Laboratory Automation
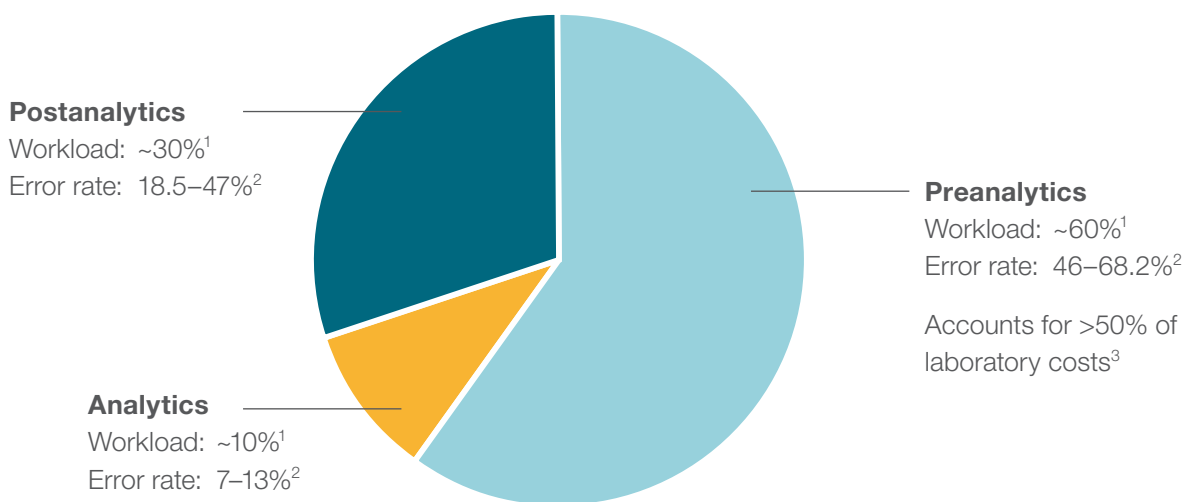
True automation. True flexibility.

Thermo Scientific TCAutomation
laboratory automation solution

thermo scientific

Automation promotes efficiency and safety

Many **pre- and postanalytical processing steps** are **highly complex** and **labor-intensive**.

Postanalytics
Workload: ~30%[1]
Error rate: 18.5–47%[2]

Analytics
Workload: ~10%[1]
Error rate: 7–13%[2]

Preanalytics
Workload: ~60%[1]
Error rate: 46–68.2%[2]

Accounts for >50% of laboratory costs[3]

Benefits of automation

>70%
reduction of error rate[4]

50%
less turnaround time[4]

47%
increased productivity[5]

Lower infection risk for lab techs

Virus transmission through high-concentration bioaerosols is possible in case of long-term exposure in a relatively closed environment. Automation limits the infection risk by reducing direct human involvement in clinical laboratory processes.

Thermo Scientific TCAutomation solution

➡ open ➡ flexible ➡ scalable

Cost-effectiveness & safety

The Thermo Scientific™ TCAutomation™ solution offers **high sample throughput**, **improves efficiency, minimizes errors**, and **enhances safety** by lowering the risk of infection for laboratory professionals.

