TotalTox™ Fumonisin

Catalog AQ 411 BG *Part #12866*

Matrix and Detection Summary:

Matrix Group ID	Protocol	Results reported in the range of:	Limit of Detection (LOD)*	Highest Approved Level*
FM MG1 – Corn	Base Range	0 - 10 ppm	0.10 ppm	10 ppm
	Dilution A	0 - >100 ppm	2.0 ppm	100 ppm
FM MG2 - DDGS	Base Range	0 - 15 ppm	0.20 ppm	15 ppm
	Dilution A	15 - >100 ppm	15 ppm	100 ppm
FM MG3 - Corn flour	Base Range	0 - 10 ppm	0.20 ppm	10 ppm
FM MG4 - Sorghum	Base Range	0 - 10 ppm	0.20 ppm	10 ppm
	Dilution A	0 - >100 ppm	10 ppm	100 ppm
FM MG5 - Masa flour	Base Range	0 - 5 ppm	0.40 ppm	5 ppm
FM MG6 – Corn Gluten Meal (CGM)	Base Range	0 - 8 ppm	0.4 ppm	8 ppm
	Dilution A	8 – 38 ppm	8 ppm	38 ppm
FM MG7 – Corn germ	Base Range	0 - 12 ppm	0.2 ppm	12 ppm
	Dilution A	12 - 75 ppm	12 ppm	75 ppm
FM MG9 - Corn Fermented Protein	Base Range	0 - 20 ppm	3 ppm	20 ppm
FM MG 10 – Wheat	Base Range	0 - 10 ppm	0.5 ppm	10 ppm

**Do not assume accuracy for results reported below the protocol's LOD or above the protocol's highest approved level.*

Scan to View Verified Matrices:

Important Notes:

- Before testing, the enclosed Multi-Matrix Barcode Card (MMBC) must be scanned just once for each kit lot to upload information to the QuickScan
- QuickScan Software Version 5.9 or later is required
- **Verified Matrix** is a customer-specific sample type that has been rapidly and reliably tested using EnviroLogix strips through our agile Matrix Addition process—delivering fit-for-purpose protocol guidance where full validation is not required. Because the samples used in verification may not represent global sample variation, Verified Matrices are not covered under the EnviroLogix limited warranty. We recommend evaluating performance using your own samples prior to incorporating a Verified Matrix into your operations.
- **Validated Matrix** are listed in the table on page 1 and are covered under the EnviroLogix limited warranty.

A Summary Guide for testing is provided on Page 14-16. More details for each step in the process are described below and are important for achieving optimal, accurate results.

Matrices

Note: Scanning the Multi-Matrix Barcode Card once per kit lot is required. The QuickScan software will prompt users to select a Matrix Group (MG) before proceeding to the result screen. **If you only plan to test matrices within the MG1 group (Corn), scan the side of the MMBC card that only has the MG1 barcode. This allows the software to skip the Matrix Group selection step.**			
▪ Corn ▪ Sorghum ▪ Corn flour ▪ Corn Germ	**SET A** PROCEDURE: PAGE 6	▪ DDGS ▪ CGM ▪ CFP	**SET B** PROCEDURE: PAGE 7
		▪ Masa flour	**SET C** PROCEDURE: PAGE 9
		▪ Wheat	**SET D** PROCEDURE: PAGE 10

Intended Use

TotalTox™ Fumonisin is designed to quickly provide quantitative results for the presence of total fumonisins. Matrix and Detection Summary on Page 1 lists the Limit of Detection (LOD) and Assay Range for each matrix.

How the Test Works

A composite sample is collected, ground, and extracted to solubilize any fumonisin present. The extract is further diluted into Buffer before being run on the test strip. Each strip has an absorbent pad at each end. The sample extract travels up the test strip and is absorbed into the larger pad at the top of the strip. At the end of the reaction time, the strip is cut at the top of the arrow tape, the bottom pads are discarded, and the strip is inserted into the QuickScan reader to obtain quantitative results.

Matrix specific extractions and analysis protocols are chosen for accuracy and precision. Each matrix is assigned to a Matrix Group (MG). Each MG has a common standard curve, Limit of Detection (LOD), and maximum reported value. When the user selects the MG during testing, the QuickScan System software reads the test strip, retrieves information encoded in the strip's barcode and on the Multi-Matrix Barcode Card (MMBC), and uses the appropriate curve to obtain a result for the matrix being tested.



Contents of Kit:

- 50 TotalTox Strips packed in a moisture-resistant canister
- 50 reaction tubes
- 100 pipette tips (1-200 µL)
- DB5 Buffer
- Multi-Matrix Barcode Card - kit lot specific

Items Not Provided:

- 50 EB17 dissolvable pouches (1 pkt per 25g sample)
- QuickScan System*
- Incubator (base + block)*
- Bunn grinder or equivalent
- 20-mesh screen (available through Seedburo or other vendor)
- Digital scale for weighing samples
- Extraction cups with lids* or other suitable vessels for sample extraction
- Graduated cylinder*
- Orbital/rotary shaker
- Pipette to deliver 100 µL*
- Pipette to deliver 50 µL (for Dilution A if desired)*
- Pipette to deliver larger volumes (for Dilution A if desired)*
- EB18 Extraction Buffer* for DDGS, Corn Gluten Meal, and/or Corn Fermented Protein (see Notes, p.4, for more info)
- Timer
- Scissors
- Distilled, deionized or bottled water

