

Filtration Sand



Sand is a crucial component in **groundwater filtration systems**, where it acts as a natural and effective **mechanical and biological filter**. Here's how sand is used:

1. Physical Filtration

- **Process:** As groundwater flows through a sand bed, **suspended solids** (like silt, clay, organic matter, and debris) are physically **trapped between sand grains**.
- **Effectiveness:** Fine sand is particularly effective at capturing smaller particles, helping to clarify water.

2. Biological Filtration (in slow sand filters)

- **Process:** Over time, a **biological layer** forms on the top layer of the sand bed.
- **Function:** This layer contains microorganisms that **consume pathogens and organic contaminants**, further purifying the water.

3. Chemical Adsorption

- While less significant than physical and biological processes, sand can **adsorb some dissolved contaminants** (like iron or manganese), especially when coated with oxides or combined with other filter media.

4. System Types Using Sand:

- **Slow Sand Filters** – used in small-scale or municipal water treatment.
- **Rapid Sand Filters** – common in industrial and municipal systems, using coarse sand and backwashing for cleaning.
- **Multimedia Filters** – combine sand with layers of gravel, anthracite, or garnet for improved efficiency.

Why Sand Is Ideal:

- **Inert & Non-toxic** – Does not react with water.
- **Readily Available** – Cost-effective and abundant.
- **Customizable** – Can be dried, graded, and sized to meet performance specs.

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