

CARTRIDGE

SYSTEM

OWNER'S MANUAL

Green Turtle (USA)
201 South Tryon Street, Suite 1475
Charlotte, North Carolina 28202
T: 704.295.1733 TOLL FREE 1.877.428.8187
F: 704.295.1734

Green Turtle (Canada)
880 Rangeview Road
Mississauga, Ontario L5E 1G9
T: 416.966.9400 TOLL FREE 1.877.966.9444
Fax: 416.966.3439



www.greenturtletech.com

© Copyright 2005. Green Turtle Technologies Ltd. / Green Turtle Americas Ltd. Patent pending



version 1

Table of Contents

1.	PHIX™ Cartridge System Overview	1
1.1.	PHIX™ Cartridge System Design and Operation	1
1.2.	PHIX™ Cartridge Design Considerations	2
2.	Principles of Operation	3
3.	Step-by-Step Installation Procedures	6
4.	Maintenance of the PHIX™ Cartridge System	10
4.1.	Maintenance Inspection (Chamber 2)	10
4.2.	Solids Removal	10
4.3.	Media Replacement	11
5.	PHIX™ Cartridge System Replacement Parts	13
6.	Green Turtle Limited Warranty	14

Congratulations!

You now have the most efficient and innovative wastewater neutralization system. The PHIX™ Cartridge System, manufactured by Green Turtle, is a point-source acidic wastewater treatment solution complying with local plumbing codes throughout North America. Your engineered system protects your building's plumbing system and the local sanitary sewer system from harmful solids and corrosive acids. Now, you have a safe, easy and worry-free neutralization solution treating low pH where it starts – at the sink.

1. PHIX™ Cartridge System Overview

The PHIX Cartridge System, installed directly under the sink, treats acidic wastewater and removes solids. The PHIX Cartridge System is compatible with all sink sizes, and easy to install in most commercial, institutional and industrial applications.

The PHIX Cartridge System features an engineered flow-through design to maximize efficiency and minimize maintenance. The System uses all natural and safe PHIX™ Media which permits better control over effluent pH. It is consumed throughout the neutralization process. PHIX Media requires no special storage or handling and ensures optimal neutralization treatment within the space-saving unit.

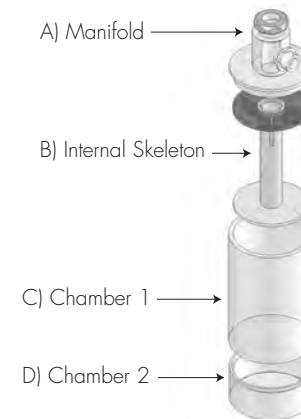
1.1. PHIX™ Cartridge System Design and Operation

The PHIX Cartridge System is constructed from 100 percent durable Polypropylene (poly) and has a high resistance to numerous chemicals. The PHIX Cartridge System is shipped pre-assembled and includes a bucket, siphon pump and hose, supporting bracket and one prescribed package of PHIX Media.

The PHIX Cartridge System design has four main components (see Figure 1.1.) and is sized for standard sink drain down times in North America. Its engineered design allows for efficient neutralization of acidic wastewater using PHIX Media, removal of harmful solids, and easy installation and maintenance.

The PHIX Cartridge System attaches easily to the underside of a sink using the specially designed Manifold. Wastewater from the sink flows down through the Internal Skeleton into Chamber 2 (Solids Collection Chamber). Solids settle to the bottom of Chamber 2 and the wastewater then flows up through the perforated plate and into Chamber 1 (Treatment Chamber). The treated wastewater then exits the unit through the Manifold and into the drain pipe.

Figure 1.1. PHIX Cartridge System



The PHIX Cartridge System uses four main components to adjust pH. Any modifications to the unit will alter the ability of the System to effectively treat wastewater.

