



## Coffee Break Training - Fire Protection Series

### Storage Practices: High-Piled Storage: Banding or Encapsulating?

No. FP-2010-6 February 9, 2010

**Learning Objective:** The student shall be able to explain the difference between “encapsulated” and “banded” unit loads.

This stack of palletized products awaits loading into the nearby rack storage system. Each pallet of material is known as a “unit load.”

Notice how the unit loads are wrapped with a thin plastic sheet. This sheet stabilizes the load and prevents small items from slipping off. However, the arrangement creates a potential problem that the fire inspector may need to address.

If a unit load of combustible commodities is wrapped with a plastic sheet completely enclosing the sides and top (all five faces) it is classified as *encapsulated*. On the other hand, if it is wrapped only on four sides, it is said to be *banded*.

- Combustible commodities individually wrapped in plastic sheeting and stored exposed in a pallet load also are categorized as *encapsulated*.
- Totally noncombustible commodities on wood pallets enclosed only by a plastic sheet are not considered *encapsulated*.
- Where there are holes or voids in the plastic or waterproof cover on the top of the carton exceeding more than 50 percent of the top surface area, the term *encapsulated* does not apply.
- The term *encapsulated* does not apply to plastic-enclosed products or packages inside a large, nonplastic, enclosed container.



These unit loads await loading into nearby rack storage.

Differentiating between *encapsulated* and *banded* unit loads is important to assure the fire sprinkler system that may be protecting the storage area is designed adequately. Where storage is *encapsulated*, ceiling sprinkler discharge densities should be 25 percent greater than for like unit loads that are not *encapsulated*. This is due to the fact that adequate sprinkler discharge water will not accumulate on *encapsulated* unit loads to keep them from being ignited by a spreading fire.

According to National Fire Protection Association (NFPA) 13, *Standard for the Installation of Automatic Sprinkler Systems*, 2007 Edition, full-scale test data are not available for *encapsulated* products stored higher than 15 feet (4.6 m). However, in limited rack storage tests involving *encapsulated* storage 20 feet (6.1 m) high, increased protection was needed over that for non*encapsulated* storage.

For additional information, refer to NFPA 13, *Standard for the Installation of Automatic Sprinkler Systems*, Chapters 14 and 16.



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