

Going Green Improves the Bottom Line

A Business Case for Sustainability

Nancy Westcott

President and CEO

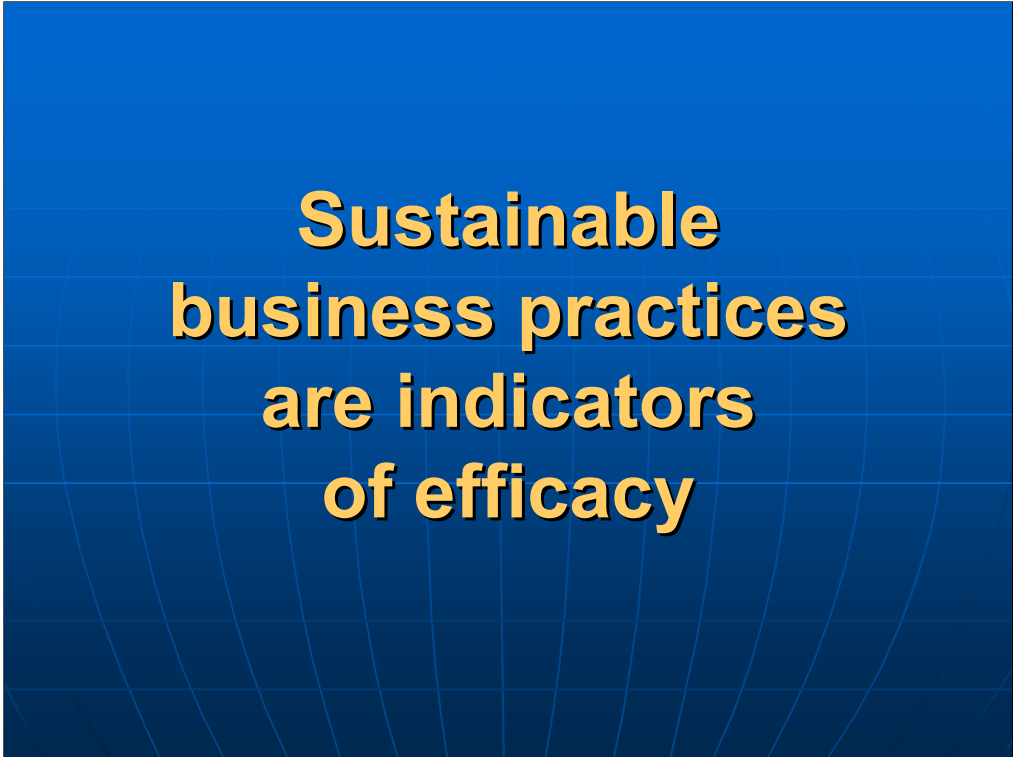


As the realities of resource depletion and global environmental degradation become more evident, we can see a maturing and strengthening of the public's concern for and knowledge of the broad goals of environmental issues. Businesses will be increasingly scrutinized by both the public and regulatory agencies and will be required to develop approaches and practices which address immediate environmental concerns and adhere to the emerging principals and dictates of sustainability.

“...The word ‘sustainability’ remains ambiguous and politically charged, particularly within the lexicon of business. When as is commonly the case, the term is limited to encompass environmental management of social equity, sustainability is often perceived to be at odds with fiduciary responsibility and unlinked to business strategy. ... **A sustainable organization** is one whose characteristics and actions are designed to lead to a ‘desirable future state’ for all stakeholders. For investors, a desirable future state would surely include **sustained revenue growth over the long term**. For the talent market, it would include workforce diversity. Regulators and the community at large value **environmental stewardship** and social responsibility. Consumers seek **useful, reliable, price efficient products** and services. From the view of employees of the company itself, a desirable future state includes maintaining viability and profitability as well as **managing risk while promoting innovation**. Companies that actively manage responses to a wide range of sustainability indicators are better able to **create value** for all of these stakeholders over the long term.”

