



## **Solutions for Environmental Analysis**

Enhancing productivity & quality in lab routine

Determining pollutants in environmental and food matrices requires efficient sample preparation. BUCHI offers a wide range of solutions for reliable, efficient, flexible and safe sample processing procedures in the laboratory work flow to enhancing productivity and quality.



## Ingenious solutions for your matrices

Covering a wide variety of analytes

A clean and safe environment is a prerequisite for health and quality of life. BUCHI contributes to this by providing market-leading solutions for sample preparation and analysis to a wide range of industrial companies, environmental testing labs, consultants, and government authorities.

### Soil, sludge, sediment



#### Analyte:

PCDD/PCDF, PAH, PCB, flame retardants (BFR, PBDE), TPH, pesticides, Total Kjeldahl Nitrogen (TKN), trace and heavy metals, ammonia

#### Matrix:

soil, sediments, sludge, brownfields

#### Compliant with e.g.:

EPA 1613B	ISO 10382
EPA 1664	ISO 11261
EPA 1668B	ISO 11466
EPA 3540C	ISO 13859
EPA 3541	ISO 16703
EPA 3545A	ISO 18287
EPA 8082A	DIN ISO 11261
EPA 8290A	EN 13342
EPA 8270	DIN 13346
EPA 9071	DIN 38414

### Waste



#### Analyte:

Restriction of hazard substances (RoHS): PBDE and PBB, phthalate esters (eg. DEHP, BBP, DBP, DIBP) lead and cadmium from electrical and electronic products, trace and heavy metals

#### Matrix:

e-waste, recycled material, polymer waste, bio waste

#### Compliant with e.g.:

EPA 8270  
IEC 62321  
Directive 2002/95/EC  
EN 14039  
EN 15308  
DIN EN 13657  
ISO 16797

Our solutions comprise sample preparation and testing of air, soil, sediment, sewage sludge, waste and waste water to assess their quality with impact on health and the environment.

## Water, waste water



### Analyte:

PAH, PCB, TPH, flame retardants (BFR, PBDE), Total Kjeldahl Nitrogen (TKN), phenol, cyanide, formaldehyde, chemical oxygen demand (COD), ammonia, nitrate and nitrites, phosphate

### Matrix:

municipal and industrial water discharges, water from sanitation, surface water, runoff from fertilized lawns, animal manure and storage areas

### Compliant with e.g.:

EPA 608	ISO 5663
EPA 8081	ISO 9377-2 (DIN H53)
EPA 8082A	DIN 38406-E5-2
EPA 9010C	DIN 38409
EN 38414-20	NEMI D6303
AOAC 973.48	

## Air



### Analyte:

PCDD/PCDF, PCB, nitrate, nitrite, ammonia

### Matrix:

ambient air, stack gas, incineration, car exhaust and fly ash

### Compliant with e.g.:

EPA 3542A
EPA TO-4A
EPA TO-9A
EPA TO-10A
EPA TO-13
EN 1948

Find your solutions at:  
[www.buchi.com/environmental](http://www.buchi.com/environmental)



## Dedicated solutions along your value chain

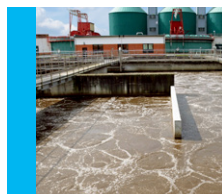
Covering the most important analytes in today's analysis

Our portfolio for environmental testing comprises of five sample preparation methods and supplementary application tools. They allow you to perform classical Soxhlet and hot extraction, pressurized solvent extraction, solid phase extraction, acid digestion and steam distillation.

Solutions by BUCHI	Page	Analytes and parameter groups	Soil Sludge Sediment	Waste	Water / Waste Water	Air
«Extraction Throughput»	8	Pesticides, PAH, PFC, TPH, phthalates, POPs as flame retardants (BFR), PCDD/PCDF, PCB	●	●		●
«Extraction Universal»	10	Pesticides, PAH, PFC, TPH, phthalates, POPs as flame retardants (BFR), PCDD/PCDF, PCB	●	●		●
«Digestion & Distillation»	12	TKN, urea, ammonia, nitrate, nitrite, cyanide, formaldehyde, phosphate	●		●	●
«Reflux Digestion»	16	Trace and heavy metals, COD	●	●	●	
«Parallel Evaporation Pre-Analytical»	18	Pesticides, PAH, PFC, TPH, phthalates, hydro-carbon oil index, PCB, DDT, POPs as flame retardants (BFR), PCDD/PCDF	●	●	●	●



Soil,  
sludge,  
sediment



Water /  
waste water



Waste



Air

Sampling	Homogenization Grinding Sieving	Digestion Separation Extraction	Evaporation Concentration Distillation	Clean-up	Analysis
•	•	Extraction	Concentration	(•)	GC/MS HR-GC/HR-MS LC/MS
•	•	Extraction	Concentration	(•)	GC/MS HR-GC/HR-MS LC/MS
•	•	Digestion	Distillation		Titration
•	•	Digestion			ICP (metals) Titration (COD)
			Concentration	(•)	GC/MS HR-GC/HR-MS LC/MS

