because

Collaboration, Biomimicry and Success Stories

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FLEXcon Statistics

Confidential

- Founded in 1956; Corporate headquarters in Spencer, MA.
- Privately held, global sales exceed $400 million.
- Leading converter of coated materials for Product Identification, Brand Promotion and Bonding markets.
- Global presence.
- Spencer, MA. ~1,000,000 sq. ft. manufacturing and distribution.
- Columbus, NE. ~400,000 sq. ft. manufacturing and distribution.
- Elkton, KY.~ 75,000 sq. ft. dedicated manufacturing facility.
- Glenrothes, Scotland ~100,000^{+} sq. ft. manufacturing and distribution.
- Distribution, Chino, Ca., Laredo, TX (for Mexico), Mississauga, CN, Weesp, Singapore, Shanghai. Other distributor relationships R.O.W.
- 3500 B2B customers nationwide.

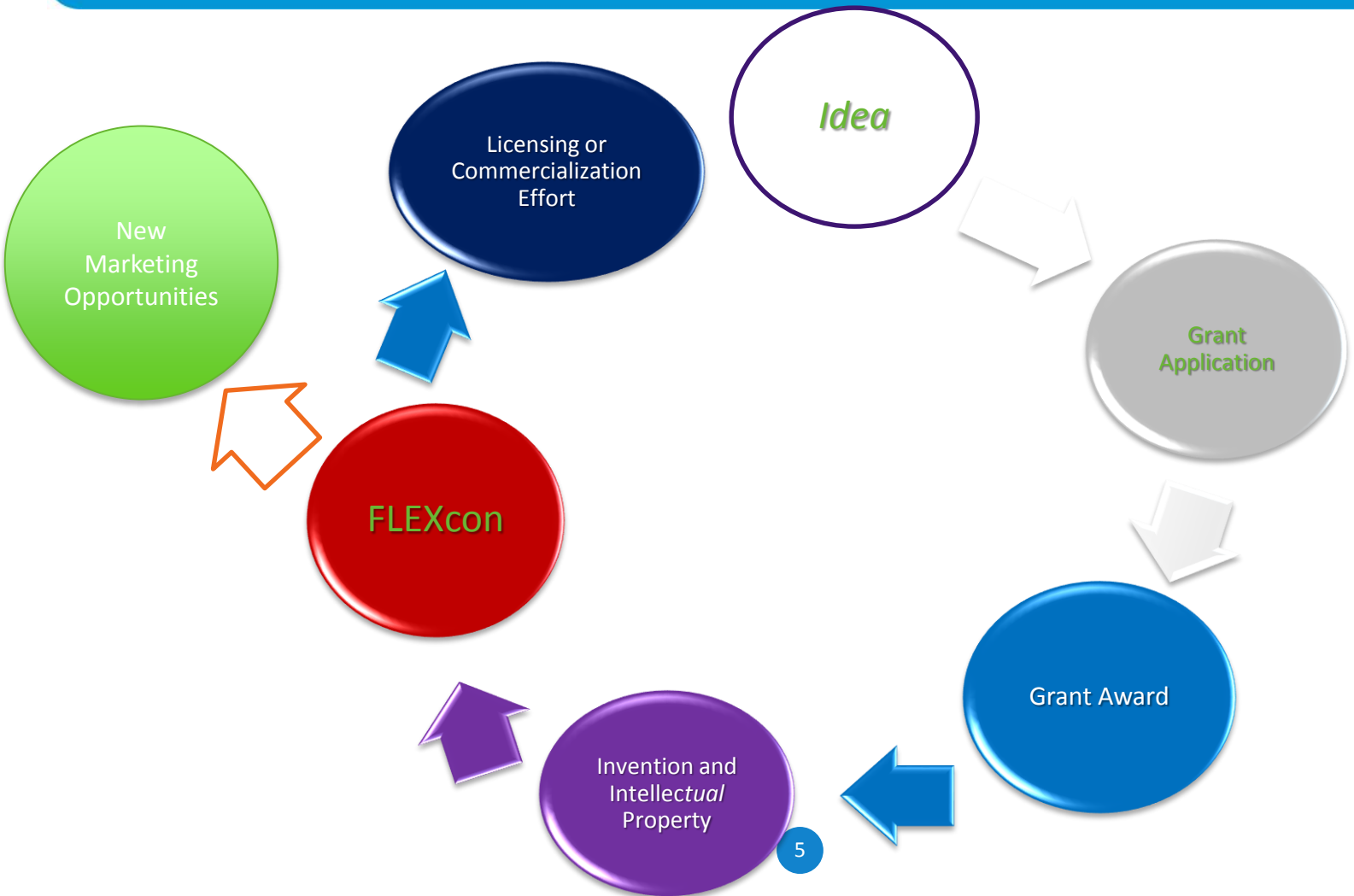