*Available as Accessories

***Available Accessories:**

Item	*Catalog No.*	*Part #*
QuickScan™ System	ACC 351	13065
TotalTox Extraction Set (EB17), 50	ACC 117	12938
TotalTox EB17/EB18 Extraction Set *(includes10X EB18 Extraction Buffer Concentrate and EB17 Extraction Buffer pouches, for DDGS, CGM, or CFP)*	ACC 114	12978
5 oz Sample cups/lids *Case of 500; for extracting samples up to 30g*	20-0047	10167
10 oz Sample cups/lids *Case of 100; for extracting samples >30g*	20-0129	12383
13 oz Sample cups/lids *Case of 24; for extracting 50g DDGS samples only*	20-0131	13968
Graduated cylinder (100 mL)	ACC 068	11207
MiniPet pipette 100 µL	ACC 041	11202
EB18 Extraction Buffer 10X Concentrate *See instructions and SDS under 'Notes'*	KR 270-530	11930
Coffee filters (100)	ACC 083	11434
Centrifugation Set: *Disposables for 50 tests*	ACC 010	11214
Microcentrifuge	ACC 064 E	11204
50g Sample Extraction Set *Additional EB17 dissolvable pouches and sample cups (100)*	ACC 099	12409
DB5 Buffer *Additional Buffer for DDGS, requires > 100 µL per Strip*	KR-266-7	11665
Dilution Set: *Blue dilution tubes and EB17 dissolvable pouches for 50 tests*	ACC 103	12500
Dilution Tubes: *Blue dilution tubes for non-EB17 dilution, 50*	ACC 098	12236
MiniPet pipette 50 µL	ACC 051	11203
1 mL adjustable pipette	ACC 1303-PRO-1000	11964
Pipette tips for 1 mL pipette (50)	20-0127	12243
Incubator	ACC BSH301	12458

Precautions – Read First!

SAFETY

Disposal of fumonisin-contaminated materials. Follow your facility's safety procedures for disposal of samples and extracts potentially containing or known to contain fumonisin.

Sample Preparation

1. Collect a composite sample according to your own sampling plan or USDA/FGIS (formerly GIPSA) guidelines. Consult USDA reference documents to help design a plan that fits your needs. Contact Technical Support for more information.
2. Grind samples to provide a consistency such that 95% passes through a 20-mesh sieve.
3. Mix ground material thoroughly before sub-sampling, to minimize variability.
4. Weigh 25-50g samples (or 10g for Masa Flour and Corn Fermented Protien) into containers that will allow enough head room for the liquid to move forcefully when shaken vigorously.

Sample Clarification

Depending on the sample matrix, there may be multiple acceptable methods for removing particulate from the extract. Refer to Matrix Group instructions (pages 6-9) or Summary Table (pages 14-16).

Centrifugation	Filtration
1. Fill a microcentrifuge tube with extract. 2. Centrifuge for the specified time at 2000 x *g* (rcf, ***not rpm***). 3. Use the top layer of extract for all matrices except flour and corn germ; there may be a solid floating layer above that extract that should not be used for testing.	1. Add an approved coffee filter (e.g. BUNN Part #BUNBCF100B) to a clean vessel. 2. Pour extract into filter. Wait no more than 2 min. 3. Pull back the filter to access the filtered extract.

Testing in Base Range

Refer to Matrix Group instructions (pages 6-9) or Summary Table (page 14-16) for base range testing.

Range with Dilution

If after running and reading the test, the initial result is greater than the upper end of the Base Range, some samples can be diluted and retested to extend quantitation (see Summary on Page 1). Combine extract with the appropriate Dilution Reagent to create a diluted extract. Measure carefully and mix well.

Dilution Reagent

Corn/MG1; Sorghum/MG4	*Corn Germ/MG7*	*DDGS/MG2*
EB17 Dilution Solution: Dissolve 1 EB17 pouch in 150 mL of water and mix well; Dilution Solution mixture will appear cloudy. Label, date, and document the preparation. Dilution Solution can be stored at ambient temperature for 30 days. Thoroughly mix before use.	**EB17** Dilution Solution: Dissolve 1 EB17 pouch in 200 mL of water and mix well; Dilution Solution mixture will appear cloudy. Label, date, and document the preparation. Dilution Solution can be stored at ambient temperature for 30 days. Thoroughly mix before use.	**EB18** Dilution Solution: Dissolve 1 EB17 pouch in 150 mL of **1X** EB18 Buffer and mix well; Dilution Solution mixture will appear cloudy. Label, date, and document the preparation. Dilution Solution can be stored at ambient temperature for 30 days. Thoroughly mix before use.

Corn/Sorghum Extended Range: Testing samples at levels greater than 10 ppm (> 10 ppm in Base Range)

A1. Mix 700 µL Dilution Reagent + 50 µL clarified extract in a blue Dilution Tube or other suitable vessel.

A2. Rerun assay as before Example: for corn, pipette 100 µL DB5 + 100 µL of the diluted extract into a new reaction tube; place tube in 22°C incubator for 2 min^, add a new test strip, and wait 4 minutes for test results. Note: for sorghum extended range, the diluted extract volume is 200 µL (see Summary Table page 12).

A3. In the QuickScan Results Screen, use the dilution tab pull down menu to select Dilution A (1:A). The System will adjust and display the fumonisin level from diluted samples. Adjusted results are valid in the range of **2-100 ppm** for corn or **10-100** ppm for sorghum.

DDGS Extended Range: Testing samples at levels greater than 15 ppm (> 15 ppm in Base Range)

B1. Mix 700 µL Dilution Reagent + 100 µL clarified extract in a blue Dilution Tube or other suitable vessel.

B2. Rerun assay as before (see Page 7). Example: for DDGS, pipette 200 µL DB5 + 100 µL of the diluted extract into a new reaction tube; place tube in 22°C incubator for 2 min^, add a new test strip, and wait 5 minutes for test results.

B3. In the QuickScan Results Screen, use the dilution tab pull down menu to select Dilution A (1:A). The System will adjust and display the fumonisin level from diluted samples. Adjusted results are valid in the range of **15-100 ppm**.

