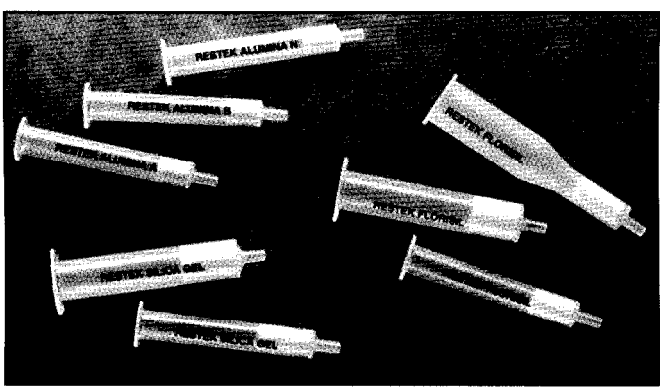
The Advantage RESTEK

Innovators of High Resolution Chromatography Products

SUPERIOR SPE CARTRIDGES

- **Activated Florisil , Silica Gel and Alumina cartridges.**
- **Non-contaminating medical grade polypropylene tubes and polyethylene frits.**
- **Ultra Pure Stainless Steel frits also available.**
- **Large volume (10ml) cartridges available for large samples.**
- **Attach easily to the Resprep-12T extraction system.**

Restek now offers Florisil, Silica Gel, and Alumina solid phase extraction cartridges for use in EPA Methods 3620A, 3630B, 3610A, and 3611A. Restek's extraction cartridges are made of ultra-clean medical grade polypropylene tubes and polyethylene fiits that are quality control tested for purity and cleanliness prior to packing with sorbent. Stainless steel frits are also available for those analyses that require ultra purity. **Large volume tubes (10ml) are ideal** when sample or rinse volumes are greater than the volume that can be held by standard SPE cartridges. This eliminates the need for multiple transfers of the sample. All sorbents are thoroughly quality control tested to ensure reproducible extraction selectivity from lot-to-lot. All cartridges are flow-tested to ensure a rapid even flow of solvent through the cartridge for fast, efficient extraction every time. The use of these cartridges with our unique all Teflon Resprep-12T vacuum manifold system will provide the most reliable, efficient and contamination-free extractions available.



BACKGROUND

Silica Gel, Alumina and Florisila have been used for many years in chemical laboratories because of their ability to adsorb a variety of compounds. They were popular long before the advent of convenient pre-packed disposable cartridges such as those used for solid phase extraction (SPE). However, with the introduction of these cartridges, the job of sample clean up is much simpler. This fact is evidenced by the growing list of procedures using these materials, especially in official methods recognized by the United States Environmental Protection Agency (USEPA) and Association of Official Analytical Chemists (AOAC).

FLORISIL

(magnesium silicon oxide, Mg_2SiO_3) is a highly active, polar sorbent. Because of its slightly basic surface, it is good for the adsorption of low to moderately polar species in either an aqueous or non-aqueous matrix. Florisila has been used to determine the amount of insecticides in grain, aflatoxins in animal feed fungicides in waste water and flavor compounds in milk.

