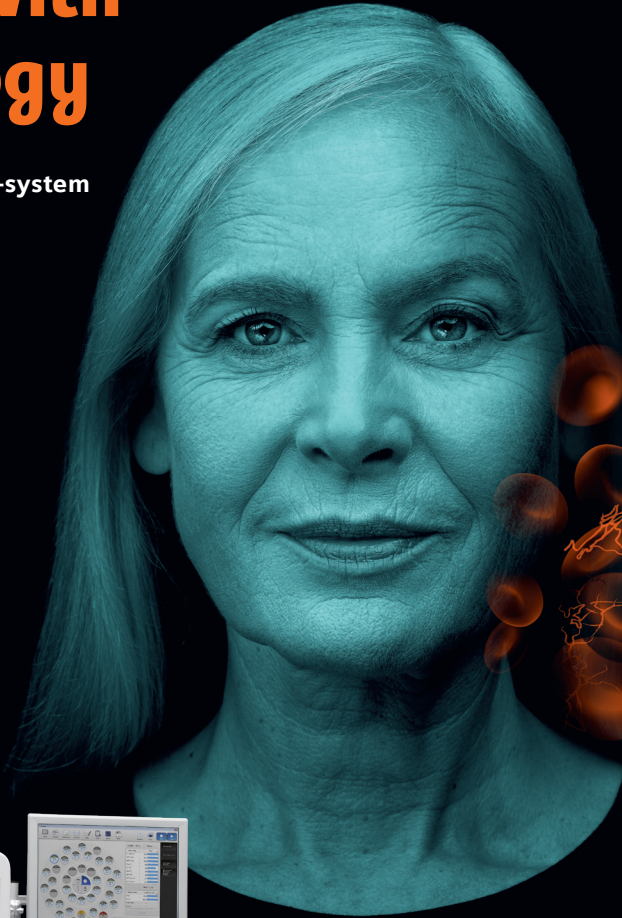


CS-5100 Hemostasis System

Break through the routine with PSI technology

siemens-healthineers.com/cs-5100-system



SIEMENS
Healthineers 

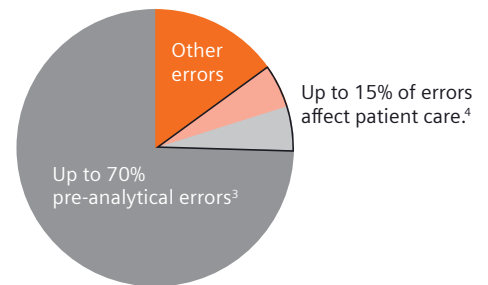
Overcome pre-analytical errors in hemostasis testing

For faster diagnosis and reliable monitoring

Pre-analytical errors may affect testing and patient outcomes

- Underfilling of sample tubes may cause significant sample dilution and provide falsely prolonged clotting times.¹
- Hemolytic specimens are the leading cause of pre-analytical variability and have been shown to negatively affect medical care.²
- Icteric specimens cannot be reliably identified by visual inspection alone, requiring photometric detection instead.³
- Lipemic specimens have been shown to affect the activity levels of clotting factors.¹

Diagnostic errors in the lab



Break through routine levels of performance with CS-5100 System

With high precision in high-volume hemostasis testing

Fully automated solution features PSI technology and automation connectivity

CS-5100 Hemostasis System is a random-access, high-volume coagulation analyzer. It offers large and multisite labs advanced features and benefits for a streamlined workflow and reliable test results.

