



Paper Recyclers: Best Practices – Fire Prevention

During 2018, the waste and recycling industry experienced 365 reported fires in both the U.S. and Canada. Based on reasonable assumptions, it can be estimated that 1,800-plus facility fires have occurred during that time, which based on the number of facilities reported by the Environmental Research & Education Foundation, is more than 40 percent of the industry. There were also three deaths and 13 injuries reported during that time.

These fires are not only occurring at materials recovery facilities (MRFs) and transfer stations but also at scrap metal, construction and demolition, paper, plastic, chemical and organics recycling operations. They are caused by a list of fire hazards, including, but not limited to, lithium-ion batteries, pressurized tanks/containers, fuels, fertilizers, propane tanks, aerosols and more. Most fires are caught during their very early stages, but the fires reported by news outlets have typically passed the incipient stages.

Approximately 8% of those fires are at a paper recycling facility. Fires at these facilities are difficult to extinguish due to the burrowing nature of the baled waste paper into the storage pile. Firefighting most likely will require extensive manual overhaul of the burning pile by removing the smoldering bales from buildings or outdoor storage areas, so the individual bales can be broken apart and extinguished. Water discharge from sprinkler and hose streams compound the difficulty in removing the bales from their storage areas as the baled paper absorbs significant amounts of moisture and greatly increase the weight of the piles. Many of these fires have resulted in total losses or extensive damage to the site. To prevent these fires or minimize their impact, AIG Property Risk Engineering has developed the following guidelines:

Interior Building Baled Waste Paper Storage:

The following should be provided for adequate fire protection of baled waste paper storage inside buildings:

- a. Strictly enforce hot work permit and no smoking programs around all areas where baled wastepaper is stored.
- b. Provide automatic sprinkler protection for areas that store baled waste paper inside buildings or beneath canopies outside building per the requirements of NFPA 13 General guidelines.
- c. Baled wastepaper will expand when it becomes wet; therefore, a minimum of two feet should separate bales storage from walls, steel framing and sprinkler risers.
- d. Piles should be limited to 1,000 ft² with minimum of 15 feet clear aisles between piles. The aisle ways will limit the horizontal fire spread and will facilitate manual fire fighter access to the burning pile.
- e. In buildings with adequately designed automatic sprinkler protection, protection of steel columns is not required. However, the steel columns should be encased in concrete to protect the columns from physical damage caused by impact from forklifts or front-end loaders. This will help reduce the potential for severe damage to the steel columns and possible roof collapse.



- f. Baled waste paper storage for new facilities (new construction) should be separated from other areas of the facility by a three-hour fire rated, free standing fire wall. Openings in the wall should be kept at a minimum and should be protected by three hour rated fire doors.

Note: Retrofitting three-hour fire rated walls into existing facilities will most likely be cost prohibitive compared to the risk reduction achieved. Instead, it is suggested that a 10ft. clearance between this and other areas should be established. In addition, a minimum of three feet clearance must be kept away from electrical equipment.

Exterior Baled Waste Paper Storage:

The following should be provided for adequate fire protection for exterior baled waste paper storage:

- a. Exterior storage beneath canopies attached to important insured buildings should be provided with automatic sprinkler protection.
- b. Outside bale paper storage should be a minimum of 50ft from the exterior of important insured buildings or insured equipment.
- c. Limit pile sizes to maximum of 750 tons per pile and provide 50ft clear main aisle ways between piles and 25ft cross aisles to facility manual firefighting operations.
- d. Outside bale paper storage should be provided with fire hydrants spaced around the baled waste paper storage area(s) to supplement NFPA 24 Standard for the Installation of Private Fire Service Mains and their Appurtenances.
- e. For large bale waste paper storage areas equal or exceeding 3,000 tons consideration should be given to providing monitor nozzles around the piles. Monitor Nozzles should have a minimum rating of 500 gallons per minute (gpm) and arranged such that a minimum of two monitor nozzles can reach any and all portion of the baled waste paper storage. Solid streams are typically operated at 80 psi nozzle pressure. Adjustable nozzles are operated at 100 psi.
- f.

NOTE: Typical weight of a cardboard bale is about 600-1,000lbs/cubic yard and for paper bale is about 1,000-2,000lbs/cubic yard.

Additional Items to Consider:

- 1. Conduct ongoing and rigorous documented inspections, focusing on ignition sources and items that can fuel a fire but not limited to verifying storage limits and separations limits.
- 2. Yearly review of fire response activities including regular scheduled training, drills and unannounced drills.
- 3. Consider creating a fire brigade to take charge of evacuation, property protection and emergency response coordination.
- 4. Ensure that business interruption and recovery plans are in place and regularly updated.
- 5. Have a central station monitored fire alarm or flow alarm system and test it regularly.
- 6. Consider using a third party remotely monitored infrared paper storage monitoring including remote controlled firefighting apparatus handled by a central station.



Sources:

"Waste Recycling Facilities Fires Up 26% in 2018 compared to 2017" by Ryan Fogelman – Waste 360, January 3rd, 2019.

"Baled Waste Paper Storage", AIG Technical Engineering Guidelines. Date Issued: 21st August 2013. Index #: CP-EG-05-0005

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