

Honeywell Burdick & Jackson®



Chromatography Guide

Honeywell

Honeywell Burdick & Jackson® Chromatography Guide

Tracing our history

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Honeywell Burdick & Jackson®, a leading manufacturer of high purity solvents, DNA/RNA reagents and chromatography columns and accessories, was founded by Orel Burdick and Bill Jackson in 1959. Burdick and Jackson recognized the need for high purity solvents suitable for use in emerging analytical techniques such as gas chromatography and high performance liquid chromatography. The company set about developing the technology and processes that led to the introduction of B&J Brand® solvents, the first commercially available high purity solvents.

Over time, Burdick & Jackson has expanded its portfolio of consistent, high purity solvents to meet the requirements for applications ranging from the most demanding LC-MS, HPLC and GC analyses to general use applications requiring an ACS grade of solvent. To address the market for oligonucleotide synthesis, our BioSyn® line of DNA/RNA solvents and reagents are processed to exacting high purity and low water content specifications. Burdick & Jackson's line of chromatography columns features our Inert II SPE columns, which are specially treated to be inert to solvents yet have the added safety and lower cost of plastic. The Honeywell LabReady® line of HPLC and LC-MS grade solvent blends are produced using our proprietary blending technology.

Burdick & Jackson implements leading manufacturing techniques at its ISO 9001 certified facilities, including

Six Sigma Plus methodology and the Honeywell Operating System. These stringent approaches, coupled with proprietary packaging techniques, result in delivery of products known for their outstanding purity and lot-to-lot consistency. Products are available in packaging suited for lab scale through production applications.

Today, as part of Honeywell, Burdick & Jackson offers an extensive global network of resources and support. Burdick & Jackson's technical service experts are available to assist with product selection, delivery and dispensing.

For more information including health and safety information and to obtain material safety data sheets (MSDS) and certificates of analysis please visit us on the web at:
www.honeywell.com/burdickandjackson

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Honeywell

Distinguishing Characteristics of Normal Phase Sorbents

Sorbent	Phase Type	Distinguishing Feature	Choose For	Such As	General Surface Chemistry
Alumina-A	Normal Phase	More stable than Silica at high pH	Wash with acidic solution to increase capacity for neutral or anionic compounds	PCBs, pesticides	Acidic (pH 4.5)
Alumina-B	Normal Phase	More stable than Silica at high pH	Wash with basic solution to increase capacity for cationic compounds	PCBs, pesticides	Basic (pH 10)
Alumina-N	Normal Phase	More stable than Silica at high pH	Neutral surface interacts with highly aromatic compounds and neutral hydroxyls	PCBs, pesticides	Neutral (pH 7.5)
Aminopropyl	Normal Phase	Not deactivated by small amounts of water. Weak anion exchange recovers strong acids that can bind irreversibly to SAX	Polar compounds, or as a weak anion exchanger	Dyes, lipids, trace metals, mycotoxins, strong acids, structural isomers	Basic
Cyanopropyl	Normal Phase	Can be reversed phase or normal phase	Highly to moderately polar compounds	Antidepressants, carbohydrates, herbicides, drugs	Neutral
Diol	Normal Phase	Not deactivated by small amounts of water	Moderately polar compounds from polar or non-polar matrices	Alkaloids, antibiotics, pesticides, structural isomers	Neutral
Florisil-PR	Normal Phase	QC'd more tightly for chlorinated pesticides	Polar pesticides, metal organics	Metal organics, PCBs, PAHs	Basic
Silica	Normal Phase	Most polar phase	Highly polar compounds	Aflatoxins, pesticides, steroids, vitamins, structural isomers	Slightly Acidic

Distinguishing Characteristics of Reversed Phase Sorbents

Sorbent	Phase Type	Distinguishing Feature	Choose For	Such As	General Surface Chemistry
C ₁₈	Reversed Phase	Most hydrophobic phase	Highly non-polar compounds	Aflatoxins, drugs, antibiotics, fatty acids, vitamins, desalting	Neutral
C ₂	Reversed Phase	Less hydrophobic than C ₁₈ or C ₈ , most silanol interactions	Compounds retained too strongly on C ₁₈ or C ₈	Drugs from body fluids	Neutral
C ₈	Reversed Phase	Less hydrophobic and more silanol interactions than C ₁₈	Compounds retained too strongly on C ₁₈	Drugs, dyes, vitamins polar functional groups	Neutral
Cyclohexyl	Reversed Phase	Fewer interactions with silanols	Cyclic or aromatic non-polar compounds	Phenols, anilines	Neutral

SPE Characteristics of Ion Exchange Sorbents

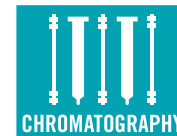
Sorbent	Phase Type	Base	Functional Form	Retains
SCX	Strong Cation Exchanger	Polystyrene-Divinylbenzene	Benzenesulfonic Acid	Positively charged compounds (cations)
SAX	Strong Anion Exchanger	Polystyrene-Divinylbenzene	Quaternary Amine	Negatively charged compounds (anions)
SCX	Strong Cation Exchanger	Silica	Benzenesulfonic Acid	Positively charged compounds (cations)
SAX	Strong Anion Exchanger	Silica	Quaternary Amine	Negatively charged compounds (anions)

Extraction Hint:

Prior to elution, fully dried cartridges will ensure optimal analyte recovery. To confirm column dryness, press the sides of the cartridge at the sorbent level at full vacuum. Columns should feel ambient temperature, not cool. If the column feels cool, water is probably present. Dry the column further.

