

# INITIAL TITLE V AIR PERMIT APPLICATION REVIEW

DRAFT

<b>APPLICANT:</b> Honeywell International, Inc..	<b>SITE LOCATION:</b> Moncure	<b>COUNTY:</b> Chatham	
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<b>REVIEW ENGINEER:</b> Michael Brandon	<b>SIGNATURE:</b>	<b>DATE:</b> October 6, 2003	
<b>REGIONAL CONTACT:</b> Charles McEachern	<b>REGIONAL OFFICE:</b> Raleigh	<b>SIC CODE:</b> 2821	
<b>APPLICATION NUMBER:</b> 190002A5.A	<b>EXISTING PERMIT NUMBER:</b> 02657R24	<b>NEW PERMIT NUMBER:</b> 02657T25	

## I. Introduction

The U.S. Environmental Protection Agency (EPA) has given full approval to North Carolina's Title V operating permits program effective on October 1, 2001. The EPA interim approval of December 15, 1995 triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This Initial Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the Title V operating permit. The primary source of information used to construct the permit is the above referenced air permit application.

## II. Background Information

The Title V operating permit replaces an existing Air Quality Construction and Operation Permit No. 02657R24 which was issued on June 10, 2003 and is currently scheduled to expire on April 30, 2007.

Pursuant to 15A NCAC 2Q .0506, Honeywell International, Inc. submitted its initial Title V application to the Division of Air Quality on August 9, 1996. The application was considered complete for processing on November 16, 2001. The permit was required to go to public notice pursuant to 15A NCAC 2Q .0521.

## III. Facility Description

Honeywell International, Inc. produces high viscosity polyethylene terephthalate using a continuous multiple end finishing process. The yarn is also produced from the resin at this facility.

## IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. On its latest inspection, the facility was in compliance with all applicable requirements. The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

**V. Summary of Emission Sources and Control Devices**

The following table contains a summary of all permitted emission sources and associated air pollution control devices and appurtenances:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control/Recovery Device Description
<b>ALAN III ESTERIFICATION</b>			
ES01 PSD NSPS DDD* MACT JJJ	three esterification reactors in series APT101A/APT104A/APT107A Recovered condensate goes to ethylene glycol recovery at CL2  Wastewater goes to prefinish Alan III seal pots (Hotwells HT205A/HT206A)	C110A/ C111A  C112A/ C113A MACT JJJ ww2	<b>Recovery Device</b> surface condenser/spare venting to  <b>Control Device</b> direct contact barometric condenser/spare (exit vent temperature maintained at 49 degrees C)
<b>ALAN IV ESTERIFICATION</b>			
ES02 PSD MACT JJJ	three esterification reactors in series APT101B/APT104B/APT107B Recovered condensate goes to ethylene glycol recovery at CL2  Wastewater goes to prefinish Alan III seal pots (Hotwells HT205A/HT206A)	C110B/ C111B  C112B/ C113B MACT JJJ ww2	<b>Recovery Device</b> surface condenser/spare venting to  <b>Control Device</b> direct contact barometric condenser/spare (exit vent temperature maintained at 49 degrees C)
<b>ALAN III PREPOLYCONDENSATION</b>			
ES12 PSD NSPS DDD* MACT JJJ	first stage reactor APT114A vents through barometric condenser and liquid ring vacuum pump(s)	C124A/ C125A	<b>Control Device</b> direct contact barometric condenser/spare
ES13 PSD NSPS DDD* MACT JJJ	second stage reactor APT117A vents through barometric condenser and liquid ring vacuum pump(s)	C122A/ C123A	<b>Control Device</b> direct contact barometric condenser/spare
ES21 PSD NSPS DDD* MACT JJJ	direct contact barometric condenser receiver HT126A  ethylene glycol/water goes to ethylene glycol recovery CL1 and recycle CL2	na	na
<b>ALAN IV PREPOLYCONDENSATION</b>			
ES14 PSD MACT JJJ	first stage reactor APT114B vents through barometric condenser and liquid ring vacuum pump(s)	C124B/ C125B	<b>Control Device</b> direct contact barometric condenser/spare
ES15 PSD MACT JJJ	second stage reactor APT117B vents through barometric condenser and liquid ring vacuum pump(s)	C122B/ C123B	<b>Control Device</b> direct contact barometric condenser/spare

