

# Severn Trent, J.T.Baker and Solid Phase Extraction

## Introduction

Among chromatography suppliers, J.T.Baker stands out with a unique breadth of separations capabilities. You may know us for our high purity reagents, but we have also been in the chromatography business since the 1970s. We have been working with Severn Trent for several years on improving environmental analyses and sample preparation techniques. Together, we are working on continued improvement of products and processes to further the efficiency and effectiveness of environmental testing and to reduce the volume of hazardous solvents used by Severn Trent.

## Solid Phase Extraction

Solid Phase Extraction (SPE) is a fast and easy method to selectively do sample preparation and separations. SPE removes compounds from a matrix based on the same principle as chromatography, which is differential compound affinity and retention on a solid support.

J.T.Baker pioneered the development of Solid Phase Extraction. The advantages of SPE are many compared to older technologies such as liquid/liquid extraction. Separations are generally faster, equally as effective or better, and use much less solvent.

J.T.Baker offers a range of products for Solid Phase Extraction, from normal phase to reverse phase to ion exchange to mixed mode (reverse phase plus ion exchange):

- Conventional spe columns for routine sample preparation
- *Speedisk*<sup>™</sup> spe silica columns for faster, high throughput sample preparation
- *Speedisk* extraction disks for larger volume and dirty sample separations
- *Speedisk* polymer columns and disks for separations of a broad number of analytes

## Conventional spe Columns

With BAKERBOND spe<sup>™</sup> columns, you can choose the solid phase extraction column that best fits your sample size and performance requirements. Use BAKERBOND spe 1, 3 and 6 ml ultraclean polypropylene columns for samples from 0.2 to 10 ml when standard speed, recovery and final concentration with good economy are needed.

- Standard columns are vacuum packaged to preserve sorbent performance; ultraclean packaging is utilized.
- Optimized, round-rimmed tube and frits are made from ultrapure polymers.
- Tubes fit into all popular processors and racks.
- Tube inlet adapters are available for use with Gilson ASPEC.

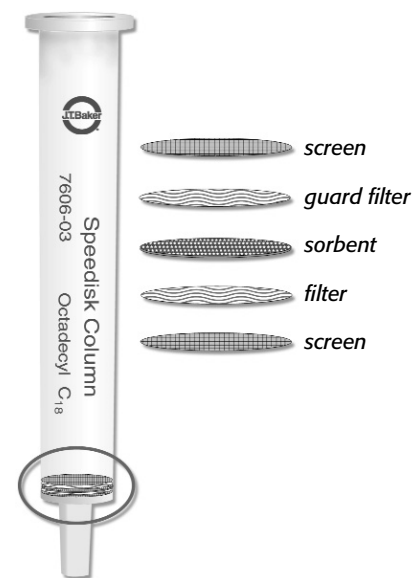
## Speedisk Columns and Disks

Due to microparticle technology and unique column configurations, J.T.Baker has developed even faster products. Our *Speedisk* products are 9X faster than conventional spe products because they triple flow rate and decrease solvent volumes to 1/3. The *Speedisk* column design shortens run times, increases capacity, and may eliminate pre-filtration and evaporation steps.

*Speedisk* products are available as spe columns or as extraction disks.



*BAKERBOND spe columns come in a variety of sizes and configurations.*



*Speedisk columns unique laminar configuration.*



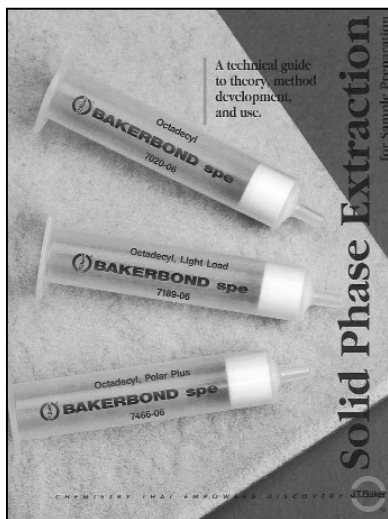
*BAKERBOND Speedisk extraction disks*



Speedisk 96 Positive Pressure Processor



DISKMATE II Rotary Extraction Station for Speedisk Disks



Our SPE Manual is a valuable reference tool



Speedisk columns are available with J.T.Baker® polymer resins or silica-based sorbents. Our polymer resins are the product of J.T.Baker ultraclean polymer microparticle technology. These resin particles have a large surface area, are highly rigid and are stable over pH range 1–14. Available in hydrophilic and hydrophobic forms and as ion exchangers, they are recommended when advance detection methods will be used, and offer the unique selectivity of a polymer.