Inert II Solid Phase Extraction (SPE)

Columns



Honeywell Burdick & Jackson® Inert II SPE columns are a significant improvement over glass columns; they are inert to solvents yet have the added safety and lower cost of plastic. Inert II SPE columns are specially treated to be inert to solvents and include PTFE inlet and outlet meshes. This means

no extractable phthalates, no residual production oil and no extraneous peaks.

Like the original inert glass columns, Burdick & Jackson's inert plastic columns are manufactured with stringently selected packing materials to ensure maximum recovery and reproducibility. Inert II SPE Columns are available in a variety of bonded phases including Florisil®, C8 (both suitable for the CLP Quick Turnaround Methods), C₁₈, cyclohexyl, diol, silica, and alumina packing materials. Custom configurations are available on request.

For applications that require no trace amounts of extractables from plastic found in conventional SPE columns, try B&J's Inert II SPE columns for improved performance and better results.

ADVANTAGES

Reduced background contamination results in significant gains in detection capabilities

Decreases downtime for GC/MS source cleaning

Eliminates extraneous peaks

Every stationary phase batch tested to ensure lot-to-lot reproducibility

Empty Inert II SPE Columns and Sampling Adapter

Description	Pkg. of	Cat. No.
Empty 8 mL column, no frits	30	5430
Empty 8 mL column, bulk	1000	5435
Empty 8 mL column, with loose frits	30 columns/60 frits	5440
Empty 25 mL column, with loose frits	100 columns/200 frits	5444
Inert II SPE Sampling Adapter	1	9470A
Inert II SPE Sampling Adapter	6	9472A

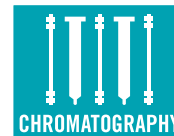
Inert II SPE Columns

Columns consist of inert plastic housing with PTFE frits.

Description	Size	Particle Size	Pore Size	Carbon Load %	Surface Area	End-capped	Phase Type	Precondition and Wash	Elute With	Pkg. of	Cat. No.
Octadecyl (C ₁₈)	500 mg/6 mL	40 – 63µ	60 Å	20.5 – 22.7	500 m ² /g	Yes	Reversed	Polar	Non-polar	30	5004
Octadecyl (C ₁₈)	1000 mg/6 mL	40 – 63µ	60 Å	20.5 – 22.7	500 m ² /g	Yes	Reversed	Polar	Non-polar	30	5008
Octadecyl (C ₁₈)	1500 mg/6 mL	40 – 63µ	60 Å	20.5 – 22.7	500 m ² /g	Yes	Reversed	Polar	Non-polar	30	5010
Octyl (C ₈)	500 mg/6 mL	40 – 63µ	60 Å	10.0 – 12.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	30	5014
Octyl (C ₈)	1000 mg/6 mL	40 – 63µ	60 Å	10.0 – 12.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	30	501
Cyclohexyl (CH)	1000 mg/6 mL	40 – 63µ	60 Å	11.0 – 12.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	30	5028
Diol	500 mg/6 mL	40 – 63µ	60 Å	7.20 – 8.80	500 m ² /g	No	Normal	Polar	Non-polar	30	5044
Diol	1000 mg/6 mL	40 – 63µ	60 Å	7.20 – 8.80	500 m ² /g	No	Normal	Polar	Non-polar	30	5048
Silica (SI)	5000 mg/25 mL	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	50	5049
Silica (SI)	5000 mg/25 mL	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	500	5049B
Silica (SI)	500 mg/6 mL	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	30	5054
Silica (SI)	1000 mg/6 mL	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	30	5058
Silica (SI)	2000 mg/6 mL	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	30	505
Florisil-PR	500 mg/6 mL	60/100 Mesh 150 – 250µ	60 Å	NA	NA	NA	Normal	Non-polar	Polar	30	5104
Florisil-PR	1000 mg/6 mL	60/100 Mesh 150 – 250µ	60 Å	NA	NA	NA	Normal	Non-polar	Polar	30	5108
Florisil-PR	2000 mg/6 mL	60/100 Mesh 150 – 250µ	60 Å	NA	NA	NA	Normal	Non-polar	Polar	30	5109
Alumina Neutral	3000 mg/6 mL	50 – 200µ	NA	NA	200 m ² /g	NA	Normal	Non-polar	Polar	30	5133

Solid Phase Extraction (SPE)

Manifolds and Accessories



The Honeywell Burdick & Jackson® SPE system features columns and cartridges as well as vacuum manifolds, bulk sorbent, 96 Deep Well Plates and accessories. Combined with our line of analytical HPLC columns and B&J Brand® high-purity solvents, the Burdick & Jackson SPE system allows you to order the highest quality chromatography products from a single source.