Comprehensive workflow support

The TCAutomation solution seamlessly automates **pre- and postanalytics** and combines all **analytical systems** within a single workcell.
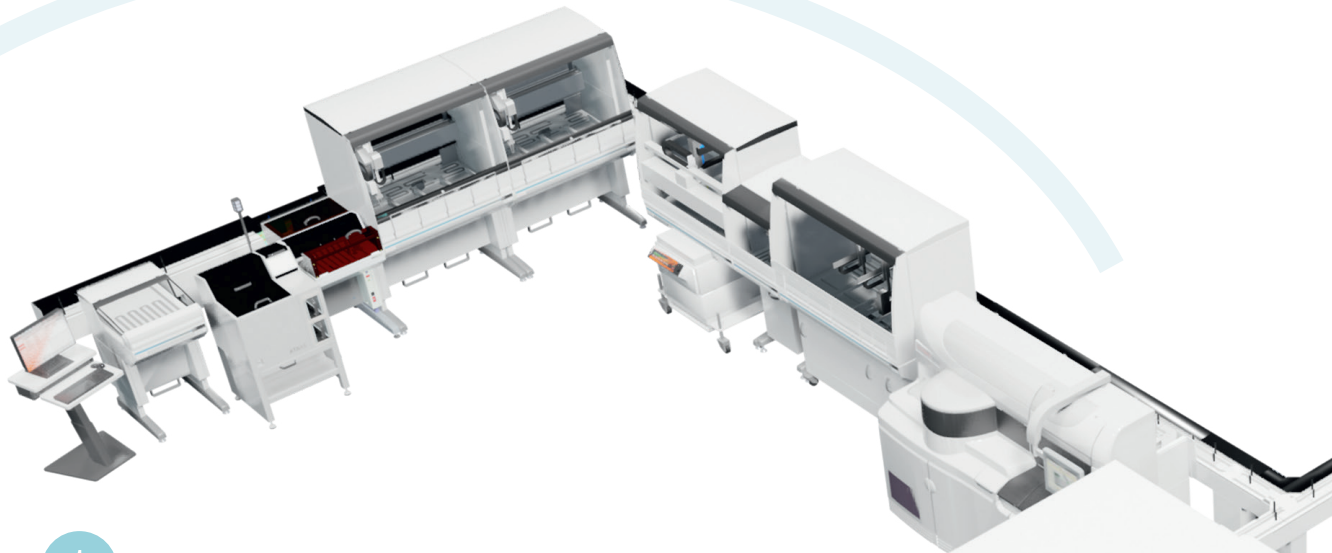
Unlimited flexibility

The TCAutomation solution offers a **broad range of modules** for any configuration and is expandable anytime to boost productivity.
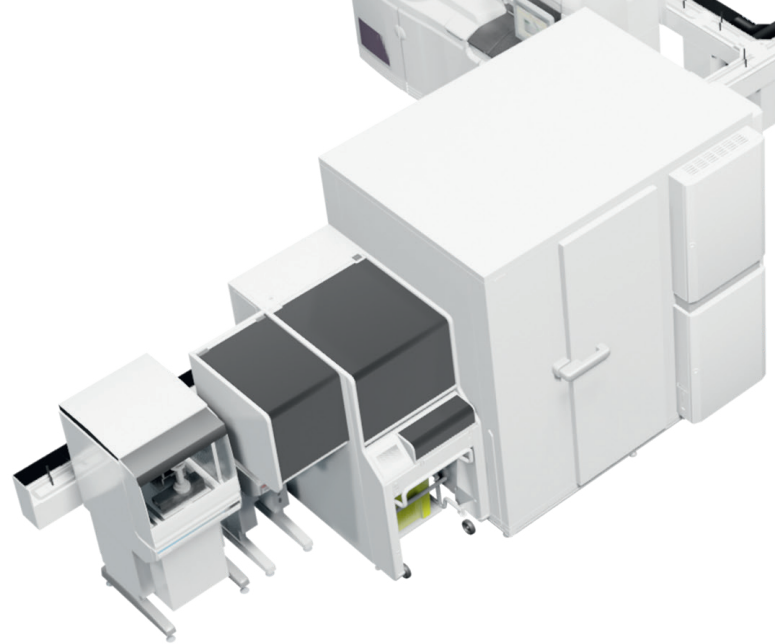
Simplify your workflow

The TCAutomation solution offers a great variety of options for automation at any stage.

1 **Efficient preanalytics**
- Sample entry and sorting
- Centrifugation
- Decapping
- Aliquoting and labeling

3 **Easy postanalytics**
- Sorting
- Recapping
- Storage/cold storage with automatic disposal

Seamless analyzer integration
- Modular solutions for clinical chemistry, immunochemistry, coagulation, and hematology
- Options for point-in-space, robotic, and track-to-track interfaces

High throughput for your laboratory

Depending on your setup, the TCAutomation solution can process **up to 1,200 tubes per hour**.

1 Efficient preanalytics

The TCAutomation solution allows you to automate labor-intensive preanalytical tasks. Thanks to the unique expandable concept, you can easily add additional modules in the future.

Fast sample input and sorting
The TCAutomation solution offers a choice between manual and fully automated robotic sample entry.

