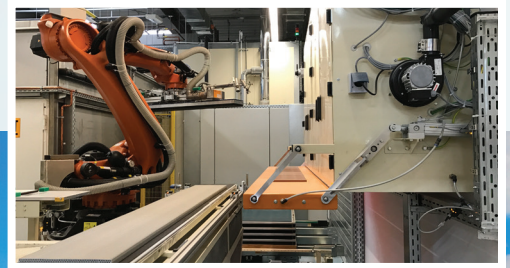
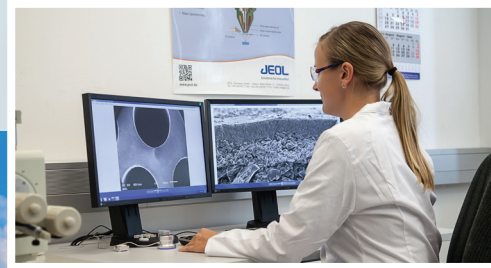


# NANOSTONE PRODUCTION & RESEARCH CENTER



Halberstadt, Germany



Nanostone water is a world class membrane manufacturing company with a unique technology for nanoparticle ceramic coatings and a patented ceramic membrane module design. The nanotechnology coatings provide a tight pore size distribution in the ultrafiltration range with high strength and high water permeability. The unique design of extruding the ceramic support in individual flat segments dramatically increases the yield and capacity of the manufacturing process. Both of these technology breakthroughs are combined in the Nanostone CM-151™ ceramic ultrafilter (UF) membrane module to optimize the performance for water and waste water treatment applications.

Nanostone Water has focused on automation of the manufacturing process to maximize the quality and production capacity of the CM-151. The ceramic manufacturing operations and research center is located

in Halberstadt in the center of Germany. Germany is known for its manufacturing ingenuity, our ceramic membranes are no exception. All aspects of the manufacturing process are done on-site in Halberstadt including the synthesis of the nanoparticle coatings, extrusion and sintering of the ceramic structures, module assembly, and final quality assurance. Consistency and quality are hallmarks of our manufacturing process.

At Nanostone Water, our mission is to provide a new generation of reliable, robust ceramic UF membranes, that provide long term predictable performance at the lowest total cost of ownership for our water treatment customers.

The key to the performance of the Nanostone ceramic membrane is the hydrophilic nanoparticle coating.

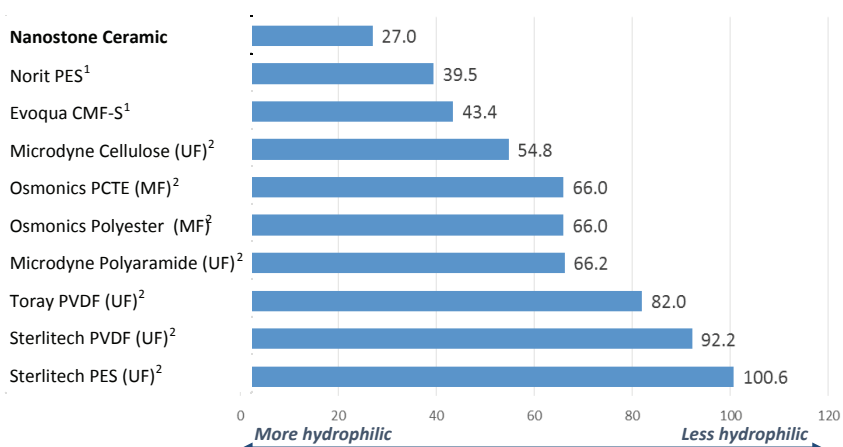
The nano sized ceramic particles are asymmetrically layered and fused together at high temperature in our state of the art sintering furnace. The result is an extremely strong ceramic surface with millions of consistently sized pores formed between the ceramic nanoparticles. The multiple asymmetric layers provide a strongly bonded surface that gives ceramic membranes their extraordinary long life. The resulting ceramic surface is also extremely hydrophilic.

A routine approach to assessing membrane hydrophilicity is measuring the contact angle of a droplet of water placed on the surface of the membrane. The lower the observed contact angle, the greater the hydrophilicity. As you

can see from the graph below the Nanostone ceramic membrane surface is much more hydrophilic than all of the polymeric membranes.

Beyond the high technology ceramic coatings, the Nanostone ceramic membrane module assembly process is rigorously controlled in the ISO 9001 certified facility. Each membrane module must pass strict quality control standards for integrity. In addition, the design of the product has gone through extensive advanced life cycle testing with pressure, temperature, and chemical exposure testing to assure the finished module will perform long term in a variety of water and waste water applications.

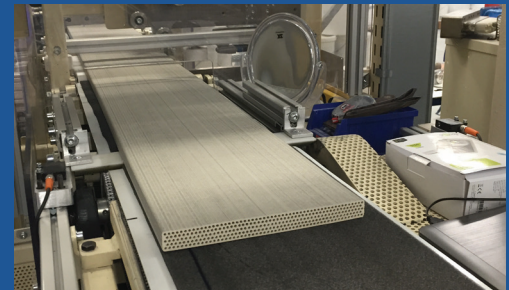
## NANOSTONE CERAMIC SURFACE CONTACT ANGLE COMPARED TO POLYMERIC MEMBRANES



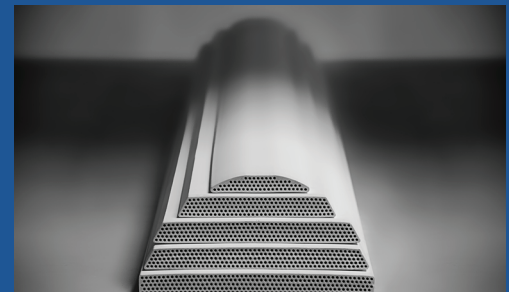
1. "Evaluation of Membrane Characterization Methods", (Water Research Foundation, Web Report 4102, 2012); <http://www.waterrf.org/publicreportlibrary/4102.pdf>

2. "Effect of Membrane Surface Properties on Membrane Fouling"; S. Woon, 2011; <http://onlinemembr.info/principles/contactangle.html>

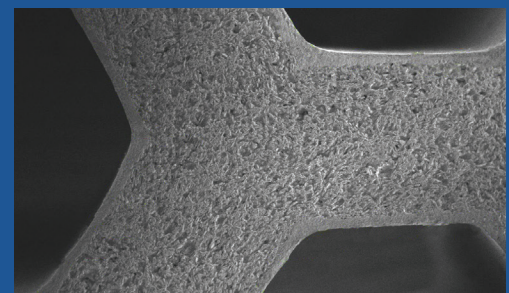
### CERAMIC FLAT SEGMENT EXTRUSION



### CERAMIC SEGMENTS



### HEXAGONAL FLOW CHANNELS 40X SEM IMAGE



### NANOPARTICLE COATING 400X SEM IMAGE

