ISO-17025 Accredited Testing Laboratory

PJLA ISO/IEC 17025:2005 Testing Accreditation # 59423

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Explanation of Results

Biobased Analysis using ASTM-D6866-10, August 2010

The application of ASTM-D6866 to derive a "Biobased content" is built on the same concepts as radiocarbon dating, but without use of the age equations. It is done by deriving a ratio of the amount of radiocarbon (14C) in an unknown sample to that of a modern reference standard. The ratio is reported as a percentage with the units "pMC" (percent modern carbon). If the material being analyzed is a mixture of present day radiocarbon and fossil carbon (containing no radiocarbon), then the pMC value obtained correlates directly to the amount of Biomass material present in the sample.

The modern reference standard used in radiocarbon dating is a NIST (National Institute of Standards and Technology) standard with a known radiocarbon content equivalent approximately to the year AD 1950. AD 1950 was chosen since it represented a time prior to thermo-nuclear weapons testing which introduced large amounts of excess radiocarbon into the atmosphere with each explosion (termed "bomb carbon"). This was a logical point in time to use as a reference for archaeologists and geologists. For an archaeologist or geologist using radiocarbon dates, AD 1950 equals "zero years old". It also represents 100 pMC.

"Bomb carbon" in the atmosphere reached almost twice normal levels in 1963 at the peak of testing and prior to the treaty halting the testing. Its distribution within the atmosphere has been approximated since its appearance, showing values that are greater than 100 pMC for plants and animals living since AD 1950. It's gradually decreased over time with today's value being near 105.5 pMC. This means that a fresh biomass material such as corn would give a radiocarbon signature near 105.5 pMC.

Combining fossil carbon with present day carbon into a material will result in a dilution of the present day pMC content. By presuming 105.5 pMC represents present day biomass materials and 0 pMC represents petroleum derivatives, the measured pMC value for that material will reflect the proportions of the two component types. A material derived 100% from present day soybeans would give a radiocarbon signature near 105.5 pMC. If that material was diluted with 50% petroleum carbon, it would give a radiocarbon signature near 53 pMC.

A biomass content result is derived by assigning 100% equal to 105.5 pMC and 0% equal to 0 pMC. In this regard, a sample measuring 99 pMC will give an equivalent Biobased content result of 94%. This value is referred to as the MEAN BIOBASED RESULT and assumes all the components within the analyzed material were either present day living or fossil in origin.

The results provided in this report involved materials provided without any source information. This situation is highly probable in a real life situation. The MEAN VALUE quoted in this report encompasses an absolute range of 6% (plus and minus 3% on either side of the MEAN BIOBASED RESULT) to account for variations in end-component radiocarbon signatures (a conservative approximation). It is presumed that all materials are present day or fossil in origin and that the desired result is the amount of biobased component "present" in the material, not the amount of biobased material "used" in the manufacturing process. The most conservative interpretation of the reported percentages is as maximum values.

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Summary of Results : Biobased Determination using ASTM-D6866-10

Date Received	August 24, 2010
Date Reported	August 30, 2010

Laboratory Number	Submitter Label	Material	ASTM-D6866 Method	Mean Biobased Result*
Beta-283380	OMICA-MSM	Biobased Solid	METHOD-B	100%

Authorizing Signature:

Darden Hood, President

* ASTM-D6866 cites precision on The Mean Biobased Result as +/- 3% (absolute). This is the most conservative estimate of error in the measurement of complex biobased containing solids and liquids based on empirical results. Real precision for readily combustible and homogenous materials (e.g. gasoline) and especially samples recieved as CO2 (e.g. flue gas or CEMS exhaust) can be as low as +/- 0.5-2%. The result only applies to the analyzed material. Fluctuations in carbon content within a batch of product, gasoline or flue gas must be determined separately (e.g. averaged measurements of multiple solids or liquids, and single measurement of the combination of gas aliquots collected over time). The accuracy of the result as it applies to the analyzed product, fuel, or flue gas relies upon all the carbon in the analyzed material originating from either recently respired atmospheric carbon dioxide (within the last decade) or fossil carbon (more than 50,000 years old). "Percent biobased" specifically relates % renewable (or fossil) carbon to total carbon, not to total mass or molecular weight. Mean Biobased estimates greater than 100% are assigned a value of 100% for simplification.

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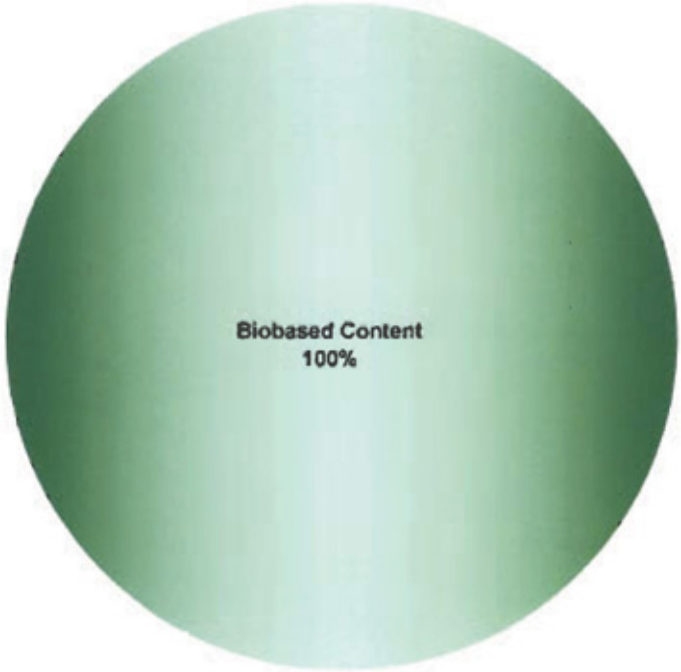
Report of Biobased Content Analysis using ASTM-D6866-10

Submitter Label:	OMICA-MSM
Laboratory Number:	Beta-283380
Material Analyzed:	Biobased Solid
Date Received:	August 24, 2010
Date Reported:	August 30, 2010

Mean Biobased Result: 100% *

Proportions Biobased vs. Fossil Based
indicated by ^{14}C content



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