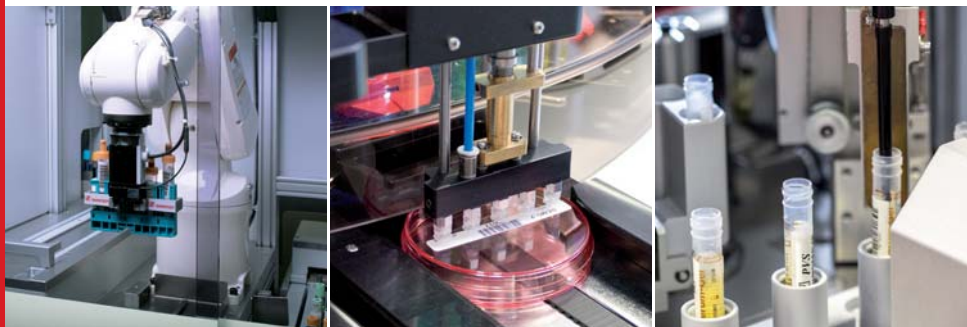


Systematic workflow

Laboratory automation for pre- and post-analytics



System solutions



for Clinical Laboratories and Microbiology

SARSTEDT International

Your partner in medicine and science worldwide



The Company — Foundation and History

Ever since the company was established in 1961, progress has been a top priority. Today, the SARSTEDT Group is a global company with 15 production sites in Europe, North America and Australia and 2,900 employees.

For decades, research and purpose-oriented product development using innovative technologies, along with constant dialogue with users, have been decisive factors in making us a leading supplier in the field of laboratory and medical technology today.

Quality under one roof – from product idea to the customer

From development through to production and sales – all our services are from a single source.

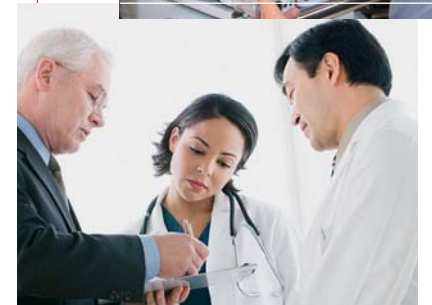
PRODUCT DEVELOPMENT at our R&D centre is based on close dialogue with users and state-of-the-art technologies – from the initial idea through to the finished product!

PRODUCTION is carried out at our company-owned production sites here and abroad using state-of-the-art equipment. More than 90% of the products in our portfolio are produced here.

The use of our products directly on patients as well as in research and development laboratories requires a high **QUALITY STANDARD**. We meet this requirement through our modern integrated quality management system in accordance with EN ISO 13485.

Global **MARKETING & SALES** of SARSTEDT products is primarily carried out via our 34 sales organisations. In addition, our customers have access to an extensive dealership network.

With a team of qualified medical device consultants, we can guarantee you the highest quality of consulting and **SERVICE**.



*"Optimally compatible modular system components and tailor-made service for the whole system: that's what we expect from high quality laboratory technology!
And that is what we get with SARSTEDT!"*



