Institute for Research and Technical Assistance

The Alternative

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IRTA and Port of San Diego Begin Alternative Marine Coating Tests

Suppliers Submit Forty-Six Alternative Coatings

IRTA and the Port of San Diego received a grant from EPA to identify, test and demonstrate alternatives to copper based anti-fouling hull coatings for marine vessels. The copper coatings are a problem because the copper leaches from the coatings over time and divers clean the coatings aggressively which leads to high copper loadings in the marinas and basins in California. In particular, there are high levels of dissolved copper in the Shelter Island Yacht Basin (SIYB). A limit for the copper in the SIYB has been established and over the next 17 years, the regulation requires a reduction in copper loading of 76 percent. Thus, three out of four of the pleasure craft in the Basin must switch to non-copper hull coatings.

As part of the EPA project, The Port and IRTA assembled a workgroup and a smaller stakeholder group to guide and help with the research. The stakeholder group is comprised of representatives from marinas and yacht clubs, boat yards, the environmental community, regulatory agencies, hull cleaners (divers) and paint manufacturers and suppliers. Three meetings of the workgroup have been held to date since the project was initiated in January.

With input and comment from the workgroup, IRTA and The Port designed a protocol for the first phase of the testing. It involves testing alternative non-copper coatings on panels. This phase of the testing has just been initiated and the coatings will be tested over the summer which is the highest fouling period. Coating manufacturers and suppliers provided 46 alternative coatings for testing. These coatings were applied to the panels at four of the San Diego boat yards that are participating in the project. The panels were placed in the water in boat slips at two yacht clubs the first week of June. They will be cleaned and monitored by the project team until October 1.

Two of the copper coatings used by the boat yards routinely in San Diego are included in the testing to serve as baseline coatings. Copper is used in the coatings as a biocide which prevents attachment of the marine organisms. Suppliers are exploring alternative coatings of three types. The first type uses zinc as a biocide. Although the zinc content is lower in these coatings than the copper content in the currently used copper coatings, it could eventually build up in the marinas and basins and pose a problem. The second type of coating uses an organic biocide. The third type of coating has no biocide. These coatings generally provide a “smooth” surface that makes it difficult for organisms to attach to the hull.

Eighteen of the coatings that are being tested contain zinc, four contain organic biocides and 24 of them contain no biocide. The project team will follow a protocol over the summer that involves conducting a fouling assessment and a cleaning assessment. Updates will be provided to the workgroup members through September. After the testing is completed, the team will evaluate the results and decide which coatings performed well in

(See **Marine Coating** *continued on page 7)*

Small Business Corner

IRTA Begins New Project on Textile Cleaning With BAAQMD

IRTA has just initiated a project with the Bay Area Air Quality Management District (BAAQMD) to conduct research and development activities for perchloroethylene (PERC) dry cleaning alternatives. The project will focus on investigation of methods that would make the use of water-based cleaning and carbon dioxide cleaning easier and less costly.

The California Air Resources Board (CARB) adopted a regulation to phase out PERC in dry cleaning by 2023. The South Coast Air Quality Management District (SCAQMD) has also adopted a regulation to phase out PERC by 2020. Cleaners in California have begun to convert to alternatives to comply with these regulations. About a third of the cleaners in the state have converted to alternative technologies but most of them have adopted hydrocarbon cleaning. Fewer than 100 of the 5,000 cleaners in the state have converted to water-based cleaning exclusively and only a handful of cleaners have converted to carbon dioxide.

From an overall environmental and health standpoint, water-based and carbon dioxide technologies are the best alternatives. CARB and SCAQMD have grant programs that provide funds to cleaners who replace a PERC machine with a water-based or carbon dioxide technology. Even so, few cleaners are selecting these alternatives. The BAAQMD has noted the reluctance of cleaners to adopt these more benign technologies and is sponsoring the IRTA project which will focus on improving the technologies so they will be embraced by more cleaners.

Traditional wet cleaning systems require more finishing labor than PERC dry cleaning. Cleaners are reluctant to learn the new process which does require training and they are concerned about shrinkage and finishing of certain garments. They simply do not believe that wet cleaning is suitable for all garments they receive for cleaning.

For the wet cleaning alternative, IRTA plans to test alternative drying systems that don't employ heat for drying. This will avoid the issue of shrinkage and could make the garments easier to finish. IRTA also plans to examine the effect of pairing a low cost wet cleaning machine with the Green Jet system. This system does not immerse the garments so they are much easier to finish. Finally, IRTA will investigate the "icy water" system, a method that minimizes heat in the wash and dry systems.