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control/Recovery Device Description
ES22 PSD MACT JJJ	direct contact barometric condenser receiver HT126B  ethylene glycol/water goes to ethylene glycol recycle CL2	na	na
<b>ALAN III POLYMERIZATION</b>			
APT201A PSD NSPS DDD* MACT JJJ	prefinish reactor feeding three final finish reactors with multiple stage steam ejectors and intercondensers venting to seal pots HT205A/HT206A	na	na
APT301A PSD NSPS DDD* MACT JJJ	final finish reactor with multiple stage steam ejectors and intercondensers venting to seal pots HT305A/HT306A	na	na
APT401A PSD NSPS DDD* MACT JJJ	final finish reactor with multiple stage steam ejectors and intercondensers venting to seal pots HT405A/HT406A	na	na
APT601A PSD NSPS DDD* MACT JJJ	final finish reactor with multiple stage steam ejectors and intercondensers venting to seal pots HT605A/HT606A	na	na
<b>ALAN IV POLYMERIZATION</b>			
APT201B PSD MACT JJJ	prefinish reactor feeding three final finish reactors with multiple stage steam ejectors and intercondensers venting to seal pots HT205B/HT206B	na	na
APT301B PSD MACT JJJ	final finish reactor with multiple stage steam ejectors and intercondensers venting to seal pots HT305B/HT306B	na	na
APT401B PSD MACT JJJ	final finish reactor with multiple stage steam ejectors and intercondensers venting to seal pots HT405B/HT406B	na	na
APT601B PSD MACT JJJ	final finish reactor with multiple stage steam ejectors and intercondensers venting to seal pots HT605B/HT606B	na	na
<b>ETHYLENE GLYCOL RECOVERY CL1</b>			
ES26CL1 PSD NSPS DDD* MACT JJJ	distillation column CL1  Bottoms ethylene glycol goes to spent glycol storage tank VT20. Overheads wastewater is used in direct contact condensers at Alan III esterification.	C127 MACT JJJ ww2	<b>Control Device</b> overheads surface condenser venting to seal pot VT41

<b>Emission Source ID No.</b>	<b>Emission Source Description</b>	<b>Control Device ID No.</b>	<b>Control/Recovery Device Description</b>
<b>ETHYLENE GLYCOL RECYCLE CL2</b>			
ES24 PSD	spent ethylene glycol feed tank HT10	na	na
ES26CL2 PSD NSPS DDD* MACT JJJ	MPT feed purification system and distillation column CL2	C143	<b>Recovery Device</b> surface condensers and reflux tank VT87
	Bottoms ethylene glycol is returned to the process. Overheads wastewater is sent to the cooling tower.	C128 MACT JJJ ww2	<b>Control Device</b> side stream overheads direct contact condenser
ES23 PSD	ethylene glycol bottoms tank HT11	na	na
<b>WASTEWATER</b>			
HT205A/ HT206A MACT JJJ ww2	Alan III prefinish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT305A/ HT306A MACT JJJ ww2	Alan III final finish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT405A/ HT406A MACT JJJ ww2	Alan III final finish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT605A/ HT606A MACT JJJ ww2	Alan III final finish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT205B/ HT206B MACT JJJ ww2	Alan IV prefinish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT305B/ HT306B MACT JJJ ww2	Alan IV final finish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT405B/ HT406B MACT JJJ ww2	Alan IV final finish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
HT605BA/ HT606B MACT JJJ ww2	Alan IV final finish reactor seal pots (hotwell for intercondensers and water seal for final vacuum vent)	na	na
VP137A MACT JJJ ww2	Alan III prepolycondensation vacuum pump cooling water	na	na
VP138A MACT JJJ ww2	Alan III prepolycondensation vacuum pump cooling water	na	na

<b>Emission Source ID No.</b>	<b>Emission Source Description</b>	<b>Control Device ID No.</b>	<b>Control/Recovery Device Description</b>
VP135A MACT JJJ ww2	Alan III prepolycondensation vacuum pump cooling water	na	na
VP136A MACT JJJ ww2	Alan III prepolycondensation vacuum pump cooling water	na	na
VP137B MACT JJJ ww2	Alan IV prepolycondensation vacuum pump cooling water	na	na
VP138B MACT JJJ ww2	Alan IV prepolycondensation vacuum pump cooling water	na	na
VP135B MACT JJJ ww2	Alan IV prepolycondensation vacuum pump cooling water	na	na
VP136B MACT JJJ ww2	Alan IV prepolycondensation vacuum pump cooling water	na	na
C128 MACT JJJ ww2	side stream CL2 overheads direct contact condenser sent to cooling tower	na	na
C127 MACT JJJ ww2	CL1 overheads surface condenser seal pot VT41 used in direct contact condensers for esterification	na	na
C112A/ C113A MACT JJJ ww2	direct contact condensate from Alan III esterification	na	na
C112B/ C113B MACT JJJ ww2	direct contact condensate from Alan III esterification	na	na
<b>COOLING TOWERS</b>			
TW2 PSD MACT JJJ NSPS DDD*	Marley process cooling tower units 11, 12, and 13	na	na
TW3 PSD MACT JJJ NSPS DDD*	Marley process cooling tower units 14 and 15	na	na
<b>SPINDRAW OPERATIONS</b>			
ES103 PSD	six spin draw operations for Alan III polymer production	MISTE1	<b>Control Device</b> condenser/mist eliminator
ES104 PSD	six spin draw operations for Alan IV polymer production	MISTE2	<b>Control Device</b> condenser/mist eliminator
<b>UTILITIES</b>			