Clinical Laboratories

Stand-Alone Solutions for Decapping & Recapping

Page 8

- DC 1200
- RC 1200
- RC 1200 S



RC 1200

The Compact, Combined Solution for Decapping, Recapping and Sorting

Page 10

- 900 Flex ID
- DC 900 Flex
- RC 900 Flex
- DC/RC 900 Flex



DC/RC 900 Flex

The Compact Stand-Alone Aliquoter

Page 12

- AL-Flex

Bulk Loader – An Efficient and Safe Solution for Sample Entry

Page 14

- BL 1200
- BL 1200 SORT CONNECT
- HCTS2000 MK2



BL 1200
SORT CONNECT

Modular Solutions for Complete Pre- and Post-Analytics

Page 16

- HSS
- PVS 1625 / 2125 / 2625



PVS 1625

Function Modules – The Choice is Yours

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Microbiology

Petri Dish Organisation System

Page 24

- POS 720/2

Petri Dish Transfer System

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- PTS

Software

Page 28

Consumables for Laboratory Automation

Page 30

The SARSTEDT Product Range

Page 31



PTS



Clinical Laboratories

Automation for Clinical Laboratories

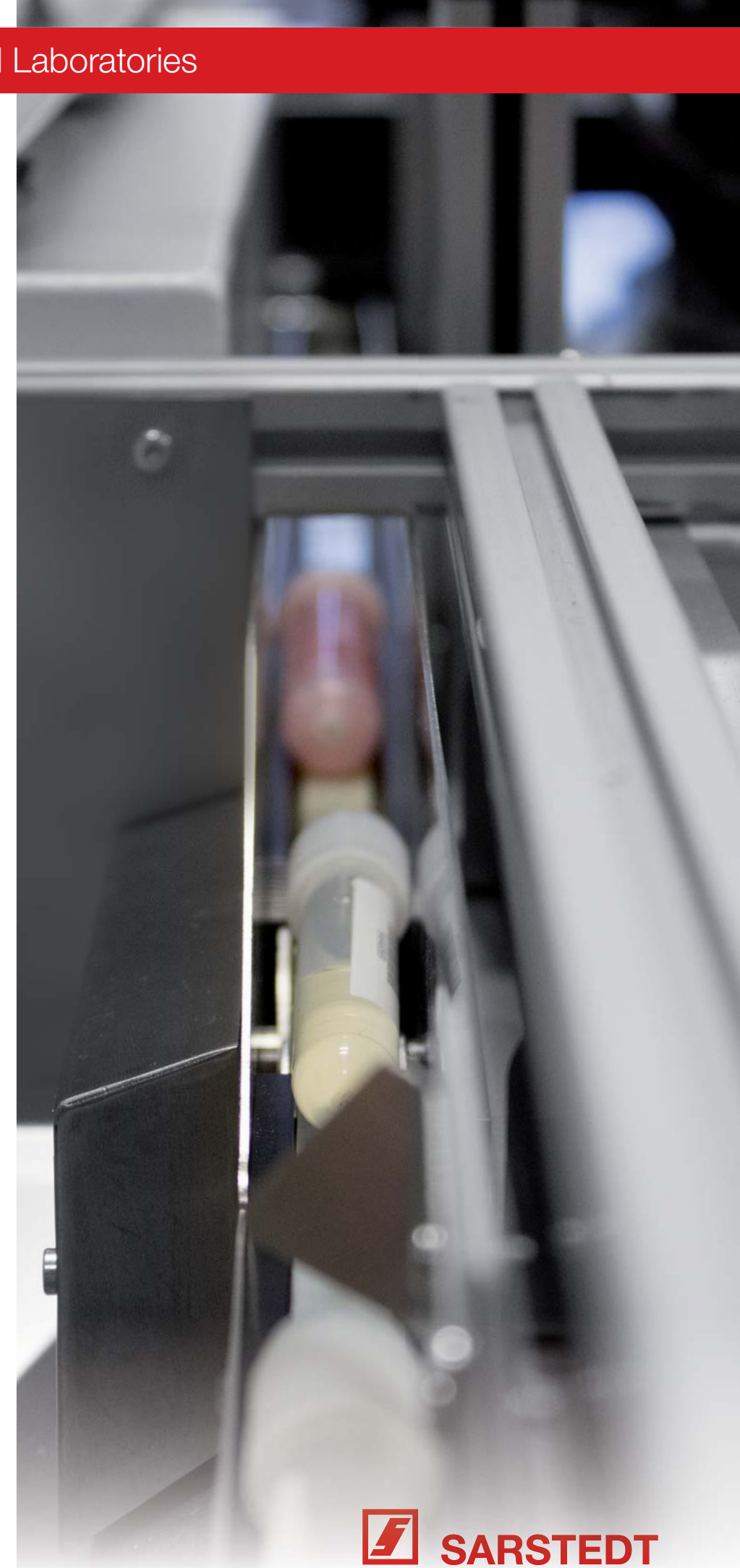
The importance of laboratory automation has grown considerably in recent years. Intense competition and high cost pressures inevitably require the organisation, optimisation and automation of laboratory processes.

With more than **25 years of experience** in the development, manufacturing and distribution of laboratory automation systems, we are competent consultants for our customers in this area. Our customer-specific automation solutions guarantee maximum flexibility and help you make your processes safer, more effective and more economical.

As a provider of system solutions, we have a broad product portfolio of compact devices and modular automation solutions for pre- and post-analytical processes in clinical and microbiological laboratories. Our many years of experience and specialisation in pre- and post-analytics mean that we are able to respond to individual, complex laboratory requirements and offer customer-specific automation solutions for the laboratory processes in question. We have expertise in the following areas:

- Sample loading
- Sample identification
- Decapping of samples
- Aliquoting
- Recapping
- Sorting, distribution and archiving

We would be happy to advise you in a personal consultation. You can find contact details on the back of the brochure.



DECAPPING



Throughput
of up to 1,200
tubes per hour



DC 1200

Automated **decapping** for
tube diameters from 11-16 mm

- Tubes from various manufacturers with screw caps or push caps are opened in a mixed operation
- Decapping is carried out in the analysis rack - no reloading required
- Throughput of up to 1,200 tubes per hour
- Available for many common linear racks
- Prevents chronic repetitive strain injury (RSI)

RECAPPING

Evaporation protection



Throughput
of up to 1,200
tubes per hour



RC 1200

Automated **recapping** for
tube diameters of 13-16 mm

- Minimises evaporation
- Prevents contamination
- Archiving push cap fits all standard tubes with a diameter of 13, 15 and 16 mm
- Automated re-processing (decapping/recapping)
- Throughput of up to 1,200 tubes per hour
- Available for many common linear racks
- Prevents chronic repetitive strain injury (RSI)

