

Soy-based lubricants – A machinist's dream

By Joni Lindauer, Iowa Waste Reduction Center

Traditional metal working fluids are safely used by hundreds of thousands of workers, yet problems can still develop when petroleum fluids are used or when fluids are not properly managed or maintained. When this is the case, metal working fluids have the potential to cause adverse health effects through skin contact with materials and through inhalation from breathing fluid mist or spray. Major health concerns include skin irritation, allergic contact dermatitis, irritation of the eyes, nose and throat, and occasionally, breathing difficulties such as bronchitis and asthma.

In response to these adverse health effects, the New Environmental Technologies for Small Business (NETSB) program at the Iowa Waste Reduction Center (IWRC) has partnered with Environmental Lubricants Manufacturing, Inc. (ELM) and the Agriculture-Based Industrial Lubricants (ABIL) research program at the University of Northern Iowa, to research the benefits and utility of soy-based metal working fluids. In their study with Iowa machine shops, it was found that, in most cases, ELM's manufactured soy-lubricant (formulated with the best-optimized USA-grown natural seed oils and select additives) surpassed the lubricity and performance of petroleum metal working fluids.

ELM currently produces SoyEasy Cool™ - XXL, a semi-synthetic bio-stable, water-soluble metal working fluid concentrate, as well as other soy-based products. Designed to mix with water, SoyEasy Cool™ - XXL forms a stable water-soluble emulsion that provides excellent cooling, lubricity and rust protection for use in a wide variety of grinding and machining operations. This bio-tech based fluid works great for general purpose cutting and grinding; milling tapping and reaming; gear cutting including: hobbing, gun drilling, broaching and shaping; sharpening high-speed steel and carbide cutting tools; and is excellent for use with ferrous material and aluminum.

Perhaps the most beneficial characteristic of such ag-based fluids is their ability to decrease the health hazards previously mentioned and create a safer, healthier work environment. SoyEasy Cool™ - XXL does not contain toxic chlorine or sulfur. Due to its larger cellular composition, it also decreases the amount of mist generated when used. Because of the elimination of toxic chemicals and its vegetable oil base, the occurrence of dermatitis is significantly reduced. Other benefits (besides health) include the reduction of grinding wheel usage, the extension of tool life and improved centricity, accuracy and part run-out. Finally, because it is made from renewable USA-grown crop-based vegetable oils, this fluid can be treated as any other fluid when it comes time for disposal.

Since 1988, the Iowa Waste Reduction Center, a service of the University of Northern Iowa, has strived to meet the needs of Iowa's small businesses in regards to environmental regulations and waste reduction. For additional information regarding the use of soy-based metal working lubricants or on any other environmental issue, please

call Sue Schauls at 319-273-8905. All services provided by the IWRC are free and remain confidential.