

# Toxics Use Reduction Techniques

During your planning process, consider options using all of these techniques to identify the best opportunities in the short-term and long-term.

<b>Input Substitution</b>	<p><b>Replacing a toxic substance or raw material used in production with a non-toxic or less toxic alternative</b></p> <p>Examples: Aqueous parts washer instead of mineral spirits or solvent.            Ultrapure water for cleaning instead of hazardous solvents.            Water-based or low-VOC paints instead of solvent-based.</p>
<b>Product Reformulation</b> (Product Modification)	<p><b>Reformulated or redesigning end products to be non-toxic or less toxic upon use, release, or disposal.</b></p> <p>Examples: Make unbleached paper instead of paper.            Soy-based glues instead of formaldehyde glues in plywood.            Offer products with a “natural” finish.</p>
<b>Process Redesign</b> (Process Change)	<p><b>Using production processes of a different design than used previously.</b></p> <p>Examples: Eliminate unnecessary cleaning steps.            Switch to powder coating from spray coating.            Replace solvent-based paint strippers with mechanical abrasion.</p>
<b>Modernization</b> (Equipment Upgrade)	<p><b>Upgrading or replacing production equipment or methods.</b> Can be combined with Process Redesign or a simple one-to-one replacement of old equipment with newer, more efficient models.</p> <p>Examples: High-efficiency nozzles to conserve chemicals/coatings.            Automated flow controls.            Optical sensors to control cycle duration or prevent product loss.            Counter-current rinsing instead of single rinse tank.</p>
<b>Improved Operation &amp; Maintenance</b> (Spill/Leak Prevention; Improved Inventory Control)	<p><b>Modifying existing equipment or methods to gain efficiency by such steps as improved housekeeping, system adjustments, process/product inspections.</b></p> <p>Examples: Improved inventory &amp; purchasing control.            Staff training.            Pre-measure cleaning products.            Rearrange production schedule to reduce cleaning frequency.</p>
<b>Recycling</b> (In-Process; Outside Process)	<p><b>Recycling, reuse, or extended use of toxics.</b> In-Process, or integral, recycling is preferable because it minimizes the risk of release or worker exposure.</p> <p>Examples: Capture final rinse to reuse as 1<sup>st</sup> rinse.            Solvent distillation &amp; reuse.</p>