Katrina Funk, Cap Gemini Ernst & Young

The business case for sustainability has been made by many, but it bears repeating here. According to Katrina Funk of Cap Gemini Ernst & Young, “...The word ‘sustainability’ remains ambiguous and politically charged, particularly within the lexicon of business. When as is commonly the case, the term is limited to encompass environmental management of social equity, sustainability is often perceived to be at odds with fiduciary responsibility and unlinked to business strategy. ... A sustainable organization is one whose characteristics and actions are designed to lead to a ‘desirable future state’ for all stakeholders. For investors, a desirable future state would surely include sustained revenue growth over the long term. For the talent market, it would include workforce diversity. Regulators and the community at large value environmental stewardship and social responsibility. Consumers seek useful, reliable, price efficient products and services. From the view of employees of the company itself, a desirable future state includes maintaining viability and profitability as well as managing risk while promoting innovation. Companies that actively manage responses to a wide range of sustainability indicators are better able to create value for all of these stakeholders over the long term.”



Sustainable business practices are indicators of efficacy

Today, Managers are discovering that the intangible indicators that gauge sustainability can **ALSO** be indicators of efficacy ... that is how well a company is run. A sustainable business strategy in manufacturing facilities can improve all aspects of the corporate manufacturing activity.

Environmental management is a good proxy for gauging overall management capabilities at both the strategic and operational levels. Cost advantages can result from adopting best practices that focus on a company's production processes. The recent trend of outsourcing manufacturing operations – ie, sending jobs off shore - has created an even greater than normal need to identify and reduce American industries costs of manufacturing

Going Green Improves the Bottom Line

Process-focused best practices can be seen as the basic precondition for implementation of all best practices at the environmental level and the most basic building block of a responsible environmental strategy. The most important competitive result of sound environmental strategies that companies consider are short term cost savings. In other words, process-focused best practices can create cost savings faster than other practices.



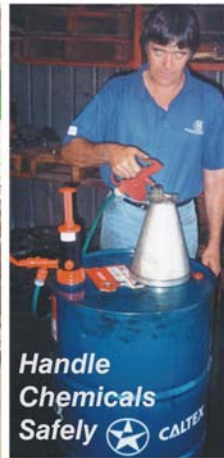
Ensuring worker safety and environmental compliance has never been easier



Reduce
VOCs



Improve
Worker
Safety



Handle
Chemicals
Safely



Prevent
Pollution

Firms can choose from a variety of technologies to reduce the negative effects of their activities on the natural environment as well as the effect on the business environment. Improved pollution prevention, attention to worker safety, reduction of VOCs and safe chemical handling, using tools and products which have no built in obsolescence, are some key components which demonstrate a firm's commitment to its environmental responsibility and can actually improve their financial status. In other words, going green improves the bottom line.

As you know, some firms choose to meet or beat compliance targets as a way to demonstrate their commitment to sustainability. Proactive investing in environmental measures beyond those required by law can be good for the bottom line if for no other reason than to limit the downside risks of damages, hefty fines and litigation fees and, of course, public relations disasters. To further the cause of sustainability as a best practice, these companies may require that their suppliers complete ISO 14001 registration as a way to further the efforts of environmental compliance and to extend their commitment to sustainability.

Pollution Prevention

Companies which register to ISO 14001, currently the most important of the ISO14000 standards, demonstrate sound environmental management practices, are able to prevent environmental disasters and government sanctions, and experience fewer regulatory audits by anticipating and correcting environmental problems.

Pollution Prevention

Company A

Company A, manufactures thermostats and other devices for the automobile industry in Waltham Massachusetts. Recently, the Ford Motor company required Company A to fulfill the requirements for ISO14001 and become registered before January 2004. Developing and implementing the plan took over two years,

Company A

before



One of the problem areas which they had with regard to chemical storage and dispensing was in their boiler room for the biocides and phosphates for their cooling tower and boiler room chemicals. For pollution prevention, they had established the standard which required that stringent spill containment devices and barriers needed to be put in place to contain any large spills, should they occur. As we all know, depending on the exact chemical and volume spilled, the paperwork for the reporting to EPA is very time consuming, and the cost of lost chemical inventory and clean up time is not an inexpensive proposition either. While establishing the ISO 14001 standard, the engineers at Company A discovered that if they left the drums on the side and used a gravity fed system, such as you see here, the barrier system which they would have to create to contain a spill would have to accommodate 100% of each container in the room, and would cost thousands of dollars to build.

