

RCRA Compliance Evaluation Inspection Report

1) **Inspector and Author of Report**

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2) **Facility Information**

Renesas Electronics of America Inc.
1650 Robert J Conlan Blvd NE
Palm Bay, Florida 32905

County: Brevard
Latitude: 28° 2' 7.0691"
Longitude: -80° 36' 7.2469"
EPA ID Number: FLD000602334

Primary NAICS: 334413 – Semiconductor and Related Device Manufacturing
SIC Code: 3674 – Semiconductor and Related Devices

3) **Responsible Official**

Wayman Aldridge, Principal EHS Engineer, Renesas Electronics of America Inc.
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4) **Inspection Participants**

Parvez Mallick, US EPA Region 4
Miranda Rothenberger, Florida Department of Environmental Protection (FDEP)
Wayman Aldridge, Principal EHS Engineer, Renesas Electronics of America Inc.
Layza Irizarry, EHS Intern, Renesas Electronics of America Inc.

5) **Dates of Inspection**

July 13, 2021, 10:00 a.m.

6) **Applicable Regulations**

Resource Conservation and Recovery Act (RCRA) Sections 3002, 3005 and 3007 (42 U.S.C. §§ 6922, 6925 and 6927), and the regulations promulgated pursuant thereto at 40 Code of Federal Regulations (C.F.R.) Parts 260-270, 273 and 279.

Florida Statutes (F.S.) Chapter 403.702 et seq., and the regulations promulgated pursuant thereto and set forth at the Florida Administrative Code (Fla. Admin. Code Ann. r.), Chapters 62-710, 62-730 and 62-750.

As the State's authorized hazardous waste program operates in lieu of the federal RCRA program, the citations of those authorized provisions alleged herein will be to the authorized State program; however, for ease of reference, the federal citations will follow in brackets.

Pursuant to Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.17], a LQG may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, as required by Section 403.722 of the Florida Statutes, Fla. Stat. § 403.722 [Section 3005 of RCRA, 42 U.S.C. § 6925], provided that the generator complies with the conditions listed in Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.17] (hereinafter referred to as the "LQG Permit Exemption").

Pursuant to Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.15(a)], a generator may accumulate as much as 55 gallons of non-acute hazardous waste in containers at or near the point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste, without a permit or without having interim status, as required by Section 403.722 of the Florida Statutes, Fla. Stat. § 403.722 [Section 3005 of RCRA, 42 U.S.C. § 6925], and without complying with Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.16(b) or §262.17(a)], except as required in Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.15(a)(7) and (8)], provided that the generator complies with the satellite accumulation area conditions listed in Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.15(a)] (hereinafter referred to as the "SAA Permit Exemption").

7) **Purpose of Compliance Evaluation Inspection**

On July 13, 2021, Miranda Rothenberger, Florida Department of Environmental Protection (FDEP), and Parvez Mallick, U.S. EPA, conducted a routine compliance evaluation inspection of Renesas Electronics of America Inc. (Renesas or the facility) to determine the facility's compliance with state and federal hazardous waste regulations. This was an EPA lead inspection. Renesas was represented by Wayman Aldridge, Principal EHS Engineer, Renesas Electronics of America Inc. and Layza Irizarry, EHS Intern, Renesas Electronics of America Inc. Upon entering the facility, the inspectors introduced themselves, showed their credentials and explained the purpose of the visit and a description of the facility's process was discussed. The inspectors described the anticipated use of digital camera during the inspection. The inspectors briefly discussed the company's ability, pursuant to 40 C.F.R. § 2.203, to assert a business confidentiality claim for information submitted to EPA. The company did not assert a business confidentiality claim. The inspection participants also discussed health and safety protocols and required personal protective equipment before Mr. Aldridge and Ms. Irizarry led the inspectors on a tour of the facility operations.

