

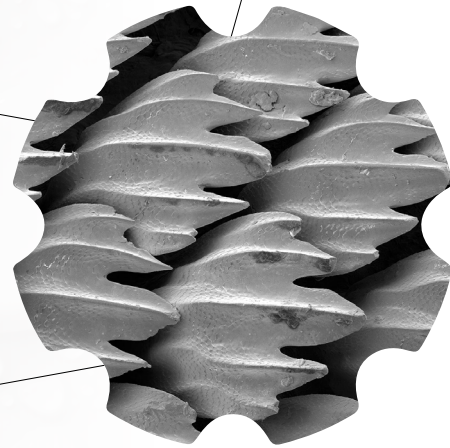
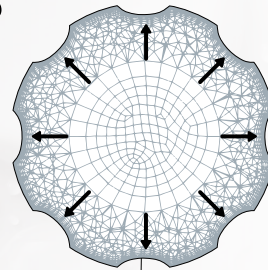


GERMAN
**INNO
VATION**
AWARD '22
WINNER

RIDGE-M™

Next generation tubular
ultrafiltration membranes

BIO-INSPIRED



Membranes
Think outside the box

Bio-inspired innovation

Did you know that the earth is operational for nearly four billion years? During that time the earth has mastered a wide variety of challenges. This is why nature is a great source of inspiration for finding a solution for challenges in today's technology. Therefore it is no surprise that the power of Berghof Membranes bio-inspired innovation lies in nature's unconventional solutions. It is what drives us to think outside the box.

Ocean life inspires our future

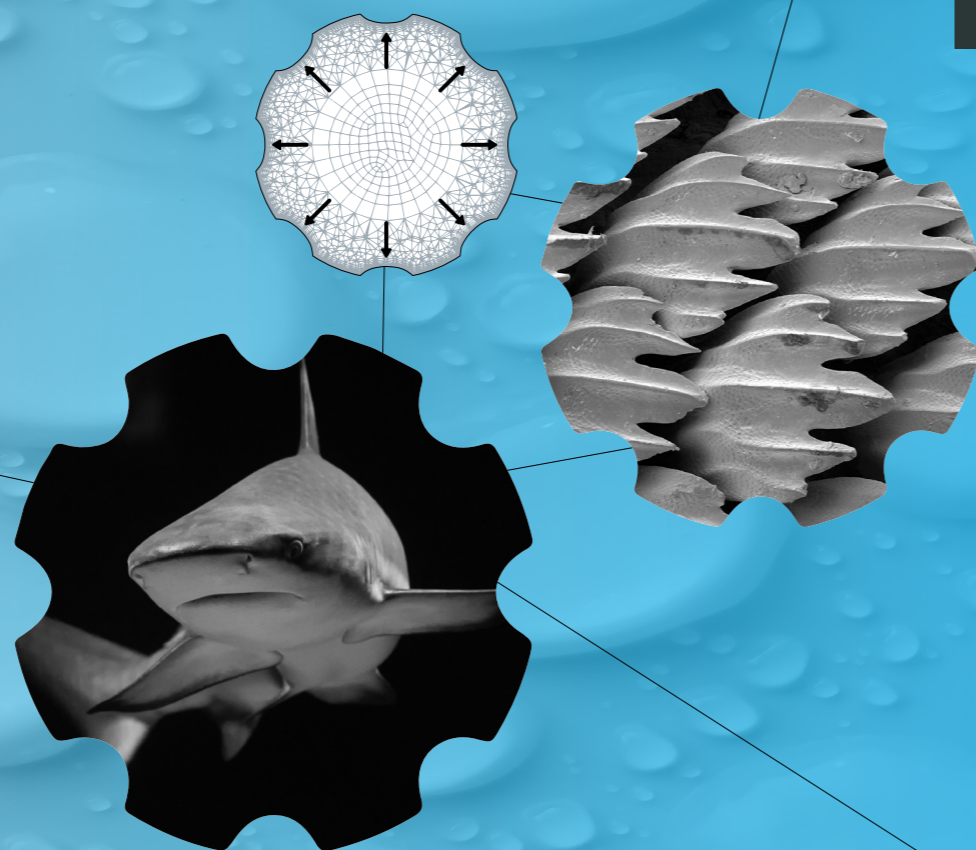
The World Ocean is the largest existing ecosystem on our planet. Covering over 71% of the Earth's surface, it's a source of livelihood for over 3 billion people. Yet, we often forget how dependent we are on the sea and everything that lives in it. Actually marine life reinvents itself time and time again by adapting to changing environmental conditions. In nature nothing is lost and the available energy is used as efficiently as possible. It is this efficiency that inspired us to develop our latest innovation, Ridge-M™.

Don't stick to the standard

Let's zoom in on one of the ocean's greatest representatives – the shark. Fast and agile, and able to reach astounding speeds. Their secret? A skin to which nothing sticks. And yet this skin is not smooth. It is covered with famous sharp, tooth-like placoid scales. These so-called denticles protect the shark by preventing the attachment of organisms present in the water that could contaminate or disturb it.



