Renewable Operating Permit No. MI-ROP-N1192-2017c
Malfunction Abatement Plan
DENSO Manufacturing Michigan, Inc.
Original: February 2013
Update: July 2023

Introduction

This Malfunction Abatement Plan (MAP) is being prepared as required by DENSO Manufacturing MI, Inc.'s (DMMI) air permits obtained from the Michigan Department of Environment, Great Lakes, and Energy, and as described in Rule 911(2). The plan is meant to prevent, detect, and correct malfunctions or failures of control equipment that could result in emissions exceeding an applicable emission limit. According to the permits obtained by DMMI at this time, DMMI shall submit a MAP for the following control equipment:

- Condenser C452A, C550A, C1150A oven degreasers – a thermal oxidizer for each
- Heater Core H451 and H751 oven degreasers – a thermal oxidizer for each
- Radiator R540, R640 and R140 oven degreasers – a thermal oxidizer for each
- Evaporator C801, C852, C884, E320A oven degreasers – a thermal oxidizer for each
- Condenser C1100, C1200, C1300 plasma flux – two (2) Amano cartridge filter dust collection systems for each
- Evaporator E210 & E310 plasma flux – two (2) Amano cartridge filter dust collection systems for each
- Evaporator C902 & E303/4 small parts flux - one Donaldson Torit cartridge filter dust collection system for each

After approval by the Air Quality Division (AQD), DMMI must amend the MAP within 45 days of any failure to address a malfunction, and within 45 days of new equipment installation. The amended MAP must also be submitted to the AQD District.

General Process Description

DMMI produces automotive heat exchangers; including heaters, radiators, condensers, and evaporators. The cores are formed from rolls of aluminum which contain a cladding layer on the surface of the metal. The aluminum is lubricated with machining oil to facilitate the formation of aluminum fins. Simultaneously, stamping oil is used in the stamping presses to facilitate stamping of small pieces. These pieces may be degreased prior to attachment to the cores. Additionally, a flux material may be applied to the small parts, and to aluminum used for manufacturing of tubes, to aid in the brazing process. Tubes, fins, and other small parts are assembled and temporarily secured by metal wires to form the various heat exchange cores. Flux material may also be added to specific areas of the cores after assembly. The machining oil must be removed from the cores in an oven degreaser, before they can

be permanently adjoined in the brazing furnace. Heating in the oven degreasers vaporizes the oil, and the exhaust gases are conveyed to a natural gas fired thermal oxidizer. The majority of the volatile organic compounds (VOCs) in the oil vapors are destroyed in the thermal oxidizers. After brazing, the cores undergo some quality checks and final assembly processes.

Preventative Maintenance Program

The dust collection systems and all thermal oxidizers plant-wide will be maintained according to a preventative maintenance schedule managed in DMMI's computerized maintenance system. The preventative activities performed are recorded in the system. Filter changes for the dust collection system and some inspections on the thermal oxidizers are performed by the Production department, and hard copy records are kept in the Production area.

- **Responsible Personnel:** The supervisory personnel responsible for overseeing the preventative maintenance and repair of the plasma flux filters, and all thermal oxidizers at DMMI, is the Maintenance Manager(s).
- **Inspections and Preventative Maintenance:**

  Thermal Oxidizers

  - Annually, the following activities are performed on each thermal oxidizer:
    1. Verify temperature accuracy of thermocouple using a thermocouple probe calibrator. Compare results with manufacturer recommended tolerances and adjust as required (calibrate). Notify environmental department if temperature is 10°C or more out of standard.
    2. Verify that alarm sounds if below low limit and that operation of the machine stops if temperature is below the low limit for greater than 59 minutes.
    3. Check gas train circuits for leak.
    4. Check flame condition.
    5. Check linkage on gas valves.
    6. Check pneumatic circuits for leaks and proper set point on gauges.
    7. Check system fan for excessive vibration / fan belts.

  C1100, C1200, C1300, E210 and E310 Amano Dust Collection Systems (Main system and Sub system)

  - Annually, the following activities are performed on each of the two cartridge filter dust collection systems on C1100, C1200, C1300, E210 and E310 (the Main system and Sub system):
    1. Check grounding wires, electrical panel, belts, and motors.
  - For E210 and E310- Every 2,000 running hours, which is approximately semi-annually, the following activities are performed on each of the two cartridge filter dust collection systems (the Main system and Sub system):
    1. Change or clean all cartridge filters (24 for Main system, 6 for Sub system).

2. Vacuum and clean inside of dust collection system (no specific records kept of this).

- For C1100, C1200, and C1300- Semi-annually, the following activities are performed on each of the two cartridge filter dust collection systems (the Main system and Sub system):
  1. Change or clean all cartridge filters (24 for Main system, 6 for Sub system).
  2. Vacuum and clean inside of dust collection system (no specific records kept of this).

C902, E303/4 Donaldson Torit Dust Collection Systems

- Monthly, the following activities are performed on the cartridge filter dust collection systems on C902 and E303/4:
  1. Change or clean all cartridge filters (3).
  2. Vacuum and clean inside of dust collection system if flux buildup (no specific records kept of this).