1.2. PHIX™ Cartridge Design Considerations

1. The PHIX Cartridge System removes solids and treats acidic wastewater only.
2. The PHIX Cartridge System is primarily designed for under the sink installation.
3. The PHIX Cartridge System cannot intercept fats, oils or grease from the wastewater. A Proceptor™ Separator by Green Turtle is recommended if oil and grease are present. For more information on Proceptor™ Separators, please visit www.greenturtletech.com or contact a Green Turtle Representative at 1-877-428-8187 (USA) | 1-877-966-9444 (Canada) or phixinfo@greenturtletech.com.

2. Principles of Operation

Introduction

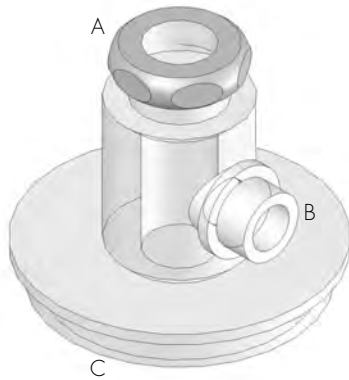
The operation of the PHIX Cartridge System is simple, safe and effective. The System has four main components: Manifold, Internal Skeleton, Chamber 1 and Chamber 2. All components work together to ensure acidic wastewater is neutralized to within by-law regulations.

Manifold

The Manifold houses the unit's three main connections:

- A) Threads to the sink drain (see Figure 2.1.);
- B) Connection to the drain pipe with a 1½" adapter, not included with the System (see Figure 2.1.);
- C) Threads into Chamber 1 of the PHIX Cartridge (see Figure 2.1.).

Figure 2.1. Manifold

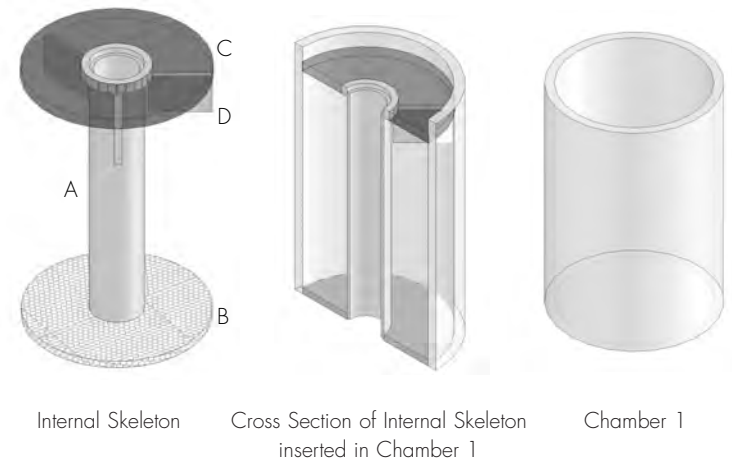


Internal Skeleton and Chamber 1 (Treatment Chamber)

The Internal Skeleton directs the flow of the wastewater through the System. PHIX Media is contained in Chamber 1. The two components operate as follows:

1. The Internal Skeleton inserts into Chamber 1 and channels wastewater from the sink strainer through the center pipe (A) directly into Chamber 2 for solids removal (see Figure 2.2.).
2. Wastewater flows up from Chamber 2 through the perforated plate (B) where it comes into contact with PHIX Media housed in Chamber 1 (see Figure 2.2.). The perforated plate ensures the PHIX Media remains in Chamber 1 and solids are retained in Chamber 2.
3. The neutralized wastewater flows through the woven filter (C). The woven filter retains the PHIX Media inside the PHIX Cartridge System. The internal structure brackets (D) support the woven filter (C) (see Figure 2.2.).
4. The treated wastewater exits the unit through the Manifold and into the drain pipe.

Figure 2.2. Internal Skeleton and Chamber 1



Chamber 2 (Solids Collection Chamber)

Chamber 2 is threaded onto the bottom of Chamber 1 and can be removed as required, provided the water is first removed from the System (see Section 4.2. for instructions). Chamber 2 captures solids larger than 1/8" (paper, food etc.) preventing items from disrupting the neutralization treatment process, or becoming lodged in the downstream piping.

