

# THE GREEN INDUSTRY GUIDE TO ENVIRONMENTAL PURCHASING



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[www.deq.state.mi.us/documents/deq-ess-p2-turf-purchasingguide.pdf](http://www.deq.state.mi.us/documents/deq-ess-p2-turf-purchasingguide.pdf)

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## ACKNOWLEDGEMENTS

- ✓ The Minnesota Environmentally Preferred Purchasing Guide was used with permission from the Minnesota Solid Waste Management Coordinating Board as a reference to develop the introduction and as source material.
- ✓ The National Biodiesel Board was consulted as a reference for biodiesel questions and answers.
- ✓ The Michigan Soybean Promotion Committee was utilized as a source for general bio-based products.
- ✓ The Environmental Science & Services Division collaborates with Green Seal and uses the Choose Green Report as a resource publication for fact sheets and product information. The listing of cleaners and paints was adapted from previous Green Seal publications.
- ✓ The Environmental Protection Agency's Energy Star Program was used as a resource for energy efficient products.
- ✓ The Environmental Protection Agency's Pollution Prevention and Compliance Assistance was used as a resource for many aspects of this guide.
- ✓ The Clean Air Households fact sheet "Campaigns for Clean Air and Development, Metropolitan Chicago" was referenced for this publication.

This purchasing guide has been developed with the cooperation of the following:

Michigan Turfgrass Environmental Stewardship Program  
Michigan Turfgrass Foundation  
Michigan Golf Course Owners Association  
Golf Association of Michigan  
Regional Golf Course Superintendent Associations

# 1.0 INTRODUCTION

**HOW CAN THIS GUIDE HELP ME** - From hydraulic oil to hand cleaners, motor oil to paint, every product you purchase can have multiple impacts on human health and the environment. It is not always easy to know what choices are good, better, or best for the environment or even if you have any choices. The Green Industry Guide to Environmental Purchasing will help you make these purchasing choices.

This Guide has been primarily developed as a reference tool for golf course maintenance employees who want to make wiser purchasing choices, but could also be used as a resource for virtually any setting. It will help you find ways to reduce workplace hazards, consume less energy, and protect natural resources by identifying environmentally preferable alternatives in several product areas. Important information is included in this guide on the performance of various products and their availability. The manufacturers listings included with this guide are not considered an exhaustive list and will be monitored and updated on an as needed basis.

**WHAT ARE ENVIRONMENTALLY PREFERABLE PRODUCTS** - Environmentally preferable products are goods and services that have a lesser or reduced effect on human health and the environment compared to other goods and services that serve a similar purpose.

## **QUESTIONS TO CONSIDER WHEN PURCHASING:**

- Is the product non-hazardous or less hazardous when compared with competing goods and services?
- Is it reusable compared with competing goods and services?
- Is it made from recycled materials?
- Do we really need to buy a virgin product when the recycled version is just as good?
- What happens to it at the end of its life? Can it be recycled? Will the manufacturer take the product back?
- Will it require special disposal considerations?
- Does it conserve energy or water or result in saving money?
- Is it manufactured from plant-based or otherwise renewable raw materials?

**WHY IS ENVIRONMENTALLY PREFERABLE PURCHASING IMPORTANT** - The purchase and use of environmentally preferable products can have a profound impact on the environment. Here are just a few of the many benefits:

- Buying less hazardous products will keep hazardous chemicals out of the soil, air, and water. It also reduces regulatory, environmental, and personal liabilities; improves worker safety; and can reduce disposal costs.
- Using energy-efficient and water-conserving products can save money.
- Products that are reusable, refillable, repairable, or more durable create less waste and are more cost-effective in the end than disposable or short term-use products.
- Buying recycled products help "close the loop" by supporting the recycled materials markets and more importantly conserves our natural resources.
- Using products made with renewable resources reduces our dependence on non-renewable resources.

## GLOSSARY OF ENVIRONMENTAL TERMS

**Conserves Energy** - Reducing energy use is important because most energy production contributes to carbon dioxide emissions (global warming), mercury releases, acid rain, volatile organic compounds, or the accumulation of spent nuclear materials. The U.S. Environmental Protection Agency and U.S. Department of Energy developed the Energy Star label to help purchasers identify available energy-efficient products. By choosing Energy Star-labeled or other energy-efficient products, you will reduce your energy consumption, save money and protect the environment at the same time.

**Conserves Water** - Less than one percent of the Earth's water is available for human consumption. There is no "new" water on Earth. Dry spells have reminded us that our water supply can be threatened, even in Michigan where water surrounds us, resulting in bans and limitations of watering in some municipalities. Choosing products and services that conserve water can save money on water and sewer bills.

**End of Life Management** - What happens to a product after we use it? Some materials cannot go in the trash because they are hazardous in some way and need separate, possibly expensive, management. Some products are recycled easier than others that do the same job. Making wiser choices when you buy can prevent a disposal concern at the end of a product's useful life, keep hazardous materials out of the environment, and expand options for recycling and reuse.

**Energy Star** - The energy star program was introduced by the EPA in 1992 as a voluntary labeling program designed to identify and promote energy-efficient products with a goal of reducing carbon dioxide emissions. EPA collaborated with the US Department of Energy in 1996 to promote the ENERGY STAR label, with each agency taking responsibility for particular product categories. ENERGY STAR has expanded to cover new homes, most of the building sectors, residential heating, and cooling equipment, major appliances, office equipment, lighting, consumer electronics, and many more products. The [Energy Star](#) website offers a tremendous amount of information and available technologies.

**Hazardous Components** - Products containing hazardous chemicals can pose health risks to employees and the public, as well as threaten the environment. In addition, hazardous products often require special and costly waste disposal methods. If possible, buy products that do not contain the following signal words in their labeling.

- ✓ **Caution:** mild to moderate hazard
- ✓ **Warning:** moderate hazard
- ✓ **Danger:** corrosive, extremely flammable, or highly toxic
- ✓ **Poison:** highly toxic

If less hazardous alternatives are not readily available, use the least amount (according to package instructions) of a hazardous product needed to accomplish a task and utilize all remaining product before you dispose of the container or packaging.

**Low Volatile Organic Compounds (VOCs)** - VOCs evaporate easily (volatilize) at room temperature and often have a sharp, sweet smell. They can come from many products, such as office equipment, adhesives, carpeting, upholstery, manufactured wood products, paints, solvents, pesticides, and cleaning products. Some VOCs can cause cancer in certain situations, especially when they are concentrated indoors. When they hit sunlight, VOCs create ozone, a harmful air pollutant to both people and plants. Many low-VOC versions of products reduce risks to human health and the environment.

**Prevents Waste** - Michigan generates millions of tons of municipal solid waste annually, and this amount is increasing every year. Much of this waste comes from disposable and over-packaged products. Preventing waste can conserve natural resources and avoid the need to build new, expensive waste disposal facilities. You prevent waste when you:

- ✓ Reduce the amount of material you buy to accomplish any task
- ✓ Reuse a product in its original form
- ✓ Use repairable, refillable, or durable products

**Recycled Content** - Recycled content products save energy, resources, and keep waste out of landfills and incinerators. Recycled content products can be made with post-consumer content, pre-consumer content, or a mix of both. Products made with post-consumer recycled content support our recycling programs at home and at work. If people do not purchase products with post-consumer recycled content, manufacturers will no longer support markets for the paper, cans, glass, or plastic we separate from trash. Pre-consumer content comes primarily from manufacturer scrap and does not directly support the use of materials we recycle at home and work.

**Renewable Resource** - Use products or services that are made with renewable resources. A renewable resource is one that is readily available and not subject to depletion or it can be replenished on an ongoing basis over a relatively short period. Using bio-based products can reduce hazardous components of a product, as in citrus or soy-based cleaners. Using a renewable energy source like biodiesel, ethanol, or using Green Power\* to obtain your electricity can help reduce our dependency on petroleum, coal and other non-renewable energy sources.

\*Green Power refers to electricity supplied from readily renewable energy sources, such as, energy from the wind, sun, earth, plants, and water.

## STRATEGIES FOR INCORPORATING ENVIRONMENTAL PURCHASING INTO CONTRACTS

- **Put it in writing** - consider whether environmental attributes could be included as specifications in your bid solicitations or proposal requests.
- Avoid using language that prohibits the purchase of environmentally preferable products (e.g. avoid specifications that require new equipment so that vendors are able to offer remanufactured items, such as auto parts and toner cartridges).
- Require recycled content if adequate competition exists for a product that is readily available with recycled content (e.g. require 30 percent post-consumer recycled-content copy paper).
- If you are uncertain about the availability of a particular recycled content product, you could instead give a preference to bids offering recycled content or award additional points based on the level of recycled content offered in the bid or proposal (e.g. you could award zero points for bids offering motor oil with no recycled content, five points for 10 percent recycled content, and 10 points for 30 percent recycled content).
- Eliminate over-specification without compromising performance. Allow alternatives that satisfy the end use. Specify product qualities that are critical to performance and leave your other options open (e.g. avoid specifying clear plastic trash bags. Otherwise, you may eliminate recycled content trash bags that are often darker or opaque in color, but perform just as well).
- Include environmental criteria - such as post-consumer recycled content, mercury-free, or Energy Star compliance for the product you want to purchase.
- Take into account the life-cycle costs of products, such as savings on maintenance, replacement costs, and disposal costs, which are not factored into the initial unit price (e.g. your evaluation criteria for bids offering plastic benches and tables could include price, durability, manufacturers warranty, required maintenance, recycled content, testing of product samples, and references).
- If packaging or containers are necessary, specify that they should be refillable, returnable, or recyclable. Otherwise, specify that no packaging or container is necessary.
- Require vendors to report your environmental purchases on a quarterly or annual basis so that your organization can track its progress, such as amount of recycled content copy paper and file folders purchased.
- Give yourself credit - consider tracking the total purchase of environmentally preferable products in your department or agency.

You may also want to keep track of what worked well and any difficulties you encountered, so you can build on what you learned. You might track whether the products were priced competitively, whether they were readily available, and whether the vendor met your expectations. (Source: [Minnesota Environmentally Preferred Purchasing Guide](#))

## 2.0 ENGINE/EQUIPMENT MAINTENANCE

### BIO-BASED

Soybean products are used in many applications as a substitute for petroleum-based products and offer an excellent opportunity for new industrial uses in environmentally sensitive areas. Soybeans are domestically grown, a renewable resource, biodegradable, and environmentally friendly. Bio-based research continues to seek environmentally friendly alternatives to petroleum-based products.

Soy is not the only vegetable-based oil available. It is one of the most commonly used, along with rapeseed (a relative of North American canola) and sunflower. Rapeseed, grown widely in Europe in response to environmental mandates, has benefited from years of research there and as a result, has made the most headway in the slowly emerging North American market. Estimates of the vegetable oil used for lubricant production in the U.S. consist of 85 percent canola oil and 15 percent soy and/or other oils such as sunflower.

Vegetable oils have some qualities that give them advantages over petroleum oils as the feedstock for lubricants.

- Vegetable oils are derived from a renewable resource
- Using them avoids the pollution associated with petroleum extraction and refining
- Vegetable oils are readily biodegradable
- They are also low in toxicity
- They do not harm aquatic organisms and surrounding vegetation

These qualities are essential for lubricants used in environmentally sensitive areas such as streams, ponds, and wetlands, and for products that have a high potential of being released into the surrounding environment (e.g. fairways and greens).