Transport



Throughput
of up to 1,200
tubes per hour



RC 1200 S

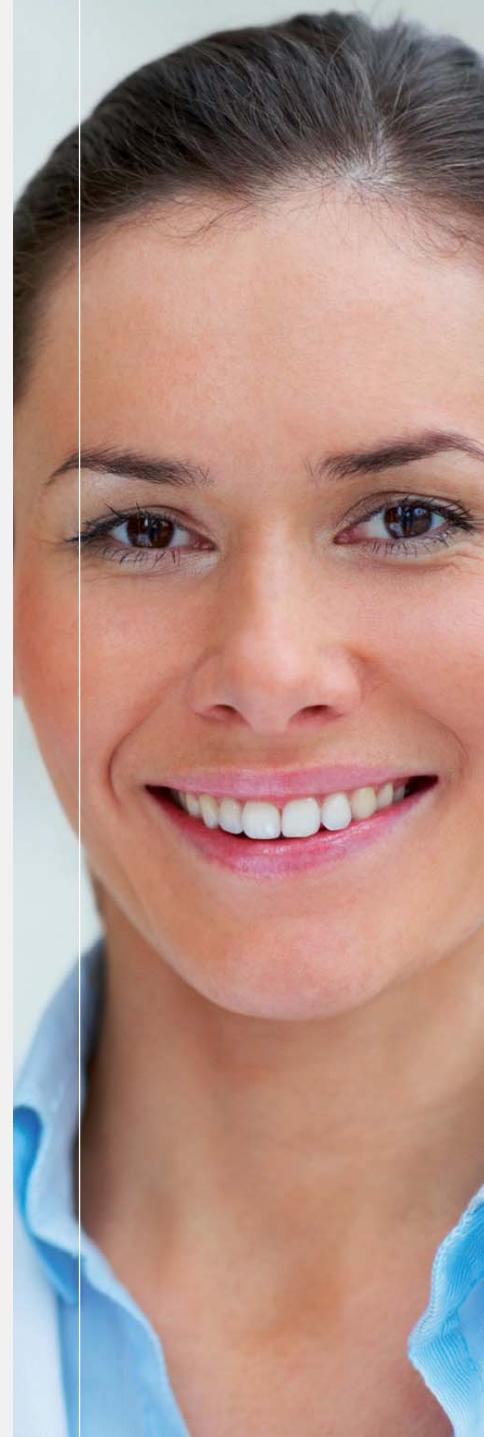
Automated **recapping with a screw cap** for
SARSTEDT tubes with a diameter of 13 or 15 mm

- Perfect recapping of tubes to preserve sample quality
 - Eliminates cross-contamination from previously used caps
 - Prevents evaporation
 - Fulfills all requirements for sample transport
 - Ideally suited for sample archiving
- Automated re-processing (decapping/recapping)
- Throughput of up to 1,200 tubes per hour
- Available for many common linear racks
- Prevents chronic repetitive strain injury (RSI)

DC 1200

RC 1200

RC 1200 S



The compact, combined solution for decapping, recapping and sorting



- Pre- and post-analytics in the one compact device
- High throughput of up to 900 tubes per hour
- For tubes 11-16 mm in diameter
- Compatible with all common rack or carrier systems
- Online or offline operation
- Opens tubes with stoppers or screw caps
- Sorts by order, barcode, material, etc.
- Recapping of tubes with archiving push cap
- Closes 13 or 15 mm diameter SARSTEDT tubes with screw caps, e.g. S-Monovette®
- Can be retrofitted individually with decapping or recapping modules

DC/RC 900 Flex combines pre- and post-analytics in a single compact stand-alone system. This ensures optimal utilisation of materials along with superior economic efficiency. Repetitive manual work, such as the strain of recapping and decapping sample tubes, is eliminated, thereby protecting human resources.

All tubes 65–100 mm in length and 11–16 mm in diameter are processed in a mixed operation (other tube types can be accommodated on request). Whether push caps or screw caps, all caps are safely removed and disposed of hygienically.

The customisable working platform can be configured for any rack and carrier systems, both for analysers and archiving. The control software can specify the desired criteria for processing containers and can be operated online or offline. Tubes with a diameter of 13, 15 or 16 mm are closed with an archiving cap. The modular concept makes it possible to start with only the decapper or recapper module and retrofit the other function later.



Decapping



Recapping: Archiving cap



Recapping: Screw cap



900 Flex ID
DC 900 Flex
RC 900 Flex
DC/RC 900 Flex

For subdistribution into secondary tubes



AL-Flex

- Intelligent volume management
- Contamination-free pipetting
- Integrated barcode labeling of aliquot tubes immediately before filling
- Compatible with aliquot tubes in 3 sizes
- All commonly used source and target carriers are freely configurable

To keep the analysis time as short as possible, tests must be conducted on several analysis devices at the same time. For this purpose, sample material from a primary tube is distributed into one or several secondary tubes.

Compared with other pre-analytical work steps, the subdistribution of samples into secondary tubes is a slow process. It is therefore beneficial for the throughput times of patient samples to separate this processing step from other steps of sample preparation. The AL-Flex provides the technical solution for this.

Open primary tubes intended for subdistribution are loaded into the system in predefined source carriers. In the laboratory information system (LIS), a query for every primary tube retrieves the information for the required secondary tubes. The AL-Flex labels each secondary vessel with a copy of the primary barcode and pipettes the required volume into it. Conductive disposable tips facilitate precise fill level measuring and contamination-free pipetting. Secondary and primary vessels are both transferred onto previously defined target carriers and manually brought to the analysis unit for further processing.



Sampling from a primary tube



Conductive disposable tips for precise filllevel measurement and contamination-free pipetting



Aliquot tubes in three sizes
92 x 15 mm (5 ml)
75 x 13 mm (2.5 ml)
75 x 13 mm (5 ml)



Loading of unracked sample tubes



BL 1200
SORT CONNECT
BL 1200
HCTS2000 MK2

- Ideal in combination with all analysis lines
- Sample tubes can be fed in bulk, without pre-sorting
- For all closed tubes 75-120 mm in length and 11-19 mm in diameter (each with cap), including those with false bottoms
- For all sample types (serum/plasma, serum gel/plasma gel, EDTA, citrate, blood glucose, urine)
- Integral ID module
- Automated sample entry accessioning
- Task-orientated sorting into bins, racks or on the laboratory line
- Safe, rapid and error-free continuous operation

System range:

BL 1200 SORT CONNECT – from bulk loader to track (bulk to track)

- Pre-sort sample tubes and transfer selectively to the laboratory line
- Modular configuration possible
- Throughput of up to 1,200 tubes per hour

BL 1200 – from bulk loader to rack (bulk to rack)

- Throughput of up to 1,200 tubes per hour
- The capacity is up to 600 tubes per platform sorting surface,
- Up to 1,200 tubes with two platforms

HCTS2000 MK2 – from bulk loader to bin

- Throughput of up to 2,000 tubes per hour
- Up to 22 distribution targets, plus 1 faulty sample compartment
- Up to 200 tubes per target bin

Request our individual brochures.