Figure 2.3. Chamber 2



3. Step-by-Step Installation Procedures

Introduction

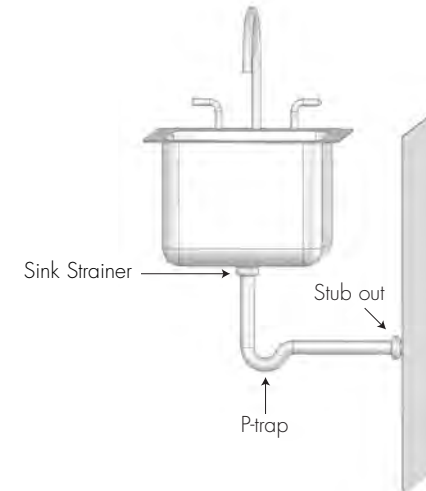
The PHIX Cartridge System is shipped pre-assembled and includes a bucket, siphon pump and hose, supporting bracket, and one prescribed package of PHIX Media. To install the unit, please follow these simple step-by-step installation instructions.

Installation Instructions:

1. Remove Drain

Remove the existing waste (drain) pipe between the sink strainer and the stub out at the wall or floor. If the piping is plastic with compression (threaded-type) fittings, unthread the pipe and save it for possible reuse. If the pipe is welded or metal, cut using a hacksaw and discard. Unscrew fittings by hand or with groove-joint pliers.

Figure 3.1. Standard Sink Connection

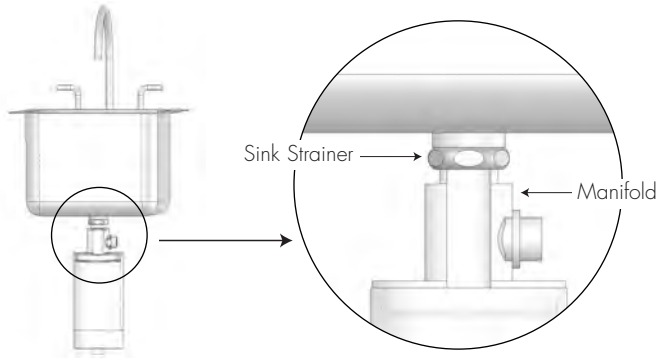


Installation Tip: Before removing the drain plug or disconnecting the trap, place a plastic bucket under the drain trap to catch any standing water.

2. Connect the PHIX™ Cartridge System

To connect the PHIX Cartridge System to the sink, thread the slip nut at the top of the PHIX Cartridge System onto the threads of the sink strainer (underneath the sink). Ensure the washer, provided with the System, is installed between the top of the PHIX Cartridge System and the sink strainer before threading the two together.

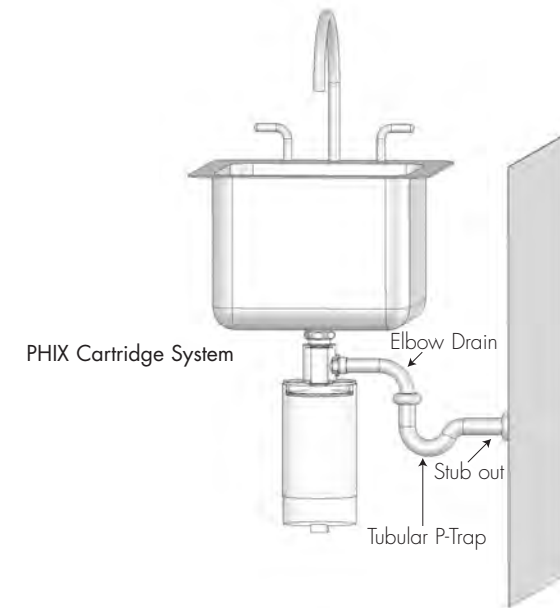
Figure 3.2. Connection between the PHIX Cartridge System and Sink