8) Facility Description

Renesas Electronics of America Inc. is a semiconductor manufacturing facility that consists of silicon wafer fabrication, photolithography operations, and probe assembly and testing. Prior to February 2017, the facility was known as Intersil Corporation. On February 24, 2017, Renesas acquired Intersil Corporation and becomes a wholly owned subsidiary of Renesas Electronics. Effective January 1, 2018, Intersil Corporation started to operate in the market under the name of Renesas Electronics America Inc.

Renesas employs approximately 380 people; the wafer fabrication process employs approximately 140 people who work 24/7 split into 12 hour shifts and the remaining 240 employees work standard business hours. The facility's most recent hazardous waste generator notification form (EPA form 8700-12) submitted on March 16, 2020 characterized the facility as a large quantity generator (LQG) of hazardous waste, a large quantity handler of universal waste (LQHUW) batteries, lamps, and devices, and as an underground injection facility. The facility began operation at this location since 1990. Brevard County provides potable water and sanitary sewer services. Solvents such as acetone, M-Pyrol, and isopropyl alcohol (IPA); and acids such as sulfuric acid, nitric acid and hydrochloric acid are used in various processes throughout the facility.

The facility retains an underground injection control class I injection well system operation permit, Permit Number 0317381-004-005-UO/II, to operate two non-hazardous Class I injection wells (IW-1 and IW-2) and associated dual zone monitor well DZMW-1 for the disposal of pretreated rinse water from the semiconductor manufacturing process at the Renesas facility.

9) Inspection Findings

Building 58 - Probe Assembly and Testing

Probe assembly and testing is conducted in this building. The waste from wet benches located on the test floor is piped to the central accumulation area (CAA) located outside the building. The building is equipped with fire suppression sprinklers, fire extinguishers, and a fire alarm system. During the inspection the following wastes were present (Photo #1):

- One 55-gallon container of non-regulated waste Markem Remover, a non-hazardous ink remover;
- One 55-gallon container of hazardous waste flammable wipes managed as excluded solvent-contaminated wipes. The container was not marked with the words "Excluded Solvent-Contaminated Wipes." **Pursuant to Pursuant to Fla. Admin. Code Ann. r. 62-730.030(1) [40 C.F.R. § 261.4(a)(26)(i)], the solvent-contaminated wipes, when accumulated, stored, and transported, are contained in non-leaking, closed containers that are labeled "Excluded Solvent-Contaminated Wipes." The containers must be able to contain free liquids, should free liquids occur. During accumulation, a container is considered closed when there is complete contact between the fitted lid and the rim, except when it is necessary to add or remove solvent-contaminated wipes. When the container is full, or when the solvent-contaminated wipes are no longer being accumulated, or when the container is being transported, the container must be sealed with all lids properly and securely affixed to the container and all openings tightly bound or closed sufficiently to prevent leaks and emissions.** On July 15, 2021, Mr. Aldridge submitted a photo via

email of the container now properly marked “Excluded Solvent-Contaminated Wipes;” and

- One 55-gallon container marked “Hazardous Waste Flammable” and dated 6/21/21.

The inspectors observed that all containers were located on secondary containment and under a metal awning. A fire extinguisher and spill kit were noted in the area. There was one empty 55-gallon drum labelled “Hazardous Waste Flammable” for use when the existing drum is full. The facility maintains an automatic switchover system for their piped central accumulation areas. When one drum is full the device will automatically switch the flow of waste to the second empty drum. At that time a yellow flashing light is activated to alert staff to mark the new accumulation drum with an accumulation start date and have the full drum moved to the main CAA.

The inspectors observed that the test floor generated solvent waste from a work bench using M-Pyrol and IPA. The bench is drained to a 15-gallon sump satellite accumulation area (SAA) and then the waste is pumped into the drums in the central accumulation area. Additionally, there were two 5-gallon step cans for excluded solvent-contaminated wipes but were not marked with the words “Excluded Solvent-Contaminated Wipes.”

