

EDS-Pak[®] Point-of-Use Polisher

Endocrine disrupter-free water at the ultrapure water point of delivery



Key benefits:

- Point-of-use polisher for use with Milli-Q[®] and other Merck Millipore Type I water purification systems
- Final purification step provides endocrine disrupter-free ultrapure water at high flow rate—when you need it
- Delivers a minimum of 300 l of EDS-free ultrapure water
- Validated for efficient removal of bisphenol A, diethyl phthalate and di-n-butyl phthalate
- Each EDS-Pak[®] cartridge is delivered with a Certificate of Quality

Endocrine disrupters

Endocrine disrupters are small, man-made organic chemicals whose structures mimic those of hormones, enabling them to interact with normal endocrine system functions. By sheer coincidence, their key-shaped molecules open the hormonal locks that control proper development and behavior in both humans and animals.^{1,2,3}

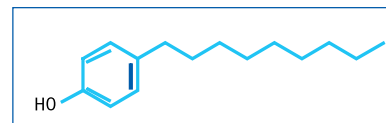
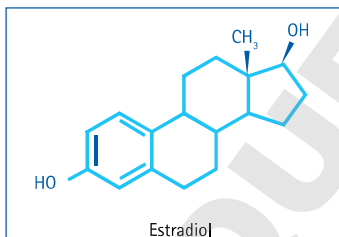
Today, endocrine disruptors are increasingly present in the environment. Although endocrine disruptors may be only somewhat dangerous for adults, mounting evidence suggests that they can significantly disturb fetal and infant development. As researchers increasingly focus on the effects of these chemicals, there is a need for endocrine-disrupter free water for use in experimental tests. While conventional water purification techniques remove the bulk of organic compounds from ultrapure water, some trace organics still may remain.

These man-made chemicals can be found in many products widely used in industrial societies:

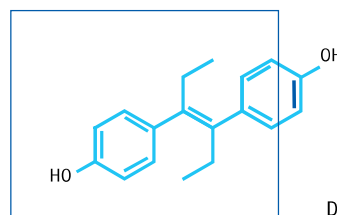
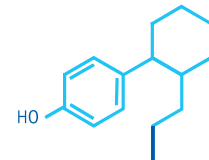
- Bisphenol A is a plasticizer used in reusable water bottles, laptop computer housings, dental sealants and the resins in some food can linings.
- Phthalates are found in a wide variety of products, including vinyl flooring, food packaging, blood-storage bags, intravenous medical tubing, as well as many health and beauty products such as detergents, soaps, shampoos, deodorants, fragrances, hair spray and nail polish. They are often used as a plasticizer in PVC pipes distributing water in buildings.

Examples of endocrine disruptors include nonylphenol (a detergent), bisphenol A (a plasticizer), diethylstilbestrol (a growth agent administered to livestock) and DDT (a pesticide).

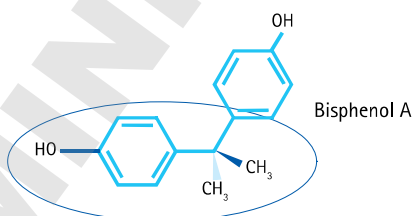
Examples of man-made chemicals with estrogeno-mimetic structure



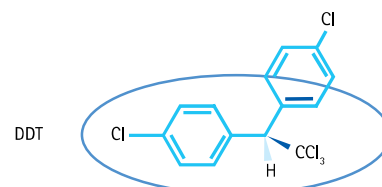
Nonylphenol



Diethylstilbestrol



Bisphenol A



DDT

EDS-Pak® polisher design

The EDS-Pak® is a disposable point-of-use ultrafiltration cartridge developed by Merck Millipore to meet the needs of researchers who require ultrapure water free of endocrine disrupters (EDS).

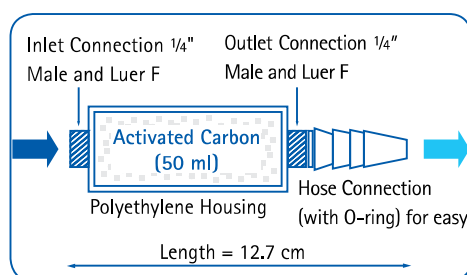
The EDS-Pak® can be installed on all Merck Millipore Type I water purification systems that deliver ultrapure water with TOC < 5 ppb, including the Milli-Q®, Synergy®, Simplicity® and Direct-Q® systems. It is designed to provide at least 300 l of EDS-free ultrapure water before replacement is necessary.

EDS-Pak® polisher operation

The EDS-Pak® cartridge contains a specific type of activated carbon that has been validated for the removal of several endocrine disrupters. The cartridge's housing and connector materials also have been validated for the absence of endocrine disrupters.

Before use, the EDS-Pak® unit must be conditioned with methanol to ensure that all binding surfaces are accessible to endocrine disrupters.*

Following this step, the cartridge should then be flushed with ultrapure water to remove any excess methanol. Once conditioned, the EDS-Pak® unit is warranted to deliver up to 300 l of EDSfree water (see specifications below) when fed by ultrapure water with a TOC level < 5 ppb at a flow rate between 0.5 – 2 l/min.



EDS-Pak® polisher specifications

The EDS-Pak® has been validated for the efficient removal of the following endocrine disrupters: bisphenol A, diethyl phthalate, di-n-butyl phthalate and nonylphenol.

EDS tested	Feed (ppb)	Product (ppt)	Volume (l)	Flow (l/min)
Bisphenol A	Up to 4	< DL (5 ppt)	300	0.5 – 2.0
Diethyl phthalate	Up to 1.5	< DL (200 ppt)	300	0.5 – 2.0
Di-n-butyl phthalate	Up to 1.5	< DL (200 ppt)	300	0.5 – 2.0
Nonylphenol	Up to 3.3	< DL (100 ppt)	300	0.5 – 2.0

Each EDS-Pak® cartridge is delivered with a Certificate of Quality showing the analytical results of the Endocrine Disrupter Analysis performed on the cartridge lot.

Ordering information

Description	Catalogue No.
EDS-Pak® Cartridge (1/pk) delivered hermetically sealed, with a Certificate of Quality	EDSPAK001
EDS-Pak® Cartridge installation and Conditioning Kit including the following reusable parts: <ul style="list-style-type: none">• Polyethylene 1/4 Gaz F-Hose barb connection with O-ring• Polyethylene 1/4 G F – 1/4 Gaz F connectors for connection to Millipak®	EDSKIT001

*Note: A 50 ml glass syringe is required to condition the EDS-Pak® cartridge with methanol. This syringe is not provided by Merck Millipore.

Bibliography

1. Huang, Y.W.; Twidwell, D. L.; Elrod, J.C. "Occurrence and Effects of Endocrine Disrupting Chemicals in the Environment," *Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management*, 7 (4), p. 241-247 (2003).
2. Brevini, T.A.L.; Zanetto, S.B.; Cillo, F. "Effects of Endocrine Disrupters on Developmental and Reproductive Functions," *Current Drug Targets – Immune, Endocrine & Metabolic Disorders*, Volume 5, Number 1, p. 1-10 (2005).
3. Bigsby, R.; Chapin, R. E.; Daston, G. P.; Davis, B.J.; Gorski, J.; Gray, L.E.; Howdeshell, K.L.; Zoeller, R. T. and vom Saal, F. S. "Evaluating the Effects of Endocrine Disrupters on Endocrine Function during Development," *Environmental Health Perspectives* 107 (Suppl. 4), p. 613-618 (1999).