FLEXcon Campus

Confidential

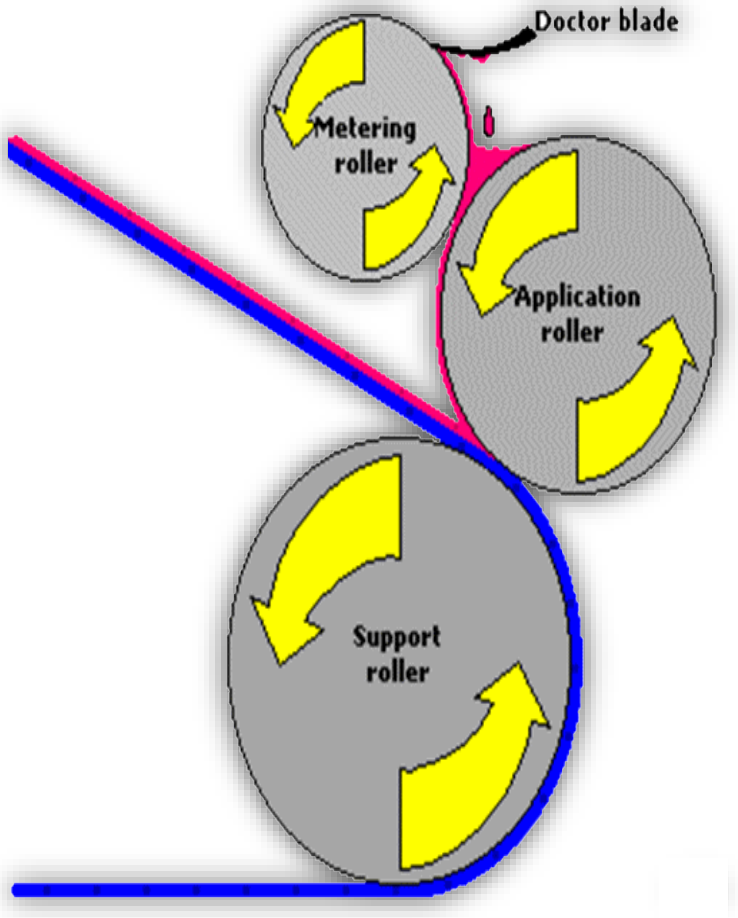
Energy-efficient wind turbines inspired by schooling fish

Healthy glues biomimic blue mussels byssal threads; or

Stronger materials biomimicking

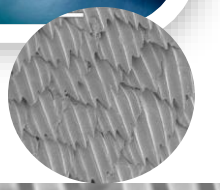

Idea
Grant Application
Grant Award
Invention and Intellectual Property
FLEXcon
New Marketing Opportunities
Licensing or Commercialization Effort

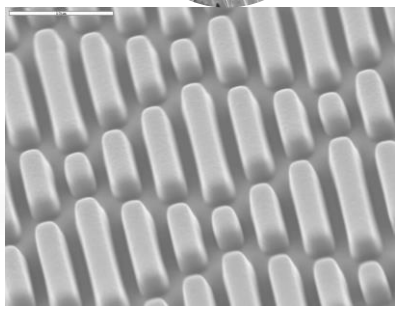
Roll Web Coating / Imaging

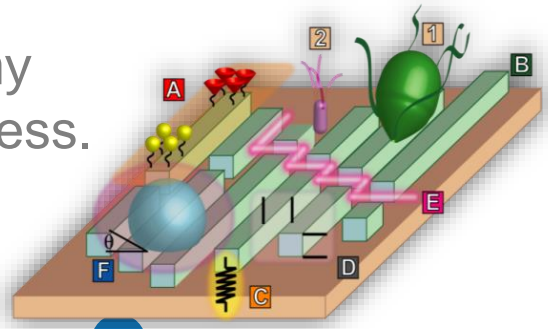


The Power is in the Pattern

- Dr. Anthony Brennan discovers pattern while searching for an antifouling solution on behalf of Office of Naval Research.
- Sharklet is a biomimetic technology.
  - Sharklet inspired by shark denticles and their microorganism resistant properties.
- Denticles match Dr. Anthony Brennan's model for roughness.