Pursuant to Pursuant to Fla. Admin. Code Ann. r. 62-730.030(1) [40 C.F.R. § 261.4(a)(26)(i)], the solvent-contaminated wipes, when accumulated, stored, and transported, are contained in non-leaking, closed containers that are labeled “Excluded Solvent-Contaminated Wipes.” The containers must be able to contain free liquids, should free liquids occur. During accumulation, a container is considered closed when there is complete contact between the fitted lid and the rim, except when it is necessary to add or remove solvent-contaminated wipes. When the container is full, or when the solvent-contaminated wipes are no longer being accumulated, or when the container is being transported, the container must be sealed with all lids properly and securely affixed to the container and all openings tightly bound or closed sufficiently to prevent leaks and emissions. On July 15, 2021, Mr. Aldridge submitted a photo via email of the containers now properly marked “Excluded Solvent-Contaminated Wipes”.

Building 59 – Wafer Fabrication

Wafer Fabrication building consists of an east and west side. The building is equipped with fire suppression sprinklers, fire extinguishers, and a fire alarm system. There is a clinic in the building for administering first aid.

The east fabrication area consists of a materials fabrication and a clean kit area. Materials fabrication consists of wet benches using hydrofluoric, hydrochloric, and nitric acids, and potassium hydroxide. Wet bench waste is generated when the baths are drained. Grinders and polishers located in this area generate a wastewater consisting of ammonium hydroxide, sodium hydroxide, and silica that is sent to the on-site industrial wastewater treatment plant (IWWTP).

The clean kit area is a dual-purpose room for maintenance and cleaning. The inspectors observed one 5-gallon and one 35-gallon SAA containers marked “Hazardous Waste” arsenic contaminated waste. The containers were marked with a DOT class 9 diamond indicating a “Miscellaneous” hazard. During the August 12, 2019, FDEP inspection, the FDEP inspectors explained to the facility that this is an unacceptable hazard content marking as per 40 C.F.R. § 262.15(a)(5).

Pursuant to Fla. Admin. Code Ann. r. 62-730.160(1), [40 C.F.R. § 262.15(a)(5)(ii)], which is a condition of the SAA Permit Exemption, an indication of the hazards of the contents (examples include, but are not limited to, the applicable hazardous waste characteristic(s) (i.e., ignitable, corrosive, reactive, toxic); hazard communication consistent with the Department of Transportation requirements at 49 CFR part 172 subpart E (labeling) or subpart F (placarding); a hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 CFR 1910.1200; or a chemical hazard label consistent with the National Fire Protection Association code 704). During the inspection the facility marked the containers “Toxic.”

Near the fume hoods there was one 8-gallon container of non-hazardous labelled “corrosive waste.” The facility maintained an accurate waste determination for this waste stream. At the end of the fume hoods was one 8-gallon container labeled “Solvents”. This container is meant for excluded solvent-contaminated wipes but was not marked with the words “Excluded Solvent-Contaminated Wipes.”

Pursuant to Pursuant to Fla. Admin. Code Ann. r. 62-730.030(1) [40 C.F.R. § 261.4(a)(26)(i)], the solvent-contaminated wipes, when accumulated, stored, and transported, are contained in non-leaking, closed containers that are labeled “Excluded Solvent-Contaminated Wipes.” The containers must be able to contain free liquids, should free liquids occur. During accumulation, a container is considered closed when there is complete contact between the fitted lid and the rim, except when it is necessary to add or remove solvent-contaminated wipes. When the container is full, or when the solvent-contaminated wipes are no longer being accumulated, or when the container is being transported, the container must be sealed with all lids properly and securely affixed to the container and all openings tightly bound or closed sufficiently to prevent leaks and emissions. On July 15, 2021, Mr. Aldridge submitted a photo via email of the container now properly marked “Excluded Solvent-Contaminated Wipes”.

The inspectors observed one 30-gallon container for the accumulation of empty solvent cans located towards the back of the room.

The east side CAA is located outside the building. At the time of the inspection the following wastes were present:

- Two 55-gallon containers marked “Hazardous Waste Flammable” and dated 06/28/21 and 05/25/21 (Photo #2);
- One 55-gallon container marked “Hazardous Waste Corrosive” and “moat etch” dated 05/17/21;
- There was one empty 55-gallon drum marked “Hazardous Waste Flammable;” and
- One empty 55-gallon container labeled “Hazardous Waste Corrosive” that will be used when the existing containers are full.

