behr
Labor-Technik

# The behr range
# for Extraction / Distillation

EN



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**Quality** made in Germany

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# The behr range for the

## extraction process



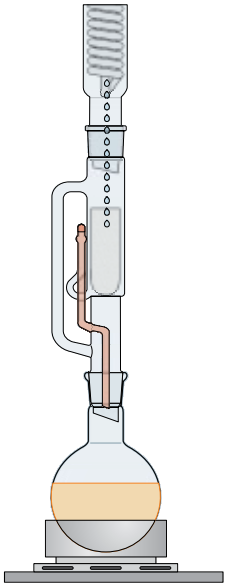
Extraction processes (more precisely: solid-liquid extraction process) are used to separate soluble components from a solid sample.

### Examples:

- Determining the fat content in foods
- Determining an impurity
  (e.g. PCB, abandoned armaments) in soil samples
- Examining the components of natural substances.

Even brewing coffee is an extraction process. However, in the laboratory the focus is on completely dissolving the examined components from the sample under defined conditions and in a not unnecessarily diluted form. In the laboratory, solvents such as ligroin or hexane are used as extraction agents.

The objective of all extraction processes is to dissolve as much of the soluble components as possible with a specific amount of solvent. This is achieved by constantly vaporising the solvent and allowing it to drip into the sample from a reflux condenser. In contrast to a coffee machine, the same solvent is constantly sent back to the sample. The extracted component accumulates in the distillation flask.



Soxhlet

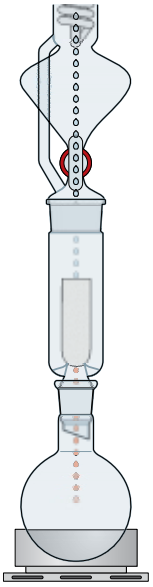
### Classic extraction: Soxhlet

The standard extraction method is the Soxhlet method. behr apparatus for Soxhlet extractions fulfil all the various requirements in everyday laboratory practice.

- Practical brackets for condensers and intermediate extraction pieces for safe storage between extractions
- Extractor sizes from 30 ml to 5000 ml
- Compact apparatus with one sample position
- Series extraction devices with 4, 6 or 8 sample positions
- Extractors with specially developed siphon tubes (make: “Bröckerhoff”) guarantee consistent results across all sample positions.
- Extractors with taps remove the need for additional distillation after the extraction
- Condensers with screw connections improve work safety
- The hydrolysis units (1, 4 or 6 sample positions) also enable acid digestion prior to extraction (determination of the total fat content according to Weibull and Stoldt).

## Hot extraction according to Twisselmann

In the Twisselmann process, the vessel in which the extraction thimble is placed is open at the bottom; the extract immediately flows back into the distillation flask. The extraction thimble is constantly rinsed by the solvent from above and hot steam circulates from below.



Twisselmann

## Hot extraction according to Randall

The hot extraction process according to Randall consists of three steps:

- Boiling
- Rinsing
- and evaporation.

### Boiling

In the first step, the extraction thimble with the sample is located in the vessel with the boiling extraction agent - similar to a tea bag in a cup of hot water. Most of the substance to be extracted should dissolve in this step and is distributed in the solvent. The top part of the apparatus simply acts as a reflux condenser; the condensate drips into the extraction thimble and helps to dissolve the substance.

### Rinsing

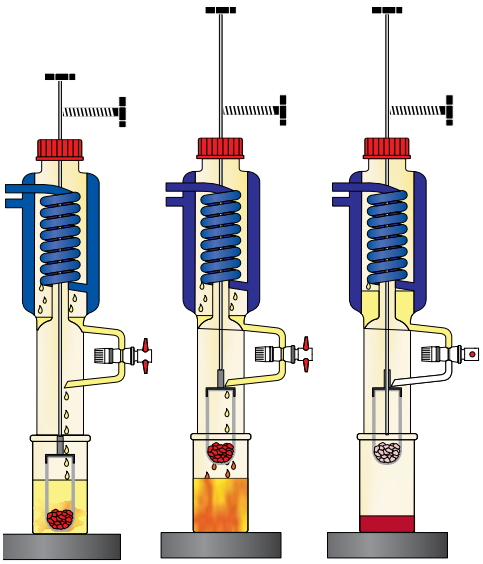
In the second step, the extraction thimble is lifted out of the pool. Extract may still adhere to the thimble; and some of the substance that has not yet dissolved may still be located in the sample. The condensate from the condenser flushes the remaining extract and progressively dissolves the previously undissolved portion. If the dissolved extract is to be subjected to further processing, the extraction is now complete. Otherwise, the solvent is removed in the third step.

### Evaporation

Connect the recirculating tap to the condenser for evaporation. The condensate collects in the lower part of the condenser;  it can be reused for the next extraction. Thanks to the the short path to the apparatus, the sample can be evaporated until it is almost dry. Benefits of the hot extraction process include

- A compact apparatus with short process paths,
- Low solvent requirement,
- Short extraction period - typically about an hour.

Due to the short extraction period, hot extraction is also gentle on the extract. There are now also an increasing number of analysis processes that use hot extraction.



Randall

# The “right” extraction for your

## task - examples




Are you looking to analyse encased and bound fat in food?

- Hydrolysis
- Then use the standard Soxhlet extraction, e.g. fat determination according to Weibull-Stoldt or the AOAC international hydrolysis method




Are you looking to determine the raw fat content in food and processed animal feed (with homogeneous composition)?

- Direct hot extraction according to Randall
- Hydrolysis to determine the total fat content for some samples prior to extraction if required




Are you looking to examine the composition of packaging material or consumer products? For example

- Hot extraction according to Randall to determine plasticisers in packaging
- Soxhlet extraction of organic compounds from plant tissue




Are you looking to analyse pesticide residues in grain products?

- Extraction of the residues and contaminants from food and fodder samples or other organic materials under inert conditions. The necessary detection limits are reached by higher sample weights

# Introduction

## from sample preparation to extraction

### Only necessary on high fat content and bound fat

#### Hydrolysis principle

This acid digestion process dissolves both “free fats” as well as “bound fats” from the overall fat content.

The fat is frequently naturally enclosed in the cell matrix of the food or fodder or chemically bound. In these cases, a hydrolysis step before extraction completely releases the fat. Determination of the total fat content according to Weibull and Stoldt.

The user filters the hydrolysate of the separated sample by using a glass sample tube filled with sand or Celite.

The user then rinses the fatty filter residue with water in order to remove the acid.




HY 6

Sample preparation

After drying, the filter residue is finally extracted.

This is done by applying one of the 3 following methods:

