



# TITANSORB™

ADVANCED, POWERED AND PATENTED  
PROVIDING THE ADSORBENT YOU NEED

Not only can **TITANSORB™** granules help **split water** in H<sup>+</sup> and OH<sup>-</sup>, it can also make water filter Adsorbent hydrophilic – allowing water to flow easily through it, while adsorbing **Arsenic, Lead, Selenium** and other

foreign contaminants, including **bacteria** making it perfect for **purifying water**. Thus a new super high capacity (adsorption) powered Adsorbent is developed.

With the worlds' Population expected to hit 8.3 billion by 2030, there will be a massive increase in the Global Demand for Adsorbents. **All water and food needs Arsenic, Lead, Selenium free drinking water.**



## ARSENIC

skin cancer stomach irritation  
LUNG CANCER infertility  
cardiovascular disease  
DIABETES weakness **DEATH**  
immune system disorder  
bladder cancer NERVE INJURY  
BRAIN risk of infection  
DAMAGE miscarriage  
heart disruption lymphatic cancer

## Advantages

- **Highest Arsenic Loading**
- **Operates in wider pH range**
- **Highest purity**
- **Very high capacity**
- **Very little capital costs**
- No regeneration chemical required
- Simple system design
- Simple manual or Automatic Systems
- Simple start ups
- Reduced equipment footprint
- High adsorption capacity for Arsenic and other Heavy Metals.
- Removing Arsenic in millions of gallons of drinking water worldwide.
- Extremely fast kinetics
- Empty Bed Contact Time (EBCT) between 0.5 – 3 minutes.





## WHAT IS TITANSORB™?

### General description

Titanium dioxide is a widely available compound that can be mined from minerals in the ground and is commonly found in food as whitening additives and in sunblock products. **TITANSORB™** a new advanced Wonder Adsorbent that can remove Arsenic, Cadmium, Copper, Chromium (VI), Lead, Selenium and many other heavy metals and produces Clean-Water. With its superior bacteria killing capabilities, it can also be used to kill bacteria in water. Watch-Water® have succeeded in developing a high capacity, revolutionary Adsorbent that can do all the above mentioned at very low cost compared to other Titanium dioxide based existing technology.

The breakthrough, which has taken Watch-Water® five years to develop the Double Capacity Titanium dioxide crystals into Patented Adsorbent. **TITANSORB™**, such a low cost Adsorbent is expected to have immense potential to help tackle ongoing Global Adsorbent Market in Arsenic and Environmental issues of Arsenic Removal.

Patented **TITANSORB™** media used for commercial, municipal, bottle water, mineral water is capable of removing arsenic, selenium, uranium, radium, molybdenum, nickel and other heavy metals. **TITANSORB™** has several advantages to existing adsorbents based on aluminum or iron hydroxide medias. **TITANSORB™** has the fastest mass transfer kinetics, and this results in very short EBCT'S. Lower the EBCT, lower the capital cost of the equipment. EBCT of 30 seconds is absolutely acceptable for of **TITANSORB™**. Granules of **TITANSORB™** are so strong that system almost has no pressure drop. Media is washed and results in no under mesh. **TITANSORB™** surface has very large pore sizes. Large pores in of **TITANSORB™** media permits rapid intra-particle mass transport, this allows for very short EBCT's of seconds instead of more minutes on every other existing adsorbents. Pressure vessel sizes are much smaller than the aluminium based or iron hydroxide based adsorbents.

### Arsenic Removal

To reduce the arsenic concentration from drinking water, there are several short-term (Low capacity) and long term (High capacity) adsorbent solutions. There are three types of water treatment systems to remove arsenic.

1. Point-of-Use (POU) systems treat the water at the kitchen tap. *(Picture 1)*
2. Point-of-Entry (POE) treatment systems for the entire household. *(Picture 2)*
3. Large system for municipalities serving 100 homes or more. *(Picture 3 on page 3)*

If arsenic is detected above the new Maximum Contaminant Level (MCL) is **5 µg/l**, watch this warning "Don't use this water for drinking, cooking, bathing, or in other consumption ways". At this time Watch-Water® recommends arsenic removal for residential, commercial, hospitals, schools and all other food service whose city water or well water contains arsenic above 5 µg/l to install a arsenic removal system.

