Have You Considered Trying an Alternative Bio-Based Solvent?

by Helen Miller, Inspections Support Unit

Does your business clean or degrease parts, strip paint or remove ink? If you answered “yes,” you may want to consider evaluating some of the alternative bio-based solvents on the market.

Biobased solvents are derived from agricultural crops such as corn, soy beans, citrus fruit skins or tree bark. Ethyl lactate is made from processing corn and methyl soyate is made from soybeans. Other alternative solvents, like terpenes, are made from citrus fruit peels or pine oil and have been available for awhile. However, over the past few years more bio-based solvents are available and more companies have switched to using them. Bio-based chemicals are also being used in a variety of other products such as metalworking fluids, lubricants, hydraulic fluids and for dust suppression.

What are the advantages of using bio-based products?

Lower Environmental Impact: low toxicity, high biodegradability, lower volatile organic compounds (VOCs) are generated and less pollution is generated during the manufacture of the product than a petrochemically based product.

Increased Business Advantages: reduced disposal costs, improved worker safety and the ability to market “green consumerism.”

What Types of Businesses Have Switched to Bio-based Solvents?

Several types of businesses have successfully switched to using bio-based solvents. Bolger Publications, a lithographic printer in Minnesota, changed to a bio-based press wash made from coconut oil. They had been using a petroleum-based press wash and purchased about 30 55-gallon drums per year. After changing to a bio-based wash, they purchased one to two 55-gallon drums per year and generated one-tenth the amount of waste they generated using the petroleum-based press wash. This switch to a bio-based solvent saved money on product purchase and disposal costs.

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Bio-base Solvent

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Boeing Aerospace Corporation used methyl ethyl ketone (MEK) for surface preparation for airplane parts before painting and sealing. They now use a terpene-based cleaner for this process, requiring approximately 75 percent less solvent. Boeing now launders the wipe rags that used to be disposed of as hazardous waste, thereby saving $75,000 per year.

In 2002, the Department of Defense completed a demonstration at Anniston Army Depot in Alabama by installing a parts washer with a bio-based cleaner made from corn and soybeans to clean combat vehicle components, like bearings, springs, housings and gears, from engines and transmissions. They evaluated three blends of bio-based cleaners and found the lactate esters performed well with cleaning efficiencies in the range of 91-98 percent. They also conducted an economic analysis for two scenarios using baseline data and demonstration results. In Scenario 1, they considered using lactate esters with a six-month bath life as a drop-in replacement. This annual operating cost savings was approximately $45,000, with a payback in less than three months. Scenario 2 included installing a parts washer with filtration using lactate esters with a 12-month bath life. Its annual operating cost savings was $83,000, with a payback in approximately 19 months. Their findings concluded that bio-based cleaners using lactate esters could be implemented with little facility modification. They also recommended using an agitated parts washer with a filtration system because the agitation decreased production time and filtration increased solvent life while maintaining cleaning efficiency.

Tips to Evaluate Switching to a Bio-based Solvent

1) Talk with your current supplier and find out whether they sell any of these bio-based solvents, then ask whether you can try out a sample since you're a current customer.

2) Try to find the least hazardous product to fit your needs.

3) Suggest that your employees experiment by using less product to find the minimum amount needed for each use.

4) Always keep in mind that you must evaluate all of the waste you generate. Sometimes during the cleaning process, heavy metals and other residuals can be picked up in filters. Analytical testing may determine this to be hazardous.

If you have additional questions or would like advice about how to generate less hazardous waste, please contact your DWHM district office inspector. Our hazardous waste inspectors offer technical assistance to businesses by helping them identify ways to generate less waste. If you would like to learn more about pollution prevention, go to: http://www.epa.state.oh.us/opp/oppmain.html

Resources and References

Ohio EPAs Office of Pollution Prevention list of various suppliers of products:
www.epa.state.oh.us/opp/Biobasedoils.html

United Soybean Board: www.unitedsoybean.org


"Biochemicals for the Printing Industry" publication, 1997, and "Biochemical Cleaning Solvents," Pollution Solution Fact Sheet, 1996, Institute for Local Self-Reliance
www.carbohydrateeconomy.org/

"NDCEE Determines Lactate Esters Are Effective Non-Toxic Cleaning Materials" article from Spring 2003 National Defense Center for Environmental Excellence (NDCEE) newsletter at:
www.ndcee.ctc.com/

Notifier-Fall 2004
Ask The Inspector

by Dan Sowry, Regulatory Services Unit

Do I have to keep my containers closed when I am treating my hazardous waste?

Q  This question is often raised. Ohio Administrative Code (OAC) rule 3745-52-34(A) states that generators may conduct treatment provided that they comply with the container management standards in OAC rules 3745-66-70 to 3745-66-77. The closed container requirements, located in OAC rule 3745-66-73, state containers holding hazardous waste must remain closed during storage, except when it is necessary to add or remove waste. However, when conducting acceptable forms of treatment, such as the addition of heat to evaporate excess water from the waste or a treatment method that generates heat, the containers cannot be closed because of pressure build-up (see the recent article on evaporators in the Summer 2004 Notifier).