From a worker safety perspective, plant-based lubricants are more attractive than petroleum counterparts because of their relatively low toxicity, high flash point, and low volatile organic compound (VOC) emissions.

Vegetable oils also do not thin as readily as petroleum oils in warm temperatures and they possess superior natural lubricity, which results in less equipment wear.

Economically, soy, rapeseed and sunflower producers will benefit from increased demand for vegetable oils and the increased use of alternatives to petroleum oil helps free our economy from the dependency of imported oil.

### CONSIDERATIONS FOR BIODIESEL USE

**What is Biodiesel** - Biodiesel is a clean burning, biodegradable fuel derived from domestic, and renewable soybean oil. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. It can be used in compression ignition (diesel) engines with no major modifications. Biodiesel is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics. Biodiesel has been extensively used in mass transit systems, school-busing operations, marine and underground mining industries, and can now be used in most other diesel engine applications. It not only reduces harmful emissions, but also adds lubricity qualities to fuel extending engine life.

**Biodiesel - Pure Fuel or Petroleum Diesel Blends-** Biodiesel can be used as a pure fuel (neat) or blended with petroleum in any percentage. B20 is a blend of 20 percent by volume biodiesel with 80 percent by volume petroleum diesel. This means that you can have any percentage of biodiesel with petroleum, except B100, which

is all biodiesel. B20 has demonstrated significant environmental benefits with a minimum increase in cost for fleet operations and other consumers' applications.

**Approved For Use in the United States** - Biodiesel is registered as a fuel and fuel additive with the EPA and meets clean diesel standards established by the California Air Resources Board (CARB). By being registered through these agencies strict standards and approval process, the biodiesel fuels have an added credibility. Neat (B100) biodiesel has been designated as an alternative fuel by the US Department of Energy and the US Department of Transportation.

**Biodiesel Emissions Compared to Petroleum Diesel** - Biodiesel is the only alternative fuel to have fully completed the health effects testing requirements of the Clean Air Act. The use of biodiesel in a conventional diesel engine results in substantial reduction of unburned hydrocarbons, carbon monoxide, and particulate matter compared to emissions from diesel fuel. In addition, the exhaust emissions of sulfur oxides and sulfates (major components of acid rain) from biodiesel are essentially eliminated compared to diesel.

Of the major exhaust pollutants, both unburned hydrocarbons and nitrogen oxides are ozone or smog forming precursors. The use of biodiesel results in a substantial reduction of unburned hydrocarbons, and emissions of nitrogen oxides are either slightly reduced or slightly increased depending on the duty cycle of the engine and testing methods used. Based on engine testing, using the most stringent emissions testing protocols required by EPA for certification of fuels or fuel additives in the US, the overall ozone forming potential of the specified hydrocarbon emissions from biodiesel was nearly 50 percent less than that measured for diesel fuel.

**Biodiesel Safer Than Petroleum Diesel** - Scientific research confirms that biodiesel exhaust has a less harmful impact on human health than petroleum diesel fuel. Biodiesel emissions have decreased levels of polycyclic aromatic hydrocarbons (PAH) and nitrated PAH (nPAH) compounds that have been identified as potential cancer causing compounds. Test results indicate PAH compounds were reduced by 75 to 85 percent with the exception of benzo (a) anthracene, which was reduced by nearly 50 percent. Targeted nPAH compounds were also reduced dramatically with biodiesel fuel with 2-nitrofluorene and 1-nitropyrene reduced by 90 percent, and the rest of the nPAH compounds reduced to trace levels.

**Biodiesel Costs Compared to Other Alternative Fuels** - When reviewing the high costs associated with other alternative fuel systems, many fleet managers have determined biodiesel is their least-cost-strategy to comply with state and federal regulations. The use of biodiesel does not require major engine modifications, which suggests that operators keep their fleets, their spare parts inventories, their refueling stations, and their skilled mechanics. Biodiesel is competitive with CNG/diesel and methanol fuels. However, biodiesel is less competitive compared with petroleum diesel fuel. Biodiesel represents one of the best alternatives as a renewable fuel for diesel engines from economic, energy, and environmental protection perspectives.

**Biodiesel Use in Existing Diesel Engines** - Biodiesel can be operated in any diesel engine with little or no modification to the engine or the fuel system. Biodiesel has a solvent effect that may release deposits accumulated on tank walls and pipes from previous diesel fuel storage. The release of deposits may clog filters initially and precautions should be taken. Ensure that only fuel meeting the biodiesel specification (ASTM D 6751-02) is used. Be sure to look into [biodiesel fuel warranties on engines](#). To minimize large deposits in filters start with a lower concentration of biodiesel to petroleum and then start upgrading to higher concentrations of biodiesel, such as start with B2 then move to B5, B10, B20, etc. Before switching to biodiesel, perform an oil analysis and check that maintenance is updated to make sure that after switching to biodiesel that you can track any changes it may have on the vehicle performance and maintenance.

**Storage Facilities** - In general, the standard storage and handling procedures used for petroleum diesel can be used for biodiesel. The fuel should be stored in a clean, dry, dark environment. Acceptable storage tank materials include aluminum, steel, fluorinated polyethylene, fluorinated polypropylene, and Teflon. However, copper, brass, lead, tin, and zinc should be avoided.

**Biodiesel Helps Mitigate CO<sub>2</sub> Emissions** - A 1998 biodiesel lifecycle study, jointly sponsored by the US Department of Energy and the US Department of Agriculture, concluded biodiesel reduces net carbon dioxide (CO<sub>2</sub>) emissions by 78 percent compared to petroleum diesel. This is due to biodiesel closed carbon cycle where CO<sub>2</sub> is released into the atmosphere through combustion is recycled by growing plants and later reprocessed into biofuel.

**Purchasing Biodiesel** - Biodiesel can be made available anywhere in the US. The [National Biodiesel Board \(NBB\)](#) maintains a list of registered fuel marketers. The NBB maintains the largest library of biodiesel information in the US. Additional information can be obtained by emailing the NBB at [info@biodiesel.org](mailto:info@biodiesel.org), or by calling NBB's toll free number (800) 841-5849.

According to the [National Biodiesel Board](#), the biodiesel distributors listed can deliver throughout the U.S. so the board recommends contacting several distributors to get the best prices. The [Biodiesel Distributors](#) website contains a map of the U.S. with locations of biodiesel distributors throughout the country that you can contact. In addition, the [Biodiesel Retailers](#) website also provides a map of the U.S. with the locations of the biodiesel retailers throughout the country that you can contact.

In Michigan, there is a [listing of suppliers of biodiesel](#) from the [Michigan Soybean Promotion Committee](#) along with other information regarding soybeans, such as legislation or conferences. Please look at the list if you are interested in purchasing biodiesel from a Michigan supplier near you.

**Warranty Information** - Before switching to biodiesel be sure to look into your engine warranty and if your engine is capable of handling biodiesel. Each manufacture should have its own requirements for the engines. The National Biodiesel Board offers information and links to companies with statements regarding [biodiesel fuel warranties on engines](#).

**MOTOR OILS** - "Using motor oil made from soybeans will give better gas mileage through improved engine efficiency. Because soybean oil naturally adheres to metals, has a neutral pH, and contains natural antioxidants, heavy metals are not stripped from the engine and oxidative stability is preserved, both improving the engine's efficiency and conserving energy. The motor oil also reduces harmful emissions and reduces the potential for soil and water contamination from spills or illegal disposal. In fact, independent toxicity tests show the soy-containing motor oil is 230,000 times less toxic than conventional motor oil". (Michigan Soybean Promotion Committee)

Agro Management Group has extensively tested AMG2000, environmentally benign vegetable based motor oil that is biodegradable and displays the qualities of high performance motor oil, both in the laboratory and in actual on-road field tests. The United States Postal Service in Michigan and the City of Fort Collins has tested the oil in their vehicles. Savant Laboratories of Midland, Michigan has conducted independent parallel testing comparing the performance of bio-based motor oil with petroleum oil. AMG 2000 is designed for use in four-cycle gasoline engines and has now been tested and proven in cars and trucks on the road for over 200,000 combined miles. AMG 2000 tests lasted over a thousand of hours and proven reliable from testing for smaller engines, such as lawn mowers and garden tractors. The fresh product is nontoxic to humans, animals and the environment.

The current problem is availability. Agro Management in Colorado says that they are on the verge of mass production, but there are no Michigan distributors equipped to supply it to local users. For further product information and availability, see the following company information for Agro Management.

**AMG 2000**

**Agro Management Group**  
1127 W. Colorado Ave.  
Colorado Springs, CO 80904  
Phone: 888/520-2476  
Fax: 719/520-9975  
E-mail: [Agro5@aol.com](mailto:Agro5@aol.com)  
[www.agromgt.com](http://www.agromgt.com)

**Engine Oil**

**Sterling Grade**  
P.O. Box 950  
107 South Third Street  
Sterling, CO 80751  
Phone: 970/521-7645  
Fax: 970/521-1025  
Email: [info@sterlingbiotech.com](mailto:info@sterlingbiotech.com)

**BIO HYDRAULIC OILS** – Bio-based hydraulic oil is a soybean or canola oil based hydraulic oil designed to meet or exceed the performance requirements for high-pressure hydraulic systems. Bio-based hydraulic oil combines anti-wear properties with oxidation stability for prolonged oil effectiveness and protection of hydraulic components. Vegetable oils tend to have a higher viscosity index (VI) than a petroleum product, which indicates it is not as susceptible to thinning or breakdown in high temperatures operations. Bio based oils have higher lubricating properties than their traditional petroleum counterparts so there is less resistance between moving parts, allowing for softer start ups due to friction reduction. Bio-based hydraulic oil is non-toxic and biodegradable so it is safer for machinery operators and better for the environment. Bio-based hydraulic oil can also help reduce potential liability for oil clean up from spills and leaks.

Dan Dinelli, Superintendent at Northshore Country Club, Glenview, IL uses bio-based hydraulic oil and is a believer, "What I like best is the environmental friendliness of the product, which means it is safer for the turf if a leak occurs". Look for:

- Bio based hydraulic oil that meets or exceeds requirements of API GL-4, Low-Speed/High Torque
- Non-toxic additives. Additives help eliminate odor, provide a higher flash point, and improve cold weather fluidity
- Proven field performance in agriculture, industrial and construction equipment

**Environmental Lubricants  
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**SL- Hydraulic Fluid  
GEMTEK Products**  
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602/265-8586  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
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[www.hydrosafe.com](http://www.hydrosafe.com)

**Bio-Penetrating Lubricant  
Renewable Lubricants**  
476 Griggy Road, PO Box 474  
Hartville, OH 44632  
Phone: 330/877-9982  
Fax: 330/877-2266  
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**Envirologic Hydraulic Fluid**  
**Terresolve Technologies**  
35585 G Curtis Blvd.  
Eastlake, OH 44095  
Phone: 440/951-8633  
Fax: 440/951-4341  
[www.terresolve.com](http://www.terresolve.com)

**Uniqema**  
1000 Uniqema Boulevard  
New Castle, DE 19720-2790  
Phone: 800/424-2024  
[www.uniqema.com](http://www.uniqema.com)

**BioSOY Hydraulic Oil**  
**West Central Soy**  
PO Box 68  
Ralston, IA 51459  
Contact: Bev Tierney  
Phone: 800/843-4769  
E-mail: [bevt@westcentral.net](mailto:bevt@westcentral.net)  
[www.soypower.net](http://www.soypower.net)

**BIO-BASED TWO CYCLE-ENGINE OIL** - Bio-based two-cycle engine oil can directly replace conventional petroleum and synthetic 2-cycle lubricants. Bio-based lubricants can improve wear life, lowers nitrogen oxide and carbon monoxide emissions and is non-toxic. It is readily biodegradable and has lower VOCs than conventional 2-cycle lubricants. Bio-based lubricants improve horsepower output without detergents and toxic additives and may be used in colder and hotter operating temperatures without break down. Bio-based lubricants are available in various grades to meet nearly all air-cooled two cycle equipment maintenance needs (e.g. chainsaws, weed trimmers, and lawnmowers).