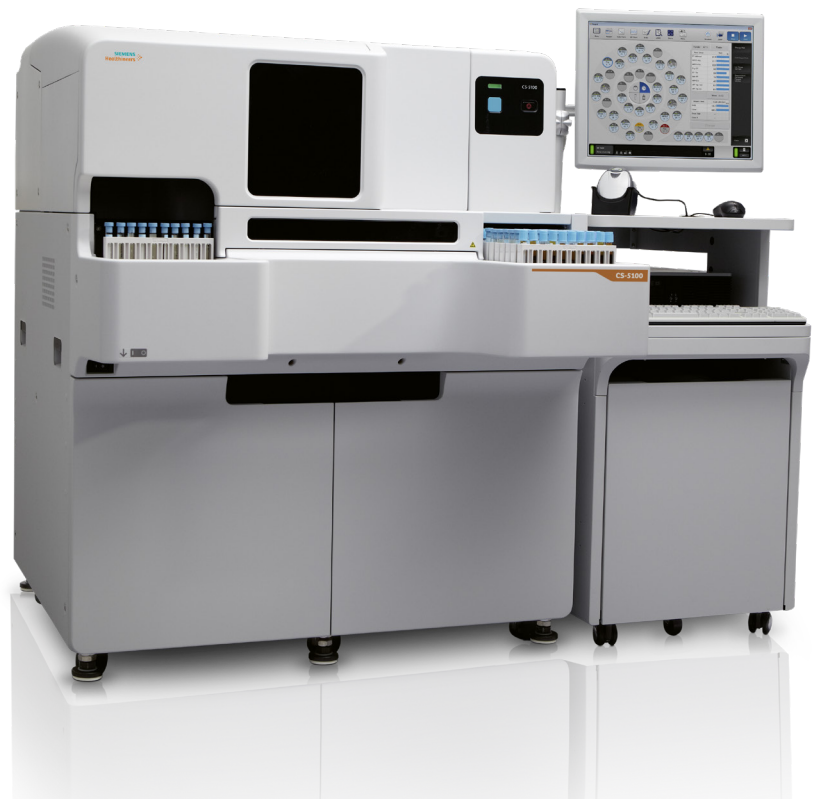
With assay-based pre-analytical sample-quality checks using PSI® technology and simultaneous multiwavelength scanning to identify and manage unsuitable test specimen prior to analysis, CS-5100 System helps high-volume laboratories manage these errors and reduce reruns.

“High throughput and improved workflow [are] delivered with a high level of precision.”⁵

Woolley A, Kitchen S.
Sheffield Teaching Hospitals, UK
NHS Foundation Trust

CS-5100 System delivers advanced diagnostic workstation capabilities:

- Speed
- Security
- Capacity
- Consistency
- Connectivity



The trusted hemostasis partner you can count on

Let's go beyond hemostasis testing—today, tomorrow, and in the future

Siemens Healthineers is one of the world's largest providers of hemostasis solutions. With a scalable and integrated portfolio, backed by a dedicated team, we're committed to fulfilling your current and future laboratory requirements in hemostasis and beyond.

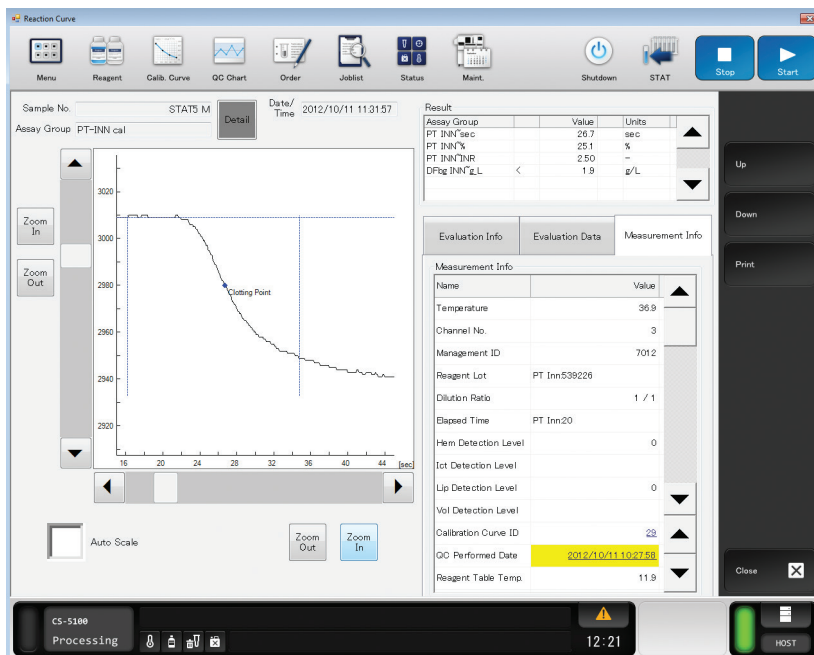
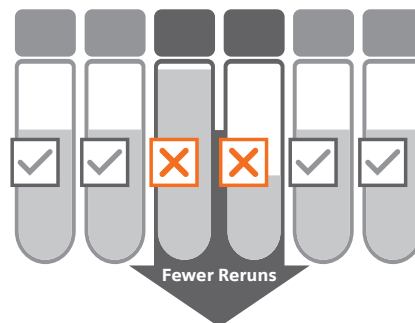
Boost your lab quality and efficiency