<b>Emission Source ID No.</b>	<b>Emission Source Description</b>	<b>Control Device ID No.</b>	<b>Control/Recovery Device Description</b>
SG1	natural gas/No. 6 fuel oil-fired boiler 64.2 million Btu per hour heat input	na	na
SG2	natural gas/No. 6 fuel oil-fired boiler 64.2 million Btu per hour heat input	na	na
SG3 PSD NSPS Dc	natural gas-fired boiler 37.8 million Btu per hour heat input	na	na
HE553 NSPS Dc	natural gas/propane-fired steam superheater 10 million Btu per hour heat input	na	na
HE554 NSPS Dc	natural gas/propane-fired steam superheater 10 million Btu per hour heat input	na	na
HE3	natural gas/No. 6 fuel oil-fired Dowtherm heater 16.8 million Btu per hour heat input	na	na
HE4	natural gas/No. 6 fuel oil-fired Dowtherm heater 16.8 million Btu per hour heat input	na	na
HE5	natural gas/No. 6 fuel oil/on site generated waste oil-fired Dowtherm heater 17.8 million Btu per hour heat input	na	na
F07	Dowtherm Transfer and Storage	na	na

\* 40 CFR 63.1311(i) -Affected sources producing PET using a continuous terephthalic acid process subject to 40 CFR 63, Subpart JJJ that are also subject to the provisions of 40 CFR part 60, subpart DDD, are required to comply only with the provisions of 40 CFR 63, Subpart JJJ. However, existing affected sources producing PET using a continuous terephthalic acid high viscosity multiple end finisher process shall continue to be subject to requirements for maximum ethylene glycol in cooling tower water [40 CFR 60.562-1(c)(2)(ii)(C)] until the affected source becomes subject to and achieves compliance with the MACT requirements for maximum concentration of ethylene glycol in cooling tower water [40 CFR 63.1329(c)].

## VI. Emission Source-by-Source Evaluation

- A. **Alan III - Esterification Reactors (ID No. ES01) with barometric condenser (ID No. C112A/C113A)**  
**Alan IV - Esterification Reactors (ID No. ES02) with barometric condenser (ID No. C112B/C113B)**

1. Description

Ethylene glycol and terephthalic acid are mixed to form a paste which is fed to the esterification reactors under temperature and pressure. The applicant has stated that the mixing/feed tanks for the esterification process do not qualify as continuous process vents because the concentration of HAP in the vent stream is less than 50 ppmw. The esterification reactors create monomer and oligomer for polymerization in later steps. Water and HAP byproducts (acetaldehyde and 1,4 dioxane) are also created during the esterification reaction and are vented along with ethylene glycol vapors to a surface condenser and then to a direct contact barometric condenser. The condensate from the surface condenser is sent to the CL2 distillation column as a recycle stream. The condensate in the barometric condenser is sent to the prefinish seal pot (hotwell) in polymerization.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

The following table provides a summary of limits and standards for the emission source(s) described above:

<b>Regulated Pollutant</b>	<b>Limits/Standards</b>	<b>Applicable Regulation</b>
Hazardous Air Pollutants	organic HAP emissions from all of the sources listed above in the raw materials preparation sections for PET Esterification Alan III and PET Esterification Alan IV shall be no greater than 0.04 Kg per MG of PET polymer produced	15A NCAC 2D .1111 National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII.A.1. General Recordkeeping and Reporting	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ) National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII.A.2. Maintenance Wastewater Requirements	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ) National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII.A.3. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) National Emission Standards for Hazardous Air Pollutant Emissions: Operation and Maintenance Requirements
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII.B. Work Practice Standards	15A NCAC 2D .0958
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII.C. PSD BACT Limit	15A NCAC 2D .0530

**a. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS - MATERIALS PREPARATION CONTINUOUS PROCESS VENTS**

i. Regulatory Analysis

The Permittee shall limit organic HAP emissions from all process vents containing greater than 0.005 weight percent total organic HAP from continuous unit operations associated with the esterification vessels in the collection of raw material preparation sections, as listed above, to no greater than 0.04 kilogram organic HAP per megagram of PET produced from all associated thermoplastic polymer production units.

ii. Testing

Testing was conducted and reported in the MACT Notification of Compliance submitted November 16, 2001. It was determined that the condenser outlet vent temperature has to be maintained at or below 49 degrees C to ensure compliance with the MACT standard.

- iii. **Monitoring Requirements**  
The Permittee is required to continuously monitor the exit vent temperatures of barometric condensers ID Nos. C112A, C112A, C113A, and C113B
- iv. **Recordkeeping Requirements**  
The Permittee is required to maintain records of measured parametric values, excursions, monitor maintenance and calibration, equipment malfunctions, start up, shut downs, and other items as may be required in 40 CFR 63.1319.
- v. **Reporting Requirements**  
The Permittee is required to report any excursions, equipment malfunctions, and other items as may be required in 40 CFR 63.1320.

