

US EPA ARCHIVE DOCUMENT

# Paint & Coatings

## Sector At-a-Glance

Number of Facilities:	1,500
Value of Shipments:	\$20 Billion
Number of Employees:	51,000

Source: U.S. Census Bureau, 2001<sup>1</sup>

**Profile** The paint and coatings sector<sup>2</sup> manufactures a variety of products that preserve, protect, and beautify the objects to which they are applied. There are four main types of paints and coatings:

- ■ ■ ■ Architectural coatings used in homes and buildings, such as interior and exterior paints, primers, sealers, and varnishes;
- ■ ■ ■ Industrial coatings that are factory-applied to decorate and protect manufactured goods as part of the production process;
- ■ ■ ■ Special purpose coatings, such as aerosol paints, marine paints, high performance maintenance coatings, and automotive refinish paints; and
- ■ ■ ■ Allied paint products, including putties, paint and varnish removers, paint thinners, pigment dispersions, and paint brush cleaners.

The paint and coatings industry has been going through a period of increasing consolidation, marked by a large number of mergers, acquisitions, and spin-offs during the last decade.

**PRODUCTION PROCESS** Paint and coatings are made of a variety of compounds formulated to fulfill the requirements of different applications. Paint and coatings are manufactured through the following basic steps, which must be adapted to the characteristics of different ingredients:

- ■ ■ ■ Addition of raw materials (resins, dry pigments, water, or solvents, depending on the type of paint);
- ■ ■ ■ Mixing/dispersion;
- ■ ■ ■ Filtration; and
- ■ ■ ■ Packaging the paint or coating for sale.

**PARTNERSHIP** The National Paint and Coatings Association (NPCA) has formed a partnership with EPA's Sector Strategies Program to improve the environmental performance of the paint and coatings industry. NPCA membership includes more than 350 companies that account for close to 90% of the total dollar volume of architectural paints and industrial coatings produced in the U.S.<sup>3</sup>

**KEY ENVIRONMENTAL OPPORTUNITIES** The paint and coatings sector is working with EPA to improve the industry's performance by:

- Managing and minimizing waste;
- Reducing air emissions; and
- Promoting environmental management systems.



## Managing and Minimizing Waste

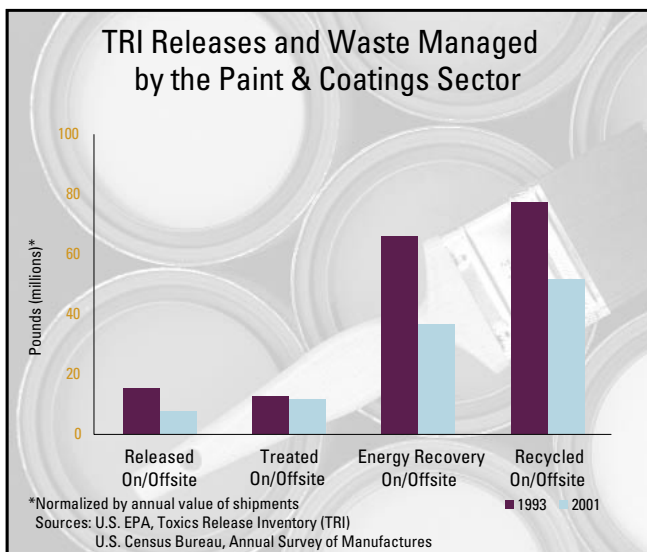
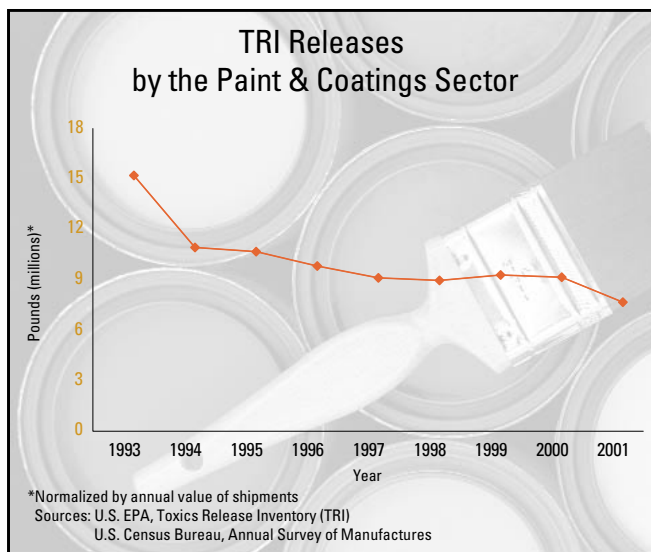
The paint and coatings sector is working to reduce generation and increase recycling of waste, as well as to address the life cycle impact of paint and coatings products.

### Reduction in Environmental Releases

Paint and coatings facilities use a variety of chemicals and report on the release and management of many of those materials through EPA's Toxics Release Inventory (TRI). Over the past decade, the sector has made progress in reducing releases of TRI chemicals. Between 1993 and 2001, normalized TRI releases by paint and coatings facilities decreased by 50%. Most of these releases were to air. In 2001, close to 50% of the sector's TRI waste was managed through recycling.<sup>4</sup> While current levels of recycling across the sector are already substantial, additional opportunities may exist for further increases.

### Life Cycle Impacts

The paints and coatings sector has reduced or eliminated a number of harmful constituents, such as lead and mercury, from most of its products. Opportunities still exist, however, to reduce life cycle impacts associated with the manufacture and use of paints and coatings. For example, environmental benefits could be achieved by substituting greater amounts of leftover paint for virgin raw materials in the production of new paint and coating products.



