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C G T A T C G C C A T C T T C A T C C G T A T C T G C T T C C A T C T G C T
A T C C G T A T C T C C A T T T C A T C C G T A T C
C T A T C G C T T T G C T T C C A T C C C T A T C G C
C T A T C G C T A T C A T C C A T C C C T A T C T G C T T C C A T C T G C T



C A T C A T
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BIOTECON Diagnostics

high purity
isolation
certificates
high quality
foodborne pathogens
food safety



BIOTECON Diagnostics

DNA/RNA Extraction

DNA / RNA Extraction – Key to Successful Analysis



StarPrep Kits

Fast and easy lysis by mixing samples with buffer



ShortPrep Kits



Sample Preparation Kits Magnetic Preparation Kits

High purity DNA/RNA clean-up, manual column based or automated magnetic bead based



Reliable analysis of food and feed samples with real-time PCR require appropriate sample preparation. Optimized and validated methods for the extraction of nucleic acids from any kind of biological material are of high importance. The processed sample must be free of contaminants, especially inhibitors, while retaining even small amounts of the target's genetic information. The extraction method should be as fast and convenient as possible without compromising safety or reproducibility.

Optimized Combination of Extraction Kit and PCR Assay

BIOTECON Diagnostics has developed a broad range of fast, safe and easy-to-use DNA and RNA extraction kits for any food, beverage or environmental sample. Our

extraction kits have been optimized in combination with our **foodproof®** real-time PCR Detection, Identification and Quantification Kits. The isolated DNA/RNA can be used directly in all our real-time PCR assays.

Direct lysis, Column based or Automated

The **foodproof®** ShortPrep, StarPrep, Sample Preparation and Magnetic Preparation Kits assist you in efficiently working with all types of sample matrices, including difficult complex samples like e.g. cheeses, spices or cacao.

Succeed the challenges of complex matrices, PCR inhibitors and hidden targets with fast, straight-forward easy-to-use solutions.

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Table 1: Comparison of **foodproof**[®] extraction kits for food and beverage relevant parameters

Target	Rapid		Highly purified	
	Bulk	Prefilled	Column based	Bead based/ Automated
Gram-negative bacteria	StarPrep One*	ShortPrep I	Sample Preparation I	Magnetic Preparation I, V
Gram-positive bacteria	StarPrep Two*	ShortPrep II	Sample Preparation II	Magnetic Preparation II
<i>Enterobacteriaceae, Cronobacter</i>	StarPrep One	-	-	Magnetic Preparation IV
<i>Vibrio</i> , STEC, Beer spoilage bacteria	StarPrep Three	-	-	-
<i>Dekkera, S. cerevisiae var. diastaticus</i>	StarPrep Two	StarPrep Four	-	-
Yeast & Mold	StarPrep Two	-	-	-
GMOs, Animal ID, Allergens	-	-	Sample Preparation III	Magnetic Preparation III
Viruses	-	-	Sample Preparation IV	-

* High-throughput protocol available. See 8-strip DNA extraction protocols.





StarPrep Kits: Versatile

WORKFLOW

e.g. StarPrep One



Enjoy convenient and flexible DNA extraction: the **foodproof® StarPrep Kits** are designed for quick and easy extraction of DNA from food and beverage samples by heat-induced lysis. StarPrep is a cost-effective, versatile solution for nearly all kind of foods, with optimized lysis reagents and protocols for different applications.

StarPrep can be used for rapid DNA extraction from enrichment cultures, direct and rinse samples. The reagents contain no hazardous chemicals or compounds, unlike other sample preparation methods. The entire DNA preparation can be performed in a single tube, minimizing handling steps, reducing risk of cross-contamination and exposure to bio-hazardous material.