Through intelligent sample management and reduced reruns

PSI checks reduce pre-analytical concerns

CS-5100 System helps high-volume labs achieve reliable results by identifying and automatically managing potentially problematic test samples prior to analysis, minimizing the need for manual sample inspections and maximizing operator support. The system automates and standardizes sample management for reliable results.

- Automates primary-tube sample-volume checks to identify potential inaccuracies caused by improper sample collection.
 - Sample results from collection tubes with improper sample volume are flagged for review and recording purposes.
- Qualitative detection of hemolysis, icterus, and lipemia (HIL) is provided with a pre-analytical scan of the patient sample performed at three wavelengths—405 nm, 575 nm, and 660 nm—allowing assay-based flagging.



Sample result details with reaction curve.

Harness the power of multiwavelength analysis

For a wide variety of test profiles

Simultaneous scanning of clotting reactions

The wide optical spectrum of the CS-5100 System provides four different measurement principles, allowing clotting, chromogenic, immunologic, and aggregation/agglutination testing capabilities on a single, high-volume platform.

- Simultaneous multiwavelength scanning of clotting reactions is performed at 340 nm, 405 nm, 575 nm, 660 nm, and 800 nm in all detector channels.
 - Automatic selection of optimal wavelengths reduces effects of interfering substances on absorbance spectra.
 - 20 reaction detectors enable high-throughput capacity for a variety of test profiles.

“Photo-optical clot detection provides multiple advantages over mechanical detection systems.”⁶

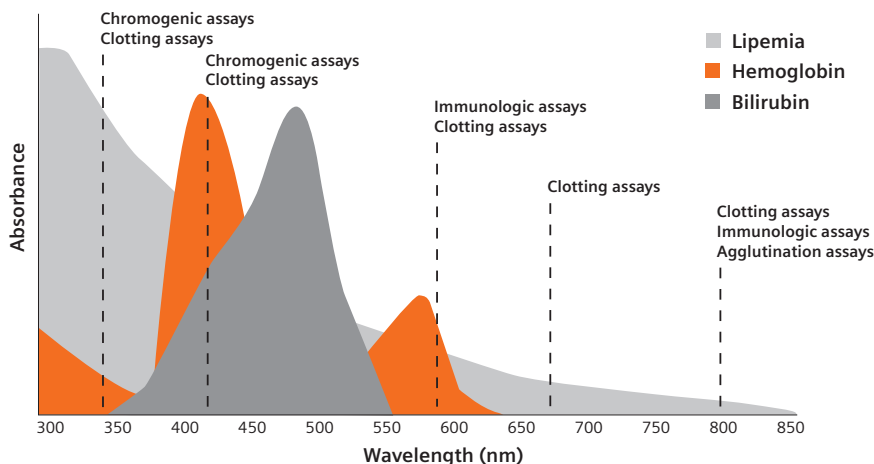
Woolley A, Kitchen S.
Sheffield Teaching Hospitals, UK
NHS Foundation Trust

Pre-analytical interferences associated with diagnostic errors in hemostasis^{4,7,8}

	Hemolysis	Icterus	Lipemia	Improper Tube Filling
Falsely Increased Results	PT, APTT, D-dimer, FV, FVII, FX	PT, Fibrinogen	Antithrombin	PT, APTT
Unaffected Results	APTT		PT, APTT	
Falsely Decreased Results	APTT, Fibrinogen, Antithrombin, Thrombin Time	Antithrombin	Fibrinogen	D-dimer

Reliable test results from simultaneous multiwavelength scanning

Spectra of Interfering Substances



Simultaneous multiwavelength scanning of clotting reactions help manage interfering substances.