BL 1200
SORT CONNECT
BL 1200
HCTS2000 MK2

Video at www.sarstedt.com



Loading of unracked sample tubes



Sorting into BL 1200 target rack



Distribution to HCTS2000 MK2 target bins



Transfer to laboratory line

Multifunctional with high throughput



HSS 1625

- Modular configuration for pre- and post-analytics possible
- Specimen feeding via bulk loader or rack loader module
- ID module with camera (barcode, tube type)
- Decapper module for screw caps and push caps
- Recapper module for universal archiving caps or screw cap S 13 or S 15
- Sorter module for many common analysis device racks or archiving racks
- High throughput of up to 1,200 tubes per hour
- FlexPlates for adapting the platform layout (rack loader and sorter)

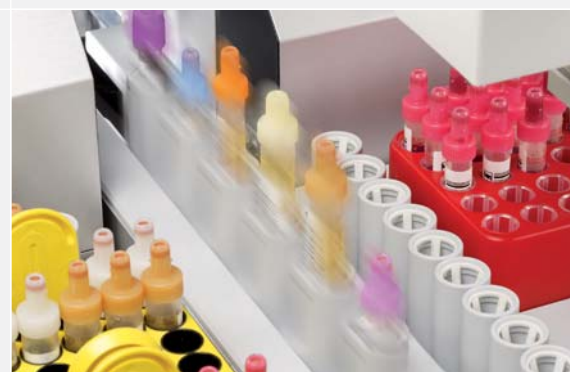
With a throughput of up to **1,200 tubes per hour**, the HSS is ideally suited for rapid and flexible sorting of sample tubes before and after analysis tasks.

Sample tubes are fed in via bulk loader or in the rack loader module.

The HSS registers the barcode and tube type, opens the sample tubes according to the workstation and then transfers them into any common rack types (e.g. Abbott, Beckmann, Roche, Siemens, etc.) for analysis.

After routine analysis, the sample tubes can be sorted again or taken directly from the analyser racks, recapped and transferred to archiving racks.

The customer-specific configuration of the layout for various carriers can be easily and completely modified by putting on a **FlexPlate**. This allows, for example, a variety of source and target carriers to be used for routine and archival throughputs.



Short cycle time of just 3 seconds



Flexibility with a variable platform



Pre- and post-analytical applications



... ideal for aliquoting



- All-in-one system for pre- and post-analytics
- Scalable from 1625 to 2625
- Ideal in combination with any analysis line
- Customer-specific configuration with modules:
 - Sample loading in racks or in bulk
 - ID module
 - Decapper
 - Recapper
 - Aliquoter
 - Sorter
- For all common tube types: 13-16 mm in diameter and 65-100 mm in length
- Compatible with all common rack and carrier systems

The PVS 1625 is a customer-specific configured automation system for **pre- and post-analytic processing of samples**. It is not bound to specific rack or holder systems, but can process any source and target carriers. As an open system, it is complementary to any analysis line or can be used independently.

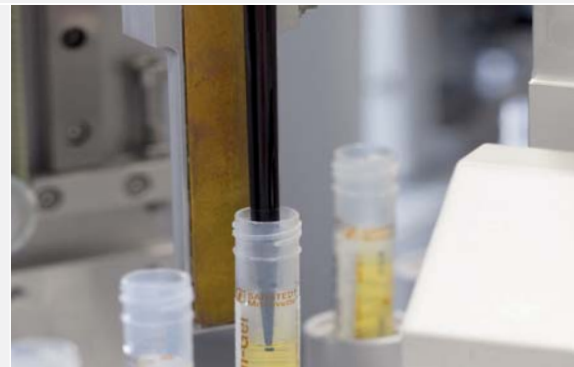
Unracked sample tubes are loaded via the **Bulk Loader** (see p. 14) or in racks via the loading platform. This makes it equally capable of processing closed and open tubes.

The **ID module** with camera reads out the barcode and identifies features such as cap colour and tube type.

Barcoded secondary tubes are produced and the requested volumes pipetted into them at the **aliquoter**. Sample mix-ups are eliminated and the available sample amount will be used in the most efficient way.

Two types of **recapper modules** are available for archiving or for send-out samples. Tubes are either closed with an archiving push cap (all diameters from 13-16 mm) or with a screw cap (SARSTEDT tubes with a diameter of 13 or 15 mm, e.g. S-Monovette®).

For aliquot tubes and caps, see page 30.



Sampling from a primary tube



Dispensing into a secondary tube



Aliquot unit





Assemble a system tailored to your individual needs!



- Sample loading
- Identifying
- Decapping
- Aliquoting
- Recapping
- Sorting/archiving

Sample loading

With the **bulk loader** module, closed sample tubes are loaded by pouring them into the chute of the bulk loader, i.e. without having to handle each individual tube separately. Alternatively, open or closed sample tubes in any rack or tray are placed onto the loading platform and fed from there into the system. Use of the FlexPlate provides the maximum number of options for sample carriers (see p. 17).