Manual
- **TCAutomation Entry** – for loading sample tubes one by one

Automatic
- **ES Flex** – fully automated sample input, output, and sorting
- **BES Flex** – for sample tube batches

High-throughput centrifugation
The **Centrifuge module** allows you to automate loading, balancing, and unloading of centrifuge racks.

- Three robotic arms for optimum performance
- User-definable parameters for added flexibility
- Temperature-controlled

Efficient decapping

With the **Decapper Flex module**, you can efficiently remove caps from a variety of primary tubes.
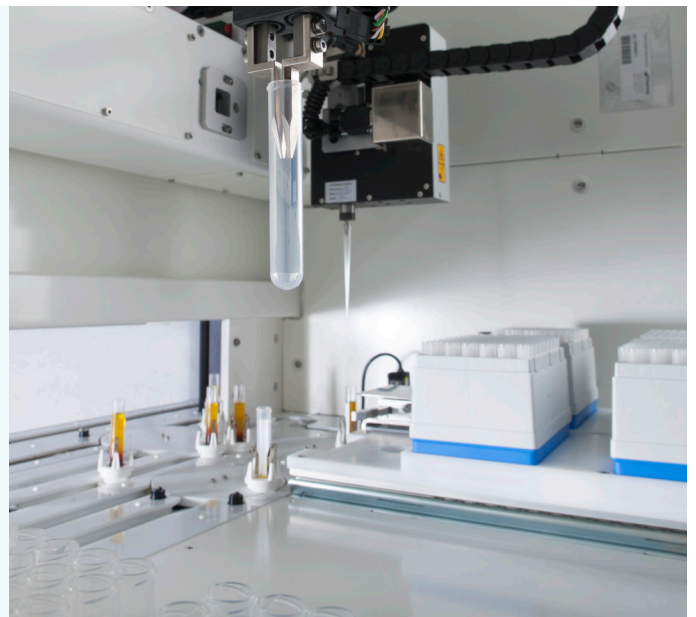
- Identifies tube height and diameter
- Works with traditional rubber as well as screw caps

Reliable aliquoting & labeling

The **Aliquoter & Labeler module** prepares secondary tubes and dispenses aliquots from primary samples into them.
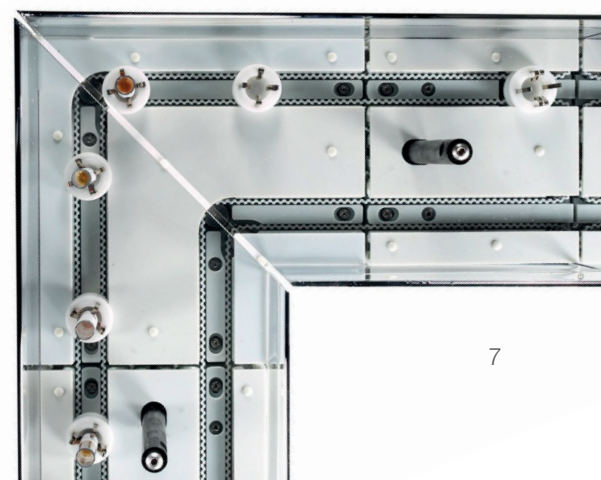
- User-definable rules
  (for max. 9 secondary tubes)
- Disposable tips
- Level sensing and clot detection
- Label application with customizable fields

Custom fit, universal convenience

Thanks to a **wide selection of conveyors**, the TCAutomation solution can be tailored exactly to your space requirements.

The **multitube carrier** with embedded microchip helps you minimize barcode reading and thereby reduces the risk of errors.