The level of hemolysis causing clinically important changes is test-specific; therefore, test-specific thresholds should be used to assess patient samples that have hemolyzed during collection and/or processing.⁹

Break through the routine with powerful, high-capacity performance to improve lab productivity



1

High sample-processing throughput with fast TAT facilitates quicker diagnosis and monitoring.

- Processes up to 400 tests per hour for PT/APTT.*
- Third-generation cap-piercing technology maintains throughput, regardless of open, capped, or mixed samples.
- Provides full random access with broad test menu, including specialty and agglutination test capabilities.
- Allows priority loading and testing of STAT samples at any time.



2

Pre-analytical sample-quality checks using PSI technology help reduce pre-analytical errors to minimize lab concerns.

- Primary-tube sample-volume check identifies potential inaccuracies caused by improper sample collection.
- User-defined criteria are used to detect and manage hemolysis, icterus, and lipemia (HIL).
- Simultaneous multiwavelength analytical scanning detects and helps to manage unsuitable samples.



3

High-capacity performance streamlines workflow and supports extended walkaway time.

- Provides onboard capacity of up to 3000 tests^{1,†} with up to 40 reagents.
- Enables more than 11 hours of continuous walkaway time and maximum of approximately 5 hours with cuvette supply.[‡]
- Innovative cap-piercing technology allows mix of capped and uncapped tubes and cups for dependable throughput.
- Simultaneous processing of primary samples and micro mode for precious pediatric samples help increase productivity.
- Reagent chamber is refrigerated at approximately 10°C for extended onboard reagent stability.

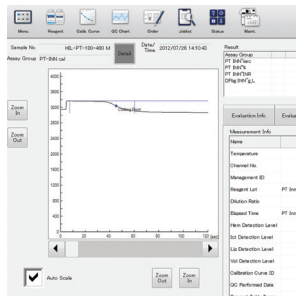


4

Consistency of results optimizes use across multisite labs.

- Results correlate with CS-2500 and CA-600 hemostasis systems.
- Shared reagents, consumables,[§] controls, and calibrators simplify purchases for multisite labs.
- Similar user software minimizes training requirements for multisite users.

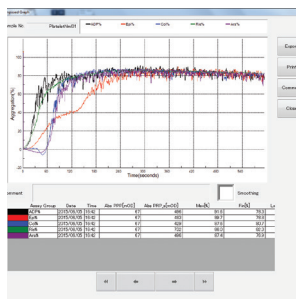




5

Intuitive user interface with detailed sample traceability provides greater confidence.

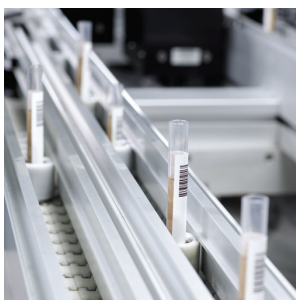
- Thorough traceability of sample results with easy-to-use audit trails supports greater clinical insight.
- Provides detailed sample result reporting, with data storage for up to 60 results per sample for 10,000 samples.
 - Includes operator ID, time, and date stamps; calibration curve and measurement result information; operation and error logs; maintenance and QC history; and automatic backup and data storage.



6

Integrated platelet aggregation testing provides cost-effective system consolidation for detection of inherited, acquired, or drug-induced platelet disorders.**

- Streamlined workflow with fewer instruments and less specialized staff leads to significant time and resource savings.
- Standardized testing reduces variability of results and helps to minimize the need for retesting.
- Ability to process low sample volumes (140 μ L per test) enables testing for geriatric and pediatric patients.



7

Point-in-space sample transfer supports further automation of processes and improved efficiencies.