Company A

meets ISO 14001 Goals



Further research by the engineering department showed that they could substantially reduce the financial outlay by keeping the drums upright, placing them on spill sumps such as you see here, and dispensing from an upright position.

Spill containment for containers placed in an upright position on a sump is 110% of the largest container – and not 100% of all containers - because there is little chance of a spill. Further, a containment sump which can hold 4 55 gallon containers can be purchased for about \$125 delivered. The environmentally sound hand pump, which Company A selected, dispenses fluids in a controlled manner using a spring actioned tap which will deliver chemicals amounts from as little as 5 CCs to up to 4.5 gallons per minute. With this pump, they were able to complete their registration by the deadline.

Worker Safety

From the view of employees of the company itself, sustainability includes maintaining viability and profitability as well as managing risk while promoting innovation. Staying ahead of the trends and protecting employees by staying in compliance with a myriad of laws and regulations needs to be a top priority while growing a business. Despite popular belief, a company's biggest investment is its employees. – without them , electronics don't get programmed, tools aren't used and the work doesn't get accomplished. The importance of worker safety cannot be stressed enough

Worker Safety

Ixion Ceramics

We have a good example of how one company saved money while putting its workers safety as a top priority. Ixion Ceramics, Inc., a Chattanooga, TN-based subsidiary of Ixion Technologies, Inc., designs and manufactures microcircuit "packaging" for telecommunications, military, aerospace and other applications. It makes precision-engineered ceramics and metals that begin as slurries and, when shaped and dried, form tapes and pastes that are, in turn, used to create electronic circuits or screen-printed dielectric layers. The layers are stacked to form three-dimensional ceramic packages onto which Ixion's customers place electronic components for specific uses.

Chemicals needed in Ixion's processes include alcohols and solvents, such as Toluene. Due to their flammable nature, the chemicals cannot be used with or near electric motors or electric-powered pumps.

Ixion Ceramics

old way



As a result, most fluids had been dispensed using a gravity-fed system attached to the chemicals' 55-gal. shipping containers. This involved threading a spigot into the top of the drum, placing the drum on a roll-down fixture, and tipping it into a horizontal position for dispensing.

Difficulties with this type of system include the effort it takes workers to turn a drum on its side, spigots that clogged and leaked, uneven flow rate, and the fact that it did not allow for complete removal of fluid from the drum. Added effort was required by employees to make drums RCRA ready (Resource Conservation and Recovery Act).

Ixion Ceramics

new way



To avoid these problems, Ixion recently switched to a unique hand-operated transfer pump which requires no power and fits containers from 2 to 55 gal. It also allows access to drums in the upright position.

According to David Kuster, Ixion's environmental, health and safety coordinator, "This reduces drum handling and worker injuries which can result from turning drums on their sides, and it means no more leaking fittings."

Additionally, Ixion has created a closed system from the 55 gallon drum to the 5 gallon working container so there is no more splashing of the chemicals onto the workers when transferring to the smaller container.

The pumps also enable Ixion to make its containers RCRA-ready, which means they have no more than 2 in. of product left in them after dispensing operations. "These pumps will literally leave only a few ounces of fluid in the bottom," says Kuster. "We were leaving 5 to 8 gallons in the drums before, which was returned to the company we bought it from. Then we had to pay for that much product again." Clearly, using this pump was a good financial investment as there were fewer employee lost-work days and now Ixion could use all of the chemical in the drums.

Reducing VOCs

In considering the issue of worker safety and the bottom line, it is important to consider the effects of volatile organic compounds. Many chemicals or chemical combinations used in industry are evaporative, which not only compromises the working environment but it also loses money for the company as the fluid inventory is depleted into the air.

