

## **Glyphosate in Green Coffee Sample Grinding of Whole Green Coffee Beans**

### **1. Intended Use**

For grinding whole green coffee beans for analysis of the presence of glyphosate with ABRAXIS® Glyphosate ELISA, Microtiter Plate, or ABRAXIS® Glyphosate Strip Test.

Presented are two procedures, one for use with an Ika® Tube Mill, the other for use with a Vitamix® Professional Series 750 blender; both of which are equally effective with either glyphosate test method provided by Gold Standard Diagnostics.

The grinding procedure validated for use with the Ika® Tube Mill requires smaller samples to efficiently grind, and may employ separately-purchased Ika® individual disposable grinding chambers (MT 40) enabling multiple samples to be ground easily without risk of cross-contamination. Therefore, it is recommended whenever the amount of available sample is limited, when cross-contamination must be absolutely avoided, or when many unique samples must be ground separately.

The grinding procedure validated for use with the Vitamix® Professional Series 750 blender is capable of processing large amounts of sample. This method is therefore useful, in combination with a well-distributed sampling method, when one wishes to take a sampling from a bulk material and ensure that test material is representative of the larger bulk.

Either method may be adapted for use with equivalent grinding devices, at the discretion of the user.

### **2. Materials and Reagents Required**

Analytical Balance

Disposable spatulas, VWR part no. 80081-190 or equivalent

500 µm (USA Standard #35) sieve (optional)

Sample storage container with lid

Ika® Tube Mill Grinding Procedure

Metal hammer or mallet

Disposable zipper seal plastic bags (4 MIL heavy duty)

Ika® Tube Mill control (part no. 0004180001) with individual disposable grinding chambers (MT40) (optional) or equivalent (countertop coffee grinder, blender, etc.)

Vitamix® Professional Series 750 blender Procedure

Vitamix® Professional Series 750 blender

### **3. Notes and Precautions**

For the procedure described in section 4.1 below, a sample size of at least 30 grams of whole green coffee beans must be used. Use of a smaller sample size may result in a non-representative sample and may produce inaccurate (biased high or biased low) sample results.

For the procedure described in section 4.2 below, the crushed coffee beans should be mixed thoroughly before adding the crushed sample to the tube mill grinding chamber. Use of crushed samples that have not been thoroughly mixed may result in a non-representative sample and may produce inaccurate (biased high or biased low) sample results.

Use of the Ika® Tube Mill grinder with less than 15 grams of crushed sample may result in a non-representative sample and may produce inaccurate (biased high or biased low) sample results. Use of greater than 15 grams of crushed sample may result in longer grind times and less efficient sample grinding. If larger final sample amounts are necessary, multiple tube mill ground batches of a single sample can be combined and then must be thoroughly mixed before use. Lack of thorough mixing may

result in a non-representative sample and may produce inaccurate (biased high or biased low) sample results.

Sample can accumulate along the sides of the container of the Vitamix® Professional Series 750 blender, beyond the diameter of the grinding blade. The included agitation rod can be used while the machine is running to reintroduce sample to the blade and continue grinding, but care must be taken when opening the port on the lid to do so whilst the blender is running.

Be aware when using the Vitamix® Professional Series 750 blender that the motor is extremely powerful and the speed of the blade can produce enough heat through friction to begin cooking the sample. If the vessel feels hot to the touch, pour sample out of the container and wait until both are cool, then continue grinding.

If processing multiple samples, the vessel in which the sample is ground must be thoroughly washed then rinsed with deionized or distilled water between samples to prevent cross-contamination, which would produce inaccurate (biased high or biased low) sample results. If employing the Ika® Tube Mill, individual disposable grinding chambers may be purchased to omit the need for washing between samples.

If desired, a 500 µm sieve can be used after grinding with either method to ensure uniform sample consistency. The sieve must be thoroughly washed then rinsed with deionized or distilled water between samples to prevent cross-contamination, which would produce inaccurate (biased high or biased low) sample results.

Samples should be stored at room temperature in appropriately labeled storage containers.

#### **4. Grinding Procedure, Ika® Tube Mill**

- 4.1. Add 30 grams of green coffee beans to an appropriately labeled zipper seal plastic bag and close tightly. Place a clean sheet of paper under the bag. Using a hammer, thoroughly crush green coffee beans. If plastic bag tears and begins to lose sample, transfer sample to a new bag and continue crushing coffee beans until no whole beans remain in sample.
- 4.2. Transfer 15 g of crushed green coffee beans from step 4.1 to a clean disposable grinding chamber. Using maximum speed on the tube mill grinder (25,000 rpm), grind for 3 minutes. Repeat 3 minute grinding cycle two times for a total of 3 grinding cycles, scraping down the sides of the chamber with a clean disposable spatula between each cycle.

*Note: If required, a 500 µm sieve can be used after grinding to ensure uniform sample consistency.*

- 4.3. The sample is ready for extraction using the Glyphosate in Green Coffee Bean Sample Extraction technical bulletin.

#### **5. Grinding Procedure, Vitamix® Professional Series 750 blender**

- 5.1. Add 250 or more grams of green coffee beans to the blending container, and grind for 10 minutes at speed setting 5 or until the beans have been coarsely broken.
- 5.2. Using maximum speed on the blender (Speed setting 10), grind for 5 minutes. Repeat 5 minute grinding cycle two times for a total of 3 grinding cycles, or until the sample has been thoroughly and homogeneously powdered, scraping down the sides of the chamber with a clean disposable spatula between each cycle.

*Note: If required, a 500 µm sieve can be used after grinding to ensure uniform sample consistency.*

- 5.3. The sample is ready for extraction using the Glyphosate in Green Coffee Bean Sample Extraction technical bulletin.

#### **6. For ordering or technical assistance contact:**

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Date this Technical Bulletin is effective: 05/16/2024

Version: 01