

SMO SOLUTION

FOR FRESHWATER PEARL FARMING IN SHANXI PROVINCE

Cleaner Water • Healthier Mussels • Better Pearls
Higher Yield • Sustainable Future



Better Water
Better Life



Green Technology
Low Carbon



Pearl Quality
Enhancement



Sustainable
Aquaculture



We turn water into a life-activating solution
and a target for resource recovery.



SHANXI PROVINCE: A PROMISING PEARL INDUSTRY

- ✓ Abundant **reservoirs, lakes** and slow-moving waterways
- ✓ Suitable **climate** and **water temperature** for *Hyriopsis cumingii*
- ✓ Growing local industry with strong **government support**
- ✓ Huge potential for **high-quality** pearl production and branding



Rich Water
Resources



Favorable
Climate



Traditional Aquaculture
Foundation



High-Value
Pearl Market

CHALLENGES IN PEARL FARMING

Poor water quality is the main cause of low production and poor pearl quality.



Organic Load

High Organic Load

Leftover feed, feces and decaying matter increase BOD/COD.



Algae Growth

Excess Algae

Algae bloom causes dissolved oxygen fluctuation and toxin risk.



Low DO

Low Dissolved Oxygen

Low DO leads to stress and slow growth.



Ammonia

Ammonia & Toxic Gas

NH₃-N and H₂S are toxic to mussels and reduce survival rate.



Pathogens

Pathogens & Disease

Harmful bacteria increase morbidity and mortality.



Poor Quality

Poor Pearl Quality

Thin nacre, weak luster, irregular shape and lower grade.



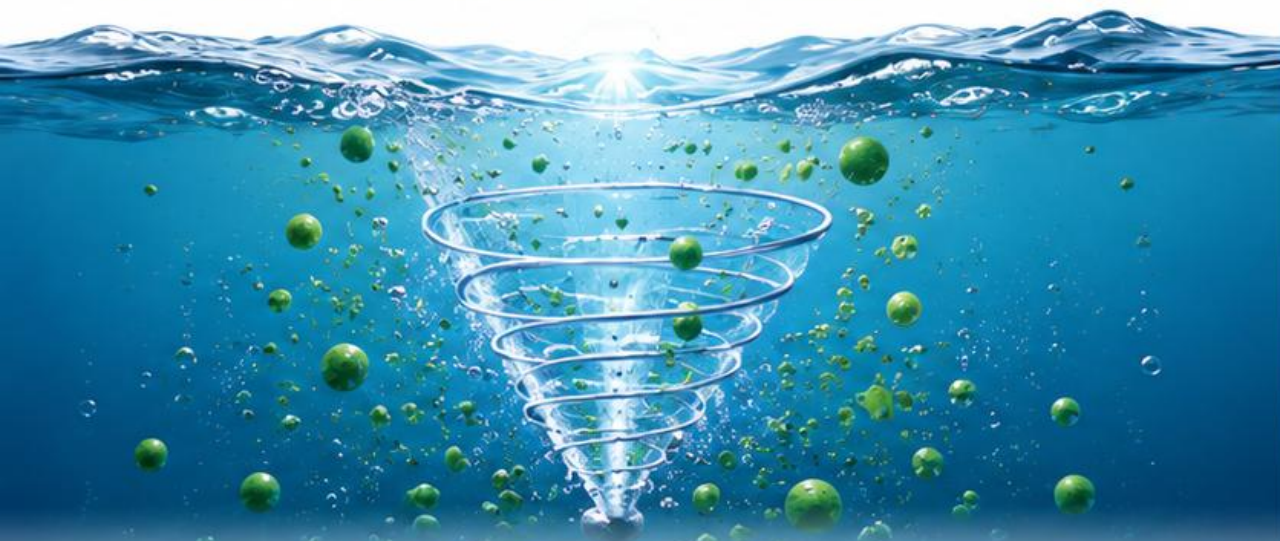
- ✗ Low dissolved oxygen (DO)
- ✗ High organic matter (BOD/COD)
- ✗ Ammonia, nitrite and H₂S
- ✗ Pathogens, harmful bacteria and algae
- ✗ Decomposes sludge and prevents accumulation
- ✗ Creates unstable and unbalanced aquatic ecosystem



The solution is not more chemicals or more water exchange, but **SMARTER, CLEANER** and **SUSTAINABLE TECHNOLOGY**.