Corn Germ Extended Range: Testing samples at levels greater than 12 ppm (> 12 ppm in Base Range)

C1. Mix 500 µL Dilution Reagent + 50 µL clarified extract in a blue Dilution Tube or other suitable vessel.

C2. Rerun assay as before (see Page 6). Example: for Corn Germ, pipette 100 µL DB5 + 100 µL of the diluted extract into a new reaction tube; place tube in 22°C incubator for 2 min^, add a new test strip, and wait 6 minutes for test results.

C3. In the QuickScan Results Screen, use the dilution tab pull down menu to select Dilution A (1:A). The System will adjust and display the fumonisin level from diluted samples. Adjusted results are valid in the range of **12-75 ppm**.

Corn Gluten Meal Extended Range: Testing samples at levels greater than 8 ppm (> 8 ppm in Base Range)

C1. Mix 500 µL of water + 100 µL clarified extract in a blue Dilution Tube or other suitable vessel.

C2. Rerun assay as before (see Page 7). Example: for Corn Gluten Meal, pipette 100 µL DB5 + 100 µL of the diluted extract into a new reaction tube; place tube in 22°C incubator for 2 min^, add a new test strip, and wait 5 minutes for test results.

C3. In the QuickScan Results Screen, use the dilution tab pull down menu to select Dilution A (1:A). The System will adjust and display the fumonisin level from diluted samples. Adjusted results are valid in the range of **8-38 ppm**.

^ The tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F).

Use of the QuickScan System

Detailed instructions for use of the QuickScan System are supplied with each unit and can also be found at www.envirologix.com/support. The lot-specific Multi-Matrix Barcode Card (MMBC) must be scanned into the system prior to testing. In summary, a strip is inserted into the reader and the strips are read by touching or clicking on the "Read Test" area of the screen. The "Select Matrix Groups" screen will appear if more than one barcode was scanned into the system from the MMBC. Select the group that displays the matrix run. Results are then recorded in an electronic worksheet, allowing each user to report and track data easily.

Kit Storage

This Kit should be stored refrigerated. Note the shelf life on the kit box. Prolonged exposure to high temperatures may adversely affect the test results; protect all components from extreme hot or cold temperatures. Do not leave in direct sunlight or in a vehicle. Do not open the desiccated canister until ready to use the strips.

Cross-reactivity

The following mycotoxins have been tested with this kit and no false positive results occurred at the 100 ppm level: Aflatoxin, DON (deoxynivalenol), T2, Zearalenone.

Notes

- This product is currently not applicable for use in testing any other crops beyond those specified in this Product Insert.
- Pipettes lose calibration accuracy over time. Calibrate or replace pipettes at least annually.
- Immediate shaking of the sample after water addition is critical to ensure the EB17 packet does not cause clumps which may interfere with test results.
- This assay is calibrated against reference samples supplied by Trilogy Analytical Laboratory, Washington, MO, and other vendors and associated HPLC data.

- As with all screening tests, it is recommended that results be confirmed by an alternate method when necessary.
- The assay has been optimized for use with the protocols provided in the kit. Deviation from these protocols may invalidate the results of the test. Room temperature components, proper and thorough mixing, timing, and accurate pipetting are essential to accurate results.
- The results generated through the proper use of this diagnostic tool reflect the condition of the working sample directly tested. Extrapolation as to the condition of the originating lot, from which the working sample was derived, should be based on sound sampling procedures and statistical calculations which address random sampling effects, non-random sampling effects and assay system uncertainty. A negative result obtained when properly testing the working sample does not necessarily mean the originating lot is entirely negative for the analyte in question.
- **EB18 Extraction Buffer – IMPORTANT NOTES:** If used, the 10X EB18 Extraction Buffer should be considered an irritant (SDS available at https://www.envirologix.com). Avoid contact with the skin, eyes, or clothing. Wear personal protective equipment including safety glasses, gloves, and a lab coat when handling.
  - When 10X EB18 is stored refrigerated, a crystalline precipitate may form on the bottom of the container. Warm the buffer to room temperature to resolubilize prior to diluting to the working concentration. The use of a warm water bath and gentle mixing is recommended.
  - **To prepare 1X EB18 Buffer Solution:** Mix 1 part 10X EB18 Extraction Buffer with 9 parts of water.
  - 1X EB18 solution expires one week from date of mixing when stored at room temperature, or 4 weeks when stored at 2-8°C. Bring to room temperature before using.

Set A: Corn, Sorghum, Corn Flour, Corn Germ

- Review Sample Preparation on Page 2 and 3 for grinding consistency and notes.
- Turn on the incubator and set to 22°C for a minimum of 10 minutes before testing. Ensure that the temperature display has stabilized and indicates "OK" before starting the assay. All reagents should be at room temperature.
- Use distilled, deionized, or flat (non-carbonated) bottled water.
- If testing 50-gram samples, additional EB17 Buffer pouches and larger extraction vessels are required (50g Sample Set, order Catalog No. ACC-099).