Most fleet operations in the Utility and Government Service sectors use a broad range of chemicals including degreasers, windshield fluids, among others, and managers of fleet operations are always searching for the best, most efficient ways to handle these chemicals.

Reducing VOCs

Company B Water Company

Inventory management is a critical component of the manager's day to day operation. Questions that always arise are whether it is better to purchase smaller, more manageable quantities of the fluid at higher prices which can be poured directly out of a 1 gallon or a 5 gallon container or to purchase larger quantities and then have to deal with transferring the fluids out of the container safely. To top it off, OSHA and EPA have increased environmental health and safety (EHS) regulations so decision making in this area is critical.

A service manager at a Water Company in Connecticut recently faced this dilemma. To save money for his company, he began purchasing 30 gallon containers of a very evaporative degreaser together with the recommended dispensing pump. However, he found that the recommended pump did not seal off the bung hole and all of the expected saving were evaporating into the air. Further, VOC's such as hexane and methanol in the air were not healthy for his workers, so the concern for the health and safety of the workers became very important

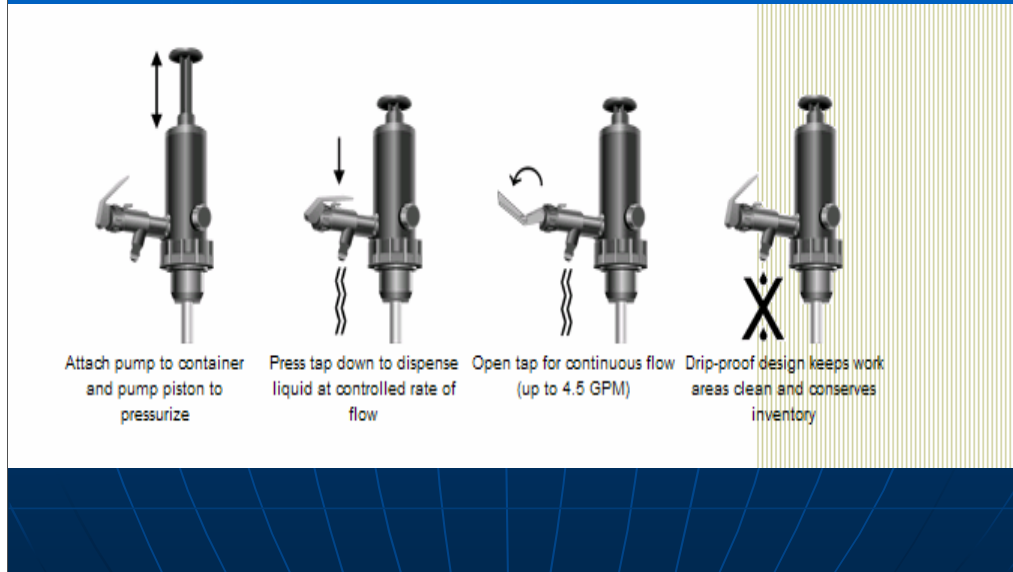
Company B Water Company



He looked for a pump which would eliminate the evaporation and give him control in dispensing. Finally he purchased this unique hand pump.

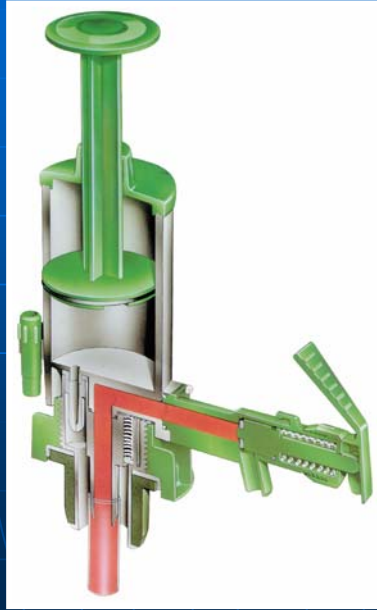
According to the manager, “We don’t have problems with evaporation any more. My workers are no longer exposed to the hexane and methanol in the air. We can pump 1 or 2 strokes with the piston and then the drip proof faucet lets us dispense exactly how much degreasing fluid we need to fill our canisters. This is a great cost saver for my company because the volume buying is working and now we are delivering the fluids safely for the guys in the shop.”