Identifying

- Barcode
- Tube type: Cap colour, length, diameter
- Plausibility check

For precise sample processing, each tube must be identified by the barcode, which can also include information about the sample material. Lastly, the tube type is also important for trouble-free processing. The **ID module** with camera detects features such as the barcode, cap colour and shape of the tube.

Opening (decapper)

- Push cap
- Screw cap

The **decapper** module opens screw cap and push cap tubes. All tubes 11-19 mm in diameter and 75-120 mm in length (each with cap) are processed in a mixed operation and without prior sorting (additional sizes upon request).

The push caps and screw caps are safely removed and disposed of hygienically.

Aliquoting

The **aliquoter** produces barcoded secondary tubes and fills these with the required volumes. Sample mix-ups are avoided and the available sample volume is used in the most efficient way. Refer to p. 30 for information on available secondary tubes.

The **AMC** module pipettes small volumes into multiwell plates or cluster tubes for space-saving long-term archiving or for bio-banking. Archiving is thus integrated into the routine process, eliminating the need for a separate work step.

Closing (recapper)

- Universal push caps
- Screw caps for SARSTEDT tubes (e.g. S-Monovette®)

Two types of **recapper** modules are available. Tubes are either closed with a universal stopper suitable for all diameters from 13-16 mm or with a screw cap for SARSTEDT tubes (e.g. S-Monovette®) with a diameter of 13 or 15 mm.

Sorting/archiving

The sample tubes are **sorted** according to analysis requests from the LIS (laboratory information system) or according to strict distribution rules, e.g. cap colour. All common rack and carrier systems can be used (see FlexPlate, p. 17).

For the Bulk Loader HCTS2000 MK2, unranked tubes are sorted into **target bins** for individual working areas.

Tubes destined for archiving are logged with sample ID, carrier ID, position and time stamp. Seamless sample tracking enables immediate access to all samples.



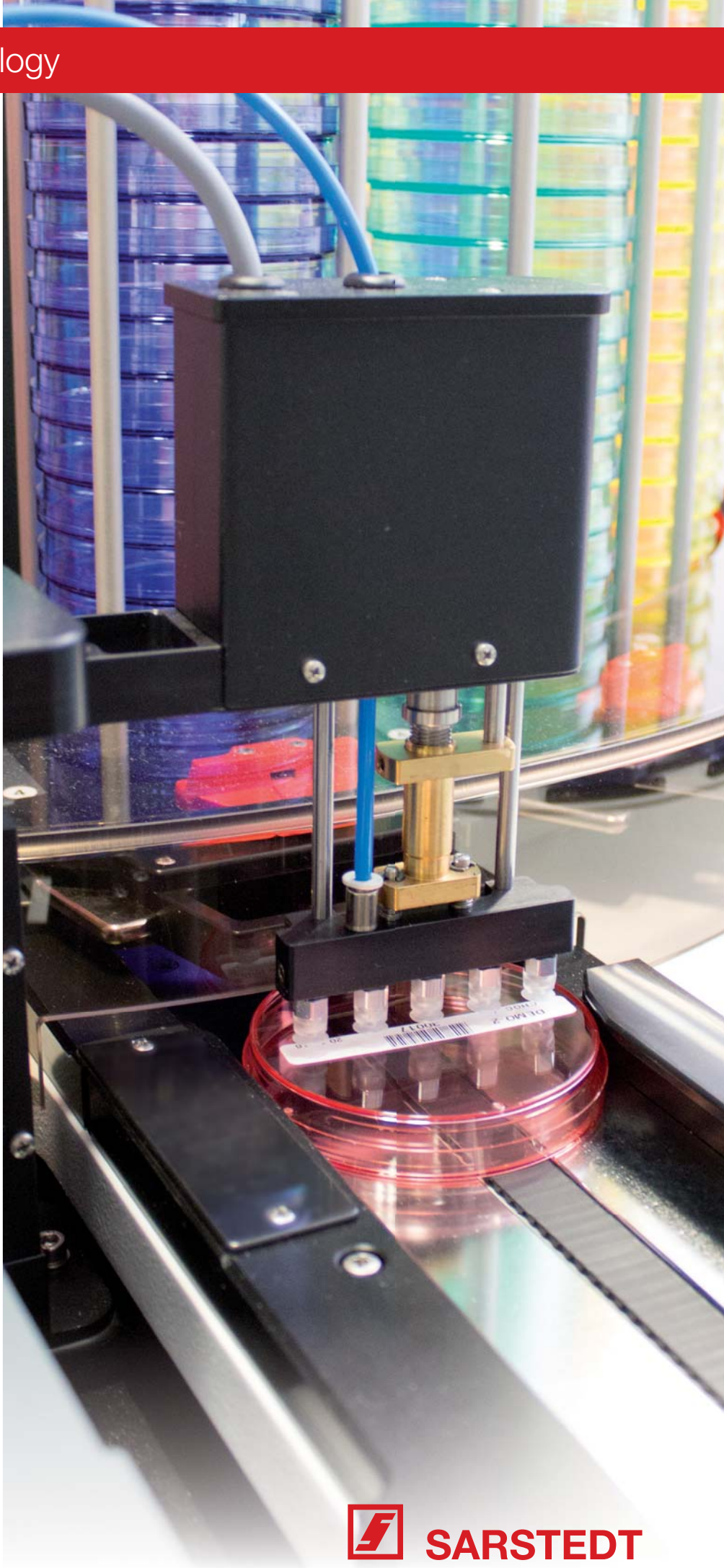
Microbiology

Automation in Microbiology

In times of increasing quality requirements coupled with scarcer human resources, the field of microbiology too must make increasing use of automation. New developments in collection materials and increasing standardisation are helping to take this process forward. In this area as well, SARSTEDT has more than 25 years of experience.