For the carbon dioxide alternative, IRTA plans to examine methods of reducing the cost of the technology and improving its cleaning capability. There is only one manufacturer of carbon dioxide equipment in the U.S. and the machine made by the company is a 60 pound machine. If a smaller machine, say a 35 pound machine, could be made, it would reduce the cost of the equipment substantially.

Part of the project involves developing and testing alternative spotting agents. A few years ago, IRTA conducted a project sponsored by Cal/EPA's Department of Toxic Substances Control (DTSC) and EPA to find and demonstrate alternative POG spotting agents. The project was motivated by the fact that most of the industry, even cleaners who have converted to alternative technologies, are still using PERC and trichloroethylene (TCE) based POG spotting agents. TCE, like PERC, is a carcinogen and both chemicals have been found in the

(see **Textile Cleaning** *page 4)*

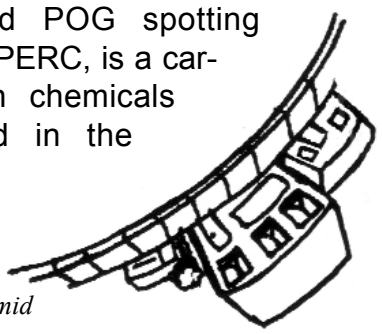

Illustration by Todd Schmid

IRTA Completes DTSC Project on Autobody Industry

IRTA recently completed a project sponsored by Cal/EPA's Department of Toxic Substances Control (DTSC) that focused on the autobody industry. DTSC works with the autobody industry as part of its SB 1916 efforts. SB 1916 was passed in 1998 by the legislature because of continuing concerns about pollution. The DTSC program involves selecting two industry targets for pollution prevention outreach and assistance every two years, one of which must be a small business category. For the 2004 through 2006 cycle, DTSC selected the autobody and paint industry as the small business category. DTSC has made significant progress in identifying best management practices and pollution prevention strategies and preparing information materials for the auto body industry.

As part of the SB 1916 efforts, IRTA worked with DTSC in four areas to investigate pollution prevention measures for the autobody industry. The research included examining:

- alternative coating application equipment cleaners;
- alternative thinners;
- alternative coatings; and
- dust control methods.

Autobody shops in the state typically clean their spray equipment with high VOC solvents. IRTA focused on testing alternative low-VOC, low toxicity cleanup materials with seven autobody shops that participated in the project. In all cases, plain acetone worked well as an alternative cleanup material for the solventborne coatings. Acetone is not classified as a VOC and it is lower in toxicity than almost all other organic solvents.

IRTA tested three alternative thinners for solventborne coatings with the participating autobody shops. These included plain acetone, acetone blended with small amounts of a glycol ether and acetone blended with a small amount of soy. The best performing alternative thinner was the acetone/glycol ether blend.

Autobody shops generally apply three sets of coatings including primers, base or color coats and top coats to vehicles. The South Coast Air Quality Management District (SCAQMD) adopted a regulation that requires autobody shops in the South Coast Basin to convert to lower VOC base coats shortly. Waterborne base coats have been used in Europe for a number of years and many domestic producers acquired European companies in their efforts to comply with the SCAQMD mandate. The waterborne coatings are thinned with deionized water and the equipment used to apply them can be cleaned with water. IRTA analyzed these alternatives. IRTA worked with two companies that adopted the alternative waterborne coatings. One of the companies has 11 shops in the Basin and the other has two. IRTA found that the painters at these and other shops like the waterborne coatings. The results of analysis indicated that the cost of using the alternative coatings is comparable to the cost of using the solventborne coatings for one of the companies. IRTA found that the cost of using the alternative coatings was slightly higher for the second shop.

Autobody shops perform a significant amount of sanding as part of their repair operations. Paint-Only shops sand whole vehicles. Autobody shops sand primer, plastic filler and base/top coat. Autobody primers contain zinc and often other metals as well. Dust from the sanding operations is emitted and can expose workers. There is increasing evidence that particulate matter (PM) emissions can cause lung disease. Some of the dust falls to the ground and some autobody shops wash down the floor at the end of the day. If the dust is not properly managed and contained, it can be washed into the stormwater system. Allowing washwater of any kind to enter the storm drain system violates state and local laws.

IRTA tested an alternative sand paper which is designed to be paired with a vacuum. The sand paper, made by a company called Mirka, substantially reduces the dust generated in the sanding process. Three companies

(see **Autobody Industry** *page 7)*

Collision Craft Begins Conversion to Alternative Sanding Technology

Collision Craft is an autobody shop located in Hesperia, California. The company repairs between 50 and 75 cars per month. IRTA worked with the shop as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control (DTSC). Collision Craft is not located in the jurisdiction of the South Coast Air Quality Management District (SCAQMD) and does not have to convert to waterborne coatings at this time.

