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Flammable and/or Combustible Liquids Drum Storage Heights

A common HSIP recommendation is to lower the height to which drums of flammable and/or combustible liquids are stored.

The allowed drum storage arrangements, including height limits, are dependent upon the available fire sprinkler protection. The water discharge from the ceiling sprinklers must be able to reach, and sufficiently cool, the drums below, to prevent these drums from over-pressurizing and rupturing beyond the capability of the emergency pressure relief bungs. A drum that has ruptured due to pressure severely challenges a fire sprinkler system in many ways.

If a drum ruptures, the contents immediately become involved and consequently contribute to fire growth. Also, a rupturing drum may become a rocketing drum, potentially advancing a fire that originated in one area to multiple other areas. A fire sprinkler system is designed to produce a specified water density over a specified area of floor (i.e., 0.60 gpm per square foot over 3,000 square feet). Once a fire advances to an area greater than the design area, and fuses sprinklers in these areas greater than the design area, the delivered water density to a design area will begin to decrease and possibly reach inadequacy.

Currently, NFPA 30, Flammable and Combustible Liquids Code, allows for flammable and/or combustible liquids

storage on wood pallets either in open racks or on floor, with an adequately designed ceiling fire sprinkler system and in-rack fire sprinkler system (as needed). (To date, there has been no full-scale testing to determine appropriate fire protection design criteria for Class IA liquids or unstable liquids). Also, for drums stacked more than one high, the drums must be placed on open slat pallets and not 'nested' to allow for pressure relief from drums on the level below.

In addition to the above, the Steel Shipping Container Institute (SSCI is a not-for-profit organization representing the manufacturers of new steel shipping containers) led a group of sponsors (consisting of steel suppliers, container manufacturers, container users, suppliers of fire protection equipment, and insurers) to conduct a series of fire tests on steel drums fitted with plastic relieving style bung closures. These fire tests confirmed that plastic relieving style bung closures are an effective method of relieving internal pressure that can occur when drums containing flammable and/or combustible liquids are involved in a fire.

In summary, when storing flammable and/or combustible liquids, for optimum protection, choose metal containers, pressure relieving style bung closures, open slat pallets, and, most importantly, an adequately designed fire sprinkler system.

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