The working steps required to prepare culture medium plates before the sample smears in particular can be made more transparent, safer and more efficient with a **Petri Dish Organisation System**. Mix-ups are avoided while maintaining a consistently high throughput.

With the SARSTEDT **Petri Dish Transfer System**, laboratory processes can be shortened considerably by automatically delivering sets of plates to the streaking station.



Petri Dish Organisation System



POS 720/2

- Low personnel requirement and easy to operate
- Reliable provision of all required Petri dishes
- Error-free machine-readable labelling of plates with barcode and plain text
- Reliable identification of plates throughout processing
- Additional labels for special media and bouillons available at the streaking station.

With **POS 720/2** up to **650 Petri dishes per hour** are labelled and stacked in sets in a fully automatic process.

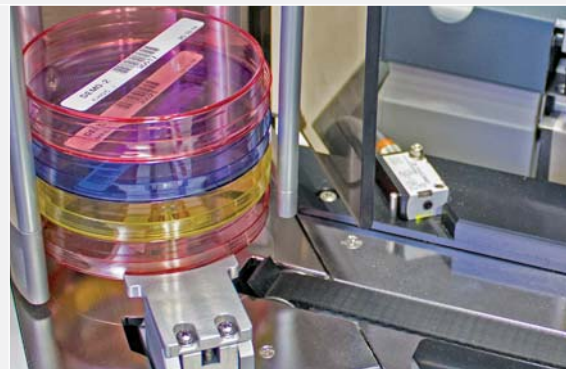
With a capacity of 600 plates (15 magazines of 40 plates each), the system offers high capacity and flexibility.

Prevention of errors in labeling and reading and more transparency in the workflows increase the quality and competitiveness in a microbiology laboratory.

Space for up to 8 stacks, each with 18 plates



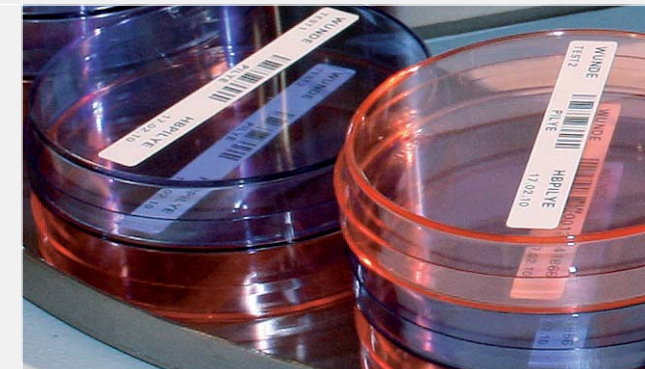
Plate magazine for up to 15 cultures



Stacker for plate sets



Label on the side...



...or on the base

Petri Dish Transfer System



PTS

- Transport system for stacks of plates to the streaking stations
- Customised configuration of the track length and route
- Low personnel requirement and easy to operate
- Reliable provision of all required Petri dishes
- Reliable identification of plates throughout processing
- Additional labels for special media and bouillons available at the streaking station.

The Petri Dish Transfer System **PTS** transports the plate stacks prepared by the POS 720/2 to the streaking stations. It is configured for the specific customer, is free-standing and height-adjustable within a defined range. Laboratory tables and benches can be positioned close to the **PTS**.

The design is based on the individual requirement of the culture medium at the respective workstations. Samples are identified by scanning and the plates required thus specified. These are sorted and labelled by the POS 720/2 and transported by the PTS to the requesting workstation.



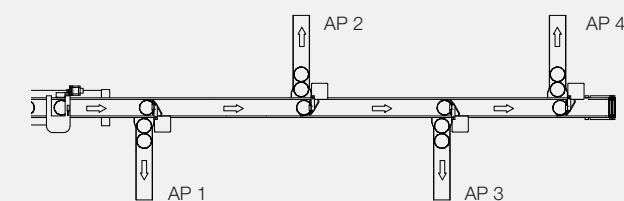
Plate labelled with required information



