

III. SUMMARY AND CONCLUSIONS

During this project, IRTA worked with four facilities in the South Coast Basin to document the use of and test alternative low-VOC materials for cleaning UV and EB curable coating and adhesive application equipment. The alternatives used or tested successfully by the facilities had a VOC content of 25 grams per liter or less. This is the current limit for materials used for cleaning coating and adhesive application equipment in SCAQMD Rule 1171.

Sandberg Furniture put in a UV coating flat line several years ago. Since then, the company does not need to use VOC solvents to clean the application equipment. Sandberg now does not clean routinely and, when periodic cleaning is required, uses acetone. Acetone is exempt from VOC regulations.

Medtronic Diabetes uses UV curable adhesives in several of their operations. The company has decided to use acetone premoistened wipes for cleaning the application equipment in some of the operations. The cost of converting to acetone for cleaning would be the same as the cost of using IPA. In another operation, the company plans to use a water-based cleaner for routinely cleaning the application equipment.

DRS Sensors & Targeting Systems historically used IPA for cleaning the application equipment used to apply UV curable conformal coatings to electronic devices. The testing indicated that the best alternative for this cleaning task is methyl acetate which performed better than IPA. The cost of converting to methyl acetate would increase DRS's cost of cleaning.

Huhtamaki applies a clear EB curable coating over ice cream carton packaging that is printed using a lithographic printing press. Plain water was found to be effective for cleaning the coating residue from the floor. A water-based cleaner was found to perform well for cleaning the coating application equipment station on the press. The cost of using the low-VOC alternatives would reduce Huhtamaki's cleaning cost.

Table 3-1 presents the facilities and the alternatives that worked most effectively for their operations.

**Table 3-1
Results of Low-VOC Alternatives Testing**

<u>Company</u>	<u>Cleaning Task</u>	<u>Low-VOC</u>
<u>Alternative</u>		
Sandberg Furniture	Routine Maintenance	No Cleaning
	Periodic Maintenance	Acetone
Medtronic Diabetes	CAM/TAM Adhesive Equipment	Acetone
	PATCH Equipment	Water-Based Cleaner
DRS Sensors & Targeting Systems	Conformal Coating Equipment	Methyl Acetate
Huhtamaki	Floor Cleaning	Water
	Clear Coating Station	Water-Based Cleaner

Note: CAM and TAM are automated medical device assembly machines.

The results of the project indicate that low-VOC alternatives can be used by facilities that employ UV and EB curable coatings in their operations. Alternatives that were tested successfully in the project include not cleaning at all, plain water, water-based cleaners, acetone and methyl acetate.