WHAT IS SMO TECHNOLOGY?

SMO (Sustainable Marine & Freshwater Optimizer) is an advanced water quality improvement technology that creates a healthy aquatic environment by utilizing **beneficial microorganisms** and **natural minerals**.



Multi-Radical
Generation



Nanocavity
Technology



DO
Enhancement



Eco-Friendly
& Sustainable



Enhances dissolved oxygen (DO)

Promotes oxygen transfer and maintains high DO levels for healthy mussels.



Reduces organic matter (BOD/COD)

Decomposes organic pollutants and improves water clarity.



Controls ammonia, nitrite and H₂S

Reduces toxic substances and prevents stress and mortality.



Suppresses harmful bacteria and algae

Inhibits pathogens and algae blooms naturally without harsh chemicals.



Decomposes sludge and prevents accumulation

Reduces bottom sludge and keeps the pond clean and healthy.



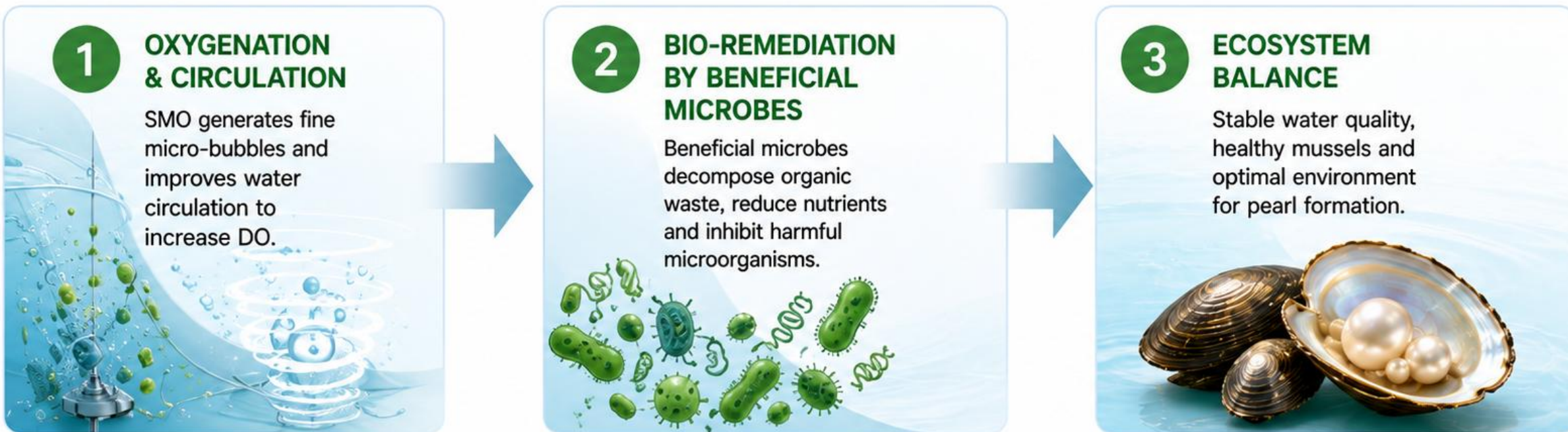
Creates stable and balanced aquatic ecosystem

Supports beneficial microorganisms and builds a self-sustaining, resilient environment.

SMO does not just clean the water, **SMO RESTORES, THE NATURAL BALANCE.**

HOW SMO WORKS

The 3-Step Synergy for Water & Ecosystem Restoration



Synergy of



Oxygen

+



Microbes

+



Minerals

=



Clean Water,
Healthy Mussels,
Better Pearls

SMO creates a self-sustaining, healthy aquatic ecosystem for **higher yield and premium quality pearls**.

PROVEN BENEFITS FOR PEARL FARMING

SMO improves water quality and creates the optimal environment for healthy mussels and premium pearls.