Speedisk disks can save time in water sample preparation—they offer easier, faster, and more economical testing of all water sample types compared with liquid-liquid or membranes and other solid phase alternatives. Other environmental applications such as pesticides in solid waste, and oil and grease are also good candidates to benefit from Speedisk disks.

Our patented disk is pre-assembled. Its laminar configuration provides filtration capacity and inlet characteristics that maximize access of analyte molecules to the microparticulate sorbent. BAKERBOND Speedisk™ disk design resists clogging and ensures high throughput rates even when samples contain solids. Capacity, recovery, and precision are high due to the unique disk configuration and performance of BAKERBOND™ sorbent.

## Processors

In addition to columns, J.T.Baker also offers SPE Processors—both vacuum and positive pressure types. For columns, the BAKER spe 12-G and BAKER spe 24-G process up to 12 or 24 samples simultaneously. For even higher throughput, the Speedisk 48 and Speedisk 96 Pressure Processors can process 48 or 96 samples simultaneously. The Speedisk Expanded Extraction Station and DISKMATE™ II Rotary Extraction Station are available for use with Speedisk disks. These six-port vacuum manifolds are configured with rectangular and hexagonal footprints, respectively, and inter-port spacing to accommodate six, side-by-side sample reservoirs, each up to one liter in volume. A single extraction station is also available for processing individual samples.

## Service and Support

J.T.Baker has a number of tools and support to help you successfully use Solid Phase Extraction (SPE) in a wide variety of applications. One of the most popular technical documents on our web site ([www.jtbaker.com](http://www.jtbaker.com)) is our Solid Phase Extraction Manual, Lit #8008. You can view the document on-line by clicking on the photo, or request a copy by clicking on the document title.

Prepared by the J.T.Baker scientific staff, “Solid Phase Extraction for Sample Preparation” provides an overview of SPE theory and principles as well as examples of SPE applications encountered in everyday analytical situations. The 56-page technical manual also features a glossary of SPE terms, a troubleshooting guide, buffer pKa and pH ranges, and physical constants of commonly used solvents. Useful to both the novice and experienced analyst, the manual provides more than 100 detailed application notes to assist with sample preparation method development.

Our web site Technical Library ([www.jtbaker.com](http://www.jtbaker.com)) contains a wealth of information for the SPE user including additional application notes, instructions for use, and relevant published journal articles. And our Technical Service staff is fully trained and equipped to answer questions and provide help on SPE questions. After hours? No problem—our web-based Solv-IT Center<sup>SM</sup> has a storehouse of SPE information that is searchable. Still can't find an answer? Use the Solv-IT Center to “Ask an Expert”. Your question will be routed to the correct area of the company for a prompt, personalized response.

We also can work with you to develop suitable processes and methods to solve any problem—just give us a call at 1-800-JTBAKER (1-800-582-2537).

