

Dear Sir / Madam:

We believe the Australian National Greenhouse and Energy Reporting System Technical Guidelines for the Estimation of Greenhouse Emissions and Energy at Facility Level should include the use of ASTM D6866 'Standard Test Methods for Determining the Biobased Content of Natural Range Materials Using Radiocarbon and Isotope Ratio Mass Spectrometry Analysis' for the measurement and verification of biogenic/biomass CO₂. This well proven method is particularly useful for measuring heterogeneous fuels (i.e. mixture of biomass with fossil fuel materials). It is particularly useful for determining the biogenic carbon fraction of heterogeneous fuels such as municipal solid waste or tires. The method works well with any type of sample (gas, liquid or solid).

We believe copies of ASTM D6866 are available through Standards Australia or direct from ASTM.

The ASTM D6866 method is a standardized version for industrial use of radiocarbon dating, an analytical technique that was developed in the 1950's. Radiocarbon dating has been used for decades for dating archaeological artifacts. The same principles of dating (i.e. analysis of the carbon 14 atom) can also be used to measure the biomass component of materials. In effect, biomass contains a well characterized amount of carbon 14 that is easily distinguished from other materials such as fossil fuels that do not contain any carbon 14. Since the amount of carbon 14 in biomass is well known, a percentage of biogenic carbon (or in the case of a gas sample, CO₂) can be calculated easily from the overall carbon atoms (or CO₂) in the sample.

Although ASTM D6866 is now used throughout the world to measure biomass carbon / CO₂, the origins of the method are American. It was written at the request of the USDA to satisfy legislation requiring Federal agencies to give preferred procurement to manufacturers using the greatest amount of biomass in their products (per the Farm Security and Rural Investment act of 2002). It was quickly established that radiocarbon dating was the only viable accurate technique to make the determination of the biomass percentage. A working standard of radiocarbon dating for industrial use was completed in 2004 and is now cited in US Federal Law (7 CFR part 2902).

ASTM D6866 is currently under consideration for California's AB 32 program.

A variant of ASTM D6866 (CEN 15591:2007) is used to monitor Refused Derived Fuels for the European Union's Emission Trading Scheme. The European Union also allows the use of ASTM D6866 for monitoring other types of heterogeneous fuels. Lastly, the Renewable Obligation Certificate program in the United Kingdom is considering this method for monitoring biomass energy production.

In addition, the analytical method can be used with a CEMS (Continuous Emissions Monitoring System) to measure the biogenic fraction of the CO₂ gas emitted from the combustion. This can be useful where fuel sampling is difficult. The CEMS can be retrofitted with a gas bag apparatus to capture the CO₂ at whatever interval the operator desires (i.e. daily, weekly, monthly). If a CEMS is not available, a gas sample can be taken directly from the stack.

To support our argument to include ASTM D6866 as a verification and measurement tool in the Australian National Greenhouse and Energy Reporting System Technical Guidelines, we have attached the following two documents:

1. The draft version of the California Mandatory Greenhouse Gas (GHG) Emissions Reporting Protocol (Please see sections A-78 and A-80).
2. The independent study by Fichtner/Columbia University commissioned by the Renewable Energy Association for the United Kingdom's Renewable Obligation Certificate Program. This study demonstrates the clear advantages of using ASTM D6866 for determining the biogenic CO2 fraction.

The long history of radiocarbon dating with decades of exhaustive research on the variables effecting the analytical technique make radiocarbon dating a robust analytical tool for monitoring biomass carbon/CO2. The standardized version now available with ASTM D6866 only strengthens its applicability for monitoring and verifying biomass emission sources and we would recommend that it be adopted in the Technical Guidelines.

If you require any further information please do not hesitate to contact us.

Sincerely,

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Director

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