P09-831-001
PREVENTIVE MAINTENANCE PROCEDURE

I. Scope:

This Preventive Maintenance Procedure is not intended to mean a "Preventive Maintenance Program" as described in technical literature where equipment is systematically scheduled to be shut down regardless of customer needs.

The accepted definition of preventive maintenance at this facility includes maintenance activities that extend the life of equipment and that identify equipment wear and potential equipment failure. Equipment deficiencies identified that compromise the quality of product are immediately brought to the attention of the Plant Superintendent who initiates appropriate action. Other equipment deficiencies identified are prioritized for replacement and/or repair to be conducted when the equipment becomes available.

II. Purpose:

To describe the system used at this facility to maintain equipment in suitable working condition and document that system.

III. Responsibilities:

The Maintenance Crew Leader is responsible for managing the Preventive Maintenance Program. Maintenance associates and the Crew Leader are responsible for inspecting and servicing equipment.

IV. Process:

Daily, weekly, monthly, and quarterly checklists identify specific equipment used to manufacture products that are inspected and serviced as necessary. The frequencies at which inspections and servicing are conducted are specified by the title of the list and these checklists document the actual inspections and/or servicing.

The Maintenance Crew Leader and Plant Superintendent, who use prior experience and manufacturer's literature, determine the contents of these lists. Daily inspections are conducted while the equipment is in operation as is the case with some weekly inspections. On some servicing applications the equipment is scheduled to be inoperable.

The Maintenance Crew Leader maintains records of inspections and servicing. These records include evidence that the inspections and servicing has been conducted, wear or problems observed, corrective action implemented, or servicing that requires immediate attention.

V. Attachments:

P09-831-001A Daily P.M. Schedule
P09-831-001B Web Aligner Log
P09-831-001C Trash Compactor Log
P09-831-001D Conveyor Gear Drive Log
P09-831-001E Conveyor Hydraulic Pump Log
P09-831-00 IF Baler Log
P09-831-001G Air Compressor Log
P09-831-001H Weekly P.M. Schedule
P09-831-001I Quarterly P.M. Schedule
P09-831-001J Bi-Weekly P.M. Schedule
P09-831-001K Dust Collector Weekly

VI. Approvals:

Plant Manager _____

Maintenance Crew Leader _____

FIRESTONE BUILDING PRODUCTS
DAILY P.M. SCHEDULE

DATE	NAME	ITEM	CHECKED YES	CHECKED NO	COMMENTS / CORRECTIVE ACTION
		ALL PUMPS AND PIPING (FOR LEAKS)			
		AIR DRYER			
		FIRE DOORS			
		HIGH PRESSURE SKID			
		DESICCANT DRYER			
		MOLD RELEASE			
		AIR LINE LUBRICATORS			
		TRASH COMPACTOR			
		WEB ALIGNERS			
		LAMINATOR HYDRAULICS			
		CHILLER			
		CHILLER WATER, FILTER			
		AIR COMPRESSOR, WATER BARRELS			
		COLD ROOM			
		DUST PICKUPS			
		BALER / DUST COLLECTOR			
		RTO / SUCTION SYSTEM			

FIRESTONE BUILDING PRODUCTS
WEEKLY P.M. SCHEDULE

DATE	NAME	ITEM	CHECKED YES NO	COMMENTS / CORRECTIVE ACTION
		WEB ALIGNER		
		BALER		
		TRASH COMPACTOR		
		CONVEYOR HYDRAULIC PUMP		
		TRASH COMPACTOR		
		BLOW DUST FROM ALL MOTORS		
		CHANGE LAMINATOR HEATER FILTERS		
		LUBRICATE ROLL STAND BEARINGS		
		DUST COLLECTOR		MAGNAHELIC READING
		RTO		SCFM READING

OPERATION AND MAINTENANCE PLAN FOR THE REGENERATIVE THERMAL OXIDIZER (RTO)

Operation Plan for the RTO:

The RTO is designed to burn the excess pentane used as a blowing agent in the foam board production process. Excess pentane is drawn to the RTO via a suction fan. The RTO is heated with natural gas to a temperature that ignites and then burns the pentane.

