

Building Sustainability into Your Cleaning Process

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Sustainable cleaners are compatible with a wide range of metals and plastics and clean a variety of soils including particulate, grease, wax and oils.



Building sustainability into your cleaning process is a manufacturing effort that has been growing for years. Prior to the turn of the century, most metal fabricating companies and machine shops only concerned themselves with preventing pollution and protecting their workers' health and safety. But over the past two decades their focus has widened. Today, many companies are adding sustainability practices to their policies. This includes efforts like reducing greenhouse gas emissions and improving energy efficiency. It also includes adding recycling programs, managing waste elimination and getting more efficient use out of resources like raw materials or water.

For today's modern metal fabricating company or machine shop, it is no longer enough to produce high quality parts at a good price. Companies must now minimize negative environmental impact, conserve energy and protect natural resources all while protecting the health and well-being of their employees. Meanwhile, these same companies need to stay profitable without compromising product quality or customer's requirements. This is sometimes referred to by sustainability experts as the 'triple bottom line'. The challenge is to meet today's short-term business goals without losing sight of any long-term impact that manufacturing operations might have on the planet and future generations.

Better Cleaning Fluids for Now and the Future

The use of sustainable metal cleaning fluids and methods plays an important role in meeting this new sustainability challenge. Many metal fabricating companies require metal cleaning fluids that perform reliably and safely, but they must also be clean and "green". In addition, the fluids must comply with an increasing number of environmental laws regulating cleaning fluid use and disposal. Growing numbers of regulatory agencies across the globe are increasing legislation and enforcing the laws more stridently in an effort to reduce any negative impact to the planet.

In the US, the EPA added TCE, Perc and nPB to the environmental watch list. Canada and Japan are severely restricting, and are on the verge of banning, these solvents altogether. A phase down of "F-gas" emissions is also in effect in many European countries. Therefore, with each passing year, it makes sense that metal fabricating companies should be proactively upgrading from the less planet-friendly metal cleaning solvents to more modern sustainable alternatives. By proactively changing now, it prepares companies for compliance with regulations not only today, but with those emerging in the future.

Innovating Sustainable Solutions

Fortunately, cleaning fluid manufacturers are innovating sustainable metal cleaning fluids to meet the challenge. The newly emerging regulations are the incentive for them to constantly formulate groundbreaking fluids that have minimal Volatile Organic Compound (VOC) content and low global warming potential (GWP). Due to those efforts, metal fabricators now have access to revolutionary metal cleaning fluid options to help them meet increasingly stringent local, national and global environmental policies.



Sustainable metal cleaning fluids make ideal long-term replacements for less planet-friendly solvents like nPB, Perc and TCE.

Many of the new sustainable metal cleaning fluids are based on HFO (hydrofluoroolefin) technology that offers excellent performance along with improved environmental properties. Unlike the legacy cleaners that were based on HFCs (hydrochlorofluorocarbons), the new cleaning fluids have a very low GWP which helps reduce greenhouse gas effects, and low VOC content to meet strict regional air quality regulations.

The typical GWP of a sustainable metal cleaning fluid is less than 3. This is compared to HFCs that may have GWP ratings in the thousands. In addition, sustainable cleaning fluids have significantly reduced or zero VOC content.

Sustainable metal cleaning fluids are also healthier for workers to be around. The PEL (Permissible Exposure Limit) or OSHA-designated time limit that workers should be exposed to a chemical is much better for sustainable cleaning fluids. Typical permissible exposure levels for the sustainable fluids are 200-250 ppm. Compared with TCE which has a 100-ppm PEL or nPB that is US EPA rated at just 0.1 ppm, the sustainable metal cleaning fluids are significantly better for the safety of exposed workers.

Because of their improved environmental and safety profile, sustainable metal cleaning fluids make ideal long-term replacements for less planet-friendly solvents including HFCs, nPB-based solvents, perchloroethylene (Perc), trichloroethylene (TCE) and hydrofluoroethers. Many companies are replacing those legacy solvents with newer, better alternatives. The new fluids not only meet regulatory demands and protect workers, but they also provide reliable and consistent parts cleaning in existing equipment.

