Proposed Item for Biobased Designation

The following biobased product information has been collected to support item designation by USDA for the Federal Biobased Product Preferred Procurement Program (FB4P). This summary reflects data available as of July 26, 2006.

Title: Metalworking Fluids

Description: Concentrates that use either water or other solvents for applications such as cooling and lubricating during the metal removal process, and also for corrosion prevention.

Manufacturers Identified: 16 manufacturers producing Metalworking Fluids have been identified through internet searches, manufacturer's directories, trade associations, and company submissions.

Industry Associations Investigated: The following industry associations have been investigated for member companies producing Metalworking Fluids:

- Biobased Manufacturers Association
- United Soybean Board
- Independent Lubricant Manufacturers Association
- National Lubricating Grease Institute
- Strat Soy
- National Defense Industrial Association
- ASM International
- National Fluid Power Association

Commercially Available Products Identified: Of the manufacturers identified, 45 Metalworking Fluids are commercially available on the market.

Product Information Collected: Specific product information including company contact, intended use, biobased content, and performance characteristics have been collected on 10 Metalworking Fluids.

Industry Performance Standards: Product information submitted by biobased manufacturers indicate that have typically been tested to the following industry standards:

- American Society for Testing and Materials #D3233-93(2003) Standard Test Methods for Measurement of Extreme Pressure Properties of Fluid Lubricants (Falex Pin and Vee Block Methods)
- American Society for Testing and Materials #D3946-92(1997) Standard Test Method for Evaluating the Bacteria Resistance of Water-Dilutable Metalworking Fluids (Withdrawn 2004)
- Readily Biodegradable EPA 560/6-82-003 Monitors the conversion of the test material carbon to carbon dioxide, the product must biodegrade in 28 days to pass

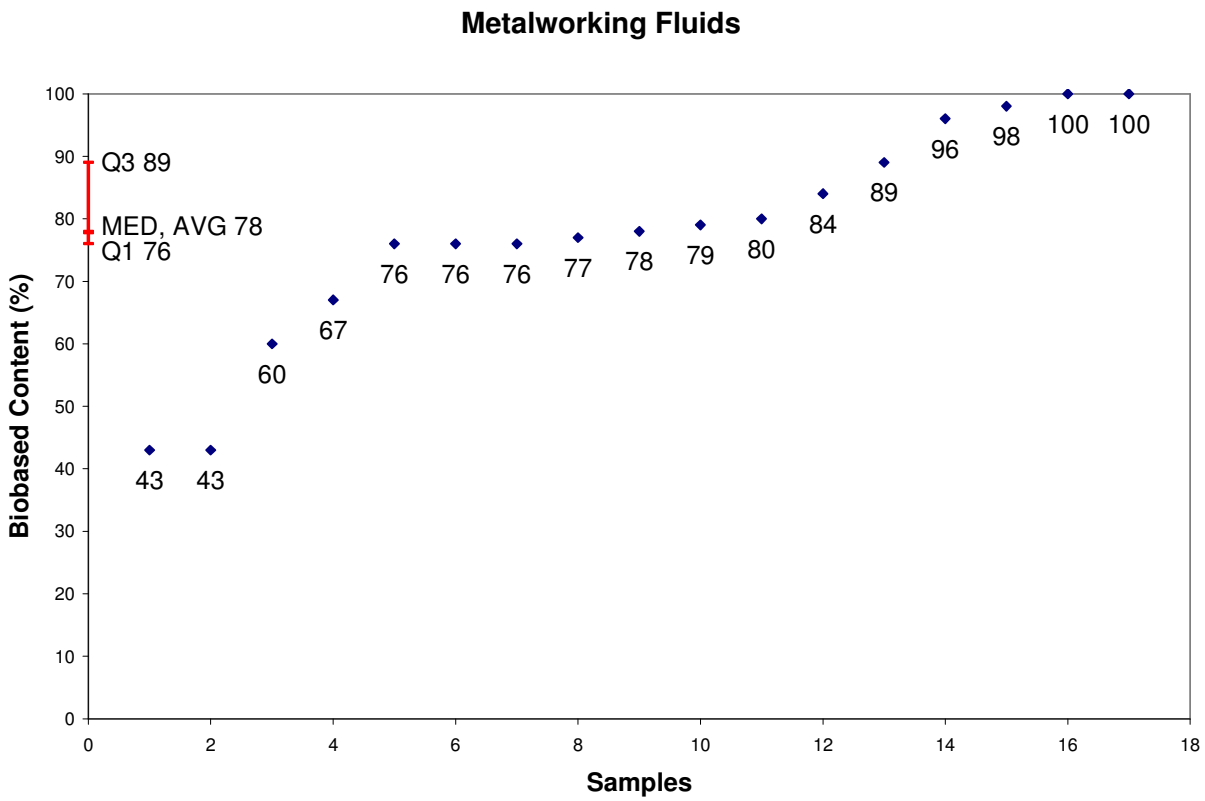
Samples Tested for Biobased Content: 17 samples of Metalworking Fluids have been submitted to independent laboratories for biobased content testing as specified by ASTM standard D6866-04.