In this Issue

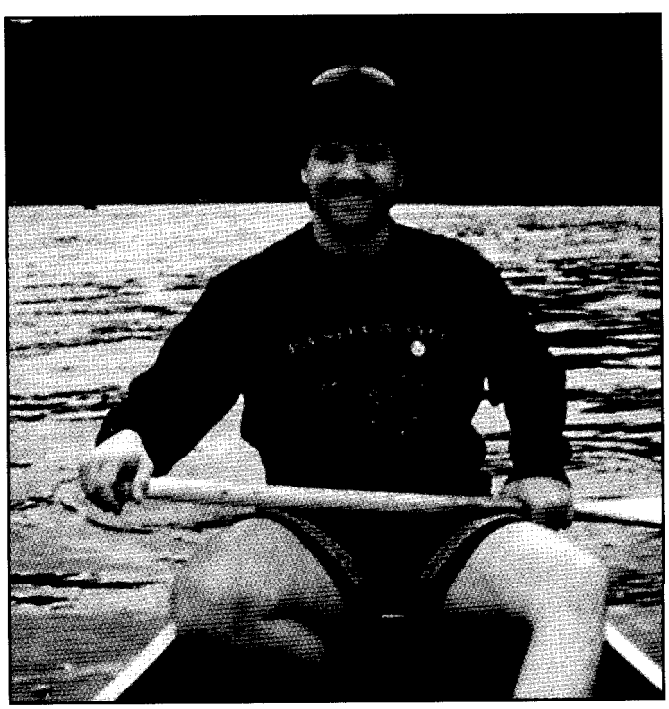
Winter 96 INTERNATIONAL

SILICA GEL
(silicon hydroxide, SiOH) is also a polar sorbent. The binding mechanism can be either hydrogen or dipole-dipole interaction. It is primarily used to adsorb species from non-polar solvents like hydrocarbons or substituted hydrocarbons and low polarity esters. Elution solvents are usually more polar and include polar esters, ethers, alcohols, acetonitrile or water. Silica can also be used as a medium strength cation exchanger in aqueous solutions. One important use of Silica is to separate polychlorinated biphenyls from oil samples (PCBs were commonly used in transformer oils to improve their electrical breakdown characteristics).

Another "official" application for silica was recently suggested by the USEPA in their proposed method to determine the oil and grease content of aqueous samples. After the sample is treated by traditional extraction techniques (either SPE or liquid/liquid), the hexane eluent is exposed to Silica in order to fractionate the petroleum from non-petroleum based species.

ALUMINA
(aluminum oxide, AJO,) is available in acidic, basic and neutral grades, and is used in a manner similar to Silica since it has a highly active polar surface. The binding mechanisms also include specific interaction with the pi electrons of aromatic hydrocarbons. This characteristic has been used for applications like crude oil fractionation. Ionic grades can also be used as low strength ion exchangers. Alumina has often been used for cleaning up homogenates of vegetable samples. Non-polar species are allowed to pass through the Alumina bed while polar extractables from the vegetables are commonly retained on the Alumina. Applications where Alumina has been used include the determination of cosmetic contents, as well as the extraction of basic drugs from blood plasma, organochlorine pesticides from vegetables, and polycyclic aromatic hydrocarbons from animal feeds.

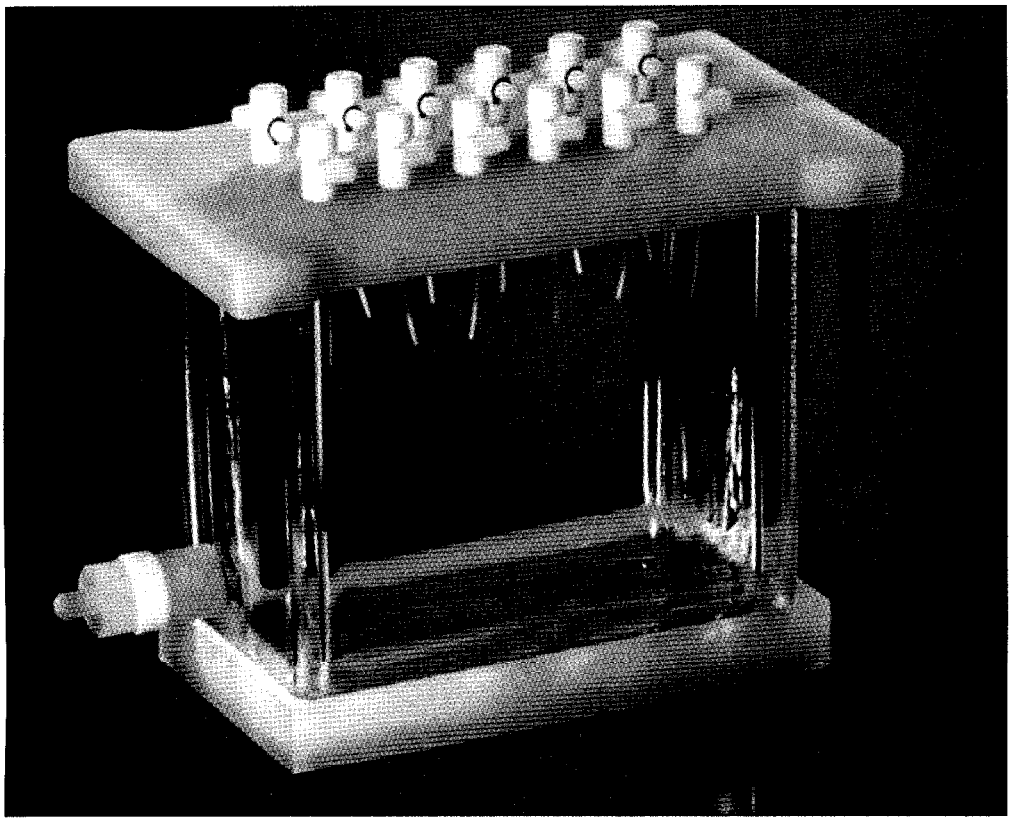
Florisil, Alumina, and Silica have been used for many years in adsorption or extraction chemistry. These sorbents have stood the test of time and have proven to be some of the most useful products available to the laboratory chemist. Whether used as a clean-up device or for analyte concentration, these materials will continue to demonstrate their versatility and utility in laboratories throughout the world.

