Housekeeping

Keep glue containers covered whenever possible to prevent chemical vapors from escaping, and keep out moisture and oxygen, prolonging shelf life.

Periodic maintenance and calibration (where possible) of glue applicators provides proper transfer and prevents waste.

P2 Gluing Technologies

The seven general categories of contact adhesives used by the wood furniture industry are solvent-based, epoxy resin, urea-formaldehyde resin, hot melt, heat seal, aqueous-based and polyvinyl acetates (PVA). Solvent-based, urea-formaldehyde resin and some epoxy resin adhesives contain ingredients which can generate significant air emissions. Hot melt, heat seal, aqueous-based and PVA adhesives do not generate significant air emissions at wood product manufacturers and are considered alternatives to solvent-based adhesives.

PVA glues are aqueous-based synthetic latex systems and is the primary glue for solid wood. Its vinyl acetate monomer is regulated; however it makes up less than 0.4 percent of the adhesive, so emissions are low. PVA adhesives are widely used in furniture assembly, and their use in veneering and laminating is increasing.

Hot melt adhesives cure as they cool and are used primarily for edge banding applications. Polyurethane refractive (PUR) hot melts are a common wood furniture hot melt adhesive.

Heat seal adhesives generally are applied to the back of flexible laminates by the laminate manufacturer and then heat sealed with low temperature and pressure to panels by an automated roller or press system at the furniture manufacturer. Unlike hot melts, it does not reflow if reheated. Concern for emissions here is with the laminate manufacturer who might choose to switch to aqueous-based products to reduce regulatory burden.

Haworth Case Study
Holland, Michigan

Haworth is a large manufacturer of all types of office furniture. Haworth switched to a two-component, aqueous-based, formaldehyde-free contact adhesive for the manufacture of fabric-wrapped flipper doors for overhead storage compartments. Haworth had to purchase new spray equipment to apply the two-part adhesive. The new adhesives instantly bond a variety of fabrics. Haworth believes the new adhesive system produces a more consistent quality product.

Drying ovens are no longer needed, and spray booth exhaust is now filtered and directed back into the plant. Combined, these greatly reduce utility requirements. In addition, removing ovens and exhaust stacks has freed up roughly 600 square feet of floor space and allowed easier layout changes.

The new system has many benefits. Haworth realized an 88 percent reduction in VOC emissions and a 33 percent reduction in adhesive use. Utility savings are estimated at $16,000 per year. Quality improvements result in approximately $18,000 in savings per year.

Source: "Solvent-Free Switch Yields Savings," Upholstery Design & Manufacturing, July 1996.

Aqueous-based adhesives are used in laminating, too, typically applied with spray guns. The adhesives can take 30 minutes or more to adequately set before bonding, and six hours or more for a total cure time after bonding. However, some of these type adhesives can set and cure in comparable times to solvent-based adhesives. Standard fan drying works well but compressed air should be avoided as it tends to dry the adhesive too quickly. Check to see if there is urea-formaldehyde in your adhesive as this emission becomes federally regulated.