Biobased Content Data: Results from biobased content testing of Metalworking Fluids indicate a range of content percentages from 43% minimum to 100% maximum biobased content as defined by ASTM D 6866-04. A detailed distribution of biobased content levels is included as Appendix A.

Products Submitted for BEES Analysis: Life-cycle cost and environmental effect data for 5 Metalworking Fluids have been submitted to NIST for BEES analysis.

BEES Analysis: The life-cycle costs of the submitted Metalworking Fluids range from $0.72 minimum to $20.00 maximum per usage unit. The environmental scores range from 0.0018 minimum to 0.0272 maximum. A detailed summary of the BEES results is included as Appendix B.

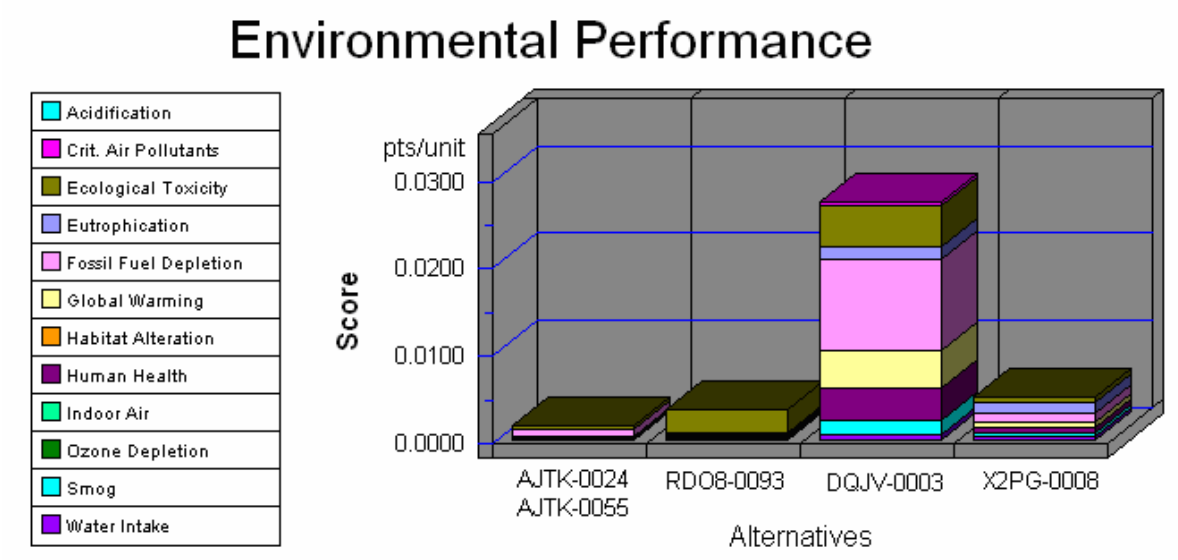
Appendix A - Biobased Content Data



	Manufacturers Identified	Products Identified	C14	BEES
1	AJTK	AJTK-0024	43	yes
2	AJTK	AJTK-0055	43	yes
3	DQJV	DQJV-0003	60	yes
4	WF5U	WF5U-0013	67	
5	X2PG	X2PG-0002	76	
6	X2PG	X2PG-0003	76	
7	X2PG	X2PG-0006	76	
8	D6S7	D6S7-0010	77	
9	X2PG	X2PG-0001	78	
10	X2PG	X2PG-0005	79	
11	AJTK	AJTK-0034	80	
12	X2PG	X2PG-0008	84	yes
13	X2PG	X2PG-0004	89	
14	X2PG	X2PG-0007	96	
15	D6S7	D6S7-0011	98	
16	AJTK	AJTK-0033	100	
17	AJTK	AJTK-0032	100	
18	RDO8	RDO8-0093		yes

Appendix B - BEES Analysis Results

Units: One gallon (diluted and ready for use)