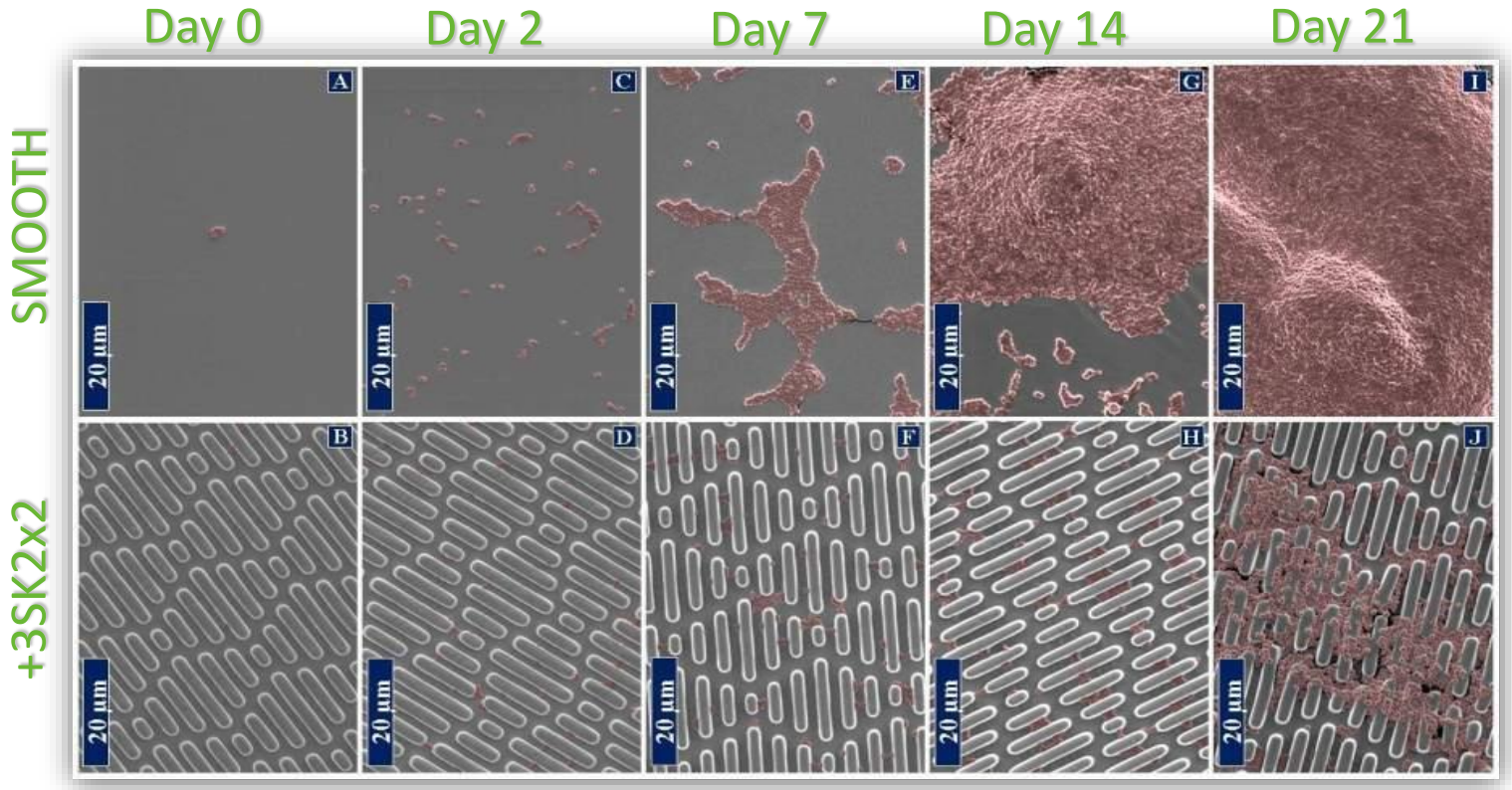




Testing Results

Sharklet Technologies conducts 7, 14, 21-day tests

- Rare to see a biofilm test beyond 24 hours
- Bacteria in recesses **are dead**



S. aureus - Static, media replenished, no cleaning

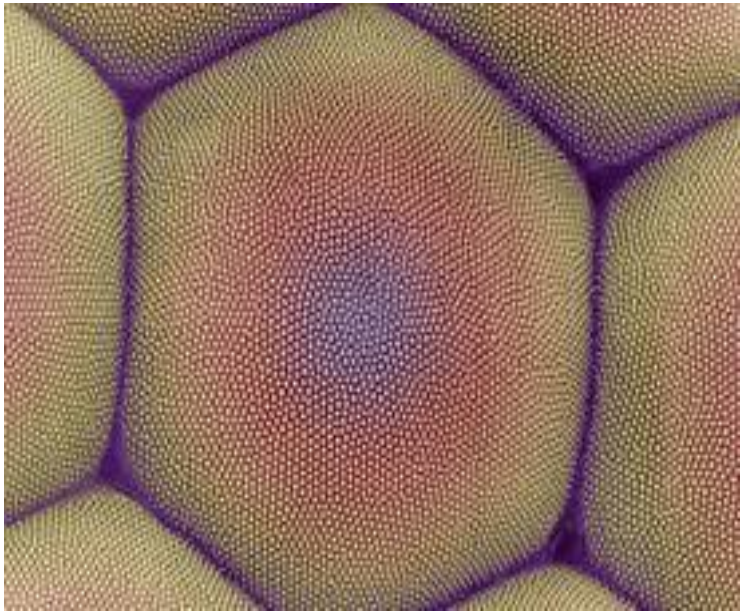
Sharklet™ SafeTouch Applications – *Disposable*