- Connectivity to Aptio® Automation supports today's high-volume testing and TAT demands and offers flexibility to accommodate future expansion.
- Atellica® Data Manager enables standardized testing protocols and result management throughout the lab and across lab networks.
- Atellica Process Manager provides centralized oversight and control of all systems,†† while also helping labs to standardize and optimize processes through built-in analytics.††

*Throughput values were determined by the time to first result; processing capability varies depending on the assay used. Stated throughput value was determined using Siemens Healthineers study protocol with PT (Thromborel® S assay), APTT (Pathromtin® SL assay), INNOVANCE® D-Dimer assay, and AT (INNOVANCE Antithrombin assay) test applications.

†3000-test capacity for PT testing; 2880-test capacity for APTT testing; 2880-test capacity for PT/APTT testing; 2840-test capacity for PT/APTT/Fbg testing; 2436-test capacity for PT/APTT/AT3 testing; and 1890-test capacity for PT/APTT/AT3/DD testing.

‡Based on internal validation data from Sysmex Corporation.

§Excludes CA Systems consumables.

**The products/features are not commercially available in all countries. Due to regulatory reasons, their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details. In the U.S., platelet aggregation testing is for research use only, not for use in diagnostic procedures.

††Instruments require virtual network computing (VNC) or Remote Desktop capability. Not available on all systems.

‡‡Atellica Process Manager's functionality on CS-5100 System currently excludes real-time reagent status and real-time alerts. Protocol under development. Its future availability cannot be guaranteed.

Transform care delivery through increased workforce productivity

For profit-driven lab management

High sample-processing throughput is optimized with full random access*

- Up to 400 PT tests/hour
- Up to 400 PT/APTT tests/hour
- More than 300 PT/APTT/D-dimer/antithrombin tests/hour

Large reagent, sample, and consumable capacity helps streamline workflow

- Up to 3000 tests onboard,^{†,‡} with up to 100 patient samples per run.
- Reagent chamber refrigerated at approximately 10°C maximizes onboard reagent stability.
- Tilted reagent vial angle provides greater usable reagent volume.
- Intelligent, simultaneous processing of primary and pediatric samples enables increased productivity.
- Ready-to-use cleaning solution simplifies daily maintenance.

Automated mixing studies, integrated platelet aggregation,** and clot waveform analysis (CWA)^{§§} deliver cost-effective instrument and staff consolidation

- Automated mixing studies help clinicians make decisions regarding factor deficiencies and circulating inhibitor patterns.
- Platelet aggregation testing** simplifies and automates assessment of inherited, acquired, or drug-induced platelet disorders.
- CWA^{§§} illustrates the optical reaction profile during PT or APTT measurement and provides qualitative and sensitive waveform patterns.
- Powerful, easy-to-use graphical analysis tools simplify operations.

Advanced reagent management helps maintain uninterrupted workflow

- Load up to 40 reagents on the reagent table and 5 buffers on the buffer rack.
- Two-dimensional barcode input of TAV for standards, calibrators, controls, and reagents ensures correct transfer of ISI and nominal values.
- QC runs automatically with change of reagent vial and at user-defined time intervals.

Includes advanced cap-piercing technology

- Delivers proven high throughput with both capped and open-vial samples.¹⁰
- Enhances operator safety by reducing risk of exposure to biohazardous materials.
- Secure aliquot technology enables multiple tests per sample without the risk of debris from cap-piercing in the measurement system.

Test menu with broad capabilities, including platelet aggregation testing,** increases lab consolidation

Measurement Principle	Assays	Wavelengths (nm)
Clotting	PT, APTT, Fbg, TT, Intrinsic and Extrinsic Factor Assays, Protein S Activity, Free Protein S Antigen, Protein C Clotting, Lupus Screening and Confirmation, Activated Protein C	340, 405, 575, 660, 800
Chromogenic	Factor VIII, Factor XIII, Heparin, Antithrombin, α2 Antiplasmin, Protein C, Plasminogen, C1 Inhibitor	340, 405
Immunologic	D-dimer, vWF Antigen, vWF Activity	575, 800
Aggregation/Agglutination	Ristocetin Co-Factor, ADP, Epinephrine, Ristocetin, Collagen, Arachidonic Acid	660, 800

Manage complex operations with sophisticated software

For increased walkaway time

CS-5100 System shares powerful, user-friendly CS family software—providing a dynamic, customizable user environment

- Software-supported error management and troubleshooting
- Automatic validation of results with bidirectional LIS connectivity

Real-time reagent and consumables monitoring facilitates ease of use and workflow efficiency

- Provides complete, easy-to-understand onboard reagent status information with supporting graphics and data.
- Displays large, intuitive status symbols.
- Identifies and resolves issues with clear status messages.