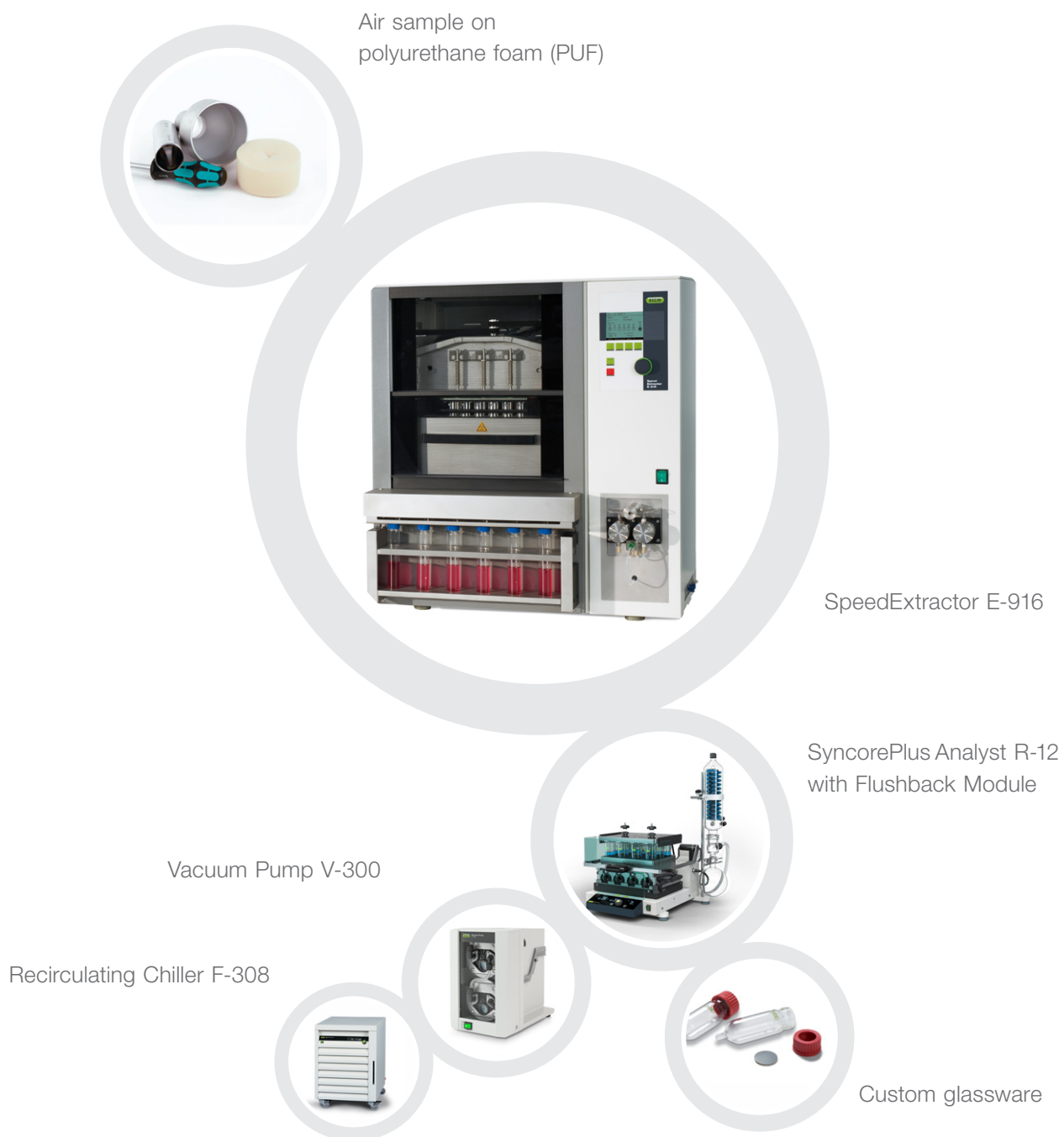
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You want to analyze various pollutants contained by byproducts of processes and materials contaminating our environment. We offer sample preparation solutions by pressurized solvent extraction for the analysis of persistent organic pollutants (POPs) and other contaminants.



Alternative solution: «Extraction Universal», page 8

UniversalExtractor E-800  
Five compliant and versatile  
extraction methods

SyncorePlus Analyst R-12 / R-6  
Parallel evaporation and  
concentration to defined volume

Recirculating Chiller F-308  
The efficient and water saving  
way of cooling

## Your most important benefits

### Safe and reliable

- No contamination of samples since components in contact are inert
- No cross-contamination of adjacent positions due to individual valves and pathways
- Reliable analysis of low polluted samples with large cell volumes (up to 120 mL)
- No loss of analyte due to concerted workflow of extraction and concentration

### Speed and throughput

- Up to 6 times faster than other PSE instruments thanks to parallel extraction concept
- Extraction of up to 96 samples in an 8 hour shift
- Acceleration of the extraction process, thus facilitate final results within one working day
- Reduced number of replicates due to identical extraction conditions for up to 6 samples

### Low running costs

- Reduced solvent consumption for pre-cleaning cartridges / PUF and the extraction step
- Minimal need for consumables give lower running costs
- Save energy and costs with «ECO» mode for automated heater control
- Complementary workflow and synergy with parallel evaporation and concentration

## Your solution «Extraction Throughput»



- PSE: SpeedExtractor E-916
- Concentration: SyncorePlus Analyst R-12 with-Flushback Module
- Vacuum Pump V-300
- Cooling: Recirculating Chiller F-308

#### Options:

- PSE: SpeedExtractor E-914
- Parallel evaporation: SyncorePlus Analyst R-6, Multivapor™ P-12 / P-6
- Evaporation: Rotavapor® R-300
- Solid Phase Extraction (SPE)



- Comprehensive list of reference applications
- Customized application support
- Authorized IQ/OQ documentation
- Practical workshops, trainings and seminars
- Preventive maintenance including IQ/OQ
- Minimize downtime thanks to our service hotline

*“The parallel extraction operation of the SpeedExtractor saves us time whilst maintaining accuracy demanded by our customers”*

Karl Pettit, Marchwood Scientific Services, Southampton, United Kingdom

You need a most flexible solution for the sample preparation step. We offer automated Soxhlet extraction and complementary evaporation solutions which are proven preparation techniques for the determination of pollutants like PCBs. For enhanced speed and throughput use pressurized solvent extraction with BUCHI's SpeedExtractor.