**SL-CyclePro**  
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602/265-8586  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
[www.gemtek.com](http://www.gemtek.com)  
[www.bio-gem.com](http://www.bio-gem.com)

**Envirologic 440, AquaLogic 450**  
**Terresolve Technologies**  
35585 G Curtis Blvd.  
Eastlake, OH 44095  
Phone: 440/951-8633  
Fax: 440/951-4341  
[www.terresolve.com](http://www.terresolve.com)

**SOY BASED PUMP OIL** - Pump oil provides excellent lubrication to protect your investment in irrigation pumps. It is safer than petroleum drip oils because it is biodegradable and non-toxic. It has a high viscosity index and excellent lubricity properties.

**Archer Soy T-Drip Oil**  
**Archer Petroleum**  
10101 J Street  
Omaha, NE 68127-1133  
Contact: Doug Salmon  
Phone: 402/597-8889  
Fax: 402/597-9866  
E-mail: [mail@archeroil.com](mailto:mail@archeroil.com)  
[www.archeroil.com](http://www.archeroil.com)

**SL-Way**  
**GEMTEK/SAFE LUBE**  
3808 N 28th Avenue  
Phoenix, AZ 85017-4733  
Phone: 800/331-7022  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
[www.gemtek.com](http://www.gemtek.com)  
[www.bio-gem.com](http://www.bio-gem.com)

**BAR CHAIN OIL** - Biodegradable bar, chain, and sprocket oil is a good choice for chain saws, open and closed chains on snowmobiles, motorcycles, lawn, and garden equipment. Bio-based bar and chain oil contains a tacky agent to reduce drip and oil throw-off. It protects against rust and wear, penetrates into rivet holes and bar channels to reduce friction, link breakage, and extend equipment life. Aquatically non-toxic, biodegradable chainsaw and general-purpose oil contains a blend of biodegradable base stocks, biodegradable thickeners, and biodegradable wear reducers.

***Archer Bar & Chain Oil***

**Archer Petroleum**  
10101 J Street  
Omaha, NE 68127-1133  
Contact: Doug Salmon  
Phone: 402/597-8889  
Fax: 402/597-9866  
E-mail: [mail@archeroil.com](mailto:mail@archeroil.com)  
[www.archeroil.com](http://www.archeroil.com)

***Soy 50 Chain Bar Lubricant***

**Terrabond Industries, LLC**  
1424 South Hugh Wallis  
Lafayette, LA 70508  
Phone: 888/356-7847  
Fax: 337/291-2781  
[www.terrabond.net](http://www.terrabond.net)

***Bar Chain & GP Oil***

**GEMTEK Products**  
3808 N 28th Avenue  
Phoenix, AZ 85017-4733  
Phone: 800/331-7022  
602/265-8586  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
[www.gemtek.com](http://www.gemtek.com)  
[www.bio-gem.com](http://www.bio-gem.com)

***EnviroLogic 268, PDS\_EnviroLogic  
268 & 268A, MSDS\_EnviroLogic  
268 & 268A***

**Terresolve Technologies, Ltd.**  
35585 G Curtis Blvd.  
Eastlake, OH 44095  
Phone: 440/951-8633  
Fax: 440/951-4341  
[www.terresolve.com](http://www.terresolve.com)

***LUBEGAURD Bar Chain Lubricant***

**International Lubricants Inc.**  
7930 Occidental South  
Seattle, WA 98108  
Phone: 800/333-5823  
Fax: 206/762-7989  
E-mail: [contact@lubegard.com](mailto:contact@lubegard.com)  
[www.lubegard.com](http://www.lubegard.com)

***SoyLINK Chain-Bar Oil***

**West Central Soy**  
PO Box 68  
Ralston, IA 51459  
Contact: Bev Tierney  
Phone: 800/843-4769  
E-mail: [bevt@westcentral.net](mailto:bevt@westcentral.net)  
[www.soypower.net](http://www.soypower.net)

**BIO PENETRATING LUBRICANT**—A multifunctional bio-based product that acts as a penetrant. BPL is used to penetrate close tolerant areas, lubricate, and prevent corrosion. BPL is very good to use as a light air tool lubricant and preservative oil for parts. It is biodegradable so when there is a direct loss of lubricant into water, soil, or work environment there is no harm as there is with petroleum lubricants.

***Penetrating Oil***

**Amax Industrial Products Division**  
Phone: 800/662-0023  
Fax: 800/887-1603  
Email:  
[AmaxIndustrialProducts@hotmail.com](mailto:AmaxIndustrialProducts@hotmail.com)  
[www.amaxindustrial.com](http://www.amaxindustrial.com)

***Evergreen Renewable Technologies***

P.O. Box 266  
St. John, WA 99171  
Phone: 800/900-5271  
Fax: 509/569-3610  
Email: [terry@egreenrenew.com](mailto:terry@egreenrenew.com)  
[www.egreenrenew.com](http://www.egreenrenew.com)

***SL-SoyEster, SL- Bio RP***

**GEMTEK Products**  
3808 N 28th Avenue  
Phoenix, AZ 85017-4733  
Phone: 800/331-7022  
602/265-8586  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
[www.gemtek.com](http://www.gemtek.com)  
[www.bio-gem.com](http://www.bio-gem.com)

***Lubegard Lube N Loosen & SOY II***

**International Lubricants Inc.**  
7930 Occidental South  
Seattle, WA 98108  
Phone: 800/333-5823  
Fax: 206/762-7989  
E-mail: [contact@lubegard.com](mailto:contact@lubegard.com)  
[www.lubegard.com](http://www.lubegard.com)

***Penetrating Oil***

**Kroon Oil BV**  
Dollegoorweg 15  
7602 EC Almelo  
The Netherlands  
Phone: 310546818165  
Fax: 310546817367  
Email: [info@kroon-oil.net](mailto:info@kroon-oil.net)  
[www.kroon-oil.com](http://www.kroon-oil.com)

***EnviroLogic 31***

**Terresolve Technologies, Ltd.**  
35585 G Curtis Blvd.  
Eastlake, OH 44095  
Phone: 440/951-8633  
Fax: 440/951-4341  
[www.terresolve.com](http://www.terresolve.com)

***SoyClean Penetrant Lubricant***

**West Central Soy**  
PO Box 68  
Ralston, IA 51459  
Contact: Bev Tierney  
Phone: 800/843-4769  
E-mail: [bevt@westcentral.net](mailto:bevt@westcentral.net)  
[www.soypower.net](http://www.soypower.net)

## Non-Bio-Based

**LUBRICANTS** - Environmentally preferred lubricants include re-refined products such as motor oil and other automotive and industrial lubricants. Synthetic lubricants also can be considered an environmentally preferred product because they can last longer and possess some other performance advantages over conventional petroleum lubricants.

**RE-REFINED MOTOR OIL** - There are two re-refineries in the United States that produce the base oil. These companies are Evergreen Oil in California and Safety-Kleen in Illinois. The process they use is very similar to what traditional oil refineries do to remove base oil from crude. ChevronTexaco Corporation, Lyondell, Rosemead Oil Products, Inc., and ConocoPhillips Company are the major oil blenders. A blender will purchase base stock from the re-refinery and combine it with an additive package to meet specific performance and certification requirements. Re-refined oil comes in a variety of blends, suitable for different types of gas and diesel engines.

**Other Re-refined Oil Products** - Safety-Kleen produces the following re-refined oil products.

### Re-refined Oil Electronic Publications Available on Americas Choice website

Antiwear Hydraulic Oils  
Antiwear Hydraulic Oils - Low Temperature  
Antiwear Hydraulic Oils - Zinc Free  
Automatic Transmission Fluid

Automotive Gear Oils (GL-5)  
Industrial Gear Oils (EP)  
Heavy Duty Diesel Motor Oils  
Universal Tractor Fluids

These oils contain 100 percent re-refined oil in the base stock and meet American Petroleum Institute (API) and Society of Automotive Engineers (SAE) performance specifications.

### Refiners

#### *Safety-Kleen*

#### **America's Choice**

Sales Office: 601 Riley Road  
East Chicago, IN 46312  
Phone: 800/525-5739  
Email: [sales@ac-rerefined.com](mailto:sales@ac-rerefined.com)  
[www.ac-rerefined.com](http://www.ac-rerefined.com)

#### *Evergreen Motor Oil*

#### **Evergreen Oil**

2355 Main Street, Suite 230  
Irvine, CA 92614  
Phone: 800/972-5284  
Fax: 949/474-9149  
E-mail: [info@evergreenoil.com](mailto:info@evergreenoil.com)  
[www.evergreenoil.com](http://www.evergreenoil.com)

### Blenders

#### *Firebird Oils*

**ConocoPhillips Company**  
600 North Dairy Ashford  
2W9076  
Houston, TX 77079  
Phone: 800/435-7761  
Fax: 619/234-0360  
[www.76lubricants.com](http://www.76lubricants.com)

#### *ECO*

**ChevronTeexaco Global  
Lubricants**  
9401 Williamsburg Plaza Suite  
201  
Louisville, KY 40222  
Phone: 800/582-3835  
Fax 800-219-7613  
[www.chevron-lubricants.com](http://www.chevron-lubricants.com)

#### *Enviroil Motor Oil*

**Lyondell Lubricants**  
P.O. Box 4454  
Houston, TX 77210-  
4454  
Phone: 800/447-4572  
Fax: 713/321-4125

#### *SOAR*

**Rosemead Oil Products, Inc.**  
P.O. Box 2645  
Santa Fe Springs, CA 90670  
Phone: 800/794-8400  
Fax: 562/941-4104  
[www.rosemeadoil.com](http://www.rosemeadoil.com)

**SYNTHETIC LUBRICANTS** - Some synthetic motor oils are designed for extended drain intervals thereby reducing the amount of oil used by as much as 80 percent. Synthetic oil has less resistance to flow in colder temperatures and superior protection in high-heat and high-load situations. Engine wear is most severe at startup, which is why chemists strive to improve pumpability, ability for oil to flow to moving parts fast. Conventional oil does not always fare well in this regard, particularly in colder temperatures.

Movement of the longer, heavier molecules in conventional oil slows significantly in colder temperatures, and the wax found in crude-based oils crystallize when cold, causing a thickening effect. Combined, these two factors produce a molasses like consistency, increased resistance to flow, and thus greater engine wear upon startup. This is not an issue with synthetics because of the consistency of the molecules, and the fact that the product contains no wax by any means. Conventional oils do not always perform well in high-heat and high-load situations based on the shorter, lighter chain molecules having a tendency to boil off under these conditions. This causes oxidation, eventual breakdown of the lubricant, and the potential for engine damage. Synthetics do not share this problem due to their consistent molecular structure.

