



NANORESONANCE
INDUSTRIES

NONTOX™

NANO-ORGANIC TECHNOLOGY

Nanoresonance technologies combined with bio-organic catalyst/dispersant offer the ultimate approach to petroleum hydrocarbon removal



IMMEDIATE ADVANCED OXIDATION FOLLOWED BY BIOREMEDIATION

★ CRUDE OIL ★ VEGETABLE OIL ★ DIESEL OIL ★ JET FUEL ★ LUBRICATING OIL ★ GASOLINE ★ HEAVY FUEL OIL

HYBRID APPROACH FOR HYDROCARBON DEGRADATION

- ✓ Nanoresonance technologies are applied to enhance the effectiveness of NONTOX®.
 - ✓ NONTOX® combines (1) physical, (2) chemical and (3) biological processes to accelerate the breakdown of heavy hydrocarbons.
- (1) **NONTOX®** contains **nonionic surfactant alcohols** that emulsify the contaminants. This facilitates the washing off of fuel hydrocarbons from surfaces, including animal skin and feathers.
 - (2) **Organic oxidants** derived from yeast supernatants catalyze chemical oxidation, breaking long hydrocarbon chains into simpler, water-soluble components that are more easily biodegraded.
 - (3) **Biocatalytic substances** stimulate the growth of natural oil-degrading bacteria by over 100 times, promoting further natural hydrocarbon decomposition.

EFFECTIVENESS IN CHALLENGING CONDITIONS

- ✓ Effective even at low temperatures, down to +2 °C.
- ✓ Provides immediate effects without the need for the introduction of live microorganisms.
- ✓ Reduces total petroleum hydrocarbons (TPH) by 81.5% within 8 days.
- ✓ Reduces phenol levels by 94%.
- ✓ Eliminates the odor of fuel hydrocarbons within 1–3 days of application.

APPLICATION EQUIPMENT



NONTOX® is compatible with all kinds of equipment:

- ✓ Hand or power sprayers, helicopter, airplane, or floating equipment.
- ✓ Nanoresonance technologies: nano-bubble generators and resonant frequency devices.
- ✓ Requires no special personnel protective equipment.

AREAS OF APPLICATION

- Marine vessels:** ships, bilge water, fuelling stations, barges
- Cleaning animals:** skin and feathers (e.g., dolphins, birds)
- Contaminant degradation from **water bodies:** sea, rivers, lakes, ponds, wetlands, lagoons
- Contaminant degradation from **hard surfaces:** sand, rocks, machinery
- Bioremediation:** soil and water quality restoration and regeneration
- Landfills:** cleaning leachates, removing odour and speeding up the contaminant degradation
- Flame retardant:** 100% PFAS-free biodegradable solution
- Gas stations:** fuel hydrocarbon spills
- Gas pipelines:** non-chemical biofilm removal
- Papermills:** cleans grease, oil, and hydrocarbon residues from machinery

ECOLOGICAL AND SAFETY FEATURES

- ✓ NONTOX® is registered at the U.S. Environmental Protection Agency (EPA): NONTOX™ SURFACE WASHING AGENT SW-65.
- ✓ Safety Data Sheets for the U.S., Canada, Europe, UAE.
- ✓ Fully biodegradable, meeting OECD standards.
- ✓ Non-corrosive and safe for spraying without personal protective equipment (PPE).
- ✓ Non-flammable, ensuring safe use under various conditions.



APPLICATION RATE

Concentrate: pH 3.9–4.3.

Working solution: pH 6.3–6.9

Viscosity: 2.3373 cSt (at 40°C).

Dilutions of 0.2% - 3% depending on the TPH concentrations, equipment specifications

For light cleaning: 1 part NONTOX : 499 parts water.

For heavy cleaning: 1 part NONTOX : 33 parts water.

100% soluble in water. **Shelf life:** maximum 2 years



NET CONTENT

○ 2.5 Gallons/ 9.5 Liters

● 55 Gallons/ 208 Liters

○ 275 Gallons/ 1041 Liters

Manufactured in the USA under domestic and international patents by the Bio-Organic Catalysts, Inc.