*StarPrep One Kit
Bulk solution for fast and flexible
DNA extraction*

Table 2: Overview of **foodproof®** StarPrep Kits

	foodproof® StarPrep One	foodproof® StarPrep Two	foodproof® StarPrep Three	foodproof® StarPrep Four
Targets	Gram-negative bacteria, e.g. <i>Salmonella</i>	Gram-positive and other bacteria, e.g. <i>Listeria</i> , <i>Campylobacter</i> , <i>E. coli</i> O157, <i>Alicyclobacillus</i> ; Yeast and Mold	<i>Vibrio</i> , STEC, Beer spoilage bacteria	<i>Dekkera</i> , <i>S. cerevisiae</i> var. <i>diastaticus</i>
Matrices	Suitable for a wide range of food, animal feed and environmental samples		Enrichment cultures, beverage samples	
Principle	Heat-induced lysis	Mechanical disruption and heat-induced lysis	Heat-induced lysis	Mechanical disruption and heat-induced lysis
Isolations	100 / 500	96	96	96
Additional Products	-	Resuspension Reagent, Washing Solution	-	-
Approvals	MicroVal, AOAC, NordVal and DAFF	AOAC, NordVal and DAFF	-	-



ShortPrep Kits: Ready-to-Use

The fast and easy DNA extraction method for your enriched samples: the **foodproof® ShortPrep Kits** are designed for quick and easy DNA extraction of bacterial DNA to be used directly for PCR. Simply add enriched sample to pre-aliquoted buffer, and in less than 30 minutes, samples from bacterial enrichment cultures are ready for PCR. The entire extraction is performed in a single tube, minimizing handling steps and reducing risk of cross-contamination. The lysis buffers are free of dangerous reagents.

The kits are validated and certified by internationally recognized institutions such as AOAC, NordVal and DAFF, and can be used for a variety of foods, like raw materials or processed food, environmental samples and pet foods.



ShortPrep I Kit

Prefilled tubes for fast DNA extraction in less than 30 minutes

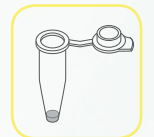
Table 3: Overview of **foodproof® ShortPrep Kits**

	foodproof® ShortPrep I	foodproof® ShortPrep II
Targets	Gram-negative bacteria, e.g. <i>Salmonella</i>	Gram-positive and other bacteria, e.g. <i>Listeria</i> , <i>Campylobacter</i> and <i>Alicyclobacillus</i>
Matrices*	Suitable for a wide range of food, animal feed and environmental samples	
Principle	Heat-induced lysis	Mechanical disruption and heat-induced lysis
Convenience	96 individual ready-to-use reaction mixes for maximum efficiency and easy DNA extraction	
Approvals	AOAC, NordVal and DAFF	

* DNA extracts from some raw materials of plant origin (e.g. spices) and from some beverage samples may still contain substances that interfere with PCR amplification or with fluorescent signal detection. For such materials, preparation and purification with the BIOTECON Diagnostics' foodproof Sample Preparation Kit I and II are recommended.