**B. Alan III Prepolycondensation**

first stage reactor (ID No. ES12) with barometric condenser (ID No. C124A/C125A)  
second stage reactor (ID No. ES13) with barometric condenser (ID No. C122A/C123A)  
barometric condenser receiver HT 126A (ID No. ES21)

**Alan IV Prepolycondensation**

first stage reactor (ID No. ES14) with barometric condenser (ID No. C124B/C125B)  
second stage reactor (ID No. ES13) with barometric condenser (ID No. C122B/C123B)  
barometric condenser receiver HT 126B (ID No. ES22)

**Alan III Polymerization**

prefinish reactor (ID No. APT201A)  
final finish reactor (ID No. APT301A)  
final finish reactor (ID No. APT401A)  
final finish reactor (ID No. APT601A)

**Alan III Polymerization**

prefinish reactor (ID No. APT201B)  
final finish reactor (ID No. APT301B)  
final finish reactor (ID No. APT401B)  
final finish reactor (ID No. APT601B)

**Ethylene Glycol Recovery CL1**

distillation column (ID No. ES26CL1) with surface condenser (ID No. C127)

**Ethylene Glycol Recycle CL2**

distillation column (ID No. ES26CL2) with contact condenser (ID No. C128)

1. **Description**

The monomer/oligomer from esterification is polymerized in a three step process under temperature and vacuum. These steps are prepolycondensation, prefinish, and final finish.

The vent stream from the prepolycondensation reactors pass through barometric condensers and then through liquid ring vacuum pumps. The Permittee has stated that there is no vent stream from the vacuum pumps and that the vents have been blocked off. It is not reasonable to assume that absolutely no vent stream comes from these vacuum pumps, but it is reasonable to assume that the flow may be very low. The operation of the barometric condensers determines whether there is an inconsequential flow through vacuum pumps and the magnitude of any emission from the prepolycondensation reactors. Condensate from the prepolycondensation reactors may be sent to either CL1 distillation column recovery or CL2 distillation column recycle and it also serves as the cooling media in the barometric

condensers. The water in the barometric condenser condensate tank is constantly recirculated through two chilled water surface condensers. Since the barometric condensate tanks are an integral part of the process (i.e., continuous process vents associated with polymerization), emissions from these tanks as well as emissions out of the vacuum pumps are required to be determined for compliance with the MACT standard. The barometric condensers must also be monitored as emissions are a function of these condensers.

The prefinish and final finish polymerization reactors pass through multi stage steam jet jets with intercondensers. The final steam jet ejector on each of the two prefinishers and six final finishers is injected into a seal tank (hotwell) which is more or less open to the atmosphere. These emissions were not determined by the applicant, and testing to determine these emissions is required to ensure compliance with MACT standard. As the steam ejectors and the intercondensers are considered process equipment, no monitoring of this equipment was required.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

<b>Regulated Pollutant</b>	<b>Limits/Standards</b>	<b>Applicable Regulation</b>
Hazardous Air Pollutants	organic HAP emissions from all of the sources listed above in the polymerization reaction sections, including ethylene glycol receiver equipment, for Alan III and Alan IV PET prepolycondensation/polymerization, and materials recovery equipment CL1 and CL2 shall be no greater than 0.02 Kg per Mg of PET polymer produced	15A NCAC 2D .1111 National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII.A.1. General Recordkeeping and Reporting	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ) National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII.A.2. Maintenance Wastewater Requirements	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ) National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII.A.3. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) National Emission Standards for Hazardous Air Pollutant Emissions: Operation and Maintenance Requirements
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII.B. Work Practice Standards	15A NCAC 2D .0958
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII.C. PSD BACT Limit	15A NCAC 2D .0530

**a. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS - POLYMERIZATION CONTINUOUS PROCESS VENTS**

i. Regulatory Analysis

The Permittee shall limit organic HAP emissions from all process vents containing greater than 0.005 weight percent total organic HAP from continuous unit operations in the collection of polymerization reaction sections and ethylene glycol recovery sections, as listed above, to no greater than 0.02 kilogram organic HAP per megagram of PET product, as a whole, from all associated thermoplastic polymer production units.

ii. Testing

Emission testing shall be conducted by [180 days of permit issuance] using the above referenced procedures and test methods in Section 2.1 B.1. b, to determine emissions from polymerization units in Alan III (ID Nos. APT201A, APT301A, APT401A, and APT601A); Alan IV (ID Nos. APT201B, APT301B, APT401B, and APT601B) prior to seal pot injection ; distillation column vents (ID Nos. ES26CL1) after the final control device (ID Nos. C127); distillation column vents after the final recovery device (ID No. C143) and after the side stream condenser (ID No. C128) ; prepolycondensation direct contact barometric condenser receivers HT126A and HT126B (ID Nos. ES21 and ES22).

iii. Monitoring Requirements

"Where a condenser is the final recovery device in the recovery system, a condenser exit (product side) temperature monitoring device equipped with a continuous recorder shall be used." The spray condensers on the prepolycondensation reactors (ID Nos. ES12, ES13, ES14, and ES15) shall each be equipped with continuous recording devices to monitor the temperature and flow rate of direct contact cooling liquid. The surface condenser (ID No. C127) on the ethylene glycol recovery column (ID No. ES26CL1), the surface condenser (ID No. C143) and spray condenser (ID No. C128) on the ethylene glycol recycle column (ID No. ES26CL2) shall each be equipped with continuous recording devices to monitor the temperature of the exit vents. Alternatively, the Permittee shall submit a plan for alternative parametric (e.g., monitoring of condenser operating parameters) or direct monitoring (i.e., continuous vapor analyzers) by [60 days of permit issuance].

