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From: Barbara Cenalmor
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Technical Support Document
Proposed Title V Permit
Republic Plastics, LTD
Permit # V20632.000

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1. BACKGROUND

1.1 Applicant

FACILITY: Republic Plastics San Manuel Foam Plant
27095 S Republic Road
San Manuel, Arizona
Assessor Parcel # 307-05-02905

MAILING ADDRESS: Republic Plastics, LTD
27095 S Republic Road
San Manuel, Arizona

1.2 Attainment Classification

The facility is situated in an area classified as "attainment" for all pollutants.

1.3 Application History

The following information was used in the processing of this permit:

1. Previous minor New Source Review (NSR) permits C30851.000 and C30851.R01
2. Permit application received on 3/3/08[1].

1.4 Permitting History

Permit	Permit Type	Issue Date	Equipment/Change
C30851.000	Minor Source (synthetic minor)	9/7/2005	Initial permit
C30851.R01	Minor Modification	5/30/2006	Addition of 1 more extruding line (extruder, 3 thermoformers, 3 stamping machines, 3 grinders)

1.5 Compliance/Enforcement History

PCAQCD issued a Notice of Violation (NOV) on 2/15/08 for having exceeded the 100 ton threshold while operating as a minor source, not having kept the records required by the permit, not having submitted a deviation report and not having submitted the annual emissions inventory on time.

[1]Original application received on 12/5/07 with proposed production levels that would have triggered Prevention of Significant Deterioration (PSD). To avoid triggering such requirements, permittee submitted a revised application on 3/3/08 requesting enforceable permit limitations on production and/or throughput.

The issuance of an Order of Abatement by Consent is pending.

2. PROCESS DESCRIPTION

This source's primary process is the extrusion of foam from polystyrene pellets. The source includes 2 pellet receivers, two lines of one extruder, three thermoformers and stamping machines with scrap recycling systems each, as well as an inkjet printer and a 30,000 gallon isobutane storage tank. The proposed expansion would include a third and fourth line each including one extruder, two thermoformers, two stamping machines with grinders, a scrap grinder and a fluff recycling system.

2.1. Polystyrene pellets are transferred from storage silos into receivers and transferred into the extruder. Isobutane, a blowing agent, is injected into the extruder at high pressure, where it mixes with the molten polystyrene. Volatile Organic Compounds (VOC) emissions in the form of isobutane are emitted during this process, as well as particulate matter (PM) from the transfer of the pellets.

2.2. The polystyrene is forced through an exit die, and as it exits, the release of pressure causes the blowing agent to expand, forming bubbles with the polystyrene mixture. VOCs are emitted during this process.

2.3. After aging, the rolls of material are fed through the thermoformers to mold plates and bowls. The molded parts are stamped from the sheet, leaving a trim skeleton. An inkjet printer using water-based inks is used to mark the final products before inspection and packaging. VOCs are emitted during the aging of the material and during the thermoforming and stamping. A negligent amount of VOCs are emitted from the printer since the ink is water-based.

2.4. Any off-spec material is mixed with the trim skeleton, ground and recycled back into the process. Particulate emissions from the hopper are controlled by a baghouse.

3. EMISSIONS

3.1 VOCs

Isobutane released from the foam manufacturing represents the bulk of emissions. These emissions occur during extrusion, expansion, aging, thermoforming and stamping process.

According to product testing conducted at the Republic Plastics Texas plant on March of 2003, 0.018 pounds of isobutane are retained per pound of final product. Testing conducted on site at the San Manuel plant showed the average retention to be 0.022 pounds of isobutane per pound of final product. Since the Texas factor is more conservative, permittee used it to calculate potential emissions for Title V and PSD applicability purposes. The less conservative on-site factor should be used for purposes of emissions inventory and compliance assessment.

Because the production rate of the extruder varies, production is not related directly to hours of operation. Instead, since isobutane use and retention depend on foam sheet production and foam product production, the permit limits both those items in order to maintain emissions below 250 tpy.

Since the original permit application for this facility, Permittee has found that less isobutane is needed per pound of extruded foam sheet than previously thought. Also, Permittee is replacing a percentage of the isobutane with CO2, not a regulated pollutant.

The following table summarizes the total isobutane emissions from the 2 proposed lines as well as from the entire plant. Details of the emissions calculations that are considered confidential are not included here.

Emission Source	Isobutane used as a blowing agent		Isobutane retained in final product		Total VOCs (isobutane) emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Lines 3 & 4	94	238	45	114	49	124
Plant-wide	187.20	475.6	89.4	227	97.8	**248.4**

3.2 PM10

Polystyrene particulate matter is controlled in the initial material handling operations by a pellet feed filter at 0.01 grains/scf. PM emissions are also controlled in the fluff reclaim by 2 baghouses with the same outlet grain loading as the pellet feed filter. The filter and baghouses vent back into the building. The permittee has estimated that 10% is released out of the building as fugitive emissions[2]. The table below indicates the total emissions, fugitive and non-fugitive.