Recirculating Chiller F-308



UniversalExtractor E-800



SyncorePlus Analyst R-12  
with Flushback Module



Vacuum Pump V-300



Alternative solution: «Extraction Throughput», page 6

SpeedExtractor E-916 / E-914  
Pressurized solvent extraction

SyncorePlus Analyst R-12 / R-6  
Parallel evaporation and  
concentration to defined volume

Recirculating Chiller F-308  
The efficient and water saving  
way of cooling



## Your most important benefits

### Flexible applications

- Profit from five different extraction methods in one universal glass assembly. Choose the optimal extraction method to achieve the highest analyte recovery with the lowest variation of results
- For low analyte concentration, the Large Sample Volume (LSV) glass assembly can increase the sample volume by 60 %
- Fast and equal heating, even for high boiling solvents such as water or toluene

### Fully inert conditions and maximized safety for the analyte

- All components in the UniversalExtractor E-800 that are in contact with the sample and the solvents are made of inert material
- Eliminates sample contamination and any memory effects from leaching materials
- The inert gas supply is selectable through-out all stages of the process
- Inert gas is automatically switched on if the analyte protection sensor is triggered

### Multitasking

- Six distinct extraction positions enable individual process control and simultaneous operation of different extraction methods
- Different extraction tasks can be carried out in parallel
- Faster method development and higher sample throughput

## Your solution «Extraction Universal»



- Extraction: UniversalExtractor E-800
- Concentration: SyncorePlus Analyst R-12
- Vacuum Pump V-300
- Cooling: Recirculating Chiller F-308

#### Options

- UniversalExtractor E-800 LSV for large sample volumes
- Parallel evaporation: SyncorePlus Analyst R-6 Multivapor™ P-12 / P-6
- Evaporation: Rotary Evaporator® R-300
- Solid Phase Extraction (SPE)



- Comprehensive list of reference applications
- Customized application support
- Authorized IQ/OQ documentation
- Practical workshops, training and seminars
- Preventive maintenance including IQ/OQ
- Minimize downtime thanks to our service hotline

You have to deal with various applications for monitoring or determining environmental parameters such as nitrogen, ammonia or other steam volatile compounds. BUCHI's versatile solutions for digestion and steam distillation cover a broad range of applications in solids, waste water, fly ash and air.

Scrubber K-415  
QuadScrub<sup>ECO</sup>



Optional H<sub>2</sub>O<sub>2</sub>  
digestion



Linked external titrators



SpeedDigester K-439



KjelFlex K-360



Mixer B-400



Recirculating Chiller F-308

## Your most important benefits

### Highly flexible and convenient

- One solution for nitrogen determination, direct distillation or Kjeldahl applications
- Highest flexibility combining dedicated accessories and varying sample tube sizes
- Convenient operation thanks to automated procedures and enhanced visualization:
  - programmable digestion temperature profiles
  - distillation parameters like automated dilution, alkalization or acidification, aspiration of chemicals
  - automated titration with linked external titrators
- Ready-to-use pre-programmed methods for various sample matrices

### Fast

- Time savings of up to 135 minutes thanks to fast heating and cooling of the SpeedDigester
- Accelerated digestion process by optional continuous addition of  $H_2O_2$
- Concerted online titration with dedicated titrators while the sample is still being distilled (K-360/Titrino Plus)
- Automated calculation and result transfer

### Safe and secure

- Maximum safety thanks to perfectly sealing joints and the ultimate four stage Scrubber K-415 (QuadScrub<sup>ECO</sup>)
- Prohibition of unauthorized process or data manipulation with password protection (K-360)

## Your solution «Digestion & Distillation»



- Distillation: KjellFlex K-360
  - Digestion: SpeedDigester K-439
  - Neutralization: Scrubber K-415 (TripleScrub<sup>ECO</sup>)
  - Recirculating Chiller F-308
  - Mixer B-400
  - External third party titrators
- Options:
- Distillation Unit K-350 / K-355
  - KjellMaster System K-375 / K-376 / K-377
  - KjellDigester K-446 / K-449



- Comprehensive list of reference applications
- Customized application support
- Authorized IQ, OQ and PQ documentation
- Useful tools for application development
- Practical workshops, trainings and seminars
- Preventive maintenance including IQ/OQ/PQ
- Minimize downtime thanks to our service hotline

*“BUCHI is considered as the key supplier for nitrogen determination application for the SDL. The training and support from BUCHI was in every way excellent and we look forward to future collaboration.”*

Barry Daniel Nourice, Principal Laboratory Officer, Seychelles Agricultural Agency, Seychelles

## Solution «Reflux Digestion»

Determination of trace and heavy metals, and COD



You need to analyze heavy metals in soil, sewage sludge or electronic waste. With BUCHI's solution «Reflux Digestion» you digest up to 12 samples simultaneously at homogeneous conditions to transfer the analyte into the measurable property for final ICP analysis or titration. The modular system configuration allows for various other applications like Kjeldahl and COD digestion.