3. Connect Plastic Waste Pipe

Install a 1½" adapter to the threaded connection on the outlet of the Manifold (1½" adapter not included with the System). Connect a two-piece tubular P-trap between the adapter, and to the stub out (drain fitting). If required, cut the P-trap and rotate both the trap section of the P-trap and the PHIX Cartridge System to ensure that they are aligned. Complete the connection by tightening the waste pipe fittings and the PHIX Cartridge System. **All piping from the PHIX Cartridge System must meet the local plumbing codes.**

Figure 3.3. PHIX Cartridge System and Piping Connections



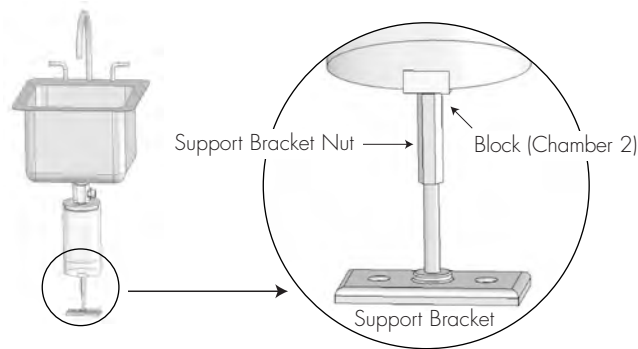
Please Note: If a dishwasher is present, connect the dishwasher hose between the PHIX Cartridge System drain fittings and the P-trap.

4. Install Support Bracket

The installation of the support bracket ensures that the suspended PHIX Cartridge System is properly supported. The bracket also prevents the unit from accidentally being moved or nudged.

1. Place the bracket on the ground or cabinet floor directly below the block located on the bottom of Chamber 2.
2. Thread the nut from the bracket up into the notch on the block (located on the bottom of Chamber 2). The nut should rest snugly inside the notch. If the bracket does not reach the block, a spacer is required.
3. Screw the flange of the bracket down into the ground or cabinet floor.

Figure 3.4. Expanded view of the Support Bracket



5. Initial Startup Procedure

Once the installation is complete, you must perform a flow test to verify there are no leaks.

Flow test:

Run water from the tap into the sink, and visually inspect threaded connections.

1. If a leak is detected tighten threaded connections until the leak has stopped.
2. Once the test is complete, please see Section 4.3. for instructions on adding PHIX Media to the PHIX Cartridge System.
3. After the PHIX Media is added, the System is ready for operation.

4. Maintenance of the PHIX™ Cartridge System

The maintenance of the PHIX Cartridge System is critical to ensure no disruption in the neutralization treatment process. The PHIX Cartridge System must be maintained according to the following procedures to ensure continual effective treatment of acidic wastewater.

4.1. Maintenance Inspection (Chamber 2)

When the drain down time of the sink increases, the PHIX Cartridge System requires cleaning. To check the amount of waste in Chamber 2 use a flashlight and shine behind the Chamber to perform a visual inspection. If half of Chamber 2 is filled with waste, the unit requires cleaning (see Section 4.2 for Solids Removal instructions).

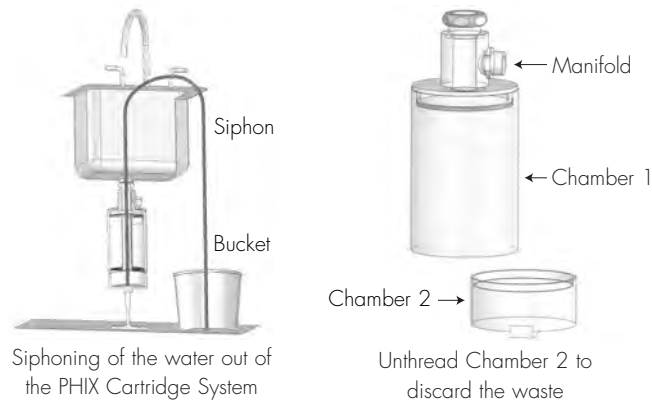
4.2. Solids Removal

Chamber 2 captures any solids that may go down the sink; if the Chamber becomes full of waste and requires cleaning, please do the following:

