

## Oil Spill Cleanup

A new way of cleaning up oil spills by “bioremediation” is being marketed by Petrol Rem, Inc., Pittsburgh, Pennsylvania. Invented by Petrol Rem chief scientist Joseph A. Resnick, the product is known as PRP™, for Petroleum Remediation Product. It incorporates technology related to fabrication of microcapsules developed by Marshall Space Flight Center and Jet Propulsion Laboratory. Resnick, at left **below**, is pictured with a technician in the company’s production facility.

PRP consists of thousands of microcapsules, tiny balls of beeswax with hollow centers. The hollow core contains live microorganisms and nutrients to sustain them. Water cannot penetrate the microcapsule’s shell, but oil can, by osmosis. The encapsulated microorganisms — known as lipolytica — are capable of degrading hydrocarbons by secreting enzymes that break down oil into base elements of carbon dioxide and water. As oil flows through the microcapsule’s shell, it is consumed and digested by the microorganisms. When PRP explodes — due to pressure buildup — the enzymes, carbon dioxide

and water are released into the environment. The process leaves a residue that is environmentally safe and can be consumed by fish as food.

For cleaning up an oil spill, PRP is used in conjunction with an apparatus also developed by Petrol Rem. The Bio-Boom™ is an oil spill containment system available in a number of sizes or tailored to a user’s requirements. The Bio-Boom, shown being deployed **above**, has a flotation device that keeps the boom on top of the water and prevents contaminated water from spreading into nonpolluted water.

A 10-foot-long Bio-Sok™ cartridge fits into a mesh enclosure on the boom. The cartridge contains an oil-absorbent material and seven pounds of PRP. The oil-absorbent material “wicks” the contaminated water toward the PRP, the oil penetrates the shells of the microcapsules and is digested by the microorganisms.



Work performed at Jet Propulsion Laboratory demonstrated the feasibility of encapsulating live cells and Petrol Rem chief scientist Resnick employed that technology in developing PRP. Technology developed at Marshall Space Flight Center for experiments in orbital production of microspheres provided the basic design of the delivery system that protects encapsulated cells from the water but allows passage of hydrocarbons through the microcapsule’s shell.

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