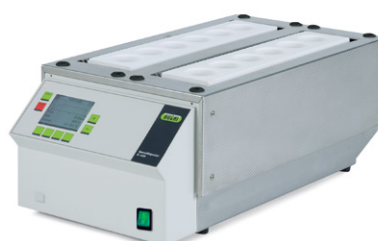
Recirculating Chiller F-308



Scrubber K-415  
QuadScrub<sup>ECO</sup>



Water reflux  
setup



SpeedDigester K-439



COD setup for air  
reflux digestion

### Alternative solution for «Reflux Digestion»

#### Wet Digester B-440

Pre-incineration unit for ash  
determination

## Your most important benefits

### Range of applications

- Aqua regia,  $\text{HNO}_3$  or  $\text{HCl}$  digestion under reflux (with water condensers) for heavy metal analyses, e.g. soils, sludge, sediments and electronic waste
- COD determination to evaluate the water quality using air condensers according to ISO 6060.
- Fast IR digestion for nitrogen determination according to Kjeldahl.

### Flexible and fast

- Quick and easy switch between Kjeldahl and trace metal or COD digestion without laborious conversions.
- 20 ready-to-use pre-programmed methods for various sample matrices
- Storage of 30 personal methods

### Safe and reliable operation

- No harmful fumes with the ultimate four stage Scrubber K-415 QuadScrub<sup>ECO</sup>
- Safe and reproducible aqua regia digestion thanks to tight water reflux setup with efficient and water saving cooling (F-308)
- Excellent reproducibility thanks to superb thermal homogeneity and process supervision

## Your solution «Reflux Digestion»



- Digestion: SpeedDigester K-439
- Setup: water or air reflux condenser setup
- Neutralization: Scrubber K-415 (QuadScrub<sup>ECO</sup>)
- Cooling: Recirculating Chiller F-308

#### Options:

- SpeedDigester K-425 / K-436



- Comprehensive list of reference applications
- Customized application support
- Useful tools for application development
- Practical workshops, trainings and seminars
- Preventive maintenance including IQ/OQ/PQ

*“The SpeedDigester is the ideal tool for dealing with medium sample loads for both TKN and heavy metal determinations.”*

Municipal Sewage Plant, France



## Solution «Parallel Evaporation Pre-Analytical»

For concentration to a pre-defined volume



You are looking for the most efficient and sustainable way of parallel sample evaporation. Environmental soil, water, air and waste samples are usually extracted with an organic solvent which is subsequently concentrated before final analysis to overcome detection limits. Our time saving, flexible and highly efficient solution «Parallel Evaporation Pre-Analytical» guarantees maximum reproducibility and highest recovery rates.



### Alternative solution for «Parallel Evaporation Pre-Analytical»

Vacuum Pump V-300  
The economic and  
silent vacuum source

Interface I-300 Pro  
Central control of all  
process parameters

Multivapor™ P-6 / P-12  
Efficient evaporation for  
multiple samples

## Your most important benefits

### Reliable

- No contamination thanks to inert materials
- No cross contamination due to individual sample sealing
- Highest analyte recoveries in combination with the Flushback Module
- No loss of volatile compounds due to cooled appendix

### Cost-efficient

- Increased productivity by concentrating up to 12 samples to a pre-defined residual volume in parallel
- Low operating cost due to independence of nitrogen
- Improved efficiency by combining SPE (Solid Phase Extraction) and concentration

### Sustainable

- Environmental-friendly due to high solvent recovery
- No solvent emission
- No water consumption and disposal while using the eco friendly BUCHI chiller

## Your solution «Evaporation Pre-Analytical»



- SyncorePlus Analyst with stand-alone condenser
- Recirculating Chiller F-308
- Vacuum Pump V-300 with Interface I-300 Pro
- Flushback Module for 12 samples
- Solid Phase Extraction (SPE)

#### Options:

- Rack sizes (4, 6, 12 samples)
- SPE: Accessories for parallel SPE



- Customized application support
- Application booklet
- Workshops and trainings
- Minimize downtime thanks to our service hotline
- Preventive maintenance
- Service and documentation (IQ/OQ)



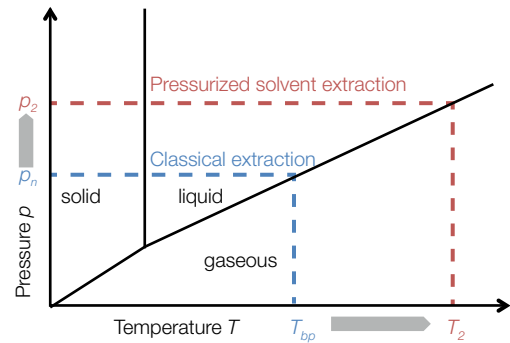
	Speed-Extractor E-914 / E-916	Universal-Extractor E-800	R-300 «Dynamic»	SyncorePlus Analyst R-12, R-6, R-4	Multivapor™ P-12 / P-6	SPE Module SyncorePlus Analyst
<b>Workflow steps</b>	Extraction		Evaporation, concentration & drying			SPE
«Pressurized Solvent Extraction»	•			•		
«Solvent Extraction»		•		•		
«Pre-analytical Evaporation»				•		•
«Reflux Digestion»						
«Digestion & Distillation»						
<b>Soils / Sediments / Sewage sludge</b>						
Pesticides, PAH, PFC, TPH	•	•	•	•	•	•
POPs as flame retardants, PCDD/PCDF, PCBs	•	•	•	•	•	•
Nitrogen (TKN), urea						
Nitrate, nitrite, ammonia						
Trace and heavy metals						
<b>Waste / Hazardous waste</b>						
PAH, PCBs	•	•	•	•	•	
Phthalates	•	•	•	•	•	
RoHS: trace metals, heavy metals						
RoHS: flame retardants	•	•	•	•	•	
<b>Waste / Wastewater</b>						
Pesticides, PAH, PCB, TPH			•	•	•	•
Hydro-carbon oil index				•		•
Nitrogen (TKN), urea						
Nitrate, nitrite, ammonia						
COD, phosphate						
Phenol, cyanide, formaldehyde						
Oil and grease		•				
<b>Air / Fly ash</b>						
Dioxins/furans and other POPs	•	•	•	•	•	
Nitrate, nitrite, ammonia						
<b>Characteristics</b>						
No. of samples per run	6 / 4	6	1	12 / 6 / 4	12 / 6	12 / 6
Tube size [mL]	10 – 120	65/120	20 – 3000	0.5 - 500	5 – 180	5 – 120