Sample Extraction

Corn, Sorghum, Corn flour	25g	Add 1 EB17 pouch to sample Add 75 mL water	Wet sample immediately, by vigorously shaking for 10 seconds by hand. If needed, shake the sample against the palm of your other hand or a hard surface to loosen up any dry sample areas. **Immediately** proceed to next shaking step.
	50g	Add 2 EB17 pouches to sample Add 150 mL water	
Corn Germ	25g	Add 1 EB17 pouch to sample Add 100 mL water	

Shake: choose mechanical shaker or hand shaking

Shaker Table: mix at highest speed (≥ 300rpm) for 1 minute	***By Hand:*** shake vigorously for 2 minutes

Clarify Extract: Centrifuge or filter:
(corn flour filter only, corn germ centrifuge only)

Centrifuge: 30 seconds or 2 min for Corn Germ at 2000 x *g* (rcf, ***not rpm***)	***Filter:*** Pour through approved coffee filter (ACC 083); wait no more than 2 minutes

Combine Buffer and Extract, then Run Test Strips

1. Add DB5 to the Reaction Tube (discard tip)
2. Add clarified extract to the Reaction Tube
3. Mix thoroughly with extract pipette tip, discard tip
4. Place the Reaction Tube in the 22°C incubator; equilibrate for 2 minutes. Note: tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)
5. Add test strip to tube, arrows down, wait 6 minutes (run time)
6. Immediately cut strips at the top of the arrow tape (discard bottom pads)
7. Insert strip into QuickScan Reader

TIPS!

Get Complete Extraction
- Fully wet samples before the next shaking step
- Avoid delay between water addition and shaking
- Assure liquid is moving forcefully though the sample while shaking

For Best Performance
- Pipette up and down while mixing
- Read strips promptly after run time

Avoid Contamination
- Use a new Reaction Tube per test
- Keep DB5 capped, when possible
- Use new pipette tips for each step

TABLE A: Set A Matrix Summary (base range)

Matrix	LOD (ppm)	Add to sample extraction vessel in order (choose 25 or 50g):		Shake	Clarify	Reaction Tube	Run
Corn Sorghum Corn flour	0.1 0.2 0.2	A1. 25g sample A2. 1 x EB17 A3. 75 mL water	B1. 50g sample B2. 2 x EB17 B3. 150 mL water	1 min – shaker or 2 min – by hand	Filter* or Centri-fuge	100 µL DB5 + 100 µL extract	4 min
		(immediately shake by hand 10 sec)					
Corn Germ	0.2	A1. 25g sample A2. 1 x EB17 A3. 100 mL water (immediately shake by hand 10 sec)			Centri-fuge		6 min

**Corn flour: filter only*

Set B: DDGS, Corn Gluten Meal, Corn Fermented Protein

- Review Sample Preparation on Page 2 and 3 for grinding consistency and notes.
- Turn on the incubator and set to 22°C for a minimum of 10 minutes before testing. Ensure that the temperature display has stabilized and indicates "OK" before starting the assay. All reagents should be at room temperature.
- Purchase ACC-114, EB17/EB18 Set for ease of extraction (CGM/100 samples, DDGS/50 samples)
- Prepare **1X** EB18 Extraction Buffer from 10X concentrate (see Notes, Page 4, for preparation instructions and SDS). Use distilled, deionized, or flat (non-carbonated) bottled water.
- If testing 50-gram samples, additional EB17 Buffer pouches (catalog number ACC-114) and larger extraction vessels (catalog number 20-0131) are required.

Sample Extraction

DDGS	25g	Add 1 EB17 pouch to sample Add 100 mL 1X EB18 Extraction Buffer	Wet sample immediately, by vigorously shaking for 10 seconds by hand. If needed, shake the sample against the palm of your other hand or a hard surface to loosen up any dry sample areas. **Immediately** proceed to next shaking step.
	50g	Add 2 EB17 pouches to sample Add 200 mL 1X EB18 Extraction Buffer	
CGM	25g	Add 1 EB17 pouch to sample Add 100 mL 1X EB18 Extraction Buffer	
CFP	10g	Add 50mL 1X EB18 Extraction Buffer	

Shake: choose mechanical shaker or hand shaking

Shaker Table: mix at highest speed (≥ 300rpm) for 1 minute	***By Hand:*** shake vigorously for 2 minutes

Clarify Extract: Centrifuge or filter through approved coffee filter (ACC-083); wait no more than 2 min (*filter method available only for DDGS*)

Centrifuge: 30 seconds (DDGS) or 1 minute (CGM, CFP) at 2000 x *g* (rcf, ***not rpm***)	***Filter:*** (DDGS) Pour through approved coffee filter (ACC 083); wait no more than 2 minutes

Combine Buffer & Extract, then Run Test Strips

1. Add DB5 to the Reaction Tube (discard tip)
2. Add clarified extract to the Reaction Tube
3. Mix thoroughly with extract pipette tip, discard tip
4. Place the Reaction Tube in the 22°C incubator; equilibrate for 2 minutes. Note: tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)
5. Add test strip to tube, arrows down, wait 5 minutes (run time)
6. Immediately cut strips at the top of the arrow tape (discard bottom pads)
7. Insert strip into QuickScan Reader

TIPS!

Get Complete Extraction

- Fully wet samples before next shaking step
- Avoid delay between EB18 buffer addition and shaking
- Assure liquid is moving forcefully though the sample while shaking

For Best Performance

- Pipette up and down while mixing
- Read strips promptly after run time

Avoid Contamination

- Use a new Reaction Tube per test
- Keep DB5 capped, when possible
- Use new pipette tips for each step

TABLE B: Set B Matrix Summary (base range)

Matrix	LOD (ppm)	Add to sample extraction vessel in order (choose sample size):		Shake	Clarify	Reaction Tube	Run
DDGS	0.2	A1. 25g sample A2. 1 x EB17 A3. 100 mL 1X EB18	B1. 50g sample B2. 2 x EB17 B3. 200 mL 1X EB18	1 min – shaker or 2 min – by hand	Centri-fuge 30 sec. or Filter	200 µL DB5 + 100 µL extract	5 min
		(immediately shake by hand 10 sec)					
CGM	0.4	1. 25g sample 2. 1x EB17 3. 100 mL 1X EB18		1 min – shaker or 2 min – by hand	Centri-fuge 1 min.	100 µL DB5 + 100 µL extract	
		(immediately shake by hand 10 sec)					
CFP	3.0	1. 10g sample 2. 50 mL 1X EB18		1 min – shaker or 2 min – by hand	Centri-fuge 1 min.	100 µL DB5 + 100 µL extract	
		(immediately shake by hand 10 sec)					

Set C: Masa flour

- Review Sample Preparation on Page 2 and 3 for grinding consistency and notes.
- Turn on the incubator and set to 22°C for a minimum of 10 minutes before testing. Ensure that the temperature display has stabilized and indicates "OK" before starting the assay. All reagents should be at room temperature.
- Use distilled, deionized, or flat (non-carbonated) bottled water.

