

Preventive Maintenance / Malfunction Abatement Plan

Emissions Source EURTO: Regenerative Thermal Oxidizer

Atlas Molded Products
Byron Center, Michigan
TVROP MI-ROP-N1794-2017a

1.0 Preventive Maintenance / Malfunction Abatement Plan Team

Atlas Molded Products (AMP) supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices:

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2.0 Inspection Items

AMP has developed a preventive maintenance checklist for the thermal oxidizer and has entered the checklist into MaintScape, a software tool for tracking maintenance activities. To ensure consistent VOC control, the structural integrity of the capture and destruction systems will be inspected and maintained, and the control system calibrated periodically. This will indicate any problems with the control system that could result in decreased performance or efficiency.

Weekly visual inspections shall be performed according to the following schedule:

RTO Incinerator & Blower <ol style="list-style-type: none">1. Inlet temperature2. Outlet temperature3. Visual inspection of gas regulators4. Visual inspection bed sight glass5. Examination of exterior of bed for signs of deterioration, damage or developing problems6. Inspection of flow chamber for signs of leaks, deterioration, damage or developing problems7. Inspection of damper plate: (To inspect damper plate seal verify open/close limits on cylinder and note any pressure differential errors on controller.)
Pipework from Expansion Chambers to RTO Blower <ol style="list-style-type: none">1. Visually inspection of all pipework / report & repair any issues2. Inspection of filter and replace as needed3. Delta P
X5 Expansion Chamber (expander must be running when performing this inspection) <ol style="list-style-type: none">1. Test actuators — confirm working correctly — Look for signs of leaks, deterioration or damage to valves, motor and linkage2. Visual inspection of pipe from expander to chamber3. Verification of proper operation of RTO status lights
X6 Expansion Chamber (expander must be running when performing this inspection) <ol style="list-style-type: none">1. Test actuators — confirm working correctly — Look for signs of leaks, deterioration or damage to valves, motor and linkage2. Visual inspection of pipe from expander to chamber3. Verification of proper operation of RTO status lights

3.0 Replacement Parts Inventory

The following replacement parts will be kept onsite for prompt repair of the emissions control device in the event of a malfunction or of an action item generated from a weekly preventive maintenance inspection.

Replacement Part	Inventory On Hand
Belt, V 2L425 or 5VX670, 5/8" x 67"	2
Bearing, Pillow Block, 2-bolt mount 2-7/16" Bore Non-Expansion for RTO Blower	1
Bearing, Pillow Block, 2-bolt 2-7/16" Bore Expansion for RTO Blower	1
Cylinder, air, 3-1/4" Bore, 8.750 Stroke	3
Disc, RTO 5.0, S.S. Valve Disc	1
Ignitor, Spark - for RTO	1
Kit, Piston Seal	1
Kit, Rod Gland Kit	1
Motor AC 30.000 Hp 1770 RPM, 230 / 460 V, 3 PH, TEFC, 286T For RTO	1
AC Output Card Allen Bradley For RTO	1
Scanner, UV - for RTO	1
Solenoid, 120V, 4-Way Valve - for RTO	1
Switch, Low-Gas Pressure - for RTO	1
Switch, High-Gas Pressure - for RTO	1
Switch, Differential Pressure, 0.4 - 1.6" WC	1
Thermocouple, Inlet / Exhaust 4" for RTO	1
Thermocouple, Combustion Zone 12" for RTO	1
Thermocouple, Combustion Zone 12" (3 sets of terminal blocks) for RTO	1
Valve, Directional Control, Pilot	1
Maxon Gas Valve for RTO	1

4.0 Operating Variables

Oxidizer Operating Temperature

The operating temperature of the thermal oxidizer combustion zone will be continuously monitored and recorded. The oxidizer operating temperature has been selected because it is indicative of the control system's destruction efficiency.

An excursion is identified as a measurement of less than a 1,340°F average temperature upon a visual review of a report generated from electronic data at the end of each operating day. A thermal oxidizer temperature below a pre-set limit automatically shuts down the emission unit.

Each excursion triggers an assessment of the problem, corrective action and potentially a reporting requirement.

Capture System Static Pressure

The static pressure of the capture system will be continuously monitored. The collection system static pressure is selected because it is indicative of the control system's collection efficiency.

An excursion is identified as any observation that the capture system is not operating under a negative operating pressure. A capture system static pressure above a pre-set maximum automatically shuts down the emission unit.

Each excursion triggers an assessment of the problem, corrective action and potentially a reporting requirement.

The desired level of overall control efficiency is expected when maintaining the capture system pressure and the operating temperature of the thermal oxidizer at or above a minimum value. If the operating pressure or temperature changes significantly, the control efficiency may be reduced.

The selected indicator range for the oxidizer operating temperature is based on previous successful stack tests. The selected range for the capture system static pressure is based on the desire to maintain maximum collection efficiency for each controlled emission unit.

Both systems include interlocks that will shut down the emission units in the event of insufficient static pressure or combustion zone temperature.

5.0 Monitoring Procedures

All preventative maintenance work orders performed must be routed to the acting shift leader to review the completed work order. Second, the completed work order is reviewed by the maintenance manager. If there are any non-conforming actions found when performing the work order, the work order must be reviewed by the plant manager. When items are found that need repair or replacement a separate work order is then created. If the repair is critical to the destruction capability, the molding department must be notified to stop all activities until a solution is found. These actions have already been implemented.

On the weekly preventative maintenance work order we identified the normal operating ranges required for proper operations. Additionally, the critical ranges of temperature and static pressure are continually monitored by the equipment. For a low temperature event, an email is now automatically generated at the time of the occurrence. This email is directed to the maintenance manager and the safety coordinator to start work order to investigate the event. A single work order can be used to track multiple occurrences until the issue is resolved.

6.0 Malfunction Discovery

AMP has installed a warning light system to visually alert equipment operators to situations where the thermal oxidizer is not operating. This will prevent AMP personnel from operating emissions generating equipment when the thermal oxidizer is not online.

7.0 Corrective Actions

In the event of a malfunction of the emissions control device, all processing will be immediately stopped until the emissions control device is brought back within the normal operating parameters. Malfunctions will be reported to the Michigan DEGLE per the requirements of the ROP.

8.0 Recordkeeping

Records of preventive maintenance performed will be kept electronically within the MaintScape software and will be available for inspection.