

Sustainable Acquisition Success Story

Product Spotlight on Los Alamos National Laboratory

LANL's Biobased Lubricant Reduces Environmental Footprint and Welding Shop Costs

Los Alamos National Laboratory's (LANL's) Maintenance Site Services (MSS) welding shop is reducing environmental liability while ensuring safe metal cutting operations and avoiding expensive disposal costs.

The machinists cut and drill about 20 tons of metal each week while processing fabrication orders for LANL customers in operations that are time, cost, and labor intensive. The fabrication process involves metal cutting and drilling, producing a considerable amount of heat. Fluid is used to cool and lubricate the metal, blades, and drill bit as well as maximize the life of blade and drill bit.



Legacy oil leaching on shop floor

LANL's Maintenance and Site Services (MSS) welding shop recently replaced traditional oil-based lubricants with a biobased lubricant for use on metal-cutting machinery. Oil-based lubricants previously used during fabricating activities required large amounts of oil, resulting in overspray to workers, equipment, and the general work area. Using a smaller amount of biobased lubricant has positive results in environmental and other areas. Some of those results include: improving safety conditions in areas where slips and falls can occur; biobased lubricant on cut metal produces dry metal shavings suitable for recycling; and the new lubricant is 100% biodegradable and is formulated almost exclusively from water and renewable non-toxic plant-based oils. Additionally, in a cost-savings analysis, the lubricant was found to significantly reduce costs by eliminating the need for oil-based lubricants, coolant treatments, spent oil storage, and waste disposal. As an additional benefit, there is no residue left to store/dispose of. The new lubricant substitute has also reduced the number of labor hours required to complete a welding operation by reducing the amount of time needed to clean the area after using oil-based lubricants. The transition to a biobased product balances potentially conflicting priorities such as cost, performance, and the availability of green equivalents. The results of the process improvement have generated increased efficiencies in metal-cutting operations, improved worker safety, minimized waste generation, and increased LANL's environmental stewardship.

Keys to Success

Challenges

Oil-based lubricants previously used during fabricating activities required large amounts of oil, resulting in overspray to workers, equipment, and the general work area.

Solution

LANL replaced traditional oil-based lubricants with a biobased lubricant to be used on metal-cutting machinery. The lubricant is almost exclusively formulated with water and renewable plant-based oils.

Results/Benefits

- Improves safety conditions by maintaining dry machinery and floors
- Allows recycling of dry metal shavings - a key LANL waste diversion strategy
- Minimizes waste generation
- Non-toxic and biodegradable
- Reduces costs by eliminating the need for oil-based lubricants, coolant treatments, spent oil storage and waste disposal
- Reduces the number of labor hours required to complete welding operation
- Balances potentially conflicting priorities about sustainable acquisition such as cost, performance, and availability of green equivalents.

Product Spotlight



1 gallon of biobased vs. 55-gallon oil-based lubricant

Product Type: Lubricant

Sustainable Attributes: Biobased

Cost per Unit/Unit Type: \$80 per gallon

Brand/Model Number: Coolube lubricant, 2210 EP

Manufacturer: Unist

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