- **Spare Parts:** The major replacement parts that are kept on hand for the control equipment include:
  - Thermocouples and burners for the oxidizers
  - Filters for all Amano and Donaldson Torit dust collector systems

Operating Variables

Pollution Control Device	Operating Parameter	Parameter Range	Monitoring Frequency	Monitoring Method	Recordkeeping
Thermal Oxidizers H451, R540, R640, C452, C1150A	Minimum Operating Temp.	> 700 deg. C	Continuous	Electronic display, alarms activate if below temp.	Alarm log (hard copy) posted at TO
Thermal Oxidizers H751, R140, C550, C801, C852, C884	Minimum Operating Temp.	> 760 deg. C	Continuous	Electronic display, alarms activate if below temp.	Alarm log (hard copy) posted at TO
C1100, C1200, C1300 Main Dust Collector System- Amano (24 cartridge)	Pressure Differential	-1,250 to 1,250 Pa	Daily if operating	Visual Reading of Manometer	Daily readings (if operating) recorded into electronic NEXUS system
E210 Main Dust Collector System- Amano (24 cartridge)	Pressure Differential	0-2,500 Pa	Daily if operating	Visual Reading of Manometer	Daily readings (if operating) recorded into electronic NEXUS system
E310 Main Dust Collector System - Amano (24 cartridges)	Pressure Differential	0-2,000 Pa	Daily if operating	Visual Reading of Manometer	Daily readings (if operating) recorded into electronic NEXUS system
C1100, C1200, C1300 Sub Dust Collector System- Amano (6 cartridge)	Pressure Differential	0 - 1.5 kPa	Daily if operating	Visual Reading of Air Gauge	Daily readings (if operating) recorded into electronic NEXUS system
E210 & E310 Sub Dust Collector System- Amano (6 cartridge)	Pressure Differential	0 - 3 kPa	Daily if operating	Visual Reading of Air Gauge	Daily readings (if operating) recorded into electronic NEXUS system
C902, E303/4 Dust Collector System- D. Torit (3 cartridge)	Pressure Differential	0 – 4.0 inches water gauge	Continuous	Electronic display, at 4.0 self-clean cycle begins until pressure drops <4.0. If pressure reaches 4.1, alarm activates	None (auto cleaning cycle has always avoided alarm)

Corrective Action Procedures

In the event of a malfunction, the production and/or maintenance departments will investigate the cause and initiate actions to return equipment to proper operation. This may include inspecting the oxidizer burners for misfires; assessing any electrical faults; and inspecting natural gas feeds, blower motors and exhaust ducts. For the flux cartridge filter dust collector systems, typical corrective actions may include inspecting the filters, motors, belts, and exhaust ducts.

The equipment is also mechanically controlled by design, such that if the air within the thermal oxidizers remains below temperature for 59 minutes, operation of the associated degreaser automatically shuts down. In this way, the VOC emission limits listed in the air permits will not be exceeded.

If the cartridge filter systems on C1100, C1200, C1300, E210, E310, C902 or E303/4 malfunction, the machine is manually shut down until the equipment can operate properly. In this way, the PM emission limits in the air permit will not be exceeded.

Records of Malfunctions or Failures

Low-temp malfunctions of the oxidizers are logged on an Alarm Activation Log kept at each machine. Information includes the date of the alarm, the time and length of the alarm, the cause of the alarm, and the corrective actions taken.

If the C1100, C1200, C1300, E210, E310, C902 or E303/4 cartridge filter systems fail or malfunction, the production department records the maintenance activities or corrective actions that they perform in the computerized work order system or in a physical logbook. The work order system and the logbook include the date, the time of the occurrence, the date/time the job is completed, and the corrective actions taken. If the problem requires a call to the Maintenance Department, the Maintenance Department logs the work order in the computerized maintenance system.

DENSO
DENSO MANUFACTURING MICHIGAN, INC.

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Battle Creek, Michigan 49037-7356
Tel (269) 965-3322 Fax (269) 965-8399

July 7, 2023

Mr. Rex Lane
Air Quality Division
Michigan Dept. of Environment, Great Lakes, and Energy
7953 Adobe Road
Kalamazoo, MI 49009-5026

Dear Mr. Lane:

Enclosed, please find two copies of the updated Malfunction Abatement Plan for DENSO Manufacturing Michigan, Inc., and a Report Certification Form EQP5736. This plan was developed to comply with Renewable Operating Permit #MI-ROP-N1192-2017c (currently in public comment for renewal) and various PTIs. It has been revised to include recordkeeping activities, remove R940 oven degreaser, and to update some operating parameter ranges. The plan is being submitted for your review and approval.

Please contact me if you have any questions.

Sincerely,

Jody L. Smith, PE, CHMM
Environmental Engineer 4

Encl.

EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
AIR QUALITY DIVISION

RENEWABLE OPERATING PERMIT
REPORT CERTIFICATION

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating Permit (ROP) program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as specified in Rule 213(3)(b)(ii), and be made available to the Department of Environment, Great Lakes, and Energy, Air Quality Division upon request.

Source Name DENSO Manufacturing MI, Inc. County Calhoun

Source Address One Denso Road City Battle Creek

AQD Source ID (SRN) N1192 ROP No. MI-ROP-N1192-2017c ROP Section No.

Please check the appropriate box(es):

☐ **Annual Compliance Certification (Pursuant to Rule 213(4)(c))**

Reporting period (provide inclusive dates): From _____ To _____

☐ 1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the ROP.

☐ 2. During the entire reporting period this source was in compliance with all terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the ROP, unless otherwise indicated and described on the enclosed deviation report(s).

☐ **Semi-Annual (or More Frequent) Report Certification (Pursuant to Rule 213(3)(c))**

Reporting period (provide inclusive dates): From _____ To _____

☐ 1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred.

☐ 2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

☒ **Other Report Certification**

Reporting period (provide inclusive dates): From 7/2023 To NA

Additional monitoring reports or other applicable documents required by the ROP are attached as described:

Malfunction Abatement Plan - July 2023

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete

Shuichi Kamakura	President	269-965-3322
Name of Responsible Official (print or type)	Title	Phone Number
Shu Kamakura.		7/10/2023
Signature of Responsible Official		Date

* Photocopy this form as needed.

EQP 5736 (Rev 04/30/2019)