Plate transport

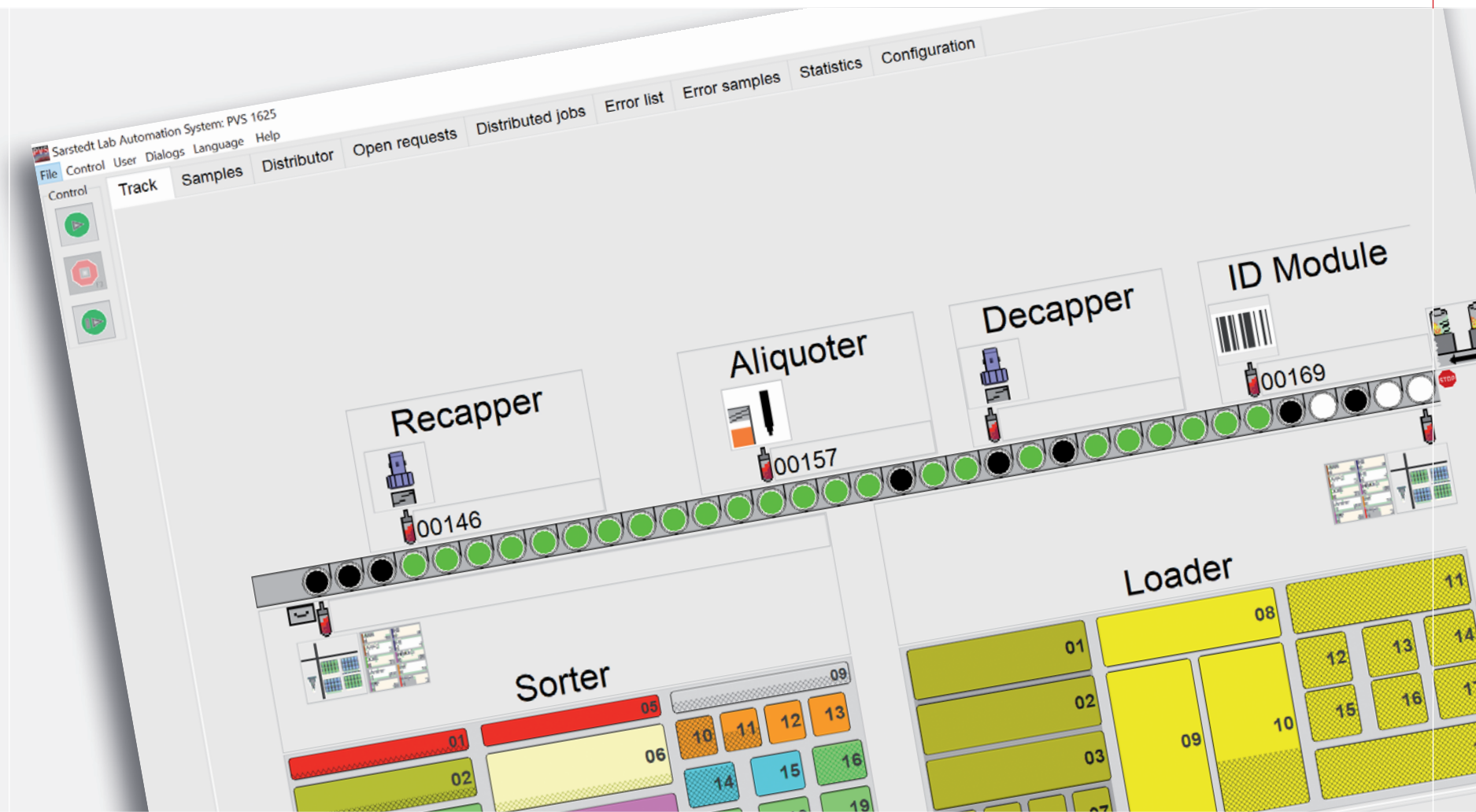


Transfer to streaking station



Layout example for PTS with four workstations (AP1-AP4)

Intelligent distribution, transparent configuration and intuitive handling



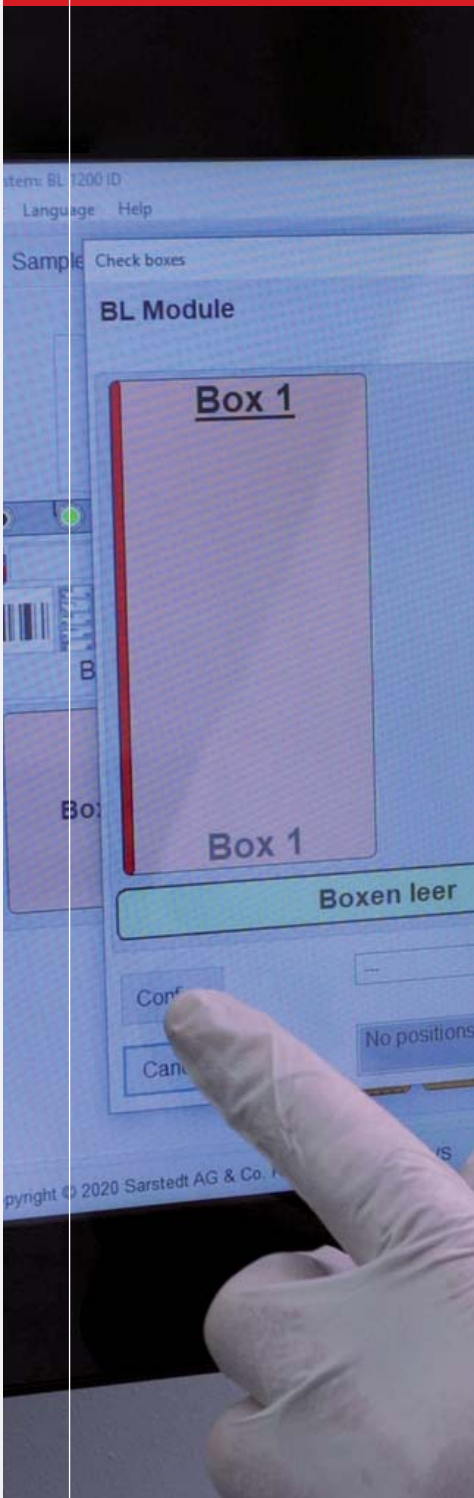
The control and operating software is so versatile, just like the laboratory automation systems themselves. Software development, maintenance and system know-how are among SARSTEDT's areas of expertise.