iv. Recordkeeping Requirements

The Permittee is required to maintain records of measured parametric values, excursions, monitor maintenance and calibration, equipment malfunctions, start up, shut downs, and other items as may be required in 40 CFR 63.1319.

v. Reporting Requirements

The Permittee is required to report any excursions, equipment malfunctions, and other items as may be required in 40 CFR 63.1320.

**C. Wastewater**

Alan III Esterification direct contact condensate from condensers (ID Nos. C112A/C113A)

Alan III prefinish and final finish reactor seal pots (ID Nos. HT205A/HT206A, HT305A/HT306A, HT405A/HT406A, and HT605A/HT606A)

Alan IV Esterification direct contact condensate from condensers (ID Nos. C112B/C113B)

Alan IV prefinish and final finish reactor seal pots (ID Nos. HT205B/HT206B, HT305B/HT306B, HT405B/HT406B, and HT605B/HT606B)

Alan III prepolycondensation vacuum pump cooling water (ID Nos VP137A, VP138A, VP135A, and VP136A)

Alan IV prepolycondensation vacuum pump cooling water (ID Nos VP137B, VP138B, VP135B, and VP136B)

Ethylene Glycol Recycle CL2 overheads seal pot (ID No. VT41)

1. Description  
Water generated in the process that is not recycled to the process.
2. Applicable Regulatory Requirements  
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

<b>Regulated Pollutant</b>	<b>Limits/Standards</b>	<b>Applicable Regulation</b>
Hazardous Air Pollutants	Group 2 wastewater	15A NCAC 2D .1111 National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section 2.2 A.1. General Recordkeeping and Reporting	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ) National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section 2.2 A.2. Maintenance Wastewater Requirements	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ) National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section 2.2 A.3. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) National Emission Standards for Hazardous Air Pollutant Emissions: Operation and Maintenance Requirements

**a. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS - GROUP 2 WASTEWATER**

Recordkeeping Requirements [40 CFR 63.147(b)(8) pursuant to 40 CFR 63.132(a)(3) pursuant to 40 CFR 63.1330] only

**D. Cooling Towers**

Marley Process Cooling Towers (ID Nos. TW2 and TW3)

1. Description  
Cooling towers blow air through a cascading water stream to cool by evaporation resulting in HAP/VOC emissions with the evaporated water.
2. Applicable Regulatory Requirements  
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	40 CFR 63.1329(c) requirement to maintain ethylene glycol concentration in cooling water at or below four percent was stayed indefinitely (February 23, 2001 FR)	15A NCAC 2D .1111 National Emission Standards for Hazardous Air Pollutant Emissions: Group IV Polymers and Resins
Volatile Organic Compounds	The ethylene glycol concentration of the water in the cooling towers must be maintain at or below six percent 40 CFR 60.562-1(c)(2)(ii)(C)	15A NCAC 2D .0524 40 CFR 60, Subpart DDD New Source Performance Standards for VOC from the Polymer Manufacturing Industry
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII.B. Work Practice Standards	15A NCAC 2D .0958
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII.C. PSD BACT Limit	15A NCAC 2D .0530

**a. 15A NCAC 2D .0524: NEW SOURCE PERFORMANCE STANDARDS FOR VOC EMISSIONS FROM THE POLYMER MANUFACTURING INDUSTRY [40 CFR 60, Subpart DDD]**

- i. The Permittee must maintain the ethylene glycol concentration in the cooling tower water less than or equal to six percent by weight until the MACT becomes effective then it drops to four percent by weight. Concentration is determined on a 14 day rolling average basis.
- ii. **Monitoring** [40 CFR 60.564(j)]  
daily sampling is required.
- iii. **Recordkeeping** [40 CFR 60.565(a)(8)]  
Daily measurement and daily average 14-day rolling average of the ethylene glycol concentration in the cooling towers.
- iv. **Reporting** [40 CFR 60.565(k)]  
The Permittee shall submit a summary report of all periods when the 14-day rolling average exceeds the standard on a semi annual basis.