Some synthetics can last more than four times the mileage of petroleum oils do with no problems. They do not react to combustion and combustion by-products to the extent that petroleum oils do. The longer drain intervals reduce the overall higher cost of the synthetics.

**AMSOIL INC.**

AMSOIL Building  
Superior, Wisconsin 54880  
Phone: 715/392-7101  
Fax: 715/392-5225  
[www.amsoil.com](http://www.amsoil.com)  
[www.lube-power.com](http://www.lube-power.com)

In 1972, AMSOIL developed the first synthetic motor oil in the world to meet American Petroleum Institute service requirements. Currently, the AMSOIL product line includes synthetic motor oils, synthetic automatic transmission fluids (ATF), diesel engine oils, synthetic gear lubes, synthetic greases, and synthetic industrial lubricants.

**EXXON MOBIL COMPANY**

Phone: 800/662-4525  
[www.mobiloil.com](http://www.mobiloil.com)

One advantage to Mobil 1 synthetic motor oil is that it can be purchased at many retail outlets. Mobil 1 has proven extended drain quality synthetics and is available for purchase through both distributors and mail order.

**INDUSTRI-LUBE CO.**

Bart & Associates Inc.  
2835 Landing Way  
Marietta, GA 30066  
Phone: 888/355-6004  
Fax: 678/445-7384  
[www.bartassociates.com](http://www.bartassociates.com)  
[www.industri-lube.com](http://www.industri-lube.com)

**RED LINE SYNTHETIC OIL CORPORATION**

6100 Egret Court  
Benicia Ca 94510  
Phone: 800/624-7958  
Fax: 707/745-3214  
[www.redlineoil.com](http://www.redlineoil.com)

**OTHER SYNTHETIC LUBRICANTS** - The following synthetic lubricants offer the same extended drain and performance advantages as synthetic motor oil and are available through the manufacturers listed below.

- Automatic Transmission Oil
- Universal Grease
- Gear Lubricant
- Hydraulic oil

**Pacific Fluid LLC**  
PO Box 1296  
Tacoma, WA 98401-1296  
Phone: 253/284-4302  
Fax: 253/284-4303  
[www.pacfluids.com](http://www.pacfluids.com)

*Bio-Base 100LF, 200, 220, 250, 300, 300E, 360, 560*  
**Shrieve Chemical Products Company**  
1755 Woodstead Court  
The Woodlands, TX 77380 - USA  
Phone: 800/367-4226  
Fax: 281/367-2014  
Email: [SCP-cust-serv@shrieve.com](mailto:SCP-cust-serv@shrieve.com)  
[www.shrieve.com](http://www.shrieve.com)

**Spartan Oil Corporation**  
P.O. Box 18218  
Lansing, MI 48901  
Phone: 800/968-6457  
Email: [sales@spartanoilcorp.com](mailto:sales@spartanoilcorp.com)  
[www.spartanoilcorp.com](http://www.spartanoilcorp.com)

*Aquamarine Oil*  
**Technology Lubricants Corporation**  
16215 Waverly  
Houston, TX 77032  
Phone: 281/821-0507  
[www.technologylubricants.com](http://www.technologylubricants.com)

**HYDRAULIC LUBRICANTS** - Aquamarine oils are high performance anti-wear hydraulic lubricants, designed for use in the pumps and gears of hydraulic equipment operating in environmentally sensitive areas. These lubricants are formulated with food grade White Mineral Oil, are non-toxic, inherently biodegradable, and easily recycled. This particular product line has been formulated for severe marine operating conditions and also functions as an environmentally preferred hydraulic oil product in any environmentally sensitive area (e.g. ponds and streams).

**ANTIFREEZE** - There is often more than one environmentally preferred choice for a product category. Antifreeze is an example of a product that provides more than one preferred choice. The first choice is to recycle your used antifreeze and purchase a high quality recycled product. Another choice that is becoming more popular is the use of extended life coolants (ELC). Using a ELC is a relatively new development and it may be the best choice for reducing the overall waste involved with antifreeze use. Although ELC can be recycled at the end of its life, it cannot currently be purchased as a recycled product. For that reason, recycling and using a high quality recycled coolant remains an environmentally preferred purchasing option. A third choice is to use a fully formulated coolant (precharged) with a supplemental coolant additive (SCA) releasing filter.

**EXTENDED LIFE COOLANTS** - The major performance difference between extended life and conventional antifreeze is the life span of the product. Conventional antifreeze lasts only two or three years due to the depletion of the antifreeze corrosion inhibitors. The automobile extended life antifreezes last five years or 150,000 miles due to the antifreeze corrosion inhibitors. Heavy-duty extended life antifreezes last between 400,000 and 600,000 miles with the use of a one-time extender.

While coolants using current supplemental coolant additives (SCA) require the SCA level to be replenished on a routine basis, coolants using extended life antifreeze require inhibitor package replenishment only once during the service life. The inhibitor additive for extended life antifreeze is not an SCA style package. Only a special formulation additive is to be used with extended life antifreezes. Neither the current formulation SCA package nor the special extended life packages are to be substituted for each other at any time. Extended life antifreeze does not require SCAs and the elimination of SCAs greatly reduces the cost and variability associated with heavy-duty cooling system maintenance.

Although extended life antifreeze is compatible with traditional formulation antifreezes, it is the recommendation of manufacturers and suppliers that the two types not be mixed. Mixing the two types of antifreezes eliminates extra life capabilities of extended life coolant. To discourage mixing, extended life antifreezes have been colored red and orange depending on the supplier. Top-off and refill of these systems is to be done only with the appropriate products.

To switch engines over to ELC simply back flush the system then fill with 50/50 ELC. Alternatively, open the thermostat by running the engine with the heater on full, while thoroughly flushing with water. When the fluid is clear, turn off the engine, drain and fill with 50/50 ELC.

**KoolKut: Coolant/Cutting Fluid**  
**Amax Industrial Products Division**  
Phone: 800/662-0023  
Fax: 800/887-1603  
Email: [AmaxIndustrialProducts@hotmail.com](mailto:AmaxIndustrialProducts@hotmail.com)  
[www.amaxindustrial.com](http://www.amaxindustrial.com)

**Penray Companies, Inc.**  
440 Denniston Court  
Wheeling, IL 60090-4731  
Phone: 800/373-6729  
Fax: 800/634-0276  
[www.penray.com](http://www.penray.com)

**ROTELLA® ELC**  
**Shell Lubricants US**  
[www.shell-lubricants.com](http://www.shell-lubricants.com)

**ENGINE COOLANT RECYCLING** - Engine coolant recycling is the process of either attaching a machine to the vehicles cooling system for filtration or the collection and processing of the used engine coolant outside of the vehicle. The collection and processing may be conducted on site, or the coolant might be transported to a recycling plant for large batch operations. The technologies involved include various types of filtration, ion exchange, reverse osmosis, and vacuum distillation.

Consumers should not accept simple filtration recycling for any vehicle. Specifically, reverse osmosis engine coolant recycling is preferred because of its cost-effectiveness. Most ion exchange and distillation systems are also capable of producing excellent quality, but at a much higher cost. Some plants exist that combine these technologies to optimize quality and recovery. Coolants processed by these state-of-the-art technologies will meet ASTM D-6210 (TMC RP-329) coolant specifications, and there is no performance compromise when compared to high quality, virgin stock antifreeze, or coolant.

#### ***Engine Coolant/Antifreeze Recyclers***

**Finish Thompson Inc.**  
921 Greengarden road  
Erie, PA 16501  
Phone: 800/934-9384  
Fax: 814/455-8518  
[www.finishthompson.com](http://www.finishthompson.com)

#### **PREFERRED SPECIFICATIONS FOR RECYCLED ANTIFREEZE SERVICE**

- Product is supplied in bulk drums
- Product is premixed (freeze point -34°F)
- Precharged with SCA (for diesel wet sleeve cavitations protection)
- Free waste antifreeze pickup
- Meets TMC RP-329 and ASTM 6210-98 antifreeze standards
- Process used to recycle antifreeze include one or more of the following:
  - Reverse Osmosis
  - Deionization
  - Distillation

#### ***MI Vendor to Supply Recycled Antifreeze & Accepts Waste Antifreeze***

##### **Recycling Fluid Technologies Inc.**

9207 Cotters Ridge Road  
Richland, MI 49083  
Contact: Malcolm Hickok  
Phone: 800/474-4947  
E-mail: [RFT2@aol.com](mailto:RFT2@aol.com)

# EQUIPMENT

## Office

The traditional office environment offers a multitude of opportunities for environmentally preferred products and services. Perhaps the vision of the traditional office needs to refocus on the opportunities that the 21<sup>st</sup> century office setting presents. These offices are actively promoting paper reduction programs (not just recycling), using non-toxic materials, recycled products, and energy efficient equipment. Many aspects of the office environment will be discussed within this chapter.

**PAPER SUPPLIES** - The office environment revolves around its production of paper. This includes reports, memos, letters, drafts, faxes, and many other hard copy documents. The fact of the matter is that we are wasteful and there are many opportunities to reduce the amount of paper that we generate on a daily basis. The current focus on office paper is on the buying of recycled papers and the subsequent establishment of recycling programs. This should be continued, but with a shift in basic philosophy from the reuse/recycling of paper to implementation of office paper reduction programs. There are several ways that we reduce the amount of paper used in the typical office setting in an easy and cost effective manner.

### OFFICE PAPER REDUCTION TECHNIQUES

- Duplexing - When printing necessary reports or other multiple page documents, we should always utilize the duplexing feature on our printers. This simple process will default all print jobs to print double-sided. This one easy step will reduce office paper usage by 50% across the board.
- Draft printing - When a paper copy is needed, but not in the final format, use a draft printer. This is a dedicated printer reusing paper previously printed on one side so that both sides of the paper are used. After utilizing a draft printer for your print job, it can be properly recycled or forwarded to others for comment.
- Email and electronic filing - This is an area of great opportunity given the technological advances in computers and electronic storage systems. The use of email has potential to replace nearly 90% of printed materials. An example of this includes receiving emails; these emails can be reviewed electronically and then stored electronically. There is no need to print all emails that an individual receives. There is incredible opportunity for direct savings here. By eliminating the unnecessary printing of emails, a typical office environment can save hundreds if not thousands of dollars each year.
- Electronic drafts - The combination of email transmittals and electronic drafts will greatly reduce the amount of generated paper. Given that the typical draft document may go through multiple revisions with each revision being printed, there are opportunities for substantial savings over the course of a year.

**TONER CARTRIDGES** - A widely accepted practice is the recycling of used toner cartridges and more importantly the purchase of re-manufactured toner cartridges. These products are widely available and offer the same performance at a reduced cost. The use of this product also strengthens and supports the market for recycled toner cartridges.

**PENS & PENCILS** - There is a wide variety of "environmentally friendly" writing supplies available in the market today. This would include pencils made from post-consumer materials, pens manufactured from reclaimed plastics and utilizing soy-based inks, and markers that contain no VOCs or other toxic materials (low

odor). Although, all of these products are less harmful to the environment and to the individuals using them, they still generate waste at the end of their useful life. One way to reduce the amount of waste generated would be to increase the usage of refillable pens and pencils. These types of products are widely available from office suppliers, but be sure that the refills and pens are readily available before purchasing.

**BINDERS** – Available with varying degrees of recycled content. Attributes that should be essential include 100% post consumer cardboard and solid plastic covers derived from recycled plastics (i.e. HDPE or PET). The major aspect of binders is their durability and the ability to reuse them repeatedly.