The entire line of packing materials used in the SPE system columns and cartridges undergoes careful testing. Each material must meet Burdick & Jackson's stringent quality assurance requirements to assure reproducibility, reliability and high recovery.

The SPE system column consists of a retaining frit, packing material and a containing frit in a polypropylene tube that serves as a reservoir. Large accessory reservoirs are also available. The exit port is a Luer tip that allows the columns to be affixed securely to the vacuum manifold. Product packaging is double sealed to ensure the integrity of the columns and to minimize the possibility of contamination.

The basic support material in the columns and cartridges is small-pore silica gel. This provides a large surface area and structurally rigid support. The silica-based packing materials include a variety of non-polar and polar bonded phases. Other packing materials include ion-exchange resins, aluminas and Florisil®.

ADVANTAGES

Wide selection of support materials and multiple cartridge/column sizes

Every stationary phase batch tested to ensure lot-to-lot reproducibility

B&J's reliable quality

SPE Sorbent Specifications and Physical Properties

Columns are medical-grade polypropylene. Frits are high-purity polyethylene.

Non-Polar Silica Based SPE Columns

All columns are reversed phase and should be preconditioned with a polar solvent with the elution solvent being non-polar. All columns are endcapped and have a surface area of 500m²/g

Description	Size	Particle Size	Pore Size	Carbon Load %	Pkg. of	Cat. No.
Octadecyl (C ₁₈)	100 mg/1 mL	40 – 63μ	60 Å	20.5 – 22.7	100	9000
Octadecyl (C ₁₈)	200 mg/3 mL	40 – 63μ	60 Å	20.5 – 22.7	50	9002
Octadecyl (C ₁₈)	500 mg/3 mL	40 – 63μ	60 Å	20.5 – 22.7	50	9004
Octadecyl (C ₁₈)	500 mg/6 mL	40 – 63μ	60 Å	20.5 – 22.7	30	9006
Octadecyl (C ₁₈)	1000 mg/6 mL	40 – 63μ	60 Å	20.5 – 22.7	30	9008
Octadecyl (C ₁₈)	2000 mg/6 mL	40 – 63μ	60 Å	20.5 – 22.7	30	9009
Octyl (C ₈)	100 mg/1 mL	40 – 63μ	60 Å	10.0 – 12.0	100	9010
Octyl (C ₈)	200 mg/3 mL	40 – 63μ	60 Å	10.0 – 12.0	50	9012
Octyl (C ₈)	500 mg/3 mL	40 – 63μ	60 Å	10.0 – 12.0	50	901
Octyl (C ₈)	500 mg/6 mL	40 – 63μ	60 Å	10.0 – 12.0	30	9016
Octyl (C ₈)	1000 mg/6 mL	40 – 63μ	60 Å	10.0 – 12.0	30	9018
Ethyl (C ₂)	200 mg/3 mL	40 – 63μ	60 Å	5.4 – 7.0	50	9032
Ethyl (C ₂)	500 mg/6 mL	40 – 63μ	60 Å	5.4 – 7.0	30	9034

Florisil SPE Columns

All columns are normal phase and should be preconditioned with a non-polar solvent with the elution solvent being polar.

Description	Size	Particle Size	Pkg. of	Cat. No.
Florisil-PR	100 mg/1 mL	60/100 Mesh (150 – 250μ)	100	9100
Florisil-PR	200 mg/3 mL	60/100 Mesh (150 – 250μ)	50	9102
Florisil-PR	500 mg/3 mL	60/100 Mesh (150 – 250μ)	50	9104
Florisil-PR	500 mg/6 mL	60/100 Mesh (150 – 250μ)	30	9106
Florisil-PR	1000 mg/6 mL	60/100 Mesh (150 – 250μ)	30	9108
Florisil-PR	1000 mg/6 mL	60/100 Mesh (150 – 250μ)	300	9108B
Florisil-PR	1000 mg/15 mL	60/100 Mesh (150 – 250μ)	30	9111

SPE Columns

Columns are medical-grade polypropylene. Frits are high-purity polyethylene.

Polar Silica-Based SPE Columns

All columns are normal phase and should be preconditioned with a non-polar solvent with the elution solvent being polar.