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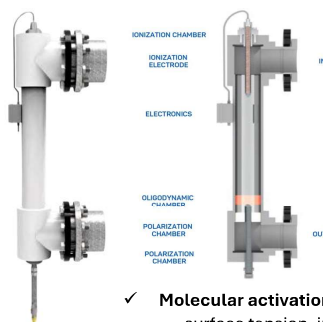
The NanoResonator® system unifies the HippoResonator® with Nano-Bubble valve

INSTANT WATER ACTIVATOR: BOOSTING REACTION RATES AND SOLVENT EFFICIENCY

★ INCREASED SOLUBILITY ★ CORROSION REMOVAL ★ ALGAE & METHANE REMOVAL ★ BIOFILM PREVENTION ★ WATER SOFTENING

HippoResonator®

The HippoResonator® provides non-chemical cleaning of water systems (scaling, corrosion, biofilms) by accelerating reaction rates and efficiency.



Innovative technology:

- ✓ **Hydrodynamic treatment:** Weakens molecular bonds through polar and ionic electrochemical potentials.
- ✓ Employs **non-ionizing Radio Frequency (RF)** to instantly modify water's physical and chemical properties without conventional ionization or magnetization.
- ✓ **Molecular activation:** Modifies hydrogen bonding, reduces surface tension, increases hydration shells around ions, improving solubility and reactivity of catalysts/dispersants

Nano/Micro Bubble valve

The Nano-bubble valve generates ultra-fine bubbles (1×10^{-6} mm) creating oxygen-rich water and enhancing mixing.

Advantages over conventional nano-bubble generators:

- ✓ **Innovative mechanism:** Bubbles are created using controlled hydrodynamic cavitation and precise molecular arrangement, eliminating the need for an external gas supply.
- ✓ **Energy-free operation:** Utilizes standard water pressure and the air already dissolved in water, requiring no additional power, making it cost-effective and sustainable.
- ✓ **Low-carbon tech:** Unlike traditional bubble generators, this technology operates without external energy sources, significantly reducing its carbon footprint and environmental impact.



When paired with the HippoResonator®, nano-bubbles act as transmitters of specific frequencies.

This synergy boosts water's efficiency as a solvent and optimizes its role as a medium for catalysts and dispersants dilution.

KEY BENEFITS OF THE HIPPORESONATOR®

- ✓ **WATER SOFTENING:** Reduces water hardness and removes excess of iron (Fe), magnesium (Mg), and calcium (Ca).
- ✓ **CORROSION PREVENTION:** Prevents water from absorbing iron by increasing hydration shells around ions and keeping pipes rust-free.
- ✓ **NON-CHEMICAL CLEANING OF PIPES:** Breaks down biofilms, old corrosion, and scale deposits.
- ✓ **ALGAE BLOOM REMOVAL:** Effectively removes green algae blooms from lakes and reservoirs by disrupting algae cells.
- ✓ **METHANE GAS REMOVAL:** Facilitate the degassing of 10% methane (1L CH₄/10L water), which is otherwise explosive under pressure, by decreasing surface tension of water.
- ✓ **PIPELINE AND WELL RESTORATION:** Removes old deposits and scale.

KEY BENEFITS OF ADDING NANO/MICRO BUBBLES

- ✓ **HIGHER EFFICIENCY OF CATALYSTS AND DISPERSANTS:** Activated water increases the reactivity of additives, enhancing eco-friendliness.
- ✓ **ENHANCED CLEANING:** Micro-bubbles lift dirt and grease, boosting cleaning efficiency.
- ✓ **ACTIVE OXYGEN:** Bubble collapse generates oxygen, further enriching the water.
- ✓ **PROLONGED SUSPENSION:** Ultra-fine bubbles stay suspended for weeks, enriching water with dissolved oxygen.
- ✓ **BIOFILM PREVENTION:** Inhibits bacterial and microbial growth, preventing biofilm formation.
- ✓ **MICROBIAL BOOST:** Oxygen-rich water enhances marine bacteria's ability to process and repurpose contaminants.

VERSATILITY AND COMPATIBILITY

Easily integrates into existing water lines and adapts to a wide range of applications with minimal operational disruption.