#### Classic extraction: Soxhlet



R 108 S

#### Hot extraction according to Twisselmann



R 106 T

#### Hot extraction according to Randall



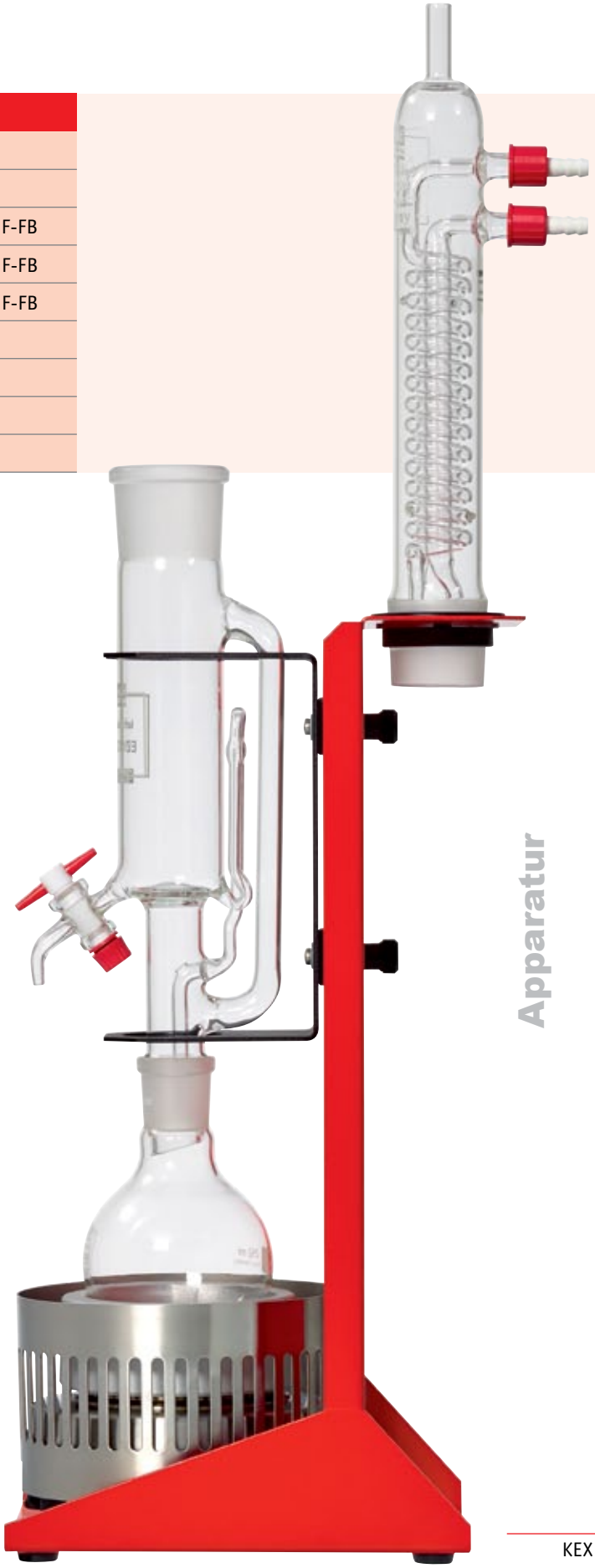

ES 6

Extraction

# Assembly of separate components

## for Soxhlet extractions

| behr apparatur | Extraction |
|---|---|
| KEX 30/KEX 30 F | 30 ml |
| KEX 60/KEX 60 F | 60 ml |
| KEX 100/KEX 100-FB/KEX 100 F/KEX 100 F-FB | 100 ml |
| KEX 150/KEX 150-FB/KEX 150 F/KEX 150 F-FB | 150 ml |
| KEX 250/KEX 250-FB/KEX 250 F/KEX 250 F-FB | 250 ml |
| KEX 500 TK/KEX 500 F-TK | 500 ml |
| KEX 1.000 F-TK | 1.000 ml |
| KEX 2.000 F-TK | 2.000 ml |
| KEX 5.000 TK | 5.000 ml |



Apparatur

KEX 100 F

| Round-bottomed flask | Flat-bottomed flask | Extractor | Extraction thimbles | Glass condenser | Titanium condenser |
|---|---|---|---|---|---|
| 100 ml | - | 30 ml | EX 30 HS | RFK 30 | - |
| 250 ml | - | 60 ml | EX 60 HS | RFK 60 | - |
| 250 ml | 250 ml | 100 ml | EX 100 HS | RFK 100 | TK 45 |
| 500 ml | 500 ml | 150 ml | EX 150 HS | RFK 100 | TK 45 |
| 500 ml | 500 ml | 250 ml | EX 250 HS | RFK 100 | TK 45 |
| 1.000 ml | - | 500 ml | EX 500 HS | - | TK 60 |
| 2.000 ml | - | 1.000 ml | EX 1000 HS | - | TK 71 |
| 5.000 ml | - | 2.000 ml | - | - | TK 60 |
| 10.000 ml | | 5.000 ml | - | - | TK 60 |

Round-bottomed flask or Flat-bottomed flask



RK 250



FB 70/250

Extractor



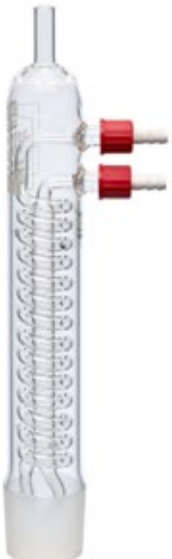
EZ 100

Extraction thimbles



EX 100 HS

Glass condenser or Titanium condenser



RFK 100



TK 45

# Soxhlet extraction

## Classic fat determination



# Complete single extraction units

The standard extraction method is the Soxhlet method. behr apparatus for Soxhlet extractions fulfil all the various requirements in everyday laboratory practice.

- Practical brackets for condensers and intermediate extraction pieces for safe storage between extractions
- Extractor sizes from 30 ml to 5000 ml
- Extractors with specially developed siphon tubes (make: „Bröckerhoff“) guarantee consistent extraction cycles across all sample positions
- Extractors with taps remove the need for additional distillation after the extraction
- Condensers with threaded fittings

## Complete single extraction units

Complete single extraction units with base frame, heating device, bracket, tubes and glass apparatus (reaction flask, extractor, Dimroth condenser for extraction). Infinitely variable heating control. After the extraction cycle, the extractors with tap conduct the solvent directly into the dispensing bottle.

Includes extraction thimble and boiling chips in a sample pack.

### Technical data the Soxhlet extraction

| | KEX 30 | KEX 100 | KEX 250 | KEX 500/1000 |
|---|---|---|---|---|
| **Voltage/Frequency** | 230 VAC/ 50/60 Hz | | | |
| **Power consumption** | 450 W | | | 350 W |
| **Weight** | approx. 7,5 kg | | | approx. 8,5 kg |
| **Dimensions in cm (W x D x H)** | approx. 23 x 33 x 71,5 | approx. 23 x 33 x 80 | | approx. 23 x 35 x 95 |

**KEX 2000 F und KEX 5000 F Technical data on request!**

Complete single extraction units with glass condenser

| Type | Product description | Art. No. |
|---|---|---|
| KEX 30 | for 30 ml extraction | B00217706 |
| KEX 60 | for 60 ml extraction | B00441131 |
| KEX 100 | for 100 ml extraction | B00217708 |
| KEX 150 | for 150 ml extraction | B00727097 |
| KEX 250 | for 250 ml extraction | B00217737 |
| KEX 30 F | for 30 ml extraction with tap | B00217738 |
| KEX 60 F | for 60 ml extraction with tap | B00441132 |
| KEX 100 F | for 100 ml extraction with tap | B00217710 |
| KEX 150 F | for 150 ml extraction with tap | B00726789 |
| KEX 250 F | for 250 ml extraction with tap | B00217732 |



KEX 30



KEX 250 F



KEX 100 F-FB

Complete single extraction units – broad surface flat-bottomed flask

| Type | Product description | Art. No. |
|---|---|---|
| KEX 100-FB | for 100 ml extraction and 250 ml flat-bottomed flask | B00722656 |
| KEX 150-FB | for 150 ml extraction and 500 ml flat-bottomed flask | B00722660 |
| KEX 250-FB | for 250 ml extraction and 500 ml flat-bottomed flask | B00722661 |
| KEX 100 F-FB | for 100 ml extraction with tap and 250 ml flat-bottomed flask | B00722639 |
| KEX 150 F-FB | for 150 ml extraction with tap and 500 ml flat-bottomed flask | B00722641 |
| KEX 250 F-FB | for 250 ml extraction with tap and 500 ml flat-bottomed flask | B00722642 |

Complete single extraction units – broad surface flat-bottomed flask and titanium condenser

| Type | Product description | Art. No. |
|---|---|---|
| KEX 100-FB/TK | for 100 ml extraction, 250 ml flat-bottomed flask and titanium condenser | B00722662 |
| KEX 150-FB/TK | for 150 ml extraction, 500 ml flat-bottomed flask and titanium condenser | B00722663 |
| KEX 250-FB/TK | for 250 ml extraction, 500 ml flat-bottomed flask and titanium condenser | B00722664 |
| KEX 100 F-FB/TK | for 100 ml extraction with tap, 250 ml flat-bottomed flask and titanium condenser | B00722644 |
| KEX 150 F-FB/TK | for 150 ml extraction with tap, 500 ml flat-bottomed flask and titanium condenser | B00722645 |
| KEX 250 F-FB/TK | for 250 ml extraction with tap, 500 ml flat-bottomed flask and titanium condenser | B00722646 |




KEX 2000 F/TK

## Complete single extraction units with integrated magnetic stirrer and titanium condenser

The heating mantle is continuously variable and has an integrated magnetic stirrer to ensure a better heat distribution of solvent and to avoid boiling retardation.