**FILE FOLDERS** – Available with different percentages for recycled content. As is true with all recycled products, we want to focus on the post-consumer content of a product and not just the recycled content.

**COMPACT DISKS (CDs)** – Compact disks contain polycarbonate and aluminum, which are recyclable materials. These disks are often thrown away rather than recycled. An office-recycling program can be established to collect and transport these disks to the proper facilities. If proprietary data is a concern, the disk can simply be cut in half by a pair of heavy-duty tin shears. Alternatives such as mini-disks and using micro drives (i.e. kangaroos), which are smaller and capable of storing greater amounts of data that can be easily transferred, could be used instead.

**GreenDisk Services**  
Phone: 800/305-3475  
[www.greendisk.com](http://www.greendisk.com)

**Plastic Recycling**  
2015 South Pennsylvania  
Indianapolis, IN 46225  
Phone: 317/780-6100

**TRANSPARENCIES** – About 15 million pounds of polyester transparency film are discarded each year in the United States. 3M offers recycling for transparencies as well as providing recycled content transparencies for sale. Advancements in computer technologies and available software (i.e. PowerPoint) are becoming more prevalent in the workplace and the usefulness and applicability of transparent film will steadily decrease until it is deemed obsolete.

**3M Recycle Program**  
c/o Gemark  
99 Stevens Lane  
Exeter, PA 18643  
(570) 654-5511  
[www.3m.com](http://www.3m.com)

**CONFERENCE CALLS AND VIDEO CONFERENCING** – Staff meetings, workgroups, and other organizational meetings may be conducted through conference calls or video conferencing. The benefits are reduced travel time and expenses, which makes these activities more productive when compared to traditional meetings. As these technologies become more cost competitive, full motion, real-time video conferencing may replace the majority of meetings.

**WRITING ALTERNATIVES** – An alternative that would replace the majority of these products is the Personal Data Assistant (Palm Pilot or PDA). This electronic device can store your complete address book, memos and notes from meetings and phone calls, appointment calendars, link to your personal computer, receive and send email, and connect to the internet. PDA's can eliminate the need for notepads, planners, printed appointment calendars, pens, pencils, and many other office supplies that we have traditionally used on a daily basis. It is an all-inclusive piece of equipment that you can take virtually anywhere.

## OUTDOOR

**MOWERS** - Electric lawnmowers are a good choice for curbing emissions compared to traditional gas powered mowers; however, electric mowers are not ready to replace most commercial gas mowers. For many applications like a gang reel pulling tractor, gas powered mowers remain the most practical choice. However, electric mowers may be able to fill a niche within the golf or landscaping industry. The main consideration is that, as with other electric vehicles, electric mowers require considerable charge-up time. Battery-powered units are quite appropriate for single home lawn care, but inadequate for larger properties such as a golf course where mowers must be available for use throughout the day.

Greens cutting, however, would be a good choice for an electric mower. One mower designed specifically for this purpose is the Ransomes E-PLEX 11 Greens-Mower. It runs on a battery pack that is replaced only once a day. Lawn specialists can cut in the morning, change the pack at lunch, and cut the rest of the day while the other pack recharges. The lifetime of the battery unit is 3 years and compared to gas or diesel mowers, operating and maintenance costs are lower. This mower offers solid-state reel controls, a 48-volt electric motor, a 7.5 mph transport speed, and a overload protection of electrical components.

Another similar electric greens mower is the Jacobsen Greens King. This is a 48-volt solid-state system providing enough power to cut up to 20 greens without recharging. Overload protection is standard for the reel drive motor and automatic traction speed control to maintain mowing speed.

### *Electric Mowers*

#### **Madison Gas & Electric**

Phone: 800/245-1123

[www.mge.com/home/appliances/mowers.htm](http://www.mge.com/home/appliances/mowers.htm)

**BUNKER RAKE** - Another electric equipment choice is the **Sand Star E** electric powered bunker rake by SMITHCO. Two models are available-the 48 volt with 8-volt batteries and the 36 volt with 6-volt batteries. This bunker rake features plenty of power for hill climbing with no noise, no emissions, and no fluids to damage turf. The electric lift and lower functions are available from the operator seat for all rear-mounted implements.

### *Greens Mowers*

#### **Jacobsen- A Textron Company**

Phone: 888/922-8873

[www.jacobsen.com](http://www.jacobsen.com)

### *Bunker Rake Sand Star E*

#### **SMITHCO**

34 West Ave.

Wayne, PA 19087

Phone: 800/891-9435

Fax: 610/688-6069

[www.smithco.com](http://www.smithco.com)

**PARTS WASHERS** - Parts washers have historically been solvent based with numerous environmental issues associated with their operations. Anytime that solvents are utilized, there are air emissions and hazardous waste disposal costs to consider during their use. Many companies have evaluated the benefits of aqueous or bio-based parts washers. By switching over, many facilities have realized substantial cost saving as well as reduced liabilities and hazardous waste handling. Also, if a facility is currently designated a small quantity generator and responsible for annual reporting, the switch to an "environmentally friendly" parts washer may remove them from this regulatory burden

Several manufacturers and suppliers feature non-solvent based parts washers. The following represent some of the companies available to contact based on your specific needs.

**Cleaners and Degreasers****Biochem Systems**

3511 N. Ohio

Wichita, KS 67219

Phone: 800/777-7870

Fax: 316/681-2168

<http://biochemsys.com/service.html>**Parts Washers****Hotsy Midwest Cleaning**

13170 Wayne Rd.

Livonia, MI 48150

Phone: 734/762-0580

[www.hotsy.com](http://www.hotsy.com)**Miraclean Cleaner/Degreaser****Mirachem Corporation**

PO Box 14059

Phoenix, AZ 85063

Phone: 800/847-3527

Fax: 602/353-1411

Email: [service@miraclean.cc](mailto:service@miraclean.cc)[www.miraclean.cc](http://www.miraclean.cc)**State Industrial Products**

3100 Hamilton Avenue

Cleveland, OH 44114

Phone: 261/861-7114

Fax: 888/771-9670

[www.stateindustrial.com](http://www.stateindustrial.com)

**PORTABLE FUEL CONTAINERS** - Emissions from gasoline containers occur from both evaporation and spillage during fueling. Emissions also occur during transportation and storage of petroleum, through secondary vent holes and through the wall of the container itself (permeation). By using, a newer low emission gas can with features such as shut off valves and closures, harmful gasoline fumes can be reduced by 75 percent as well as losses due to evaporation.

Several manufacturers feature gas cans that have automatic shut-off valves and closures and eliminate secondary ventilation holes to reduce emissions. The plastic in these lower emitting gas containers can also be treated to reduce permeation of the vapor through its walls. An environmentally friendly container typically costs 25-30 percent more than the conventional gas container. However, due to lower evaporative emissions and elimination of potential spillage, the fuel savings are considered equivalent to the additional upfront costs.

**Blitz USA**

Phone: 800/331-3795

[www.blitzusa.com](http://www.blitzusa.com)**Briggs and Stratton**

Phone: 877/737-2787

[www.jacksmallengines.com/gas\\_can.cfm](http://www.jacksmallengines.com/gas_can.cfm)**Wedco**

Phone: 888/449-3326

[www.theplasticsgroup.net/pdf/us/carbcansheet](http://www.theplasticsgroup.net/pdf/us/carbcansheet)

**MERCURY AWARENESS** - Mercury is naturally occurring in the environment. The silvery-colored liquid is a member of a group of elements called heavy metals and is used in thousands of household and commercial processes. Mercury can be converted in the environment by microorganisms into the organic form, methyl mercury, which is especially toxic. While emissions of mercury can occur from both natural and synthetic sources, synthetic sources are estimated to account for the majority of all emissions. Mercury can cause central nervous system, kidney, and liver damage in humans, and impaired child development. Several commercial lawn care manufacturers have installed mercury switches, which operate an emergency shutoff if the tractor were to tip over. In addition, there are a number of potential mercury-containing components located in cars and trucks. The majority of these components include: mercury light switches (trunks/hoods), antilock braking systems, ride control systems, fluorescent lamps, and high intensity discharge headlamps. Talk to manufacturers or suppliers about equipment that contains minimal to no mercury within them compared to other equipment. This can help reduce disposal costs or procedures need to dispose of products or equipment containing mercury. For information regarding mercury, visit the MDEQ [Mercury P2 Program](#). In addition, there is a section on Mercury Pollution Prevention in the [MDEQ Pollution Prevention Annual Reports](#) from 2004 to 1998.

## 3.0 ARCHITECTURAL PAINTS

Architectural paint (paint used in and on buildings) is used everywhere and serves several important functional and aesthetic purposes. However, it has the potential to affect both health and the environment. High levels of exposure to some of the elements in paint can cause kidney or liver damage or even respiratory problems. Carcinogenic substances like formaldehyde, benzene, and human/ecosystem toxins like heavy metals and phthalates are found in some paints. However, there are architectural paints available that do not pose health or ecosystem problems and still meet the price and performance standards required in a quality product. The following are some guidelines to help you select these environmentally preferable paints.

**CHOOSE WATER BASED PAINTS** - Paint products are generally classified as water-based (latex) or oil based (alkyd), depending on the type of carrier used to impart application and drying characteristics to the product. Latex paints now meet or exceed the performance of oil-based paints and are preferable because they use water as a carrier while alkyd paints generally use volatile solvents as carriers. Alkyd paints also require harmful solvents for cleaning up upon job completion.

**LOW OR NO VOLATILE ORGANIC COMPOUNDS (VOCs)** - The presence of VOCs in paint can often be detected by their strong odor. Low odor paints will generally have lower VOCs, while a quick drying paint will generally be higher in VOCs.

**PAINTS WITHOUT HEAVY METALS OR TOXIC INGREDIENTS** - Various compounds should be restricted from your paint selection and can be replaced by less harmful ingredients without a loss of quality. Green Seal will not recommend an interior or exterior paint that contains any of the following heavy metals or toxic ingredients.

<u>HEAVY METALS</u>	<u>TOXIC ORGANIC SUBSTANCES</u>	
Antimony	Acrolein	Methylene chloride
Cadmium	Acrylonitrile	Methyl ethyl ketone
Hexavalent chromium	Benzene	Methyl isobutyl ketone
Lead	1,2-dichlorobenzene	Naphthalene
Mercury	Ethylbenzene	Phthalate esters
	Butyl benzyl phthalate	1,1,1-trichloroethane
	Formaldehyde	Toluene
	Isophorone	Vinyl chloride

**RECOMMENDED ENVIRONMENTALLY PREFERRED SPECIFICATIONS** - Following are performance and environmental paint specifications Green Seal uses to identify environmentally preferred paints. These same specifications should be used in contract language to ensure procurement of environmentally preferred paints.

## PRODUCT SPECIFIC PERFORMANCE REQUIREMENTS

- **Interior Topcoats** - Products intended for interior opaque topcoat use shall meet the following requirements:
  - **SCRUBBABILITY (ABRASION RESISTANCE)** - Product shall demonstrate at least 100 cycles (200 separate strokes) before failure, as determined by American Society for Testing and Materials (ASTM) D2486-89.
  - **HIDING POWER (OPACITY)** - Product shall demonstrate a minimum 0.95 contrast ratio at 400 square feet per gallon as determined by ASTM D2805-88. Compliance will be determined by testing a white paint having a minimum 80 percent reflectance.
  - **WASHABILITY (STAIN REMOVAL)** - **PRODUCT** shall demonstrate the following minimum requirements for stain removal as determined by ASTM 4828-91 Mechanical Method.
    - ◆ Flat: 5 minimum rating
    - ◆ Non-Flat: 7 minimum rating
- **Exterior Topcoats** - Products intended for exterior opaque topcoat use shall meet the following Hiding Power (Opacity) requirements. The product shall demonstrate a minimum 0.95 contrast ratio at 400 square feet per gallon as determined by ASTM D2805-88. Compliance will be determined by testing a white paint having a minimum 80 percent reflectance.

