



Innovative New Uses for Soy

Soy Oil Helps Machining Industries Cool Tool



In the past, cooling and lubricating machinery in the metalworking industry required a flooding technology that was often wasteful, costly and even a detriment to the performance of advanced machining processes materials and equipment. However, new products featuring soybean oil could solve those problems and establish new technology. The United Soybean Board (USB) and soybean checkoff helped support the development of Cool Tool technology, which is bringing soybean oil into the machining industry.

The Cool Tool system from Cool Clean Technologies uses a new technology called Advanced Minimum Quantity Cooling Lubrication, which incorporates soybean oil and carbon dioxide (CO₂) cooling into a single

process when it comes to metal cutting.

"Soybean oil is very soluble in CO₂, so the Cool Tool system was a natural progression," says David Jackson, chief technical officer of Cool Clean. "Many biobased semisynthetic coolants separate the coolant from the lubrication, but with our system the cooling and lubrication are integrated."

The use of soybean oil and CO₂ results in a much better surface finish that is cleaner and brighter. There is also a noise reduction caused by decreased friction. The reduced friction leads to the machines lasting longer, with more than a 100 percent improvement in the life of the machines when applied properly.

In addition to the performance attributes, the technology using soy oil is better for the environment as well. The site study Cool Clean administered shows that biobased lubricants are more favorable to the health of workers than mineral oil.

"Cool Tool technology allows for a much cleaner operation," says Jackson. "You can clean chips up with a vacuum cleaner and the air quality is much better with less smoke from the machines."

The new technology works with all types of steel, titanium and some carbides. It also shows flexibility when working with previous systems, as operators do not necessarily need to switch out systems. The Cool Tool technology works with existing flooding chemistry.

This project is a good example of the soybean industry partnering with industrial companies to increase the use of soy bioproducts like Cool Tool technologies.

"We'd like to thank the soybean checkoff for funding some of the development work for the Cool Tool system," says Jackson. "We really appreciate the support."

To learn more about Cool Tool, go to <http://www.co2olclean.com/>, to find more information on soy products, go to <http://www.unitedsoybean.org/newuses>.

USB is made up of 64 farmer-directors who oversee the investments of the soybean checkoff on behalf of all U.S. soybean farmers. Checkoff funds are invested in the areas of animal utilization, human utilization, industrial utilization, industry relations, market access and supply. As stipulated in the Soybean Promotion, Research and Consumer Information Act, USDA's Agricultural Marketing Service has oversight responsibilities for USB and the soybean checkoff.