

# CACTUS NANO

MAXIMIZING GLOBAL HEALTH  
AND WATER SUSTAINABILITY



[Introduction]

# Corporate Philosophy

## Counting to take on new challenges as a pioneer of Antimicrobail technology

CactusNano, a spin-off of Cactus Materials, Inc. (a US-based semiconductor and advanced materials company), focuses on innovative products like CoreSil™ Membrane, Suspension, and Powder for textile, water, medical, and space industries. As a research-driven firm, Cactus collaborates with academia and national agencies, including NASA and Arizona State University, to develop advanced materials particularly its Antimicrobial Technology, the core of its materials division.

At Cactus Nano, we are not just solving problems — we are rewriting the standards of what's possible in water treatment technology. With breakthrough nanoscience, our solutions address some of the toughest fouling challenges that cripple industries worldwide. No other company brings a complete, integrated answer to these challenges. We combine science at the nanoscale with impact at the global scale — protecting industries, the environment, and the future of water itself.

### Vision & Mission

*Water sustainability by developing monopoly of technologies and their manufacturing for secure water world*

### BIOFOULING

CoreSil™ Nanomaterials and suspension provide lasting protection against microbes and unwanted odors across various materials (Patented)

### CORROSION

Cera2D™ for corrosion inhibitor coating and 10x performance over standard epoxy coating.

### PFAS (Forever Chemicals)

EndPFAS™ - A solution from Cactus Nano to solve PFAS- Most toxic and nearly indestructible persistent pollutants.

### Toughest Treatment Challenges & Our Solutions

## A COMPLETE ENVIRONMENTAL ENGINEERING SOLUTION



### Core Competence Engineering Division

- 1 Civil Engineering
- 2 Mechanical Engineering
- 3 Chemical Engineering
- 4 Environmental Engineering
- 5 Electrical Engineering
- 6 Process Engineering





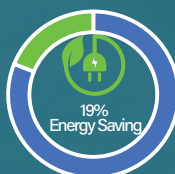
# CoreSil™ Benefits



Improves membrane lifespan (up to 2x)



Increases membrane flux (>31%) by mitigating biofilm formation



Reduces energy consumption (up to 19%) with water productivity

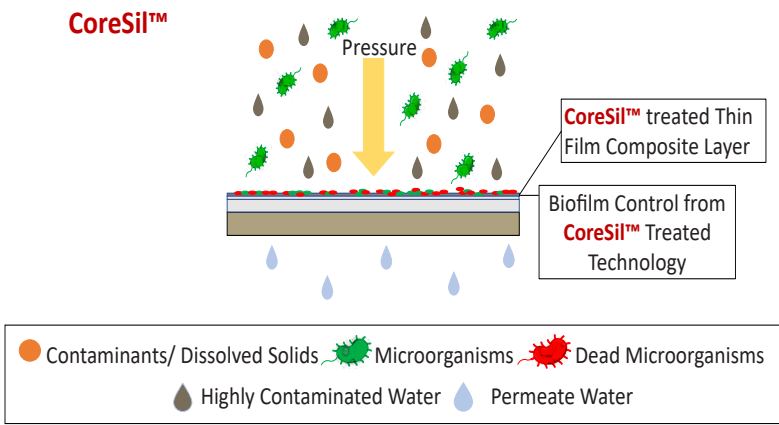


Reduces cleaning frequency (up to > 60%)



## REVERSE OSMOSIS SPECIALIZATION

### CoreSil™ Biofouling Control with CoreSil™ Membrane Technology



#### SOLUTION BY CoreSil™

CoreSil™ technology applies nanoparticles in-situ on thin film composite (TFC) membranes to provide intrinsic anti-biofouling properties and superior performance.

#### BIOFOULING PROBLEMS

- Microbial growth clogs filters and membranes.
- Causes higher energy chemical consumption and frequent cleaning of membrane.
- Frequent cleaning shortens membrane lifespan
- Huge impact in desalination, wastewater, semiconductors.

SCAN HERE







CACTUSNANO  
**Cera2D™**  
**Benefits**



**CORROSION  
INHIBITOR  
SPECIALIZATION**

**10x**

10× Performance over standard epoxy coatings



Best resistance against environmental damage



Applicable in high-value sectors such as semiconductors and other metallic infrastructure



Enhances longevity and reduces maintenance requirements

## Cera2D™

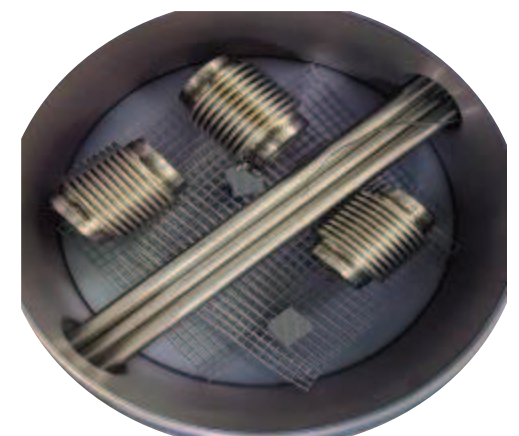
A next-generation corrosion inhibitor coating designed for metallic structures.