Smart Remove Services (SRS)*** is a fast, secure, and powerful data link that connects your medical equipment to our experts, who provide proactive and interactive services

- Enables remote technical and application support for error identification, troubleshooting, and guidance to restore your system operations.***
- Supports remote hands-on training on specific clinical applications and features, according to your training needs, to help enhance the skills and productivity of your staff.†††

Simplify operations and gain greater insights with Atellica Diagnostics IT

- Atellica Diagnostics IT leverages data-driven innovation to simplify workflows.
- Scalable, easy-to-use solutions simplify tasks and maximize the effectiveness of your laboratory and staff.
- Atellica Diagnostics IT enhances visibility, automates processes, and centralizes management across instruments, automation, sites, and networks.



*Throughput values were determined by the time to first result; processing capability varies depending on the reagent used. Stated throughput value was determined using Siemens Healthineers study protocol with PT (Thromborel S assay), APTT (Pathromtin SL assay), INNOVANCE D-Dimer assay, and AT (INNOVANCE Antithrombin assay) test applications.

†3000-test capacity for PT testing; 2880-test capacity for APTT testing; 2880-test capacity for PT/APTT testing; 2840-test capacity for PT/APTT/Fbg testing; 2436-test capacity for PT/APTT/AT3 testing; and 1890-test capacity for PT/APTT/AT3/DD testing.

‡Based on internal validation data from Sysmex Corporation.

***The products/features are not commercially available in all countries. Due to regulatory reasons, their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details. In the U.S., platelet aggregation testing is for research use only, not for use in diagnostic procedures.

§§Research use only.

†††Purchasable service option.

Enhance routine performance with powerful connectivity

For improved workflow

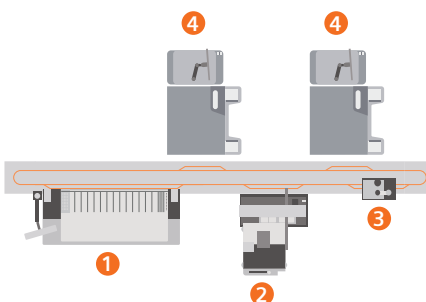
CS-5100 System is compatible with a variety of configurations to automate high volumes of hemostasis testing. You can integrate as many hemostasis analyzers as you need with Aptio Automation for high performance in a single- or multidisciplinary, automated lab setting.

Streamline your hemostasis testing

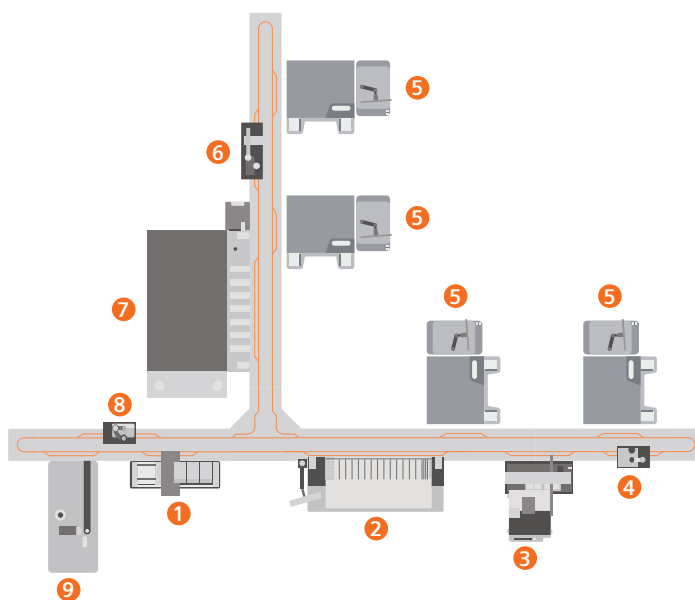
- Consolidate coagulation samples, eliminate manual handling, and reduce operator touchpoints to mitigate exposure to biohazardous materials and reduce motion-related injuries.
- Standardize processes and results across systems and disciplines to increase result accuracy and reduce TAT.
- Streamline STAT sample management with automatic routing and priority testing.
- Maintain option to front-load STAT samples to ensure quick processing of the most time-sensitive samples.
- Reduce result turnaround time with point-in-space sampling technology on Aptio Automation.
- Automate repeat and confirmatory testing to minimize manual processing for increased accuracy.