A  To answer the question, no, you do not have to comply with the closed container requirements while your hazardous waste undergoes treatment. The closed container requirements state containers holding hazardous waste must remain closed during storage, except when it is necessary to add or remove waste. Storage is defined in Ohio Revised Code (ORC) § 3734.01(M) as the holding of hazardous waste for a temporary period in such a manner that it remains retrievable and substantially unchanged physically and chemically and, at the end of the period, is treated. Treatment is defined in ORC § 3734.01(K) as any method, technique or process designed to change the physical, chemical or biological characteristics or composition of any hazardous waste. Since hazardous waste is not considered to be stored while it undergoes treatment, the closed container requirements do not apply. Generators must, however, comply with the closed container requirements before and after treatment. In addition, generators storing or treating hazardous waste in containers may be subject to federal regulations in 40 CFR Part 265, Subparts AA, BB, and CC for air emissions.

Amendment to Spring 2004 Article: Reducing Solvent Purchase and Disposal Costs - Part II

by: Rose McLean, Regulatory Services Unit

The Spring 2004 edition of the Notifier contained an article titled Reducing Solvent Purchase and Disposal Costs – Part II. The article explained how using an on-site solvent distillation unit can reduce regulatory requirements for companies if recycling sufficiently lowers your waste volumes. The article also discussed how to count recycled materials when determining your monthly generator status. This amendment to the article is intended to clarify how to properly count recycled materials when using an on-site solvent distillation unit.

The article stated, “If your company’s recycling efforts sufficiently lower the volume of waste generated, you may be reclassified into a smaller generator category. In this instance, using a solvent distillation unit may sufficiently lower the amount of waste you generate because Ohio EPA’s hazardous waste rules state that recycled materials should only be counted as wastes towards your generator status the first time they are generated.”

• We would like to clarify that a generator counts the solvent waste only the first time it is generated each calendar month, since generator status is determined on a month-to-month basis. It does not mean once that year.

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The article goes on to say that, "After recycled materials are generated once, they no longer count toward your monthly generator status, no matter how many times the recycled materials are put through your process. For example, when a tank is emptied and the solvent is distilled and returned to the tank, the annual waste volume is the solvent capacity of the tank – counted one time – plus the volume of all still bottoms generated over one year."

- Again, the generator counts the solvent waste the first time it is generated each calendar month. Subsequent generation of that solvent during the same month is not counted.

- Still bottoms should not be counted the first time they are generated in a calendar month because they are considered to be counted with the spent solvent as it is counted the first time each month. Since the spent solvent is not counted when used more than once during that month, the still bottoms must be counted subsequent to the first time they are generated that month.

- When completing your annual report, include the amount of waste solvent generated that month (counted as indicated above) and the amount of still bottoms generated subsequent to the first time they are generated that month.

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**How Do I Manage Mercury-Containing Devices?**

by Dan Sowry, Regulatory Services Unit

Mercury is a persistent, bioaccumulative and toxic metal with several unique properties that make it useful for a variety of functions. It is a liquid at room temperature, it conducts electricity, it forms alloys easily with other metals, it expands uniformly with temperature and it has medicinal and fungicidal uses. Mercury is also a highly toxic neurotoxin that is released into the environment during incineration of materials such as mercury-containing trash or combustion of fossil fuels. Mercury can also become a vapor at ambient temperatures. Because of this property, there is a potential for inhalation exposure through unaddressed releases of mercury. When mercury enters bodies of water, biological processes transform it into methylmercury, a highly toxic and bioaccumulative form. The resulting mercury concentrations can cause devastating neurological damage and death. Fortunately, through reducing mercury at the source by converting manufacturers to non-mercury technologies and properly recycling mercury containing devices, we can greatly reduce mercury pollution.

Mercury-containing devices are present in a variety of products that your business may use including thermostats, switches, thermometers, relays, manometers, barometers and sphygmomanometers (blood pressure measurement devices). Ohio EPA considers used mercury-containing devices that fail the toxicity characteristic leaching procedure (TCLP) for mercury to be characteristic by-products as defined in Ohio Administrative Code (OAC) rule 3745-51-01(C)(2). According to OAC rule 3745-51-02(C)(3), characteristic by-products are not wastes and hence not a hazardous waste when reclaimed. However, if mercury-containing devices or their reclaimed components are accumulated speculatively [as defined in OAC rule 3745-51-02(C)(8)] or used in a manner constituting disposal, the recycling exclusion does not apply.

Regardless of whether your mercury-containing devices exceed the regulatory limit for mercury, Ohio EPA strongly encourages and promotes reuse and recycling rather than disposal. A listing of mercury recycling centers can be found on Ohio EPA’s Web page. If for some reason your hazardous waste mercury-containing devices cannot be recycled (spill clean-up), they must be stored, treated and disposed of in accordance with the hazardous waste rules.