Don't boil your water as a method of treatment. This will result in higher arsenic concentrations in your water. Remember only water evaporates but not contaminants and also not arsenic. So boiling means/ results in a higher contaminants in your water.

*Pic. 1*  
Fast adsorption kinetics makes it possible to make **TITANSORB™** cartridges for POU filters



*Pic. 2*  
POE Filters are available both with manual or fully automatic valves







## pH function on Adsorption

Using granular **TITANSORB™** for arsenic removal phosphate ( $\text{PO}_4^{3-}$ ) concentration up to 10 mg/l and silica concentrations of 25 mg/l has no impact on adsorption of both As(V) and As(III) at pH 6.9. With the oxidation of As(III) to As(V) and then over **TITANSORB™**, adsorption of As(V) onto **TITANSORB™** is completely zero-zero at slightly acidic pH value as explain before (**pH value 6.9**).

Using these parameters **TITANSORB™** can treat **960,000 bed volumes** per 1 kg of **TITANSORB™** before column effluent reach 10 µg/l on a ground water containing an average **50 µg/l** of As(V). This is the biggest advantage of **TITANSORB™**.

## Disposal

According to investigations, **TITANSORB™** media requires infrequent replacement and does not require the use of chemicals or regenerators. Because it is dry, **TITANSORB™** is reportedly easier to handle than wet iron-based filtration media and can also be used in a broader range of system types. Additionally, spent **TITANSORB™** is not hazardous and can be land filled according to Environmental Protection Agency standards.



Pic. 3

High absorptive capacity allows smaller footprint of systems.

## Contaminant Loading Capacity

Contaminants	Tested capacity*
Arsenic (V)	48 – 60 g/kg
Arsenic (III)	20 – 30 g/kg
Chromium (VI)	14 – 18 g/kg

\*under specific laboratory conditions. Results may vary depending on different water parameters.

**Note:** Removal efficiency may be affected by the contaminant concentration that is present in the water, its ionic form, competing impurities and ions, and the design of the equipment.

Additionally, **TITANSORB™** has not demonstrated any contaminant leaching or reverse arsenic reaction. **TITANSORB™** is also said to remove viruses and bacteria.

## Technical Specification

Appearance	White solid granules	
Base material	Titanium oxohydrate	
Particle size	SI	0.5 – 2.0 mm
	US	10 x 35
Bulk density	SI	608 kg/m <sup>3</sup>
	US	38 lb/ft <sup>3</sup>
Moisture Content	< 4 %	
Specific surface area	300 m <sup>2</sup> /g (BET)	

For further information on removal systems contact Watch-Water<sup>®</sup> or a water treatment company specializing in adsorption medias.