SpeedDigester K-425 / K-436 / K-439		KjelDigester K-446 / K-449	Distillation Units K-350 / K-355		KjelFlex K-360	KjelMaster System K-375 / K-376 / K-377	
Digestion			Distillation				Sample per day
							72 – 96
							24 – 48
							10 - 40
•							6 – 36
•			•				72 – 96
•                      •			•	•	•		
			•                      •				
•							
•							

### Does high pressure increase the extraction efficiency?

Yes, the combination of elevated temperature and pressure results in faster extraction compared to other extraction technologies. This is the result of an improved mass transfer because of higher analyte solubility and enhanced penetration. An increase from normal pressure  $p_n$  to  $p_2$  is thereby necessary to keep the sample in the liquid state at  $T_2$ .

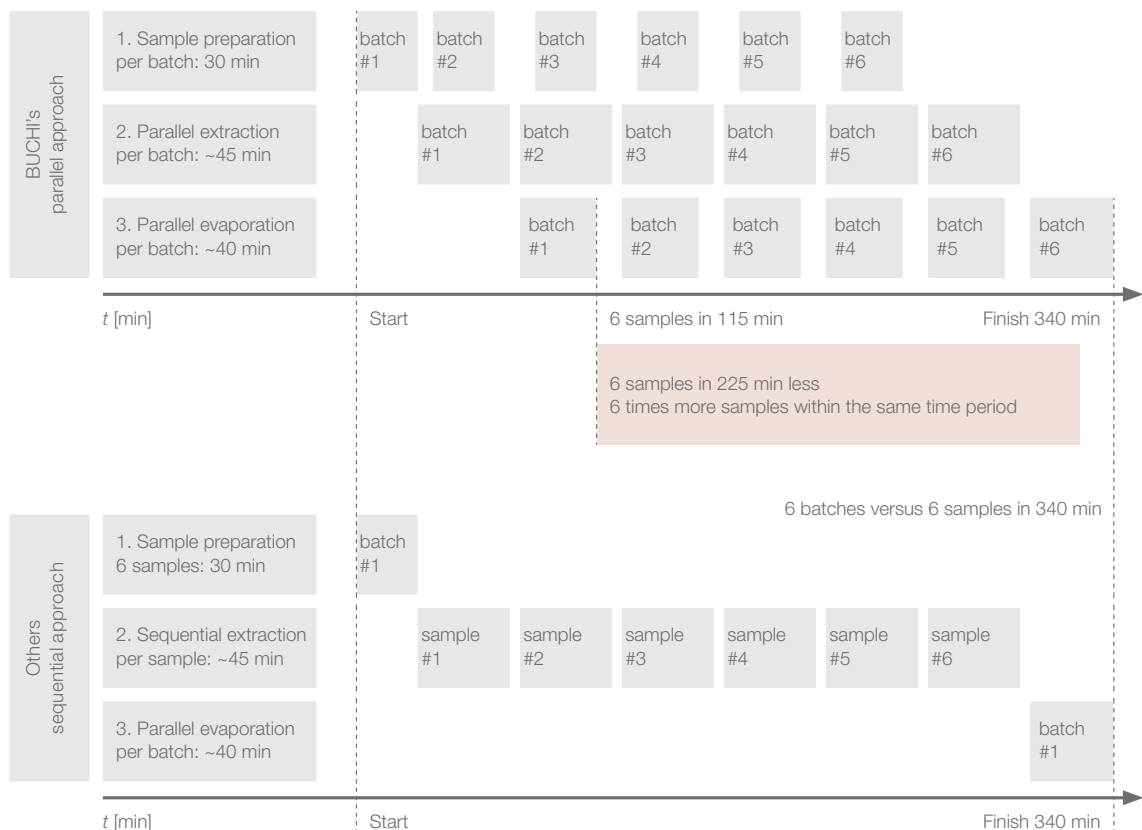


### Isn't there any risk of cross-contamination for adjacent positions in the SpeedExtractor?

No, each position has its own inlet and outlet valve as well as individual pressure sensors. Even in case of blockage of one position, cross-contamination is excluded as an integrated troubleshooting wizard automatically relieves the pressure. All other positions will be finished while the faulty position is deactivated.

### What is the benefit of a parallel extraction/evaporation approach?

Concerted parallel pressurized solvent extraction/parallel evaporation as opposed to a sequential approach increases the sample throughput. Additionally, it reduces the time to analysis significantly. An incoming batch of six samples is ready for the analysis after 115 minutes.