Maintenance Plan for the RTO:

Daily:

- Inspect suction filters
- Inspect/clean pick up grids and ducts
- Change chart recorder paper if needed and ensure proper operation
- Inspect air compressor and water separator
- Check air flow on CFM meter
- Check RTO chamber temperature (minimum 1400°F)
- Perform walk around inspection

Weekly:

- Change suction filters if needed

Monthly:

- Check RTO operations

Annually:

- Calibrate RTO temperature probes and chart recorder

Note: The interior of the RTO will be inspected and cleaned whenever the airflow declines significantly.

STANDARD OPERATING PROCEDURE

FIRESTONE BUILDING PRODUCTS

OPERATION OF THE REGENERATIVE THERMAL OXIDIZER

EMPLOYEE TITLE: PRODUCTION AND MAINTENANCE PERSONNEL SOP 46

REVISION DATE: 08/08/01

SCOPE

THE RTO -REGENERATIVE THERMAL OXIDIZER- IS DESIGNED TO BURN THE EXCESS PENTANE. PENTANE IS USED AS A BLOWING AGENT THAT SUPPORTS THE DEVELOPMENT OF THE FOAM CELL STRUCTURE. PROCESSING OF FOAM ALLOWS A SMALL AMOUNT OF THE PENTANE AGENT TO ESCAPE. THE ESCAPING PENTANE IS DRAWN TO THE RTO VIA A SUCTION FAN. THE RTO IS HEATED BY NATURAL GAS TO A TEMPERATURE THAT IGNITES AND THEN BURNS THE PENTANE.

PERSONAL SAFETY EQUIPMENT

SAFETY GLASSES

REFERENCE

REFER TO THE FOLLOWING STANDARD OPERATING PROCEDURES AND/OR M.S.D.S. ENTITLED:

OPERATION OF ELECTRICAL POWERED EQUIPMENT.
PENTANE CHEMICAL

EQUIPMENT INSPECTION

VISUALLY INSPECT CONTROL CABINET FOR DAMAGE.

POTENTIAL HAZARDS

ELECTRIC SHOCK

PROCEDURE

TO START THE RTO PRESS THE START BUTTON. THAT IS ALL THAT IS REQUIRED TO START THE UNIT. TO STOP THE RTO PRESS THE STOP BUTTON.

CONCLUSION

THE RTO, IF WORKING PROPERLY, REQUIRES THE OPERATOR TO SIMPLY START THE UNIT, IN THE EVENT THE UNIT DOES NOT PERFORM CORRECTLY IT WILL REQUIRE THE MAINTENANCE DEPARTMENT TO DETERMINE THE CAUSE. IF A PROBLEM IS PRESENT OUTSIDE NORMAL MAINTENANCE REPAIR HOURS, CONTACT THE PLANT MANAGER OR PLANT SUPERINTENDENT.

STANDARD OPERATING PROCEDURE

FIRESTONE BUILDING PRODUCTS

CHANGING RTO SUCTION FILTER

EMPLOYEE TITLE: MAINTENANCE CREW LEADER SOP 50

REVISION DATE: 08/13/01

SCOPE
CLEAN SUCTION FILTERS ARE IMPERATIVE TO THE OPERATION OF THE RTO. THE FILTERS ARE CHECKED ON A DAILY BASIS AND CHANGED AS REQUIRED. THE MAINTENANCE CREW LEADER HAS PRIMARY RESPONSIBILITY TO MAINTAIN THE SUCTION SYSTEM AS PART OF THE DAILY MAINTENANCE PROGRAM.

PERSONAL PROTECTIVE EQUIPMENT
SAFETY GLASSES
COTTON GLOVES

REFERENCE
REFER TO THE FOLLOWING STANDARD OPERATING PROCEDURE AND/OR M.S.D.S. ENTITLED:
ELECTRIC POWERED EQUIPMENT
POLYOL CHEMICAL
ISOCYANATE CHEMICAL

EQUIPMENT INSPECTION
INSPECT FILTER BOX FOR PHYSICAL DAMAGE
INSPECT FILTER DOOR HINGES FOR DAMAGE
INSPECT MAGNAHELIC GAUGE FOR PROPER OPERATION.
INSPECT FILTER RACKS FOR DAMAGE

POTENTIAL HAZARDS
CUTS TO HANDS
DUST IN EYES

PROCEDURE
CLOSE THE BLAST GATE IMMEDIATELY BEFORE THE FILTER
OPEN FILTER ACCESS DOOR
VACUUM ANY DUST ACCUMULATED AROUND FILTERS
SLIDE OUT FILTERS
VACUUM FILTER AREA
INSTALL CLEAN FILTERS
CLOSE DOOR AND LATCH
OPEN BLAST GATE

CONCLUSION
IT IS IMPERATIVE THAT THE FILTER BOX IS CLEAN.