**RED-OXY TREATMENT**

**FILTRATION**

KATALOX LIGHT  
CRYSTOLITE

**ADSORPTION**

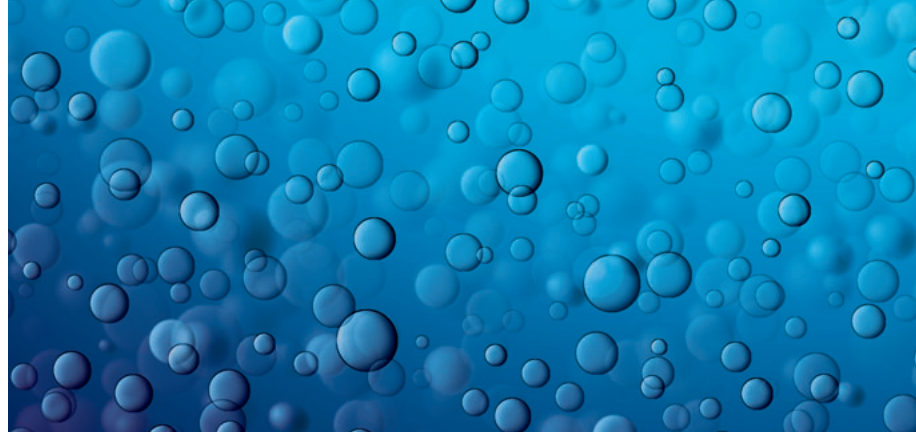
CATALYTIC CARBON  
TITANSORB  
FERROLOX

**FILTERSORB**

FILTERSORB SP3  
SPECIAL FILTER

**INSTANT PRODUCTS**

ISOFT CHEMICALS  
OXYDES  
OXYSORB  
BIOXIDE  
SCALE-OVER  
GREEN-ACID



## Operating conditions

Flow direction	Down-flow
Inlet water pH *	6.5 - 6.9
Max. feed water temp.	40 °C (104 °F)
Pressure rating	3 - 10 bar (43.5 - 145 psi)
Freeboard	40 - 45 %
Minimum bed depth	100 cm (39.4 in)
Filtration velocity	15 - 25 m/h (6 - 10 gpm/ft <sup>2</sup> )
EBCT (bed contact time)	30 - 180 sec.
Backwash velocity	6 - 10 m/h (2.4 - 4 gpm/ft <sup>2</sup> )
Backwash Volume	5 - 10 BV

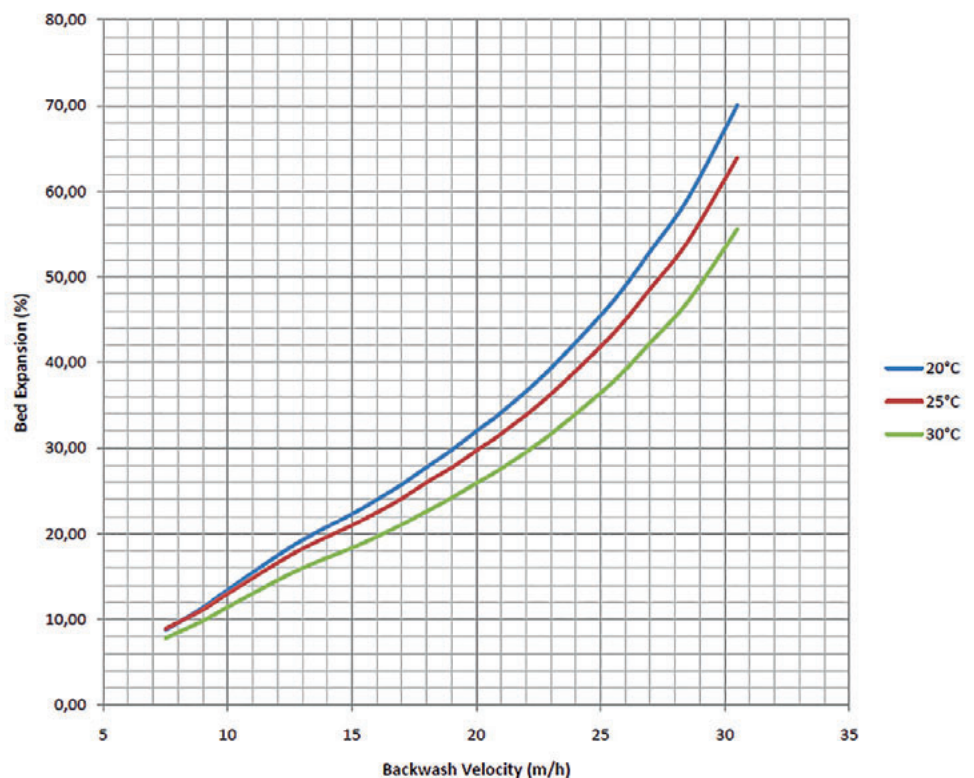
\* best recommendation

## You should know ...

Watch-Water<sup>®</sup> is a world leader in Adsorbent manufacturing for water purification solutions. With our branches for sales, technical service and representatives and Logistics centers in Seven continents, we are always there to serve you globally.

See report on Global Adsorbent Market and Watch-Water<sup>®</sup> is one of the major Adsorbent manufacturer.

## Bed expansion during backwash



To know and learn more about this huge potential of **TITANSORB™** please contact us: