

BTU Measurements for Waste Fuel

Technical Note

The Customer

The company engages in the design, manufacture, and sale of machinery for decomposing petroleum-based materials. The company uses microwave technology for recovering hydrocarbons and fossil fuels from sources such as tires, oil shale, capped wells, coal, automotive shredded residue, municipal solid waste, shale deposits and waste oil streams.

The Process

Different products such as rubber, plastic, horse manure, chicken fat etc. are shredded and put on a conveyor belt in batches. They are passed through a microwave furnace. The material is bombarded with microwaves at high frequencies. Any condensables go through a condenser and they are left with a liquid and/or gas fuel sample. These fuel gases are mostly methane and hydrogen with some amounts of propane, propylene and butane. This fuel is then used as a source of energy for other processes in the plant.

The Problem

They were utilizing on-board gas chromatography and a mass flow meter spectrometer to determine the BTU of their batched sample product. They were looking to have an online, real time measurement with a calorimeter type analyser. They wanted to determine the BTU content at any given time so their customers would know the fuel energy of their samples.

The Solution

They chose the CalorVal BTU Analyser because it completely burns the sample and therefore is a direct measure of Total Calorific Value. It is designed for real-time readings with a less than 5 second response time. Unlike the GC which has preset look up tables, the CalorVal features "Universal Calibration" which provides a highly uniform response to a wide variety of gases and solvents; regardless of what is in the sample stream.

Sensor Measurement

The measurement range is typically from 900-2200 BTU/SCF depending on the material that is being gasified. During the prototype phase the CalorVal measurements were compared to the results of an outside lab and the customer was satisfied with the analyser's accurate performance.