Cautions

- ! may require a clean room
- ! coated piece is difficult to repair
- ! polyester is chemically incompatible with nitrocellulose materials, can not be used in the same system or on the same piece - potentially explosive
- ! short life potential (1-6 hours)
- ! respiratory protection may be required (potential exposure to isocyanates)
- ! UV radiation curing may be difficult for non-flat surfaces since energy transfer is along "line of sight"
- ! some users report "plastic" looking finish

Carbon Dioxide System

In this system, super critical carbon dioxide is used to decrease viscosity and enhance atomization and replaces all or a substantial amount of the solvents used in the conventional spray application of coatings. The system's specially designed spray guns and nozzles enable the resin concentrate to be mixed with the carbon dioxide. The coating cures by air or baking. The use of carbon dioxide (CO_2) based coatings can reduce VOC emissions by 50 percent over nitrocellulose solvent-based coatings.

Benefits

- ! reduce solvent usage and associated costs
- ! reduce VOC air emissions, solvent wastes and associated compliance and disposal costs
- ! reduce worker exposure
- ! high quality finish
- ! high solids content
- ! nitrocellulose resins can be used and do not need reformulation
- ! fewer coating applications needed
- ! high transfer efficiency
- ! sometimes reduces sanding requirements
- ! easy to repair

Cautions

- ! limited suppliers of system equipment
- ! technology still in the developmental stage with limited experience
- ! lower fluid delivery rates than air spray guns
- ! gun and tubing is bulky
- ! royalty costs
- ! use of equipment requires training

Radiant Cured

The physical and chemical properties of a coating are altered by ultraviolet (UV), electron beam (EB), or infrared (IR) radiation so that a rapid polymerization takes place. In general, radiation cured coatings require less energy, less time to cure, and contain less VOCs than conventional coatings. Common radiation cured coatings include acrylate based materials and epoxies.

Lowenstein Case Study
Pompano Beach, Florida

Loewenstein is a seating manufacturer that finishes over 250 varieties of chairs. Late in 1987, it was ordered to reduce its annual VOC emissions (290,000 lbs.) by 31 percent with a deadline of February 1, 1989. By April of 1989 Loewenstein had reduced its annual emissions to 165,000 lbs, and as of March 1993, they were down to 75,000 lbs. per year.

This reduction is a result of changing from their previous sealer and with 16 percent solids to a epoxy acrylate UV sealer and 68 percent solids.

They have also switched to non-electrostatic guns for stain touch up and guns for sealer and topcoat applications.

Other benefits included improved film properties and appearance, less coatings to achieve the desired film thickness, early sealer film hardness that permits extensive without wearing through the coating.

Source: “Lowenstein VOC Dip Continues,” *Industrial Finishing*, May 1993.