

**AGTRON M-BASIC/II**  
**COFFEE ROAST ANALYZER**  
**OWNERS MANUAL**

Special Applications  
Abridged Spectrophotometer

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# **AGTRON MODEL M-BASIC II COFFEE ROAST ANALYZER** **OPERATION MANUAL**

04/05/04

## **I. INITIAL SET-UP**

- Carefully remove the analyzer from the shipping box.
- Inspect the analyzer for any sign of shipping damage.

*Contact Agtron immediately if any damage is apparent. A shipping claim for damage will need to be filed as soon as possible.*

**IMPORTANT:** *Keep the box and all packing material. Any unit returned to Agtron for service must be shipped in the original packaging or Agtron will not accept the unit.*

The carton contains the following items:

- M-BASIC II Analyzer
- Power Cord
- Rectangular Metal Tray
- Two Plastic Sample Dishes
- One Two-Sided Calibration Disk Set
- One Life Disk
- This Operation Manual

- Place the Analyzer on a clean level surface.
- Keep the cooling fan vent on the back of the unit free of obstruction.
- Avoid placing the unit where it will be in direct sunlight.
- Fully open the sample drawer by pulling it straight out until it hits the bumper stop.
- Place the LIFE DISK in place under the drawer with the handle facing down, flat side up, so that the disk handle fits into the mating hole in the bottom of the analyzer. The life disk may have marks or scratches on the surface. This is normal and will not affect performance.

**NOTE:** *The life disk is a very low reflectance target and prevents the Analyzer from going over- scale when the sample drawer is opened.*

- Place the rectangular sample dish tray into the cutout on the sample drawer top so that it recesses into the cutout.

**NOTE:** Always keep the sample drawer in the fully closed position when not in use. Always keep the sample dish holder installed in the sample drawer.

- Fully close the sample drawer.

- Connect the AC power cord to its mating socket on the back of the unit. The power cord is supplied with a surge protector attached. It is strongly recommended that you use this surge protector.
- Make certain that the plug is firmly seated.

**WARNING:** *Check that the Agtron is correctly configured for both your Mains Voltage and Frequency. Contact Agtron immediately if a power incompatibility exists. Do not attempt to connect to either an incorrect Voltage or Frequency line. Use only a 3-prong earth grounded connection. Do not bypass the power cord grounding pin or serious electrical shock to the operator and damage to the unit may occur.*

- Connect the unit to AC mains power.

**NOTE:** *The M-BASIC II has no ON / OFF power switch and will **power-up** as soon as it is connected to mains power. Always leave the unit on (connected to power). The Analyzer uses very little power, about as much power as a 15-watt light bulb.*

- The LED numeric display should illuminate.
- Contact Agtron immediately if the Display does not illuminate.

## II. CALIBRATION PROCEDURE

- Calibration should always be performed before testing product.
- *There are two Agtron scales used by the coffee industry, the Gourmet Scale and the Commercial Scale. The M-BASIC II uses the Gourmet Scale. The E10CP reads the Commercial Scale, and the E20CP can be calibrated to read either scale. The Gourmet Scale offers higher resolution (shows a greater difference in scores between two roast classifications), than the Commercial Scale.*
- Remove the two-sided Calibration Reference Disk-set and dish from its storage box.

**NOTE:** *The two-sided Calibration Reference Disk-set supplied with the analyzer is your permanent calibration reference. Disk-sets are matched by serial number to a specific Analyzer and can only be used with that unit.*

- **There is an adhesive calibration label affixed to the side of the Calibration Reference Disk dish.**
- **Write down the Reference Scores for both the black and gray disks located on the calibration label.**

**NOTE:** *Avoid touching the surface of the disks. Periodically clean the disk surfaces with a soft cotton cloth using very light pressure and a 20% solution of Windex and distilled water. Keep the disk set stored in the box provided and away from direct sunlight or heat. Never leave the reference calibration disk set in the analyzer. Never use the dish supplied with the Calibration Reference disk set for coffee samples.*

**IMPORTANT:** *Always place the disk-set into the shallow side of the dish.*

- ❶ Fully open the sample drawer.
- ❷ Place the Calibration Reference Disk into the shallow side of the dish **gray side** facing up. Place the dish/disk into the sample tray in the drawer. Make certain that the dish sits flat and fully into the recess in the tray.
- ❸ Fully close the sample drawer.
- ❹ Adjust the “SET HIGH” calibration knob so that the value on the display corresponds with the Gray Score value on the calibration label.
- ❺ Fully open the sample drawer.
- ❻ Turn the Calibration Reference Disk over into the shallow side of the dish so that the **black side** is facing up.
- ❼ Place the Calibration Reference Disk-set back into the sample tray.
- ❽ Fully close the sample drawer.
- ❾ Adjust the “SET LOW” calibration knob so that the value on the display corresponds with the Black Score value on the calibration label.
- ❿ Repeat steps ❶ through ❾ until the calibration disk reference scores and the scores displayed by the analyzer coincide without the need for adjustment.

