



Quaker Knowledge Network

Recycling Fluids

Skill Builder

Overview

The concept of recycling fluids has been around for a while. The focus of waste reduction is typically called "Reduce, Reuse & Recycle." The whole concept of recycling is to promote the following issues:

- Reuse material before it expires
- Save material from being discarded too soon
- Save money through effective reuse
- Reduce waste versus conventional methods of disposal
- Save energy by reuse

Recycling Companies

There are many companies that provide recycling services. There are some that are located in a truck which provides the service to the company requesting the recycling. The truck typically has all of the equipment enclosed inside. The fluids for recycling are collected and brought to the truck for the recycling process.

Within the process there are typically a number of steps. The first step is to define how much the fluid needs to be recycled. What is the purpose of the recycling? Is the goal to remove the solid waste, the liquid waste or both? At some point, someone needs to determine which parameters will determine if the recycled fluid meets the needs of the process where it will be used. For example, a grinding coolant will have smaller fines than a machining coolant. The filtration will have to be finer to remove the solids.

There are other companies that can provide the recycling equipment on-site where the customer has room to house the equipment. This permits the customer to learn how to use the equipment properly so that their recycling practice provides the necessary positive outcome. The fluid in the recycling process is reusable and the waste can provide some level of reward for resale or reuse.

Many processes collect the solids so that they can be resold for reuse or they can be melted down to produce new solids. Liquid waste has to meet certain customer or local government requirements for reuse. Some "tramp oils" can be burned if they don't contain anything hazardous (mostly chlorine). Again, local and federal governments will stipulate the rules for what can be burned. (Please see <http://www.epa.gov>, 40 CFR Parts 148, 261, 264, 265, 268, 271 and 302 for details.)

There are companies that specialize in collecting old oils for reuse. The old oils go through a process to remove moisture, solids and filter the oil to remove other hazardous materials. These old oils can then be resold as reclaimed oil depending upon the state and government regulations.

Re-refined oil is processed just like virgin oil to deal with the different fractions and viscosities. Re-refined oil has to meet the same requirements as virgin oil.

Most used oils are automobile engine oils. They have to be recycled to remove moisture, dirt and other contaminants. They are acceptable after recycling as long as they meet American Petroleum Institute (API) standards for fresh motor oils. Different automotive organizations define the rules for these types of recycled materials.

Filtration

There are many companies that provide filtration capabilities. Central coolant systems use filter paper that the fluid flows through to collect the solids. The spent solids can be recycled (i.e. melted) or disposed of as waste. Filtration can come in many forms:

- Flat filter paper
- Cartridge filters
- Reusable filters
- Screen filters
- Bag filters
- Canister filters



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Again, the whole focus of the filtration is to remove the solids from the process. Filtration can be done via gravity, vacuum or pressure. Gravity and vacuum rely on the density of the fines. Pressure filtration is much faster and more efficient. The level of filtration must be defined for the process where the recycled fluid is to be used.

Coalescers

A coalescer is a device that contains a surface that has a strong affinity for oil. As the contaminated, used fluid flows through the coalescer, the oil is attracted to the surface and “coalesces” the oil. The coalesced oil floats to the surface of the fluid and is removed from the surface by floating weirs. The floating oil is then collected for reuse or disposal.

There are many companies that produce coalescers. The focus should be on devices that permit the coalescing surface to be agitated to remove the oil so that more oil can be collected. Many companies offer coalescers where the coalescing media can be removed, cleaned and replaced. This keeps the coalescer from getting too dirty and permits the device to keep functioning properly.

Magnetic Separators

Another device for removing metallic solids is a metallic separator. The purpose of the separator is to remove the solids via the magnet so that the solids can be removed from the process earlier. Magnetic materials can be resold for recycling and provide a source of income for the customer. This only works for steel and cast iron parts.

Proportioners

After the solids and liquid contaminants have been removed, there is generally a need to replenish the fluid with more concentrate to maintain the correct concentration. This is typically done via a proportioner. A proportioner provides benefits versus just adding concentrate and hoping that it gets mixed into the rest of the fluid properly.

There are a number of suppliers that provide proportioners. The whole purpose of a proportioner is to premix water with the fluid, at a correct concentration, to make sure the dilution is mixed properly. This insures that the adjusted fluid is at the correct concentration and can supply all of the attributes required. This can be done via a Venturi-type device or with a pump that adds a correct amount of fluid into the water.

Limitations

There are limitations as to how far some recycling can go. There has to be enough of the correct ingredients to provide the necessary goals for:

- Lubrication
- Corrosion protection (short term or long term)
- Detergency
- Bioresistance
- Compatibility with the rest of the process

It is the testing of the recycled fluids that determines if the recycling process is keeping up with the necessary requirements. The recycled fluid has to perform as close to brand new fluid as possible. When it does not, it is time to get rid of the recycled fluid.

Summary

The use of recycling equipment is beneficial to the end user and the environment. However, dedicated associates must be assigned to understand and use the recycling equipment properly. This should ensure success of the program.

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