How It Works



The pump in question appears to be a simple hand pump. Essentially it may be conceived as an old fashioned beer tap for chemicals. After securing the pump to the container, the customer pressurized the container by pushing up and down on the piston a few times.

How It Works



The pressure pushes on the fluid which is then forced through siphon tubes up through the pump and then a spring actuated tap allows the customer to draw fluid off when needed – as little as 5 CCs or up to 4.5 gallons per minute. Fluids are able to be drawn off with as little as 2PSI.

How It Works



It looks simple, and it is in actual operation, but it is a surprisingly complex combination of several pieces of chemical grade plastic - there are several galleries inside the pump, one of which houses an internal pressure relief valve which allows excess pressure to be relieved at 10 PSI. There are other galleries for one way valves and to direct fluid flow and another gallery for pressure release for those times when the pump is being transferred between containers.

How It Works



The plastic parts are all chemical grade and food grade polypropylene giving the pump an extremely broad chemical compatibility. Additionally, there are 4 models - one with Nitrile elastomers – the red one, one with EPDM – the blue one, one with Santoprene elastomers – the modified blue one, Santoprene is a combination of polypropylene and EPDM – and Viton elastomers, the green one.

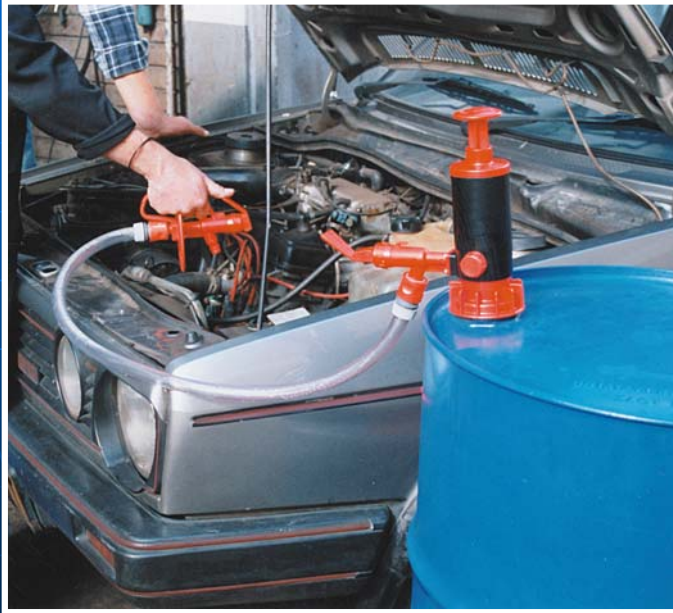
. In each pump, there are o-rings, one way valves, a drum seal for the bung hole, and other rubber components all of which are made in the same elastomer. The color coding allows users to be sure they are using the correct pump for their fluid., and makes training on the pump very easy

How It Works



Additional accessories include a shop air/compressor adapter for those users who don't want to use it as a hand pump

How It Works



and a remote tap fitting for delivering fluids to point of use which could be several feet from the container.

Safe Chemical Handling

When purchasing pumps and components - whether for manufacturing or laboratory use – it is important to consider the total cost of ownership not just the procurement price. The age old practice of purchasing based solely on the lowest price rarely translates into lowest cost of ownership. Statistics show that the cost of a typical repair is 5 – 15 times greater than the cost of the effort which would have prevented the failure from occurring in the first place. A sustainable business strategy in manufacturing facilities can improve all aspects of the corporate manufacturing activity and translate into improvements in the bottom line. Safe chemical handling is a key component of a sustainable business strategy.