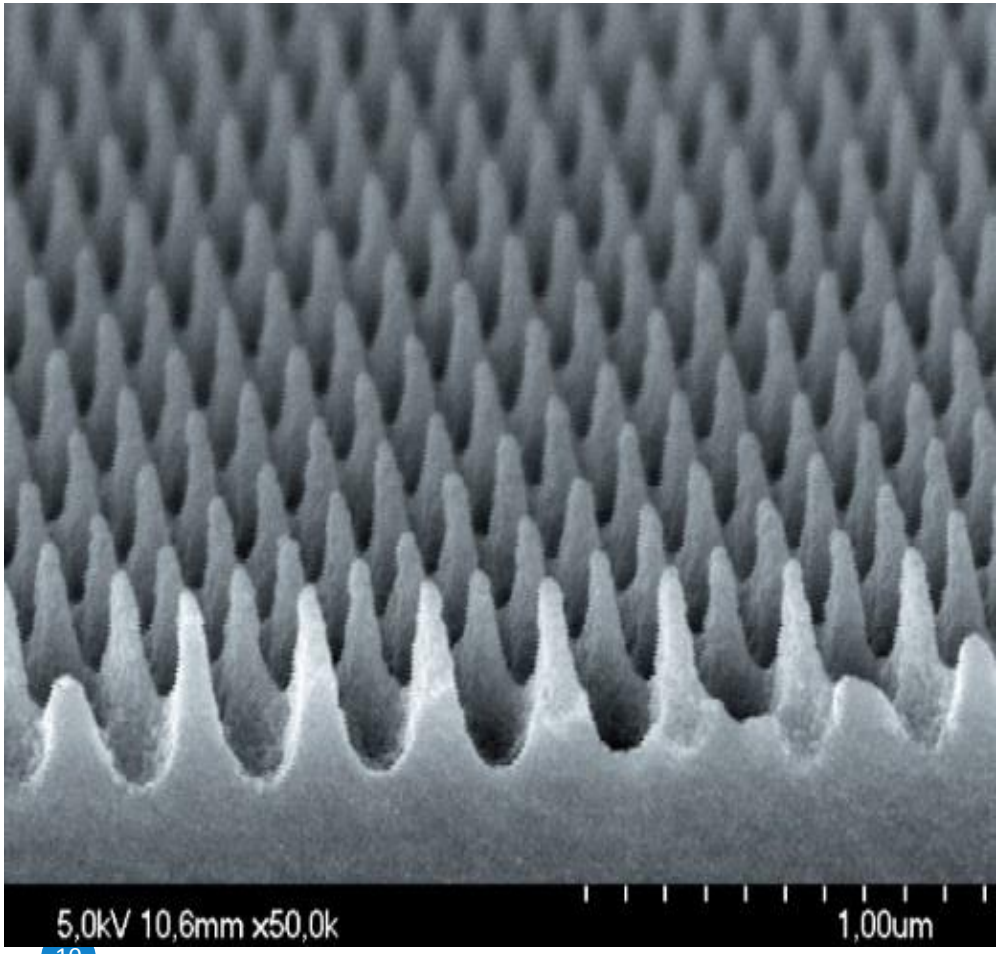
All high-touch, bacteria-prone surfaces that serve as vectors for disease

- High-touch areas in food prep (non-cutting surfaces)
- Hospital surfaces
- Public bathrooms
- Fitness facilities
- Laboratories / animal research

