2011 Presidential Green Chemistry Challenge

Zero VOC Cleaning and Remediation Technology

Primary Sponsors:

RPS Environmental Solutions, LP

Contact:

Bob Hill, President
RPS Environmental Solutions, LP
12200 Stemmons Freeway, Suite 316
Dallas, Texas 75234
972.247.1556
bhill@rpsenvironmental.com

Contributors:

RPS Environmental Solutions, LP:
Scott Olson, Bob Hill, Tim Ross

Milestones:

Products Powered by RPS technology™ have been recognized for safer chemistry by the US EPA's Desing for the Environment (DfE) partnership program (2010), approved for use on commercial aircraft by Boeing's tests for FAA standards (2010), and registered with NSF for use near food preparation areas (2010). The RPS technologies and products are patent protected.

After numerous outstanding test results for safety and efficacy in both laboratory and real world conditions, RPS expanded and launched several product lines in 2011 that provide a wide range of environmentally friendly solutions for the industrial, commercial, and consumer markets.

Nomination:

RPS technology is eligible for the Small Business Award for the following focus areas: (i) Focus Area 2 – the use of greener reaction conditions and (ii) Focus Area 3 – the design of greener chemicals.

U.S. Components:

RPS is based in Dallas, Texas. While RPS is involved in several ongoing projects around the world, the significant majority of research, development, testing, manufacturing, growth, and hiring has been in the United States. RPS products are manufactured in a zero discharge manufacturing facility in the United States.

Abstract:

Studies conducted by the US EPA and others show that indoor environments can sometimes have levels of pollutants that are actually higher than levels found outside. While there are a number of contributing factors to indoor air quality, fumes and residues from many cleaning chemicals currently used in our homes, offices, and schools have a significant effect on the quality of the air we breathe. Many common cleaners are created with dangerous and harmful chemicals that contain carcinogens, neurotoxins, hormone disruptors and reproductive toxins.

RPS recognized this issue and has developed innovative solutions that are currently used in a wide range of cleaning products from degreasers and odor eliminators to adhesive removers

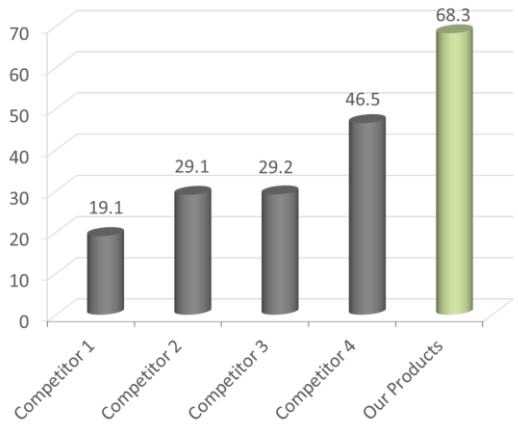
and pet care products. These products contain zero VOCs, no harsh chemicals, are hypo-allergenic, rapidly biodegradable, and have all undergone rigorous testing and review processes to ensure the best possible safety and efficacy. As a company committed to environmental and human health issues, RPS carefully manages the entire life cycle of all products from the production of safer products in a zero discharge facility to minimal impact packaging.

RPS technology has leveraged key scientific principles such as hydration and dehydration, metal ion reaction, surface charge modification, and the mechanics of conversion to provide cleaning and remediation products that are safer for use near people, pets, and plants. RPS technology not only eliminates the need for the production of many dangerous chemicals, but can actually remediate environmental damage caused by many harmful substances and improve human health specifically in the area of indoor air quality.

Through the development of products and implementation of corporate policies that meet or exceed the guidelines published by the EPA titled *Greening Your Purchase of Cleaning Products: A Guide For Federal Purchasers*, RPS has demonstrated a sincere commitment to safer chemistry and environmental stewardship.

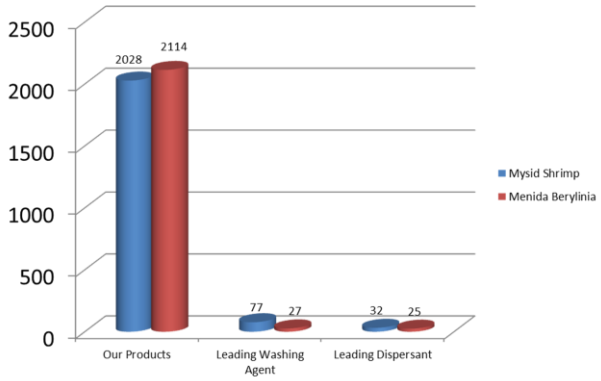
Innovation and Benefits:

RPS technology offers a safer and more effective alternative to dangerous chemicals found in many cleaning products today and completely eliminating the need for Acetone, Benzene, 2-Butoxyethanol, Ammonium Chloride (ADBAC), Trichloroethylene, Ethylbenzene, and Dibutyl phthalate, just to name a few.