Description	Size	Particle Size	Pore Size	Surface Area	Pkg. of	Cat No.
Silica (SI)	500 mg/25 mL	40 – 63 μ	60 Å	500 m ² /g	100	9049
Silica (SI)	500 mg/25 mL	40 – 63 μ	60 Å	500 m ² /g	1000	9049B
Silica (SI)	100 mg/1 mL	40 – 63 μ	60 Å	500 m ² /g	100	9050
Silica (SI)	200 mg/3 mL	40 – 63 μ	60 Å	500 m ² /g	50	9052
Silica (SI)	500 mg/3 mL	40 – 63 μ	60 Å	500 m ² /g	50	9054
Silica (SI)	500 mg/6 mL	40 – 63 μ	60 Å	500 m ² /g	30	9056
Silica (SI)	1000 mg/6 mL	40 – 63 μ	60 Å	500 m ² /g	30	9058
Silica (SI)	1000 mg/6 mL	40 – 63 μ	60 Å	500 m ² /g	300	9058B
Silica (SI)	2000 mg/6 mL	40 – 63 μ	60 Å	500 m ² /g	30	9059
Cyanopropyl (CN)	200 mg/3 mL	40 – 63 μ	60 Å	500 m ² /g	50	9062
Cyanopropyl (CN)	500 mg/3 mL	40 – 63 μ	60 Å	500 m ² /g	50	9064
Cyanopropyl (CN)	1000 mg/3 mL	40 – 63 μ	60 Å	500 m ² /g	50	9068
Aminopropyl (NH ₂)	100 mg/1 mL	40 – 63 μ	55 – 75 Å	500 m ² /g	100	9070
Aminopropyl (NH ₂)	300 mg/3 mL	40 – 63 μ	55 – 75 Å	500 m ² /g	50	9073
Aminopropyl (NH ₂)	500 mg/3 mL	40 – 63 μ	55 – 75 Å	500 m ² /g	50	9074

Ion Exchange SPE Columns

Effective Pore Size: Medium | Molecular Exclusion Limit: 1000 Daltons | Resin: Polystyrene Divinylbenzene

Description	Size	Particle Size	Pore Size	Exchange/ Binding Capacity	Surface Area (approx)	Carbon Analysis by Weight	Extraction	Pkg. of	Cat. No.
Strong Cation Exchange Sulfonated Polymer	30 mg/1 mL	20 – 60 μ	100 Å	Approx. 1.8 meq/g	200 m ² /g	NA	NA	100	9085
Strong Cation Exchange Sulfonated Polymer	50 mg/3 mL	20 – 60 μ	100 Å	Approx. 1.8 meq/g	200 m ² /g	NA	NA	50	9086
Strong Anion Exchange (Quaternary Amine Bonded Polymer)	30 mg/1 mL	20 – 30 μ	100 Å	Approx. 2.1 meq/g	200 m ² /g	NA	NA	100	9087
Strong Anion Exchange (Quaternary Amine Bonded Polymer)	50 mg/3 mL	20 – 30 μ	100 Å	Approx. 2.1 meq/g	200 m ² /g	NA	NA	50	9088
Strong Cation Exchange (Silica Based) Benzenesulfonic Acid	100 mg/1 mL	40 – 63 μ	55 – 75 Å	0.307 – 0.341 meq/g	470 – 530 m ² /g	9.28 – 12.10%	85.0 – 110.0%	100	9089
Strong Cation Exchange (Silica Based) Benzenesulfonic Acid	200 mg/3 mL	40 – 63 μ	55 – 75 Å	0.307 – 0.341 meq/g	470 – 530 m ² /g	9.28 – 12.10%	85.0 – 110.0%	50	9091
Strong Cation Exchange (Silica Based) Benzenesulfonic Acid	500 mg/6 mL	40 – 63 μ	55 – 75 Å	0.307 – 0.341 meq/g	470 – 530 m ² /g	9.28 – 12.10%	85.0 – 110.0%	30	9092
Strong Anion Exchange (Silica Based) Quaternary Amine Bonded Particle	100 mg/1 mL	40 – 63 μ	55 – 75 Å	0.200 – 0.260 meq/g	470 – 530 m ² /g	7.09 – 9.71%	85.0 – 110.0%	100	9093
Strong Anion Exchange (Silica Based) Quaternary Amine Bonded Particle	200 mg/3 mL	40 – 63 μ	55 – 75 Å	0.200 – 0.260 meq/g	470 – 530 m ² /g	7.09 – 9.71%	85.0 – 110.0%	50	9095
Strong Anion Exchange (Silica Based) Quaternary Amine Bonded Particle	500 mg/6 mL	40 – 63 μ	55 – 75 Å	0.200 – 0.260 meq/g	470 – 530 m ² /g	7.09 – 9.71%	85.0 – 110.0%	30	9096

