6.6.1 Polyvinyl Chloride

6.6.1.1 Process Description[1]

The manufacture of most resins or plastics begins with the polymerization or linking of the basic compound (monomer), usually a gas or liquid, into high molecular weight noncrystalline solids. The manufacture of the basic monomer is not considered part of the plastics industry and is usually accomplished at a chemical or petroleum plant.

The manufacture of most plastics involves an enclosed reaction or polymerization step, a drying step, and a final treating and forming step. These plastics are polymerized or otherwise combined in completely enclosed stainless steel or glass-lined vessels. Treatment of the resin after polymerization varies with the proposed use. Resins for moldings are dried and crushed or ground into molding powder. Resins such as the alkyd to be used for protective coatings are usually transferred to an agitated thinning tank, where they are thinned with some type of solvent and then stored in large steel tanks equipped with water-cooled condensers to prevent loss of solvent to the atmosphere. Still other resins are stored in latex form as they come from the kettle.

6.6.1.2 Emissions And Controls[1]

The major sources of air contamination in plastics manufacturing are the raw materials or monomers, solvents, or other volatile liquids emitted during the reaction; sublimed solids such as phthalic anhydride emitted in alkyd production; and solvents lost during storage and handling of thinned resins. Emission factors for the manufacture of polyvinyl chloride are shown in Table 6.6.1-1.

Table 6.6.1-1 (Metric And English Units). UNCONTROLLED EMISSION FACTORS FOR PLASTICS MANUFACTURING[a]

EMISSION FACTOR RATING: E

Type of Plastic	Particulate		Gases	
	kg/Mg	lb/ton	kg/Mg	lb/ton
Polyvinyl chloride	17.5[b]	35[b]	8.5[c]	17[c]

[a] References 2-3.
[b] Usually controlled with fabric filter, efficiency of 98-99%.
[c] As vinyl chloride.

Much of the control equipment used in this industry is a basic part of the system serving to recover a reactant or product. These controls include floating roof tanks or vapor recovery systems on volatile material, storage units, vapor recovery systems (adsorption or condensers), purge lines venting to a flare system, and vacuum exhaust line recovery systems.

References For Section 6.6.1

1. *Air Pollutant Emission Factors, Final Report*, Resources Research, Inc., Reston, VA, Prepared for National Air Pollution Control Administration, Durham, NC, under Contract Number CPA-22-69-119, April 1970.

2. Unpublished data, U. S. Department of Health and Human Services, National Air Pollution Control Administration, Durham, NC, 1969.

3. Communication between Resources Research, Inc., Reston, VA, and State Department Of Health, Baltimore, MD, November 1969.