NV GREEN BUSINESS NETWORK

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CASE STUDY

Working With Suppliers to Commercialize New Safer Industrial Cleaner

greenUP! and Western Nevada College worked with Dr. Katy Wolf on safer alternatives to harmful chemicals as part of an EPA P2 Safer Choice grant. Results of the project work are described below.

Key Findings:

- New cleaner, called Rev Blast, is safer than most industrial cleaners on the market
- Cleaner is low in toxicity and has low Volatile Organic Compound (VOC) content
- Cleaner works effectively in range of applications and is available in a number of packaging types and sizes
- Potential cost savings for 100 autobody shops using new cleaner is more than $80,000 annually
- Potential reduction in use of high VOC content toxic solvents for 100 autobody shops using new cleaner is close to 40 tons per year

Background on Automotive and Industrial Solvent Cleaners

There are numerous solvent-based cleaners on the market that are used in a variety of applications in auto repair, autobody and industrial facilities. Many of these cleaners contain toxic ingredients and/or have very high VOC content.

Some of these products rely on halogenated solvents like trichloroethylene (TCE), perchloroethylene (PERC), methylene chloride (MC) and n-propyl bromide (nPB). All of these solvents are carcinogens. Other nonhalogenated solvents are also widely used in cleaning products and these include mineral spirits, lacquer thinner, toluene, xylene and Methyl Ethyl Ketone (MEK). All of these solvents are VOCs and all of them also pose toxicity problems.

CASE STUDY

New Safer Cleaner

The consultant on the project team at greenUP! worked with two suppliers, Rev Polymers and E-14 Polymers, to develop and commercialize a new cleaner based on her experience in identifying, formulating, testing and demonstrating safer cleaners in projects sponsored by EPA and state and local government agencies in the past. The new cleaner is lower in toxicity and VOC content than most other cleaners on the market. The cleaner is available in both aerosol and nonaerosol form. It is designed for use in a variety of applications including:

- Brake cleaning, engine degreasing and general-purpose cleaning in auto repair shops
- General purpose cleaning, coating application equipment cleaning and thinning for certain types of coatings in autobody shops
- Surface preparation cleaning, repair and maintenance cleaning, coating application equipment cleaning and thinning for certain types of coatings in industrial facilities

The new cleaner meets the stringent VOC requirements established by the California Air Resources Board (CARB) for automotive aerosol cleaners. It also meets the requirements set by the South Coast Air Quality Management District (SCAQMD) in their regulation for cleaners for industrial facilities. The SCAQMD accounts for half of the industry in California. Many other air agencies and states across the country look to CARB and SCAQMD for setting their standards so this means the cleaner is likely to be used widely in all parts of the U.S.

Collaboration of greenUP! Consultant, Manufacturers, and Suppliers

This case study is different from most EPA P2 case studies and it is an example of a unique collaborative effort among several actors that other P2 providers might adopt. The greenUP! consultant worked with Rev Polymers and E-14 Polymers to develop a formula for a safer cleaner. During the project, the consultant also worked with SCAQMD to make sure the cleaner would meet their newly adopted VOC limit for cleaners.

The two companies have commercialized the cleaner, called Rev Blast, and are planning to market it to automotive and industrial facilities as a safer and effective cleaner. Rev Polymers is currently working on partnering with automotive distribution centers like O'Reilly Auto Parts and AutoZone for distribution. They are also interested in offering the cleaner to automotive distributors for private labeling. A related company, Premera Coatings, manufactures coatings and works with many industrial facilities that do painting as part of their operation. They will work with E-14 Polymers to market the cleaner to industrial facilities.

CASE STUDY

Feedback from Autobody Test Facilities

Rev Polymers and E-14 Polymers have focused their initial marketing plan on testing the new cleaner in several small and larger auto body shops for spray gun cleaning. Based on the testing in these shops, one distributor with 17 distribution outlets has committed to carrying the new cleaner. Four of the test shops used lacquer thinner routinely for cleaning their spray guns. Lacquer thinner has a high VOC content and would not meet the stringent VOC requirements in California for spray gun cleaners. The formulation also contains toxic components that can expose workers and community members, many of whom live close to autobody shops. The fifth shop used a high acetone content cleaner that has a low VOC content.

Spray gun cleaner in shop using lacquer thinner

The feedback from the test facilities was very positive. All of the shops indicated they liked Rev Blast better than their current cleaner. They found the new cleaner had less odor, was more effective in cleaning capability and most shops indicated they used less of the new cleaner compared with their current cleaner during the test period. All of them also said the cost of using the new cleaner was lower, most of them because they would use less.

Case Study Test Shops

The first case study shop indicated the new cleaner left less residue in the gun cup and had a better odor than their current cleaner. The shop said they used about the same amount of the new cleaner but, because the price of the new cleaner was lower, they would save money by adopting it. The cleaner the shop was using was based on acetone and it had a small amount of another solvent; it was called Naked Gun. This shop purchases the cleaner in five-gallon pails.