IRTA worked with Collision Craft to test alternative thinners and cleanup materials. IRTA also tested an alternative sanding method with the company. Based on the testing results for the Mirka sanding technology, Collision Craft decided to convert to the alternative sanding method and that conversion is underway.

"My technician tested the Mirka sand paper and vacuum for a few months," says George Sioss, the owner of Collision Craft. "Even though Richard had to use a vacuum cleaner, he liked the Mirka paper much better." During the testing, the technician estimated he used only one-third as much sand paper as he did normally.

The shop has four technicians that commonly use 40, 80, 150 and 220 grit sanding discs for sanding primer and plastic filler during body work. The painter uses 80, 180, 400, 600 and 1,000 grit sanding discs for fine detailing during painting. Mr. Sioss plans to convert all of his operations to the Mirka technology.

"The Mirka sand paper simply does not generate any dust," says Mr. Sioss. "It's safer for the workers and better for the environment. Looking at the cost, I'll get a pretty good cost reduction from the conversion."

Annualized Cost Comparison for Collision Craft Sanding Technology Conversion		
	Original Sand Paper	Mirka Sand Paper
Cost of Vaccuum Cleaners	-	$84
Cost of Sand Paper	$4,995	$2,666
Total Cost	$4,995	$2,750

Textile Cleaning

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waste streams generated in the alternative processes. In particular, both chemicals were found in the wastewater discharge from wet cleaning operations. It is illegal to discharge these chemicals and cleaners using the spotting agents should drum their wastewater instead of discharging it. In the earlier project, IRTA tested a variety of alternative spotting agents. One of the water-based cleaners that was tested and one of the soy based cleaners tested have been commercialized. In the BAAQMD project, IRTA plans to test additional water-based and soy cleaners as alternative POG spotting agents.

For more information on the new project, call Katy Wolf at IRTA at (818) 244-0300.

Need help finding an alternative?

IRTA assists firms in converting to suitable alternatives in cleaning, paint stripping, coating, dry cleaning and adhesive applications.

For more information,
visit us on the web at:
www.irta.us
or contact us at: 818-244-0300

Marina Auto Body Converts to Waterborne Coatings

Marina Auto Body operates two shops in the South Coast Basin, a large shop in Marina del Rey and a smaller shop in Huntington Beach. The South Coast Air Quality Management District adopted a regulation that requires autobody shops in their jurisdiction to convert to lower VOC waterborne base coats by July of 2008. IRTA worked with the company as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control.

Marina Auto Body converted their smaller facility, which repairs about 75 cars per month, to waterborne base coats several months before they converted their much larger shop in Marina del Rey. Says Tom Williamson, owner of the company, "we wanted to see the performance of the coatings on a smaller scale before we converted the larger shop. We also wanted to use up our solventborne base coat."

The Huntington Beach facility has one coating booth and the air flow in the booth was increased by adding two portable air dryers. The painter at the shop is happy with the waterborne coatings. He indicates, "I had to change the way I apply the coatings but it was an easy adjustment." Like other painters who have made the conversion, he finds the new coatings give a better color match than the solventborne coatings for newer vehicles. "The waterborne base coats do take longer to dry but it isn't a problem," says the painter.

The Huntington Beach facility now uses two cleanup systems, a solvent cleaning system for the solventborne primers and topcoats and a tap and D.I. water system for the waterborne base coats. "Even though we have two cleaning systems now, our cleaning costs have declined," says Mr. Williamson. "We also thin the waterborne base coats with D.I. water."

Marina Auto Body and IRTA analyzed the costs of the conversion for the Huntington Beach shop. According to Mr. Williamson, " the cost of using the waterborne coatings is about the same as the cost of using the solventborne base coats. It is an adjustment but we worked with our supplier to make the transition seamless."

The larger Marina del Rey shop converted to the waterborne coatings a few months ago. In this facility, the company modified the two coating booths and installed auxiliary air flow systems in the corners. "These systems work well to cut down the longer drying time for the waterborne base coats," says Mr. Williamson. "They have a high capital cost but are worth it when you have high throughput."

Mr. Williamson has not analyzed the costs of the waterborne coatings at the Marina del Rey facility. "I suspect the costs of using the waterborne coatings and the solventborne coatings are about the same, just like at the Huntington Beach shop," he says. "The conversion is better for the workers and the environment. Change always hard but the result is good."