② Seamless analyzer integration

In addition to simplifying the entire analytical chain, the TCAutomation solution also permits seamless integration of multiple analyzers from different manufacturers.
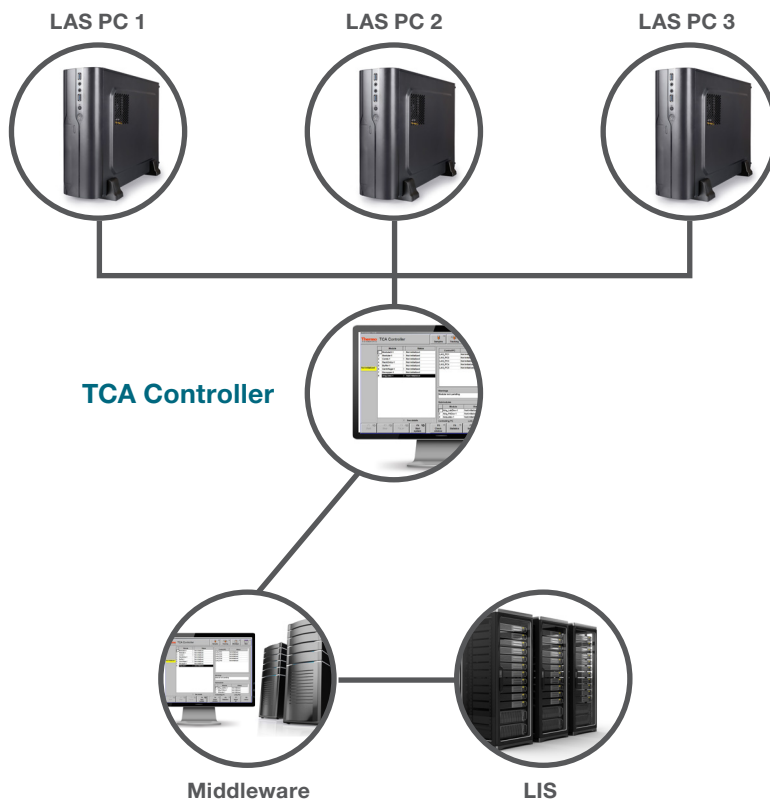
Easy integration of different analyzers
Combining two or more analyzers into one system offers increased throughput, higher efficiency, and longer walk-away time.

Analyzer interface modules for point-in-space system connections

Robotic analyzer interfaces for tube transfer from carriers to racks

CRA Interface module for integrating Roche automation systems

LAS PC 1   LAS PC 2   LAS PC 3

TCA Controller

Middleware   LIS

Centralized control via software
The TCAutomation Controller takes care of all the routing within the system.
- Easy operations
- Error handling
- TCP/IP connection to customer middleware or LIS

3 Easy postanalytics

The TCAutomation solution reduces the need for direct human involvement in key steps following analysis, helping you ensure fast turnaround in your laboratory.

Flexible recapping

The **Recapper module** caps tubes of different types and sizes.

- Primary tubes & TCA Aliquoter secondary tubes
- Continuous loading of caps without interruptions

Intelligent cold storage

The **Cold Storage system** offers flexible options for sample storage.
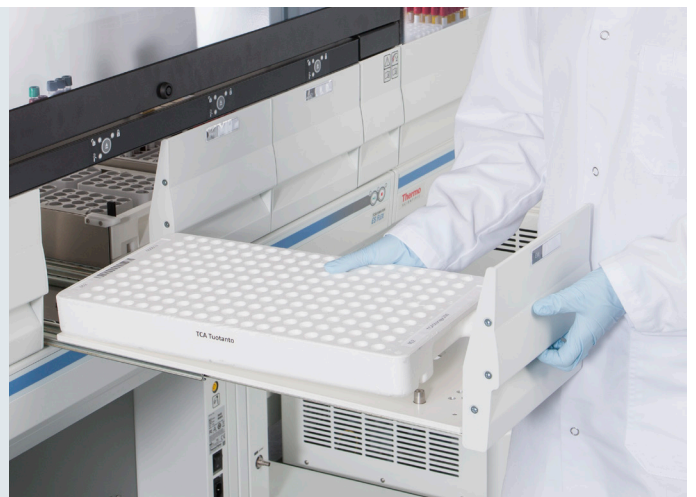
- Programmable storage profiles
- Automatic sample retrieval and discharge
- Manual tube retrieval option

Streamlined sorting

The TCAutomation solution permits fully automatic sample sorting.

ES Flex – fully automated robotic sorting for a variety of analyzer-specific or storage racks
BES Flex – user-specific sorting into target bins
Exit module – for single-tube sorting and exit

Unique expandable concept

From small systems to high-volume configurations, the TCAutomation solution is designed to meet the needs of your laboratory.

Flexible configuration

Depending on the available space and your laboratory's workload, the configuration options range from smaller to expansive setups that include several modules of the same type.