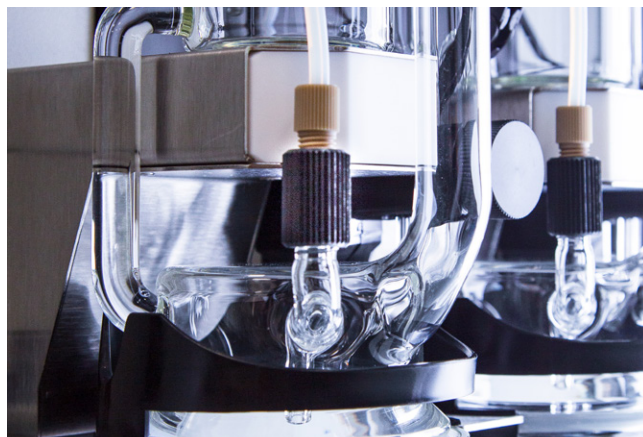
## How can I apply higher sample quantities for extraction?

The E-800 LSV with the larger sample volume allows for higher quantities to reach the required detection limit of the analyte. The main glass parts are expanded to 60 %.



## What does “inert” mean for the UniversalExtractor E-800?

In the UniversalExtractor E-800, all components in contact with the sample are inert. Contamination of the sample is prevented as leaching of additives from sealing membranes is eliminated. Additionally the extraction and drying process can be performed in an inert gas atmosphere.



## When is it recommended to work with a recirculating chiller?

When you perform extraction or evaporation with a solvent like petroleum ether, a recirculating chiller (e.g. Recirculating Chiller F-308) should be implemented, especially if the tap water is warmer than 15 °C. The temperature difference between the boiling point of the solvent and the cooling water temperature should be 20 - 25 °C in order to achieve complete condensation of the solvent and to maintain an excellent solvent recovery.



Is it possible to use the same digester for Kjeldahl, COD and aqua regia digestion?

Yes, the flexible SpeedDigester models can be adapted to several applications just by exchanging the accessories.

Can the COD sample tubes directly be transferred into an auto sampler for automated titration?

Yes, the same sample tubes can be used for sample preparation, digestion and automated titration.



Why is it important to use a K-415 QuadScrub<sup>ECO</sup> (Sccrubber with 4 cleaning stages) for aqua regia digestion?

Yes, only the fourth cleaning stage (D) reliably absorbs the toxic NO<sub>x</sub> fumes arising due to the reaction of aqua regia.

**A** Condensation step

- ① Fumes in
- ② Condenser
- ③ Condensate vessel
- ④ Cooling water inlet
- ⑤ Cooling water outlet

**B** Neutralization step

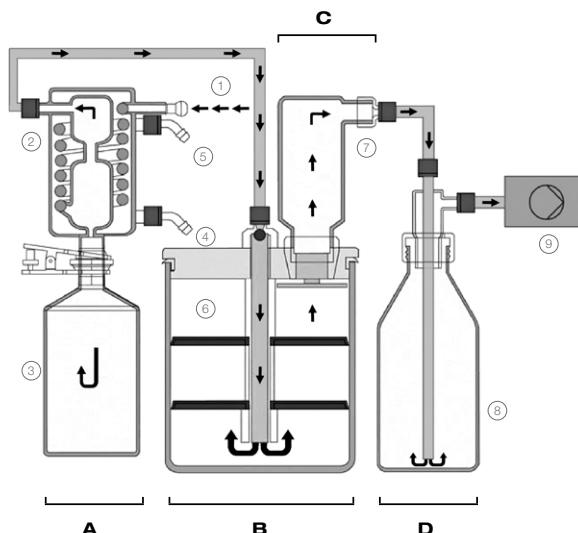
- ⑥ Neutralization vessel

**C** Adsorption step

- ⑦ Adsorption vessel

**D** Reaction step

- ⑧ Reaction vessel
- ⑨ Pump



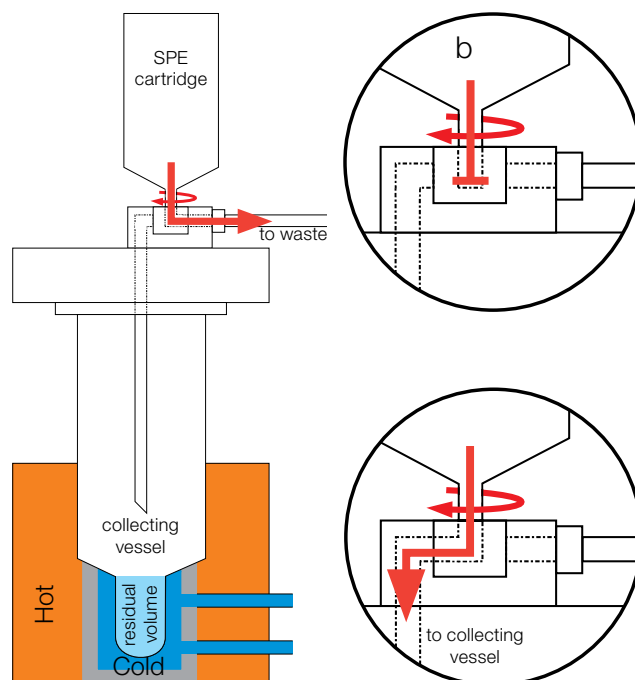
Which titrator types can be connected to the Kjelflex K-360?

The Kjelflex K-360 can be connected to different third party titrators of suppliers like Metrohm, Mettler Toledo, SI Analytics and Radiometer.



## How does the BUCHI SPE solution work?

By just simply adding the SPE cover accessory, the parallel evaporation device SyncorePlus is upgraded to a fully functional parallel SPE/filtration device. Individual sample sealing, accurate vacuum control and vortex evaporation make the apparatus a highly efficient and comprehensive solution for modern sample preparation.



