

# AMRIT

**Arsenic and  
Metal  
Removal by  
Indian  
Technology**

Presence of arsenic and iron in drinking water affects water quality significantly. Damage to human health due to the presence of arsenic in water is well-known. With the advent of nanotechnology, it is possible to address contaminants such as arsenic at affordable cost. A product, aptly titled, AMRIT is presented here. AMRIT uses a composition based on iron oxyhydroxide to remove arsenic from water.

What it means in terms of performance and affordability? AMRIT composition can handle up to an input load of 5 ppm of arsenic and bring the output level below the typical detection limit (<1 ppb). Composition is at least 5-6 times more efficient than any other adsorbent available currently. Since the contact time required for removal is fairly low (less than 1 min), the composition is used in the size of 0.2 mm, thereby offering negligible pressure drop. This helps from several aspects: treatment cost reduces, filtration unit becomes smaller, filtration unit can be operated with minimum pressure, easily maintainable by local community and reduced sludge quantity.



AMRIT was co-created by IIT Madras and InnoNano Research Private Limited, an IIT Madras incubated company. InnoNano Research is co-founded by Professors and Alumni of reputed Indian academic institutions.



## AFFORDABLE

arsenic removal at less than 2 paise/litre

## EASY INTEGRATION

with other solutions

## EASY MAINTAINABILITY

surface rubbing by brush, once a week

## ADAPTABLE

capacity from 100 - 9,000 litres/day

Parameter	Input water quality	Output water quality
<b>Turbidity</b>	Up to 200 NTU	1 NTU (WHO norm, BIS norm: 5 NTU)
<b>Iron</b>	Up to 15 ppm	<0.3 ppm (WHO and BIS norms)
<b>Arsenic</b>	Up to 5 ppm	<0.010 ppm (WHO norm, BIS norm: <0.05 ppm)
<b>Allowed TDS</b>	Up to 2000 ppm	No reduction from input
<b>pH</b>	6 to 9	7 to 8



The arsenic filter assembly



The nanocomposite material

**Product name** AMRIT – Arsenic and Metal Removal by Indian Technology

**Product description** An affordable domestic and community scale water purification unit for iron and arsenic removal

**Technical details** Iron and turbidity removal by physical filtration, arsenic removal by adsorption

**Product elements** One input water storage tank, one output water storage tank kept on a stand along with purification cartridges

**Material of construction** Food grade polypropylene for plastic components. Food grade ingredient for adsorbents

**Mode of operation** Manual pouring of water or through a pump, gravity flow to the output tank

**Electricity requirement** No electricity required for operation, electricity may be used to operate the pump

**Feed water quality** Turbidity: up to 200 NTU  
Iron: up to 15 ppm  
Arsenic: up to 5 ppm  
Allowed TDS: up to 2000 ppm

**Output water quality** Turbidity: 1 NTU (WHO and BIS norms: 5 NTU)  
Iron: <0.3 ppm (WHO and BIS norms)  
Arsenic: <0.010 ppm (WHO norm, BIS norm: <0.05 ppm)

**Rate of water filtration** 50-100 mL/min (domestic model), 100-500 L/h (community model). 500 L/h (online model)

**Replacement frequency** Yearly for arsenic removal media, 3-5 years for turbidity/iron removal media

**Expected life of the unit** 15 years

**Adaptability** Easy integration with existing water purification technologies and products



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