The containers were located on secondary containment and under a metal awning. A fire extinguisher and spill kit were noted in the area.

The west fabrication area consists of clean rooms carrying out multiple processes to fabricate wafers. These areas were viewed through windows. According to the facility, photolithography processes generate liquid photoresist that is managed as a hazardous waste. It is piped outside to a CAA located in a containment building. The CAA is commonly called the “dog house.” During

the inspection there were two 55-gallon containers marked “Hazardous Waste Flammable” and dated 07/07/21 and 07/13/21. This was an example of the automated system; the yellow light was flashing so the facility placed a new accumulation start date on the previously empty container and then they have three days to remove the full container. The inspectors observed an eyewash station and a “No Smoking” sign in the area.

Building 57

This building was not inspected during the inspection. Outside the building, there was a 55-gallon container marked “Used Oil” and the container was placed on secondary containment. The oil is generated from Building 58 vacuum pump maintenance operations.

Building 55 – Main Central Accumulation Area (90-Day Storage Area)

The Main Central Accumulation Area wastes are stored inside Building 55 and outside on a concrete pad with a metal roofing. The building also acts as facility storage for various equipment. The inspectors observed a fire extinguisher and an eye wash station in the waste storage area. Inside Building 55, the facility stores hazardous waste as well as universal waste. During the inspection, the following wastes were present inside Building 55 CAA:

- Forty-seven closed containers marked “Universal Waste Lamps” and dated 09/30/20 through 07/07/21 (Photo #3);
- Two closed containers labeled “Universal Waste Batteries” and dated 01/02/21 and 02/07/21;
- One cubic yard box labeled non-hazardous corrosive solids (Photo #4);
- One closed cubic yard box of excluded solvent-contaminated wipes that was not marked “Excluded Solvent-Contaminated Wipes” (Photo #4). **Pursuant to Pursuant to Fla. Admin. Code Ann. r. 62-730.030(1) [40 C.F.R. § 261.4(a)(26)(i)], the solvent-contaminated wipes, when accumulated, stored, and transported, are contained in non-leaking, closed containers that are labeled “Excluded Solvent-Contaminated Wipes.” The containers must be able to contain free liquids, should free liquids occur. During accumulation, a container is considered closed when there is complete contact between the fitted lid and the rim, except when it is necessary to add or remove solvent-contaminated wipes. When the container is full, or when the solvent-contaminated wipes are no longer being accumulated, or when the container is being transported, the container must be sealed with all lids properly and securely affixed to the container and all openings tightly bound or closed sufficiently to prevent leaks and emissions.** On July 15, 2021, Mr. Aldridge submitted a photo via email of the container now properly marked “Excluded Solvent-Contaminated Wipes;”
- One closed cubic yard box marked “Hazardous Waste Toxic” arsenic waste and dated 06/01/21 (Photo #4); and
- One closed 55-gallon drum labeled “Hazardous Waste Toxic” arsenic waste and dated 06/05/21.

The inspectors observed the following wastes outside Building 55:

- Three closed 55-gallon containers marked “Hazardous Waste Ignitable” solvents dated 05/13/21, 05/23/21 and 06/10/21 (Photo #5);
- Nine closed 55-gallon containers marked “Hazardous Waste Ignitable” and “resist” dated 05/17/21 through 07/02/21 (Photo #5);
- Twenty-four closed 55-gallon containers marked “Hazardous Waste Corrosive” and dated 05/12/21 through 07/08/21 (Photo #6); and

- Eight closed 55-gallon containers of non-hazardous waste “NOE-Etch.”

Record Review

The inspectors reviewed hazardous waste shipping manifests for August 2019 – July 2021. The most recent manifests were signed by Mr. Rogers. Clean Harbors Environmental Services Inc. (MAD039322250) and Robbie D. Wood (ALD067138891) have been used as hazardous waste transporters. Clean Harbors Chattanooga LLC (TND982141392), Clean Harbors Deer Park LLC (TXD055141378), and Clean Harbors La Porte LLC (TXD982290140) have been used as designated disposal facilities.