REVISION DATE: 08/23/01

RTO PREVENTIVE MAINTENANCE WEEKLY CHECK LIST

ITEM	ACCOMPLISHED BY	RECORDINGS	COMMENTS
OPERATIONAL CHECKS			
AIR PRESSURE			
CHAMBER TEMPERATURES			
STACK TEMPERATURE			
RECORD CYCLE TIME			
RECORD SCFM			
PREVENTIVE MAINTENANCE			
DRAIN SEPERATORS			
GREASE PACKING GLANDS			
CLEAN COMBUSTION AIR INLET FILTER			
CLEAN SPARKPLUG			
LUBRICATE DAMPER CONTROL LINKAGE			
DRAIN STACK			
LUBRICATE FAN BEARINGS			
CHECK FOR GAS LEAKS			

OPERATION AND MAINTENANCE PLAN FOR DUST COLLECTOR

Operation Plan for Dust Collector:

The dust collector collects foam dust trimmed from the foam board during the production process. Pickup points are located at saw trim blades and cutting blades. The dust collector pulls the dust from these points at approximately 10,000 cfm, filters the particulates, and compacts the dust particulates into dust bricks. The dust collector filters 99% of trim into dust bricks to meet air permit requirements. A static pressure gauge is monitored to ensure the filters do not clog with dust. Inspections are completed daily and monthly to meet safety, preventive maintenance and environmental requirements.

Maintenance Plan for Dust Collector:

Daily:

Exhaust vents inspected to ensure no dust released to environment.
Check that the dust collector system (blower, air lock, baghouse and baler) is operating properly.

Monthly:

Drain air supply separators
Grease air lock rotor (if equipped)
Blow out electrical cabinet
Inspect blower belts
Lubricate fan bearings
Inspect supply duct work
Clean timer controls
Inspect air supply tubing

Annual:

Bags replaced

STANDARD OPERATING PROCEDURE

FIRESTONE BUILDING PRODUCTS

BALER AND DUST COLLECTOR START UP

EMPLOYEE TITLE: PRODUCTION PERSONNEL SOP 6

REVISION DATE: 08/23/01

SCOPE
IT IS REQUIRED THAT THE BALER AND DUST COLLECTOR BE ENERGIZED AT THE BEGINNING OF EACH PRODUCTION DAY. ALTHOUGH IT APPEARS TO BE A STRAIGHT FORWARD TASK THERE IS A SPECIFIED SEQUENCE THAT MUST BE INCORPORATED TO ALLOW THE COMPUTERIZED OPERATION TO FUNCTION AS IT IS DESIGNED.

PERSONAL PROTECTIVE EQUIPMENT
SAFETY GLASSES

REFERENCE
REFER TO THE FOLLOWING STANDARD OPERATING PROCEDURES AND/OR M.S.D.S. ENTITLED:
FLUID POWERED MACHINERY.
ELECTRIC POWERED MACHINERY.

EQUIPMENT INSPECTION
VISUALLY INSPECT THE BALER FOR ANY OBVIOUS PHYSICAL DAMAGE.
OBSERVE THE BRICK DISCHARGE CHUTE FOR OBSTRUCTIONS.
VISUALLY INSPECT THE CONTROL PANEL FOR PHYSICAL DAMAGE OR FOR THE PRESENCE OF LOCK OUT EQUIPMENT.
VISUALLY INSPECT THE ENTIRE UNIT FOR EVIDENCE OF FLUID LEAKS THAT WOULD BE IDENTIFIED BY THE PRESENCE OF WET SPOTS.
INSPECT THE DUST COLLECTOR DUCTWORK FOR DAMAGE.
INSPECT THE DUST COLLECTOR INTAKE FOR OBSTRUCTIONS.
CHECK THE OUTSIDE DISCHARGE FOR DUST ACCUMULATION.

