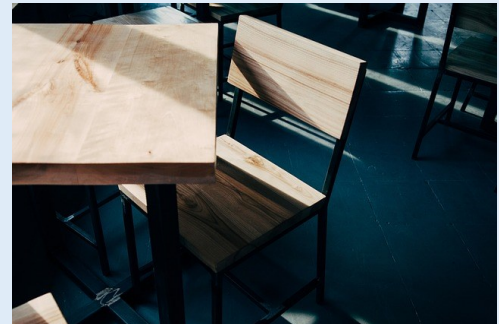


## Pollution Prevention for Furniture Manufacturers

This fact sheet outlines opportunities for furniture manufacturers to reduce their waste generation and toxic substance use in the following areas:

- **Wood Furniture**
- **Metal Furniture**
- **Upholstery**
- **Coating and Finishing**



### Wood Furniture

- Lay out sheet stock efficiently to use as much raw material as possible.
- Maintain equipment regularly to prevent defects. When defects occur, identify them as early as possible to prevent additional waste of materials and labor<sup>1</sup>.
- Investigate opportunities for dust to be reused in a secondary market. Promote reuse by segregating dust from soft and hard woods and avoid mixing dust with paint and varnish<sup>1</sup>.
- Research alternatives to formaldehyde-based resins in plywood or particleboard panels. Look for no-added formaldehyde (NAF) or ultra-low emitting formaldehyde (ULEF) resins<sup>2</sup>.



### Upholstery

- Assess the toxicity of the flame retardants used in flexible polyurethane foam and substitute less toxic, less hazardous alternatives<sup>3</sup>.
- Use hot melt, heat seal, or water-based adhesives which contain low or no solvent content. Use only as much adhesive as necessary<sup>1</sup>.

### Metal Furniture

- Research alternatives to hexavalent chromium for decorative chromium plating<sup>2</sup>.
  - \* [Independent Plating](#), a metal finishing company, experienced improved product quality and faster processing times after implementing a tri-chrome plating process that reduced their hexavalent chromium use by 88%. Operating costs increased overall, but waste disposal costs were reduced and other costs are expected to drop over time<sup>4</sup>.
- Reduce dragout of plating chemistry by lowering bath concentrations and improving drainage when withdrawing parts. Investigate opportunities to filter process wastewater and recover plating chemicals for reuse<sup>5</sup>.
  - \* [Columbia Manufacturing](#), a school furniture manufacturer, saved \$3,000,000 in water and sewer fees and \$4,650,000 in chemical costs by modernizing its nickel-chrome plating line. It reclaims 98% of plating chemistry for reuse and no longer discharges industrial wastewater<sup>6</sup>.

## Coating and Finishing

- Research alternatives to traditional organic solvent-based coatings that can reduce VOC emissions and wasted material<sup>7</sup>.
  - ⇒ High-solids coatings contain more solids and less solvent.
  - ⇒ Waterborne coatings use water as the carrier instead of organic solvents.
  - ⇒ Powder coatings contain only solids, no solvent, and require specialized equipment to apply.
  - ⇒ Radiation cured coatings can cure more quickly than traditional coatings.
- Purchase and mix only as much coating as needed for each job . Reuse excess for touchups or as primer.
- Improve transfer efficiency with upgraded equipment<sup>8</sup>.
  - ⇒ High-Volume/Low-Pressure (HVLP) spray guns can reduce overspray compared to conventional guns.
  - ⇒ Electrostatic application systems reduce wasted coating material by making the coating electrically attracted to the part.
- Train employees in proper spray techniques that will maximize transfer efficiency<sup>9</sup>.
  - ⇒ Keep a constant distance between the spray gun and the part.
  - ⇒ Hold the gun perpendicular to the part.
  - ⇒ Turn the spray gun off just before and after each pass.
  - ⇒ Take the time to do it right the first time rather than waste time and material refinishing.
- Replace aerosol cans for touchups with refillable, non-aerosol spray bottles if possible.
- Use dedicated equipment for each coating or schedule coatings in batches to minimize clean-outs. When coatings do change, start with light colors and end with dark<sup>10</sup>.
- Clean equipment with dirty solvent first, then fresh solvent. Determine whether spent solvent can be reclaimed and reused on site<sup>10</sup>.
- Tightly close all containers of cleaning solvent when not in use.

## References

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- <sup>9</sup> MnTAP. *Transfer Efficiency*. [www.mntap.umn.edu/paint/efficiency.htm](http://www.mntap.umn.edu/paint/efficiency.htm).
- <sup>10</sup> Washington Department of Ecology. *Top Tips for Pollution Prevention in Paints and Coatings*. [www.ecy.wa.gov/programs/hwtr/p2/sectors/painttop10.html](http://www.ecy.wa.gov/programs/hwtr/p2/sectors/painttop10.html).