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Mercury-containing Devices continued from page 4

Mercury thermostats that fail the TCLP are also considered universal wastes and may be managed under the universal waste rules (UWR) located in OAC Chapter 3745-273. Mercury thermostats are temperature control devices that contain metallic mercury in an ampule attached to a bimetal sensing element. Mercury thermostats include mercury-containing ampules removed from temperature control devices in compliance with the UWR. Ohio EPA’s “Universal Waste Rule” and “Universal Waste Questions” guidance documents provide additional information.

Ohio EPA works in conjunction with Bowling Green State University to conduct an elemental mercury collection and reclamation program. The program involves the collection of uncontaminated elemental mercury from a variety of sources. The program is available and free to individuals, academic institutions, small businesses, industries, medical and dental facilities, emergency response and other governmental agencies, spill response companies and any additional entity having unwanted, uncontaminated elemental mercury. Ohio EPA’s Office of Pollution Prevention also provides information on alternatives to mercury-containing products, locations to drop off old mercury-containing products and information on what to do in case of a spill.

Is There a Difference Between Used Oil and Waste Oil?

by Andy Kubalak, Regulatory Services Unit

Should I label my containers “Used Oil” or “Waste Oil?”

There is a difference between used oil and waste oil. Inspectors find that used oil generators are incorrectly labeling their used oil as waste oil.

What is Used Oil?

Hazardous waste regulations define used oil as any oil that has been refined from crude oil, or any synthetic oil that has been used and, as a result of that use, is contaminated by physical or chemical impurities.

Examples of used oil include: used motor oil, used hydraulic fluid, used electrical insulating oil, used transmission fluid, used compressor oils, used cutting oils and used coolants.

During normal use, impurities such as dirt, metal scrapings, water or chemicals can get mixed in with the oil so that in time the oil no longer performs well. Eventually, this oil must be replaced with clean oil to do the job.

Once you can no longer use the oil, you must either have it recycled or dispose of it properly. If you plan to send it off-site for disposal, you must evaluate it to determine whether it is a hazardous waste, then properly manage it. If you plan to have it recycled, note that the used oil regulations encourage different recycling options such as reconditioning, re-refining, reusing and burning for energy recovery. Standards for managing used oil are found in Ohio Administrative Code (OAC) Chapter 3745-279. A guidance document for used oil generators is available on our Web site. Additionally, the Fall, 2003 Notifier includes an extensive discussion on management options for used oil.

Used oil standards require that used oil generators label their used oil with the words “used oil.” If you are using containers or aboveground tanks to store used oil, they must be labeled or clearly marked with the words “Used Oil.” If you use underground tanks to store used oil at your site, the fill pipe used to transfer used oil into these tanks must be labeled with the words “used oil.”

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Used Oil Generators

Across
1. A used oil ___ is a person whose action or process first causes used oil to become subject to regulation.

4. If you store a ___ quantity of used oil on-site in containers or tanks, you may need to develop a spill prevention plan.

6. Materials that have not been used, such as ___ from a virgin oil tank clean-out or a virgin oil spill, are not considered used oil.

11. Good ___ and training practices can help your company stay in compliance with the used oil regulations.

12. You can burn your own used oil in an on-site ___ ___ if you meet certain regulatory requirements. (2 words)

13. Improperly disposing of used oil can pose a threat to humans and the environment, as well as lead to ___ of drinking, surface and ground water and soils.

15. Containers must be ___ with the words “used oil.”

Down
2. Used oil ___ must obtain an EPA identification number.

3. ___ returns oil to close to its original state so that it can be used to make new products.

5. Burning for ___ ___ is when used oil is treated to remove impurities such as water and solids and then burned as a fuel. (2 words)

7. ___ ___ is any oil, synthetic or refined from crude oil, that has been contaminated as a result of its use. (2 words)

8. If you store used oil in an ___ tank, you may be subject to regulation by BUSTR.

9. You cannot dispose of used oil on your ___.

10. Used oil cannot be ___ on your property. (2 words)

14. If you ___ your used oil with other wastes, this may cause it to become a hazardous waste.
What is Waste Oil?

Waste oil is off-specification product oil that you can’t use, or decide not to use, and want to dispose. This is oil that has never been used. “Waste oil” is not defined in the hazardous waste rules. Examples of waste oil can include bottom cleanout waste from product oil storage tanks, product oil spill cleanup or other oil wastes that have not been used. Waste oil is not covered under the used oil management standards in OAC Chapter 3745-279. Waste oil must be evaluated to determine whether it is a hazardous waste under OAC rule 3745-52-11 when it is disposed. Waste oil could display any of the characteristics of hazardous waste. If the waste oil exhibits any characteristic(s) of a hazardous waste, it must be managed in compliance with all of the appropriate hazardous waste requirements. If waste oil to be disposed is determined to be a non-hazardous waste, then it would be managed in accordance with applicable Solid and Infectious Waste requirements.

Answers to Summer Notifier Crossword

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REDUCTION  EFFICIENCY
HAZARDOUS  REUSE
MIX  ODOR
DRAINBOARDS  OGET
AGITATE  MEASURE
TOXIC  NAG
REDUCED  CLOSED LOOP
ACK  ON
EVAPORATORS  TAME
SEGREGATE  IN
PURCHASED
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