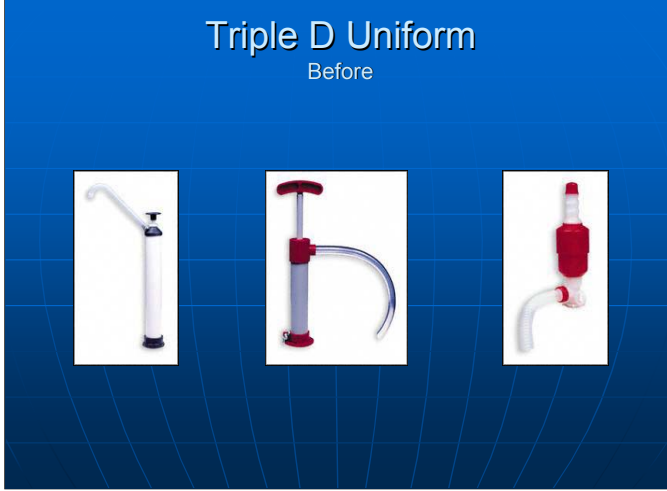
Safe Chemical Handling

Triple D Uniform Company

Triple D Uniform Company is a large dry and wet cleaning plant in Texas which handles thousands of garments a day. In order to meet the demands of their job, they use large quantities of an array of cleaning solutions which come in 55 gallon drums and include 10% chlorine and various phosphate solutions. The chemicals are hazardous and the workers have to be very careful when transferring the liquids so as not to get splashed.

Triple D Uniform

Before



Typically, Triple D purchased a \$40 pump which lasted about 3 months and then has to be thrown away and replaced. If there is not a replacement pump waiting when the pump broke down, two men then had to pick up and tip a 55 gallon container on its side to pour out the chemicals into the 5 gallon pail. This is not only hard on the workers (a full 55 gallon container can weigh over 500 lbs) but very messy as it is hard to control the volume and the direction of liquid coming out of the 2" hole in the top of the drum while balancing a heavy load. Their chemical room was always a mess. The cost of replacing a \$40 pump is not just the \$40 – it also is the \$100 or so it costs to generate the purchase order to pay for the new pump, the actual clean up of the chemicals on the floor – translation - worker time to mop up, absorption materials to mop up with, lost chemicals which cannot be used for cleaning purposes, throwing away of the materials and spilled chemicals which have to be disposed of properly, to say nothing of the pump which is discarded into the landfill. Actual cost of replacing a \$40 pump to this cleaning company is about \$200. If you replace one of these pumps 4 times a year, that is \$800 per barrel, and if you have 10 barrels of chemicals, that is \$8000 per year. Many consider the generation of purchase orders, clean up materials for spilled chemicals, worker time for clean up and lost fluid inventory as “soft dollars”. But soft dollars are real money and have to be considered when looking at the overall bottom line. I cannot put a price on the cost to the environment of discarding the \$40 pump into the landfill and the cleanup of the chemical room nor can I put a price on the unsafe conditions for the workers.

Triple D Uniform

After



After years of frustration, the maintenance manager tried the new \$200 pump with the \$99 shop air adapter accessory which allows the pump to deliver 4.5 gallons per minute with only 2PSI. His workers can now control the fluid flow with the remote tap set-up and there is no splashing and no mess to clean up. Because the pump is made of chemical grade polypropylene with only 3 moving parts, it will last for years. Initial investment for 10 setups was \$3500. Cost savings the first year is anticipated to be \$4500, and \$8000 every year thereafter.

Safe Chemical Handling

Company C

Another example of safe chemical handling will be useful here. Company C is a leader in the engineering, environmental and remedial construction industries and provides a wide variety of services including site development, planning and engineering design, construction phase services, environmental services and facilities operations and maintenance services. Their laboratories use a number of chemicals for analysis including trichloroethylene, a dangerous chlorinated solvent. Worker safety around trichloroethylene is always a huge consideration – as you know the vapors are even more dangerous than the fluid itself

Company C before



. At the Phoenix lab, the manager had tried numerous pumps over the last 10 years. The inexpensive plastic pumps broke down and need to be thrown away; Other pumps leaked around their seals, which exposed the workers to vapors and the chemical. The siphon pumps take a long time to fill a container. The manager finally got the mechanics of using a rotary pump down to a fine art. With worker turnover always an issue, training workers on the rotary pump, however, was a time consuming job, and there were frequent failures and spills which were dangerous. Plus, even these metal pumps would break down and have to be replaced. And then there was the issue of disposal of the hazardous waste.