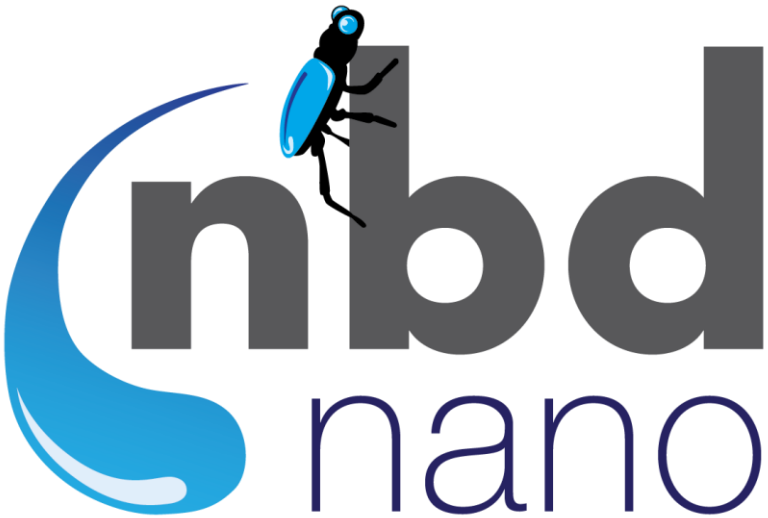
90-day +/- life

Moth's Eye



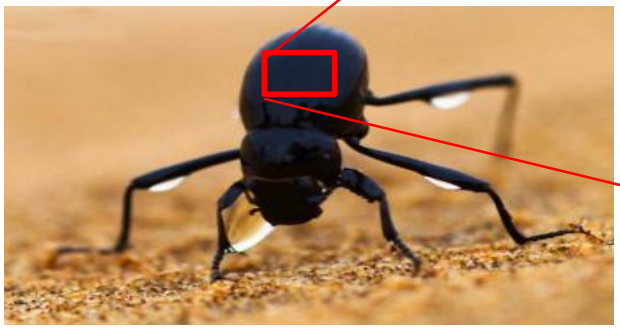


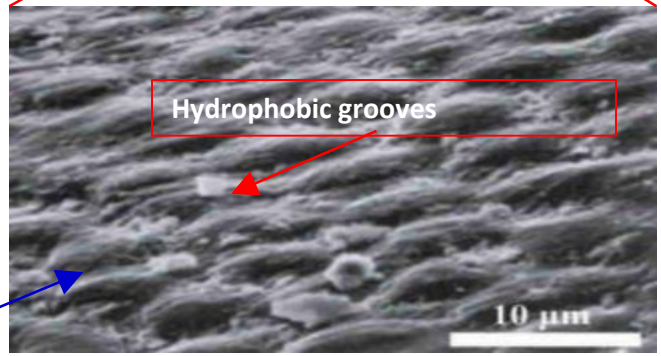
Experts in surface wettability



Contact: Deckard Sorensen
info@nbdnano.com

Namib Beetle Design Nanotechnologies, Inc





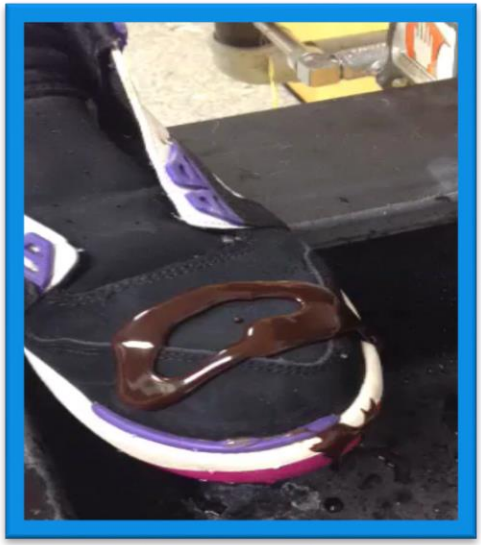
Hydrophilic bumps

Namib Desert Beetle (*Stenocara Gracilipses*):

- Utilizes amphiphilic (hydrophilic and hydrophobic) surface patterning to harvest water
- Drinks 12% of weight in water in area of world that only gets a half inch of rainfall yearly

Advanced *Durable* & Functional Surface Coatings & Additives

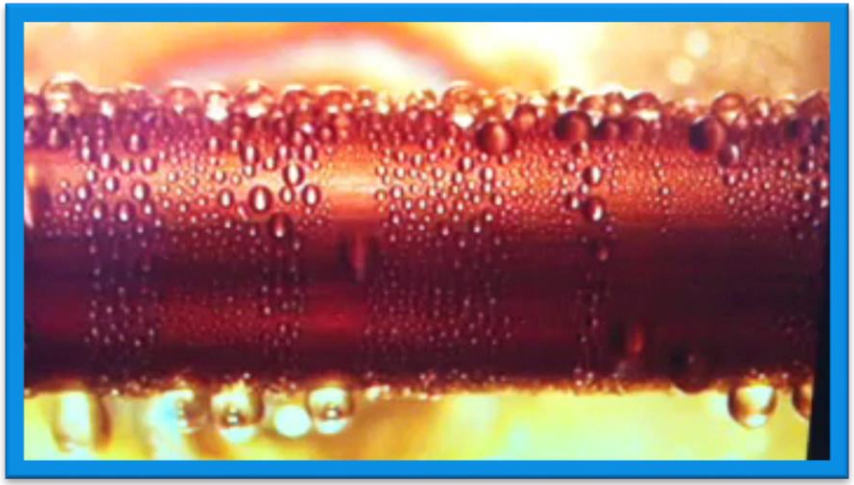
Omniphobic Protective Coating



Markets addressable:

