## <u>2 Stage – Osmosis & Micro-filtration (OMF) Cell</u>



The above diagram illustrates the "OMF-cell" process. The "OMF-cell" uses a osmosis membrane and a low-cost micro-filter to create a free-flowing water-filtration system. The micron sizes listed above and Blue Indigo dye are used as examples to demonstrate the principles.

- The "OMF-cell" consists of an osmosis membrane and a low-cost micro-filter.
- The "OMF-cell" has a concentrated (saturated) solution, whose molecules are larger than the micro-filter pores.
- Osmotic action moves water from low concentration (dirty) water to high concentration solution.
- The "OMF-cell" contains only water and the Blue Indigo dye
- The ceramic filter's pore size is too small for the dye to pass through, so only pure water goes through.
- The Osmotic pressure helps to expel pure water through the micro-filter.
- The pressure is not high enough to produce "reverse-osmosis".
- The system creates a one-way flow, from dirty water to the "OMF-cell" and then through the micro-filter, producing clean water.

The micro-filter shown above is ceramic, as this is low-cost and readily available, but any micro-filter can be used. Blue Indigo dye can also be substituted for another chemical. The principle is to create a cell containing a concentrated solution with a bigger molecule than the filter pore size.

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