## PRODUCT SPECIFIC ENVIRONMENTAL REQUIREMENTS

- **VOC:** The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by the EPA Reference Test Method 24.

<b>MAXIMUM ACCEPTABLE VOC LEVELS GRAMS/LITER (OR LBS/GALLON)</b>		
The calculation of VOC shall exclude water and tinting color added at the point of sale.		
<u>PAINT TYPE</u>	<u>INTERIOR</u>	<u>EXTERIOR</u>
Flat	50 (0.42)	100 (0.83)
Non-flat	150 (1.26)	200 (1.66)

- **Chemical Component Limitations - Aromatic Compounds:** The product must contain no more than 1 percent by weight of the sum total of aromatic compounds. Testing for the concentration of these compounds will be performed if they are determined to be present in the product during a materials audit. The manufacturer shall also demonstrate that the following chemical compounds are not used as ingredients in the product.
  - ✓ Halomethanes: methylene chloride and chlorinated ethanes: 1,1,1-trichloroethane
  - ✓ Aromatic solvents: benzene, toluene (methylbenzene), ethylbenzene
  - ✓ Chlorinated ethylenes: vinyl chloride and polynuclear aromatics: naphthalene
  - ✓ Chlorobenzenes: 1,2-dichlorobenzene and phthalate esters: di (2-ethylhexyl) phthalate, butyl
  - ✓ Phthalate compounds: benzyl, di-n-butyl, di-n-octyl, diethyl, and dimethyl
  - ✓ Miscellaneous semi-volatile/volatile organics: isophorone and acrolein, acrylonitrile
  - ✓ Metals and their compounds: antimony, cadmium, hexavalent chromium, lead, mercury
  - ✓ Preservatives (antifouling agents): formaldehyde
  - ✓ Ketones: methyl ethyl ketone, methyl isobutyl ketone

**DISPOSAL** - Simply put, the best way to dispose of your paint is to use it. Careful measurements will determine the amount of paint needed before starting a project. Another option is to store latex paint for future projects or for touching up old ones because latex paints, if properly sealed, are designed to last for several years. In addition, many cities have paint recycling programs for leftover paint.

If you must throw away paint check with your local District Office, Waste and Hazardous Materials Division, Department of Environmental Quality for proper disposal guidelines. Alternatively, call the Environmental Assistance Center at 1-800-662-9278 for further assistance.

*The following represents Architectural paint manufacturers that provide zero-VOC and low-VOC paint products.*

INTERIOR PAINT MANUFACTURER	WEBSITE	PHONE
American Formulating & Manufacturing	<a href="http://www.afmsafecoat.com">www.afmsafecoat.com</a>	619/239-0321
Benjamin Moore	<a href="http://www.benjaminmoore.com">www.benjaminmoore.com</a>	888/236-6667
Bioshield	<a href="http://www.bioshieldpaint.com">www.bioshieldpaint.com</a>	800/621-2591
Coronado Paints	<a href="http://www.coronadopaint.com">www.coronadopaint.com</a>	800/883-4193
Devoe	<a href="http://www.devoe.com">www.devoe.com</a>	866/391-1955
Dunn Edwards	<a href="http://www.dunnedwards.com">www.dunnedwards.com</a>	888/DEPAINT
Duron Paints	<a href="http://www.duron.com">www.duron.com</a>	800/72DURON
Finnaren & Haley	<a href="http://www.fhpaint.com">www.fhpaint.com</a>	610/825-1900
Frazee Industries	<a href="http://www.frazeepaint.com">www.frazeepaint.com</a>	800/826-9048
Griggs Paint	<a href="http://www.griggspaint.com">www.griggspaint.com</a>	888/947-4447
ICI Dulux	<a href="http://www.iciduluxpaints.com">www.iciduluxpaints.com</a>	888/863-8424
Innovative Formulations	<a href="http://www.innovativeformulations.com">www.innovativeformulations.com</a>	520/628-1553
Kelly-Moore	<a href="http://www.kellymoore.com">www.kellymoore.com</a>	888/677-2468
McCormick Paints	<a href="http://www.mccormickpaints.com">www.mccormickpaints.com</a>	877/PAINT55
Miller Paint Co.	<a href="http://www.millerpaint.com">www.millerpaint.com</a>	503/255-0190
Muralo	<a href="http://www.muralo.com">www.muralo.com</a>	800/631-3440
Pittsburgh Paints PPG Arch. Finishes	<a href="http://www.corporate.ppg.com">www.corporate.ppg.com</a>	517/487-2033
Richards Paint Co.	<a href="http://www.richardspaint.com">www.richardspaint.com</a>	800/432-0983
Rodda Paint Co.	<a href="http://www.rodapaint.com">www.rodapaint.com</a>	503/737-6033
Sherwin-Williams	<a href="http://www.sherwin.com">www.sherwin.com</a>	216/515-5288
United Coatings	<a href="http://www.unitedcoatings.com">www.unitedcoatings.com</a>	800/541-4383

EXTERIOR PAINT MANUFACTURER	WEBSITE	PHONE
Building for Health Materials Center	<a href="http://www.buildingforhealth.com">www.buildingforhealth.com</a>	800/292-4838
Duron Paints	<a href="http://www.duron.com">www.duron.com</a>	800/72DURON
Finnaren & Haley	<a href="http://www.fhpaint.com/index">www.fhpaint.com/index</a>	610/825-1900
Griggs Paint	<a href="http://www.griggspaint.com">www.griggspaint.com</a>	888/947-4447
ICI Dulux	<a href="http://www.iciduluxpaints.com">www.iciduluxpaints.com</a>	888/863-8424
Innovative Formulations	<a href="http://www.innovativeformulations.com">www.innovativeformulations.com</a>	820/628-1553
Kelly-Moore	<a href="http://www.kellymoore.com">www.kellymoore.com</a>	888/677-2468
Pittsburgh Paints PPG Arch. Finishes	<a href="http://www.corporate.ppg.com">www.corporate.ppg.com</a>	517/487-2033
Sherwin-Williams	<a href="http://www.sherwin.com">www.sherwin.com</a>	800/515-5288
Titan Coatings, Inc.	<a href="http://www.titancoatings.com">www.titancoatings.com</a>	205/246-8149
United Coatings	<a href="http://www.unitedcoatings.com">www.unitedcoatings.com</a>	800/541-4383

\*All VOC s measured in grams per liter minus water

**PAINT STRIPPERS** - Historically, paint strippers have been caustic by nature and high in VOC content. There are now a number of quality biodegradable paint strippers on the market. These products are just as effective at removing paint as their traditional counterparts.

PRODUCT	WEBSITE	PHONE
CitriStrip	<a href="http://www.citristrip.com">www.citristrip.com</a>	800/235-3546
Klean-Strip Strippers	<a href="http://www.kleanstrip.com">www.kleanstrip.com</a>	800/398-3892
Peel Away	<a href="http://www.diamondchemicals.com">www.diamondchemicals.com</a>	212/869-6350

**PAINT, VARNISH, URETHANE REMOVER** - Soy based paint strippers contain no methylene chloride and are non-toxic. They are safe for indoor use and can be used on vertical and horizontal surfaces. Soy based paint strippers have no odor and contain only natural ingredients. Soy based paint strippers cover about 100 square feet per gallon, and they will remove multiple layers of paint. They are effective with lead based paint and can be used for graffiti removal as well. The gel formula is thick and holds paint for easy disposal. Most strippers will burn skin on contact, but soy strippers will not burn or blister the skin.

***Citristrip***

**Consumer Products Group**  
P.O. Box 1879  
Memphis, TN 38101  
Phone: 800/398-3892  
Fax: 800/621-9508  
Email: [citristrip@wmbarr.com](mailto:citristrip@wmbarr.com)  
[www.citristrip.com](http://www.citristrip.com)

***Soy-Gel and Soy Strip***

**Franmar Chemical, Inc.**  
PO Box 5565  
Bloomington, IL 61702  
Phone: 800/538-5069  
Fax: 309/452-7526  
E-mail: [franmar@franmar.com](mailto:franmar@franmar.com)  
[www.franmar.com](http://www.franmar.com)

***SC-ActiSolv***

**GEMTEK Products**  
3808 N 28th Avenue  
Phoenix, AZ 85017-4733  
Phone: 800/331-7022  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
[www.gemtek.com](http://www.gemtek.com)

## 4.0 CLEANERS

A superior "green" cleaner lessens its environmental impact at every stage of its life, including its packaging. The following checklist describes both positive and negative characteristics to look for when purchasing an industrial cleaner.

- ✓ **Avoid Petroleum** - Based solvents, glycol ethers, phenolic compounds, and surfactants. Surfactants derived from vegetable oil are preferred. Look for a low VOC citrus-based or pine oil solvent.
- ✓ **Biodegradable and Non-Toxic** - Products for both humans and aquatic life are preferred. Biodegradability is measured by the amount of time it takes for large organic molecules to break down into smaller molecules in the environment. A **readily biodegradable** chemical begins to break down into water, mineral salts, carbon dioxide, and other oxides immediately. A product is not readily biodegradable if it accumulates in the ecosystem and poses a potential danger. Many factors affect the speed of chemical breakdown; for example, fatty acids derived from petroleum degrade more slowly than vegetable sources.
- ✓ **Chlorine Bleach or Sodium Hypochlorite** - Product ingredients to be avoided. In wastewater, chlorine containing bleaching agents can react with other chemicals to form toxic and carcinogenic compounds. A preferable substitute for chlorine bleach is sodium percarbonate.
- ✓ **Concentrated** - Products that work in cold water are preferred. Concentrated products (less than 20 percent water by weight) are cheaper to ship and produce less packaging waste. Cold water dilution saves energy.
- ✓ **EDTA and NTA (Ethylene Diamine Tetraacetic Acid and Nitrilotriacetic Acid)** - Avoid products with these ingredients. EDTA is undesirable because of its slow biodegradability and its potential to mobilize heavy metals in wastewater and surface waters. NTA is a possible carcinogen that requires the use of carcinogens and toxic substances in its production. Preferred replacements having milder environmental impacts are available; examples are sodium carbonate, sodium bicarbonate, sodium citrate, and sodium silicate.
- ✓ **Neutral pH - Is** preferable in a product. Acidic or alkaline products can cause severe burns. A pH of 7.0 is ideal. A pH of 1.0 is most acidic and a pH of 14.0 is most alkaline.
- ✓ **Packaging** - Find products that are packaged as a concentrate and are contained in recyclable/refillable containers, which contain post consumer materials.
- ✓ **Phosphates** - Products with 0.5 percent by weight or less are preferred but zero phosphates are the best. Phosphates encourage plant growth and algae blooms, which can block sunlight, leading to oxygen depletion and ultimately to the death of aquatic life.
- ✓ **Volatile Organic Compounds (VOC)** - Concentration should be no more than 10 percent of the weight of the properly diluted product. VOCs include hundreds of compounds that volatilize into the air during use or after being disposed of. VOCs can cause eye irritation, nausea, vomiting, headaches, and impaired memory. They also react with nitrous oxides in the presence of sunlight to produce ground-level ozone and photochemical smog.

