Plastic Drum & IBC Packaging Guideline For NFPA Code 30

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This paper was prepared and endorsed by the Plastic Drum Institute (PDI), International Confederation of Plastic Packaging Manufacturers (ICPP), the Rigid Intermediate Bulk Container association (RIBCA) and the Reusable Industrial Packaging Association (RIPA) [1].

This paper provides a guideline for the alignment of the recommended practices in NFPA Code 30 at it relates to the proper use of industrial plastic drums & IBC's. The 2003 edition of Code 30 was used in preparing this primer.

The paper will provide a step-by-step process for users of industrial plastic drums & IBC's to help in determining if the code applies to their products, and if so how this code is applicable.

The National Fire Protection Association (NFPA) is an international standards organization, with offices in Quincy, MA (USA) that focuses on fire and safety issues. NFPA Code 30 provides (a) definitions and classification of liquids as flammable and combustible, as well as general definitions, (b) reasonable requirements for the safe storage, handling and use of flammable and combustible liquids, and (c) explanatory material used in code development and approval.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the codes. NFPA does not list, certify, test or inspect products, designs or installations for code compliance.

NFPA does not involve itself with container transportation regulations that are governed by DOT (US Department of Transportation), Transport Canada or the UN Recommendations for the Transport of Dangerous Goods.

Contact NFPA to purchase the complete NFPA Code 30 for additional details.

Step 1.

The first step is to determine if NFPA Code 30 applies to package and ladings being packaged. Reference Figure 6.8.2(b), which provides a decision tree for flammable and combustible liquids in plastic containers.

Certain liquids are excluded in section 6.1.2. This section states that Code 30 shall not apply to the following:

1. Containers, IBC's and portable tanks that are used in process areas.
2. Liquids in fuel tanks of motor vehicles, aircraft, boats or portable or stationary engines.
3. Beverages, where packaged in individual containers that do not exceed 5 L (1.3 gal) capacity.
4. Medicines, foodstuffs, cosmetics, and other consumer products that contain not more than 50 % by volume of water miscible liquids, with the remainder of the solution not being flammable where packaged in individual containers that do not exceed 5 L (1.3 gal) capacity.
5. Liquids that have no fire point when tested by ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup*, up to the boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change.
6. Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or in dispersion with a water and inert (noncombustible) solids content of more than 80% by weight, which do not sustain combustion when tested using the "Method of Testing for Sustained Combustibility" per 49 CFR 173, Appendix H. or the UN *Recommendation on the Transport of Dangerous Goods*.
7. Distilled spirits and wines in wooden barrels or casks.

Step 2

Section 3.3.25.1 Combustible liquid and 3.3.25.2 Flammable liquid provide the guideline for determining if the lading is combustible or flammable, and in what category the product should be classified.

- Class IA Flash point below 73 & boiling point below 100 F
- Class IB Flash point below 73 & boiling point above 100 F
- Class IC Flash point 73 to 100 F
- Class II Flash point 100 to 140 F
- Class IIIA Flash point 140 to 200 F
- Class IIIB Flash point 200 F +

Refer to this section to determine where the lading being packaged is classified. If the lading does not fall into any of these categories Code 30 would not be applicable.

Step 3

Table 6.2.3 Maximum Allowable Size – Containers. This table lists the container type and the maximum allowable size of the container based on the determination of the lading classification from Step 2. Below is an excerpt from this table, which applies to plastic containers & IBC's.

	Flammable Liquids			Combustible Liquids	
Type	**Class IA**	**Class IB**	**Class IC**	**Class II**	**Class III**
UN 1H1 Plastic Drums	**5 L (1.3 gal)**	**20 L (5.3 gal)***	**20 L (5.3 gal)***	**450 L (119 gal)**	**450 L (119 gal)**
Plastic or Composite IBC's	**NP**	**NP**	**NP**	**3000 L (793 gal)**	**3000 L (793 gal)**
Metal Portable tanks & IBC's	**3000 L (793 gal)**	**3000 L (793 gal)**	**3000 L (793 gal)**	**3000 L (793 gal)**	**3000 L (793 gal)**
NP - Not Permitted					

* For Class IB and IC water-miscible liquids, the maximum allowable size of plastic container is 230 L (60 gal), if stored and protected in accordance with Table 6.8.2(g).

Table A.1.7.3 presents a comparison of the definitions and classification of flammable and combustible liquids, as set forth in Section 1.7 of Code 30, with similar definitions and classifications used by other regulatory bodies (ANSI, DOT, UN and OSHA).

Step 4

Table 6.4.4.1 Indoor Unprotected Storage of Liquids in Containers provides a guide as to the maximum amount that can be stored indoor and the maximum height allowable.

	Rigid Plastic & Composite IBC's			Portable Tank/Metal IBC		
Class	Maximum Pile Height (ft)	Maximum Quantity per pile (gal)	Maximum Total Quantity (gal)*	Maximum Pile Height (ft)	Maximum Quantity per pile (gal)	Maximum Total Quantity (gal)*
IA					NP	
IB				7	2,000	2,000
IC				7	4,000	4,000
II	7	4,125	8,250	7	5,500	11,000
IIIA	7	13,750	27,500	7	22,000	44,000
IIIB	7	13,750	55,000	7	22,000	88,000

*Applies only to cut-off rooms and attached buildings, not to liquid warehouses.

NP – Not Permitted

Table 6.7.1 Outdoor Liquid Storage in Containers provides a guide as to the maximum amount that can be stored outdoor and the maximum height allowable.

	Rigid Plastics & Composite IBC's		Portable Tanks & Metal IBC's	
Class	Capacity (gal)	Height (ft)	Capacity (gal)	Height (ft)
IA			2,200	7
IB			4,400	14
IC			8,800	14
II	8,800	12	17,600	14
III	22,000	18	44,000	14

Step 5

6.5.2.4 Liquids in Plastic Containers provides some limited exceptions. Class I and Class II liquids in plastic containers shall not be stored in general-purpose warehouses but shall be stored in inside liquid storage areas that meet the requirements of Section 6.4.

Exception No. 1: The following liquids, packaged in plastic containers, shall be permitted to be stored in general-purpose warehouses in accordance with the protection and storage limitations specified in 6.5.2 as follows:

1) *Products containing not more than 50% by volume of water-miscible liquids, with the remainder of the solution not being a Class I liquid, where packaged in individual containers*
2) *Products containing more than 50% water-miscible liquids in individual containers not exceeding 0.5 L (16 oz) capacity in cartons*

Exception No. 2: Class I and Class II liquids in plastic containers shall be permitted to be stored in a general-purpose warehouse if the packaging systems are listed and labeled for use with these materials. All other provisions of 6.5.2 shall also apply.

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[1] The Plastic Drum Institute (PDI) is a trade association, which represents manufacturers of industrial plastic containers, polyethylene resin manufacturers, closure and ring manufacturers, industrial container recyclers and equipment manufacturers in North America.

The Rigid Intermediate Bulk Container Association (RIBCA) is a trade association, which represents manufacturers of intermediate bulk containers, package testing companies and polyethylene resin manufacturers in North America.

The International Confederation of Plastic Packaging Manufacturers (ICPP) is an international trade association, which represents manufacturers of industrial plastic containers, polyethylene resin manufacturers, closure and ring manufacturers, container recyclers and equipment manufacturers worldwide.

The Reusable Industrial Packaging Association (RIPA) is a trade association, which primarily represents industrial packaging reconditioners whose membership also includes manufacturers of industrial plastic and closure and ring manufacturers in North America.