

**Tom Fitzgerald, President of TMF Corporation, discusses a question he hears often:**

**What is meant by “Plastic Pallets equivalent to wood pallets”?**

The advantages to pharmaceutical and food handling businesses of using plastic pallets instead of wood pallets can be dramatic in both cleanliness and cost savings due to the longer useful life of the pallets. One area where that sometimes causes a hesitation or delay in making the change is the need or goal of a company to meet fire protection standards.

We’ve addressed this at TMF Corporation by manufacturing our Protech Pallet using a combination of standard resins and adding fire retardant materials. We then had them tested by Factory Mutual Approvals and rated so their fire hazard classification is “equivalent to wood pallets”. That is how the fire retardant Protech Pallet is able to carry the FM Approved logo. I want to take advantage of this space to explain what that means to you, me and to the fire protection establishment.

Most plastic pallets are molded out of polyolefin materials such as high density polyethylene or polypropylene. These materials are more flammable than the wood used to make pallets. Over the years the plastics industry has argued with the fire protection establishment that plastic pallets, while they burn hotter than wood, are much more difficult to ignite. Fire protection people counter with the fact that most warehouse fires are arson and if an arsonist wants to start a fire they will do what ever they need to do to get a fire started.

Eventually the plastic pallet industry and the fire protection establishment came to some general agreements. The National Fire Protection Agency, NFPA, took the many documents that in any way referred to plastic pallets and included them in one document. This document, NFPA13, “Installation of Sprinkler Systems” identifies what warehouse owners need to do when using pallets, both wood and plastic, for storage in warehouses.

In general plastic pallets can be used in warehouse storage the same as wood pallets depending on certain situations.

Warehouses built since the mid-nineties are required to have sprinklers designated as K-17 or higher. Testing done to approve the K-17 sprinkler was done using plastic pallets. Since the K-17 sprinkler was tested and approved for protection in a plastic pallet fire, it followed that plastic pallets could be used in warehouses with K-17 or higher sprinkler protection.

The question of whether a move to plastic pallets is practical occurs in warehouses built before the mid-nineties. The challenges can be addressed in several different ways. One way is to upgrade the sprinkler system to present code. This can be done in some cases by simply replacing existing sprinkler heads with K-17 sprinkler heads, but in other cases the entire sprinkler system might need to be replaced. This is very expensive and in most cases impracticable.

NFPA 13 lays out in detailed rules how idle plastic pallets need to be stored and how the class of each commodity changes when commodities are stored on plastic pallets. If you are interested in this information please refer to NFPA 13, 2007 edition or contact us for a White Paper on this subject.

When the conditions and requirements for the warehouse and pallet handling in NFPA 13 are too expensive to be practical it is time to look at the pallets themselves. NFPA 13 allows for testing of plastic pallets. If the results from burning plastic pallets are equal to or better than results from burning wood pallets, they can be protected by

the same sprinkler scheme as approved for wood pallets. This is rating is what is meant by “equivalent to wood pallets.”

There are a number of testing facilities that can do the burn tests. However, only two companies actually have documented approval processes. These laboratories are Factory Mutual Approvals in Norwood, Massachusetts and Underwriters Laboratories in Chicago, Illinois.

Factory Mutual’s test is titled ANSI/FM4996, and involves testing idle plastic pallets as equivalent to wood pallets. This is the test that TMF Corporation’s Fire Retardant Protech Pallet passed to earn its fire retardant rating. This is a most complex testing process, which normally requires at least six months to complete and the pallet components are monitored every year thereafter to maintain the “FM” designation.

The fire test hazard classification used in this standard consists of monitoring the following criteria during actual fire test conditions. The values obtained during the fire tests are then compared to predetermined limits to determine if the pallet has met all requirements for fire hazard classification as equivalent to wood pallets.

- Number of sprinkler operations
- Maximum one minute average ceiling level gas temperature
- Maximum five minute average ceiling level gas temperature
- Maximum one minute average ceiling level steel temperature
- Maximum five minute average ceiling level steel temperature
- Extent of fire damage
- Extent of melted plastic pooling

Each criteria tells its own story of the fire. The number of sprinkler operations is useful in determining how quickly a fire can be controlled and/or extinguished by automatic sprinkler protection. The maximum one and five minute average ceiling level gas and steel temperatures are responsible for the heating of exposed steel and the operation of automatic sprinklers. The extent of fire damage is a measure of a fire’s potential for spreading horizontally and causing damage to adjacent products. The extent of melted plastic pooling is a measure of the potential of the fire to spread along the floor to adjacent products located across an aisle space.

In addition to the above test criteria, quality control tests are conducted as an aid in monitoring the quality controls exercised in the resin and pallet manufacturing process.

Having the FM Approved rating distinguishes the Protech Pallet from the competition and allows more warehouse operations to reap the benefits of having a high quality plastic pallet without incurring the cost of renovations, increased commodity class or special storage requirements. An investment in fire retardant plastic pallets is often the best step in meeting fire protection goals.

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