Annualized Cost Comparison for Marina Auto Body's Huntington Beach Shop for Solventborne and Waterborne Base Coat

	Solventborne Base Coat	Waterborne Base Coat
Capital Cost for Dryers	-	$630
Cost of Base Coat and Thinner	$26,676	$26,216
Cost of Cleanup and Disposal	$1,832	$407
Total Cost	$28,508	$27,253
Adjustment for Materials Sales	$28,508	$27,744

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Marina Autobody Converts to Better Sanding Technology

Marina Auto Body operates two shops in the South Coast Basin, a large shop in Marina del Rey that repairs about 300 cars per month and a smaller shop in Huntington Beach that repairs about 100 cars per month. IRTA worked with the company as part of a project sponsored by Cal/EPA's Department of Toxic Substances Control (DTSC) to test an alternative sanding technology.

IRTA and Marina Auto Body tested the Mirka sanding technology at both the Huntington Beach and the Marina del Rey shops. The technology significantly reduces dust generation during sanding. Technicians at both shops liked the new technology and the owner decided to convert the Huntington Beach shop. Plans are underway to convert the larger Marina del Rey shop at a later date.

At the Huntington Beach shop, the painter and two technicians are routinely using the new abrasive. The painter is using the 400 grit Abranet for his dry sanding and he indicates he uses about half as much sand paper as he did when he used the conventional sanding discs. Two other technicians are also using the Mirka abrasive for sanding primer and plastic filler. They use 40, 80 and 180 grit Abranet sand paper. They indicate the Mirka abrasive lasts about 50 percent longer than conventional abrasive.

There is not enough data yet to perform a cost comparison of the original and the Mirka sanding methods. Says the owner Tom Williamson, "we are using a lot less paper than we used to. Even though the Mirka sand paper is more expensive, there will probably be a net reduction in cost."

The technicians prefer the Mirka sanding method because it generates little, if any, dust. "There are strong advantages to using the Mirka technology even though they can't be quantified," says Mr. Williamson. "Because there is no dust, the cars are cleaner, it reduces dust cleanup and it's better for the workers and the environment."

IRTA Holds Successful Dry Cleaning Alternatives EXPO

On May 18, IRTA held an EXPO at Southern California Edison's CTAC facility in Irwindale that focused on water-based and carbon dioxide cleaning alternatives. Co-sponsors of the EXPO included Edison, the California Air Resources Board (CARB), the California Department of Toxic Substances Control and EPA Region 9. The EXPO drew more than 60 attendees who were dry cleaners, equipment distributors, allied trade representatives and government agency representatives.

The EXPO was part of a project sponsored by CARB that involves promoting the use of water-based and carbon dioxide technologies. CARB is phasing out perchloroethylene (PERC), the most widely used dry cleaning agent in California, by 2023. From an overall health and environmental standpoint, water-based and carbon dioxide cleaning are the best alternatives.

IRTA's project involved holding four showcases of cleaners using water-based or carbon dioxide technologies, developing case studies for five facilities that had converted to the technologies and designing, printing and distributing a fact sheet on safer alternative spotting agents. The final project report, which should be on IRTA's website at www.irta.us shortly, describes the showcases and presents the case studies and fact sheet.

The EXPO featured speakers from two cleaners that had adopted carbon dioxide equipment and two cleaners that had adopted traditional wet cleaning equipment combined with the Green Jet system. Government agency representatives described grant programs for cleaners to replace PERC machines with water-based and carbon dioxide technologies. The EXPO included demonstrations of wet cleaning equipment and the Green Jet system.

For more information on water-based and carbon dioxide alternatives, call Katy Wolf at IRTA at (818)244-0300.