Alumina SPE Columns

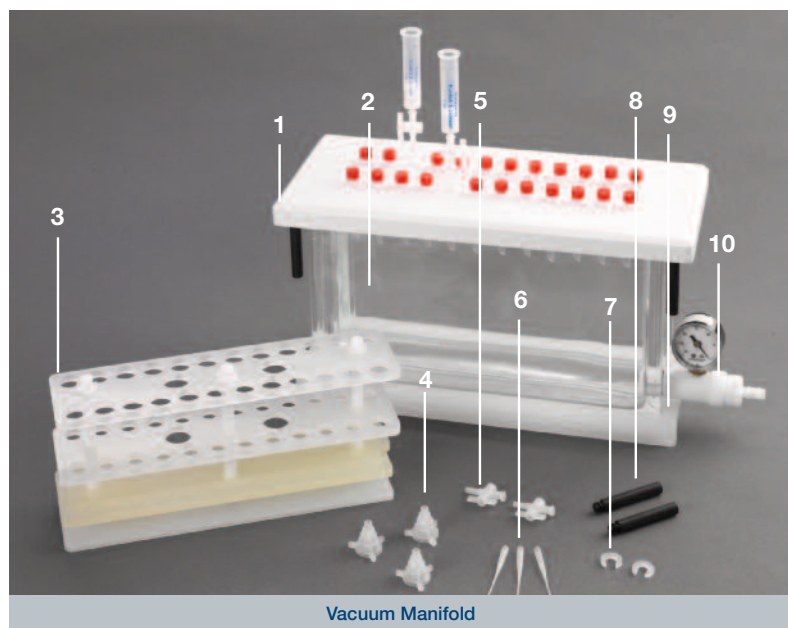
Description	Size	Particle Size	Pore Size	Surface Area	Phase Type	Precondition and Wash	Elute With	Pkg. of	Cat. No.
Alumina Basic	500 mg/3 mL	50 – 200 μ	NA	200 m ² /g	Normal	Non-polar	Polar	50	9114
Alumina Acidic	500 mg/3 mL	50 – 200 μ	NA	200 m ² /g	Normal	Non-polar	Polar	50	9124
Alumina Acidic	1000 mg/6 mL	50 – 200 μ	NA	200 m ² /g	Normal	Non-polar	Polar	30	9128
Alumina Neutral	100 mg/1 mL	50 – 200 μ	NA	200 m ² /g	Normal	Non-polar	Polar	100	9130
Alumina Neutral	500 mg/3 mL	50 – 200 μ	NA	200 m ² /g	Normal	Non-polar	Polar	50	9134
Alumina Neutral	1000 mg/6 mL	50 – 200 μ	NA	200 m ² /g	Normal	Non-polar	Polar	30	9138

SPE Cartridges Sorbent Specifications and Physical Properties

Description	Size	Particle Size	Pore Size	Carbon Load %	Surface Area	End-capped	Phase Type	Precondition & Wash Solvent	Elute with Solvent	Pkg. of	Cat. No.
Octadecyl (C ₁₈)	300 mg	40 – 63µ	60 Å	20.5 – 22.7	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9200
Octadecyl (C ₁₈)	600 mg	40 – 63µ	60 Å	20.5 – 22.7	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9202
Octadecyl (C ₁₈)	900 mg	40 – 63µ	60 Å	20.5 – 22.7	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9204
Octyl (C ₈)	300 mg	40 – 63µ	60 Å	10.0 – 12.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9210
Octyl (C ₈)	600 mg	40 – 63µ	60 Å	10.0 – 12.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9212
Octyl (C ₈)	900 mg	40 – 63µ	60 Å	10.0 – 12.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9214
Ethyl (C ₂)	300 mg	40 – 63µ	60 Å	5.4 – 7.0	500 m ² /g	Yes	Reversed	Polar	Non-polar	25	9220
Silica (SI)	300 mg	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	25	9230
Silica (SI)	600 mg	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	25	9232
Silica (SI)	900 mg	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	25	9234
Cyanopropyl (CN)	300 mg	40 – 63µ	60 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	25	9240
Aminopropyl (NH ₂)	300 mg	40 – 63µ	55-75 Å	NA	500 m ² /g	NA	Normal	Non-polar	Polar	25	9250
Florisil-PR	300 mg	150 – 250µ	NA	NA	NA	NA	Normal	Non-polar	Polar	25	9260
Florisil-PR	900 mg	150 – 250µ	NA	NA	NA	NA	Normal	Non-polar	Polar	25	9264
Alumina Acidic	300 mg	50 – 200µ	NA	NA	200 m ² /g	NA	Normal	Non-polar	Polar	25	9290
Alumina Neutral	900 mg	50 – 200µ	NA	NA	200 m ² /g	NA	Normal	Non-polar	Polar	25	9304

Solid Phase Extraction (SPE)

Manifolds and Accessories



Vacuum Manifold

- | | |
|--------------------|--|
| 1. Manifold Lid | 6. Clean-Thru Tips |
| 2. Glass Block | 7. Retaining clips for collection rack |
| 3. Collection Rack | 8. Manifold Lid Legs |
| 4. Adapters | 9. Manifold Safety Tray |
| 5. Stopcocks | 10. Vacuum Gauge and Valve Assembly |

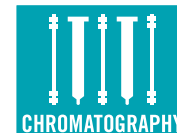
SPE Vacuum Manifold and Accessories

Description	Pkg. of	Cat. No.
16-Port Manifold	1	9300
24-Port Manifold	1	9301
16-Port Glass Block	1	9302
24-Port Glass Block	1	9303
24-Port Manifold Lid	1	9305
16-Port Manifold Lid	1	9306
24-Port Gasket	1	9307
16-Port Gasket	1	9308
24-Port Collection Rack	1	9309
Vacuum Pump (1/8 HP, 115 volts)	1	9310
Vacuum Gauge and Valve Assembly	1	9311
PTFE Luer Tips	12	9312
Retaining Clips for Collection Rack	12	9313
Bulkhead Luer Fittings	12	9314
Manifold Lid Legs	4	9315
Stopcocks 12-per package	12	9316
Stopcocks 16-per package	16	9317
Stopcocks 24-per package	24	9318
Luer Plugs	12	9319
Manifold Safety Tray	1	9320
Clean Thru Tips	50	9321
Adaptors	15	9322
16-Port Collection Rack	1	9323

* Vacuum Manifold comes with cover, gasket, vacuum gauge, valve, glass block, 12 or 24 needles and stopcocks, collection racks (1 each size).