Sample Extraction

Masa Flour	10g	Add 1 EB17 pouch to sample Add 60 mL water	Wet sample immediately, by vigorously shaking for 10 seconds by hand. If needed, shake the sample against the palm of your other hand or a hard surface to loosen up any dry sample areas. **Immediately** proceed to next shaking step.

Shake: choose mechanical shaker or hand shaking

Shaker Table: mix at highest speed (≥ 300rpm) for 1 minute	***By Hand:*** shake vigorously for 2 minutes

Clarify Extract: Centrifuge or filter:

Centrifuge: 30 seconds at 2000 x *g* (rcf, ***not rpm***)	***Filter:*** Pour through approved coffee filter (ACC 083); wait no more than 2 minutes

Combine Buffer and Extract, then Run Test Strips

1. Add DB5 to the Reaction Tube (discard tip)
2. Add clarified extract to the Reaction Tube
3. Mix thoroughly with extract pipette tip, discard tip
4. Place the Reaction Tube in the 22°C incubator; equilibrate for 2 minutes. Note: tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)
5. Add test strip to tube, arrows down, wait 4 minutes (run time)
6. Immediately cut strips at the top of the arrow tape (discard bottom pads)
7. Insert strip into QuickScan Reader

TIPS!

Get Complete Extraction
- Fully wet samples before the next shaking step
- Avoid delay between water addition and shaking
- Assure liquid is moving forcefully though the sample while shaking

For Best Performance
- Pipette up and down while mixing
- Read strips promptly after run time

Avoid Contamination
- Use a new Reaction Tube per test
- Keep DB5 capped, when possible
- Use new pipette tips for each step

TABLE C: Set C Matrix Summary (base range)

Matrix	LOD (ppm)	Add to sample extraction vessel in order:	Shake	Clarify	Reaction Tube	Run
Masa Flour	0.4	1. 10g sample 2. 1 x EB17 3. 60 mL water (immediately shake by hand 10 sec)	1 min – shaker or 2 min – by hand	Filter or Centri-fuge	100 µL DB5 + 100 µL extract	4 min

Set D: Wheat

- Review Sample Preparation on Page 2 and 3 for grinding consistency and notes.
- Turn on the incubator and set to 22°C for a minimum of 10 minutes before testing. Ensure that the temperature display has stabilized and indicates "OK" before starting the assay. All reagents should be at room temperature.

Sample Extraction

Wheat	**20g**	**Add 100 mL of water**	Wet sample immediately, by vigorously shaking for 10 seconds by hand. If needed, shake the sample against the palm of your other hand or a hard surface to loosen up any dry sample areas. **Immediately** proceed to next shaking step.

Shake: Choose mechanical shaker or hand shaking

Shaker Table: mix at highest speed (≥ 300rpm) for 30 seconds	***By Hand:*** shake vigorously for 1 minutes

Clarify Extract: Centrifuge or filter:

Centrifuge: 30 seconds at 2000 x *g* (rcf, ***not rpm***)	***Filter:*** Pour through approved coffee filter (ACC 083); wait no more than 2 minutes

Combine Buffer & Extract, then Run Test Strips

1. Add 100 µL DB5 to the Reaction Tube (discard tip)
2. Add 100 µL clarified extract to the Reaction Tube
3. Mix thoroughly with extract pipette tip, discard tip
4. Place the Reaction Tube in the 22°C incubator; equilibrate for 2 minutes. Note: tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)
5. Add test strip to tube, arrows down, wait 5 minutes (run time)
6. Immediately cut strips at the top of the arrow tape (discard bottom pads)
7. Insert strip into QuickScan Reader

TIPS!

Get Complete Extraction
- Fully wet samples before next shaking step
- Assure liquid is moving forcefully though the sample while shaking

For Best Performance
- Pipette up and down while mixing
- Read strips promptly after run time

Avoid Contamination
- Use a new Reaction Tube per test
- Keep DB5 capped, when possible
- Use new pipette tips for each step

TABLE D: Set D Matrix Summary (base range)

Matrix	LOD (ppm)	Add to sample extraction vessel in order:	Shake	Clarify	Reaction Tube	Run
Wheat	0.5	1. 20g sample 2. 100 mL water (immediately shake by hand 10 sec)	30 sec – shaker or 1 min – by hand	Filter or Centri-fuge	100 µL DB5 + 100 µL extract	5 min



For Technical Support Contact Us At:

EnviroLogix
500 Riverside Industrial Parkway
Portland, ME 04103-1486 USA
Tel: (207) 797-0300
Toll Free: 866-408-4597
Fax: (207) 797-7533

e-mail: ***info@envirologix.com***

website:
www.envirologix.com

LIMITED WARRANTY

EnviroLogix Inc. ("EnviroLogix") warrants the products sold hereunder ("the Products") against defects in materials and workmanship when used in accordance with the applicable instructions for a period not to extend beyond a product's printed expiration date. If the Products do not conform to this Limited Warranty and the customer notifies EnviroLogix in writing of such defects during the warranty period, including an offer by the customer to return the Products to EnviroLogix for evaluation, EnviroLogix will repair or replace, at its option, any product or part thereof that proves defective in materials or workmanship within the warranty period.