The record review indicated that hazardous waste training was not completed by Mr. Aldridge during the 2020 calendar year. The most recent hazardous waste training was provided on July 6, 2021 to Mr. Aldridge and Mr. Rogers. Department of Transportation training was most recently provided to Mr. Rogers on February 6, 2020.

Pursuant to Fla. Admin. Code Ann. r. 62-730.160(1) [40 C.F.R. § 262.17(a)(7)(iii)], which is a condition of the LQG Permit Exemption, facility personnel must take part in an annual review of the initial training required in paragraph 40 C.F.R. § 262.17(a)(7)(i) of this section. A large quantity generator must ensure that this program includes all the elements described in the document required under paragraph (a)(7)(iv) of this section.

Weekly inspections of the central accumulation areas for August 2019 through July 2021 were reviewed and found to be in compliance. The contingency plan (CP) was most recently updated in 2021 and Mr. Wayman Aldridge and Steven Browne, Facilities Manager, are listed as emergency coordinators. The CP is used in conjunction with the site emergency plan. Local authority notifications were submitted to Palm Bay Fire Rescue and Palm Bay Hospital via email on July 12, 2021. A quick reference guide of the contingency plan was reviewed and found to be in compliance. Job descriptions were reviewed and found to be in compliance.

The biennial report was submitted to FDEP on March 16, 2020. The following waste quantities were reported:

- D001 and D026 ignitable spent solvent from photolithography processes containing propylene glycol monomethylether acetate, xylene, and cresol – 28,130 pounds;
 - D001 and F003 ignitable spent solvent from cleaning wafers. It contained isopropanol and acetone – 16,940 pounds;
 - D002 AZ300: non-combustible, corrosive solvent from silicon wafer cleaning and stripping processes – 47,045 pounds;
 - D001 and D002 moat etch: ignitable and corrosive liquid used for etching silicon wafers. It contained isopropanol and potassium hydroxide – 2,575 pounds;
 - D004 solid, arsenic-contaminated debris from ion implantation processes and maintenance activities – 894 pounds;
 - D001 TEOS: expired ignitable waste liquid used in thin film processes – 150 pounds;
 - D001 TMP: expired ignitable liquid used in thin film processes – 28 pounds;
 - D001 solvent cleanup material: ignitable solid material from spill clean-up. The solvent absorbent materials may contain acetone, and isopropyl alcohol – 679 pounds;
 - D035 and D001 waste enamel paint from facility maintenance activities – 300 pounds;
- and

- D001, D002, and D035 lab packs of various expired or spent chemicals containing ignitable, or corrosive solids, or liquids – 1,240 pounds.

10) Closing Conference

A closing conference was conducted at the conclusion of the inspection. Mr. Wayman Aldridge and Ms. Layza Irizarry participated in the closing conference. The observations made during the inspection were discussed and the inspection was concluded. Renesas was inspected as a large quantity generator of hazardous waste. The inspectors requested that the facility submit information regarding actions taken subsequent to the inspection to FDEP and the EPA.

11) Signed

Parvez Mallick
Inspector and Author of Report

Date

12) Concurrence and Approval

Araceli B. Chavez
Chief
RCRA Enforcement Section

Date

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Compliance Evaluation Inspection photos taken by Parvez Mallick
Canon PowerShot SD980 IS - EPA Property Number S75319



Photo #1 – Building 58 - Probe Assembly and Testing CAA area containers.



Photo #2 – Two hazardous waste containers outside Building 59 - CAA.



Photo #3 – Boxes of universal wastes in Building 55, inside CAA.



Photo #4 – Hazardous and non-hazardous cubic yard boxes in Building 55, inside CAA.



Photo #5 – Flammable containers in Building 55, outside CAA.



Photo #6 – Corrosive containers in Building 55, outside CAA.