WORKFLOW e.g. ShortPrep I

ADD SAMPLE
to prefilled lysis buffer



MIX



INCUBATE
10 min



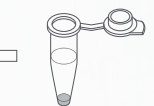
MIX



CENTRIFUGE
1 min



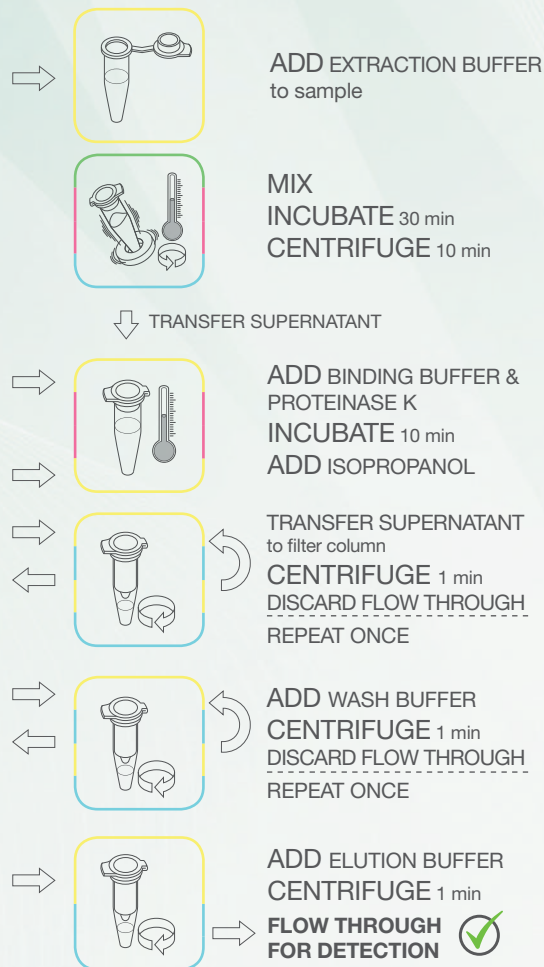
 **SUPERNATANT
FOR DETECTION**



Sample Preparation Kits: High Quality Purification

WORKFLOW

e.g. Sample Preparation III Kit*



Get rid of unwanted PCR contaminants and inhibitors: the **foodproof® Sample Preparation Kits** are designed to isolate and purify DNA or RNA even from challenging matrices containing high amounts of PCR inhibitors. Kit reagents and consumables are optimized to obtain the best results for each parameter. Protocols are easy to follow and implement in daily routine use. The quality of the DNA obtained with the kits is suitable for any application using real-time PCR.

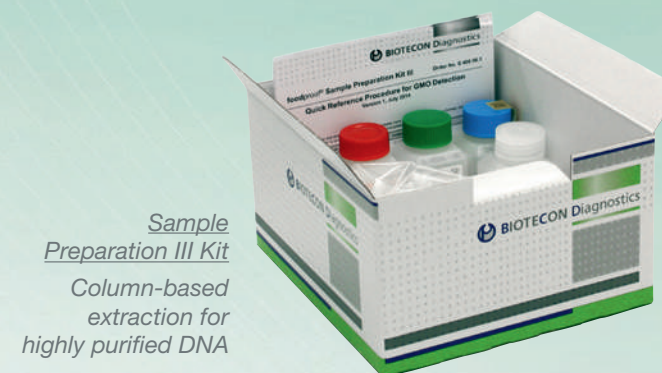


Table 4: Overview of **foodproof®** Sample Preparation Kits

	foodproof® Sample Preparation I Kit	foodproof® Sample Preparation II Kit	foodproof® Sample Preparation III Kit	foodproof® Sample Preparation IV Kit
Targets	Gram-negative bacteria, e.g. <i>Salmonella</i>	Gram-positive and other bacteria, e.g. <i>Listeria</i> , <i>Campylobacter</i> and <i>Alicyclobacillus</i>	Genetically modified organisms (GMOs), animal identification allergens	Viruses (e.g. Norovirus)
Matrices	Suitable for a wide range of food, beverages, animal feed and environmental samples			
Principle	The DNA is bound to a glass fiber filter, washed thoroughly and the pure DNA is eluted from the columns			The RNA is bound to a glass fiber filter, washed and eluted
Features	Isolation of highly purified DNA, virtually free of other cellular components and PCR inhibitors Suitable for matrices containing high amount of PCR inhibitors Sample Preparation Kit II and Sample Preparation Kit III include a lysozym and Proteinase K digestion step, respectively, for maximum performance			Isolation of viral RNA, process control included

* Workflow for GMOs & allergens; Animal ID slightly different protocol



Magnetic Preparation Kits: Automated Purification

BIOTECON Diagnostics offers a variety of solutions for automated high-throughput molecular testing for pathogens, GMOs, animal identification and allergens. The **foodproof® Magnetic Preparation Kits** are based on magnetic bead technology, providing ultra-pure, ready-to-use genomic DNA of bacterial, plant or animal origin for enhanced performance in sensitive real-time PCR applications. The process proceeds with DNA being bound to magnetic beads and washed thoroughly through multiple steps. In the final step, highly purified DNA is eluted from the beads and is ready for use.

*Magnetic Preparation Kit I
Bead-based DNA extraction for automation*



Automation Systems

The KingFisher™ Flex is a semi-automated system that allows fast and convenient DNA extraction. The high throughput system processes up to 96 samples simultaneously; fewer samples may also be processed.



KingFisher™ Flex

The Janus Integrator™ allows for full automation of processing samples through DNA extraction and PCR setup. The user then need only load the final samples in the PCR cycler.