## INDUSTRIAL

**PREFERABLE INDUSTRIAL CLEANERS** - The following industrial cleaners meet all the following criteria from Green Seal:

- Is non toxic to human and/or aquatic life
- Does not contain chlorine bleach
- Contains VOC levels under 10 percent by diluted weight
- Is free of phosphates and "readily biodegradable"
- Does not contain EDTA or NTA
- Works in cool water
- Does not contain phenolic compounds, glycol ethers or petrochemical compounds
- Has acceptable pH level (between 2.5-12)

COMPANY	PRODUCTS	PHONE
<u>Abby Science</u>	Industrial Cleaners	888/399-2229
<u>Alfa Kleen</u>	Multiple Cleaners	714/556-0145
<u>Amax Industrial Products Division</u>	SafteyFirst Degreaser/ Industrasolve	800/662-0023
<u>Citra-Solve LLC</u>	Citra-Solve	800/343-6588
<u>CFR Corporation</u>	All Purpose Spotter/Enz-Soil One	800/533-2557
<u>Eco Solve Americas, Inc.</u>	Graffiti Go	866/435-2511
<u>Environmental Chemicals Co.</u>	Industrial Cleaners	800/784-6051
<u>Envirox</u>	H2Orange2 Floor/Bathroom Cleaner	800/281-9604
<u>EZ Qui Industries</u>	A-Ben-A-Qui (EZ-Task)	603/668-2829
<u>Gaylord Industries</u>	Formula G-510	800/547-9696
<u>Global Specialty Products</u>	Cleaning Products	609/518-5277
<u>Interstate Products, Inc.</u>	Graffiti Remover Towels	800/474-7294
<u>Ipax</u>	Green Uniclean and Unisource Floor Cleaner	313/933-4211
<u>KC Products</u>	KC's Citrus	800/927-9442
<u>National Chemical Laboratories</u>	CITROL Industrial Degreaser/Deodorizer	800/628-2436
<u>Native Solutions</u>	Neutral Cleaner	360/491-0992
<u>Naturally Yours</u>	All Purpose/Enz-Away	888/801-7347
<u>PCI of America: Hurrisafe</u>	9010 All Purpose Cleaner	800/222-1455
<u>P&amp;D Creative</u>	Magic 555 Industrial Degreaser & Cleaner	888/838-4607
<u>Rochester Midland Corporation</u>	Enviro Care Multiple Cleaners	800/836-1627
<u>Sierra Consultants</u>	BioChem Cleaners & Solvents	800/769-7437
<u>Spartan Chemical</u>	Damp Mop	800/537-8990
<u>Terravendi Partners LP</u>	Cleaners	210/241-7020
<u>The Clean Environment</u>	All-Purpose/Neutral Degreaser	402/537-0011
<u>Westkal LTD.</u>	WORXbest.com Cleaning Products	800/456-8411

**SOY-BASED CLEANING SOLVENTS** - Methyl soyate, a methyl ester derived from soybean oil can be used as an industrial solvent for use in cold cleaning, carrier solvents, and resin removal and cleanup. However, soy solvents are also used in common cleaning applications such as parts, hard surface cleaning, and even hand cleaning. Some soy-based solvents can also extract crude oil or petroleum spilled on sand, gravel shorelines, and vegetation while remaining non-toxic and biodegradable. Typical applications for soy-based cleaners are for petroleum degreasing, stainless steel cleaning, storage tank cleaning, and paint clean up. These cleaners are readily biodegradable, non-toxic, non-flammable, non-carcinogenic, and are derived from renewable plant-based resources.

***SoyGold***

**AG Environmental Products**  
12700 West Dodge Road  
Omaha, NE 68154  
Contact: Pat Reisner  
Phone: 800/599-9209  
Fax: 402/498-2247  
E-mail: [preisner@agp.com](mailto:preisner@agp.com)  
[www.soygold.com](http://www.soygold.com)

***BEAN-e-doo***

***Ickee-Stickee-Unstuck***  
**Franmar Chemical, Inc.**  
PO Box 5565  
Bloomington, IL 61702  
Phone: 800/538-5069  
Fax: 309/452-7526  
E-mail: [franmar@franmar.com](mailto:franmar@franmar.com)  
[www.franmar.com](http://www.franmar.com)

***Safe-T-Solve***

**Iosso Products**  
1485 Lively Blvd.  
Elk Grove, IL 60007  
Phone: 888/747-4332  
Fax: 847/437-8478  
E-mail: [info@iosso.com](mailto:info@iosso.com)  
[www.iosso.com](http://www.iosso.com)

***SOYsolve-SOYsolvII-SOYsolvII Plus***

**SOYsolv Industrial Products**  
6154 N. Co. Rd. 33  
Tiffin, OH 44883  
Phone: 800/231-4274  
Fax: 419/992-4595  
E-mail: [sales@soysolv.com](mailto:sales@soysolv.com)  
[www.soysolv.com](http://www.soysolv.com)

***Kleenease Solvent***

**Archer Petroleum**  
10101 J Street  
Omaha, NE 68127-1133  
Contact: Doug Salmon  
Phone: 402/597-8889  
Fax: 402/597-9866  
E-mail: [mail@archeroil.com](mailto:mail@archeroil.com)  
[www.archeroil.com](http://www.archeroil.com)

***SC-Bio Steel Bright***

**GEMTEK Products**  
3808 N 28th Avenue  
Phoenix, AZ 85017-4733  
Phone: 800/331-7022  
Fax: 602/265-7241  
E-mail: [info@gemtek.com](mailto:info@gemtek.com)  
[www.gemtek.com](http://www.gemtek.com)

***Simple Green***

**McMaster-Carr Supply Co.**  
600 County Line Road  
Elmhurst, IL 60126-2081  
Phone: 630/833-0300  
Fax: 630/834-9427  
E-mail: [chi.sales@mcmaster.com](mailto:chi.sales@mcmaster.com)  
[www.mcmaster.com](http://www.mcmaster.com)

***SoyGreen***

**Soy Technologies**  
1050 Elizabeth Drive- Unit 4  
Nicholasville, KY 40356  
Contact: Wally Albers  
Phone: 800/769-8748  
Fax: 859/275-7511  
E-mail: [walbers@soytek.com](mailto:walbers@soytek.com)  
[www.soytek.com](http://www.soytek.com)

***Cleaning Solvents***

**Columbus Foods Company**  
730 North Albany  
Chicago, IL 60612  
Contact: Joe Loveshe  
Phone: 800/322-6457  
Fax: 773/265-6985  
E-mail: [sales@columbusfoods.com](mailto:sales@columbusfoods.com)  
[www.columbusfoods.com](http://www.columbusfoods.com)

***VersaGen***

**Griffin Industries**  
4221 Alexandria Pike  
Cold Spring, KY 41076  
Phone: 859/781-2010  
Fax: 859/572-2575  
E-mail: [sales@griffinind.com](mailto:sales@griffinind.com)  
[www.versageninfo.com](http://www.versageninfo.com)  
[www.griffinind.com](http://www.griffinind.com)

***Mr. Good Chem***

**Mr. Good Chem**  
3909 N. Washington Avenue  
Westmont, IL 60559  
Phone: 800/505-5176  
Fax: 630/852-2855  
E-mail: [mrgoodchem@aol.com](mailto:mrgoodchem@aol.com)  
[www.mrgoodchem.com](http://www.mrgoodchem.com)

***Soy 30 Agri-synthetic Degreaser***

**Terrabond Industries, LLC**  
1424 South Hugh Wallis  
Lafayette, LA 70508  
Phone: 888/356-7847  
Fax: 337/291-2781  
[www.terrabond.net](http://www.terrabond.net)

## OFFICE

As technology advances, the products that we use everyday are improving. They are becoming better for the environment, cheaper, and work even better than the previous products. If environmentally products are used for everyday household purposes, this could reduce the amount of pollutants discharged from our households each year.

### ***BioMax Bathroom Cleaner***

#### **Amax Industrial Products Division**

Phone: 800/662-0023

Fax: 800/887-1603

Email: [AmaxIndustrialProducts@hotmail.com](mailto:AmaxIndustrialProducts@hotmail.com)

[www.amaxindustrial.com](http://www.amaxindustrial.com)

### **Chemex Industries, Inc.**

3 Chattanooga

Irvine, California 92620

Phone: 714/832-8441

Fax: 714/832-8103

[www.chemexindustries.com](http://www.chemexindustries.com)

### **Ecosafeproducts.com**

180 Newport Center Drive, Suite 180

Newport Beach, CA 92660

Phone: 949/285-6525

Fax: 949/640-9536

Email: [johnmac@ecosafeproducts.com](mailto:johnmac@ecosafeproducts.com)

[www.ecosafeproducts.com](http://www.ecosafeproducts.com)

### **New Life Nutrients**

9924 S Marquam Circle

Molalla, OR 97038

Phone: 503/829-5047

Email: [info@newlifenuutrients.com](mailto:info@newlifenuutrients.com)

[www.newlifenuutrients.com](http://www.newlifenuutrients.com)

### **Naturally Home**

19841 North 14th Street

Phoenix, AZ 85024

Phone: 888/696-8113

Email: [info@naturallyhome.com](mailto:info@naturallyhome.com)

[www.naturallyhome.com](http://www.naturallyhome.com)

### **Nature Neutral, LLC**

PO Box 7667

Charlottesville, VA 22906

Phone: 800/656-1961

Fax: 434/975-1036

[www.natureneutral.com](http://www.natureneutral.com)

### **ECS Simple Green UK**

85, The Broadway

Wimbledon, London

SW19 1QE

United Kingdom

Phone: 01726891199

Fax: 01726891187

Email: [info@simplegreen.co.uk](mailto:info@simplegreen.co.uk)

[www.simplegreen.co.uk](http://www.simplegreen.co.uk)

### **Planet Inc.**

P.O. Box 48184

3575 Douglas Street

Victoria, British Columbia

Canada V8Z 7H6

Phone: 800/858-8449

Fax: 250/478-3238

Email: [contact@planetinc.com](mailto:contact@planetinc.com)

[www.planetinc.com](http://www.planetinc.com)

### **Singerman Laboratories**

4091 Saltsburg Road

Murrysville, PA 15668

Phone: 412/798-0447

Fax: 412/798-0450

Email: [pat@ecomade.com](mailto:pat@ecomade.com)

[www.ecomade.com](http://www.ecomade.com)

### **SoyDerm**

#### **Soy Technologies**

1405 Poinsettia Drive

Delray Beach, FL 33444

Phone: 561/266-8868

Fax: 561/266-8878

Email: [info@soytek.com](mailto:info@soytek.com)

[www.soytek.com](http://www.soytek.com)

### **WORX Environmental Products Inc.**

11310 S. Orange Blossom Trail, #383

Orlando, Florida, USA 32837

Phone: 800/424-9679

Fax: 800/816-0537

Email: [info@worx.us](mailto:info@worx.us)

[www.worx.ca](http://www.worx.ca)

**PUMICE HAND CLEANERS** - A deep cleaning, moisturizing hand cleaner made with agriculturally produced-oils and ground pumice rock for deep cleaning of the following:

- Oil & Grease
- Lubricants
- Printing Ink
- Varnish
- Paint
- Pavement Marking Paint
- Caulk & Silicon Sealants
- Tar and Asphalt
- Dirt & Grime
- Adhesive Resins

***Soy Scrub***

**Franmar Chemical, Inc.**  
PO Box 5565  
Bloomington, IL 61702  
Phone: 800/538-5069  
Fax: 309/452-7526  
E-mail: [franmar@franmar.com](mailto:franmar@franmar.com)  
[www.franmar.com](http://www.franmar.com)

***Plowman's Pumice***

**Henneberry Marketing, Ltd.**  
105 W. Winslow St.  
Danvers, IL 61732  
Phone: 888/251-1366  
Fax: 309/963-4445  
E-mail: [info@newuseproducts.com](mailto:info@newuseproducts.com)  
[www.newuseproducts.com](http://www.newuseproducts.com)

**DRAIN CLEANER** - Pest management professionals can use a freeze-dried powder containing multi-strains of bacteria, which are designed to digest the fats, oils, grease, starches, and sugars that are the cause of organic build-up in drain lines. This product is designed to control odors and unsanitary conditions necessary for drain fly and fruit fly breeding areas in drains.

