

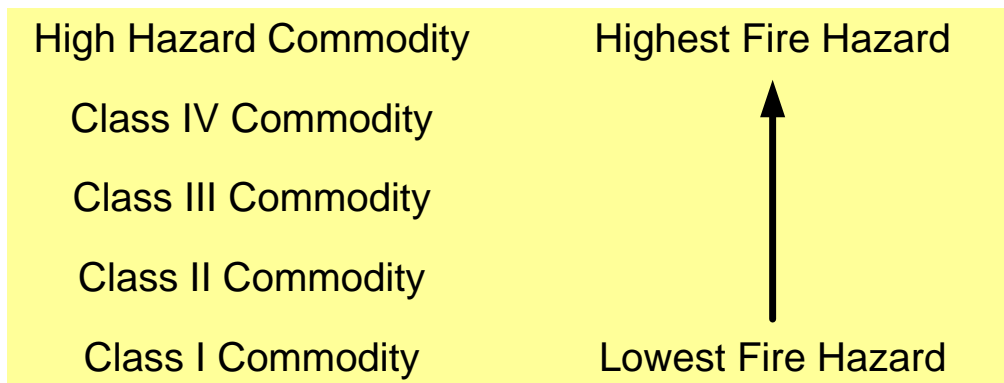


## High-Piled Combustible Commodities Guide

Chapter 32 of the 2021 *International Fire Code* (IFC) requires all commodities that will be stored as solid pile, palletized or on racks to be classified based on their fire hazard. Commodities are classified based on the heat release rate of the stored material, the packaging, and the pallets (if used). Commodities containing plastics require an additional classification based on the monomers selected by the manufacturer of the stored commodity.

Commodities are classified into four distinct classes ranging from I through IV. The higher the number, the higher the heat release rate of the stored commodity. As the commodity classification increases, the greater the volume water is required to either control or suppress the fire. This classification system is based on the criterion published in National Fire Protection Association (NFPA 13), *Standard for Sprinkler Systems*, 2021 edition.

The IFC has a separate classification system for commodities deemed as High Hazard. This classification is reserved those products that exhibit very high heat release and burning rates and includes certain plastics, rolled carpets, certain types of hazardous materials, lithium ion batteries, and aerosol products. When commodities are classified as High Hazard, very specific design rules are enforced because of the fire risk these materials represent.



### SOLID PILE STORAGE

Goods and materials that are stacked vertically, horizontally, or both on each other. Solid pile storage requires specialized material handling equipment. An ignition source must produce sufficient heat for a longer time to ignite solid piled storage. Solid pile storage requires more energy to ignite when compared to palletized or rack storage because it limited or no flue spaces. Solid pile storage is the least prevalent storage method permitted by Austin Fire Department.



## **PALLETIZED STORAGE**

Storage using wood or plastic pallets to facilitate the movement of cartoned, rolled, or bagged goods and products by manual or automatic materials handling systems is classified as palletized storage. Pallets create a path for the movement heated air that is generated during a fire and allowing for horizontal fire spread. The commodities on the pallets are shielded from the ceiling sprinklers. Pallets can be weakened by the fire and upon failure, and upon collapse, will cause the cartoned, rolled, or bagged goods to potentially fall onto and injure firefighters. Collapsed packages exposes more surface area which can increase the burning rate and cause additional sprinklers to operate.



## **RACK STORAGE**

Rack storage is the most predominant method for storage of good and products on wood or plastic pallets. This storage method allows the highest density of material inside of a building. Rack storage also represents the highest fire risk because the design enhances promotes fire spread because five of the six sides of a pallet load are exposed to direct flame impingement. Storage racks are constructed with flue spaces to allow fire sprinkler water to penetrate into the rack space and slow or stop the spread of fire by cooling the heated gases generated during combustion.