- Practical holders for the titanium condenser (page 20) and extractor (middle piece) for deposition between extractions
- Extractor sizes of 500 ml up to 5000 ml

Complete single extraction units – with round-bottomed flask and titanium condenser

| Type | Product description | Art. No. |
|---|---|---|
| KEX 500-TK | for 500 ml extraction, 1000 ml round-bottomed flask and titanium condenser | B00722666 |
| KEX 500 F/TK | for 500 ml extraction with tap, 1000 ml round-bottomed flask and titanium condenser | B00722647 |
| KEX 1000 F/TK | for 1000 ml extraction with tap, 2000 ml round-bottomed flask and titanium condenser | B00722651 |
| KEX 2000 F/TK | for 2000 ml extraction with tap, 5000 ml round-bottomed flask and titanium condenser | B00722652 |
| KEX 5000-TK | for 5000 ml extraction with tap, 10.000 ml round-bottomed flask and titanium condenser | B00696159 |

# behrotest® series extraction devices

## precisely aligned to your needs



■ Practical condenser ledge to safely deposit the condenser between extractions



■ Cooling water distribution strip ensures uniform cooling at sample positions



■ Condensers with threaded fittings



■ or titanium condenser



■ Drip tray



■ Extractors with specially developed siphon tubes guarantee consistent extraction cycles across all sample positions

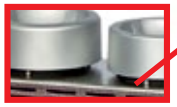


■ S models:
Extractors with taps remove the need for additional distillation after the extraction

■ PTFE tap
no fixing, does not have to be greased



■ Extractor sizes from 30 ml to 250 ml



■ Series extraction devices with 4, 6 or 8 sample positions



■ Every sample position can be individually adjusted



■ Brackets for safely holding the intermediate extraction pieces after removing the sample container

# behrotest® series extraction devices





R 304 S



R 108 S

## behrotest® series extraction devices

behrotest® series extraction devices are the cost-effective and user-friendly solution for classic Soxhlet and fat extractions:

- Complete with reaction vessels, intermediate extraction pieces and condensers
- Energy individually adjustable for every sample position
- Cooling water distribution strip ensures uniform cooling at sample positions
- Extractors with specially developed siphon tubes (make: “Bröckerhoff”) guarantee consistent extraction cycles across all sample positions
- Practical condenser ledge to safely deposit the condenser between extractions
- Brackets for safely holding the intermediate extraction pieces after removing the sample container
- S models: Extractors with taps remove the need for additional distillation after the extraction

Series extraction devices - round-bottom flasks

| Type | Sample positions | Round-bottom flasks ml | Tap | Extractor content ml | Art. No. |
|---|---|---|---|---|---|
| R 304 | 4 | 100 | - | 30 | B00218433 |
| R 306 | 6 | 100 | - | 30 | B00218434 |
| R 308 | 8 | 100 | - | 30 | B00602363 |
| R 304 S | 4 | 100 | + | 30 | B00218443 |
| R 306 S | 6 | 100 | + | 30 | B00218444 |
| R 308 S | 8 | 100 | + | 30 | B00602364 |
| R 604 | 4 | 250 | - | 60 | B00218453 |
| R 606 | 6 | 250 | - | 60 | B00218454 |
| R 604 S | 4 | 250 | + | 60 | B00218455 |
| R 606 S | 6 | 250 | + | 60 | B00218456 |
| R 104 S | 4 | 250 | + | 100 | B00218425 |
| R 106 S | 6 | 250 | + | 100 | B00218424 |
| R 108 S | 8 | 250 | + | 100 | B00441134 |
| R 254 S | 4 | 500 | + | 250 | B00218435 |
| R 256 S | 6 | 500 | + | 250 | B00218436 |



Series extraction devices – broad surface flat-bottomed flask

| Type | Sample positions | Flat-bottomed flask ml | Tap | Extractor content ml | Art. No. |
|---|---|---|---|---|---|
| R 104 S-FB | 4 | 250 | + | 100 | B00705758 |
| R 106 S-FB | 6 | 250 | + | 100 | B00705278 |
| R 108 S-FB | 8 | 250 | + | 100 | B00713792 |
| R 254 S-FB | 4 | 500 | + | 250 | B00723562 |
| R 256 S-FB | 6 | 500 | + | 250 | B00723563 |
| R 258 S-FB | 8 | 500 | + | 250 | B00723564 |



R 108 S-FB

Series extraction devices – broad surface flat-bottomed flask and titanium condenser

| Type | Sample positions | Flat-bottomed flask ml | Tap | Extractor content ml | Art. No. |
|---|---|---|---|---|---|
| R 104 S-FB/TK | 4 | 250 | + | 100 | B00726459 |
| R 106 S-FB/TK | 6 | 250 | + | 100 | B00705289 |
| R 108 S-FB/TK | 8 | 250 | + | 100 | B00726460 |
| R 254 S-FB/TK | 4 | 500 | + | 250 | B00726461 |
| R 256 S-FB/TK | 6 | 500 | + | 250 | B00726464 |
| R 258 S-FB/TK | 8 | 500 | + | 250 | B00726465 |



R 106 S-FB/TK

## Technical data for the series extraction devices

| | 4 Sample positions | 6 Sample positions | 8 Sample positions |
|---|---|---|---|
| **Voltage** | 230 VAC | | |
| **Frequency** | 50/60 Hz | | |
| **Power consumption** | 1500 W | 2160 W | 2900 W |
| **Power consumption** | 7 A | 10 A | 13 A |
| **Weight (without glass)** | approx. 15 kg | approx. 20 kg | approx. 25 kg |
| **Dimensions in cm (W x D x H) (without glass)** | approx. 53 x 32 x 74 | approx. 76 x 32 x 74 | approx. 90 x 32 x 74 |



WABEX 110



WABEX 210



WABEX 425

## Series extraction devices - with water bath for highly flammable solvents

The behrotest® waterbath extraction units are suitable for ideal and gentle extractions when using highly inflammable solvents.

- Maximun temperature of heat transfer medium up to 100°C
- On breakage of the vessel, the solvent flows in to the water

Series extraction devices - with water bath, includes glassware and connection tubes

| Type | Product description | Extractor content ml | Art. No. |
|---|---|---|---|
| WABEX 110 | 1 sample position | 100 | B00725955 |
| WABEX 125 | 1 sample position | 250 | B00725962 |
| WABEX 210 | 2 sample positions simultaneously | 100 | B00726455 |
| WABEX 225 | 2 sample positions simultaneously | 250 | B00726458 |
| WABEX 410 | 4 sample positions simultaneously | 100 | B00513701 |
| WABEX 425 | 4 sample positions simultaneously | 250 | B00513702 |
| WABEX 610 | 6 sample positions simultaneously | 100 | B00513703 |
| WABEX 625 | 6 sample positions simultaneously | 250 | B00513704 |

## Technical data

| | WABEX 110/125 | WABEX 210/225 |
|---|---|---|
| **Dimensions in cm (H x W x D)** | 70 x 41 x 40 | 70 x 41 x 40 |
| **Weight (without glass)** | 9 kg | 10 kg |
| **Nominal voltage** | 230 V | 230 V |
| **Power consumption** | 1500 W | 1500 W |

| | WABEX 410/425 | WABEX 610/625 |
|---|---|---|
| **Dimensions in cm (H x W x D))** | 81 x 68 x 32 | 81 x 98 x 32 |
| **Weight (without glass)** | 15 kg | 19 kg |
| **Nominal voltage** | 230 V | 230 V |
| **Power consumption** | 1000 W | 1500 W |

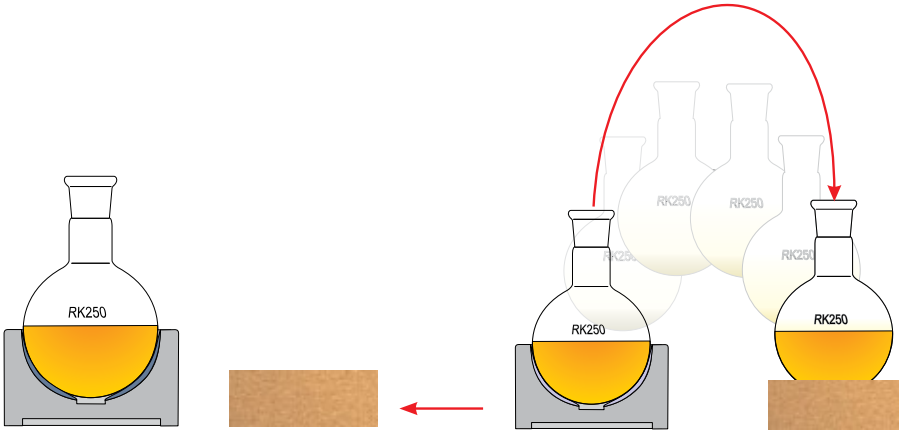
# Benefits

## of the new broad surface flat-bottomed flask from behr

### behrotest® Flat-bottomed with broad surface: Safe and practical

behr precision aluminum adapters are required for classical use of round-bottom flasks. When using the new behrotest® flat-bottom flasks these are not required.

