

Comparison between the μ Wave and the LMA-200 Moisture Analyzers from Omnimark

The Balance

The μ Wave balance is comprised of approximately 200 components that must be assembled by trained craftsmen. With the assembly of all of these parts there is a substantial tolerance stack-up. The LMA-200 is CNC milled from one block of aerospace grade aluminum alloy. There is no tolerance stack-up and no potential of human error in assembly with the LMA-200.

The μ Wave balance, being comprised of various metals is extremely sensitive to temperature fluctuations. These thermal changes cause the balance to drift because of the differing expansion, contraction co-efficients of the different metals. The LMA-200 is not affected by temperature swings because it is constructed of one monolithic metal.

The μ Wave exhibits balance drift and lag in responding to fixed weight changes. This problem is called hysteresis and is pronounced within the μ Wave due to the elasticity of the balance flexures and how they are affixed to the differing metals within the balance. The LMA-200 is not affected by hysteresis by its monolithic state of the art construction and design.

The balance within the LMA-200 is closer to “zero” drift than any moisture analyzer ever designed.

Microwave Energy Output

The μ Wave emits 100% microwave energy no matter what power level is programmed in to the unit. If the μ Wave is set at 50% power that means that a duty cycle turns the magnetron on and off half the time. At 30% power, 100% microwave energy is being emitted but only in a duty cycle approximately one third of the time. The μ Wave can only be programmed between 30 and 100% power in 10% increments. The LMA-200 utilizes an inverter that controls the voltage to the magnetron enabling the instrument to run at any given power level from 5 to 100% in one percent increments. This is a much better control of the energy emitted and is a significant benefit for running samples that require lower microwave power settings.

Finalization of a Test

The μ Wave can be programmed to finalize a test on a fixed time or by the utilization of a field sensor. This field sensor looks at the return of microwave energy and once a constant rate of return is registered over a pre-programmed period of time the instrument will finalize. Depending on the microwave absorption characteristics of a given type of sample the field sensor may finalize without all of the moisture being driven from the sample.

In addition to being able to run a fixed-time test, the LMA-200 is capable of finalizing a test based on weight change over time or by a humidity sensor within the chamber or a combination of the above.

Mechanical Design

With constant use the chamber exhaust and magnetron cooling fans must be cleaned. The μ Wave has over 25 screws that must be removed in order to reach these fans. The LMA-200 has filters in front of each fan that can be removed directly to be cleaned without any disassembly of the unit.

The LMA-200 also offers a large color touch-screen display for optimal viewing of data and graphs as well as programming of the instrument.

Unique to Sartorius's microwaves is a cylindrically designed chamber. A focused emission of microwave energy is channeled vertically through dual apertures at the bottom of this chamber. This concentrates the microwave energy specifically to the sample. During the test, a carousel spins the sample permitting an even distribution of microwave energy. This prevents hot and cold spots from occurring, a familiar problem with conventional type microwave analyzers.

Gary Beebe
gary.beebe@sartorius.com

Sartorius Mechatronics
1320 S. Priest Drive
Tempe, AZ 85281

Phone 800-835-3211
Fax 480-784-4738
www.sartorius-omnimark.com