Solid Phase Extraction (SPE)

Column Packing Kits, Filter Columns, Frits, 96 Deep Well Plates & Bulk Sorbents



SPE Column Packing Kits, Filter Columns and Frits

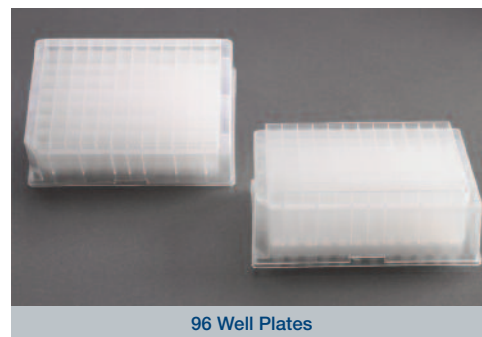
Description	Pkg. of	Cat. No.
75 mL Reservoir (no frits)	100	9434
1.5 mL Reservoir (no frits)	100	9436
4.0 mL Reservoir with 100 frits	50	9438
8.0 mL Reservoir with 100 frits	50	9440
75 mL Reservoir with 200 frits	100	9442
Frit: Fits 75 mL Reservoir	100	9444
Filter Column 1.5 mL (2 frits/column, inserted)	100	9446
Filter Column 4.0 mL (2 frits/column, inserted)	50	9448
Filter Column 8.0 mL (2 frits/column, inserted)	50	9450
Frit: Fits 1.5 mL Reservoir	100	9452
Frit: Fits 4.0 mL Reservoir	100	9454
Frit: Fits 8.0 mL Reservoir	100	9456

96 Deep Well Plates

Description	Pkg. of	Cat. No.
Empty Well Plate with Bottom Frit	1	9920
96 Well Plate with 100mg C ₈	1	9924
96 Well Plate with 100mg C ₁₈	1	9926
96 Well Plate with 100mg Strong Anion Exchange (Aminopropyl)	1	9928
96 Well Plate with 100mg Strong Anion Exchange (Quaternary Amine)	1	9930
96 Well Plate with 100mg Strong Cation Exchange (Benzenesulfonic Acid)	1	9922

Bulk Sorbent

Description	Size	Pkg. of	Cat. No.
Bulk Silica C ₈	10 grams	1	9940
Bulk Silica C ₈	100 grams	1	9942
Bulk Silica C ₈	1 kg	1	9946
Bulk Silica C ₁₈	10 grams	1	9948
Bulk Silica C ₁₈	100 grams	1	9950
Bulk Silica C ₁₈	1 kg	1	9952
Bulk Silica	10 grams	1	9954
Bulk Silica	100 grams	1	9956
Bulk Silica	1 kg	1	9958



96 Well Plates



Bulk Sorbent

Extraction Hint:

NH₄OH is more soluble in IPA than CH₂Cl₂.

To ensure complete mixing of eluate solvents, add NH₄OH and IPA, then add CH₂Cl₂.

The following are some of the many compounds that have been extracted from forensic samples using Honeywell Burdick & Jackson's drug abuse columns.

I. Acidic / Neutral Drug Fraction

Acetaminophen	Clonazepam	Nordiazepam
Barbiturates	Cotinine	Phenytoin
Benzoic acid	Diazepam	Primidone
Caffeine	Glutethimide and metabolite	Salicylic acid
Carbamazepine	Ibuprofen	Theophylline
Carisoprodol	Meprobamate	Thiopental
Chlorpropamide	Methyl salicylate	

II. Basic Drug Fraction

Amantadine	Doxepin and metabolite	Nicotine
Amitriptyline and metabolite	Ephedrine	Oxycodone
Amphetamine	Fluoxetine	Pentazocine
Benzocaine	Imipramine and metabolite	Phencyclidine
Benzoylcegonine	Ketamine	Phenethylamine
Benztropine	Lidapine	Chloroquine
Bromodiphenhydramine	Loxapine	Phentermine
Chlordiazepoxide	Meperidine	Pheny
Chloroquine	Methadone and metabolite	Ipropanolamine
Chlorpheniramine	Methamphetamine	Procaine
Chlorpromazine	Methyl Ú-aminobenzoate	Propoxyphene and metabolite
Cocaine and metabolite	Methyl benzoate	Propylparaben
Codeine	Methyl ecgonine	Tranlycypromine
Cresol	Methylparaben	Trifluoperazine
Dextromethorphan	Methylphenidate	Trimipramine
Dextrophan	Methyprylon and metabolites	Thioridazine
Dihydrocodeine	Morphine	Trazodone

SPE Columns

All columns have a particle size range of 40-63 μ with a pore size of 55-75 Å.

