

Preventive Maintenance Plan

Howard Miller Company
SRN A5937
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General Background

The Maintenance Supervisor is responsible for the maintenance of all factory equipment, including all air pollution control equipment. Since production depends on the reliability of the dust collection system, it is imperative that routine maintenance be performed to ensure uninterrupted operation of the facility. The goal of the preventive maintenance activities is to avoid the need for repairs and equipment replacement at inopportune times by routine maintenance that prolongs the life of equipment and pre-empts an unexpected shutdown of production.

The identification of the routine maintenance checks and, as appropriate, repairs are suggestive in nature and do not constitute a “violation” of this MAP for failures to conduct. Rather, the suggestive identification is intended to be guidance for maintenance staff and proper communication.

Baghouses – General Procedures

Baghouses are highly effective air-cleaning/air pollution control devices. They are used at a number of locations throughout the factory. Baghouses require a minimal amount of monitoring to ensure proper operation.

For monitoring purposes each unit is equipped with a differential pressure monitor (a pressure gauge or manometer). Baghouse differential pressures that are above the unit upper range, as detailed for each specific unit, are an indication of bag blinding (plugging). Excess emissions are typically not associated with plugged bags, since particles are not allowed to bypass the filter media; however, loss of collection effectiveness may also occur and as a result excessively high differential pressure situations should be addressed and corrected as soon as can be facilitated.

After bags are replaced and during initial start of the equipment, a gradual initial load on the fabric of the bags can result in lower than normal differential readings. Normally, this low-pressure situation does not result in significant emissions to the atmosphere and the condition will correct itself as a filter cake gradually forms on the filter media. In the event that the differential pressure readings do not return to the normal range, the unit should be shut down and the filter bags should be inspected. The filter cake buildup period during start-up can take several hours (for example 36 to 48 hours) after any prolonged (more than 48 hours) shut-down or stoppages. Pressure drops of <1.0 In. H₂O during these periods are considered typical/acceptable, so long as the pressure drop increases to normal ranges following the filter cake period build up period.

The pressure drop will be monitored by the Building Management System (BMS) which will provide an audible alarm when the differential pressure exceeds the set operating range. Second, daily manual readings of the differential pressure will be recorded to provide predictive information for when an outage may need to be scheduled for bag replacement or to alleviate a possible pluggage. Finally, there is a routine schedule of inspections of the equipment components (transfer system, bags, air locks, hangers, motors, etc.)

A general troubleshooting process description and flow chart are included in Appendix A for use as a guide for situations which go beyond the foreseeable events and procedures outlined in this written plan.

Wood Boiler

The wood fired boiler (EUWOODBOILER1) is a Steelcraft Vyncke underfeed stoker boiler with a heat input rating of 10 MMBTU/hr. The unit is equipped with an underfeed auger system, automatic feed system which supplies scrap wood working materials as fuel, on an as required basis. The boiler is used to provide hot water heat to the plant for employee comfort. Therefore, its use is seasonal, depending on atmospheric temperatures.

This plan is to satisfy the Special Condition IX.1 of MI-ROP-A5937-2015. This process is not equipped with an air cleaning device (uncontrolled), nor is this unit equipped with a burner (it is a stoker fired unit), or even an exhaust fan (natural draft). Therefore, the preventive maintenance plan is limited in its scope to fuel delivery equipment, the ash pot and inspection of the unit for ash build-up.

The inspection and maintenance of the boiler is led by the Maintenance Supervisor. Inspections are to be conducted weekly on the ash pot to ensure that it emptied before excess ash is collected. Monthly, the unit is inspected for any build-up of ash and annually, the flute tubes are cleaned, as is the inside of the boiler. During the summer down time, the fire brick inside the boiler is inspected and repaired as needed.

Below is a summary of the preventive maintenance inspections for the dust collection units and the boiler.

Preventive Maintenance Summary Table

Control System Number	Device Description	Equipment Name	Preventative Maintenance Task	Frequency	Person Responsible
1	Wood Boiler Stack	Wood Boiler	1. Inspect ash build-up, grease pump and inlet ports.	Monthly	Maintenance Supervisor
			2. Monitor ash pot, empty as required	Weekly	Maintenance Supervisor
			3. Clean flute tubes, clean inside of boiler. Inspect and repair fire brick. Inspect all mechanical parts.	Annually	Maintenance Supervisor
2	Dust Collection Unit (Shaker style)	Wheelabrator Dust Collectors	1. Visual inspection of transfer system to ensure proper material disposal.	Daily	Maintenance Supervisor
			2. Shake down of internal collector bags.	2-4 Times per Day	Maintenance Supervisor
			3. Inspect internal components of collector (bags, airlocks, hangers, motors) for proper operation.	Annually	Maintenance Supervisor/Outside Contractor
3 & 4	Dust Collection Unit (Reverse Air)	Dustar & Alanco Dust Collectors	1. Visual inspection of transfer system to ensure proper material disposal.	Daily	Maintenance Supervisor
			2. Inspect internal components of collector (bags, airlocks, hangers, motors) for proper operation.	Annual	Maintenance Supervisor/Outside Contractor
5	Silo Baghouse Cyclone		1. Check belts and motors for proper operation and changes as required.	Annual	Maintenance Supervisor
6	Vented Spray Booths w/ mat filters	Finishing Spray Booths	1. Check filters for air flow. Replace filters per PM schedule and/or air flow readings as required.	Daily	Maintenance Supervisor

Maintenance Spare Parts Summary

Control System Number	Available Spare Parts
1	SSK Auger, SSK Bearings, Airlock Bearing, Air-Lock Seals, SSK Gearbox, SSK Drive Belt, Auger Gearbox, Motor for Feed System, Belt for ID Fan, Damper Motor, Photo-helic Control for Damper Motor, SSK Temperature Sensor, Exhaust Flue (Stack) Sensor, Control Switches
2	Fan Drive Belts, Fan Bearings, Spare Bags, Spare Bag Hangers, Misc. Shaker Parts (Bearings, Shaker Bars)
3	Fan Drive Belts, Fan Bearings, 250 HP Motor, Reverse Air Fan Motor, Spare Bags, Spare Cages for Bags
4	Spare Bags
5	Drive Belts for Fan, Spare Bags