# Paint & Coatings

## Reducing Air Emissions

Organic solvents are used as an ingredient in the production of oil-based paint and coatings because of their ability to dissolve and disperse other coating constituents. Organic solvents are also used in smaller quantities as an ingredient in the production of water-based paint and coatings, as well as in other aspects of the manufacturing process.

As organic solvents evaporate, they release emissions of volatile organic compounds (VOC) and hazardous air pollutants (HAP). These releases occur inside production facilities as well as when paint and coating products are ultimately applied to building structures, consumer products, and other surfaces.

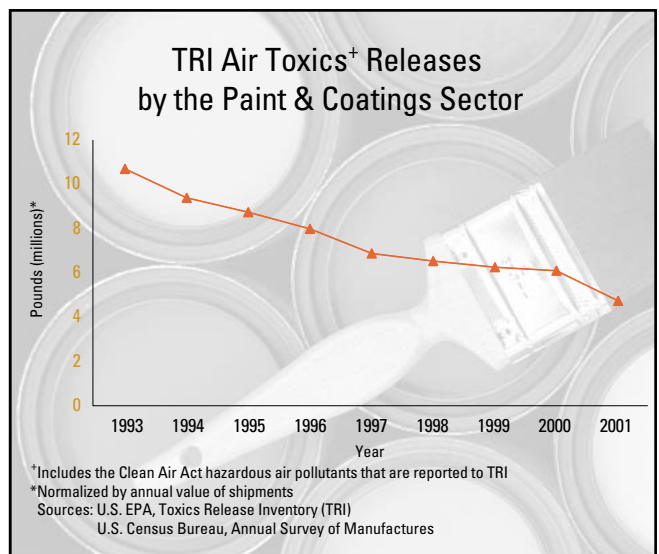
Although VOCs and HAPs resulting from the production and use of paint and coating products remain a serious environmental concern, these emissions have decreased steadily in recent years. EPA estimates that the normalized quantity of VOC emissions resulting from the manufacture of paint and coatings declined by 12% between 1996 and 2001.<sup>5</sup> The normalized quantity of HAP releases, as reported to TRI, declined by 56% between 1993 and 2001.<sup>6</sup>

Environmental regulations, changing consumer preferences, and voluntary industry efforts all contributed to these decreases. As a result of these factors:

- ■ ■ ■ Environmentally preferable water-based paint has increased from approximately 35% to over 80% of architectural coating sales, over the past few decades, taking market share away from oil-based paint.<sup>7</sup>
- ■ ■ ■ Markets for industrial and special purpose coatings have undergone transformation as customers have demanded, and manufacturers have introduced, a wide variety of more environmentally benign coating products.
- ■ ■ ■ Improvements have been made in the way that paint and coating products are manufactured, handled, and applied.

The downward trend in VOC and HAP emissions is likely to continue due to:

- ■ ■ ■ New regulatory requirements in recent years, including national VOC emissions standards for coatings, along with a number of Maximum Achievable Control Technology (MACT) standards for manufacturers and users of coatings products;
- ■ ■ ■ New, inherently cleaner products and technologies, such as powder coatings, radiation-cured coatings, and high solids technologies; and
- ■ ■ ■ Improved industrial housekeeping and application techniques, as well as advances in the manufacturing process.





## Promoting Environmental Management Systems

The adoption of environmental management systems (EMS) within the paint and coatings sector is increasing rapidly. NPCA has incorporated an EMS component into its Coatings Care<sup>®</sup> program, which is a condition of membership. Consequently, in the next few years all 900 NPCA facilities should be implementing an EMS.<sup>8</sup>

In addition, NPCA is a Performance Track Network Partner committed to encouraging top environmental performance through EMS. Five individual paint and coatings facilities have been accepted into EPA's National Environmental Performance Track.<sup>9</sup>

### *Case Study: Coatings Care<sup>®</sup>*

*NPCA's Coatings Care<sup>®</sup> program is designed to provide a comprehensive system that integrates health, safety, and environmental activities within corporate planning and manufacturing operations. The EMS component of Coatings Care<sup>®</sup> fosters continuous improvement in members' environmental performance and facilitates ongoing efforts to be sensitive to community and public concerns.*

*In addition, the EMS component of Coatings Care<sup>®</sup> requires each participating facility to develop a quantitative inventory of emissions and discharges to all media, as well as the off-site transfer of wastes from each site. The Coatings Care<sup>®</sup> guidance suggests that facilities should identify and tabulate the volume of each permitted discharge, emission or waste on an annual basis and prepare a report presenting the findings of their inventory efforts.<sup>10</sup>*

*In 2004, the Sector Strategies Program and NPCA will jointly explore opportunities for building on Coatings Care<sup>®</sup>, as well as utilizing EPA's national environmental databases and other publicly available data, to establish a comprehensive performance measurement program for the paint and coatings sector.*

Many paint and coatings companies are finding that EMS can be an effective tool for performance improvement.

### *Case Study: EMS at Sherwin-Williams*

*The Sherwin-Williams Company has implemented an EMS that not only fosters compliance with regulations as an integral part of day-to-day operations, but also charges facilities to minimize adverse safety, environmental, and health impacts through the use of integrated management systems and planning. The EMS applies to all company locations, including Sherwin-Williams' manufacturing plants, distribution service centers and warehouses, automotive branches, and commercial and retail stores.*

*One major component of Sherwin-Williams' EMS is waste minimization. Each of the company's plants has established recycling and/or rework programs. These programs aim to minimize the generation of cleaning materials and maximize reuse and recycling of cleaning solvents, recycling of wash water, reworking of miss-tinted paint into future batches, and recycling of cardboard, paper, and steel. As an indication of how successful the EMS has been, in 2002 Sherwin-Williams recycled more than 90 million pounds of paint, cleaning solvents, and wash water.<sup>11</sup>*

