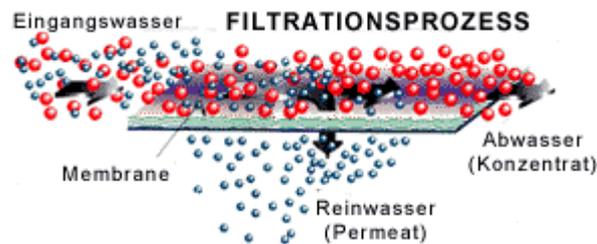


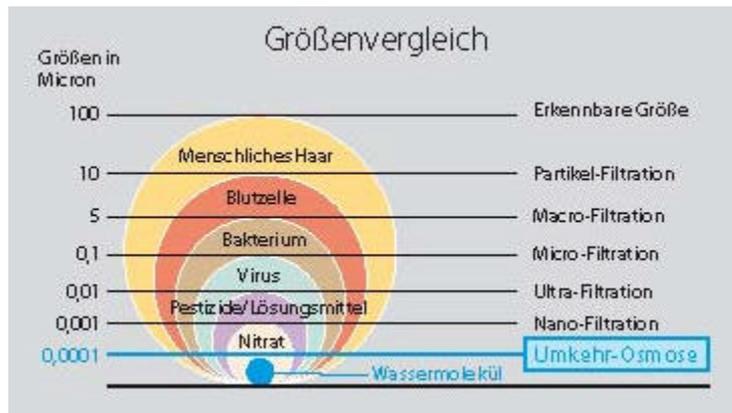
Reverse osmosis

Reverse osmosis is a physical process used for the concentration of substances dissolved in liquids. Reverse osmosis is used for the purification of drinking and process water and for the treatment of waste water. In reverse osmosis the natural osmosis process is reversed by applying high pressures. The medium in which the concentration of a specific substance is to be reduced is separated by a semi-permeable membrane from the medium in which the concentration is to be increased. In reverse osmosis this is subjected to a pressure which must be higher than that produced by the osmotic demand for concentration equilibrium. In this manner, the molecules of the solvent can move against its "natural" osmotic propagation direction into the area in which the dissolved substances are already less strongly concentrated.

Diagram of reverse osmosis and size comparison of individual molecules



Eingangswasser	Intake water
Filtrationsprozess	Filtration process
Membrane	Membrane
Abwasser (Konzentrat)	Waste water (concentrate)
Reinwasser (Permeat)	Pure water (permeate)



Größenvergleich	Size comparison
Größen in Micron	Size in Microns
Erkennbare Größe	Discernable size
Menschliches Haar	Human hair
Partikel-Filtration	Particle filtration
Blutzelle	Blood cell
Macro-Filtration	Macrofiltration
Bakterium	Bacterium
Micro-filtration	Microfiltration
Virus	Virus
Ultra-Filtration	Ultrafiltration
Pestizide/Lösungsmittel	Pesticides/Solvents
Nano-Filtration	Nanofiltration
Nitrat	Nitrate
Umkehr-Osmose	Reverse osmosis
Wassermolekül	Water molecule

In reverse osmosis the contaminated water is pressed through a synthetic semi-permeable reverse osmosis membrane, which allows water to pass thorough, but is impermeable to the contaminants in the intake water, by the working pressure produced by a pump.

Pure water collects on one side of the reverse osmosis membrane and on the other side the contaminating substances can be routed into the drain or removed via the drain by means of the automatic back-flush cleaning process. Reverse osmosis is used anywhere where water of highest purity or where natural, clean water purified by a specific membrane module is required.

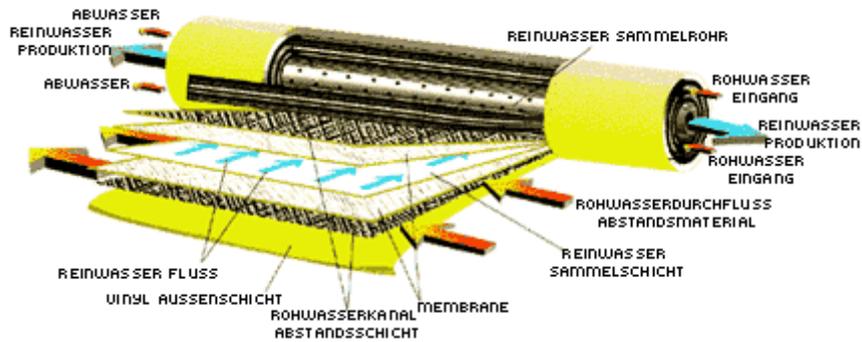
The most important part of a reverse osmosis system is the reverse osmosis membrane.

The quality of this reverse osmosis membrane is of decisive importance.

There are different manufacturing procedures and quality variants, which thus naturally also affect the quality of the reverse osmosis water and its taste.

In addition, the service life and the rejection rate of the contaminating substances depend on this.

Structure of a reverse osmosis membrane



Abwasser	Waste water
Reinwasserproduktion	Pure water production
Abwasser	Waste water
Reinwasser-Sammelrohr	Pure water collection tube
Rohwassereingang	Raw water intake
Reinwasserproduktion	Pure water production
Rohwassereingang	Raw water intake
Rohwasserdurchfluss-Abstandsmaterial	Raw water flow-through-spacer material
Reinwasser-Sammelschicht	Pure water collection layer
Reinwasserfluss	Pure water flow
Vinyl-Aussenschicht	Vinyl outer layer
Rohwasserkanal-Abstandsschicht	Raw water channel spacer layer
Membrane	Membrane

A post charcoal filter, which is mounted behind the reverse osmosis membrane, is used to further improve the taste of the reverse osmosis water.

With the aid of this molecular filter up to 99% of all the contaminants present in water can be removed, e.g., viruses, bacteria and cysts up to 100%.

By means of reverse osmosis, for example, the following substances are retained (= removed from the water) to a high percentage.

- Heavy metals
- Hardness-producing substances
- Agricultural chemicals/ nitrite, nitrate
- Hormones
- Antibiotics

- Viruses / bacteria / cysts
- Herbicides / pesticides / fungicides and their metabolites
- Medicinal residues
- Inorganic minerals / salts
- organic chlorine compounds (trichlorhalomethanes, etc.)
- Asbestos fibres, tars, radioactive particles, and many more.