Biofouling, De-icing, stain resistance, performance plastics, electronics waterproofing, paint additive

Enhanced Condensation Coating



Markets addressable:

Steam condensers in power plants and thermal desalination plants (MSF, MED)

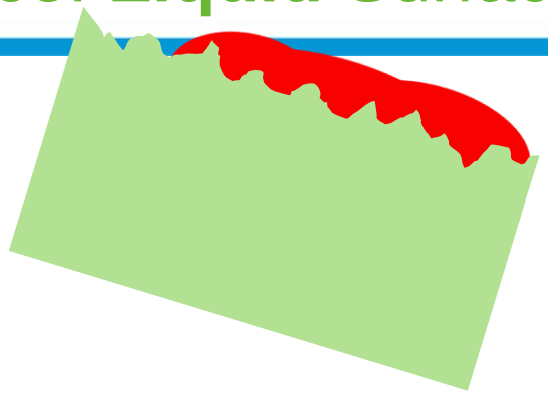
SLIPS™ TECHNOLOGIES

Slippery Solutions for Sticky Problems™

June 2016

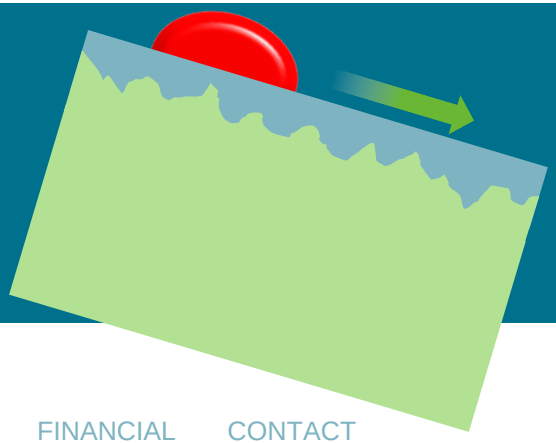
The SLIPS Difference: **Liquid** Surface Interface

Solid surfaces are **rough** and have many pinning points



Unwanted fluids or biological foulants get stuck and smear

SLIPS™ surfaces feature an immobilized **liquid** lubricant overlayer—**completely smooth and fully slippery**



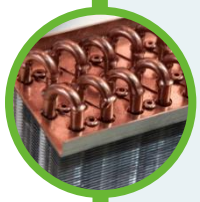
Unwanted fluids or biological foulants slide off

Slippery Solutions for Sticky Problems™

SAVINGS IN COST AND ENERGY

Marine fouling
Reduce drag and fuel consumption

Industrial release
Increase throughput and reduce waste



Heat exchangers
Ensure high heat transfer efficiency

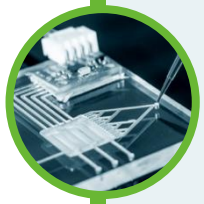
FUNCTIONALITY ENHANCEMENT

Container emptying
Reduce waste, facilitate the recycling process

Lubricity
Improve user experience of lubricated products

IMPROVED HEALTHCARE

Medical devices
Prevent bacterial infection, improve fluid drainage



Microfluidics
Reduce sticking of analytes to surfaces

Biological growth platforms
Easy release of cells, neurons, etc.

Biologically-Inspired Adhesives and Tapes

Biology provides a diverse array of methods for creating adhesion

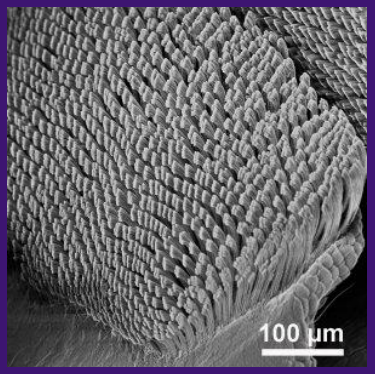
Chemical ("wet")

Spider web glue

Tree sap

Structural ("dry")

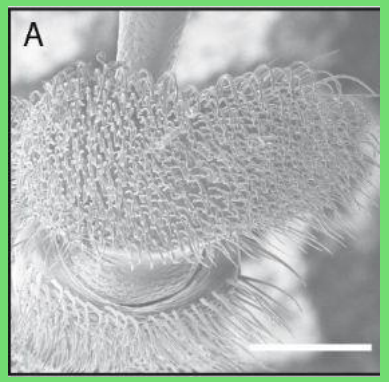
Gecko foot → "Geckskin"