1. Remove water from the unit by inserting the siphon tube (included with the System) down the center drain of the sink. When the tube touches the bottom of Chamber 2, pull back slightly so the tube no longer touches the bottom (see Figure 4.1.).
2. Begin to siphon the water from the PHIX Cartridge System into a bucket by priming the tube with the siphon pump (included with the System).
3. Once all of the water is removed, thread the nut down from the support bracket to create adequate space to remove Chamber 2 from under the system.
4. Unthread Chamber 2 from Chamber 1 using an adjustable wrench on the block at the bottom of Chamber 2. Use a strap wrench on Chamber 1 (see Figure 4.1.)
5. Empty the waste collected in Chamber 2 into a trash bin. No special handling required. Rinse Chamber 2 with water and wipe clean with a cloth.
6. Rethread Chamber 2 tightly onto Chamber 1.

Please Note: Check both O-Rings on the PHIX Cartridge System with every maintenance inspection.

Figure 4.1. Solids Removal



4.3. Media Replacement

PHIX Media in the PHIX Cartridge System must be replaced at regular intervals according to your site requirements as prescribed by a Green Turtle Representative. If the site has high acid levels or above average use, the replacement cycle may be more frequent.

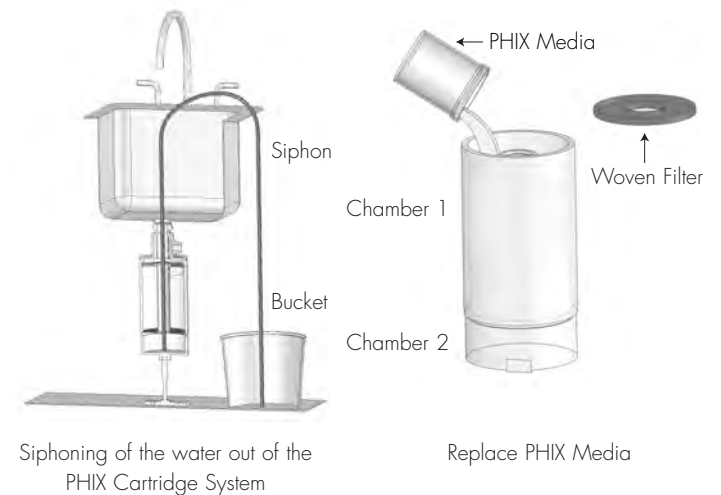
To confirm the Media maintenance schedule for your application, please contact a Green Turtle Representative at 1-877-428-8187 (USA) | 1-877-966-9444 (Canada) or phixinfo@greenturtletech.com.

To add or replace PHIX Media:

1. Remove water from the unit by inserting the siphon tube (included with the System) down the center drain of the sink. When the tube touches the bottom of Chamber 2, pull back slightly so the tube no longer touches the bottom (see Figure 4.2).
2. Begin to siphon the water from the PHIX Cartridge System into a bucket by priming the tube with the siphon pump (included with the System).
3. Once all of the water is removed, thread the nut down from the support bracket, so there is adequate space to remove Chamber 1 and 2 from the Manifold.
4. To remove Chamber 1 and Chamber 2 from the Manifold, use a strap wrench on Chamber 1 while holding the Manifold tightly. Then unthread the joint between Chamber 1 and the Manifold.
5. Remove the woven filter located on the top of Chamber 1.
6. Rinse the filter with water - the filter can be re-used, or replaced when required.