Fast installation

Each system is carefully planned based on the individual floor plan requirements, and then preadjusted and tested during production. This allows for fast installation, so that you can start working with the TCAutomation solution in no time.

Easy expansion in the future

Your system can always be expanded later. To achieve greater throughput, you can simply add additional modules or opt for new interfaces to different analyzers.
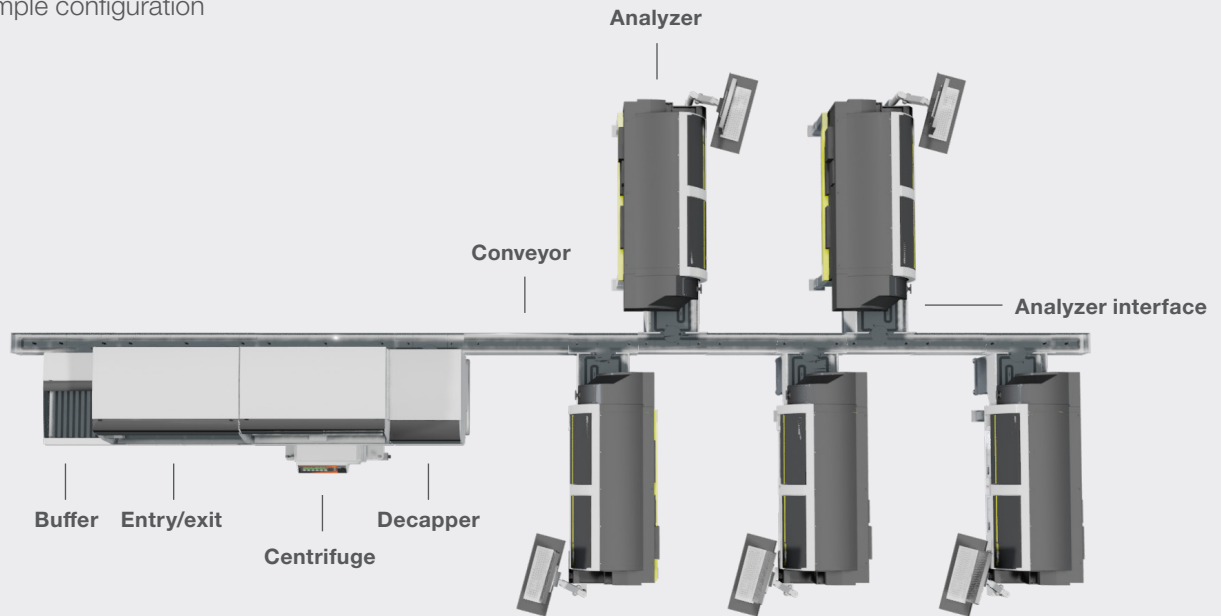
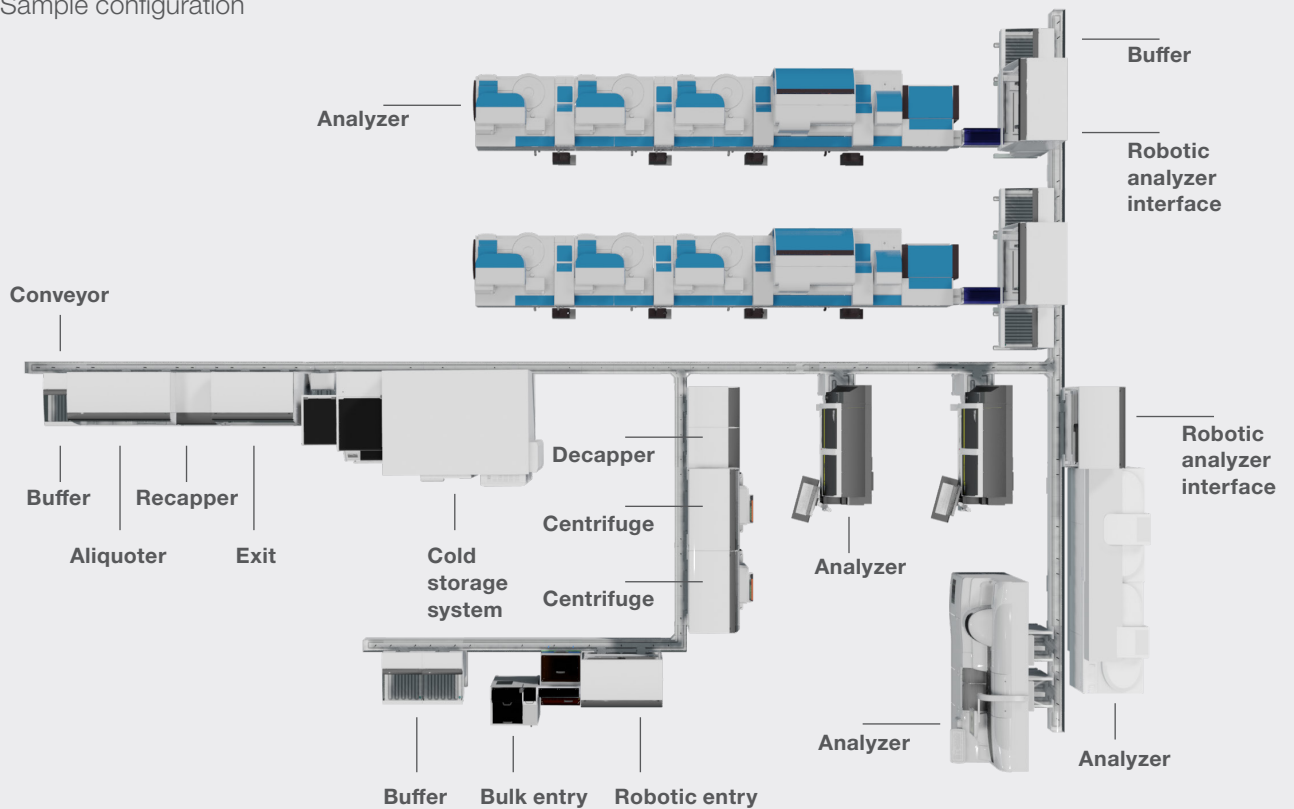## Preanalytical system
Sample configuration

