11.13 POLYESTER RESIN MANUFACTURING

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Process Description

This chapter covers the permitting of resin manufacturing. A resin is defined as a solid or semi-solid, water insoluble, organic material with little or no tendency to crystallize. Resins may be used as the basic components of plastics and as components of surface coating formulations. Resins are generally produced by combining various monomers, solvents, oils, catalysts, and other materials in batch or continuous reactors. Generally, a District permit is required for each reactor, thinning tank, and/or blending tank, which are defined in Regulation 8-36. However, for small polyester resin storage (< 600 gallon capacity), grouping of tanks may be allowed, per grouping policy. If the facility has organic liquid storage tanks, then the permit handbook chapter for Organic Liquid Storage Tanks should also be referenced.

Chapter 6.6.3 Polystyrene, of AP-42 (Fifth Edition, Volume I) provides a detailed description of how resins are manufactured.

Completeness Determination

The following District forms should be completed and fees provided for polyester resin manufacturing. Use the Completeness Determination Checklist to verify completeness. Use the Data Form Guidance to ensure that the forms are completed correctly. Use the Fee Calculation Guidance to ensure that the fees are calculated accurately.

1. Form 101-B (one for facility).
2. Form G (one form for each reactor, thinning tank, and/or blending tank).
3. Form A (one per device).
4. Fees, calculated per Regulation 3 (Schedule F).

Emission Calculations

According to EPA's FIRE Program[1], the following are the emission factors for resin manufacturing:

SCC Code	Description	Pollutant	Emission Factor (lb/ton)
3-01-018-17	General*	POC	1.07 E 01
3-01-018-19	Solvent Recovery	POC	3.20 E 00
3-01-018-21	Extruding/Pelletizing/Conveying/Storage	POC	3.00 E-01
3-01-018-27	Polyamide Resins	NOx	1.00 E 00
3-01-018-32	Urea-Formaldehyde Resins	POC	1.47 E 01
3-01-018-42	Melamine Resin	POC	5.00 E 01
3-01-018-47	Epoxy Resin	POC	5.10 E 00
3-01-018-49	Acrylonitrile-Butadiene-Styrene (ABS)	POC	6.00 E 01
3-01-018-70	Reactor (Polyester Resins)	POC	5.00 E 01
3-01-018-80	Reactor (Polyurethane)	POC	5.20 E 01
3-01-018-92	Separation Process	POC	2.00 E 00

* This factor may be used to calculate total emissions from a polystyrene resin production plant.

The following equation can be used to calculate emission rates:

$E_{Pollutant} = U(EF)$

where,

$E_{Pollutant}$ = emissions of pollutant (lb/yr)
U = throughput (tons/yr)
EF = emission factor (lb/ton)

[1] The Factor Information REtrieval (FIRE) Data System is a database containing EPA's emission estimation factors for criteria and hazardous air pollutants in an easy to use Windows program.

TOXICS
According to EPA's FIRE Program[2], the following are the toxics emission factors for resin manufacturing:

SCC Code	Description	Pollutant	Emission Factor (lb/ton)
3-01-018-19	Solvent Recovery	Styrene	1.45 E-01
3-01-018-21	Extruding/Pelletizing/Conveying/Storage	Styrene	2.463 E-01
3-01-018-32	Urea-Formaldehyde Resins	Formaldehyde	3.00 E-01
3-01-018-49	Acrylonitrile-Butadiene-Styrene (ABS)	Styrene	2.78 E 00

The following equation can be used to calculate emission rates:

$E_{Pollutant} = U(EF)$

where,

$E_{Pollutant}$ = emissions of pollutant (lb/yr)
U = throughput (tons/yr)
EF = emission factor (lb/ton)

Applicable Requirements

District Rules and Regulations

Resin manufacturing is subject to the requirements of Regulation 8, Rule 36 (Resin Manufacturing Operations). Particulate Matter and Visible Emissions Standards).

California Environmental Quality Act (CEQA)

Permit applications which are reviewed following the specific procedures, fixed standards and objective measurements set forth in this chapter (11.13) are classified as ministerial and will accordingly be exempt from CEQA review per Regulation 2-1-311.

In addition to the above-mentioned source-specific applicable requirements, other requirements may also be applicable depending on the facility, its application emissions, and its source location:

- Offsets
- Prevention of Significant Deterioration
- Risk Screening Analysis

Permit Conditions

Standardized conditions for polyester resin manufacturing are available from the Permit Condition Guidance. Refer to the Evaluation Report Template Guidance to obtain the Microsoft Word formatted permit conditions for this source category.

[2] The Factor Information REtrieval (FIRE) Data System is a database containing EPA's emission estimation factors for criteria and hazardous air pollutants in an easy to use Windows program.