*foodproof® RoboPrep+:
The KingFisher™ Flex +
optional Janus Integrator™*

Table 5: Overview of **foodproof®** Magnetic Preparation Kits

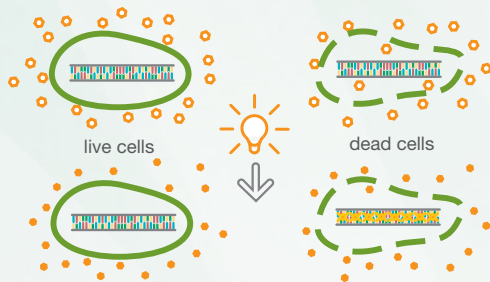
	foodproof® MPK I	foodproof® MPK II	foodproof® MPK III	foodproof® MPK IV	foodproof® MPK V
Targets	Gram-negative bacteria, e.g. <i>Salmonella</i> spp.	Gram-positive bacteria, e.g. <i>Listeria</i>	GMOs, animal identification, allergens	<i>Entero-bacteriaceae</i> , <i>Cronobacter</i> and <i>Salmonella</i> spp.	<i>Salmonella</i> spp.
Matrices	food and feed	food and feed	food and feed	infant formula	food
Approvals	AOAC and MicroVal	-	-	MicroVal	-
Additional Products	Consumable Pack (960 isolations)	Consumable Pack (960 isolations)	included	Consumable Pack (480 isolations)	Consumable Pack (480 isolations)
Instruments	foodproof® RoboPrep+ HT, KingFisher™ Flex	foodproof® RoboPrep+ HT	KingFisher™ Flex	KingFisher™ Flex	KingFisher™ Flex



Reagent D: Elimination of DNA from dead cells

PRINCIPLE

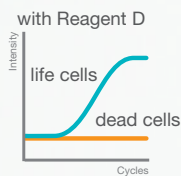
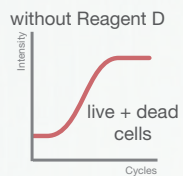
1. Reagent D Treatment



2. After Extraction



3. Real-time PCR Run



Matrices like powdered infant formula or processed seafood may contain a high background of dead (inactive) target cells, which may cause false-positive results or distort quantitative PCR assays. Reagent D is highly selective in penetrating only membranes of dead cells and can be used for live/dead differentiation to avoid false-positive results.

Elimination Procedure

Reagent D contains light sensitive substances that selectively penetrate cell membranes of dead cells. Exposure to visible light leads to covalent binding of Reagent D to DNA and prevents the masked DNA from being amplified in the PCR. Reagent D has been validated in combination with the **foodproof®** StarPrep Kits.

Processing takes only a few minutes prior to performing the DNA extraction.



Reagent D Kit

For elimination of false-positive results from dead cells to avoid false-positive results

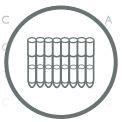


foodproof® D-Light

As a validated source of light for the photo-activation of Reagent D, the stand-alone CE/FCC certified **foodproof®** D-Light is a compact benchtop solution that fits in every lab. Up to 96 samples can be processed simultaneously. SBS format allows use of different adapters and microplates. A pre-programmed incubation starts automatically after insertion of the samples. A constant and uniform

light dose with high power LEDs and proper optical alignment guarantees reproducible results. The workflow is simple and safe: no cooling needed, as no heat will be developed.

The combination of the **foodproof®** D-Light and Reagent D, **foodproof®** DNA extraction kits and subsequent real-time PCR kits and all assay-required laboratory equipment represents a true "One-Stop-Shop" solution for the customer.



8-Strip DNA Extraction Protocols

For efficient manual handling of large sample numbers, BIOTECON Diagnostics has developed time-saving protocols for DNA extraction from *Salmonella* and *Listeria* enrichment cultures.

The manual high-throughput DNA extraction protocols utilize a validated optimized combination of consumables and instruments, including a multichannel pipette. The 8-channel pipette reduces the number of handling steps, and the 8-strip format is adaptable to the number of samples. The detailed manuals make it easy to follow the protocols. The obtained DNA can be used directly in any PCR application.

High-Throughput *Salmonella* Protocol

The **foodproof® StarPrep One Kit** includes a high-throughput method, which is described in the manual. Necessary instruments and consumables (please see table 6) can be purchased from BIOTECON Diagnostics.

High-Throughput *Listeria* Protocol

The **foodproof® StarPrep Two 8-Strip Kit** already contains all necessary reagents and consumables. The ready-to use 8-strip tubes are prefilled with beads. These tubes and the lysis buffer are included in the kit.