1. BETTER PEARL QUALITY

- Thicker nacre layer
- Stronger luster & brightness
- Higher premium grade ratio

20~30%
Higher
premium grade



2. LOWER MORTALITY RATE

- Stable water quality
- Less stress on mussels
- Lower disease risk

30~50%
Lower
mortality



3. HIGHER GROWTH RATE

- Better feed utilization
- More oxygen
- Healthier mussels

15~25%
Faster
growth



4. REDUCED WATER EXCHANGE

- Cleaner and stable water
- Less dependency on fresh water
- Lower operating cost

20~40%
Less water
exchange



5. LOWER CHEMICAL USAGE

- Less disinfectants
- Less algacide
- Lower treatment cost

30~50%
Less chemical
consumption



6. HIGHER PROFITABILITY

- Higher yield & quality
- Lower operating cost
- Stronger market competitiveness

**Significantly
Higher
Return**



Cleaner Water



Healthier Mussels



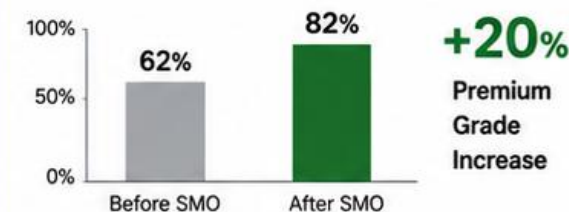
Better Pearls



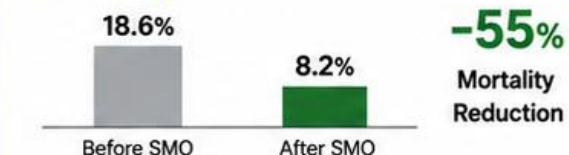
Higher Value & Profit

FIELD RESULTS EXAMPLES

Pearl Quality Improvement (Premium Grade Ratio)



Mortality Rate Reduction (60~90 Days)



Growth Rate Increase (Shell Length)



SUSTAINABLE & ECO-FRIENDLY SOLUTION

SMO supports sustainable pearl farming, protects aquatic ecosystems and builds a green future for Shanxi Province.



SMO creates clean water, healthy mussels and premium pearls – **sustainably and profitably.**

SMO SOLUTION FOR PEARL FARMS

Continuous water quality optimization for healthy mussels and premium pearls

1. WATER SOURCE



Reservoir / Lake /
River / Well Water

2. PRE-TREATMENT



- Screening
- Filtration
- Solid removal

3. SMO REACTOR SYSTEM



- Multi-radical oxidation
- Nanocavity generation
- DO enhancement
- Organic & toxic removal

4. BIO-REMEDIATION SEDIMENTATION



- Beneficial microbes
- Nutrient decomposition
- Sedimentation
- Water clarification

5. CLEAN WATER TO PEARL PONDS



- Clean, stable water
- High DO & clarity
- Healthy environment for mussels



HEALTHY MUSSELS

- Lower stress & disease
- Higher survival rate



PREMIUM PEARL QUALITY

- Thicker nacre
- Stronger luster & brightness
- Higher premium grade ratio



HIGHER PRODUCTIVITY & PROFIT

- Faster growth
- Higher yield
- Greater economic return

KEY FEATURES



OXYGEN ENHANCEMENT

Increases dissolved oxygen up to saturation level (> 99%)



MULTI-RADICAL TECHNOLOGY

Powerful oxidation of organic matter, ammonia, H₂S, and harmful substances



MICROBIAL ACTIVATION

Supports beneficial microbes and discourages pathogens and algae



CONTINUOUS & AUTOMATIC

24/7 operation with low energy consumption and easy maintenance

WHY SMO IS DIFFERENT

- ✓ Chemical-free or low-chemical operation
- ✓ Restores natural balance of water
- ✓ Improves pearl quality at the source
- ✓ Long-term sustainable solution
- ✓ Lower OPEX, higher ROI