For conventional round-bottomed flasks the user needs additional cork rings to position the flask on the working surface.







RK 250

### Why not use a flat-bottomed flask which really stands firmly?

Working with behrotest® flat-bottomed flasks, enables the user to position the glassware on any level surface.







FB 70/250

- Stands safely, no wobbling, does not tilt
- Magnetic stirring rods rotate evenly
- 4 x times higher contact surface, enabling quicker heating while saving energie
- Version with ground glass joint for insertion in complex apparatuses

# Accessories for the Soxhlet extraction




RK 250




FB 70/250



AM 100/SET



EZ 100 H

## Round-bottomed flask

| Type | Product description | Art. No. |
|---|---|---|
| RK 100 | 100 ml, for 30 ml extraction, (NS29/32) | B00218501 |
| RK 250 | 250 ml, for 60 ml and 100 ml extraction, (NS 29/32) | B00218499 |
| RK 500 | 500 ml, for 250 ml extraction, (NS 29/32) | B00218500 |
| RK 1000 | 1000 ml, for 500 ml extraction, (NS 29/32) | B00218502 |
| RK 2000 | 2000 ml, for 1000 ml extraction, (NS 29/32) | B00652062 |
| RK 5000 | 5000 ml, for 2000 ml extraction, (NS 29/32) | B00703312 |
| RK 10000 | 10000 ml, for 5000 ml extraction, (NS 29/32) | B00703313 |

## Broad surface flat-bottomed flask

| Type | Product description | Art. No. |
|---|---|---|
| FB 70/250 | 250 ml, for 100 ml extraction | B00693984 |
| FB 70/500 | 500 ml, for 150 ml and 250 ml extraction | B00713799 |

## Positioning cradles

| Type | Product description | Art. No. |
|---|---|---|
| AM 100/SET | for 100 ml round-bottomed flask incl. distance inlay | B00217701 |
| AM 250/SET | for 250 ml round-bottomed flask incl. distance inlay | B00694928 |
| AM 500/SET | for 500 ml round-bottomed flask incl. distance inlay | B00713234 |

## Extractors

| Type | Product description | Art. No. |
|---|---|---|
| EZ 30 | Soxhlet extractor, 30 ml | B00217966 |
| EZ 30 H | Soxhlet extractor, 30 ml, with Tap | B00217977 |
| EZ 60 | Soxhlet extractor, 60 ml | B00592289 |
| EZ 60 H | Soxhlet extractor, 60 ml, with Tap | B00592290 |
| EZ 100 | Soxhlet extractor, 100 ml | B00217967 |
| EZ 100 H | Soxhlet extractor, 100 ml, with Tap | B00217970 |
| EZ 150 | Soxhlet extractor, 150 ml | B00705755 |
| EZ 150 H | Soxhlet extractor, 150 ml, with Tap | B00705756 |
| EZ 250 | Soxhlet extractor, 250 ml | B00217974 |
| EZ 250 H | Soxhlet extractor, 250 ml, with Tap | B00217973 |
| EZ 500 | Soxhlet extractor, 500 ml | B00217980 |
| EZ 500 H | Soxhlet extractor, 500 ml, with Tap | B00217981 |
| EZ 1000 H | Soxhlet extractor, 1000 ml, with Tap | B00373164 |
| EZ 2000 H | Soxhlet extractor, 2000 ml, with Tap | B00688801 |
| EZ 5000 | Soxhlet extractor, 5000 ml | B00703314 |

## Extraction thimbles

| Type | Product description | Art. No. |
|---|---|---|
| EX 30 HS | for EZ 30 (EZ 30 H), package includes 25 units | B00600440 |
| EX 60 HS | for EZ 60 (EZ 60 H), package includes 25 units | B00604374 |
| EX 100 HS | for EZ 100 (EZ 100 H), package includes 25 units | B00600442 |
| EX 150 HS | for EZ 150 (EZ 150 H), package includes 25 units | B00713795 |
| EX 250 HS | for EZ 250 (EZ 250 H), package includes 25 units | B00217975 |
| EX 500 HS | for EZ 500 (EZ 500 H), package includes 25 units | B00600462 |
| EX 1000 HS | for EZ 1000 H, package includes 25 units | B00602316 |



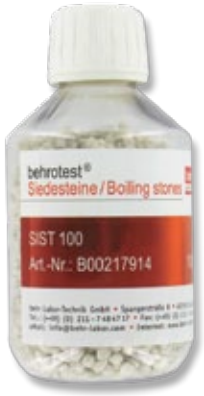

EX 100 HS

## Extraction thimbles glassware

| Type | Product description | Art. No. |
|---|---|---|
| EX 2000 HSG | for EZ 2000 H, glassware | B00688800 |
| EX 5000 HSG | for EZ 5000, glassware | B00704619 |

## Boiling stones

| Type | Product description | Art. No. |
|---|---|---|
| SIST 100 | behrotest® boiling stones, capacity 100 g | B00217914 |




SIST 100

## Stands

| Type | Product description | Art. No. |
|---|---|---|
| RIP 4 | for 4 extraction thimbles up to ø 38 mm | B00602349 |
| RIP 6 | for 6 extraction thimbles up to ø 38 mm | B00602350 |



RIP 4 und RIP 6



EXK 300

## Desiccator/ Silica gel

| Type | Product description | Art. No. |
|---|---|---|
| EXK 300 | behrotest® Desiccator, borosilicate glass 3.3, with plastic knob and porcelain plate (DN 300) | B00711550 |
| SG 500 | behrotest® Silica gel with self-indicating (orange gel), 1-3 mm, 500 g | B00726297 |
| SG 1000 | behrotest® Silica gel with self-indicating (orange gel), 1-3 mm, 1000 g | B00726298 |



SG 1000



RFK 100

## behr extraction condenser RFK

behr extraction condensers RFK ensure minimal loss of solvent also at higher room or cooling water temperatures.

- More coils
- Optimized gradient cooling coil
- Maximal cooling surface
- Cooling attachments with threaded screw

### behr glass condenser

| Type | Product description | Art. No. |
|---|---|---|
| RFK 30 | for 30 ml extractors | B00217955 |
| RFK 60 | for 60 ml extractors | B00592291 |
| RFK 100 | for 100 ml und 250 ml extractors | B00218214 |



TK 45

## behr extraction condenser TK

behr titanium condensers provide a high cooling capacity at higher room or cooling water temperatures.