POTENTIAL HAZARDS
ELECTRIC SHOCK "CONTROL PANEL."
PENETRATION OF SKIN "FLUID PRESSURE HOSE RUPTURE."
DUST IN EYES "AMBIENT CONDITIONS."
ABRASION "HAND CAUGHT ON CONTROLS."

PROCEDURE
LOCATE THE HAND / AUTOMATIC SWITCHES ON THE FRONT OF THE CONTROL PANEL AND PLACE IN THE HAND POSITION.
LOCATE THE MAIN POWER SWITCH ON THE FRONT OF THE PANEL AND PLACE IN THE ON POSITION. YOU WILL HERE THE MAIN MOTOR START AND A RED LIGHT WILL ILLUMINATE INDICATING THE MOTOR IS POWERED.

LOCATE THE BALER DOOR INDICATOR LIGHTS AND ESTABLISH THAT A YELLOW LIGHT IS ILLUMINATED INDICATING THAT THE DOOR IS IN THE DOWN POSITION. AT THIS POINT IT IS ADVISABLE TO VISUALLY INSPECT THE DOOR TO VERIFY ITS POSITION. THE DOOR MUST BE IN DOWN POSITION TO OPERATE.

LOCATE THE RAM EXTEND AND RETRACT BUTTONS AND DEPRESS THE RETRACT BUTTON. HOLD IN THIS POSITION UNTIL A GREEN LIGHT ABOVE THE BUTTON IS ILLUMINATED. THIS INDICATES THAT THE RAM IS FULLY RETRACTED.

REFER BACK TO THE HAND OR AUTOMATIC SWITCH AND PLACE IN THE AUTOMATIC POSITION. ROTATE THE START KEY TO THE RIGHT UNTIL AN ALARM SOUNDS AND RELEASE. THE BALER IS NOW READY TO BEGIN THE PRODUCTION DAY.

THE DUST COLLECTOR CONTROLS ARE LOCATED ON THE WALL. DEPRESS THE AIR LOCK START BUTTON. OBSERVE THAT THE LOCK IS ROTATING. WHEN ROTATION IS ESTABLISHED DEPRESS THE DUST COLLECTOR START BUTTON. OBSERVE THE OPERATION FOR EXCESSIVE VIBRATION OR ANY UNUSUAL SOUNDS. AGAIN, CHECK THE DISCHARGE LOCATED OUTSIDE TO INSURE NO DUST IS BEING EXHAUSTED.

THERE ARE ADDITIONAL BUTTONS AND SWITCHES ON THE PANEL FRONT, HOWEVER, FOR THE PURPOSE OF INITIATING THE AUTOMATIC CYCLE, THE ONES IDENTIFIED ARE THE ONLY ONES THAT NEED TO BE ADDRESSED AT THIS POINT.

CONCLUSION

THIS PROCEDURE IS ONLY FOR STARTING THE BALER, DUST COLLECTOR, AND INITIATING THE AUTOMATIC CYCLE, HOWEVER, IT IS NECESSARY TO APPROACH THE TASK WITH THE MINDSET THAT POTENTIAL DANGER EXISTS.

REVISION DATE: 08/23/01

DUST COLLECTOR PREVENTIVE MAINTENANCE WEEKLY CHECK LIST

ITEM	ACCOMPLISHED BY	RECORDINGS	COMMENTS
OPERATIONAL CHECKS			
AIR SUPPLY PRESSURE			
MAGNAHELIC READING			
FAN VIBRATION CHECK			
RECORD BLOWDOWN CYCLE TIME			
PREVENTIVE MAINTENANCE			
DRAIN AIR SUPPLY SEPARATORS			
GREASE AIRLOCK ROTOR			
BLOW OUT ELECTRICAL CABINET			
INSPECT BLOWER BELTS			
LUBRICATE FAN BEARINGS			
INSPECT SUPPLY DUCTWORK			
CLEAN TIMER CONTROLS			
INSPECT AIR SUPPLY TUBING			