SPE Drug Abuse Sorbent Specifications and Physical Properties

Description	Size	Carbon Load %	Surface Area	Pkg. of	Cat. No.
Drug Abuse (C ₈ + Benzyl Sulfonic Acid)	130 mg/1 mL	12.0 – 12.8	500 m ² /g	100	9900
Drug Abuse (C ₈ + Benzyl Sulfonic Acid)	200 mg/3 mL	12.0 – 12.10	500 m ² /g	50	9902
Drug Abuse (C ₈ + Benzyl Sulfonic Acid)	500 mg/3 mL	12.0 – 12.11	500 m ² /g	50	9904
Drug Abuse (C ₈ + Benzyl Sulfonic Acid)	500 mg/3 mL	12.0 – 12.12	500 m ² /g	30	9906
Drug Abuse (C ₈ + Benzyl Sulfonic Acid)	1000 mg/6 mL	12.0 – 12.9	500 m ² /g	30	9908

SPE THC Sorbent Specifications and Physical Properties

Description	Size	Carbon Load %	Surface Area	Pkg. of	Cat. No.
THC (C ₈ + Aminopropyl)	130 mg/1 mL	11.1 – 13.1	500 m ² /g	100	9910
THC (C ₈ + Aminopropyl)	200 mg/3 mL	11.1 – 13.3	500 m ² /g	50	9912
THC (C ₈ + Aminopropyl)	500 mg/3 mL	11.1 – 13.4	500 m ² /g	50	9914
THC (C ₈ + Aminopropyl)	500 mg/6 mL	11.1 – 13.5	500 m ² /g	30	9916
THC (C ₈ + Aminopropyl)	1000 mg/6 mL	11.1 – 13.2	500 m ² /g	30	9918



Honeywell Burdick & Jackson® QuEChERS products offer an alternative sample preparation technique to traditional liquid-liquid and solid phase extraction (SPE) methods. The use of QuEChERS has the potential to lower the overall cost of sample preparation due to the increased efficiency and ease-of-use when compared with SPE methods.

Honeywell Burdick & Jackson's QuEChERS portfolio includes sample extraction and sample cleanup products. These products come in a variety of sizes, from 2 mL to 15 mL for the dispersive-solid phase extraction (d-SPE) centrifuge tubes, and contain pre-measured amounts of magnesium sulfate (MgSO₄) salt and primary secondary amine (PSA) sorbent to facilitate cleanup of the extract. The d-SPE centrifuge tubes are also available with

graphitized carbon black (GCB) and/or C18 packing.

Honeywell Burdick & Jackson's QuEChERS products are appropriate for the following methodologies:

- European EN 15662 method
- AOAC 2007.01 method
- Original QuEChERS method

All QuEChERS methods consist of three common steps:

Step 1. Sample Extraction (Preparation)

Uniformly grind sample. Weigh out sample and add internal standards to acetonitrile (10 or 15mL). Add appropriate salts, buffers and acids to facilitate extraction or to enhance recovery of pH-sensitive analytes.

Step 2. Sample Cleanup

The extract from Step 1 is cleaned up using d-SPE. The d-SPE centrifuge tubes contain pre-measured amounts of sorbents/salts to remove any unwanted contaminants from the extract. Vortex and centrifuge the cleanup sample.

Step 3. Sample Analysis

Depending upon the sample, the cleanup sample may be solvent-exchanged or pH-adjusted. Transfer an aliquot of the sample to an injection vial for analysis by LC/MS or GC/MS.

ADVANTAGES

Efficient method of sample preparation

Array of tube sizes and sorbent materials available

Appropriate for use with Burdick and Jackson acetonitrile and other high purity solvents

Salt/Sorbent Selection Guide

Sorbent or Salt	Appropriate for Extracting...
C18	Fats and lipids and other non-polar contaminants
Graphitized Carbon Black (GCB)	Pigments, chlorophyll, carotenoids, polyphenols
Magnesium Sulfate (MgSO ₄)	Water
Primary Secondary Amine (PSA)	Organic acids, sugars, fatty acids

Sample Extraction Products

Extraction salts used in QuEChERS vary by method. Each extraction salt is packaged in a Mylar pouch to keep it dry. Every pack of extraction salt contains an equal number of centrifuge tubes.