- 20 times higher heat dissipation than glass
- Durable material (titanium)
- Retrievable cooling coil for easy cleaning
- PTFE connector with quick lock

### behr titanium condenser

| Type | Product description | Art. No. |
|---|---|---|
| TK 45 | for 100 ml und 250 ml extractors | B00705276 |
| TK 60 | for 500 ml extractors | B00705277 |
| TK 71 | for 1000 ml extractors | B00705883 |

# Use of the behrotest® PTFE sleeve



## PTFE sleeves

| Type | Product description | Art. No. |
|---|---|---|
| PTFE 29 | PTFE sleeves for 30 ml extractors | B00217905 |
| PTFE 34 | PTFE sleeves for 60 ml extractors | B00602392 |
| PTFE 45 | PTFE sleeves for 100 ml and 250 ml extractors | B00217909 |
| PTFE 60 | PTFE sleeves for 500 ml extractors | B00602391 |
| PTFE 71 | PTFE sleeves for 1000 ml extractors | B00602374 |

# Use of the behrotest® DOS



## behrotest® dispenser for metering acid and solvent

| Type | Product description | Art. No. |
|---|---|---|
| DOS 50 | behrotest® dispenser for metering solvent, 5-50 ml adjustable without bottle | B00661157 |
| DOS 100 | behrotest® dispenser for metering solvent, 10-100 ml adjustable without bottle | B00217810 |
| LGF 2000 | Laboratory with ISO-Thread, 2000 ml with pitch, crystal clear with ring stopper, without cap | B00225419 |

# Hot extraction

## according to Twisselmann



KEX 100 T



The extraction according to Twisselmann is a continuous hot extraction. It functions in a similar manner to the Soxhlet extraction. However, the temperature in the sample in the Twisselmann extractor is extremely hot, i.e. close to the solvent's boiling point. This improves solubility and shortens the extraction time.

The higher extraction temperature results from the condensed solvent flowing through the extraction thimble from above mixing with the rising, hot solvent vapour from below. The temperature of the mixture is much higher than that of the condensed solvent.

The Twisselmann extraction reduces the extraction time by up to 50% compared to the Soxhlet extraction.



## Single extraction unit for hot extraction according to Twisselmann

Complete single extraction unit with base frame, heating device, bracket, tubes and glass apparatus (reaction flask, extractor, Dimroth condenser for extraction) as well as a sample pack with extraction thimbles and boiling chips.

| Type | Product description | Art. No. |
|---|---|---|
| KEX 30 T | Single extraction unit for 30 ml hot extraction according to Twisselmann | B00722667 |
| KEX 100 T | Single extraction unit for 100 ml hot extraction according to Twisselmann | B00217734 |

## behrotest® series extraction devices for hot extraction according to Twisselmann

### Cost-effective and user-friendly apparatus for hot extraction according to Twisselmann

- Energy individually adjustable for every sample position
- Cooling water distribution distribution strip ensures uniform cooling at sample positions
- Practical condenser ledge to safely deposit the condenser between hot extractions
- Brackets for safely holding the intermediate extraction pieces after removing the sample container



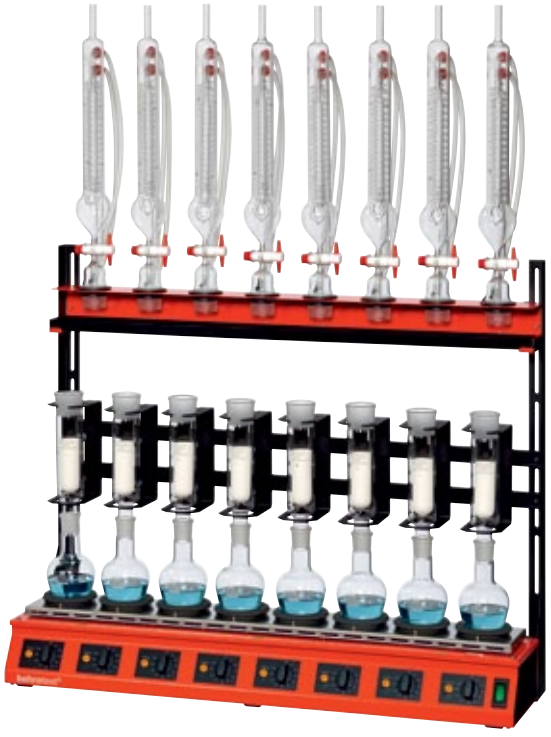
R 106 T

behrotest® series extraction devices for hot extraction according to Twisselmann - round-bottomed flasks

| Type | Product description | Art. No. |
|---|---|---|
| R 306 T | Complete for 6 positions simultaneously with 100 ml round-bottomed flasks | B00722668 |
| R 104 T | Complete for 4 positions simultaneously with 250 ml round-bottomed flasks | B00218447 |
| R 106 T | Complete for 6 positions simultaneously with 250 ml round-bottomed flasks | B00218445 |

behrotest® series extraction devices for hot extraction according to Twisselmann - broad surface flat-bottomed flask

| Type | Product description | Art. No. |
|---|---|---|
| R 104 T-FB | Complete for 4 positions simultaneously – broad surface flat-bottomed flask 250 ml | B00707366 |
| R 106 T-FB | Complete for 6 positions simultaneously– broad surface flat-bottomed 250 ml | B00707715 |
| R 108 T-FB | Complete for 8 positions simultaneously– broad surface flat-bottomed 250 ml | B00711548 |



R 108 T-FB

# Accessories for Hot extraction

## according to Twisselmann



RK 250



FB 70/250



AM 100/SET



EZT



RFKT

### Round-bottomed flask/ Broad surface flat-bottomed flask

| Type | Product description | Art.-Nr. |
|---|---|---|
| RK 100 | Round-bottomed flask, 100 ml, for 30 ml extraction | B00218501 |
| RK 250 | Round-bottomed flask, 250 ml, for 100 ml extraction | B00218499 |
| FB 70/250 | Broad surface flat-bottomed, 250 ml, for 100 ml extraction | B00693984 |

### Positioning cradles

| Type | Product description | Art. No. |
|---|---|---|
| AM 100/SET | for 100 ml round-bottomed flask incl. distance inlay | B00217701 |
| AM 250/SET | for 250 ml round-bottomed flask incl. distance inlay | B00694928 |

### Extractors

| Type | Product description | Art.-Nr. |
|---|---|---|
| EZT 30 | Extractor, 30 ml, for the Twisselmann extractors | B00521000 |
| EZT | Extractor, 100 ml, for the Twisselmann extractors | B00217978 |

### Extraction thimbles

| Type | Product description | Art.-Nr. |
|---|---|---|
| EX 30 HS | Extraction thimbles for EZT 30, package includes 25 units | B00600440 |
| EX 100 HS | Extraction thimbles for EZT, package includes 25 units | B00600442 |

### Extraction condenser

| Type | Product description | Art.-Nr. |
|---|---|---|
| RFKT 30 | Condenser for 30 ml Twisselmann extractors | B00688032 |
| RFKT | Condenser for 100 ml Twisselmann extractors | B00217979 |

### PTFE sleeves

| Type | Product description | Art.-Nr. |
|---|---|---|
| PTFE 29 | PTFE sleeves for 30 ml extractors, package includes 12 units | B00217905 |
| PTFE 45 | PTFE sleeves for 100 ml extractors | B00217909 |

# Hot extraction according to Randall

## for faster extraction



# behrotest® semi-automatic equipment

## for hot extraction according to Randall

***The semi-automatic extraction systems ES 2+2 / ES 6 save time and costs by a fast extraction.***
***The hot extraction system following Randall is several times faster than the conventional Soxhlet extraction.***




ES 6




TGE 6




TGE 4



FF 30

### Good to know:

For particularly high fat contents and bound fats we recommend the compatible HY6 hydrolysis unit for total fat determination

