

Technical Manual



Bind-ET™ Ethidium Removal System

The Safest and most Environmentally
Friendly Way of Disposing of
Ethidium Bromide Solutions

Special Features

- Ecological disposing of ethidium bromide solutions
- High binding capacity of more than 2 g of Ethidium, (corresponds to more than 4,000 l of buffer or staining solution at standard concentration 0.5 µg / ml)
- Safe handling
- Easy to use: no pumps or valves
- Easy exchange of the cartridge
- Capacity of the reservoir: 3 l
- Maximum flow rate 3 l / hour
- Regular disposal by incineration

Bind-ET™ Ethidium Removal System was specially designed for disposal of large volumes of diluted EtBr solution in safe and ecological way.

EtBr is toxic and strongly mutagenic and should not be released into the environment. Solutions containing EtBr have to be pre-treated before they can be disposed of into a sewage system. Various conventional methods of EtBr treatment are in use such as adsorption (activated charcoal) or chemical decomposition (diazotisation, treatment with hydrogen peroxide or bleach). They are time consuming, complicated, dangerous or expensive, or, in a few extreme cases even release additional toxic substances.

Bind-ET™ is a closed system which removes EtBr from aqueous solutions in the safest and simplest way. The most important part of the system is an ion exchange column with a binding capacity of more than 2 g of Ethidium. This amount corresponds to the quantity of ethidium bromide solution used by one laboratory in one year; e.g. more than 4000 l of a typical gel electrophoresis buffer or dye solution (0.5 µg/ml). The ethidium bromide solution is simply poured into the upper reservoir of Bind-ET™. The solution flows through the column at a maximum flow rate of 3 l / h. EtBr is chemically bound to the column and completely retained. The aqueous solution flowing out of the column contains no detectable amount of EtBr and can be treated as normal effluent. Because it is closed, the ion exchange column can be sent for incineration.

This convenient way of disposing ethidium bromide solutions is not only safe, efficient and cost effective, but fulfils ecological demands and regulations by completely removing EtBr from solutions.

Product

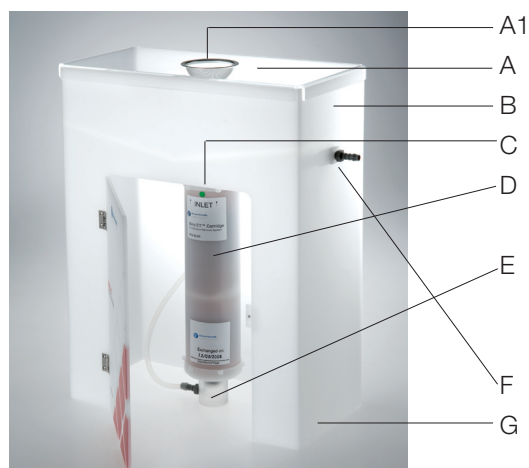
Specification

The system consists of a reservoir with the adapter, cover with sieve, a cartridge and adapter with an outlet port

- Binding capacity is more than 2 g Ethidium
- Maximum Flow rate 3 l / h
- Dimensions: 36 x 19 x 47 cm

Components

Cover (A) with sieve (A1)
Upper Reservoir (B) with the adapter (C)
Cartridge (D)
Adapter (E) with an outlet port (F)
Cabinet (G)



Assembly

1. Print the date of installation on the label attached on the replacement cartridge (Photo 1).
2. Remove the protective yellow cap (H)* from the bottom of the cartridge and immediately connect the cartridge to the adapter (E). The adapter is already connected to the outlet port (Photo 2). Try to connect the cartridge to the adapter as fast as possible to avoid the loss of water from the cartridge. Air, that might enter the cartridge if too much water will flow out, can reduce the flow of the liquid through the cartridge.
3. Remove the protective yellow cap (H)* from the upper part of the cartridge (inlet) and plug the cartridge into the adapter (C) on the upper reservoir (Photo 3).
4. Fill the upper reservoir with the 1-2 l of tap water to be sure that no air bubbles remain in the cartridge.

- * Store the protective yellow caps. When the cartridge will need to be replaced, the inlet and outlet need to be closed with the protective yellow caps (H), before it is placed to the laboratory waste.

Photo 1



Date of installation

Photo 2



E

H

Photo 3



B

C

Usage

- Pour the solution containing EtBr through the sieve (A1) into the reservoir (B), which can hold about 3 l of the solution. Let the solution flow through the cartridge. The maximum flow rate is approx. 3 l / h when the upper reservoir is full. The flow rate is determined by the outlet port (F) at the adapter (E), tubing and the position of the outlet. The liquid that flows out of the cartridge contains no ethidium and can be treated as normal effluent.
- **Caution:**
 - 1) Gel particles in the solution (usually from agarose gels) would clog any packed column. Make sure that the solution is poured into the reservoir through the sieve.
 - 2) Never change the outlet position by attaching silicon tubes to the outlet port.

Replacement of the Cartridge

1. Record the volume and concentration of EtBr solutions that are treated and change the cartridge when the cumulative amount of EtBr reaches 2g. Label the cartridge with the date you start using it.

E.g. If the system is in use 8h/day, 5days/week for 6 months, 3120l of EtBr solution will be processed at maximum flow rate of 3l/h. This corresponds to 1.56 g of EtBr at standard EtBr concentration of 0.5µg/ml: $3\text{l} \times 8\text{h} \times 5\text{days} \times 26\text{weeks} = 3120\text{l}/6\text{ months} \approx 1.56\text{g}/6\text{ months}$

2. If no records are made, we recommend changing the cartridge after six months of continuous use, since in that time period its capacity will not be exhausted.

Changing the Cartridge

- Disconnect the cartridge from the reservoir (B). Close the Inlet of the cartridge with the yellow cap. Disconnect the cartridge from the adapter (E). Close the Outlet of the cartridge with the yellow cap provided.

Quality Control of the Effluent

- For QC take 1ml effluent and measure the absorbance at 285nm against double distilled water (Fig. 1). Detection limit is 4ng/ml.

Disposal of the Cartridge

- The cartridge does not require special treatment and is sent for incineration with other laboratory waste.

Trouble Shooting

- Liquid is not passing through cartridge is clogged
- Flow is too slow low level of solution in the upper reservoir

Ordering information

P/N	Product	Quantity
2350	Bind ET™ with cartridge	1
2351	Replacement cartridge for Bind ET™	1