

III. PROJECT RESULTS AND CONCLUSIONS

During this project, IRTA staff worked with twelve screen printers to test alternative safer, low-VOC cleanup materials. SCAQMD Rule 1171 currently allows screen printers to use cleaners with 500 grams per liter VOC; in July, 2006, the VOC level will decline to 100 grams per liter.

IRTA staff tested alternatives with the twelve participating facilities for in-process cleaning and screen recycling. All of the alternatives that were tested had a VOC content of 100 grams per liter or less. The alternatives that were tested fall into three categories including water-based cleaners, soy based cleaners and exempt solvent blends. In general, these alternatives are lower in toxicity than the higher VOC cleaners used by the industry.

Table 3-1 summarizes the alternatives that were tested successfully at each of the facilities that participated in the project. The table also specifies the type of ink used by each facility.

**Table 3-1
Successful Safer and Low-VOC Alternatives**

<u>Company</u>	<u>Ink Type</u>	<u>Successful Alternative(s)</u>
Owens-Illinois	UV	Soy Based Cleaner
Southern California Screen Printing	UV	Water-Based Cleaner, Soy Based Cleaner
Com-Graf	Solventborne	Soy/Acetone/Mineral Spirits Blend
Serendipity	Solvent and waterborne	Acetone/Mineral Spirits Blend
Oberthur	Solvent and waterborne	Acetone/EEP Blend
Texollini	Waterborne	Water-Based Cleaner
Hino Designs	Plastisol	Water-Based Cleaner, Soy Based Cleaner
Quickdraw	Plastisol	Soy Based Cleaner, White Oil/ Acetone/Mineral Spirits Blend
LCA Promotions	Plastisol	Soy Based Cleaner, Water-Based Cleaner, White Oil/Acetone/ Mineral Spirits Blend
Totally Ink	Plastisol	Water-Based Cleaners; Soy Based Cleaner
Applied Pressure	Plastisol	Water-Based Cleaners
Powerhouse	Plastisol	Water-Based Cleaner

Table 3-1 indicates that UV curable ink can be cleaned with soy and water-based cleaners at Owens-Illinois and Southern California Screen Printing. Com-Graf, Serendipity and Oberthur can clean their solventborne ink with acetone blends. The cured waterborne ink at Texollini was cleaned successfully with a water-based cleaner. The six textile printers,

Hino Designs, Quickdraw, LCA Promotions, Totally Ink, Applied Pressure and Powerhouse, cleaned their plastisol ink successfully with water-based cleaners and soy based cleaners during screen recycling. For in-process cleaning, the textile printers can clean with a white oil/acetone blend.

The cost analysis indicates that the alternatives are lower cost in some cases and higher cost in other cases. Owens-Illinois converted to the soy based cleaner and reduced their cost. Southern California Screen Printing would increase their cost if they converted to the soy based cleaner; their cost would remain about the same if they converted to the water-based cleaner. Com-Graf and Oberthur would both reduce their cost by converting to the alternative acetone blends. Serendipity would increase their cost by converting to the acetone blend. Texollini converted to the water-based cleaner alternative and reduced their cost substantially in the process. The cost at Hino Designs would remain about the same if the company converted to the soy based or water-based alternative. Quickdraw would increase their cost by converting to the alternatives. LCA Promotions would reduce their cost by converting to the water-based cleaner but would increase their cost by converting to the soy based cleaner. Totally Ink would increase their cost by converting to the soy or water-based cleaners. Both Applied Pressure and Powerhouse would reduce their cost by converting to the water-based cleaners.

The results of the project indicate that screen printers using a variety of different ink types and printing on different substrates can find safer alternatives. The alternatives tested here were generally lower in toxicity than the cleaners used by the facilities today. The alternatives were also low in VOC content; all the alternative cleaners that were tested had a VOC content of 100 grams per liter or less. In some cases, use of the alternatives would increase costs but in most cases, the cost of using the alternative would be less or about the same.