### Multi-position extraction units:

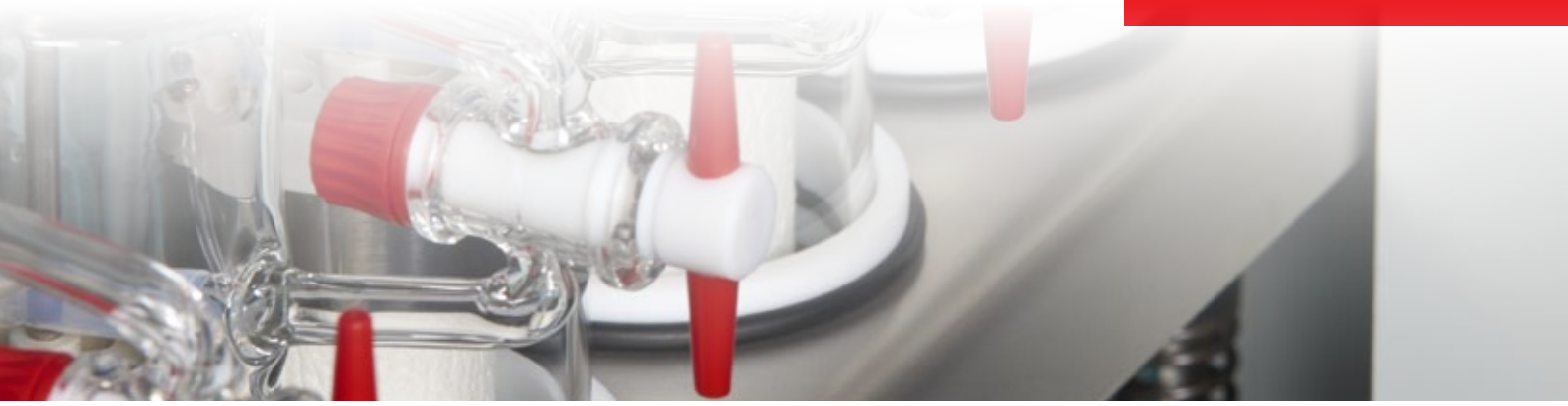
- Step-by-step user-friendly instructions on the display
- One heating program for all sample positions, but separate heating for each sample position
- Cooling water manifold ensures uniform cooling at all sample locations
- Low solvent losses due to the specially designed behrotest® coolers
- 31 freely configurable programs for your individual extraction applications
- behr one-button operation for particularly fast and easy programming
- Audible and visual error messages
- Integrated overtemperature protection
- Resource-saving cooling water saving program

### Semi-automatic hot extraction apparatus according to Randall

| Type | Product description | Art. No. |
|---|---|---|
| ES 2+2 | for 4 sample places with 100 ml extraction tubes | B00704623 |
| ES 6 | for 6 sample places with 100 ml extraction tubes | B00704624 |

### Technical data

| | ES 2+2 | ES 6 |
|---|---|---|
| **Number of sample positions** | 4 | 6 |
| **Dimensions (W x D x H)** | 56 x 52 x 67 cm | 72 x 52 x 67 cm |
| **Weight** | 42 kg | 50 kg |
| **Nominal voltage** | 230 V~, 50/60 Hz | |
| **Nominal power** | 1000 W | 1500 W |
| **Display** | LCD | |
| **Solution volume** | 60 ml; max 75 ml | |
| **Solvent recovery** | Up to 90 % | |
| **Reproducibility** | ± 1% | |
| **Temperature range** | From 20 to 260 °C | |
| **Time setting range** | 1 – 999 min, digitally adjustable | |
| **Programs** | 31 | |
| **Water consumption** | 2 l/min | |



## Accessories

| Type | Product description | VPE | Art. No. |
|---|---|---|---|
| FF 30 | behrotest® beaker for extraction | | B00687525 |
| MCR | Clamping ring, magnetic | | B00707723 |
| EX 75 HS | Extraction sleeve suitable for FF30 | Pack of 25 | B00600441 |
| SIST 100 | behrotest® boiling stones | 100 g | B00217914 |
| TGE 4 | Heat shield/support frame for 4 extraction beakers | | B00734885 |
| TGE 6 | Heat shield / support frame for 6 extraction beakers | | B00734886 |
| DEH | behrotest® PTFE lid, white | | B00707719 |
| VSL | Viton sealing ring | | B00734892 |
| BSL | Butyl sealing ring | | B00734878 |
| PSL | PTFE sealing ring | | B00734879 |
| HST 6 | Stand for 6 extraction sleeves | | B00734880 |
| ESG 6 | Desiccator stand for 6 extraction cups | | B00734881 |
| WAN | PTFE weighing rack | | B00734884 |
| EXK 300 | behrotest® Desiccator, borosilicate glass 3.3, with plastic knob and porcelain plate (DN 300) | | B00711550 |
| SG 500 | behrotest® Silica gel with self-indicating (orange gel), 1-3 mm | 500 g | B00726297 |
| SG 1000 | behrotest® Silica gel with self-indicating (orange gel), 1-3 mm | 1000 g | B00726298 |
| HHR | Hot Hand | | B00738628 |



EXK 300




ESG 6



SG 1000



WAN plus MCR und EX 75 HS




EX 100 HS




HST 6

# Hydrolysis

## Sample preparation for the extraction

***The Weibull-Stoldt method***

***The quantitative determination of the fat content of food is performed by extraction with a solvent. The "free fat" is determined by direct extraction. The "total fat content" includes both the "free fat" and the "bound fats" that are dissolved by acid digestion (hydrolysis).***




HY 6

## State-of-the-art equipment

### behrotest® hydrolysis unit for acid digestion

HY 6 is an apparatus equipped with manual energy control for 6 sample positions with highly uniform and rapid heating provided by the built-in high-quality quartz infrared emitters. Full heating power is reached within 1 minute, which eliminates the need for preheating.

With the behrotest® **quick-engagement system**, the individual sample vessels can be quickly and easily inserted into the IR heating system and brought out. Each sample vessel can then be filtered off and flushed in parallel or individually.

The HY 6 hydrolysis-filtration unit as basic unit consists of:

- Quick digestion system with manual energy control and direct heating of the samples
- Round bottom digestion vessel 250 ml
- Glass crucible, porosity 1
- Suction tubes
- Suction bridge with PTFE plug and one suction connection with threaded fitting
- Celite 545, 1 kg
- Quartz sand, 2 kg

**Optional:** For continuous vacuum during acid hydrolysis and subsequent filtration please use our optional behrotest® suction units.

### behrotest® hydrolysis unit HY6

| Type | Product description | Art. No. |
|---|---|---|
| HY 6 | for 6 sample places | B00734467 |

### Technical data HY 6

| | |
|---|---|
| **Number of sample positions** | 6 |
| **Dimensions (W x D x H)** | 54 x 37 x 63 cm |
| **Weight** | 20 kg |
| **Nominal voltage** | 230 V~, 50/60 Hz |
| **Nominal power** | 1500 W |
| **Energy adjustment range** | 0 - 100 % |



## Accessories

| Type | Product description | VPE | Art. No. |
|---|---|---|---|
| AST 6 | Stand for round-bottom digestion vessels SR3i | | B00734893 |
| TST 6 | Stand for glass crucibles | | B00734894 |
| HYR | Tube holder for the glass crucibles | | B00707740 |
| GT | Glass crucible | | B00734888 |
| SR3i | Round bottom digestion vessel | | B00217959 |
| ASR | Suction tubes | | B00734889 |
| ASB 6 | Suction bridge with PTFE plug and one suction connection with threaded fitting | | B00734890 |
| CEL | Celite 545 | 1 kg | B00734882 |
| QSH | Quartz sand | 1 kg | B00734883 |



SR 3i



AST 6




TST 6



GT



HYR



EXR 4



FU 4



SIMVAC



AFR 2

## Classical apparatus

### behrotest® hydrolysis unit for acid digestion

Hydrolysis-digestion apparatus with 4 or 6 sample positions.

Complete with:

- 600 ml beaker
- Water-cooled condenser with cool water distribution
- Condenser stand with drip tray
- Heating positions individually infinitely adjustable
- Main power switch with pilot light

Fully assembled complete device with all the necessary accessories.

behrotest® hydrolysis unit for acid digestion

| Type | Product description | Art. No. |
|---|---|---|
| EXR 4 | Hydrolysis unit, 4 sample positions | B00218446 |
| EXR 6 | Hydrolysis unit, 6 sample positions | B00218448 |

## behrotest® filtration unit

Complete with:

- Filtration attachment, 400 ml, threaded
- PP funnel, threaded
- Sieve plate with 2 seals
- Stainless steel frame

Filtration unit for hydrolysis

| Type | Product description | Art. No. |
|---|---|---|
| FU 4 | Filtration unit for hydrolysis with 4 positions | B00441135 |
| FU 6 | Filtration unit for hydrolysis with 6 positions | B00441144 |

Suited for attachment to a water jetstream pump/ vacuum pump:

| Type | Product description | Art. No. |
|---|---|---|
| SIMVAC | behrotest® suction unit with water jet pump, collection bottle 2 l and tubes | B00217922 |
| AFR 2 | behrotest® suction unit with diaphragm vacuum pump, collection bottle 2 L and tubes | B00734891 |



