

FMC Policy: “Prohibiting Wooden Pallets for H₂O₂ Drums”

The purpose of this letter is to document FMC’s position regarding the storage of Hydrogen Peroxide drums on wooden pallets and provides a clear rationale of why we have taken this position.

FMC Policy: “The storage of Hydrogen Peroxide drums on wooden pallets is prohibited.”

Since FMC initially began the manufacture of Hydrogen Peroxide in the 1930’s (at former BECCO plant in Tonawanda, NY), there have been countless case histories of fires, both major and minor in nature, that have been directly attributed to the storage of peroxide drums on wooden pallets. As a more recent example, one of FMC’s major distributors lost an entire warehouse to fire in the early 1990’s, at a cost in excess of \$1,000,000. The follow-up investigation determined that a single wooden pallet, ignited by a leaking drum of 35% Hydrogen Peroxide, initiated this warehouse fire.

Although the fire hazards associated with higher peroxide concentrations (e.g. 70% H₂O₂) are well known and understood, it is actually the lower concentrations (e.g. 50% & 35% H₂O₂) that very often can result in a more serious incident, due to the “time delay” factor. Unlike 70% H₂O₂, which can ignite a combustible material within a few minutes, the lower H₂O₂ concentrations, when contacted with a dry combustible material, can “smolder” several hours or even days before finally igniting. This time delay ignition typically occurs when it is least expected. Under the right conditions (i.e. high temperature/low humidity; and dry, porous, combustible surface), the combined effect of slow peroxide decomposition and evaporation can cause the peroxide to slowly concentrate. Once the concentration reaches about 70%, further decomposition evaporates the remaining water and the temperature rapidly rises to the point where a combustible material will spontaneously ignite with the pure oxygen released by the decomposing peroxide.

FMC’s experience is that wooden pallets, typically constructed from dry, very porous softwoods, are ideal candidates for peroxide induced fires. Unlike the hard, non-absorbent wooden floors of the trucks typically used in the transportation of peroxide drums, wooden pallets provide an absorbent surface, which is very conducive to the slow H₂O₂ decomposition/evaporation/concentration effect described above. This is why wooden pallet fires have been quite common, whereas fires caused by peroxide spillage on truck floors have been extremely rare. Another problem with wooden pallets is that they are assembled with nails that, over time, can protrude out of the wooden surface and actually create a puncture hazard for plastic drums.

Please call FMC Engineering Services for assistance at (716) 879-0494 / (716) 879-0495 or
visit the FMC website at www.fmcchemicals.com for more information

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It was specifically due to this relatively high frequency of wooden pallet fires caused by peroxide contact, that the National Fire Prevention Association (NFPA) has also adapted FMC’s policy prohibiting use of wooden pallets for peroxide service. NFPA 430 “Code for the Storage of Liquid and Solid Oxidizers” (2000 Edition) includes the following statement in paragraph 2-4.2; ***“Hydrogen Peroxide (Classes 2 through 4) stored in drums shall not be stored on wooden pallets.”*** This NFPA prohibition applies to all Hydrogen Peroxide concentrations greater than 27.5%.

Furthermore, the North American Peroxide Producers Association and the European Chemical Industry Council support FMC’s position.

Following are a few reasonable alternatives to wooden pallets:

- Use of non-wooden pallets (e.g. plastic) for peroxide drum service.
- Shipment and/or storage of peroxide drums loose, without pallets.
- Treatment of wooden pallets with an effective fireproofing agent.

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