7. Dispose any remaining PHIX Media found in Chamber 1 into a trash bin. (Note: No special handling of used PHIX Media is required)
8. If there is any waste in Chamber 2, do not remove Chamber 2 from Chamber 1, simply remove the Internal Skeleton from Chamber 1.
9. Dispose the collected waste into a trash bin. Rinse Chamber 1 and 2 with water and wipe clean with a cloth.
10. To clean the Internal Skeleton, rinse the perforated plate and the center pipe with water and wipe clean with a cloth, then insert the Internal Skeleton back into Chamber 1.
11. Pour one package of PHIX Media into Chamber 1, between the center pipe and the sidewall (see Figure 4.2.). Place the woven filter on the top of Internal Skeleton and reattach the Chamber 1 and Chamber 2 to the Manifold, using the appropriate tools to ensure a tight seal.
12. **The System is replenished with PHIX Media and is now ready to resume operation.**

Figure 4.2. PHIX Media Replacement



5. PHIX™ Cartridge System Replacement Parts

Need replacement parts for your PHIX Cartridge System?

The following replacement parts are available and can be ordered by calling a Green Turtle Representative at 1-877-428-8187 (USA) | 1-877-966-9444 (Canada).

Product Code	Product Description
C-PHIX-CARTRIDGE	PHIX Cartridge System without maintenance kit
C-PHIX-MANIFOLD	Manifold
C-PHIX-CHAMBER1	Chamber 1
C-PHIX-CHAMBER2	Chamber 2
C-PHIX-INTERNAL	Internal Skeleton
C-PHIX-FILTER	Woven Filter
C-PHIX-MEDIA-2000	Single order of PHIX Media 2000
10-PHIX-MEDIA-2000	10 packages of PHIX Media 2000
S-Siphon Pump	Siphon Pump
ST-Siphon Tube	Siphon Tube

6. Green Turtle Limited Warranty

(a) This warranty is provided by Green Turtle Technologies Ltd. for products sold in Canada, and by Green Turtle Americas Ltd. for products sold in the continental U.S. Although the companies are collectively referred to herein as "Green Turtle," each company only warrants products sold in its respective market. PHIX Cartridge Systems are not intended for industrial, residential or other consumer use, and may not be purchased or sold for those applications. Green Turtle warrants to Customer that the PHIX Cartridge System shall be free of defects in materials and workmanship for one year from the date of shipment (the "Warranty Period"), subject to the terms and conditions below. Green Turtle's warranties will not apply to any PHIX Cartridge System with respect to which there has been (i) improper installation or testing, (ii) failure to provide a suitable operating environment, (iii) use of the PHIX Cartridge System for purposes other than that for which it was designed, (iv) installation or use of the Phix Cartridge System in any application other than commercial or institutional use; (v) failure to monitor or operate or maintain the PHIX Cartridge System in accordance with applicable Green Turtle specifications and good industry practice (including, without limitation, periodic replacement of any operational media in accordance with Green Turtle's recommendations and technical requirements), (vi) unauthorized attachment or removal or alteration of any part of the PHIX Cartridge System, (vii) unusual mechanical, physical or electrical stress, (viii) modifications or repairs done by unqualified personnel, or (ix) any other abuse, misuse, neglect or accident. PHIX Cartridge System supplied hereunder may contain used parts and/or be reconditioned.

(b) After initial installation of the PHIX Cartridge System, the installation checklist supplied by Green Turtle must be properly completed, and the completed checklist must be submitted to Green Turtle within 30 days after installation (failure to deliver the document may result in denial of the claim).

(c) Customer shall notify Green Turtle in writing promptly (and in no case later than 30 days after discovery) of the failure of any PHIX Cartridge System to conform to the warranty set forth above, shall describe in commercially reasonable detail the symptoms associated with such failure, and shall provide to Green Turtle the opportunity to inspect such PHIX Cartridge Systems as installed, if possible. The notice must be received by Green Turtle during the Warranty Period for such PHIX Cartridge System.