# The behr range
# for Distillation



# Determination of the alcohol and volatile acid content




D 1




D 2



behrotest®
maintenance set

## Steam distillation units D 1 and D 2

- Alcohol
- Organic acids SOS
- Beer fermentation process
- Ammonium chloride in liquorice products

Apparatus for determining the alcohol content and the volatile acids in wine and other alcoholic drinks. Complete glassware set with volumetric flask and pycnometer.
behr D 1 and D 2 are particularly well suited for high sample throughputs due to their speed.

| Type | Product description | Art. No. |
|---|---|---|
| D 1 | behrotest® steam distilling apparatus for determining the alcohol content, distillation in a pycnometer | B00218039 |
| D 2 | behrotest® steam distilling apparatus for determining organic acids, distillation in a 500 ml Erlenmeyer flask | B00218040 |
| D 1-AM | behrotest® steam distilling apparatus for determining alcohol using Areometer, distillation in reaction vessel 750 ml | B00712946 |

## Accessories

| Type | Product description | Art. No. |
|---|---|---|
| D 1-AM-Set | behrotest® accessories set for D1-AM consisting of: Areometer and areometer cylinder 500 ml | B00723220 |
| D1 & D2 -Set | behrotest® maintenance set | B00606938 |

## Technical data for behr D 1, D 2 and D 1-AM

| | | |
|---|---|---|
| **Dimensions in cm (W x H x D)** | approx. 41 x 67,5 x 41 | |
| **Weight** | approx. 32 kg | |
| **Nominal voltage** | 230 VAC | 50 Hz/ 60 Hz |
| **Power consumption** | 1700 W | 9 A /18 A |
| **Cooling water consumption** | approx. 5 l/min | |
| **Storage container** | any size, recommendation: behrotest® canister set | |
| **Display** | LCD | |
| **Programs** | 1 | |

# Determination of the essential oil content

## Systems for determining the essential oil content

Complete compact system for determining the essential oil content in

- Pharmaceuticals,
- Spices
- Seasoning and
- Herbs

according to ISO 6571.

With base frame, heating devices, brackets, coolant hoses and glass apparatus.

### Systems for determining the essential oil content

| Type | Product description | Art. No. |
|---|---|---|
| KOL | 1 sample position with 500 ml flask | B00217736 |
| KOL 2 | 1 sample position with an integrated magnetic stirrer in a 1000 ml flask | B00602393 |
| KOL 6 | 6 sample positions with with integrated magnetic stirrer, 6 sample positions with 1000 ml flasks | B00705271 |



KOL

Complete compact system for determining the essential oil content in citrus fruits and their derivatives according to Clevenger (ISO 1955).

| Type | Product description | Art. No. |
|---|---|---|
| CLE-RK1 | Compact system for determining the essential oils in citrus fruits and their derivatives, round bottom flask 1000 ml | B00696819 |
| CLE | Compact system for determining the essential oils in citrus fruits and their derivatives, Erlenmeyer flask 3000 ml | B00217741 |



CLE

# Water content

## System for determining the water content by azeotropic distillation

Complete compact system for determining the water content by azeotropic distillation. Suitable for inhomogeneous, bulky food such as dried fruit, sauerkraut, etc. With base frame, heating device, bracket and glass apparatus.

| Type | Product description | Art. No. |
|---|---|---|
| KWA 500 | 1 sample position, behrotest® compact apparatus | B00217690 |
| KWA 500/4 | 4 sample positions, behrotest® series water distiller | B00632492 |
| KWA 500/6 | 6 sample positions, behrotest® series water distiller | B00632493 |



KWA 500

# Reflux distillation



KRD 100

## Single reflux distillation apparatus

Complete apparatus for reflux distillation, consisting of

- Complete frame with condenser support panel and condenser bracket
- Positioning cradle
- Reaction flask
- behr high-performance glass cooler
- Tubing

Single reflux distillation apparatus

| Type | Product description | Art. No. |
|---|---|---|
| KRD 50 | 1 heating position for 50 ml round-bottomed flasks, complete | B00602400 |
| KRD 100 | 1 heating position for 100 ml round-bottomed flasks, complete | B00602401 |
| KRD 250 | 1 heating position for 250 ml round-bottomed flasks, complete | B00602402 |
| KRD 500 | 1 heating position for 500 ml round-bottomed flasks, complete | B00602403 |
| KRD 1000 | 1 heating position for 1,000 ml round-bottomed flasks, complete with magnetic stirrer | B00602404 |



RH 254

## Reflux distillation apparatus

Complete apparatus for reflux distillation, consisting of

- Hot bar, 4 heating positions
- Positioning cradles
- Support rods
- Cooling water distribution with condenser support panel and condenser brackets
- Reaction flask
- behr high-performance glass coolers

Series reflux distillation apparatus

| Type | Product description | Art. No. |
|---|---|---|
| RH 104 | 4 heating positions for 100 ml round-bottomed flasks, complete | B00602394 |
| RH 106 | 6 heating positions for 100 ml round-bottomed flasks, complete | B00602397 |
| RH 254 | 4 heating positions for 250 ml round-bottomed flasks, complete | B00602395 |
| RH 256 | 6 heating positions for 250 ml round-bottomed flasks, complete | B00602398 |
| RH 504 | 4 heating positions for 500 ml round-bottomed flasks, complete | B00602396 |
| RH 506 | 6 heating positions for 500 ml round-bottomed flasks, complete | B00602399 |



RH 256 M

Series reflux distillation apparatus with magnetic stirrer

| Type | Product description | Art. No. |
|---|---|---|
| RH 256 M | 6 heating positions for 250 ml flat bottom reaction vessel, complete, block with integrated magnetic stirrer | B00696821 |
| RH 506 M | 6 heating positions for 500 ml flat bottom reaction vessel, complete, block with integrated magnetic stirrer | B00726590 |
| RH 1006 M | 6 heating positions for 1000 ml flat bottom reaction vessel, complete, block with integrated magnetic stirrer | B00726591 |

### Technical data for reflux distillation apparatus

| | 4 sample positions | 6 sample positions | 6 sample positions with magnetic stirrer |
|---|---|---|---|
| **Voltage** | 230 VAC | | |
| **Frequency** | 50/60 Hz | | |
| **Power consumption** | 1500 W | 2250 W | 2050 W |
| **Power consumption** | 7 A | 10 A | 9 A |
| **Weight (without glass)** | approx. 15 kg | approx. 20 kg | approx. 48 kg |
| **Dimensions in cm (W x D x H) (without glass)** | approx. 53 x 32 x 74 | approx. 76 x 32 x 74 | approx. 75 x 40 x 100 |

# Saponification value

The method for the determination of saponification value in animal and vegetable fats and oils is effected in accordance with DIN EN ISO 3657. With an excess of ethanolic potassium hydroxide solution the tested sample is saponified by boiling under reflux and later titrated with standard hydrochloric acid solution until reaching the end point.

## behrotest® distillation unit for the determination of saponification value

The complete programmable distillation unit consists of:

- 6 or 12 round digestion vessels SR 2, 250 ml, with standard ground joint NS 29 and container ring made of PVDF
- compact rack with cooler frame and holders
- behr high performance glass coolers
- cooling water distribution strip ensures uniform cooling at sample positions
- 25 freely configurable programs for block temperature and distillation time
- high-quality quartz infrared heaters (1500 W)
- integrated magnetic stirrer with the separate control unit
- Tubing



VFZ 12

### Reflux distillation apparatus for the determination of saponification value

| Type | Product description | Art. No. |
|---|---|---|
| VFZ 6 | behrotest® reflux distillation apparatus for the determination of saponification value, 6 positions simultaneously | B00696815 |
| VFZ 12 | behrotest® reflux distillation apparatus for the determination of saponification value, 12 positions simultaneously | B00696816 |

## Optionally available in the behr program is the manual titration station HTI 9.

The HTI 9 consists of a burette with digital display and a magnetic stirrer with fitting holder for SR2 reaction vessels.

| Type | Product description | Art. No. |
|---|---|---|
| HTI 9 | behrotest® manual titration station with digital burette, magnetic stirrer | B00707777 |



HTI 9

# Determination of Vitamin A and E



VAE 6 together with KW 6

## behrotest® saponification apparatus for determination of vitamin A and E

The method for the determination of vitamin A and vitamin E in foodstuffs by high-performance liquid chromatography (HPLC) is effected in accordance with DIN EN 12823-1 and DIN EN 12822. The sample preparation takes place in the behrotest® saponification apparatus. Since the samples are sensitive to atmospheric oxygen, the samples are saponified under reflux preferably under a nitrogen atmosphere.