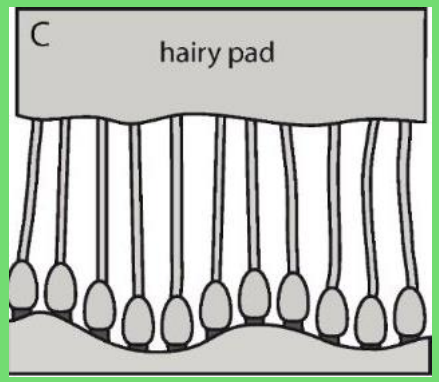


Burs → Velcro

Structural + Chemical

Insect adhesive pads

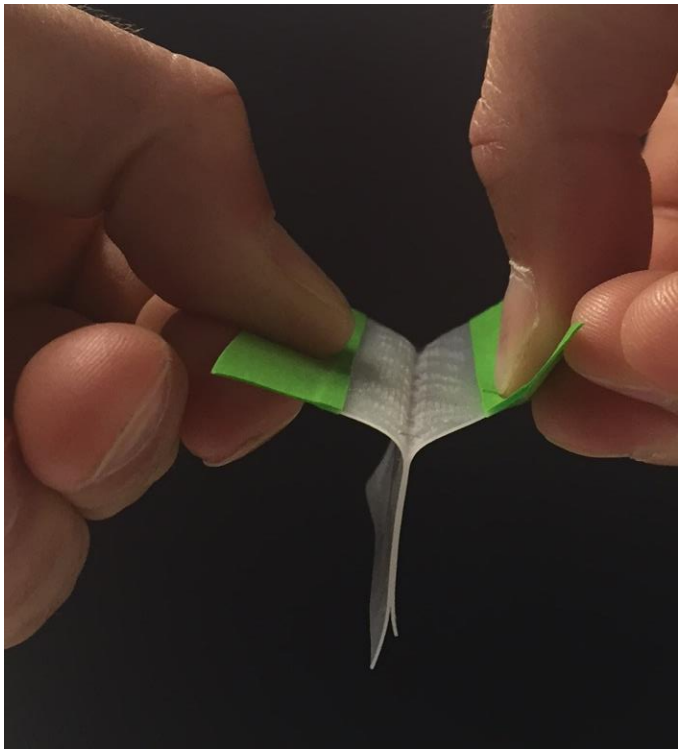




Nano Terra Adhesion System: Applied Biomimetics

- Nano Terra system uses biomimetic principles to create novel adhesion technology
- Technology has unique orientation-sensitive adhesion properties:

Aligned strips adhere tightly



Misaligned strips have no adhesion

For more information about Nano Terra's adhesion technology, please contact:
Mike Fuerstman, VP of Business Development –

Arnold Glas - Architectural Glass

Stefan Marshall-Goebel
General Manager
Arnold Glas, Corp
June 2nd 2016

www.arnold-glas.com www.ornilux.com

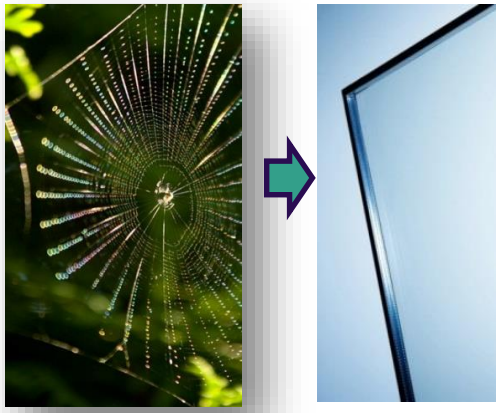
ARNOLD GLAS

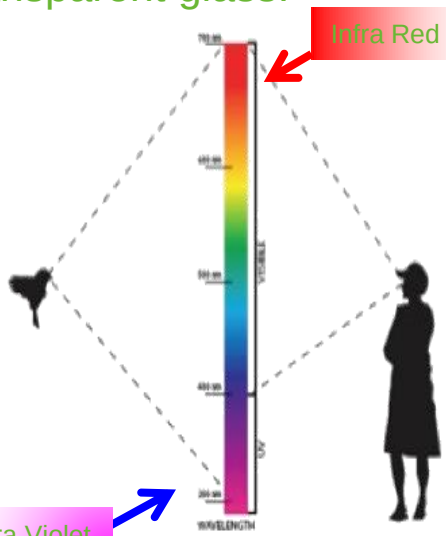
Bird Protection Glass ORNILUX **Mikado**

The Invention

Idea…

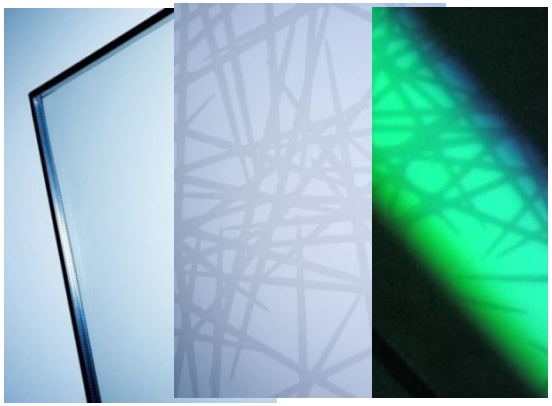
Biomimicry…
Develop a UV reflective, transparent glass!