***BioPill***

**BioStim, LLC**  
8718 Botts Lane  
San Antonio TX 78217  
Phone: 800/338-8812  
[www.biostim.com](http://www.biostim.com)

## 5.0 LIGHTING

**ENERGY-EFFICIENT LIGHTS** - Fluorescent lights are probably the most popular indoor light source because they last longer and cost about 50 percent less to run than incandescent lights. High-intensity discharge (HID) lights (such as high-pressure sodium lamps and metal halide lamps) are also extremely energy-efficient and provide high light output and an extremely long life. Traditionally, these lights were available only in high wattages and were used primarily for outdoor applications. Now there are a number of new lamps with lower wattages, which make HIDs suitable for indoor applications as well.

Energy savings will occur with the switch from standard T-12 fluorescent tubes to T-8 lamps with electronic ballasts. In a typical four lamp fixture with four-foot fluorescent tubes a savings of about 30 watts per fixture will occur with the switch to T-8 lamp technology. Low mercury energy efficient tubes are also available that reduce the level of mercury and energy use significantly. The reduced mercury levels found in a true low mercury lamp are low enough to allow the lamps to pass the standard test for hazardous waste. True low mercury lamps use a dosing technology that allows for a lower level of mercury to achieve the same level of performance as a high mercury lamp. Be aware that some lamps have claimed to be low mercury, but use a masking agent that, for testing purposes, hides the true level of mercury in the lamps.

Another energy saving lighting option is using compact fluorescents to replace standard incandescent bulbs. Compact fluorescent bulbs are still more expensive than incandescent but the price levels are dropping. The savings with compacts are due to two factors, they provide the same approximate light levels for about one fourth the wattage levels. For example, a 25-watt compact fluorescent lamp will provide about the same light levels as a 100-watt incandescent bulb. Moreover, the compact fluorescent bulb will also last up to 10 times longer than the incandescent. This tremendous increase in bulb longevity saves money on the purchase of new lamps and also saves on the maintenance involved in frequently changing incandescent. This is particularly beneficial in hard to reach bulb locations.

Two other lighting options that save money are using occupancy sensors and switching to **Light Emitting Diode** exit signs.

**OCCUPANCY SENSORS** - Occupancy sensors have a couple of different designs that indicate when a room is unoccupied. The sensors will then allow the lighting in the unoccupied room to switch off. These sensors are best suited in spaces that are used infrequently or unpredictably, such as conference rooms, private offices, classrooms, storage areas, and bathrooms. Sensors can be mounted on the wall just like a light switch or installed in the ceiling.

There are essentially three basic types of sensors: motion detecting (ultrasonic and microwave), heat-sensing (infrared), and sound sensing. The area to be lit and the types of surfaces in the space will determine which sensor is most effective.

**EXIT SIGNS** - Do not be fooled by lower first-cost price tags for incandescent exit signs. Traditional exit signs have hidden costs that add up over time, so remember to consider the total costs required to operate an exit sign for an extended period. Light emitting diode (LED) exit signs offer the best long-term value. They typically use about 1 watt as compared to a incandescent usage of 15-20 watts. On the average, these signs will last for ten years or more with average payback of less than two years (comparing the cost increase to that of incandescent models).

**OUTDOOR LIGHTING** - The most efficient outdoor lamps that should be considered are the low-pressure sodium, high-pressure sodium, and the metal halide. For more information regarding outdoor lighting and its proper application, see the following information.

**Illuminating Engineering Society of North America**  
120 Wall Street, Floor 17  
New York, NY 10005  
Phone: 212/248-5000  
Fax: 212/248-5017  
[www.iesna.org](http://www.iesna.org)

**International Dark-Sky Association**  
3225 N. First Avenue  
Tucson, AZ 85719  
Phone: 520/293-3198  
Fax: 520/293-3192  
[www.darksky.org](http://www.darksky.org)

**Pennsylvania Outdoor Lighting Council**  
141 Azalea Circle  
Limerick, PA 19468  
[www.pol.net](http://www.pol.net)

**AVAILABILITY** - Energy efficient lighting (indoor/outdoor), occupancy sensors, and exit signs are all readily available from local and regional suppliers and lighting specialists. Check with any local lighting contractor or your local utility about energy-efficient lamp and fixture options. Check in the Yellow Pages under "Energy Conservation Products and Services" or "Lighting Consultants." In addition, the Energy Star website provides a [listing of lighting and electrical distributor partners](#) to use as a tool for builders, property managers, and utilities.

**Association of Lighting & Mercury Recyclers**  
2436 Foothill Blvd., Suite B  
Calistoga, CA 94515  
Phone: 707/942-2197  
Fax: 707/942-2198  
Email: [mail@almr.com](mailto:mail@almr.com)  
[www.almr.org](http://www.almr.org)

## 6.0 MISCELLANEOUS PRODUCTS

**STORM DRAIN FILTERS** - These products are designed for the minimization and elimination of many contaminants associated with storm water or non-point source pollution. Storm water that runs over parking lots, streets, buildings, or cars can often mobilize very small petroleum spills, metals, and other pollutants associated with vehicles and transport them to area surface water. This type of pollution is very difficult to control; however, storm water filtration can be an answer. These filters trap nearly 100 percent of petroleum hydrocarbons and most metals found in storm water. The filters are periodically replaced, usually every 6-12 months.

- Phone: 616/678-5157
- [www.sierraconsultants.net](http://www.sierraconsultants.net)

## 7.0 ADDITIONAL LINKS

### **Acme Hardesty**

1787 Sentry Parkway West  
Suite 18-460  
Blue Bell, PA 19422  
Phone: 800/223-7054  
Fax: 215/591-3620  
[www.acme-hardesty.com](http://www.acme-hardesty.com)

### **Biobased Manufacturers Association**

11701 Borman Drive, Suite 300  
St. Louis, MO 63146-4193  
Phone: 314/372-3519  
Fax: 314/569-1083  
Email: [info@biobased.com](mailto:info@biobased.com)  
[www.biobased.com](http://www.biobased.com)

### ***Choose Green Reports*** **Green Seal**

101 Connecticut Ave. NW, Suite 827  
Washington, D.C. 20036-5525  
Phone: 202/872-6400  
Fax: 202/872-4324  
Email: [green seal@green seal.org](mailto:green seal@green seal.org)  
[www.green seal.org](http://www.green seal.org)

### **National Paints & Coatings Association (NPCA)**

1500 Rhode Island Ave., NW  
Washington DC 20005-5597  
Phone: 202/462-6272  
Fax: 202/462-8549  
[www.paint.org](http://www.paint.org)

### **The Council of State Governments**

641 East Butterfield Road  
Suite 401  
Lombard, IL 60148  
Phone: 630/810-0210  
Fax: 630/810-0145  
[www.csq.org](http://www.csq.org)

### ***Federal Government EPP Updates***

**U.S. Environmental Protection Agency**  
[www.epa.gov/epp/documents/docupdates.htm](http://www.epa.gov/epp/documents/docupdates.htm)

### **Alternative Fuels Data Center**

U.S. Department of Energy  
Energy Efficiency and Renewable Energy  
[www.eere.energy.gov](http://www.eere.energy.gov)

### **EarthEasy**

P.O.Box 531  
Parksville, B.C.  
Canada V9P 2G6  
Email: [info@eartheasy.com](mailto:info@eartheasy.com)  
[eartheasy.com/live\\_nontoxic\\_paints.htm](http://eartheasy.com/live_nontoxic_paints.htm)

### **Master Painters Institute (MPI)**

4090 Graveley St.  
Burnaby, BC Canada V5C 3T6  
Phone: 888/674-8937  
Fax: 888/211-8708  
[www.paintinfo.com](http://www.paintinfo.com)

### ***Environmentally Preferable Products*** **StopWaste.Org**

777 Davis Street, Suite 100  
San Leandro, CA 94577  
Phone: 510/614-1699  
Fax: 510/614-1698  
[www.stopwaste.org](http://www.stopwaste.org)

### ***New Uses for Soybeans Product Guide***

**United Soybean Board**  
16640 Chesterfield Grove Road, Suite 130  
Chesterfield, MO 63005  
Phone: 800/989-8721  
[www.unitedsoybeans.org](http://www.unitedsoybeans.org)

### **Zero VOC Paint Manufacturers**

[www.delta-institute.org/publications/paints.pdf](http://www.delta-institute.org/publications/paints.pdf)

# TESTIMONIALS

## Amsoil Synthetic Motor Oils

"Like most superintendents, we are consistently skeptical about trying so-called revolutionary new products, taunted by unsolicited salespeople explaining the reason why you cannot live without their "one product does it all" sales pitch. However, 10 years ago I agreed to test synthetic motor oil in one piece of grounds maintenance equipment. Amsoil is the brand product we chose to try in our daily in-service mower. Crankcase drain intervals were extended per Amsoil's recommendation, followed by an oil sample analysis completed by an independent lab. Test results were quite detailed and all reports rated Amsoil motor oil superior to conventional petroleum motor oil on all counts. To date we have utilized Amsoil synthetic motor oils in our entire maintenance equipment fleet. Our equipment fleet ranges in age from new purchases to 25 plus years of age. We have experienced no engine failures related to synthetic motor oils over the past decade. Our preventative maintenance program consists of twice-yearly oil drains of all engine-powered equipment, we purchase annually two (2) drums of oil, and costs per gallon are competitively priced with petroleum-based oils. This reduces the amount of product in the past we normally purchased as well as reduces the amount of waste oil we generate. Amsoil synthetic motor oil reduces friction more effectively than conventional oils, so engine bearings rotate easier. This, in turn, saves energy and conserves fuel. Amsoil motor oils can reduce excessive operating temperatures, compared to conventional oils. Less heat is generated, which further enhances the cooling process. The bottom line is Amsoil increases engine performance and life."

Mr. Marvin Ash - Golf Course Superintendent

Sylvan Glen Golf Course, Troy, MI

## COMMENTS/SUGGESTIONS

Please feel free to offer any comments or suggestions for improvements to this guide. Also, please include any quotes, examples, or testimonials regarding alternative products that you have used or are currently using at your facility. You can send any comments to Jeff Spencer at [spencejl@michigan.gov](mailto:spencejl@michigan.gov).