The complete apparatus consists of:

- Reaction vessels
- behr high performance glass coolers
- Cooling water distribution strip ensures uniform cooling at sample positions
- Precision heating block with integrated magnetic stirrers
- Separate control unit with very precise temperature control
- Flowmeter for nitrogen

### Saponification apparatus

| Type | Product description | Art. No. |
|---|---|---|
| VAE 6 | behrotest® saponification apparatus for the determination of vitamin A and E in the heating block with integrated magnetic stirrers, 6 positions with 250 ml vessels | B00707766 |

### Optional: behrotest® cooling trough

| Type | Product description | Art. No. |
|---|---|---|
| KW 6 | behrotest® cooling trough for smple rack EG 6/RF | B00726596 |

# Determination of sulfite



KSO 2N

The determination of sulfite (sulfurous acid) in food is carried out in accordance with DIN EN 1185 and DIN EN 1988-1 (optimized Monier-Williams method). The apparatus is for the release and distillation of sulfurous acid.

- reaction flask 500 ml or 1000 ml
- Systems available with one or two absorption vessels.
- Heating hood with an integrated magnetic stirrer for even mixing
- 1 or 6 sample positions possible
- The injection volume flow is set with a precision flow meter

| Type | Product description | Art. No. |
|---|---|---|
| KSO 2N | Compact system for the determination of sulfurous acid in accordance with DIN EN 1185, 2 absorption vessels, magnetic stirrer. | B00604572 |
| SO 2-6 | Devices for the determination sulfurous acid in up to 6 sample positions simultaneously in accordance with DIN EN 1185. 2 absorption vessels. Magnetic stirrer. | B00218429 |
| SU 1000 | Compact system for the determination of Sulfite in accordance with DIN EN 1988-1 (Optimized Monier-Williams method) | B00652910 |

# Determining hydroxyproline content

## Classic behrotest® digestion apparatus for determining hydroxyproline content

Apparatus for digestion testing when determining hydroxyproline content in meat, meat products and sausage products according to Sec. 64 LFGB (German Feed and Food Act). After acidic digestion, hydroxyproline is photometrically determined at 558 nm.

The equipment consists of:

- Serial heating block with 6 sample positions
- Each sample position individually adjustable
- Deposit pit
- Support rods
- Cooling water distribution with condenser console and holders
- Digestion vessels with a volume of 250 ml.
- for high-performance condensers



RH 6

### Digestion apparatus

| Type | Product description | Art. No. |
|---|---|---|
| RH 4 | behrotest® series heating block for determining hydroxyproline content with 4 sample positions, for 250 ml digestion vessels | B00218449 |
| RH 6 | behrotest® series heating block for determining hydroxyproline content with 6 sample positions, for 250 ml digestion vessels | B00218426 |

## Modern behrotest® digestion apparatus for determining hydroxyproline content

Apparatus for digestion testing when determining hydroxyproline content in meat, meat products and sausage products according to Sec. 64 LFGB (German Feed and Food Act). After acidic digestion, hydroxyproline is photometrically determined at 558 nm.

Modern infrared heating units from behr are equipped with high-quality quartz infrared heaters, built-in inductive magnetic stirrers and a temperature control.

- Apparatus with high-quality non-corrosive block casing made of stainless steel
- Insertable frame for 6 or 12 spaces
- Digestion vessels with a volume of 250 ml.
- Firmly sealing vessels with high temperature screw caps made of PP (GL 32) with welded PTFE membrane for pressure compensation, suitable for autoclaving
- 25 freely configurable programs for block energy and digestion time
- Even heating on all sample positions
- 6 or 12 digit integrated inductive magnetic stirrer
- behr one-button operation for extremely easy and quick programming
- Menu navigation in country language



HDP 6

### Digestion apparatus for determining hydroxyproline content

| Type | Product description | Art. No. |
|---|---|---|
| HDP 6 | behrotest® digestion apparatus for determining hydroxyproline content with 6 sample positions, for 250 ml digestion vessels | B00696810 |
| HDP 12 | behrotest® digestion apparatus for determining hydroxyproline content with 12 sample positions, for 250 ml digestion vessels | B00696811 |



HDP 12

# Recirculating cooler

## The UK series




UK 12/1030

### behrotest® UK recirculating cooler

behrotest® UK series recirculating coolers are ideally suited for use with the behr separation and distillation systems. The new and improved successor models of our UK 12 series are just as reliable and suitable for everyday use as their predecessors, but their performance has improved by 20%.

They are also generally suited

- as replacements for condensing systems that are cooled using domestic water
- for the dissipation of process heat
- for the thermostatic control of apparatus such as centrifuges, microscopes, spectrometers, analysers, distillation apparatus, rotary evaporators, electrophoresis, reaction vessels

All recirculating coolers can be used as a closed or open system

Features:

- Electronic temperature control with LED display
- Float switch to monitor the coolant level
- Limit alarm if the permitted field of activity is exceeded
- Cooling unit: quiet, fully hermetic, air-cooled, low-maintenance
- 12 mm internally threaded tube connections (M10 x 1)
- 3/4" filler spout with vent valve on the surface of the device
- Stainless steel housing parts
- Non-ferrous metal heat exchanger
- Circumferential skirting protection rings both top and bottom
- UK 2020 has a cooling unit with two separately operating cooling circuits. This provides better setting options and the opportunity of emergency operation with the second machine if a compressor fails.

| Type | Product description | Art. No. |
|---|---|---|
| UK 12/1030 | 1200 watt cooling capacity with circulating pump and digital temperature control for regulating the temperature and cooling individual or several apparatus | B00692940 |
| UK 12/2020 | 2200 watt cooling capacity with circulating pump and digital temperature control for regulating the temperature and cooling several apparatus | B00602389 |

## Technical data

| | UK 12/1030 | UK 12/2020 |
|---|---|---|
| **Cooling capacity in watts** | | |
| **at +21°** | 1200 | 2200 |
| **at +11°** | 950 | 2000 |
| **at +6°** | 740 | 1460 |
| **Operating range** | +5° to +40° C | +5° to +40° C |
| **Recirculating pump** | | |
| **Flow rate** | 12 l/min | 12 l/min |
| **Flow pressur** | 2,9 bar | 2,9 bar |
| **Electr. connection** | | |
| **Volt** | 230 | 230 |
| **Hz** | 50 | 50 |
| **Amp** | 3,5 | 8,0 |
| **External dimensions in cm (W x L x H)** | approx. 34 x 40 x 60 | approx. 44 x 47 x 76 |
| **Weight** | approx. 41 kg | approx. 80 kg |
| **Coolant container** | 4,6 l | 9,0 l |

# This may also interest you




## Extraction units for extracting liquids

## Determination of the nitrogen content according to Kjedahl:

- Infrared digestion devices with manual operation and also programmable
- Block digestion unit, also with fully-automatic lift
- Steam distillation units for (almost) any requirement
- Titration devices

## The complete range for the CSB titration method:

- Dosing units for sulphuric acid, manual and also programmable
- Digestion units with fully-automatic time/temperature profile for standardised CSB determination
- Titrators, manual and fully-automatic, also as dosing-titrating combination

## Further determinations

- Crude fiber
- Determination of fibers
- Cyanide
- Heavy metal digestion systems

Made in Germany

224205

ISO 9001 BUREAU VERITAS Certification

behr Labor-Technik GmbH • Spangerstraße 8 • 40599 Düsseldorf/Germany
Tel.: (+49) (0) 211 – 7 48 47 17 • Fax: (+49) (0) 211 – 7 48 47 48
Email: info@behr-labor.com • Internet: www.behr-labor.com

behr Labor-Technik

Subject to technical changes and errors.

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