

Halogens and Waste Oil

What are halogens?

Halogens are any compound containing chlorine, bromine, fluorine, and iodine. Typically, the Department of Environmental Protection (DEP) is concerned with the chlorine compounds.

Why be concerned about halogens?

Most waste oil today is recycled as fuel. During the combustion process, some of the chlorine compounds are chemically converted into hydrogen chloride. When combined with water, which also forms during the burning of fuels, hydrogen chloride becomes hydrochloric acid. Hydrochloric acid is a toxic compound that can corrode furnaces and threaten public health. Additionally, products created from the incomplete combustion of chlorine compounds, such as dioxins, pose significant health risks in the exhaust. Volatile halogen compounds have been shown to damage the ozone layer.

How do halogens get into waste oil?

Some oil products contain halogens by design. For example, chlorinated paraffins, often used in cutting oils and in some lubricating applications for railroads, have thermal properties that make them useful in applications where unchlorinated oils could break down due to heat. Oils containing chlorinated paraffins are much less of a threat to human health and the environment than waste oil containing other halogen compounds.

In industrial settings and auto repair shops, halogens frequently get into waste oil from other products used by waste generators, including chlorinated solvents found in some degreasers, brake cleaners, and carburetor cleaners. Their presence in waste oil can make the mixture a hazardous waste, requiring disposal under hazardous waste regulations, which can be more costly.

What happens if the halogens are high in the waste oil?

If the total halogen level exceeds 1,000 ppm, the presumption is the waste oil is mixed with hazardous waste. If the waste producer is certain that the waste oil has not been mixed with hazardous waste, they can rebut the presumption by demonstrating that the high halogen levels are not due to mixing with hazardous waste. A reasonable defense includes the generator's knowledge of the source of the halogens. For example, the waste producer may be able to show that the halogen level in the chlorinated cutting oil is the same as in the waste cutting oil. More commonly, testing the oil for halogenated compounds provides a determination of the halogenated compound's origin. The testing usually involves a determination of a few specific chlorinated solvents. Showing that these chlorinated solvents are not present at significant levels is usually sufficient to rebut the presumption of mixing. Of course, if the waste oil has been mixed with hazardous waste or the waste producer cannot rebut the presumption that it was mixed, the waste oil must be managed as hazardous waste.

What can be done to lower the halogens in waste oil?

The most obvious way to keep unwanted halogens out of waste oil is simply to not mix other wastes or products with the oil. Sometimes this is difficult and would require major changes in business operations. An effective and potentially less disruptive option is to switch to more environmentally friendly products. Many products found in the shop—washer solvents, degreasers, brake cleaners, and carburetor cleaners—may contain chlorinated solvents. To check a product for chlorinated compounds, simply look at the list of ingredients on the container or on a material safety data sheet (MSDS). If the ingredient contains “chloro” somewhere in its name, it is chlorinated. Sales representatives for these materials should be able to help find more environmentally friendly substitutes.

Businesses complying with the waste oil regulations will save money by avoiding costs associated with the strict management standards for hazardous waste disposal. At the same time, these businesses will

be helping to improve waste oil recycling efforts while reducing environmental and human health risks in Pennsylvania.

For more information, please contact the local DEP regional office.

For more information, visit www.dep.pa.gov, and enter search term: residual waste.

**DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT
P.O. BOX 8472
Harrisburg, PA 17105-8472**

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