Conveyor

Recapper   Buffer   Entry/exit   Centrifuge   Decapper   Aliquoter

Workcell setup

Sample configuration

Analyzer

Conveyor

Analyzer interface

Buffer   Entry/exit

Centrifuge

Decapper

Total laboratory automation

Sample configuration

Buffer

Analyzer

Robotic
analyzer
interface

Conveyor

Robotic
analyzer
interface

Buffer   Recapper

Decapper

Aliquoter   Exit

Centrifuge

Cold
storage
system

Centrifuge

Analyzer

Analyzer

Buffer   Bulk entry   Robotic entry

Analyzer

Analyzer

Quality and environmental management systems
ISO 9001:2015 – certified by BSI
ISO 13485:2016 – certified by BSI
ISO 14001:2015 – certified by BSI
MDSAP ISO 13485:2016 – certified by BSI

25+ years of experience in laboratory automation

TCAutomation laboratory automation systems are installed and sold worldwide through our trusted partners. The systems' development takes place in Vantaa, Finland. **Thermo Fisher Scientific's Vantaa Center of Excellence** is a high-tech powerhouse known for advanced IVD instrumentation and laboratory automation solutions. The center complies with the requirements of the FDA, and various international institutions.

References
1. Robotic lab automation: specimen transport robots, robotic centrifugation, capping robots, robotic liquid handlers, and other clinical laboratory systems. MarketResearch.com, published May 2017. Lenicek Krleza J, Honovic L, Vlasic Tanaskovic J et al. (2019) Post-analytical laboratory work: national recommendations from the Working Group for Post-analytics on behalf of the Croatian Society of Medical Biochemistry and Laboratory Medicine. *Biochem Med* 29(2):020502.
2. Da Rin G (2009) Pre-analytical workstations: a tool for reducing laboratory errors. *Clin Chim Acta* 404(1): 68–74.
3. The worldwide market for in vitro diagnostic tests: 12th edition. MarketResearch.com, published August 2019.
4. Global laboratory automation systems market – analysis and forecast (2017–2026). BIS Research, February 2018.
5. Puustinen M (2013) From preanalytical sample handing to total automation in a laboratory of clinical chemistry: a prospective study. University of Eastern Finland Licentiate Thesis.

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