## Conventional SPE Columns

Description	Product Number	Sizes
<b>Reverse Phase</b>		
Octadecyl (C <sub>18</sub> )	7020	1 ml, 3 ml, 6 ml, Jumbo Packs, Wide-Mouth
Octadecyl (C <sub>18</sub> ) LightLoad, non-encapped	7189	1 ml, 3 ml, 6 ml, Wide-Mouth
PolarPlus™ Octadecyl (C <sub>18</sub> )	7466	3 ml, 6 ml
Octyl (C <sub>8</sub> )	7087	1 ml, 3 ml, 6 ml
PolarPlus Octyl (C <sub>8</sub> ), non-encapped	7523	6 ml
Ethyl (C <sub>2</sub> )	7273	1 ml, 3 ml
Cyano (CN)	7021	1 ml, 3 ml, 6 ml
Phenyl (C <sub>6</sub> H <sub>5</sub> )	7095	1 ml, 3 ml
Cyclohexyl (C <sub>6</sub> H <sub>11</sub> )	7212	3 ml
<b>Normal Phase</b>		
Cyano (CN)	7021	1 ml, 3 ml, 6 ml
Amino (NH <sub>2</sub> )	7088	1 ml, 3 ml, 6 ml, Wide-Mouth
Diol (COHCOH)	7094	3 ml
<b>Ion Exchange</b>		
Quaternary Amine (N <sup>+</sup> )	7091	1 ml, 3 ml, 6 ml, Jumbo Packs, Wide-Mouth
Amino (NH <sub>2</sub> )	7088	1 ml, 3 ml, 6 ml, Wide-Mouth
Diamino (NH <sub>2</sub> /NH)	7089	3 ml
Aromatic Sulfonic Acid (C <sub>6</sub> H <sub>5</sub> SO <sub>3</sub> H)	7090	1 ml, 3 ml, 6 ml
Carboxylic Acid (COOH)	7211	3 ml, Wide-Mouth
<b>Adsorption</b>		
Silica Gel (SiOH)	7086	1 ml, 3 ml, 6 ml, Jumbo Packs, Wide-Mouth
Florisil (Mg <sub>2</sub> SiO <sub>3</sub> )	7213	6 ml, Jumbo Packs
Alumina, Neutral (Al <sub>2</sub> O <sub>3</sub> )	7214	6 ml

## Speedisk Polymer Columns

Description	Product Number	Sizes
<b>Hydrophilic</b>		
H <sub>2</sub> O-Philic DVB	8108	1 ml, 3 ml, 6 ml
H <sub>2</sub> O-Philic SC-DVB (SO <sub>3</sub> )	8111	1 ml, 3 ml, 6 ml
H <sub>2</sub> O-Philic SA-DVB (N <sup>+</sup> )	8113	1 ml, 3 ml, 6 ml
<b>Hydrophobic</b>		
H <sub>2</sub> O-Phobic DVB	8109	1 ml, 3 ml, 6 ml
H <sub>2</sub> O-Phobic SC-DVB (SO <sub>3</sub> )	8196	1 ml, 3 ml, 6 ml
H <sub>2</sub> O-Phobic WA-DVB (NH <sub>2</sub> )	8115	1 ml, 3 ml, 6 ml

## Speedisk Silica Columns

Description	Product Number	Sizes
<b>Reverse Phase</b>		
Octadecyl (C <sub>18</sub> )	7606	1 ml, 3 ml, 6 ml
Octadecyl (C <sub>18</sub> ) LightLoad	8151	1 ml, 3 ml, 6 ml
Octadecyl (C <sub>18</sub> ) PolarPlus	8153	1 ml, 3 ml, 6 ml
Octyl (C <sub>8</sub> )	8154	1 ml, 3 ml, 6 ml
Octyl (C <sub>8</sub> ) PolarPlus	8156	1 ml, 3 ml, 6 ml
Butyl (C <sub>4</sub> )	8184	1 ml, 3 ml, 6 ml
Ethyl (C <sub>2</sub> )	8157	1 ml, 3 ml, 6 ml
Phenyl (C <sub>6</sub> H <sub>5</sub> )	8160	1 ml, 3 ml, 6 ml
<b>Normal Phase</b>		
Diol (COHCOH)	8167	1 ml, 3 ml, 6 ml
Cyano (CN)	8159	1 ml, 3 ml, 6 ml
Quaternary Amine (N <sup>+</sup> )	8168	1 ml, 3 ml, 6 ml
Amino (NH <sub>2</sub> )	8165	1 ml, 3 ml, 6 ml
Aromatic Sulfonic Acid	8170	1 ml, 3 ml, 6 ml
Carboxylic Acid	8172	1 ml, 3 ml, 6 ml
<b>Adsorption</b>		
Silica	8163	1 ml, 3 ml, 6 ml