ENVIROLOGIX MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The warranty provided herein and the data, specifications and descriptions of EnviroLogix products appearing in EnviroLogix published catalogues and product literature are EnviroLogix' sole representations concerning the Products and warranty. No other statements or representations, written or oral, by EnviroLogix' employees, agents or representatives, except written statements signed by a duly authorized officer of EnviroLogix Inc., are authorized; they should not be relied upon by the customer and are not a part of the contract of sale or of this warranty.

EnviroLogix does not warrant against damages or defects arising in shipping or handling, or out of accident or improper or abnormal use of the Products; against defects in products or components not manufactured by EnviroLogix, or against damages resulting from such non-EnviroLogix made products or components. EnviroLogix passes on to customer the warranty it received (if any) from the maker thereof of such non-EnviroLogix made products or components. This warranty also does not apply to Products to which changes or modifications have been made or attempted by persons other than pursuant to written authorization by EnviroLogix.

THIS WARRANTY IS EXCLUSIVE. The sole and exclusive obligation of EnviroLogix shall be to repair or replace the defective Products in the manner and for the period provided above. EnviroLogix shall not have any other obligation with respect to the Products or any part thereof, whether based on contract, tort, strict liability or otherwise. Under no circumstances, whether based on this Limited Warranty or otherwise, shall EnviroLogix be liable for incidental, special, or consequential damages.

This Limited Warranty states the entire obligation of EnviroLogix with respect to the Products. If any part of this Limited Warranty is determined to be void or illegal, the remainder shall remain in full force and effect.

License

EnviroLogix has developed this kit using proprietary reagents.

EnviroLogix, the EnviroLogix logo, TotalTox, and QuickScan are trademarks of EnviroLogix Inc.

© EnviroLogix 2025

Safety data sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name: **DB 5 Dilution Buffer**
Part number 11150, 11665, 12495 (KR-266)

1.2 Relevant identified uses of the substance or mixture and uses advised against application of the substance / the preparation : Laboratory chemicals; kit component. Not to be used for purposes other than those specified in product literature.

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier: EnviroLogix Inc., 500 Riverside Industrial Pkwy. Portland ME 04103, USA Phone: (207) 797-0300

1.4 Emergency telephone number: (207) 797-0300 Technical Service

SECTION 2. Hazards identification.

2.1 Classification of the substance or mixture

Classification according to 29CFR 1910.1200: Eye Damage Category 1
Aquatic Toxic, Chronic Category 2

2.2 Label elements

Labeling according to 29CFR 1910.1200:

Pictogram: 

Signal word: Warning

Hazard Statements: H318 Causes serious eye damage

H411 Toxic to aquatic life with long lasting effects

Precautionary Statements: P264 Wash hands thoroughly after handling

P280 Wear protective gloves/protective clothing/eye Protection/face protection

P305+P351+P338 IF IN EYES: Rinse cautiously with Water for several minutes. Remove contact lenses If present and easy to do. Continue rinsing.

P337+P313 IF eye irritation persists: Get medical attention/advice

2.3 Other Statements Restricted to professional users

SECTION 3. Composition/information on ingredients.

3.2 Mixture

Chemical name	CAS No	EC No	Classification According to 29CFR 1910.1200	Amount (%)
Sodium Tetraborate Decahydrate	1303-96-4	215-540-4	H360 Rep 1B	< 3 %
p-tertiary Octylphenoxy polyethyl alcohol (Triton X-100)	9002-93-1		H302 Acute Tox. Oral 4 H315 Skin Irrit. 2 H318 Eye Dam. 1 H411 Aquatic Chronic 2	1 %
Surfynol	9014-85-1		H315 Skin irritation 2 H318 Eye damage 1 H335 STOT SE 3	2 %
1,2 Benzisothiazolin-3-one (Proxel- GXL)	2634-33-5	220-120-9	H302 Acute Tox. 4; H315 Skin Irrit. 2 H317 Skin Sens. 1 (C≥ 0.05%) H318 Eye Dam. 1 ; H400 Aquatic Acute 1	0.048 %

SECTION 4. First aid measures.

4.1 Description of first aid measures

After inhalation : In case of inhalation. Remove to fresh air. If not breathing give artificial respiration. Get medical attention immediately.

After skin contact : In case of skin contact. Remove contaminated clothing and shoes immediately. Wash affected area with mild soap or detergent for at least 10 minutes or until no evidence of chemical remains.

After eye contact : In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Lifting eyelids occasionally, until no evidence of chemical remains. Get medical attention immediately.

After swallowing : In case of ingestion, DO NOT Induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed: None

4.3 Indication of any immediate medical attention and special treatment needed: None

SECTION 5. Firefighting measures.

5.1 Extinguishing media: CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

5.2 Special hazards arising from the substance or mixture: None

5.3 Advice for firefighters: Wear protective gear appropriate for fire conditions including respiratory protective gear.

SECTION 6. Accidental release measures.

6.1 Personal precautions, protective equipment and emergency procedures: In the case of spilled mixture wear gloves to prevent skin contact. In the case of a large spill, additional protection is recommended.

6.2 Environmental precautions: Do not discharge mixture to sewer system or waterways.

6.3 Methods and material for containment and cleanup: Absorb in paper towel and discard in appropriate waste. Clean with water afterwards. Large spills may be neutralized with dilute solutions of sodium carbonate or calcium oxide.

6.4 References to other sections: For safe handling refer to Section 7. For information on PPE refer to Section 8. For disposal refer to Section 13

SECTION 7. Handling and storage.

7.1 Precautions for safe handling: Practice good chemical hygiene when handling. Avoid contact with eyes, skin, and clothing.

7.2 Conditions for safe storage, including any incompatibilities: Store in tightly closed, non-metal container, in a corrosive compatible area. Prevent direct sunlight and heat. Store in well aired storage rooms.