Place the two-sided disk set into its storage box and close the cover.

***The M-BASIC II is now ready to read product.***

### **III. MEASURING ROAST CLASSIFICATION**

#### **How Does the AGTRON M-BASIC II Evaluate Roast Development?**

The M-BASIC II does not look at the color of the coffee or the lightness or darkness of a sample. Instead, it measures the amount of near-infrared energy at specific wavelengths reflected from the surface of a sample. The wavelengths selected relate to compounds that directly correlate to the development of soluble organics. The entire flavor of coffee is related to soluble organics. By ignoring color, the old school method, and concentrating on the development of organic compounds, the M-BASIC II is capable of identifying subtle changes introduced by various roasting strategies. It also provides a much more accurate and repeatable method for controlling roast consistency.

#### **A. FACTORS AFFECTING ANALYTICAL RESULTS**

As with any piece of analytical equipment, good sample preparation is important if meaningful and repeatable results are to be achieved.

##### **Sample Temperature**

Samples should always be analyzed at room temperature. Never evaluate a hot or warm product, as this will affect the score.

##### **Grind Specification**

The grind coarseness / fineness affects the amount of surface that the analyzer sees. It is important to have a grind similar to the CBC standard for auto-drip. A screen specification is included for reference. (See attachment). If you do not have access to screens, you can adjust the grind by observing the surface of the coffee during sample preparation. When the particles plow (form waves) during a third pass, the grind is too coarse. If the surface compacts, compresses and cakes, the grind is too fine. What may look like an identical surface to the eye can appear quite different to the analyzer.

##### **Time from Roasting / Cooling / Grinding, to Analysis**

Once coffee is roasted, it acts like organic compost and begins to decompose. Since the M-BASIC II is a system based on chemistry, it will see the change of decomposition much in the same way you taste it in the cup. A sample's score can change (lower) as much as 4 points in 24 hours. To eliminate this variable, it is important to analyze samples as soon as possible after roasting /cooling. Within 15 minutes is preferable.

##### **Roast Classification, Whole Bean and Ground**

The M-BASIC II is designed to evaluate both whole bean and ground samples. A sample is first analyzed as whole bean and then as ground. The difference between the two scores approximates how uniformly or non-uniformly the sample is roasted. The character of the cup changes with different roast uniformity. While both measurements should be included in a comprehensive QC program, it is the ground score that determines cup

development (roast classification). For any given product, it is ultimately the ground roast score that should be the focus of controlling product consistency.

## **B. SAMPLE PREPERATION**

### **Whole Bean Sample Preparation**

Pour the whole bean sample into the deep side of the sample dish. Put enough coffee into the dish to form a flat surface that is level with the edge of the dish. Use your hand or a straight edge to pat the surface until it is flat.

### **Ground Coffee Sample Preparation**

Once you obtain the whole bean score, grind the same sample into the shallow side of the sample dish. Overfill the dish. Use a straightedge (a wood ruler with a metal edge insert works very well) to level the surface. Hold the straight edge perpendicular to the top surface. Rest the straightedge the rim of the dish and make a sweeping motion to the opposite side. Repeat this motion starting at the opposite side. Avoid compressing or overworking the sample. The surface of the coffee should be flat and uniform with no voids or irregularities. Make certain that the sample covers the entire area of the dish, including the edges.

## **AGTRON ROAST ANALYZER SAMPLE GRIND SPECIFICATION**

*WEIGHT OF COFFEE RETAINED ON SCREEN #10 & #14: 3.5%  
(0.0% - 3.5%)*

*WEIGHT OF COFFEE RETAINED ON SCREEN #20 & #28: 71.5%  
(65.0% - 75.0%)*

*WEIGHT OF COFFEE PASSING THROUGH SCREEN #28: 25.0%  
(25.0% - 35.0%)*

## **C. MEASURING COFFEE SAMPLES**

- ① Check the calibration
- ② Place the prepared whole bean or ground sample to be evaluated into the drawer sample tray.

⑤ Fully close the sample drawer. Take care to avoid moving the drawer quickly or abruptly to avoid disturbing the sample. Once the reading settles, record the sample score.