## BAKERBOND *Speedisk* Extraction Disks for Manual Extraction Stations

Description	Product Number
BAKERBOND <i>Speedisk</i> C <sub>18</sub> 50 mm extraction disk. For use in EPA Methods 500 Series, 608, SW 846/3535 and with slightly polar to non-polar industrial samples. Also available in high capacity format.	8055
BAKERBOND <i>Speedisk</i> C <sub>18</sub> XF 50 mm extraction disk. For dirty samples: EPA Methods 608, 846 and slightly polar to non-polar industrial samples.	8056
BAKERBOND <i>Speedisk</i> C <sub>8</sub> 50 mm extraction disk. For diquat, paraquat, EPA Method 549.2.	8057
BAKERBOND <i>Speedisk</i> SAX 50 mm extraction disk. For EPA Method 552.1, haloacetic acids and Dalapon.	8058
BAKERBOND <i>Speedisk</i> DVB 50 mm extraction disk. For chlorinated acids, EPA Method 515.2.	8068
BAKERBOND <i>Speedisk</i> Oil & Grease 50 mm extraction disk. For use with slightly polar to non-polar hydrocarbons, EPA Method 1664, Rev. A.	8060
BAKERBOND <i>Speedisk</i> PolarPlus C <sub>18</sub> 50 mm extraction disk. For extraction of slightly polar to moderately polar compounds such as sulfonylureas, phenols, chlorophenoxy acids, and urones.	8061
BAKERBOND <i>Speedisk</i> DVB 50 mm extraction disk. For SW846 H <sub>2</sub> O phobic to slightly H <sub>2</sub> O philic compounds. Also available in high capacity format.	8072

## BAKERBOND *Speedisk* Extraction Disks for Automated Extractors

Description	Product Number
BAKERBOND <i>Speedisk</i> C <sub>18</sub> Auto 50 mm extraction disk. For use in EPA Methods 500 series, 608, SW 846/3535 and with slightly polar to non-polar industrial samples. Also available in high capacity format.	8062
BAKERBOND <i>Speedisk</i> C <sub>18</sub> XF Auto 50 mm extraction disk. For dirty samples: EPA Methods 608, 846, and slightly polar to non-polar industrial samples.	8063
BAKERBOND <i>Speedisk</i> DVB Auto 50 mm extraction disk. For SW846 H <sub>2</sub> O phobic to slightly H <sub>2</sub> O philic compounds. Also available in high capacity format.	8073
BAKERBOND <i>Speedisk</i> DVB Auto 50 mm extraction disk. For chlorinated acids, EPA Method 515.2.	8069
BAKERBOND <i>Speedisk</i> Oil & Grease Auto 50 mm extraction disk. For use with slightly polar to non-polar hydrocarbons, EPA Method 1664, Rev. A.	8064

## Vacuum and Positive Pressure Processors

Description	Product Number
<b>Vacuum Processors for spe Columns</b>	
BAKER spe-12G Column Processor (process up to 12 samples)	7098
BAKER spe-24G Column Processor (process up to 24 samples)	7208
<b>Vacuum Processors for extraction disks</b>	
<i>Speedisk</i> Expanded Extraction Station Six-port processing system for direct sample loading. Rectangular footprint and inter-port spacing to accommodate six side-by-side 1 L sample reservoirs.	8095
<i>Speedisk</i> Compact Extraction Station Six-port processing system. Reduced vacuum manifold inter-port spacing and footprint. Load samples through remote sample adapter or mount up to three 1 L reservoirs directly onto the disks.	8094
<i>Speedisk</i> Single Extraction Station Single-port processing system. Vacuum platform for a <i>Speedisk</i> extraction disk and any sample loading technique.	8093
DISKMATE II Rotary Extraction Station Six-port processing station. Vacuum manifold mounted on a convenient turntable with full spacing for direct mounting of six 1 L containers.	7463
<b>Positive Pressure Processors for spe Columns and 96-Well Plates</b>	
<i>Speedisk</i> 96 Positive Pressure Processor (process up to 96 samples)	8129
<i>Speedisk</i> 48 Positive Pressure Processor (process up to 48 samples)	8118

For a complete listing of accessories and replacement parts for any of our processors, please see the latest J.T.Baker catalog or visit our web site ([www.jtbaker.com](http://www.jtbaker.com)).