(d) Within a reasonable time after verification by Green Turtle that the PHIX Cartridge System fails to meet the warranty set forth above, Green Turtle shall correct such failure by, at Green Turtle's option, either (i) modifying or repairing the PHIX Cartridge System or (ii) replacing the PHIX Cartridge System. If Green Turtle is unable to modify, repair or replace a PHIX Cartridge System to conform to the warranty set forth above, then Green Turtle shall, at Green Turtle's option, either refund to Customer or credit to Customer's account the purchase price of the PHIX Cartridge System less depreciation calculated on a straight-line basis over Green Turtle's stated Warranty Period. Warranty does not include labor, transportation, or other installation or removal costs or expenses. THESE

REMEDIES SHALL BE BUYER'S EXCLUSIVE REMEDIES FOR BREACH OF WARRANTY.

(e) EXCEPT FOR THE EXPRESS WARRANTY SET FORTH ABOVE, GREEN TURTLE MAKES NO OTHER REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, REGARDING THE PHIX CARTRIDGE SYSTEM, THEIR FITNESS FOR ANY PURPOSE, THEIR QUALITY, THEIR MERCHANTABILITY, THEIR NON-INFRINGEMENT, OR OTHERWISE. NO EMPLOYEE OF GREEN TURTLE OR ANY OTHER PARTY IS AUTHORIZED TO MAKE ANY OTHER REPRESENTATIONS, WARRANTIES, OR CONDITIONS FOR THE PHIX CARTRIDGE SYSTEM OTHER THAN THE WARRANTY SET FORTH HEREIN. GREEN TURTLE'S MAXIMUM LIABILITY UNDER THE WARRANTY SHALL BE LIMITED TO A REFUND OF THE PURCHASE PRICE OF THE PHIX CARTRIDGE SYSTEM. IN NO EVENT SHALL GREEN TURTLE BE LIABLE FOR THE COST OF PROCUREMENT OR INSTALLATION OF SUBSTITUTE GOODS BY BUYER OR FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT, PUNITIVE, CONSEQUENTIAL OR OTHER DAMAGES, INCLUDING, WITHOUT LIMITATION, COSTS, EXPENSES, OR LIABILITIES ASSOCIATED WITH ENVIRONMENTAL CONTAMINATION, FINES OR PENALTIES, FIRES, EXPLOSIONS, OR ANY OTHER CONSEQUENCES ALLEGEDLY ATTRIBUTABLE TO A BREACH OF THE WARRANTY OR DAMAGES UNDER DECEPTIVE TRADE PRACTICES OR SIMILAR CONSUMER PROTECTION ACTS. THE FOREGOING CONSTITUTES GREEN TURTLE'S EXCLUSIVE OBLIGATION.

(f) Customer assumes the risk of and agrees to indemnify Green Turtle against and hold Green Turtle harmless from all liability relating to (i) assessing the suitability for Customer's intended use of the PHIX Cartridge System and of any system design or drawing and (ii) determining the compliance of Customer's use of the PHIX Cartridge System with applicable laws, regulations, codes and standards. For PHIX Cartridge Systems resold by Customer, Customer retains and accepts full responsibility for all warranty and other claims relating to, or arising from, Customer's PHIX Cartridge System which include or incorporate PHIX Cartridge System or components manufactured or supplied by Green Turtle, and Customer is solely responsible for any and all representations and warranties regarding the PHIX Cartridge System made or authorized by Customer. Customer will indemnify Green Turtle and hold Green Turtle harmless from any liability, claims, loss, cost or expenses (including reasonable legal fees) attributable to Customer's PHIX Cartridge System or representations or warranties concerning same.

Contact Green Turtle

Green Turtle (USA)
201 South Tryon Street, Suite 1475
Charlotte, North Carolina 28202
T: 704.295.1733 TOLL FREE 1.877.428.8187 F: 704.295.1734

Green Turtle (Canada)
880 Rangeview Road
Mississauga, Ontario L5E 1G9
T: 416.966.9400 TOLL FREE 1.877.966.9444 F: 416.966.3439