## What type of SPE cartridges/disks can be used?

The SPE platform can be used with any SPE or filtration cartridge or disk that has a standardized *Luer* adapter. This open design allows for using the best cartridge/disk possible for any given application, without limitation of proprietary consumables.

## Does the BUCHI SPE module allow for a 3-way-flow control?

Yes, the SPE advanced cover has up to 24 manually controllable 3-way valves that allow for conditioning into a waste container and consequent elution into the evaporation vessel at once. This combined functionality saves manual labor, costs and time, and reduces the risk of sample loss, spillage and contamination of the analyte.





PCB, dioxins and furans from soil and fly ash  
Marchwood Scientific Services, United Kingdom

Customer: independent laboratory. They are the leading laboratory for dioxin analysis in the UK receiving samples from all over the world.

Application: determination of PCBs, dioxins and furans in soil and fly ash.

Equipment: SpeedExtractor E-916 with Rotavapor®



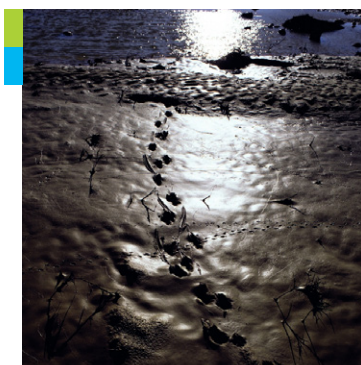
Organic contaminants in soil

Ecological Institute of Binzhou University, China

Customer: key ecological-environmental laboratory in the Yellow River Delta, soil research for protecting the ecosystem and the environment.

Application: determination of TPH, PCBs, and POPs in different soils.

Equipment: SpeedExtractor E-916 with SpeedExtractorRecord™



Sample preparation for trace analysis of PAHs  
in soil and groundwater using Syncore Analyst

Ecological Environmental Laboratory BECEWA, Nazareth, Belgium

Customer: BECEWA belongs to Eurofins which is a group of laboratories active in 39 countries and represents more than 225 laboratories and 22,000 employees.

Application: determination of TPH, PCBs, and POPs in different soil samples.

Equipment: Syncore Analyst R-12 for parallel evaporation of 12 samples to a pre-defined residual volume of 1 mL.

Explore more than 100 comprehensive case studies  
[www.buchi.com/casestudies](http://www.buchi.com/casestudies)







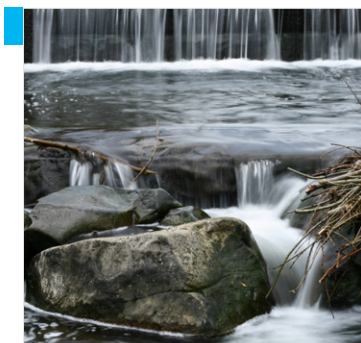
### TKN according to NEN-ISO 5663

AQUON, Netherlands

**Customer:** institute for water research, consultancy and analysis service for surface, ground water and waste water samples.

**Application:** determination of TKN in waste water according to NEN-ISO 5663

**Equipment:** KjellMaster System K-375 / K-377, KjellDigester K-449 and Scrubber K-415



### Ammoniacal nitrogen and phenol in waste water

JSW Steel Ltd, Bellary, Karnataka, India

**Customer:** JSW is a leading steel company.

**Application:** determination of ammoniacal nitrogen and phenols in waste water to control the production process and monitor the quality of waste water released into the environment.

**Equipment:** Distillation Unit K-355



### EPA method 8082

Phoenix Environmental Laboratories, USA

**Customer:** offers high quality testing of soils, water, sludge, and solids meeting EPA, state DEP and DOH requirements.

**Application:** determination of concentrations of polychlorinated biphenyls (PCBs) in extracts from solid and aqueous matrices.

**Equipment:** The Syncore Analyst R-12 with Flushback Module, Vacuum Pump V-300, Vacuum Controller V-855 and Recirculating Chiller F-305, Interface I-300



### Water analysis

Laboratory of Metropole Européenne de Lille, France (Veolia Group)

**Customer:** Veolia designs and delivers services that are vital to human development and sustainable performance through three complementary business activities: water management, waste management and energy services. The company provides innovative, sustainable solutions to improve people's everyday lives and protect future resources.

**Application:** determination of trace metals by aqua regia digestion

**Equipment:** SpeedDigester K-439 with water-reflux setup



### Pressurized Extraction



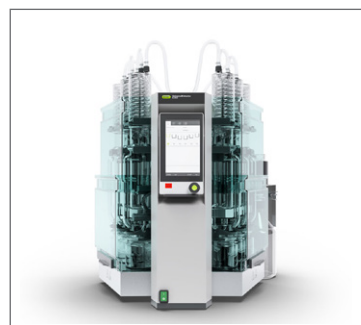
The SpeedExtractor E-914 / E-916 excels in pressurized solvent extraction (PSE) for the determination of residues, contaminants and additives.

### Parallel Evaporation



The Multivapor™ is a compact 6 or 12 position parallel vortex evaporator that is designed to optimize existing personal process workflows.

### UniversalExtractor E-800



The UniversalExtractor E-800 is perfectly suited to any demanding extraction task. Six distinct extraction positions enable individual process control and simultaneous operation of different extraction methods.

### KjelMaster K-375



The KjelMaster K-375 meets the highest demands in usability, automation, user administration and sophisticated data management.

### Unit K-350 / K-355



Perform Kjeldahl nitrogen or protein determinations compliant to officially approved methods in the most cost effective way. Expand your range of applications with the additional features of the K-355.