**E. Spindraw Operations**

Alan III six spindraw operations (ID Nos. ES103) with condenser/mist eliminator (ID No. MISTE1)

Alan IV six spindraw operations (ID Nos. ES104) with condenser/mist eliminator (ID No. MISTE2)

1. Description

This is where the melted polymer is made into yarn. It includes the application of sizing. Both processes result in condensible particulate matter which is controlled by a condenser and mist eliminator.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate Matter	particulate emissions shall not exceed the rate prescribed by the process weight equations: For process rates up to 30 tons per hour: $E = 4.10 \times P^{0.67}$ For process rates greater than 30 tons per hour: $E = 55.0 \times P^{0.11} - 40$ Where: E = allowable emission rate in pounds per hour, and P = process weight in tons per hour	15A NCAC 2D .0515
Visible Emissions	visible emissions shall not exceed 20 percent opacity	15A NCAC 2D .0521
Volatile Organic Compounds	See "Multiple Emission Sources" Section VII.B. Work Practice Standards	15A NCAC 2D .0958
Particulate Matter	See "Multiple Emission Sources" Section VII.C. PSD BACT Limit	15A NCAC 2D .0530

**a. 15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES**

- i. Emissions of particulate matter from each source shall not exceed an allowable emission rate as calculated by the following equation: [15A NCAC 2D .0515(a)]  
 For process rates up to 30 tons per hour:  $E = 4.10 \times P^{0.67}$   
 For process rates greater than 30 tons per hour:  $E = 55.0 \times P^{0.11} - 40$   
 Where: E = allowable emission rate in pounds per hour, and P = process weight in tons per hour

Testing, Monitoring, Recordkeeping, Reporting

- ii. (see PSD requirements of Section IV.C.)

**b. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**

- i. Visible emissions from spindraw operations shall not be more than 20 percent opacity when averaged over a six-minute period.

Monitoring

- ii. To assure compliance, once a week the Permittee shall observe the emission points of this source for any visible emissions above normal.

- Recordkeeping
- iii. The results of the monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request.
- Reporting
- iv. The Permittee shall submit a semi annual summary report of the observations.

**F. Utilities**

- natural gas/No. 6 fuel oil-fired boiler (ID No. SG1)
- natural gas/No. 6 fuel oil-fired boiler (ID No. SG2)
- ab natural gas-fired boiler (ID No. SG3)
- ab natural gas/propane-fired steam superheater (ID No. HE553)
- ab natural gas/propane-fired steam superheater (ID No. HE554)
- natural gas/No. 6 fuel oil-fired Dowtherm heater (ID No. HE3)
- natural gas/No. 6 fuel oil-fired Dowtherm heater (ID No. HE4)
- c natural gas/No. 6 fuel oil/waste oil-fired Dowtherm heater (ID No. HE5)

1. Description  
Steam, superheated steam and hot Dowtherm are produced here for process heat.
2. Applicable Regulatory Requirements  
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate Matter	Particulate matter emissions shall not exceed 0.284 pounds per million Btu heat input for Boilers SG1, SG2, SG3, and Dowtherm heaters HE3, HE4, and HE5.  Particulate matter emissions shall not exceed 0.264 pounds per million Btu heat input for steam superheaters HE553 and HE554.	15A NCAC .0503
Sulfur Dioxide	Sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input.	15A NCAC .0516
Visible Emissions	Visible emissions shall not exceed 20 percent opacity for Boiler SG3, steam superheaters HE553 and HE554, and Dowtherm heater HE5.  Visible emissions shall not exceed 40 percent opacity for Boilers SG1 and SG2, and Dowtherm heaters HE3 and HE4.	15A NCAC 2D .0521
Sulfur dioxide <sup>a</sup>	Recordkeeping of Fuel use for boiler SG3 and steam superheaters HE553 and HE553.	15A NCAC 2D .0524 (40 CFR 60, Subpart Dc)New Source Performance Standards for Commercial-Industrial-Institutional Steam Generating Units

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate Matter <sup>b</sup>	See “Multiple Emission Sources” Section VII.C. PSD BACT Limit for boiler SG3	15A NCAC 2D .0530
Criteria Pollutants <sup>c</sup>	PSD Avoidance Condition	15A NCAC 2Q.0317

abc- denotes that the corresponding regulation applies only to this (theses) source(s)

**a. 15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS**

- i. Emissions of particulate matter from boilers SG1, SG2, and SG3, and Dowtherm heaters HE3, HE4, and HE5 shall not exceed 0.284 pounds per million Btu heat input.
- ii. Emissions of particulate matter from superheaters HE553 and HE554 shall not exceed 0.264 pounds per million Btu heat input. These rates were recalculated based on the dates of their construction.

Monitoring, Recordkeeping, Reporting

- iii. No monitoring/recordkeeping/reporting is required for particulate emissions from the firing of natural gas, propane, waste oil, or No. 6 fuel oil in these sources.

**b. 15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES**

- i. Emissions of sulfur dioxide from boilers SG1 and SG2, and Dowtherm heaters HE3, HE4, and HE5 shall not exceed 2.3 pounds per million Btu heat input.

Monitoring/Recordkeeping

- ii. No monitoring/recordkeeping is required for sulfur dioxide emissions from natural gas/propane for these sources. However, the maximum sulfur content of any No. 6 fuel oil and on site generated waste oil burned in boilers SG1 and SG2, and Dowtherm heaters HE3, HE4, and HE5 shall not exceed 2.1 percent by weight and shall be monitored per shipment received.

Reporting

- iii. The Permittee shall submit a summary report of the fuel oil sulfur content determinations semi annually.