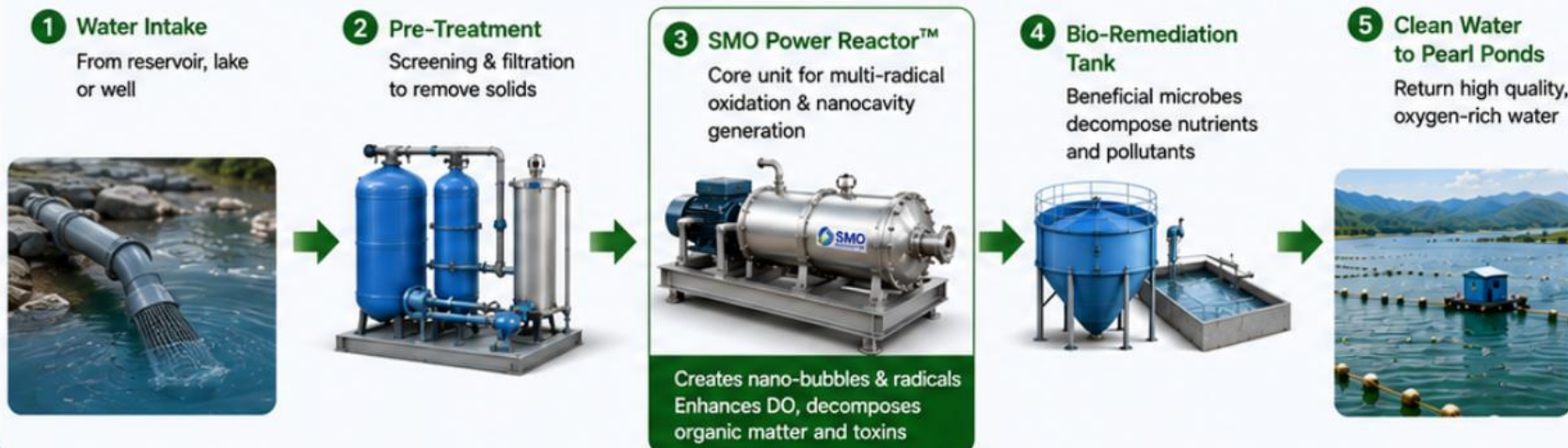
SMO creates the optimal water environment for healthy mussels and premium pearls.

Cleaner water, healthier mussels, better pearls, higher profits.

SMO SYSTEM CONFIGURATION

Easy integration, low energy consumption, and continuous operation

TYPICAL SMO APPLICATION SYSTEM FOR PEARL FARMS



RECOMMENDED INSTALLATION



SYSTEM HIGHLIGHTS

- LOW ENERGY CONSUMPTION**
High efficiency, low operating cost
- EASY INSTALLATION**
Compact design, simple integration
- DURABLE & RELIABLE**
Stainless steel, corrosion resistant
- AUTOMATIC OPERATION**
24/7 continuous monitoring & control

PILOT TEST RESULTS (Example)

Parameter	Before SMO	After SMO	Improvement
Dissolved Oxygen (DO)	3.1 mg/L	7.8 mg/L	+152%
BOD	6.8 mg/L	2.1 mg/L	-69%
Ammonia-N (NH ₃ -N)	0.48 mg/L	0.08 mg/L	-83%
Turbidity	26.5 NTU	4.2 NTU	-84%
Total Coliform	1.6×10 ⁴ CFU/mL	2.0×10 ² CFU/mL	-98.8%



Healthier environment leads to **higher quality pearls** and **better farming performance**.

VISIBLE RESULTS IN PEARL QUALITY

Before SMO



After SMO



- ✓ Thicker nacre layer
- ✓ Stronger luster & brightness
- ✓ Higher premium grade ratio

“ Since applying SMO, the water is clearer, the mussels are healthier, and the pearls are brighter with higher market value. ”

– Pearl Farmer, Shanxi Province



SMO provides a smart, reliable and sustainable solution to maximize **pearl quality**, **farm productivity** and **long-term profitability**.

SMO: SUSTAINABLE, ECO-FRIENDLY SOLUTION

SMO supports pearl farms in achieving environmental protection, resource savings and carbon neutrality.