Company C

after



He has found that by using the new transfer pump, the training was reduced to about 10 minutes, there are no leaks around the seals and no vapors are released, his workers have control over the volume dispensed, and there is no more hazardous waste.

OSHA Steps In

Regulators and the community at large value environmental stewardship and social responsibility. While we always prefer that companies volunteer to meet or exceed regulations sometimes OSHA has to step in to keep the working environment safe.

As we all know, many of the process chemicals which manufacturing uses are evaporative, explosive, highly caustic or acid and most are quite dangerous.. Many companies keep all of their process chemicals in one room where the chemicals dispensing is controlled by key personnel while other companies allow employees access to chemicals whenever needed. Limiting access to large volumes of chemicals reduces worker injuries during the manufacturing process - OSHA is very active in reviewing and correcting procedures at facilities when necessary.

OSHA Steps In

Company D – Jet Manufacturer

At Company D's manufacturing facility in Wisconsin, OSHA recently changed requirements and required that all chemicals which the workers use on the manufacturing line had to be in 1 pint containers and not the larger 1 quart size. As there are 300 workers on the manufacturing line, the stock room personnel is kept quite busy filling 1 pint containers with such chemicals as MEK, acetone, iso-alk and distilled water.

Company D

old way



As with many facilities, the metal rotary pump you see here is a typical device used to transfer the chemicals from a 55 gallon container to the application size container. Many maintenance personnel add a 2' hose so that they can direct the fluid into the container of their choice. Once OSHA changed the requirements so that assembly personnel could only use the 1 pints size for all chemicals, common comments from the stock room personnel were that you needed 3 hands to transfer the fluids safely and correctly. And of course the MEK ate up the metal and so these pumps had to be replaced frequently. The stock room was always a mess and the managers sought a way to handle their chemicals safely.

Company D

new way



They finally found a pump which gave the stock room staff the safe and controlled delivery they wanted and which didn't break down. Their stock room is now a model of cleanliness.

Environmental Stewardship

Sifco Selective Plating

SIFCO Selective Plating is a world leader in selective plating, providing portable equipment for on-site work or contract work to be completed in one of their shops located throughout the world. The SIFCO Process allows plating of specific areas and fittings in the construction of the station that would be nearly impossible to duplicate using conventional tank and masking processes. For example, the replacement of wind turbine generator bearings is a costly, time-consuming operation, which typically necessitates the removal of the generator from the nacelle and shipment to an off-site repair facility. With the Sifco specially designed, portable machining equipment and transportable, automated plating technology, damaged bearings can be replaced and bearing journals enhanced or repaired, IN PLACE with minimal downtime at a fraction of the cost and without the logistic and environmental concerns usually associated with this type of equipment failure. One of the plating solutions which is used in this process is a proprietary mix of chemicals including potassium cyanide. Because of the dangerous nature of cyanide and DOT regulations, SIFCO headquarters would produce the proprietary mix and then package and ship forty 1 pint containers to a single destination. Clearly, this resulted in very high labor, packaging and container disposal costs, especially as there are 6 US branches..

Sifco Selective Plating



The picture you see here is a demonstration with WATER and not cyanide. My distributor was very excited about the story and forgot about the usual safety precautions of gloves, glasses, aprons etc. The new system they use allows them to package and ship the propriety mix in five gallon over-packed returnable containers WITHOUT the cyanide, and allows the cyanide to be added locally at the branches. The plastic screw caps of the internal 5 gallon containers are adapted to accept fluids from this hand pump and place the spout in a convenient position. Cyanide is safely dispensed as needed locally. Empty bulk containers are returned when empty. The elimination of the disposal of 40 1-pint containers, reduced labor and container costs more than offset the backhaul of re-useable packaging .