The second shop reported that the new cleaner had less odor than the lacquer thinner they were using currently. They said it was more effective, that it lasted longer in the gun cleaner and that it left much less residue than the lacquer thinner. They estimated they used 20% less of the new cleaner. The shop purchases their cleaner in 5-gallon pails.


Close up of spray gun cups (interior) cleaned with lacquer thinner (left) vs. Rev Blast (right)

The third case study shop used a spray gun cleaning system and distills their cleaner for continued use. The shop purchases one to two drums of lacquer thinner per year. The shop technician indicated that the new cleaner had better "cutting power" than their current cleaner. He also said the new cleaner had less odor and that he didn't feel "knocked over" when opening his gun washer. He indicated it was more effective in cleaning time than lacquer thinner. He also noted that the new cleaner lasted four days longer on the cleaning cycle in the gun washer. He found that the gun cups were coming out cleaner than with the lacquer thinner. He estimated that he used 30% less of the new cleaner. This shop purchases their cleaner in drum quantities.

Spray gun cups (exterior) cleaned with lacquer thinner (left) vs. Rev Blast (right)

The fourth shop, a small rural operation, was using lacquer thinner and did not have a gun washer. They indicated the new cleaner was more effective in time and effort. They said it broke down heavy solvent paints like clear coats and primers. It left less residue, had less of an odor and lasted as long or longer than other solvents in open cups. They were interested in converting to it because they would save money since they would use an estimated 30% less of the new cleaner. The shop purchases their cleaner in five-gallon pails.

The technician at the fifth case study shop indicated that with the new cleaner, the gun washer was "cooler" in the heat and that there was little to no residue left on the cups after cleaning. He also said the new cleaner worked better on thicker materials than lacquer thinner which he was using currently. The cleaner lasted longer and he didn't have to change out the cleaner as often. He estimated he used 30% less of the new cleaner than the lacquer thinner. This shop purchases their cleaner in drums.

Cost and Usage Analysis

Each of the five test shops provided estimates of the usage of their current cleaner and the usage of the new cleaner. Based on this information and the price of their current cleaner and the new cleaner, an annual cost of their cleaner purchases could be calculated for each of the shops. The first table below shows the five-gallon pail and drum price of Naked Gun, the cleaner used by the first shop, lacquer thinner which was used by the remaining four shops and the new cleaner, Rev Blast. The second table below shows the annual cost of purchasing the current cleaner and Rev Blast for each of the five test facilities. The third table compares the annual cost of cleaner for each of the five test shops.

Table 1. Cost of Cleaners Used by Test Facilities

Cleaner	Cost of Five-Gallon Pail	Cost of Drum
Naked Gun	$180	N.A.**
Lacquer Thinner	$115	$1,100
Rev Blast	$135	$1,200

**N.A. is not applicable

Table 2. Annual Cost of Cleaner for Test Shops

Test Shop	Annual Cost of Current Cleaner	Annual Cost of Rev Blast
#1	$9,360	$7,020
#2	$2,990	$2,808
#3	$3,640	$2,780
#4	$1,495	$1,228
#5	$2,200	$1,680

In all five cases, the shops show savings in making the conversion from the current cleaner to Rev Blast. Four of the five test shops use lacquer thinner which has high VOC content and contains ingredients that are toxic. Conversion to Rev Blast would lead to a reduction in these toxic VOC cleaners. Because of the reduction in use and lower annual cost of using Rev Blast, it is likely that Rev Polymers could potentially find hundreds and perhaps thousands of autobody shops to adopt the Rev Blast cleaner. Three of the shops estimated they had a 30% reduction in cleaner usage through the conversion; one shop estimated a

20% reduction; and one shop had no reduction. Conservatively estimating a 20% reduction in use and that Rev Chem can convert 100 shops to the new cleaner, the next table shows the annual reduction in use of toxic high VOC content cleaner and annual reduction in cost to the shops that could be achieved.

Table 3. Potential Savings for 100 Autobody Shops Adopting Rev Blast

Annual Cost Savings	**$83,260**
Annual Reduction in Use of Toxic VOC Cleaners	**39.44 tons**

Autobody shops constitute only one sector where reductions in cost and usage could be achieved by more widespread adoption of Rev Blast in other sectors like auto repair shops and industrial facilities. Rev Polymers is currently conducting testing with several industrial facilities to see how the new safer cleaner will be received there. Based on the spray gun cleaning results for the autobody shops, industrial shops with coating operations should find savings in cost and usage. Those savings are likely to extend to other cleaner applications in thousands of industrial facilities that use solvents for surface preparation cleaning and repair and maintenance cleaning.

Takeaways

The test shop data indicates that autobody shops can save up to $2,340 annually for converting to Rev Blast. According to the participating test shops, the reduction in use of other high VOC content and toxic cleaners amounts to 20% to 30%.

For more information on Rev Blast, the Rev Polymers website address is revpolymers.com and the E-14 Polymers website address is e14polymers.com.

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