

Proposed Product Category for Biobased Categorization

The following biobased product information has been collected to support product category designation by USDA for the BioPreferred Program. This summary reflects data available as of January 30, 2007.

Title: Packaging and Insulating Materials

Description: Pre-formed and molded materials that are used to hold package contents in place during shipping or for insulating and sound proofing applications.

Companies Supplying Product Category: 10 companies supplying Packaging Materials 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 supplying Packaging Materials:

- United Soybean Board
- North Dakota Soybean Council
- Sustainable Packaging Coalition

Commercially Available Products Identified: Of the companies identified, 13 Packaging Materials 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 11 Packaging Materials.

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

- ASTM International D6400 Standard Specification for Compostable Plastics
- ASTM International D4169 Standard Practice for Performance Testing of Shipping Containers and Systems
- Military Specification MIL-P-1120b Cushioning material. uncompressed bound fiber
- Military Specification MIL-P-1120c Cushioning material. uncompressed bound fiber (Metric measurements)

Samples Tested for Biobased Content: 2 samples of Packaging Materials have been submitted to independent laboratories for biobased content testing as specified by ASTM standard D6866-04.

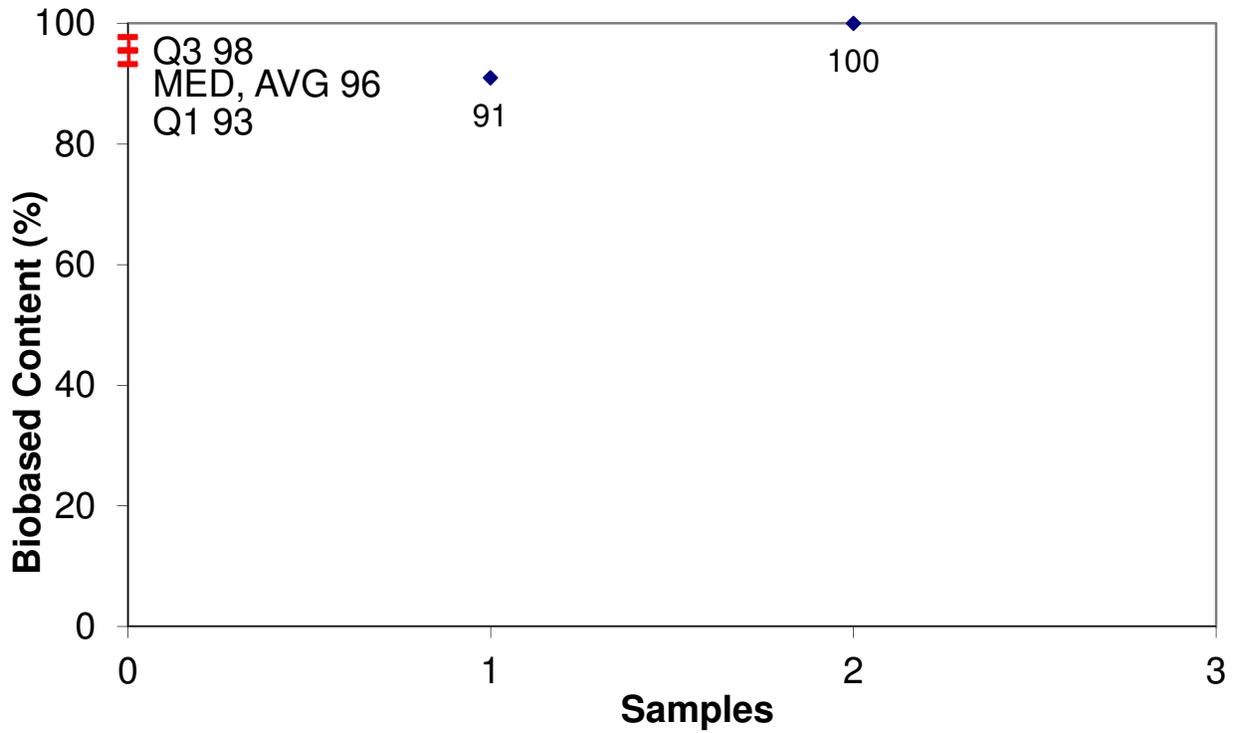
Biobased Content Data: Results from biobased content testing of Packaging Materials indicate a range of content percentages from 91% minimum to 100% maximum biobased content as defined by ASTM D 6866-04. A detailed distribution of biobased content levels is included as Appendix A.