7.3 Specific end use(s): Apart from the uses mentioned in section 1.2, no other specific uses are stipulated

SECTION Exposure controls/personal protection.

8.1 Exposure limits:
Components with limit values that require monitoring at the workplace:

	EH40/2005	OSHA
Sodium Tetraborate Decahydrate	8 Hr TWA = 5mg/m^3	8 Hr TWA = 10 mg/m^3

8.2 Exposure Controls:

8.2.1Engineering controls: Facilities using this mixture should be equipped with an eyewash and safety shower. Use general or local exhaust ventilation to keep airborne concentrations below permissible exposure limits.

8.2.2 General protective and hygienic measures: The usual precautionary measures should be adhered to when handling chemicals.

Eye Protection: Safety glasses with side shields, goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU). Eye and face protection regulations are described by OSHA (US) in 29CFR1910.133. Do not wear contact lenses when working with chemicals

Hand Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Breathing Equipment: Appropriate respiratory protection should be determined according to local conditions using risk analysis protocols. An approved disposable air purifying particulate respirator may be used as a backup to engineering controls. Always use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

8.2.3 Environmental exposure controls: Contain spills, do not allow into environment

SECTION 9. Physical and chemical properties.

9.1 Information on basic physical and chemical properties:

a) Appearance:	Clear liquid, colorless to slight yellow.
b) Odor:	None
c) Odor Threshold:	No Data Available
d) pH:	8.6
e) Melting point/freezing point:	No Data Available
f) Boiling point/Boiling range:	No Data Available.
g) Flash point:	Not applicable.
h) Evaporation rate:	No Data Available
i) Flammability (solid, gaseous):	No Data Available
j) Upper/lower flammability or explosive limits:	No Data Available
k) Vapor pressure:	No Data Available
l) Vapor density	No Data Available
m) Relative density:	No Data Available
n) Solubility(ies):	Fully miscible, water.
o) Partition Coefficient: n-Octanol/water:	No Data Available
p) Auto-ignition temperature:	No Data Available
q) Decomposition temperature:	No Data Available
r) Viscosity:	No Data Available
s) Explosive properties:	No Data Available.
t) Oxidizing properties:	No Data Available

9.2 Other information: No further relevant information available.

SECTION 10. Stability and reactivity.

10.1 Reactivity: No data available

10.2 Chemical Stability: Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

10 4 Conditions to avoid: No specific data

10.5 Incompatible materials: No Data Available.

10.6 Hazardous decomposition products: Under normal conditions of storage and use, hazardous decompositions products should not be produced.

SECTION 11. Toxicological information.

Information on Toxicological Effects
Triton X-100

Acute toxicity: Oral LD50 –Rat- 1800mg/kg
Dermal LD50- Rabbit- 8000 mg/kg

Sensitization: No sensitizing effects known

CMR (carcinogenity, mutagenicity and toxicity for reproduction) effects: No CMR effects.

Additional toxicological information: No Additional Information

SECTION 12. Ecological information.

12.1 Toxicity: Fish: LC50 Pimephales promelas (fathead minnow) – 8.9mg/l – 96.0 hr
Triton X-100 Daphnia: EC50 – Daphnia – 26 mg/l – 48 hr

12.2 Persistence and degradability : No Data Available

12.3 Bio accumulative potential: No Data Available

12.4 Mobility in soil : No Data Available

12.5 Results of PBT and vPvB assessment: Not available as a chemical safety assessment, not required/not conducted.

12.6 Other adverse effects: No Data Available

SECTION 13. Disposal considerations.

Waste treatment methods: Contact a licensed professional waste disposal service to dispose of this material. Disposal of surplus or waste solutions must be in accordance with applicable local, state, and national laws and regulations.

SECTION 14. Transport information.

14.1 UN-Number DOT, ADR, ADN, IMDG, IATA : Not Hazardous for Transport
14.2 UN proper shipping name DOT, ADR, ADN, IMDG, IATA : Not Hazardous for Transport

14.3 Transport hazard class(es) DOT, ADR, ADN, IMDG, IATA): Not Hazardous for Transport
14.4 Packing group (DOT, ADR, IMDG, IATA): Not Hazardous for Transport

14.5 Environmental hazards No environmental hazard.

14.6 Special precautions for user : None

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC code: No information available.

SECTION 15. Regulatory information.

15.1 Safety, health, and environmental regulations
US Federal Regulations
OSHA Not a hazardous material
SARA 313 Not listed
US State Regulations
European/International Regulations
European labeling in accordance with EC Directives Not hazardous according to European directives
15.2 Chemical Safety Assessment Not carried out

SECTION 16. Other information.

This information is true based on our present knowledge. However, EnviroLogix makes no representation of its accuracy or completeness. Persons receiving this information must exercise their independent judgment in determining the product's safety and suitability for its intended use. This document shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship

EHS Department
EnviroLogix Inc.