	PM10 Emissions	
Emission Source	lb/hr	tpy
Pellet feed fabric filter	0.02	0.1
Talc-filled pellet feed fabric filter	0.02	0.1
Skeleton Surge Hopper baghouses (2 hoppers, 2 baghouses for each line)	0.69	3.01
Total PM10	0.73	3.21
Total PM10 released outside the building	**0.07**	**0.32**

4. REGULATORY REQUIREMENTS AND MONITORING

4.1 TITLE V/PSD Applicability

This facility constitutes a “major source” of Volatile Organic Compounds (VOCs) due to the isobutane emissions, and requires a permit pursuant to Title V of the CAA Amendments of 1990.

Without the limitations of the permit, the source would constitute a "major emitting source" for VOCs within the meaning of 40 CFR §51.166, and would require the facility to go through a Prevention of Significant Deterioration (PSD) review. This source is considered a “synthetic minor” with respect to PSD.

In order to maintain synthetic minor status of emissions of VOCs, this permit:

- Imposes a nominal emission cap at 250 tpy and production limits configured to limit actual, worst-case VOC emissions to 248.5 tpy. The production limits restrict the amount of isobutane released into the air by the amount of foam sheets and foam product

[2]Supported by guidance issued by the Texas Commission on Environmental Quality.

produced;

- Requires the applicant to keep monthly production records, and

- Requires the applicant to conduct monthly VOC calculations. If these calculations show that the source is emitting more than 200 tons, calculations will be done on a weekly basis, and monthly calculations will resume after emissions dip back down to below 200 tons. If emissions go above 240 tons, calculations shall be conducted daily.

Uncontrolled PM10 emissions from the facility will not exceed 4 tpy, making this source a natural minor with respect to PSD. To assure that emissions are minimized, this permit requires the daily visible inspections of the baghouses.

4.2 Regulatory Emission Limitations

4.2.1 Opacity

While the federally enforceable opacity limitation is 40%, there is a locally enforceable 20% opacity limitation that applies to point sources not already regulated by a new source performance standard, or having an opacity standard in Chapter 5 of the Code. Since the baghouses and filters vent inside the building, and any other particulate emissions that escape are considered fugitive, the 20% standard does not apply to any emission units at this plant.

4.2.2 CAM: The requirements of 40 CFR 64, Compliance Assurance Monitoring (CAM), are not applicable since Republic Plastics does not use a control device to achieve compliance with any emission limitation or standard for a pollutant for which the source has potential pre-control device emissions greater than or equal to major source levels for that pollutant.

4.2.3 NSPS/MACT: This source is not subject to §111 or §112 of CAA.

4.2.3.1 40 CFR Part 60, Subpart Kb - VOL Storage Vessels

This subpart regulates unpressurized hydrocarbon storage tanks larger than 19,813 gallons capacity. Even though the tank at this facility has a working volume of 30,000 gallons, it will operate in excess of 204.9 kPa and therefore is not regulated by this section.

4.2.3.2 40 CFR Part 60, Subpart DDD - Polymer Manufacturing

This subpart affects manufacture of polyethylene, but this facility will receive polyethylene which as already been produced.

4.2.4 Chemical Accident Prevention Provisions, 40 CFR Part 68

Flammable substances (isobutane) subject to this regulation will be store on site in quantities greater than the threshold quantities. The facility will submit a Risk Management Plan and comply with all the applicable requirements.

5. AMBIENT IMPACT ASSESSMENT - VOCs MODELING

While anticipated VOC emissions from the facility will potentially approach 249 tons-per-year, VOCs do

not directly fall subject to an ambient limitation under the CAA.

Maximum anticipated emissions from this facility do not reach the quantity-threshold that would trigger an obligation to analyze the additional impact on any nearby ozone nonattainment areas.

6. LIST OF ABBREVIATIONS

CAA . . . . . Clean Air Act
CAM . . . . . Compliance Assurance Monitoring
CFR . . . . . Code of Federal Regulations
hr . . . . . Hour
lb . . . . . Pound
MACT . . . . . Maximum Achievable Control Technology
MSDS . . . . . Material Safety Data Sheet
NOV . . . . . Notice of Violation
NSPS . . . . . New Source Performance Standard
NSR . . . . . New Source Review
PCAQCD . . . . . Pinal County Air Quality Control District
PGCAQCD . . . . . Pinal-Gila Counties Air Quality Control District
PM10 . . . . . Particulate Matter nominally less than 10 Micrometers
PSD . . . . . Prevention of Significant Deterioration
SIC . . . . . Standard Industrial Code
tpy . . . . . tons per year
VOC . . . . . Volatile Organic Compound
yr . . . . . year