Products Submitted for BEES Analysis: Life-cycle cost and environmental effect data for 1 Packaging Materials has been submitted to NIST for BEES analysis.

BEES Analysis: The life-cycle cost of the submitted Packaging Material is \$4.95 per usage unit. The environmental score is 0.0007. A detailed summary of the BEES results is included as Appendix B.

Appendix A - Biobased Content Data

Packaging and Insulating Materials

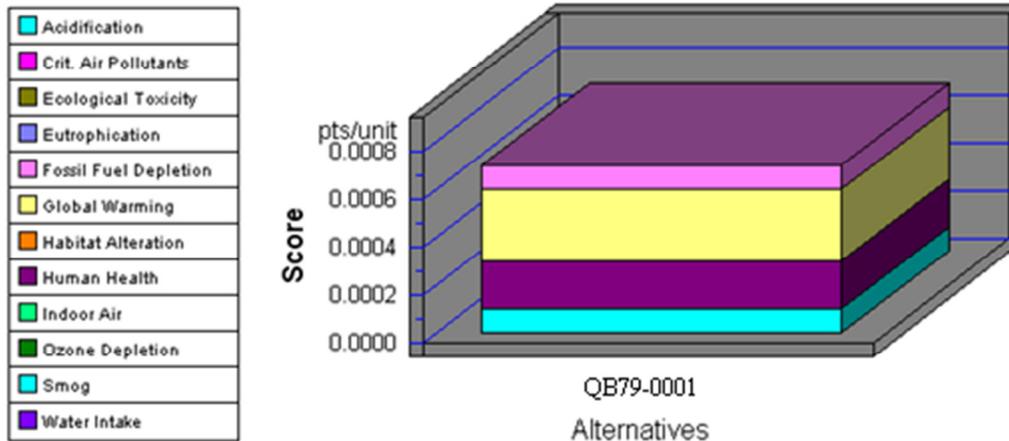


	Company	Product	C14	BEES
1	HH8H	HH8H-0001	91	
2	QB79	QB79-0001	100	Yes

Appendix B - BEES Analysis Results

Functional Unit: 1 cubic foot

Environmental Performance



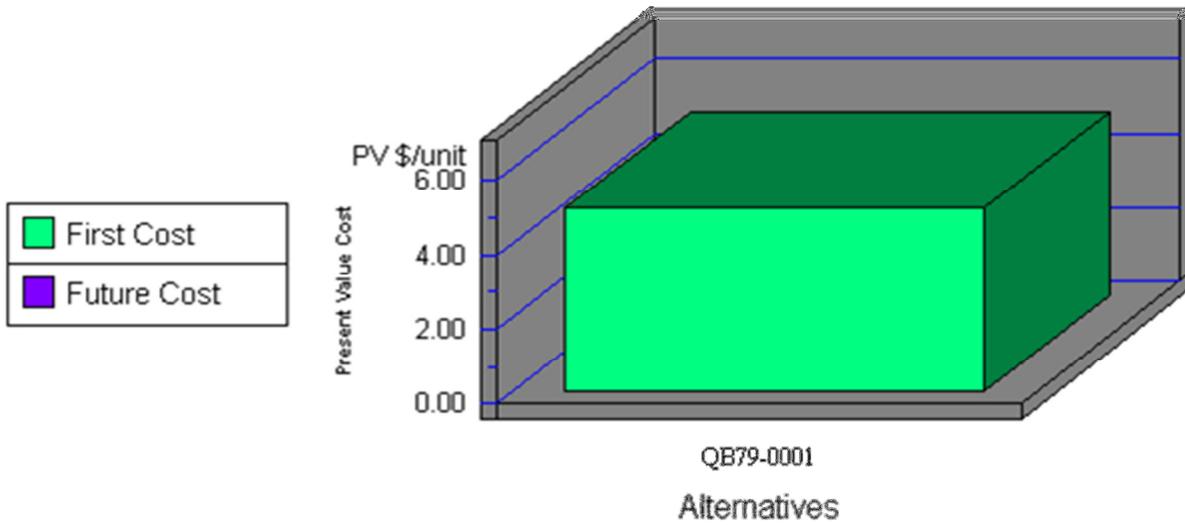
Note: Lower values are better

Category	QB79-0001
Acidification-3%	0.0000
Crit. Air Pollutants-9%	0.0000
Ecolog. Toxicity-7%	0.0000
Eutrophication-6%	0.0000
Fossil Fuel Depl.-10%	0.0001
Global Warming-25%	0.0003
Habitat Alteration-6%	0.0000
Human Health-13%	0.0002
Indoor Air-3%	0.0000
Ozone Depletion-2%	0.0000
Smog-4%	0.0001
Water Intake-8%	0.0000
Sum	0.0007