Independent laboratory testing using the ASTM D 4488 protocol for cleaning efficacy shows our products to be 3.5 times more effective than the leading “green” competitor, more than twice (2x) as effective as the most recognizable brand competitors, and over 30% more effective as than the most powerful competitor. While many competitive products must make a trade-off between being safe and being effective, RPS technologies enable our cleaning products to be both safer and more effective than both “green” and non-green competitors.

One of our safety test results by an independent, third party laboratory involved LC-50 (the Lethal Concentration required to kill 50% of the population) testing on the sensitive fresh and salt water species Mysid Shrimp and Menida Berylinia. As shown in the graph, these sensitive species were able to survive in an environment that was nearly 20% RPS product while the leading dispersant and leading washing agent were shown to be toxic at extraordinarily low levels of concentration.



Working with sound scientific principles, RPS has created a complete line of cleaning products that eliminate the need for production and use of harsh chemicals. For example only, many consumer and commercial grade grout cleaners depend on strong acids to "eat" away contaminants or soaps that encourage transfer. Rather than reduce the amount of acid or soap, RPS developed a grout cleaning product that uses no acid. Keep in mind that the RPS product was developed in a zero discharge facility and engineered not only to be safer for use near people, pets, and plants, but also environmentally friendly in every way from packaging to shipping options. When applied to the grout, the mechanics of conversion allow the RPS technology to remediate contaminants in a way that is both safer and more effective than typical products. Surface charge modification allows the treated grout to stay cleaner longer which requires less product, less production, and less energy and resource consumption. Using dehydration technology, the RPS product discourages biological growth such as mold and mildew and leaves no lingering smell or chemical odor as the RPS product contains zero VOCs and no added scents or perfumes, which improves indoor air quality and reduces exposure to hazardous chemicals found in other cleaning products.

RPS technology is used in a drain treatment that has been used by a number of restaurants and, on a larger scale, the City of Dallas to treat grease clogged sewers without sending dangerous chemicals into the water supply. While the drain treatment has been specifically formulated to yield the best possible results for its intended application, it does leverage the same scientific principles of hydration and dehydration, surface charge modification, and the mechanics of conversion to be both safer and more effective than traditional drain cleaners. Also, many dangerous contaminants, regardless of whether they are the target of treatment or not, are remediated before they ever reach a water treatment plant, lake, or stream.

With a full line of cleaning products, it would be impossible to list their many features and benefits here, but it is noteworthy that RPS technology is also used in numerous other applications such as a fire retardant product, hydrocarbon stabilizer, and heavy metal stabilizer, among others. The fire retardant received Class I Flame Index Rating in ASTM E-84 standardized testing on cedar shake shingles and showed outstanding results when tested by the Louisiana State University's Fire and Emergency Training Institute. The hydrocarbon stabilizer product has been shown to eliminate dangerous chemicals in gasoline and diesel range organics (GRO and DRO) with numerous BTEX and TPH tests results that are reduced from rampant contamination to levels too low to detect in a laboratory setting. The heavy metal stabilizer product has shown astonishing results in several areas ranging from the remediation of lead paint contamination to converting fly and coal ash into a harmless substance with beneficial uses.

RPS has engineered some of the most technologically advanced products on the market today and continues to innovate through ongoing research and development. The breakthrough RPS technologies cannot be pinned down to one specific area of benefit as it can replace cleaning products across nearly every industry, remediate contamination from hydrocarbons and heavy metals, and even act as a fire retardant.

As for safety, RPS products have been recognized for safer chemistry through the US EPA's Design for the Environment (DfE) partnership program, have passed Boeing's stringent testing to meet FAA requirements for use in aircraft, and have been registered with NSF for use near food preparation areas requiring only a potable water rinse. These products have not only been recognized and approved by various experts in the chemical industry, but have also been reviewed by several independent laboratories and the results have been nothing short of amazing. RPS products are revolutionizing the cleaning and remediation industries.

With human health, corporate responsibility, and environmental stewardship being top priorities, RPS goes beyond creating safer and more effective cleaning and remediation products by implementing corporate policies that meet or exceed the guidelines published by the EPA titled *Greening Your Purchase of Cleaning Products: A Guide For Federal Purchasers*. From production at a zero discharge facility to using recyclable packaging and offering shipping options with the lowest environmental impact possible, RPS chooses to be cleaner and greener in every aspect of business operations.