Table 6: Overview of additional equipment

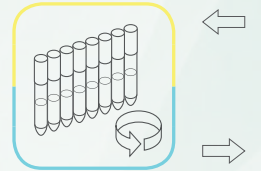
Instrument	StarPrep One	StarPrep Two
Magnetic Stirrer	X	-
Heating Block	X	X
Centrifuge	X	X
Mechanical Cell Disruption	-	X
Multichannel Pipette	X	X
Consumables	X	included



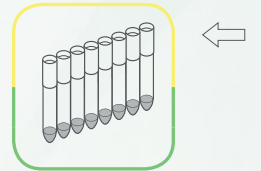
WORKFLOW

e.g. StarPrep One

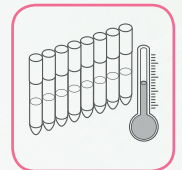
ADD SAMPLE
CENTRIFUGE 10 min
DISCARD SUPERNATANT



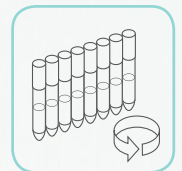
ADD DILUTED
LYSIS BUFFER
MIX
to resuspend pellet



INCUBATE
10 min



CENTRIFUGE
5 min



✓ SUPERNATANT
FOR DETECTION





Basic Lab Instruments



BIOTECON Diagnostics provides its customers a “one-stop shop” solution. We proudly offer instruments and laboratory equipment necessary to perform our high quality

nucleic acid extraction and real-time PCR kits. This select equipment has been thoroughly tested by our team to guarantee quality performance.



Disruptor Genie®

- Ideal for cell disruption/homogenization of bacteria and pellet resuspensions
- Hands-free automatically timed disruption of up to 12 microtubes
- Patented multi-directional action agitates and vortexes at high-speed producing greater yields in less time
- Suitable for use in cold rooms or in incubators
- Can be also used as vortexer



Micro Star 17 microcentrifuge

- Powerful (17,000 xg), safe, compact, versatile, convenient and ventilated centrifuge
- Easy operation, intuitive controls, bright and easy to read displays
- Designed to accelerate the routine sample preparation process
- Special ‘click’ biocontainment rotor lid keeps the user and the samples safe
- Supplied with 24-place rotor for 1.5/2.0 ml tubes and aerosol-tight rotor lid



Heating-Thermomixer MHR 13

- All-in-one: heating, cooling, mixing, timer with one single unit
- 30 different exchange blocks available (e.g. for the use of micro test tubes, test tubes, centrifugal tubes, cuvettes or PCR plates, microtiter or deep well plates)
- State-of-the-art touch panel for better handling and cleaning
- Possible to program up to 9 complete programs with up to 30 steps

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Table 7: Basic laboratory equipment required for performing nucleic acid extraction kits

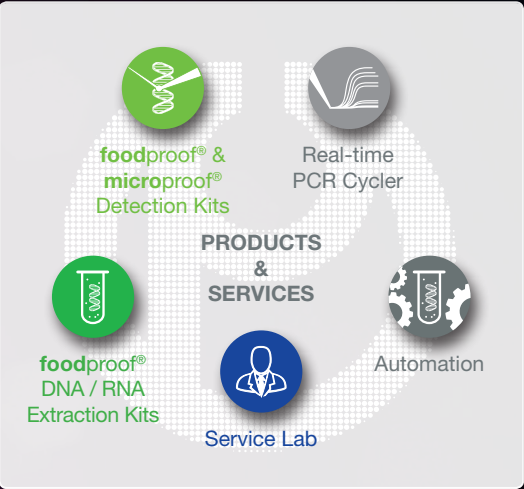
RNA/DNA Extraction Kit	Magnetic Stirrer	Heating Block	Disruptor	Reagent D & D-Light	Vortex	Centrifuge
foodproof® StarPrep One Kit	X	1.5 ml Block	-	EbC*	X	≥13,000 xg
foodproof® StarPrep Two Kit	X	1.5/2 ml Block	X	Yeast & Mold	X	≥13,000 xg
foodproof® StarPrep Three Kit	X	1.5 ml Block	-	<i>Vibrio</i>	X	≥13,000 xg
foodproof® StarPrep Four Kit	-	1.5 ml Block	X	-	X	≥13,000 xg
foodproof® ShortPrep I Kit	-	1.5 ml Block	-	-	X	≥8,000 xg
foodproof® ShortPrep II Kit	-	1.5 ml Block	X	-	X	≥13,000 xg
foodproof® ShortPrep III Kit	-	1.5 ml Block	-	-	X	≥15,000 xg
foodproof® Sample Preparation Kit I	-	1.5 ml Block	-	-	X	≥13,000 xg
foodproof® Sample Preparation Kit II	-	1.5 ml Block	-	-	X	≥13,000 xg
foodproof® Sample Preparation Kit III	-	2 ml Block	-	-	X	≥13,000 xg
foodproof® Sample Preparation Kit IV	-	-	-	-	X	≥20,000 xg
foodproof® Magnetic Preparation Kit I	-	-	-	-	-	-
foodproof® Magnetic Preparation Kit II	-	-	-	-	-	≥2,250 xg**
foodproof® Magnetic Preparation Kit III	-	2 ml Block, mix	-	-	X	-
foodproof® Magnetic Preparation Kit IV	-	-	-	EbC*	-	-
foodproof® Magnetic Preparation Kit V	-	-	-	-	-	-