Special features:

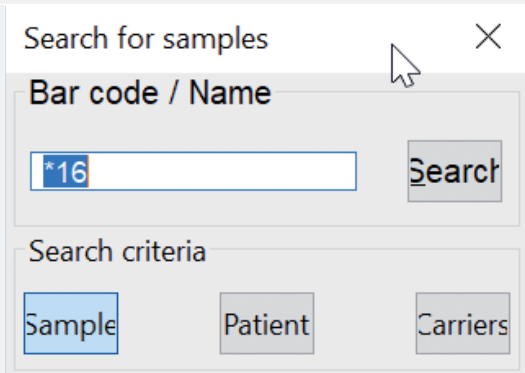
- Easy-to-learn system operation
- Swift and simple configuration
- Transparent system status layout
- Effortless sample tracking
- Optimal archiving sample administration
- Plausibility check
- Completeness check
- Quick access to information on faulty samples
- Comprehensive statistical functions

The program is available on a Windows-based touch panel PC which is an integral system component. As the graphical user interface (GUI), it links both the user to the automation system and the automation system to the laboratory information system (LIS) or to any middleware installed. It enables clear visualisation of system components. It displays internal sample transport paths, logistical transfer, the orientation and filling status of the carriers on the feeding and release platforms, as well as the current status of the functional modules.

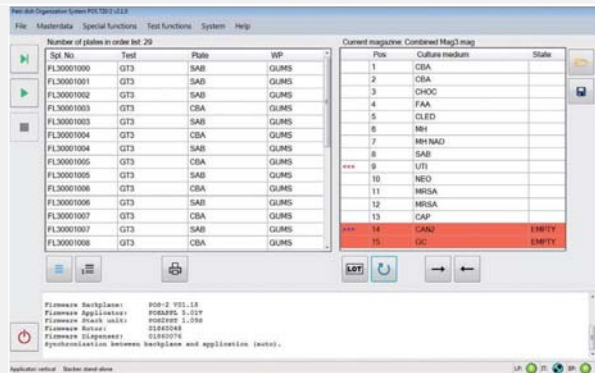
There are almost no limits to the configuration of workstations, carriers, tests, and the processing of special distribution rules and priority criteria. Information on the sample processing status and orders can be easily retrieved. Statistical data can also be prepared and provided. The information storage period on the database can be defined according to customised requirements. Communication between the automation system and LIS proceeds in query mode or batch mode.



Tube type identification



Sample traceability



Definition of the culture media for POS 720/PTS

Clinical Laboratories

S-Monovette®



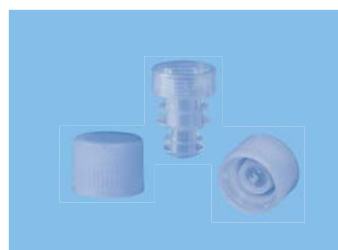
With the advent of automation in the clinical laboratory, the requirements for blood collection tubes have changed. These blood collection tubes must comply with defined preconditions for specimen identification using barcode readers, centrifugation, decapping, recapping, sub-distribution, and the transportation of samples in pucks in analysis lines. The S-Monovette® 75 x 13 mm is ideally suited to meet these requirements and is available with any preparation.

Aliquot tubes



Depending on the application, aliquot tubes are available in a diameter of 13 or 15 mm, with or without false bottom, and with a push or screw cap. If required, the tubes are automatically recapped. Screw cap tubes are ideal for long-term archiving and transport.

Archiving push caps and screw caps



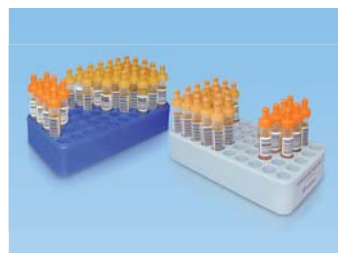
Archiving push caps for any tube 13–16 mm in diameter are ideal to minimise the evaporation of sample material during storage. The push cap can be automatically pressed in and taken out again. The screw cap is an ideal solution for long-term archiving and transport.

Pipette tips



A conductive black tip is used for sub-distributing into aliquot tubes. The fluid level is determined conductively. During pipetting, the tip descends as the fluid level drops. The slim shape enables pipetting from narrow tubes.

Racks



The universal block rack made from polypropylene is highly resilient, stackable and autoclavable. It makes an ideal target carrier for various workstations on specimen distribution systems as well as for archiving. The double or quadruple blocks, in particular, provide a space-saving solution for the storage of samples. Availability in a range of colours enhances clarity at the workstation and in the archive.

Microbiology

Petri dishes



Made of crystal-clear polystyrene, our Petri dishes for use with hot agar are heat-resistant to 80°C. Due to their high dimensional stability, they are particularly suited for all automated processing steps from labeling, stacking, streaking and incubation through to automated analysis.

Diagnostics

- Venous blood
- Capillary blood
- Blood gas
- Urine and faeces
- Saliva/sputum
- Miscellaneous applications
- Transport
- Multi-Safe
- Blood sedimentation

Laboratory

- Reagent and centrifuge tubes
- Screw cap micro tubes and reaction tubes
- Cell and tissue culture
- General laboratory products
- Forensics
- Racks and storage boxes
- Environmental technology
- Centrifuges
- Mixing equipment

Clinical products

- Urine drainage
- Infusion and transfusion
- Regional anaesthesia
- Other medical products
- Heating
- Syringe labels
- General hospital ward articles

Transfusion

- Blood mixing carts and weighing equipment
- Sealing and streaking out
- Transport and storage
- Incubators and agitators
- Special products for blood donation



*If you have any questions,
we'd be happy to help!*

Visit our website: www.sarstedt.com



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