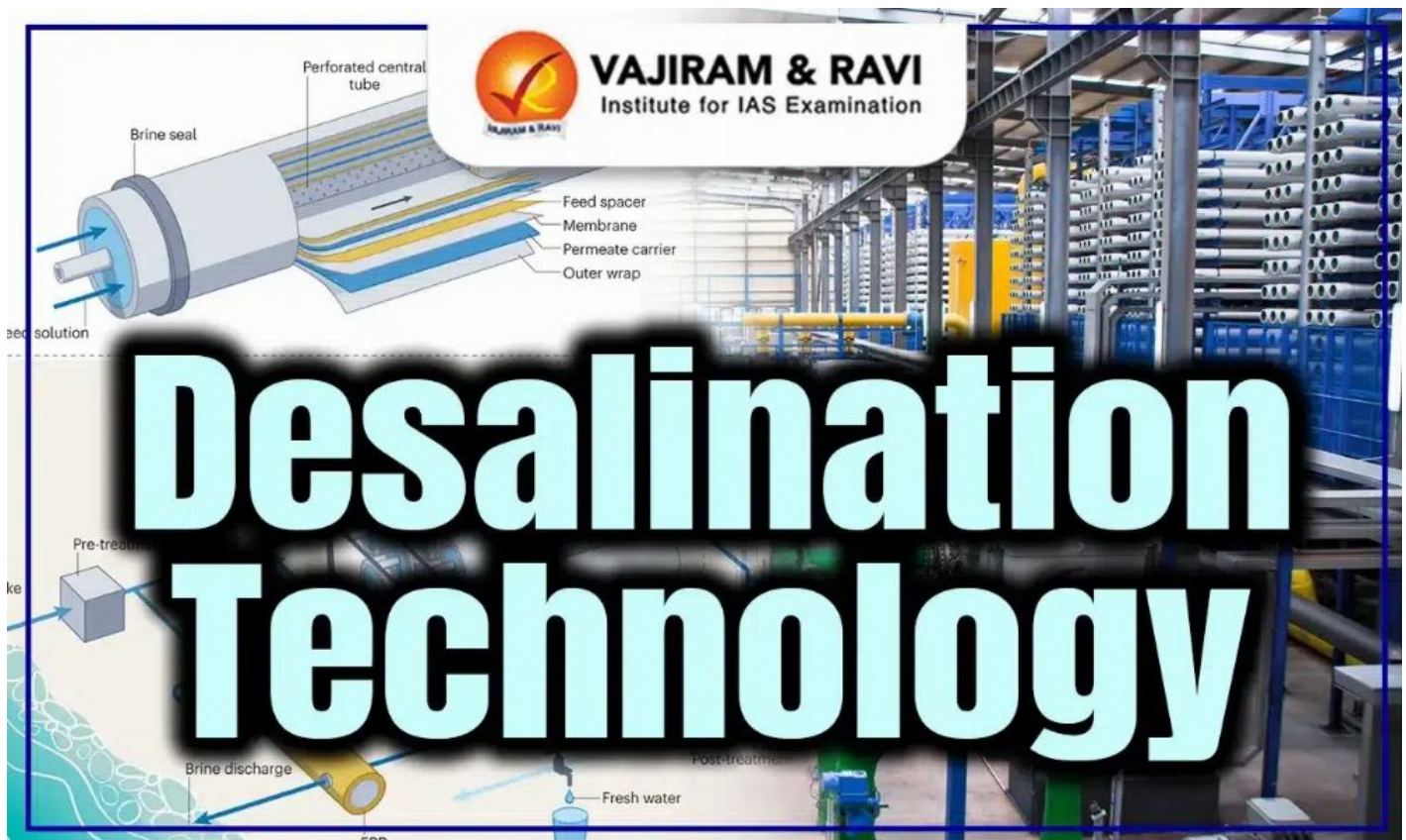


Desalination Technology

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Desalination Technology Latest News

The Defence Research & Development Organisation (DRDO) has developed an indigenous high-pressure nanoporous multilayered polymeric membrane for seawater desalination.

Purpose and Strategic Importance

- The project was executed by **Defence Materials Stores Research & Development Establishment (DMSRDE), Kanpur**, under the **Aatmanirbhar Bharat** initiative.
- The membrane was designed to meet the **operational needs of the Indian Coast Guard (ICG)**, particularly to withstand **chloride ion-induced instability** in saline water.
- The technology is intended for use in **Offshore Patrol Vessels (OPVs)** of the Coast Guard, providing **self-reliant onboard freshwater capability**.

About Desalination Technology

- **Desalination** is the **removal of dissolved salts and minerals from saline or brackish water** to make it fit for human use.
- Two primary technologies used globally:
 - **Reverse Osmosis (RO)** – pressure-driven membrane-based filtration.
 - **Thermal Desalination** – evaporation-condensation method using heat.
- A **desalination plant** converts **seawater into freshwater** by **removing salts** to meet **drinking or industrial quality standards**.

Working of Reverse Osmosis (RO) Desalination

- **Osmosis** refers to the natural movement of water from an area of **low solute concentration to high solute concentration** through a **semi-permeable membrane**.
- In **reverse osmosis**, **external pressure** is applied to push water from a **high-solute (saline) side** to a **low-solute (freshwater) side**, against the natural osmotic gradient.
- **Microscopic pores** in the RO membrane **allow water molecules** to pass while **blocking salts and other impurities**.
- **Seawater typically has a TDS (Total Dissolved Solids) of ~35,000 ppm**, while RO brings it down to **200-500 ppm**, making it potable.

Desalination Technology FAQs

Q1: What is desalination?

Ans: Desalination is the process of removing salts and minerals from seawater or brackish water to produce freshwater for drinking or agriculture.

Q2: What are the main desalination methods?

Ans: Common methods include Reverse Osmosis (RO), Multi-Stage Flash (MSF), and Electrodialysis. RO is the most widely used.

Source: PIB

Source: <https://vajiramandravi.com/current-affairs/about-desalination-technology/>

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