Codes:

H302 Harmful if swallowed **H315** Causes skin irritation **H317** May cause an allergic skin reaction
H318 Causes Serious Eye Damage **H335** May cause respiratory irritation **H411** Toxic to Aquatic Life with Long Lasting Effects

Summary Guide for Approved Matrices

Approved Matrix	Add to Sample Extraction Vessel (in this order)	Then shake immediately	Clarify	Run the Base Range Protocol First, followed by Dilution Protocol, if necessary	Transfer to Reaction Tube	Add Reaction Tube to Incubator Set at 22°C	Add Strip for	Read in QuickScan: Dilution Tab on the Result Page Should Display
Corn (MG1) Corn flour (MG3) Sorghum (MG4)	1. 25g sample 2. 1 EB17 pouch 3. 75 mL water* 4. Immediately shake vigorously for 10 seconds by hand ---------*OR*--------- 1. 50g sample 2. 2 EB17 pouches 3. 150 mL water* 4. Immediately shake vigorously for 10 seconds by hand	1 min highest speed on shaker table or 2 min by hand	Filter or Centri-fuge 30 sec. at 2000 x *g* *(corn flour, filter only)*	Base Range 0 – 10 ppm	100 µL DB5 buffer + 100 µL clarified extract in Reaction Tube	Acclimate tube for 2 min^	4 min.	1:1 (this is software default)
				Dilution A Corn: 2 – 100 ppm	**Pre-Mix** 700 µL EB17 Dilution Solution† + 50 µL clarified extract **Transfer** 100 µL DB5 and 100 µL Pre-Mix		4 min.	1:A (this must be selected)
				Dilution A Sorghum: 10 – 100 ppm	**Pre-Mix** 700 µL EB17 Dilution Solution† + 50 µL clarified extract **Transfer** 100 µL DB5 and 100 µL Pre-Mix			
Corn Germ (MG7)	1. 25g sample 2. 1 EB17 pouch 3. 100 mL water* 4. Immediately shake vigorously for 10 seconds by hand	1 min highest speed on shaker table or 2 min by hand	Centrifuge 2 min. at 2000 x *g*	Base Range 0 – 12 ppm	100 µL DB5 buffer + 100 µL clarified extract in Reaction Tube		6 min	1:1 (this is software default)
				Dilution A Corn Germ: 12 – 75ppm				1:A (this must be selected)

Notes:

*Use distilled, deionized, or flat (non-carbonated) bottled water

^The tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)

†Refer to page 3 for Dilution Reagent instructions

**DDGS only: for 50g samples, use 13 oz cup (catalog number 20-0131).

Approved Matrix	Add to Sample Extraction Vessel (in this order)	Then shake immediately	Clarify	Run the Base Range Protocol First, followed by Dilution Protocol, if necessary	Transfer to Reaction Tube	Add Reaction Tube to Incubator Set at 22°C	Add Strip for	Read in QuickScan: Dilution Tab on the Result Page Should Display
DDGS (MG2)	1. 25g sample 2. 1 EB17 pouch 3. 100 mL 1X EB18 4. Immediately shake vigorously for 10 seconds by hand ---------*OR*--------- 1. 50g sample** 2. 2 EB17 pouches 3. 200 mL 1X EB18 4. Immediately shake vigorously for 10 sec by hand	1 min highest speed on shaker table or 2 min by hand	Centrifuge 30 sec. at 2000 x *g* or Filter	Base Range 0 – 15 ppm	200 µL DB5 buffer + 100 µL clarified extract in Reaction Tube	Acclimate tube for 2 min^	5 min.	1:1 (this is software default)
				Dilution A 15 – 100 ppm	**Pre-Mix** 700 µL EB18 Dilution Solution† + 100 µL clarified extract **Transfer** 200 µL DB5 and 100 µL Pre-Mix			1:A (this must be selected)
CGM (MG6)	1. 25g sample 2. 1 EB17 pouch 3. 100 mL 1X EB18 4. Immediately shake vigorously for 10 sec by hand	1 min highest speed on shaker table	Centrifuge 1 min. at 2000 x *g*	Base Range 0 – 8 ppm	100 µL DB5 buffer + 100 µL clarified extract in Reaction Tube			1:1 (this is software default)
				Dilution A 8 – 38 ppm	**Pre-Mix** 500 µL of water + 100 µL clarified extract **Transfer** 100 µL DB5 and 100 µL Pre-Mix			1:A (this must be selected)
CFP (MG9)	1. 10 g sample 2. 50 mL 1X **EB18** Immediately shake vigorously for 10 seconds by hand	1 min highest speed on shaker table or 2 min by hand	Centrifuge 1 min. at 2000 x g	Base Range 3 – 20 ppm	100 µL DB5 buffer + 100 µL clarified extract in Reaction Tube			1:1 (this is software default)

Notes:

*Use distilled, deionized, or flat (non-carbonated) bottled water

^The tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)

†Refer to page 3 for Dilution Reagent instructions

**DDGS only: for 50g samples, use 13 oz cup (catalog number 20-0131).

Approved Matrix	Add to Sample Extraction Vessel (in this order)	Then shake immediately	Clarify	Run the Base Range Protocol First, followed by Dilution Protocol, if necessary	Transfer to Reaction Tube	Add Reaction Tube to Incubator Set at 22°C	Add Strip for	Read in QuickScan: Dilution Tab on the Result Page Should Display
Masa flour (MG5)	1. 10g sample 2. 1 EB17 pouch 3. 60 mL water* 5. Immediately shake vigorously for 10 seconds by hand	1 min highest speed on shaker or 2 min by hand	Filter or Centrifuge 30 sec. at 2000 x *g*	Base Range 0 – 5 ppm	100 µL DB5 buffer + 100 µL clarified extract in Reaction Tube	2 min	4 min.	1:1 (this is software default)
Wheat (MG10)	1. 20g sample 2. 100 mL water 3. Immediately shake vigorously for 10 seconds by hand	30 sec. highest speed on shaker or 1 min by hand	Filter or Centrifuge 30 sec. at 2000 x *g*	Base Range 0 – 10 ppm	100 µL DB5 buffer + 100 µL clarified extract in Reaction Tube	2 min	5 min.	1:1 (this is software default)

Notes:

*Use distilled, deionized, or flat (non-carbonated) bottled water

^The tube acclimation step is only required if the temperature of the testing environment is unknown or outside of 20 - 24°C (68 - 75°F)

†Refer to page 3 for Dilution Reagent instructions

**DDGS only: for 50g samples, use 13 oz cup (catalog number 20-0131).