* *Enterbacteriaceae* plus *Cronobacter*
 ** Centrifuge for deepwell plates



C C A T C C C T A C A T C A T C G T A T C C A T C C C C A T C A T C G T A T C C A T C C C T A T C C A T C C
A T C G C T T C A T C A T C C C T A T C G C T T T A T C C A T C C C T A T C G C T T C C A T C T G C T
C G T A T C G C C A T C T T C A T C C G T A T C T G C C A T C T T C A T C C G T A T C G C T T C C A T C T
A T C C G T A T C T C C A T T T C A T C C G T A T C C T T C C A T C T T C A T C C G T A T C
C T A T C G C T T T G C T T C C A T C C C T A T C G C T G C T T C C A T C C C T A T C G C T T C T C A T C C C
C T A T C G C T A T C A T C C A T C C C T A T C T G A T C A T C C A T C C C T A T C G C T T C C A T C T G

Product List



DNA Extraction Kits

- S 400 01 **foodproof®** ShortPrep I Kit, 96 reactions
- S 400 02 **foodproof®** ShortPrep II Kit, 96 reactions
- S 400 03 **foodproof®** ShortPrep III Kit, 96 reactions
- S 400 04 **foodproof®** Sample Preparation Kit I, 100 reactions
- S 400 05 **foodproof®** Sample Preparation Kit II, 100 reactions
- S 400 06.1 **foodproof®** Sample Preparation Kit III, 50 reactions
- S 400 14 **foodproof®** Sample Preparation Kit IV, 50 reactions
- S 400 07 **foodproof®** StarPrep One Kit, 100 reactions
- S 400 07 L **foodproof®** StarPrep One Kit, 500 reactions
- S 400 08 **foodproof®** StarPrep Two Kit, 96 reactions
- S 400 17 L **foodproof®** StarPrep Two 8-Strip Kit, 480 reactions
- S 400 18 **foodproof®** StarPrep Three Kit, 96 reactions
- S 400 09 **foodproof®** StarPrep Four Kit, 96 reactions
- S 400 11 **foodproof®** Magnetic Preparation Kit I, 96 reactions
- S 400 11 L **foodproof®** Magnetic Preparation Kit I, 480 reactions
- S 400 12 **foodproof®** Magnetic Preparation Kit II, 96 reactions
- S 400 12 L **foodproof®** Magnetic Preparation Kit II, 480 reactions
- S 400 13 L **foodproof®** Magnetic Preparation Kit III, 480 reactions
- S 400 15 L **foodproof®** Magnetic Preparation Kit IV, 480 reactions
- S 400 19 L **foodproof®** Magnetic Preparation Kit V, 480 reactions

Additional

- A 500 02 Reagent D, 30 ml
- A 500 02 S Reagent D, 15 ml
- A 500 12 Reagent P, 550 reactions
- A 500 14 Resuspension Reagent, 35 ml

Basic Lab Instruments

- D 100 03 Disruptor Genie®
- D 110 10 Micro Star 17 microcentrifuge
- D 110 44 Heating-Thermomixer MHR 13
- D 110 38 TH 21 Heating Block
- D 110 39 TH 21 Exchange heating block for deepwell plates
- D 110 27 Magentic Stirrer

Many others on request

Automation

- D 220 01 KingFisher™ Flex
- Z 600 06 KingFisher™ Flex Consumable Pack

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