ORNILUX

...Patent



What we see... **What the birds see..** **With UV photography…**

ARNOLD GLAS

Bird Protection Glass ORNILUX - The Market Development

U.S. Project Impressions

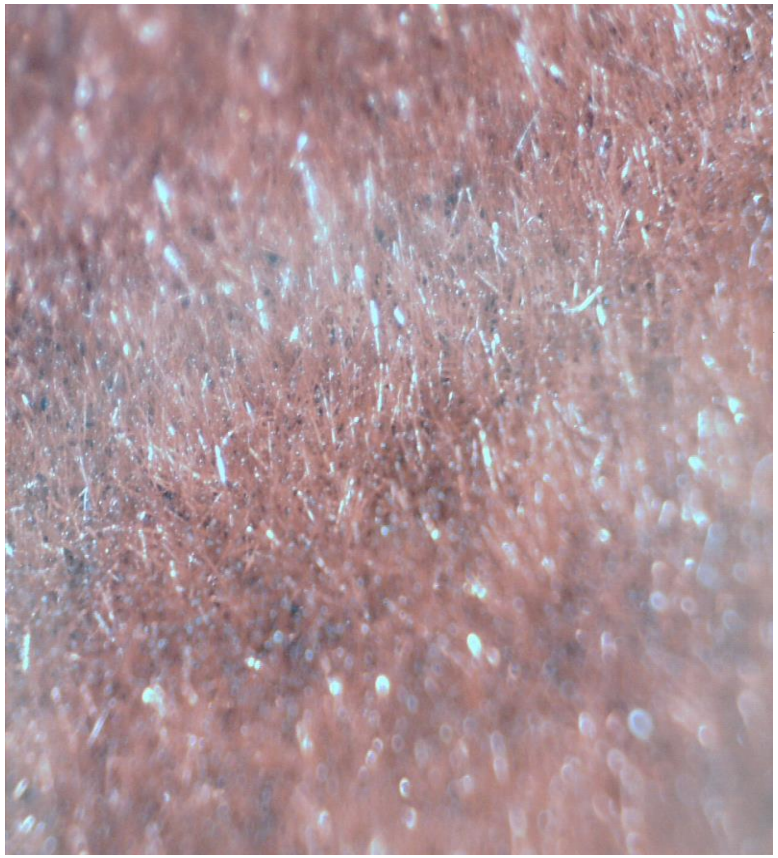
University of Massachusetts, Integrated Sciences Building, Amherst, Massachusetts, Brett Drury Architectural Photography Inc

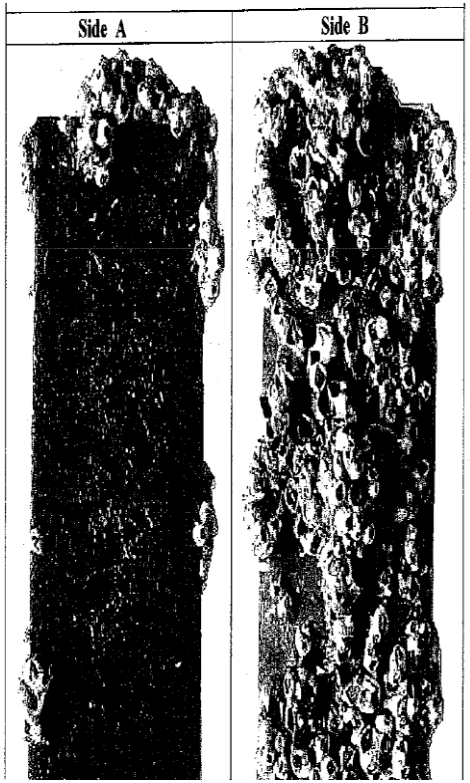
Vassar College, NY
Ennead Architects

Centennial Beach, BC Architecture/ Brenda Liu Photography

BioFouling on Retrieved Buoy

LivingLabs Concept Test





Exciting Opportunities

- Drag reduction
- Medical closures
- Medicine delivery
- Natural adhesion
- Diagnostics
- Ice Build Up Reduction
- Irrigation
- Security
- Air Flow

because

Thank you!