



Best Practices in Wood Waste Recycling

Automatic Detection of Metal

Material: Wood Waste

Issue: *One of the most common contaminants of recovered wood waste supplies is ferrous metal. One can find ferrous metal within crates, pallets, construction and demolition debris as nails, screws, staples and other hardware. Larger pieces such as scrap metal can also be found within the wood waste supply. Other sources of metal contaminant include damaged parts from the processing equipment (for example, sections of chain, bolts, and tools). Metal contaminants create problems for processing equipment. For example, chippers are sensitive to even the smallest pieces of metal. Even the sturdiest hog can receive serious damage from a piece of metal. Most importantly, to safeguard against damage to the equipment, detect ferrous metals at the in-feed of certain critical pieces of process equipment, like size-reduction equipment.*

Best Practice: This Best Practice recommends wood waste processors install a metal detection system upstream of sensitive or critical process equipment.

Generally, metal detection equipment is installed in a conveyor system. The basic equipment consists of a section of metal free conveyor trough, usually fiberglass, that contains a metal detecting coil. The detector is activated by the presence of magnetic or non-magnetic metal in the material flow. Any metal passing over the coil produces an electronic signal that activates an alarm system. The alarm usually sets off a warning light and stops the conveyor. Once the metal is removed, the operator can reset the detector and restart the conveyor to resume operation. The detection system can be adjusted to allow small pieces of metal to pass through and only activate for large pieces of metal, if appropriate.

Also available are more sensitive systems that incorporate coils that completely surround the conveyor. These systems contain more sophisticated electronics which create several advantages compared to the flat coil systems. One advantage is better resolution in distinguishing between small and large pieces of metal. When the burden depth on the conveyor goes above ten inches, the 'surround' type detector is better able to distinguish between a small piece of metal on the bottom of the conveyor and a large piece of metal riding on the top of the material flow. The surround type coil is also able to incorporate a discriminate circuit that can be set to reject certain non-ferrous metal like aluminum or copper wire.

Implementation: Metal detection systems can be installed in new or existing facilities. The metal detection system should be installed at an adequate distance from the chipper in-feed spout to allow belt travel after the detector stops the drive motor.

Benefits: Metal detection systems provide protection for sensitive or critical process equipment. The systems are an excellent safeguard against excessive equipment maintenance and catastrophic equipment damage.

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Application Site: Processing Facility and Manufacturing Plant.

Contact: For more information about this Best Practice, contact CWC (206) 443-7746, e-mail info@cw.org.

References:

1. Perdew, Frank. Metal Detectors, Inc. Eugene, OR.
2. Willis, Ken. Rens Manufacturing Company. Creswell, OR.

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