IBCs have become a popular container for the transportation and storage of combustible liquids. The term "composite" refers to multiple materials of construction, typically polyethylene (inner container) and steel (outer system). The term "Intermediate Bulk Container" refers to a container with capacity between 60 and 793 gallons (227 to 3000 L). Typical composite IBCs consist of a 275-gallon (1040 L) plastic bottle surrounded by steel tube grids with an integral pallet.

Many fire codes and Occupational Safety and Health Administration (OSHA) 1910.106, *Flammable and Combustible Liquid Standard*, are based on National Fire Protection Association (NFPA) 30, *Flammable and Combustible Liquids Code*, and allow the indoor storage of these containers under specific conditions, with special limitations:

1. The storage of Class I flammable liquids in composite IBCs is prohibited.
2. Listed composite IBCs may be used for indoor storage of Class II and III combustible liquids of unlimited quantity, but only in specific palletized arrays or rack configurations protected by sprinkler systems with large hydraulic demands.
3. Non-Listed composite IBCs may be used for indoor storage of combustible liquids. This storage, however, is treated as unprotected storage, and the total number of containers, pile size, and pile height are limited. Unprotected storage implies that should a fire occur, the total contents of the fire area may become involved in the fire, regardless of the fire protection features provided.

Photo courtesy of Schütz Industrial Packaging.

Note: Composite IBCs are listed when they pass a standardized fire test, such as Underwriters Laboratories (UL) 2368, *Fire Exposure Testing of Intermediate Bulk Containers for Flammable and Combustible Liquids*. While listed composite IBCs are available commercially, few are used presently. It is important to ensure that all the limitations and restrictions of unprotected storage are enforced and understood when nonlisted composite IBCs are used to store combustible liquids.

The main area of concern is that nonlisted composite IBCs will fail quickly during fire exposure, adding a large amount of additional fuel to a fire. This large fuel release may overwhelm a building's fire protection features.

For additional information, refer to NFPA 30, the UK Health & Safety Executive Report entitled "Fire Performance of Composite IBCs" (http://www.hse.gov.uk/research/rrhtm/rr564.htm), and to the UL Composite IBC testing program (http://www.ul.com/regulators/ibc.cfm).