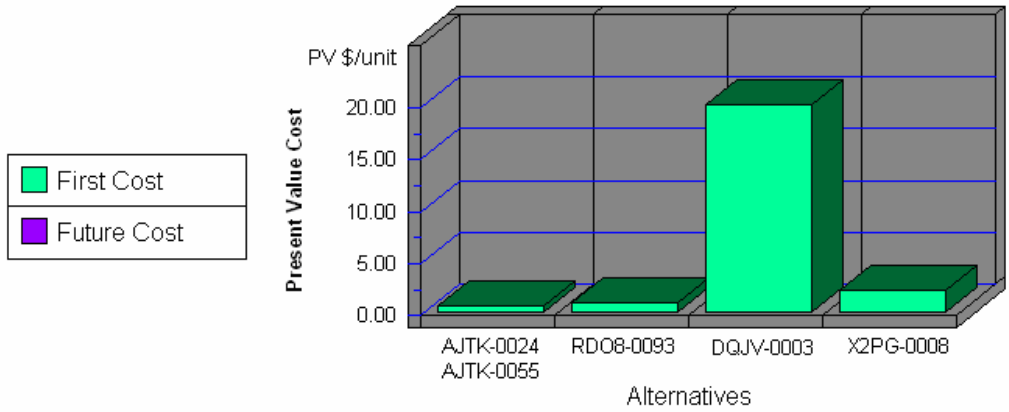


Note: Lower values are better

Category	AJTK-0024 AJTK-0055	RDO8-0093	DQJV-0003	X2PG-0008
Acidification--5%	0.0000	0.0000	0.0000	0.0000
Crit. Air Pollutants--6%	0.0000	0.0000	0.0003	0.0000
Ecolog. Toxicity--11%	0.0004	0.0026	0.0048	0.0007
Eutrophication--5%	0.0001	0.0001	0.0014	0.0012
Fossil Fuel Depl.--5%	0.0008	0.0002	0.0103	0.0010
Global Warming--16%	0.0002	0.0002	0.0044	0.0005
Habitat Alteration--16%	0.0000	0.0000	0.0000	0.0000
Human Health--11%	0.0002	0.0001	0.0037	0.0007
Indoor Air--11%	0.0000	0.0000	0.0000	0.0000
Ozone Depletion--5%	0.0000	0.0000	0.0000	0.0000
Smog--6%	0.0001	0.0000	0.0016	0.0003
Water Intake--3%	0.0000	0.0004	0.0007	0.0006
Sum	0.0018	0.0036	0.0272	0.0050

Appendix B (continued)

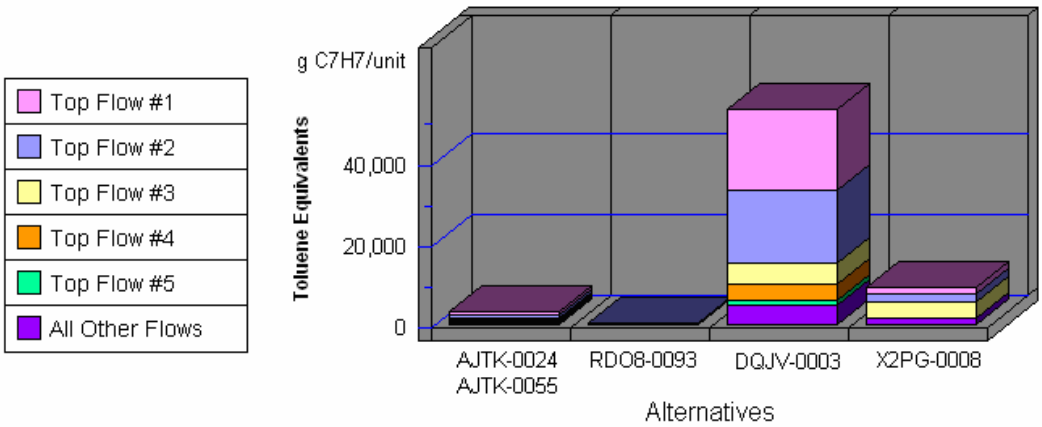
Economic Performance



Category	AJTK-0024 AJTK-0055	RDO8-0093	DQJV-0003	X2PG-0008
First Cost	0.72	0.96	20.00	2.10
Future Cost-- 3.9%	0.00	0.00	0.00	0.00
Sum	0.72	0.96	20.00	2.10

*No significant/quantifiable durability differences were identified among competing alternatives. Therefore, future costs were not calculated.

Human Health by Sorted Flows*



Note: Lower values are better

Category	AJTK-0024 AJTK-0055	RDO8-0093	DQJV-0003	X2PG-0008
Cancer--(w) Arsenic (As3+, As5+	829.54	234.06	19,964.12	1,819.14
Cancer--(w) Phenol (C6H5OH)	922.07	206.06	17,799.96	1,660.53
Cancer--(a) Dioxins (unspecifie	321.28	131.73	5,131.22	3,990.10
Cancer--(a) Arsenic (As)	301.48	118.21	3,938.11	206.49
Noncancer--(a) Mercury (Hg)	381.25	7.91	1,292.02	18.38
All Others	670.09	92.04	4,840.61	1,702.80
Sum	3,425.71	790.02	52,966.04	9,397.44

*Sorted by five topmost flows for worst-scoring product