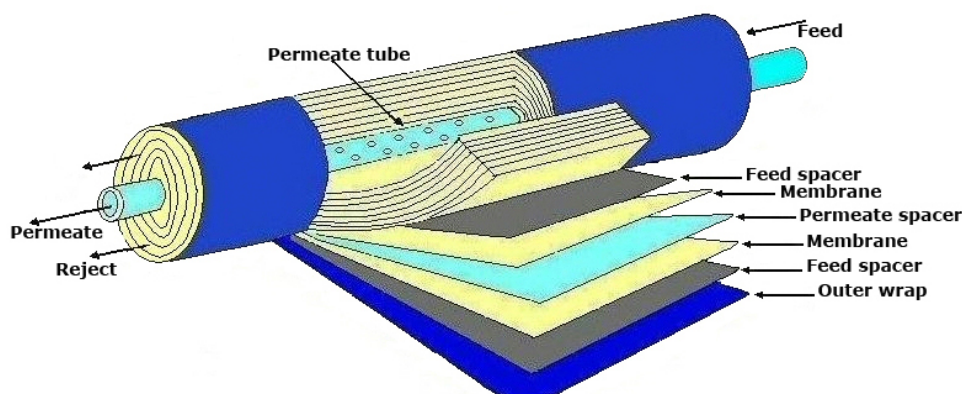


Ultrafiltration membrane based water purifier

Water-borne diseases such as cholera, typhoid, polio, dysentery and hepatitis are caused by pathogenic bacteria and viruses and spread through contaminated water particularly where proper sanitation facilities are not available. Common water disinfection methods, such as chlorination, ultraviolet (UV), and ozone filtration/treatment kill pathogenic species, leaving cell debris. Use of membrane in water treatment however, has the advantage of physically removing undesirable species in water like worms, spores, bacteria, viruses, etc.

Scientists at National Chemical Laboratory (NCL), Pune have developed an ultrafiltration (UF) membrane with pores too small to permit viruses and bacteria. Special additive used in the dope solution

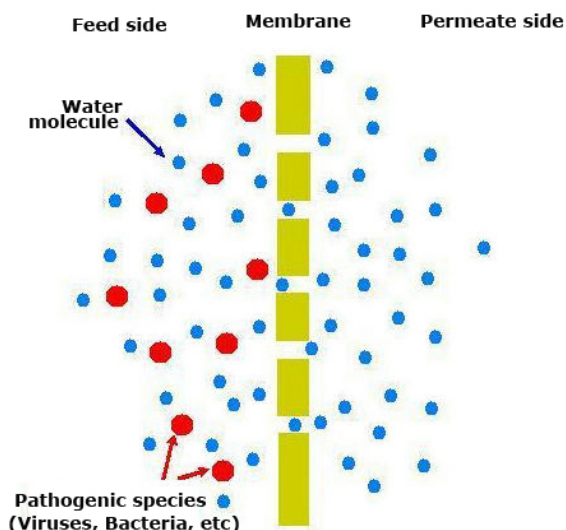


for membrane casting controls membrane porosity and offers membranes with desirable pore size. It operates on normal tap water pressure (0.5 bar) and does not require electricity. The device uses a flat sheet UF membrane that withstands pressure up to

4 bars, wound in the form of a spiral module and fixed in PVC housing. The membrane module for household application is 30 cm long with 6.5 cm diameter; while a longer one (1 m long with the same diameter) is suitable for community applications. The water filtration rate for 30 cm module is 1 lit/min, and 3 lit/min at 1 bar pressure for community module. Average life of the membrane is three years depending upon the quality of water.

The performance test by the Pune based Agharkar Research Institute and National Institute of Virology has shown a 5-log reduction for viruses (including Hepatitis-A virus) and 7-log reduction for bacteria

(including *Escherichia coli*, *Salmonella typhi* and *Vibrio cholera*). The modules filter solutes of molecular weight more than 60,000 dalton. However, it does not remove dissolved salts of small particle size.



Field trials of the device have demonstrated its use in rural environment, particularly cyclone affected areas in Orissa and earth-quake affected areas in Gujarat. The units installed at Orissa cyclone site proved effective in microbial count as tested by National Environmental Engineering Research Institute (NEERI), Nagpur. Applicability of the membrane was demonstrated in various prototype units like hand pump, foot pump, cycle pump, and compact, online and electrically operated pumps. With the support of Department of Science and

technology (DST), New Delhi 40 units have been supplied to NGOs working in public health monitoring for trial and performance evaluation. The technology on non-exclusive basis has been transferred to M/s. Membrane Filters (India) Pvt. Ltd.

For further information on this work please contact: [Dr U.K. Kharul](#)

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