### KjelDigester K-446 / K-449



The manual K-446 is an entry level block digester with effortless manual control and rack handling of up to 20 samples. The fully automated model K-449 offers a convenient automatic lift for raising and lowering the sample tube rack.

### Recirculating Chiller



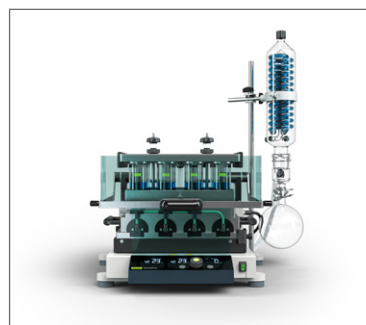
Sustainable cooling in accordance with economical and ecological needs is achieved with the Recirculating Chillers F-308 and F-314.

### Chemicals for Extraction



Use the BUCHI approved extraction sand Celite® and diatomaceous earth for reliable operation and effective drying.

### Parallel evaporation



The SyncorePlus Analyst R-6 / R-12 evaporates extracts to pre-defined residual volumes. Optionally, it combines SPE clean-up with concentration of the elutes.

### Scrubber



The Scrubber K-415 with up to four cleaning steps provides maximum safety for operator and environment.

### Kjeldahl Sample Tubes



BUCHI precision sample tubes stand for extended lifetime, trouble-free operation even with foamy or splashy samples, and safe processing.

### Kjeldahl Tablets



Our high quality Kjeldahl Tablets guarantee reproducible digestion and consider ecological and economical aspects.



## Support and customer service

### From feasibility to preventive maintenance

You value an efficient and personalized service. Our network of professional application specialists and service technicians as well as a large number of satisfied customers around the world give you the assurance that you are working with the right partner.



### Improve your applications

A team of highly qualified specialists continuously improves our reference Application Notes. Ready-to-use detailed descriptions comprise of the entire process from milling to sample preparation and analysis. Customized solutions are developed in close cooperation whenever you face new requirements, changing circumstances or new parameters to be determined.

Find hundreds of Application Notes at:  
[www.buchi.com/applications](http://www.buchi.com/applications)



### Profit from our experience

Over more than 50 years of experience in protein determination resulted in a number of practical guides, scientific publications and useful apps. Improve your theoretical knowledge or find helpful tips and tricks for everyday laboratory practice.

Discover our literature at:  
[www.buchi.com/literature](http://www.buchi.com/literature)



### Apps ease your daily work

Strong customer relationships result in a growing number of practical apps facilitating your daily routine. With the Kjeldahl Optimizer you predict the best process parameters. And the Kjeldahl Reports allows you to calculate results and create reports.

Experience our Kjeldahl apps online:  
[www.buchi.com/kjeldahl/apps](http://www.buchi.com/kjeldahl/apps)





## Profit from workshops, trainings and seminars

We regularly offer practical seminars and workshops, often in co-operation with other partners in the field of sample preparation and analysis. Customer contributions thereby underline how our solutions facilitate the daily routine. We also attend many local and international scientific and industrial congresses.

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Find an overview of our activities:  
[www.buchi.com/events](http://www.buchi.com/events)



## Use your product most effectively

We help you to set your product properly into operation. We provide thorough Installation/Operation Qualification (IQ/OQ) services to ensure compliance with FDA, GLP/GMP standards or GAMP guidelines. Whether it is because of an initial installation, requalification or relocation, we provide professional compliance verification.

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Find out more about our services:  
[www.buchi.com/service-support](http://www.buchi.com/service-support)



## Minimize downtimes

Avoid products' downtimes with preventative maintenance and tailored service packages. We offer a product warranty of one year and guarantee ten years of spare parts availability.

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Get in touch with us:  
[www.buchi.com/warranty](http://www.buchi.com/warranty)



## Global Network

Our subsidiaries and qualified distribution partners ensure proximity where ever you are. Since we are familiar with your requirements, we use our experience and knowledge to provide first-rate solutions.

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Get in touch with us:  
[www.buchi.com/worldwide](http://www.buchi.com/worldwide)

# Core messages to our customers

## BUCHI creates added value

«Quality in your hands» is the guiding principle that shapes our philosophy and our actions. It challenges us to provide outstanding services that are precisely tailored to your needs. This means that we must stay in close contact with our customers. That is why we keep in touch and continue to work very hard to understand you and your business even better.

We help you by providing high-quality products, systems, solutions, applications and services that offer you added value. This allows you to focus entirely on your processes and your work.



### Competent

We have the technological expertise and decades of experience needed to provide competent support and work with you to continually improve our services.



### Reliable

We guarantee the quality and functionality of our equipment and will continue to help you quickly and efficiently whenever something does not operate to your satisfaction.



### Safe

By collaborating closely with you, we do everything in our power to make our products, systems, solutions, applications and services as safe as possible for people and the environment.



### Cost-effective

We strive to create a high level of economic benefit and maximum added value for you.



### Global

As an international family-owned business with own subsidiaries and qualified distributors, we have a presence wherever you are located.



### Easy

We support you by providing carefully designed solutions as well as instruments and systems that are easy to operate.



### Sustainable

We support environmentally friendly processes and manufacture products that have a long service life. We utilize advanced technologies to leave the smallest environmental footprint possible.

BÜCHI Labortechnik AG  
CH – 9230 Flawil  
T +41 71 394 63 63  
F +41 71 394 64 64  
info@buchi.com

[www.buchi.com](http://www.buchi.com)

Quality in your hands