## **D. CONVERTING GOURMET SCORES TO COMMERCIAL SCORES**

M-BASIC II product readings can be converted to Commercial Scores with the following equation:

$$\text{Commercial Score} = (X+C) \times B$$

**Where: X = Gourmet Score (M-Basic II Reading)**

**C = 1.528**

**B = 0.7429**

## **IV. PERIODIC MAINTENANCE**

### **A. CLEANING THE FAN FILTER MEDIA**

The fan filter media should be cleaned with a mild soap and warm water solution or replaced periodically. If the analyzer is used in a clean laboratory environment, it may require attention every six months. If the analyzer is used in the production environment, it may require cleaning as frequently as once a week.

***CAUTION: DO NOT REMOVE THE FOUR SCREWS HOLDING THE FAN IN PLACE. The screws hold the entire fan assembly in place and do not need to be removed to remove the filter media.***

There is a snap-in frame that holds the media in place. Use a small screwdriver or knife to snap-out the inner frame holding the media. Remove the media and clean thoroughly with the warm water/soap solution. Dry the filter, align it in the fan frame, and snap the retaining frame back in place.

### **B. CLEANING THE DISKS**

Agtron calibration disk surfaces should be kept clean and free of contaminants. Clean disk surfaces periodically using a soft, lint free cloth and 20% solution of Windex and distilled water. Be careful not to scratch the disk surface.

### **C. STORING THE TWO-SIDED CALIBRATION DISK**

Keep the two-sided calibration disk in its box and away from direct sunlight whenever the disk-set is not in use. Never leave the disk-set in the analyzer.

### **D. CLEANING THE ANALYZER INTERIOR**

Unplug the analyzer. Remove the LIFE DISK from under the sample drawer. Remove the rectangular sample tray. Use compressed air to blow out any product that may have accumulated on the inside of the unit.

#### **E. CLEANING THE LED DISPLAY & ANALYZER EXTERIOR SURFACE**

Use a soft cloth moistened with a 20% solution of water and Windex to clean the LED display window.

**CAUTION: *Do not apply too much pressure to the LED or you might crack the window glass or damage the LED.***

Use Windex at full strength and a soft cloth to clean all other analyzer exterior surfaces.

**GOURMET SCALE / COMMERCIAL SCALE / SCAA TILE  
GROUND COFFEE SCORE CORRELATION**

<u>CLASSIFICATION</u>	<u>GOURMET SCALE</u>	<u>COMMERCIAL SCALE</u>	<u>SCAA TILE</u>
Undeveloped	100	75.4	-NO TILE-
Extremely Light	95	71.7	#95
<b>①</b>	<b>90</b>	<b>68.0</b>	-NO TILE-
Very Light	85	64.3	#85
	80	60.6	-NO TILE-
Light	75	56.9	#75
	70	53.1	- NO TILE-
Medium Light	65	49.4	#65
	60	45.7	-NO TILE-
Medium	55	42.0	#55
	50	38.3	-NO TILE-
Medium Dark	45	34.6	#45
	40	30.8	-NO TILE-
Dark	35	27.1	#35
<b>②</b>	<b>30</b>	<b>23.4</b>	-NO TILE-
Very Dark	25	19.7	#25
Extremely Dark	20	16.0	-NO TILE-
Organic Matter Reduced To Carbon	0	0.0	-N/A-

① Agtron 90 Score similar to Cinnamon Roast

② Agtron 30 Score represents the nominal development for Italian / French Roast

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**WARRANTY**  
**and**  
**Return for Repair Procedures**

Agtron Inc. warrants this product to be free of defects in material and workmanship for a period of one year from date of purchase (date of invoice). This warranty is valid only to the original customer.

This warranty does not extend to Agtron equipment used for any than its intended application, to external appearance or damage resulting from improper installation, line voltage, alteration, misuse, neglect, or abuse.

Agtron equipment requiring warranty repair should be returned under a Return For Repair authorization number (RFR) provided by Agtron and repackaged in the original shipping container and packing materials. Warranty repairs must be accompanied by a copy of the original sales invoice as proof of date of purchase. The customer must pay return freight and insure the unit for full value. Agtron will not assume the responsibility for any shipping damage; Agtron will pay the return freight.

Unit returned for service should not include additional hardware, instruction manual, or other inclusions.

**AGTRON, INC.** \_\_\_\_\_  
*Reno, Nevada USA*

Year 2001

**CE MARKING  
DECLARATION OF COMPLIANCE**

This declaration certifies that this product is in total compliance with CE - Marking and CE Legislation.

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Certified  
Agtron, Incorporated