ENVIRONMENTAL BENEFITS



Increase Dissolved Oxygen

Enhances oxygen levels up to saturation (> 99%), creating a healthy aquatic environment.



Reduce Organic Pollution

Decomposes organic matter (BOD/COD) and reduces ammonia, nitrite, and H₂S effectively.



Control Algae & Harmful Bacteria

Suppresses algae blooms and harmful bacteria naturally without harsh chemicals.



Reduce Sludge & Maintain Clean Water

Decomposes sludge and prevents accumulation, keeping ponds clean and healthy.



Eco-Friendly & Carbon Neutral

Low energy consumption, low chemical use, and reduced greenhouse gas emissions.

CONTRIBUTION TO SUSTAINABLE PEARL FARMING

Clean Water & Healthy Ecosystem

Improves water quality and protects the aquatic ecosystem.

Healthy Mussels & Higher Survival

Reduces stress and disease, improving mussel health and survival rate.

Sustainable Aquaculture

Supports long-term, sustainable pearl farming with natural balance.

Resource Savings

Reduces water exchange, chemical use and operating cost.

Higher Yield & Premium Quality

Better growth and luster lead to more premium grade pearls.

Carbon Neutral Future

Contributes to carbon neutrality and a greener planet.

SMO

The Natural Choice for Sustainable Pearl Farming

RESOURCE SAVINGS (EXPECTED EFFECTS)



Water Exchange Reduction

20~40% ↓



Chemical Usage Reduction

30~50% ↓



Energy Consumption Reduction

10~20% ↓



CO₂ Emissions Reduction

15~30% ↓

A GREEN FUTURE WITH SMO



- ✓ Protect the environment
- ✓ Save resources
- ✓ Increase productivity
- ✓ Create value for future generations



SMO is more than a water treatment technology.

It is a sustainable solution for nature, people and future generations.

SUSTAINABLE
DEVELOPMENT
GOALS (SDGs)



SMO – FOR CLEANER WATER, HEALTHIER MUSSELS, BETTER PEARLS AND A GREENER PLANET.

REAL RESULTS, TRUSTED SOLUTION

Proven performance in pearl farms and aquaculture operations

PEARL FARM CASE STUDIES

1. PEARL FARM IN SHANXI, CHINA



- SMO System Operation: 6 months
- Water Volume: 50,000 m³

RESULTS

- ✓ Dissolved Oxygen (DO) **+145%**
- ✓ Mortality Rate (60–90 Days) **–58%**
- ✓ Shell Length Growth **+22%**
- ✓ Premium Grade Ratio **+18%**

2. PEARL FARM IN ZHEJIANG, CHINA



- SMO System Operation: 8 months
- Water Volume: 30,000 m³

RESULTS

- ✓ Dissolved Oxygen (DO) **+138%**
- ✓ Mortality Rate (60–90 Days) **–62%**
- ✓ Shell Length Growth **+24%**
- ✓ Premium Grade Ratio **+20%**

3. PEARL FARM IN GUANGXI, CHINA



- SMO System Operation: 10 months
- Water Volume: 40,000 m³

RESULTS

- ✓ Dissolved Oxygen (DO) **+160%**
- ✓ Mortality Rate (60–90 Days) **–65%**
- ✓ Shell Length Growth **+25%**
- ✓ Premium Grade Ratio **+21%**

* Results may vary depending on local conditions and farm management.

“ Since applying SMO, the water is cleaner, mussels are healthier, and the pearls are brighter with higher market value.

– Pearl Farmer, Shanxi Province ”



WHY CHOOSE SMO?



PROVEN PERFORMANCE

Significantly improves water quality, growth rate and pearl quality.



NATURAL & SAFE

Eco-friendly, chemical-reduction solution that protects aquatic life.



COST-EFFECTIVE

Reduces water exchange, chemical usage and operating costs.



EASY OPERATION

Fully automatic system with simple installation and low maintenance.



SUSTAINABLE FUTURE

Supports green aquaculture and helps build a better environment for future generations.