**c. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**

- i. Visible emissions from the Boiler SG3, steam superheaters HE553 and HE554, and Dowtherm heater HE5 shall not be more than 20 percent opacity, and visible emissions from Boilers SG1 and SG2, and Dowtherm heaters HE3 and HE4 shall not be more than 40 percent opacity.

Monitoring

- ii. To assure compliance, once a day the Permittee shall observe the emission points of the boilers SG1 and SG2 and the Dowtherm heaters HE3, HE4, and HE5 when firing No. 6 fuel oil for any visible emissions above normal. No monitoring/recordkeeping/reporting is required for visible emissions from the firing of natural gas, propane, or No. 2 fuel oil.

Recordkeeping

- iii. The results of the monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request.

Reporting

iv. The Permittee shall submit a summary report of the observations semi annually.

**<sup>a</sup> d. 15A NCAC 2D .0524: NSPS 40 CFR PART 60 SUBPART Dc**

Recordkeeping

i. The Permittee shall record and maintain records of the amounts of each fuel fired during each day.

**<sup>c</sup> e. 15A NCAC 2Q .0317: PSD AVOIDANCE CONDITION**

Per request of the applicant in order to avoid PSD applicability, the No. 6 fuel oil/natural gas/waste oil-fired hot oil heater (17.8 million Btu per hour maximum heat input, ID No. HE-5) shall be subject to the following conditions of operation and limitations:

- i. the combustion of fuel and waste oil shall not exceed 569,000 gallons in any consecutive rolling twelve months period;
- ii. only waste oils generated at this plant site may be combusted;
- iii. the waste oil injection rate to the hot oil heater shall not exceed a maximum limitation of fifteen (15) gallons per hour;
- iv. the waste oils combusted shall not contain or result in the emissions of polychlorinated biphenyl (PCBs) or hazardous waste as defined by the U.S. Environmental Protection Agency (EPA) or the State of North Carolina regulations; and

Recordkeeping

v. the Permittee shall maintain a waste oil combustion logbook and record the maximum waste oil injection in gallons per hour and gallons per day.

Reporting

vi. Quarterly reports of No. 6 fuel oil and waste oils use, the percent sulfur content by weight, and the total number of gallons combusted in HE-5 for each of the three rolling twelve month periods of the calendar quarter.

**G. Utilities**

Dowtherm Transfer and Storage

The following table provides a summary of limits and standards for the emission source(s) described above:

<b>Regulated Pollutant</b>	<b>Limits/Standards</b>	<b>Applicable Regulation</b>
Volatile Organic Compounds	See "Multiple Emission Sources" Section VII.B. Work Practice Standards	15A NCAC 2D .0958

## VII. Multiple Emission Source Limits

### A. Facility Wide - Affected Units Pursuant to 40 CFR 63, Subpart JJJ

The Permittee provided a list of heat exchangers and the qualifying exemptions for each. It was also determined that leak inspection and repair provisions of MACT 40 CFR 63.148 and Subpart H do not apply to this facility due to low HAP vapor pressures and/or the extensive use of vacuum lines at this facility. Therefore; no heat exchanger or leak monitoring and repair provisions were included in the permit.

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	General Recordkeeping and Reporting	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)
Hazardous Air Pollutants	Maintenance Wastewater Requirements	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)
Hazardous Air Pollutants	Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)

**1. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS GENERAL RECORDKEEPING AND REPORTING PROVISIONS**

These provisions are verbatim of the requirements of 40 CFR 63.1335 as they apply to the affected sources at this facility.

**2. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS MAINTENANCE WASTEWATER REQUIREMENTS**

These provisions are verbatim of the requirements of 40 CFR 63.105 as modified by 40 CFR 63.1330(c) (i.e., HAPs include only acetaldehyde and 1,4 dioxane).

**3. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS START UP, SHUT DOWN MALFUNCTION**

These provisions are verbatim of the requirements of 40 CFR 63.1335(b).

### B. Facility Wide - Volatile Organic Compound Emission Sources

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Volatile Organic Compounds	Work Practice Standards	15A NCAC 2D .0958

**1. 15A NCAC 2D .0958: WORK PRACTICES FOR SOURCES OF VOLATILE ORGANIC COMPOUNDS**

**i. Regulatory Analysis**

All sources that use volatile organic compounds (VOC) whose emissions of VOC are greater than 15 pounds per day are required to employ specific work practice standards.

- ii. **Monitoring**  
Monthly visual inspection of all operations and processes utilizing volatile organic compounds is required to ensure that work practices are being employed.
- iii. **Recordkeeping**  
The results of the inspections shall be maintained in a logbook which shows the date and time of each inspection and the results of each inspection noting whether or not noncompliant conditions were observed.
- iv. **Reporting**  
Semi annual reports of observations is required.

