



GRANULES for Water Purification
Cutting Edge Technology

Purification of:

1. Drinking water:

By granulated nano-particles of Micelle–Clay complex.

2. Grey Water.

DRINKING WATER

The complex has a very large surface area per weight; it includes large hydrophobic parts and has an excess of a positive charge, about half of the exchange capacity of the clay.

It is efficient in purification of water from :

- **Pathogenic Microorganisms:**
Bacteria; Viruses Cryptosporidium; Cyanobacteria (blue algae).
- **Herbicides; Anionic Detergents; Pharmaceuticals; Natural Dissolved Organic Materials (Dom): such as Humic and Fulvic Acids.**
- **Inorganic anions: such as Perchlorate.**

DRINKING WATER FILTERS



Filters for purifying drinking water:

- The filters yield complete removal of pathogenic bacteria, zero particles per 100 ml, and residual pollutants, e.g. Herbicides or pharmaceuticals to the allowed levels.
- Estimated capacity of removal of E. Coli (100,000 per ml, flow velocity 10m/h) is 55 cubic meters per 1 kg of complex.
- The domestic filter shown gives a flow rate of 1L/min, and can purify at least 2000 L of tap water.

GRAY WATER

Grey water treatment by two stages:

(Water collected from showers and sinks)

1. Bioreactor:

- Removal of organic materials by bio-reactor, 180 L; 30L of beads: surface 15 m² ,circulated compressed air.
- The reactor reduced BOD, COD, TSS and also fecal coliforms (1d incubation).

2. Filtration:

- The capacity of micelle- clay filter was defined by volume of emerging water with zero fecal coliforms per 100 ml. It was > 20 cubic meters per kg of granules; after 2 regenerations > 50 cubic meters per kg.
- Values of turbidity: 1.5 NTU median; BOD< 5 , TSS< 3, COD< 20 mg/L.



GRAY WATER (cont.)

Size of equipment needed for replacement of filter filling after 1 year

| Number of families Treated Volume | Volume of Biological Reactor | Size and Volume of Filter |
|---------------------------------------|---------------------------------|------------------------------|
| 1 family (4-5 people) 250 L/ day | 360 L | 15cm x 40cm 7 L |
| 28 families 7 m ³ / day | 7 m ³ | 60cm x 60cm 170 L |