SMO POWER REACTOR™

The Heart of Water Transformation

- ✓ Multi-radical oxidation
- ✓ Nanocavity generation
- ✓ DO enhancement
- ✓ Organic & toxic removal



LET'S WORK TOGETHER
for Cleaner Water,
Healthier Mussels,
Better Pearls.

www.smoinnovation.com
info@smoinnovation.com
+82-10-1234-5678



SMO CREATES **CLEAN WATER, HEALTHIER MUSSELS, BETTER PEARLS** AND A GREENER PLANET.

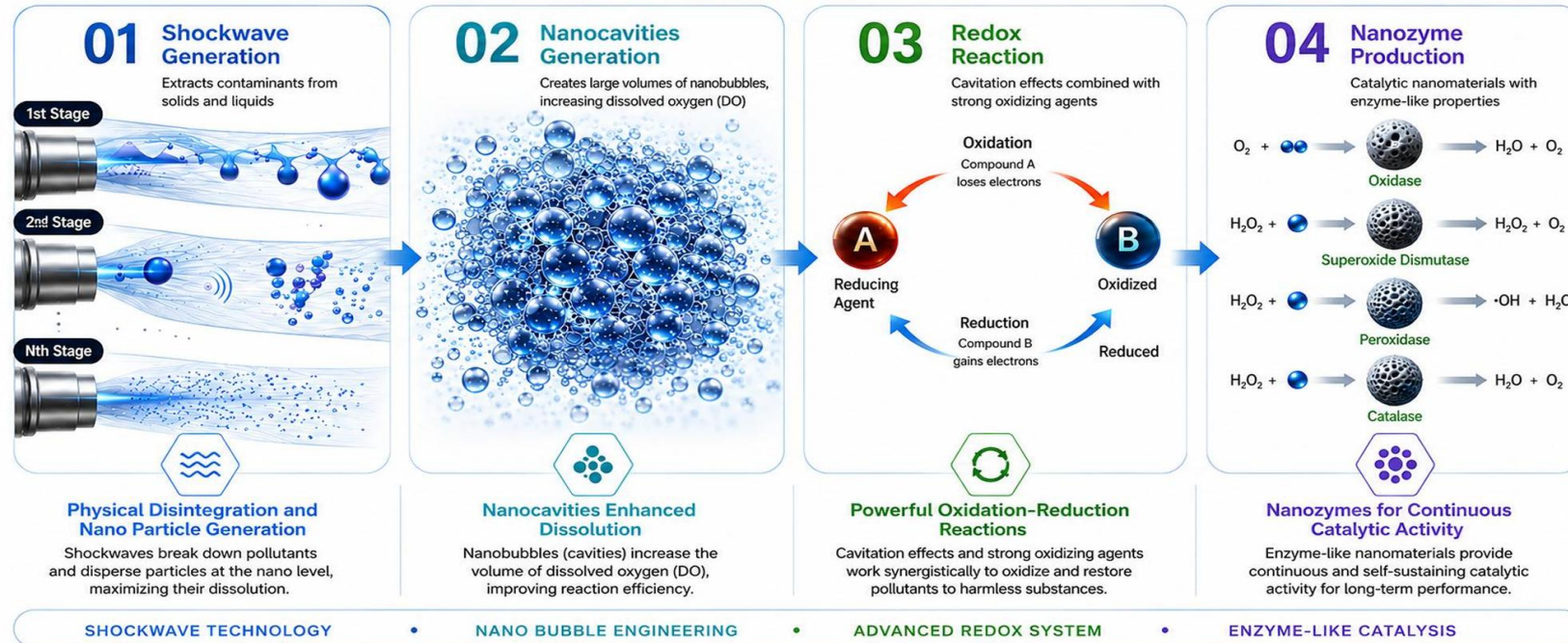
Sustainable today, prosperous tomorrow.





SMO POWER REACTOR MECHANISM

SCIENCE • INNOVATION • SUSTAINABILITY



Thank you!



P168, 13 HeungDeok 1-ro, Giheung-gu, Yongin,
Gyeonggi-do, 16954, Republic of Korea
Tel: +82-31-340-3551

www.orpinnovation.com