There is so much left to discover beneath the surface. Scan the QR Code and stay informed!



The Ridge-M™ technology

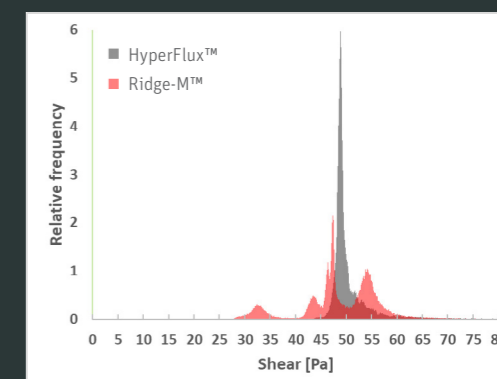
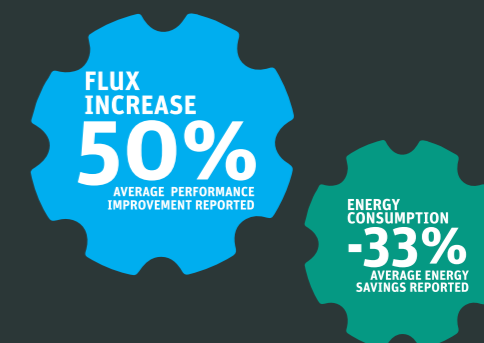
One of the tedious bottlenecks in high-solids ultrafiltration is the excessive accumulation of solids on the membrane surface, resulting in fouling or clogging of the membrane. With the development of our new patented Ridge-M™ membrane technology, which offers an enhanced self-cleaning effect, the build-up of foulants on the surface of the membrane is prevented. This results in a higher, more stable permeate flow that yields better permeability, thus a higher permeate flux.

Advantages

Multiple sharkskin-inspired ridges in the length of the inside of the membrane increase the surface turbulence due to uneven shear stress distribution. The technology creates a continuous mixing of solids in the feed water delaying the forming of a cake layer on the membrane surface.

Possible fouling between the ridges is removed easily due to the combination of turbulence and the uneven shear stress. This technology boosts the average performance of the membrane up to 50%* and lowers the consumption of both energy and chemicals.

*Average flux increase up to 50% compared to the standard Berghof HyperFlux™ membrane. Results may vary by application or operating conditions



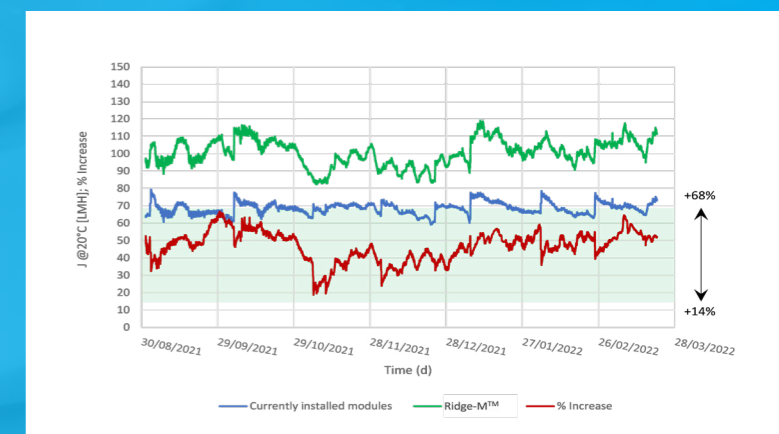
Shear stress distribution HyperFlux™ vs. Ridge-M™
Crossflow velocity 4 m/s

The Ridge-M™ Performance comparison

Berghof Membranes carried out a comparative study at Holland Malt to demonstrate the improved performance of the new Ridge-M™ technology. The new technology was tested in a full-scale plant, in such a way that the test was performed with real biomass and under the ordinary operational conditions and variabilities. Flux increased from 72 lmh for standard HyperFlux™ to 121 lmh with the Ridge-M™ technology. This results in energy savings up to 40%.

Project Details

Location: Eemshaven, the Netherlands
Product: Ridge-M™ Technology
Membrane: PVDF, 8mm
Capacity: 2.500 m³/day
Project: Fullscale evaluation RIDGE-M™ Membrane technology vs. standard Berghof HyperFlux™ membranes



Daily average values of permeability (flux normalized for temperature and TMP). RIDGE-M™ membrane technology vs. standard Berghof HyperFlux™ membranes



BERGHOF'S NEXT GENERATION MEMBRANES

BIO-INSPIRED

Innovation Method: thinking outside the box

Bio-inspired innovation is a method that uses nature as an inspiration for out-of-the-box innovations. Our out-of-the-box applications can be technical, but also offer solutions for societal challenges and social innovation. Nature uses efficiency and sustainability as the basis for the survival of life on our planet of which we can learn a lot.



Membranes
Think outside the box

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