### CORROSION PROBLEMS

- Deteriorates pipes, tanks, and water systems.
- Leads to system failure and contamination risks.
- Especially costly in industrial water infrastructure.

### SOLUTION BY Cera2D™

- Superior Adhesion, Coverage & Electrochemical Protection
- Ensures full surface coverage, even on micro-imperfections.
- Minimizes electron transfer that drives corrosion reactions.
- Strong bonding to the metal prevents coating cracks or peeling over time.



**Cera2D™** applied parts



# FOREVER CHEMICAL SPECIALIZATION



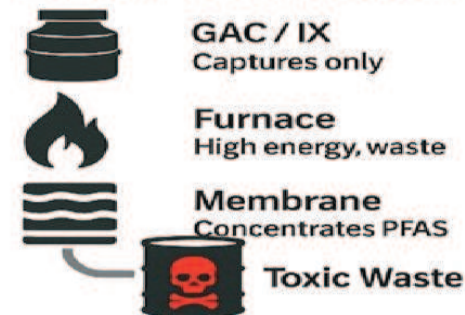
## EndPFAS™

Per-and polyfluoroalkyl substances (PFAS)

### PROBLEMS WITH PFAS

- Per-and polyfluoroalkyl substances (PFAS), often referred to as “forever chemicals are Toxic, and hazardous to for environment, and hard to destroy.
- Found in drinking water, environment, and industrial discharge.
- Regulations on PFAS are becoming more stringent worldwide.

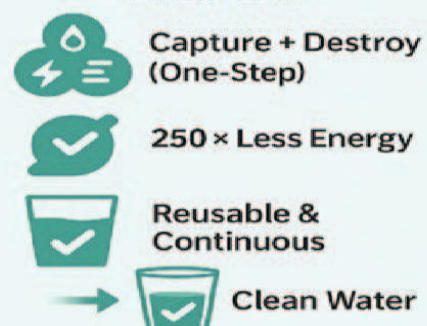
#### Legacy Technologies



### SOLUTION EndPFAS™ PROVIDES

- Simultaneous capturing and destroying of PFAS compounds
- High energy efficiency with minimum heat loss
- No down time of the system

#### EndPFAS™



CoreSil™

## Boiler Feed Water & Turbine Condensate Polishing/Recirculation Specialization

2019

Initiate

~Cactus Antimicrobial, Inc. founded in Delaware  
~Entered R&D stealth mode



2023

Execution

~Cactus Antimicrobial, Inc. to Cactus Materials, Inc.  
~Entered semiconductor chip manufacturing



2025

Aspiration

~Scale-up & global expansion  
~Customer engagement & EPA approvals

2021

Achievement

~Awarded million-dollar from NASA to develop antimicrobial materials



2024

Milestone

~“Cactus Nano” established  
~In-house CoreSil™ product manufacturing





# Industrial Solutions

Giving you a wide range of industrial solution

## Key Projects:

- Feasibility UPW and Water Reuse Design and
- Environmental for a Semiconductor Fab in Kenya under USTDA as a subcontractor; (\$USD 410,000; 9 months)
- Service Water Treatment and Environmental with Veolia; (\$USD 60,000/- year; 5 years contract)
- Submitted PFAS PRISM Proposal – a Department of Energy (DoE) for PFAS destruction and detection as a primary
- Indigo Dye Recovery Pilot – International
- Liz Fashion – International; \$USD 60,000

## Semiconductor & Microelectronics

CoreSil RO Membranes and Systems, PFAS end-to-end solution

## Textile

CoreSil RO Membranes and System

## INDUSTRIAL SOLUTIONS FIELD

## Wastewater

Low Energy CoreSil RO Membranes and System

## Data Center

CoreSil Nanomaterials and Suspension. Fouling solution

## Firms & Dairy

Forward Osmosis Process, CoreSil RO Membrane



# Projects & Collaboration

Engineering, Procurement & Construction

## Effluent Treatment Plant

- Biological Effluent Treatment Plant
- Bio-Chemical Effluent Treatment Plant
- Central Effluent Treatment Plant (CETP)



## Reverse Osmosis (RO) Water Treatment Plant

- Medical Waste Management
- Water Managment Engineering
- Indigo Dye Recovery System
- PVA Recovery System
- Zero Liquid Discharge Plant



## Sewage Treatment Plant



## Forward Osmosis (FO)

Improving forward osmosis process energy efficiency through forming high osmotic pressure zones (HOPZ) near the membrane



## Research Collaboration







**Global Headquarters, USA**

2502 West Huntington Drive  
Tempe, AZ 85282 ARIZONA, USA.

Regional office: United Arab Emirates, Bangladesh, India  
[www.cactusnano.com](http://www.cactusnano.com) | [sales@cactusnano.com](mailto:sales@cactusnano.com)