



## **Cycletime Tips - General**

### **Volume 5: The Clean Air Act and Emissions in Your Plant**

By Ken Barnett

General Polymers is committed to aiding its customers in safely and properly using thermoplastic materials throughout their life-cycles. This commitment to our customers begins with delivering correctly labeled and packaged materials, and extends through providing technical service and providing guidance on disposal or recycling of scrap material. All these actions reflect Ashland Chemical's commitment to providing leadership in the Product Stewardship code of the Responsible Care<sup>1</sup> initiative.

During the processing of thermoplastic materials, varying amounts of volatile organic compounds (VOCs) and particulate matter can become airborne. The amounts of these airborne materials generated depend upon the nature and characteristics of the resin, processing temperature and other plant conditions. Such emissions may be subject to regulation under the Federal Clean Air Act of 1990 as well as a variety of state and local regulations.

The Society of the Plastics Industry (SPI) sponsored research into this subject. Data have been obtained for low density (LDPE), linear low density (LLDPE) and high density (HDPE) polyethylenes at two operating temperatures. The worst case scenario for emission of VOCs is the generation of 727 pounds/year of VOCs generated from four million pounds annually of LDPE at 620°F. This falls far short of the 10 tons/year stipulated for the major source threshold limit for Los Angeles, which has the most stringent requirements under the Clean Air Act. Under the Clean Air Act, major source thresholds for VOCs vary with the air quality of the region.

Data from the SPI-sponsored study for emissions from polyethylene at several temperatures are shown in Charts 1-3. Bear in mind that these data refer specifically to polyethylene. At present there are no similar data available for polypropylene, polystyrene, acrylonitrile-butadiene-styrene terpolymer (ABS) or poly (vinylchloride) (PVC). The latter three materials may in some cases contain low levels of unreacted monomer which could be released during processing and add VOCs. As information becomes available on other thermoplastic materials, we will share the data with you.

For PVC, ABS and polystyrene, there is another classification of emissions which is of concern: Hazardous Air Pollutants, HAP. The monomers of these polymers, vinyl chloride, acrylonitrile, 1,3-butadiene and styrene are HAP. Major source thresholds for HAP are independent of the air quality of the region. A major source for HAP has the potential to emit 10 tons/year or more of any single HAP or 25 tons/year or more of any combination of HAP.

While it is unlikely that plastics processors will exceed any of the above thresholds, it is important to be aware of applicable state and local regulations. Many state and local agencies require air permits for sources with very low actual emissions of both VOCs and particulate matter.

Although this article focused on emissions from polymer processing, it is important to remember that use of clean up solvent, adhesives, inks, paints and other coatings also can contribute to overall emissions. Other types of equipment at your facility may also be regulated - for instance boilers with heat input greater than one million BTU per hour. All of your polymer processing, finishing operations and related activities for your facility must be considered in assessing total emissions.

Also note that the amount of material emitted to the atmosphere is independent of the efficiency of your ventilation system. Adequate ventilation does, however, positively impact the health and safety of you and your employees.

Please refer to the Material Safety Data Sheet (MSDS) for the materials you purchase from General Polymers for information on safe handling and ventilation practices. As discussed in an earlier edition of Cycletime Tips, copies of MSDSs are available by calling Ashland Chemical Company's MSDS Center at (614) 790-4612.

If you have any questions regarding the issues discussed here, call your sales representative or Richard Wright of Ashland Chemical's Environmental Health and Safety Department at (614) 790-3577.

#### 1. HDPE VOCs and Temperature

160

120

80

40

0

1 2 3 4

MM Lbs. Processed

#### 2. LDPE VOCs and Temperature

800

600

400

200

0

1 2 3 4

MM Lbs. Processed

#### 3. LLDPE VOCs and Temperature

80

60

40

20

0

1 2 3 4

MM Lbs. Processed

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