Autobody Industry

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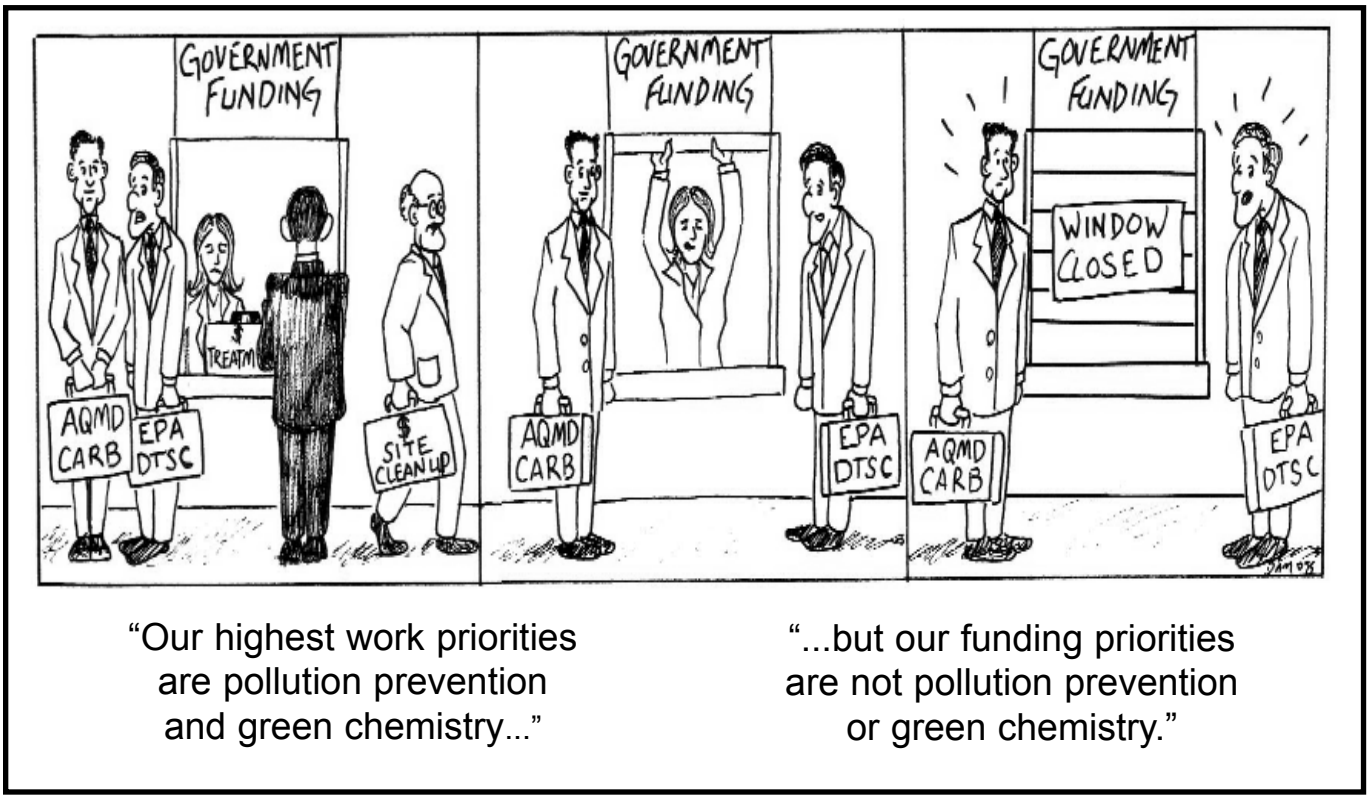
participating in the project decided to convert to the alternative sand paper. The costs of using the alternative sand paper are lower even though the companies purchased portable vacuums to use it. Advantages are that the alternative sand paper lasts longer and it can be reused.

The document summarizing the results of the project includes case studies for some of the companies that participated in the project. In IRTA's last newsletter, case studies for Seidner's Collision Center's conversions to waterborne coatings and the Mirka sanding technology were presented. This newsletter includes two case studies for Marina Auto Body for conversions to waterborne coatings and the Mirka technology and one case study for Collision Craft for the conversion to the Mirka sand paper.

The document describing the results of the project will be on IRTA's website at www.irta.us shortly. For more information, call Katy Wolf at IRTA at (818) 244-0300.



"Our highest work priorities are pollution prevention and green chemistry..."

"...but our funding priorities are not pollution prevention or green chemistry."

Marine Coating

(continued from front page)

the panel testing.

The second phase of the project involves testing the coatings that do well in the panel testing on boats. The project team will recruit boat owners who wish to try the alternative coatings and they will be cleaned in a standard way and assessed for fouling. The second phase will be initiated next summer and may last a few years.

The coating manufacturers and suppliers are very interested in this project. It provides them with the opportunity to test and compare their new and emerging coatings with other coatings. The project results are important because they are being assessed by two third party independent groups, IRTA and The Port. It is likely that additional regulations that affect other marinas and Basins in California and the rest of the country will be developed over the next few years. The results of this project may be meaningful on a much wider basis.

For more information on the project, contact Katy Wolf at IRTA at (818) 244-0300.

CALENDAR

July 17
Dr. Katy Wolf of IRTA will present a webinar "Safer Lihographic Printing Cleanup Solvent Alternatives." For Information, call IRTA at (818) 244-0300.

July
South Coast Air Quality Management District Workgroup meeting for proposed lubricant regulation. For information, call Mike Morris at SCAQMD (909)396-3282.

September 22-28
Pollution Prevention Week. A number of events will be held to feature pollution prevention in the state.

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