Packaging and Insulating Materials		
Impacts	Units	QB79-0001
Acidification	millimoles H ⁺ equivalents	7.48E+01
Criteria Air Polutants	microDALYs	1.13E-02
Ecotoxicity	g 2,4-D equivalents	3.26E-01
Eutrophication	g N equivalents	7.12E-02
Fossil Fuel Depletion	MJ surplus energy	3.89E-01
Global Warming	g CO ₂ equivalents	2.27E+02
Habitat Alteration	T&E count	0.00E+00
Human Health--Cancer	g C ₆ H ₆ equivalents	1.10E-01
Human Health--NonCancer	g C ₇ H ₈ equivalents	8.59E+01
Indoor Air Quality	g TVOCs	0.00E+00
Ozone Depletion	g CFC-11 equivalents	1.08E-08
Smog	g NO _x equivalents	1.96E+00
Water Intake	liters of water	0.00E+00
Functional Unit	-----	1 cubic foot

1 Following are more complete descriptions of units: Acidification: millimoles of hydrogen ion equivalents; Criteria Air Pollutants: micro Disability-Adjusted Life Years; Ecological Toxicity: grams of 2,4-dichlorophenoxy-acetic acid equivalents; Eutrophication: grams of nitrogen equivalents; Fossil Fuel Depletion: megajoules of surplus energy; Global Warming: grams of carbon dioxide equivalents; Habitat Alteration: threatened and endangered species count; Human Health-Cancer: grams of benzene equivalents; Human Health-NonCancer: grams of toluene equivalents; Indoor Air Quality: grams of Total Volatile Organic Compounds; Ozone Depletion: grams of chloroflourocarbon-11 equivalents; Smog: grams of nitrogen oxide equivalents; and Water Intake: liters of water.

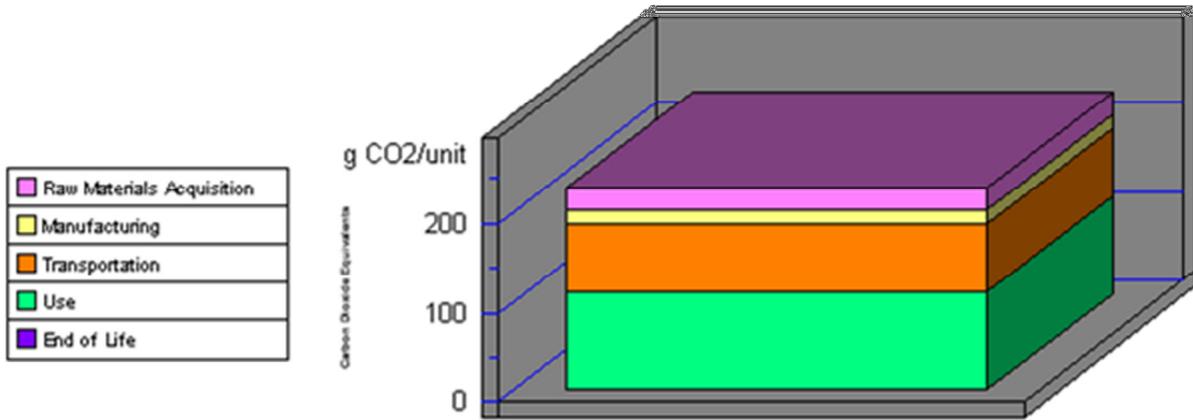
Economic Performance



Category	QB79-0001
First Cost	4.95
Future Cost- 3.0%	0.00
Sum	4.95

*This is a consumable product. Therefore, future costs are not calculated.

