4.10.2 Wood Products Industry: Wood Treatment

Case Study #1

BUSINESS: **Rapid Die & Molding Company; Cassville, Wisconsin**
WASTE ORIGIN: **Loudspeaker Components Manufacturing**
WASTE TYPES: Lacquer Volatile Organic Compound (VOC) Solvents, Acetone, Methyl Ethyl Ketone (MEK), and Toluol

COMPANY BACKGROUND

RDM manufactures speaker cones, whizzers, and domes with 165 employees.

MOTIVATION

Use of VOC solvents created large volume of potentially harmful air emissions and expensive hazardous waste disposal costs. Meet and exceed environmental regulatory compliance standards for VOC emissions.

STRATEGIES

Reduce, then totally eliminate VOC solvent usage while still maintaining fiber strength and water resistance of products.

ORIGINAL PROCESS

Formed-paper speaker components, like cones, were dried and dipped in solvent-thinned lacquer, then dried in an oven to evaporate excess solvent.

NEW PROCESS

Non-solvent treatments are added directly to the fiber pulp mix instead of treating the cones with lacquer in an additional process. RDM is currently seeking solvent-free replacements for fire retardance treatment and area-strengthening of cones.

RESULTS

Waste Reduction

Reduced VOC emissions from 103 tons in 1990 to 49 tons in 1991, 27.5 tons in 1992, to 14 tons in 1993.

Reduced hazardous waste shipment from 32 drums/year to 16 drums/year.

Economics (Information not available.)

HEALTH & SAFETY BENEFITS

Acetone, MEK, and toluol can cause varying health problems if inhaled, ingested, or absorbed through skin cuts. All are eye and skin irritants, may cause many systemic problems ranging from headaches, internal organ damage, nervous system disorders, and possibly cancer. All of these liquids are highly flammable.

TECHNOLOGY TRANSFER

The cone-shaped die is lowered into a pulp vat where a vacuum strains the fibers out of the water into the die. The new non-solvent cone treatments create a paper emulsion that contains no hazardous solvents.

PROBLEMS

A thermal oxidizer to burn solvents was considered, but burning large volumes of VOCs produces tons of carbon dioxide, some levels of carbon monoxide, and other troublesome gases.
Customers had to be asked to rate the new emulsion to determine sound quality, durability, and adequate waterproofing of products.