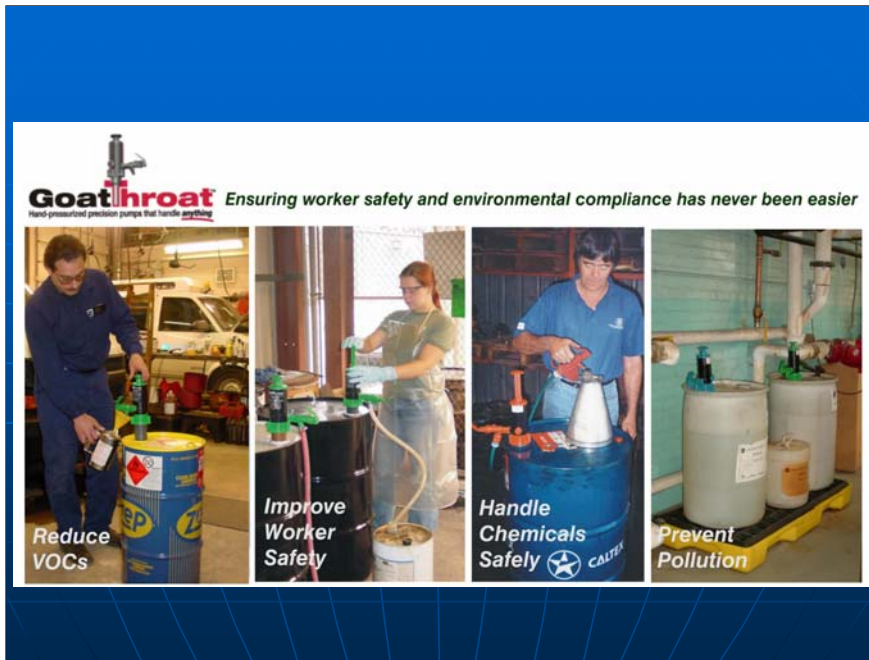
The Bottom Line

Ormco Dental Devices

My final example of how going green improves this bottom line:

Sybron Dental Specialties is a manufacturer of high technology dental and infection prevention products. Their products are consistent technology leaders in the dental restorative, orthodontic, endodontic, and infection prevention marketplace. The ORMCO, division a top manufacturer of orthodontic devices, uses potent 70% Nitric Acid in its tumbling equipment to remove foreign matter from the orthodontics devices before final finishing. For years, ORMCO had been searching for a pump that would allow them to purchase 6½ gallon carboys of the Nitric Acid rather than the smaller and expensive 2½ liter bottles. It will come as no surprise to you that GoatThroat Pumps with a remote tap for point of use delivery of the Nitric acid solved their problem. Danny Eakins, the purchase agent said in 2001 “ Purchasing chemicals in bulk translates into thousands and thousands of dollars in savings,”.

“GoatThroat™ will probably save us over \$15,000 in acid this first year alone!” I also point out that this new method essentially eliminated the toxic fumes which are dangerous to the employees. And , by the way, they are still using this pump – and hasn’t had to replace it – and that was 3 years ago! So there are some soft dollar savings as well.



With these stories, we have demonstrated that this pump make significant financial, environmental, and safety contributions to manufacturing sites by integrating safe chemical handling, pollution prevention, improved worker safety, VOC reduction, while providing substantial contributions to the company's bottom line. I know that I stand here before you as a peddler of pumps – around the office they call me the pump queen. However, that does not take away from the fact that businesses will be increasingly scrutinized by both the public and regulatory agencies and will be required to develop approaches and practices which address immediate environmental concerns and adhere to the emerging principals and dictates of sustainability. Cost advantages can result from adopting best practices that focus on companies' production processes. The issues of sustainability will become increasingly important over the next decade. Companies that actively manage responses to a wide range of sustainability indicators are better able to create value for all stakeholders over the long term. We believe that going green improves the bottom line, and we hope to help get this message out to branches in all manufacturing industries.