Global Warming by Life-Cycle Stage



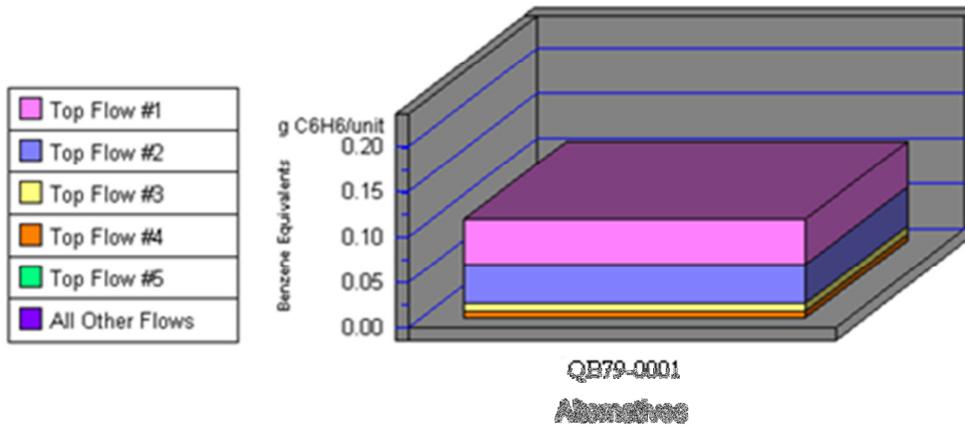
QB79-0001

Alternatives

Note: Lower values are better

Category	QB79-0001
1. Raw Materials	25
2. Manufacturing	15
3. Transportation	76
4. Use	110
5. End of Life	0
Sum	227

Human Health Cancer by Sorted Flows*

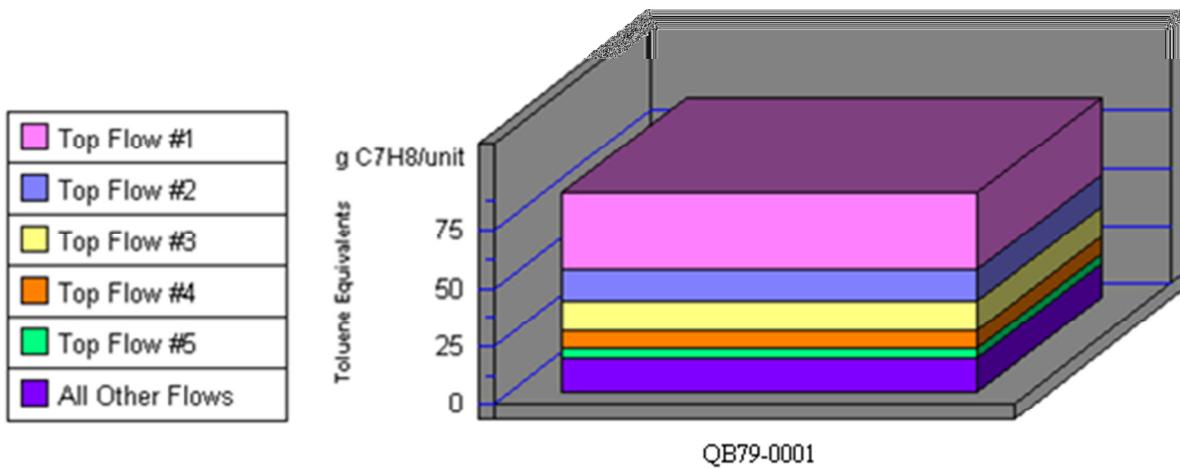


Note: Lower values are better

Category	QB79-0001
Cancer-(v) Arsenic (As3+, As5+)	0.05
Cancer-(g) Phenol (C6H5OH)	0.04
Cancer-(g) Dioxin (unspecific)	0.01
Cancer-(g) Arsenic (As)	0.01
Cancer-(g) Benzene (C6H6)	0.00
All Others	0.00
Sum	0.11

*Sorted by the highest flow for most-oncing product

Human Health Noncancer by Sorted Flows*



Alternatives

Note: Lower values are better

Category	QB79-0001
Noncancer-(v) Barium (Ba++)	32.67
Noncancer-(v) Lead (Pb++, Pb4+)	13.85
Noncancer-(v) Chlorine (m-spec)	12.59
Noncancer-(v) Mercury (Hg)	6.08
Noncancer-(v) Mercury (Hg+, Hg)	3.92
All Others	14.79
Sum	85.92

*Sorted by five topmost flows for worst-scoring product