**C. PSD BACT Emissions Limitations and Testing Requirements**

1. Monitoring requirements were established for the condensers on the spindraw operations similar to those for condensers used to comply with MACT standards for Subpart JJJ. Potential VOC emissions will not exceed 124.56 pounds per hour because compliance with MACT JJJ provisions limit HAP emissions which comprise a majority of the VOC emissions to much less than this amount. Therefore; no additional monitoring is needed for this limit. In addition, limitations for a maximum six percent ethylene glycol concentration in cooling tower water, the 0.04 kg VOC per megagram of product limitation from esterification, and the 0.02 kg VOC per megagram of product limitation for polymerization will all be adequately monitored by the NSPS Subpart DDD and MACT JJJ requirements. Opacity monitoring is covered under the specific regulations for opacity and no additional monitoring is imposed. The particulate BACT limit for SG3 was established pursuant to the allowable calculated under 15A NCAC 2D .0503. The correct limit should have been 0.284 pounds per million Btu heat input.

<b>Regulated Pollutant</b>	<b>Limits/Standards</b>	<b>Applicable Regulation</b>
Volatile Organic Compounds	<p>Alan III and Alan IV PET production total volatile organic compounds shall not exceed 124.56 pounds per hour and opacity (each stack) shall not 20 percent.</p> <p>Ethylene glycol concentration shall not exceed six percent by weight (14 day rolling average) in the waters of the cooling towers (ID Nos. TW2 and TW3).</p> <p>Total organic compound emissions shall not exceed 0.04 kg per Mg of product from esterification (ID Nos. ES01 and ES02)</p> <p>Total organic compound emissions shall not exceed 0.02 kg per Mg of product from prepolycondensation (ID Nos. ES12, ES13, ES21, ES14, ES15, and ES22), polymerization (ID Nos. APT201A/B, APT301A/B, APT401A/B, and APT601A/B), and ethylene glycol recovery (ID No. ES26CL1) and ethylene glycol recycle (ID No. ES26CL2).</p>	15A NCAC 2D .0530

Regulated Pollutant	Limits/Standards	Applicable Regulation
Opacity	Visible emissions from PET esterifiers, prepolycondensation, polymerizers, and spindraw machines shall not exceed 20 percent opacity.  Visible emissions from boiler SG3 shall not exceed 20 percent opacity.	15A NCAC 2D .0530
particulate matter	PM-10 emissions from spindraw operations ES103 and ES104 shall not exceed 7.5 pounds per hour  Particulate emissions from boiler SG3 shall not exceed 0.284 lbs per million Btu heat input.	15A NCAC 2D .0530

- a. Annual testing of the emission limit for Alan III and Alan IV PET polymer spindraw operating is required
  - Monitoring
- b. The Permittee shall continuously monitor the condenser (ID No. MISTE1 and MISTE2) outlet temperatures to ensure that the temperature determined during the latest BACT compliance testing is not exceeded. The maximum temperature for each respective condenser shall be established during performance testing to determine compliance with the BACT mass emission limit and the process weight rate limit established pursuant to 15A NCAC 2D .0515, whichever is more stringent.
  - Recordkeeping
- c. Hourly and daily average condenser temperatures must be maintained.
  - Reporting
- d. More than one exceedance of the maximum condenser temperature per semi annual period is a violation. The Permittee shall submit reports identifying the condenser and each date that a daily average value exceeding the condenser temperature established during performance testing, any periods of insufficient monitoring data, and any periods of startup/shutdown/malfunction when monitoring data was not available or invalid.

**VIII. Permit Shield (including non-applicable requirements)**

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

**IX. General Conditions**

The “General Conditions” section of the Title V Operating Permits lists additional applicable rule requirements that the permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

**X. Insignificant Activities**

The insignificant activities listed in the application have been reviewed and verified. Because an emission source or activity is insignificant does not mean that the emission source or activity is exempted from any

applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement. Insignificant activities were determined to be as follows:

1. pyrolysis furnace (ID No. IOV1) 400,000 Btu heat input
2. pyrolysis furnace (ID No. IOV2) 400,000 Btu heat input
3. terephthalic acid storage silo (ID No. IVT2)
4. terephthalic acid storage silo (ID No. IVT3)
5. terephthalic acid storage silo (ID No. IVT33)
6. diesel emergency generator (ID No. IF5) 536 hp
7. diesel fire pump (ID No. IFP1) 175 hp
8. diesel fire pump (ID No. IFP2) 290 hp
9. Alan IV copolymer extruder (ID No. IXT506)
10. di-isopropyl amine tank (ID No. IVT78) 10,000 gallon
11. epsilon caprolatone tank (ID No. IHT28) 11,420 gallon
12. esterification mix and feed tanks
13. virgin ethylene glycol tank (ID No. VT34) 200,000 gallons
14. virgin ethylene glycol tank (ID No. VT19) 200,000 gallons
15. spent ethylene glycol tank (ID No. VT20) 200,000 gallons
16. purified ethylene glycol tank (ID No. VT34) 30,000 gallons **NSPS Kb**

## **XI. Public Notice**

Pursuant to 15A NCAC 2Q .0521, a notice of the Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30 day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA.

## **XII. Recommendations**

The initial Title V application for Alcoa Inc. has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the proposed permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.