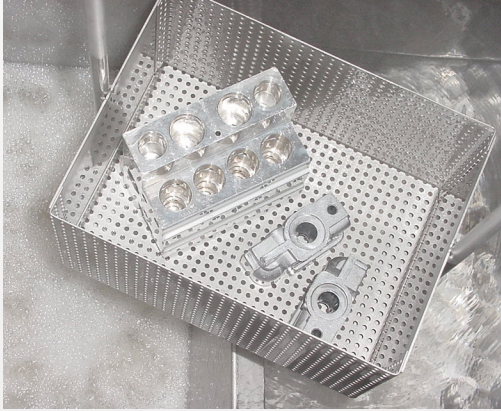
Sustainability And Performance Join Forces

When used in a vapor degreaser, sustainable metal cleaning fluids perform at optimal levels. The sustainable cleaning fluids have high solvency and strong cleaning power. Like the cleaning fluids they are replacing, they feature low surface tension to allow the cleaning fluid to get into, and even more importantly, out of blind holes and other tight openings in the parts without leaving residue behind. They are compatible with a wide range of metals and plastics and clean a variety of soils including particulate, grease, wax and oils. The fluids are also chemically and thermally stable meaning they don't go acid with use, and are nonflammable for workplace safety. Additional advantages of modern, sustainable metal cleaning fluids include:

Improved Cleaning Performance: Using a sustainable metal cleaning fluid improves or increases cleaning consistency. This reduces scrap and rework which lessens the amount of raw materials used to complete an order. Plus, fewer scrapped parts get sent to the landfill.

Conserved Natural Resources: Many of the modern cleaning fluids have a lower boiling point and heat of vaporization than the legacy solvents, reducing the amount of energy needed to heat the cleaner. This reduces fossil fuel consumption resulting in a lower total carbon emission and less greenhouse gas output. In addition, the vapor degreasing process uses zero water, helping ensure future populations will have enough of this vital non-renewable resource.





Sustainable fluids clean well. Plus, they have a very low GWP and low VOC content to meet strict regulations.

Better Waste Management: When used in a vapor degreaser, sustainable metal cleaning fluids are recycled and reused in the degreaser, allowing for hundreds of hours use before they need to be refreshed or replaced. In addition, the vapor degreaser concentrates the soil and contaminants as it works, minimizing the amount of hazardous waste generated.

Easier Maintenance And Recycling: Modern sustainable cleaning fluids do not require the stabilizers, scavengers or weekly acid acceptance testing required of legacy chlorinated solvents, reducing overall maintenance costs. In addition, the fluids are more easily recycled on-site because they do not contain any of the stabilizers or additives required when using legacy solvents.

Good Reputation: A reputation as an eco-efficient, sustainable company can interest potential employees, new customers and even investors. Being planet-friendly is a competitive business advantage.

Solid Workforce: Companies with a good sustainability reputation typically attract and retain more qualified employees who are happy within their workplace. Happier workers tend to perform better and stay longer at their companies, reducing employee turnover and the costs of hiring and training.

The Next Steps For Sustainability

The metal fabricating and machine shop industries are ripe for sustainability. Metalworking companies are implementing sustainable practices in a variety of ways including upgrading their facilities and production processes. Many are converting to LED lighting, replacing outdated air conditioning systems, installing solar panels and adding well-developed scrap metal recycling programs. By moving toward sustainability, they are reducing their resource footprint, safeguarding their employees and complying with environmental regulations.

But while sustainability is about the future of our planet, for many, it is also about ensuring long-term business success. Therefore, it's important that metal fabricating companies and machine shops have production tools and methods that are not only green, but ones that also perform effectively and reliably.

Fortunately, when it comes to parts cleaning, there are a number of sustainable vapor degreasing cleaning fluids that not only clean exceptionally well and are highly cost effective, but are also safe for workers and the planet. They can help manufacturers operate in the most efficient, environmentally sound ways while still producing high-quality parts and keeping their company successful. Plus, they meet evolving regulatory requirements. By upgrading now to more sustainable cleaning fluids many companies can be prepared to not only meet their metal cleaning needs for today, but also be equipped to comply with emerging, long-term regulations well into the future.

For companies looking for help in selecting and using sustainable metal cleaning fluids, it is essential to work with a partner that has sustainable cleaning fluid and vapor degreasing expertise. Based on specific parts make-up and the contamination encountered, they can recommend the sustainable fluids and metal cleaning methods that will work best.



About the Author:

Venesia Hurtubise is a Technical Chemist at MicroCare which offers precision cleaning solutions. She has been in the industry more than 6 years and holds a MS in Green Chemistry from Imperial College. Hurtubise researches, develops and tests cleaning-related products that are used on a daily basis in precision cleaning and medical applications. For more information, visit www.microcare.com.



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