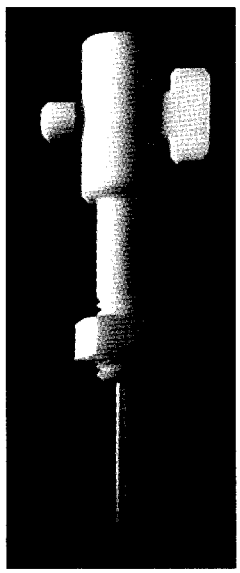


Sean's **envivonrnentol insiqht keeps Restek on the leadinq edqe of Sample Prep innovations.**

Sean Randall: Environmental Applications Chemist & Sample Prep Product Manager

RESPREPTM-12T SPE MANIFOLD SYSTEM
Designed specifically for the use of SPE cartridges, such as Florisil, Silica Gel or Alumina, the 12 position manifold has many new improvements over the traditional manifold system. One major weakness in the traditional manifold system is the control valves. We redesigned the valves for inertness and durability. Our valves, constructed of Teflon, mount securely to the manifold top via a durable threaded nut that won't break if side torque is applied against the valve. We made precise flow regulation convenient by providing a valve turning tool that screws into the top plate for storage. The base of the valve was designed to allow 1/16" OD Teflon tubing to press-fit inside the valve base. Not only does this create a completely inert sample pathway, but it allows inexpensive 1/8 Teflon tubing to be cut to the appropriate length for different size collection vessels. The complete Teflon flow path ensures that your sample will not be contaminated from polypropylene or metal valve parts. Other improvements include a polypropylene base plate with rubber feet so the manifold will not slide and scratch the bench, a multipurpose interior sample rack, and built in legs to support the manifold top.





Sturdy Teflon valve offers inertness and longevity.

RESPREP-12T Extraction System for SPE Cartridges: cat.# 24001
Complete Kit includes: propylene top with twelve sturdy Teflon flow regulation valves, '1/16" Teflon tubing, glass block with built in vacuum regulator and scratch resistant polypropylene base, multipurpose sample holding rack, and convenient valve turning tool.

An Application Note is available detailing the Florisil cleanup procedure for Organochlorine Pesticides and PCBs via the USEPA CLP methodology. Call your local distributor to receive a copy.

Name	Sorbent Mass (mg)	Cartridge Volume (ml)	Frit Style	Pkg. Size	Catalog Number
Florisil Cartridges	500	3	PE	50	24031
Florisil Cartridges	500	3	SS	50	24032
Florisil'") Cartridges	500	10	PE	50	24033
Florisila Cartridges	1000	6	PE	30	24034
Silica Gel Cartridges	500	3	PE	50	24035
Silica Gel Cartridges	500	3	ss	50	24036
Silica Gel Cartridges	500	10	PE	50	24037
Silica Gel Cartridges	1000	6	PE	30	24038
Alumina-N Cartridges	500	3	PE	50	24039
Alumina-N Cartridges	500	3	ss	50	24040
Alumina-N Cartridges	500	10	PE	50	24041
Alumina-A Cartridges	500	3	PE	50	24042
Alumina-A Cartridges	500	3	ss	50	24043
Alumina-A Cartridges	500	10	PE	50	24044
Alumina-B Cartridges	500	3	PE	50	24045
Alumina-B Cartridges	500	3	ss	50	24046
Alumina-B Cartridges	500	10	PE	50	24047

**PE: Polyethylene frits SS: Stainless steelfrit*