Description	Extraction Salt per Mylar Pouch (Unit)	# Units/ Pack	Cat. No.
Extraction Salt for AOAC QuEChERS Method w/ 50 mL Tube	6 gm MgSO ₄ , 1.5 gm sodium acetate	50	5600
Extraction Salt for AOAC QuEChERS Method w/ 50 mL Tube, Bulk Pack	6 gm MgSO ₄ , 1.5 gm sodium acetate	250	5626
Extraction Salt for EN15662 QuEChERS Method w/ 50 mL Tube	4 gm MgSO ₄ , 1 gm sodium chloride, 500 mg sodium citrate (dibasic sesquihydrate), 1 gm sodium citrate (tribasic dihydrate)	50	5602
Extraction Salt for Original QuEChERS Method w/ 50 mL Tube	4 gm MgSO ₄ , 1 gm sodium chloride	50	5601
Extraction Salt for Original QuEChERS Method w/ 50 mL Tube, Bulk Pack	4 gm MgSO ₄ , 1 gm sodium chloride	250	5627

Sample Cleanup Products

The cleanup of the extracted sample is done through the dispersive-solid phase extraction (d-SPE) process. This step requires a formulation of pre-measured salts and sorbents packaged in a centrifuge tube.

Description	Cleanup Materials per Tube (unit)	# Units/ Pack	Cat. No.
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 25 mg PSA	100	5656
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 50 mg PSA	100	5651
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 50 mg PSA, 50 mg C18	100	5653
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 150 mg PSA, 50 mg C18	100	5652
15 mL Centrifuge Tube for Dispersive SPE	900 mg MgSO ₄ , 300 mg PSA, 150 mg C18	50	5655
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 25 mg PSA, 2.5 mg GCB	100	5657
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 25 mg PSA, 7.5 mg GCB	100	5658
2 mL Centrifuge Tube for Dispersive SPE	150 mg MgSO ₄ , 50 mg PSA, 50 mg C18, 7.5 mg GCB	100	5654

Alternative SPE Cleanup Products

In case the dispersive SPE cleanup is not sufficient for total sample cleanup, alternative columns containing a top layer of graphitized carbon black (GCB) and a bottom layer of primary secondary amine (PSA), separated by a PTFE frit, may be used.

Description	Cleanup Materials per Tube (unit)	# Units/ Pack	Cat. No.
6 mL SPE Cleanup Column	250 mg GCB, 500 mg PSA	30	5700
6 mL SPE Cleanup Column	500 mg GCB, 500 mg PSA	30	5701

Honeywell Burdick & Jackson® Solvent Selection for Use with QuEChERS

Acetonitrile is commonly used as the organic solvent of choice with QuEChERS due to its excellent characteristic of extracting the broadest range of pesticides with the least amount of co-extractables. It can be also used as the mobile phase in LC/MS. Based on published methods, the solvents in the chart below may be used with QuEChERS:

Solvent	Grade	Packaging	Cat. No.
Acetonitrile	LC/MS	1-liter bottle, case of 6	LC015-1
		2.5-liter bottle, case of 4	LC015-2.5
	B&J Brand	1-liter bottle, case of 6	015-1L
		4-liter bottle, case of 4	015-4
Methanol	LC/MS	1-liter bottle, case of 6	LC230-1
		2.5-liter bottle, case of 4	LC230-2.5
	B&J Brand	1-liter bottle, case of 6	230-1L
		4-liter bottle, case of 4	230-4
Toluene	B&J Brand	1-liter bottle, case of 6	347-1L
		4-liter bottle, case of 4	347-4
Water	LC/MS	1-liter bottle, case of 6	LC365-1
		2.5-liter bottle, case of 4	LC365-2.5
	B&J Brand	4-liter bottle, case of 4	365-4



Honeywell Burdick & Jackson® offers a wide range of reversed phase and normal phase HPLC columns. All packing materials are based on a 5µ porous spherical silica support. The columns are available in either 15 or 25 cm lengths, both having 4.6 mm inner diameters.

All tubing and endfitting components are 316 stainless steel. A set of nuts and ferrules is

included to enable easy and rapid connection of the column into any LC system. Included with each column are guidelines for usage and storage plus a solvent miscibility table.

Each column type and length has a unique set of rigorously controlled specifications. The test solutes are chosen to characterize the column in terms of hydrophobic and polar retention mechanisms.

These solutes are specially selected to probe significant chromatographic properties of the packed column. The number of theoretical plates (N), skew (A/B) and separation factors (a) are guaranteed to meet stringent specifications.

Each column includes:

- An actual test chromatogram
- Quality assurance to meet Burdick & Jackson performance specifications
- Support by Burdick & Jackson's technical service hotline for HPLC applications

ADVANTAGES

Quality assurance to meet performance specifications

Tested to guarantee reproducible column-to-column performance

Responsive technical support

Tested to meet exceedingly rigorous specifications using specially selected test solutes

Specially selected phases for unique separations

HPLC Columns

Description	Column Size	Particle Size	Pore Size	Surface Area	Element Analysis %C	End Capped	Cat. No.
Octadecyl OD5	15 cm x 4.6 mm	5µ	80 Å	225 m ² /g	12.5	Yes, Trimethylsilyl	9570
Octadecyl OD5	25 cm x 4.6 mm	5µ	80 Å	225 m ² /g	12.5	Yes, Trimethylsilyl	9575

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