Choose the level of automation that's right for your lab

Whether you want simple mechanization of tasks such as centrifugation and decapping, or streamlined management of workflows that require sample mixing or proportional aliquoting, you can connect as many automation modules and single- or multidiscipline analyzers as needed in highly flexible track configurations.



Sample configuration A:
 1. Input/Output Module
 2. Centrifuge Module
 3. Decapper Module
 4. CS-5100 System



Sample configuration B:
 1. Rack Input Module
 2. Input/Output Module
 3. Centrifuge Module
 4. Decapper Module
 5. CS-5100 System
 6. Sealer Module
 7. Refrigerated Storage Module
 8. Desealer Module
 9. Aliquoter Module

The C-family of systems: True consistency and compatibility

For advanced patient care

Facilitates monitoring within and between labs

- Excellent correlation values with CS-2500 System
- Lab-to-lab consistency for confident patient monitoring
- Same reference ranges, assay applications, reagents, consumables, software, and QC
- Compact footprint comparable to CS-2500 System

Excellent correlation of results across the CS family of systems

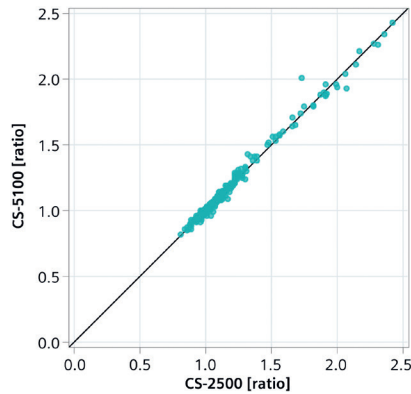


Figure 1. Passing-Bablok regression analysis for method comparison of lupus anticoagulant ratio with LA1/LA2 Reagents: CS-5100 system versus CS-2500 system.

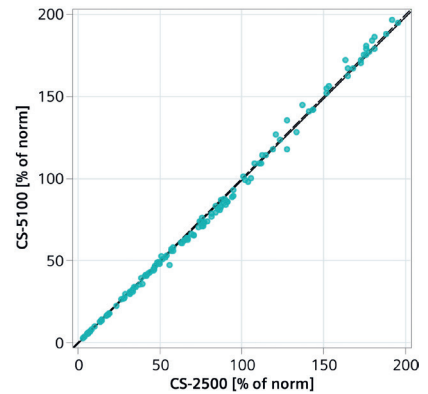


Figure 2. Passing-Bablok regression analysis for method comparison of coagulation factor VIII with Dade® Actin® FS Activated PTT Reagent: CS-5100 system versus CS-2500 system.



CN-3000 and CN-6000 Systems^{†††}

Mid- and high-volume, fully automated solutions featuring a small footprint, high throughput, smart workflows, and flexible configurations



CS-2500 System

Mid-volume, fully automated solution featuring assay-based HIL checks using PSI technology, automated mixing studies, automated platelet aggregation,^{**} and clot waveform analysis^{§§}



CA-600 Systems

Compact, fully automated coagulation analyzers offering a variety of configurations for clotting, chromogenic, and immunologic methods

^{†††}The products/features/applications mentioned here are not commercially available in all countries and are subject to local regulations. Their future availability cannot be guaranteed. Not available for sale in the U.S.

^{**}The products/features are not commercially available in all countries. Due to regulatory reasons, their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details. In the U.S., platelet aggregation testing is for research use only, not for use in diagnostic procedures.

^{§§}Research use only.

At Siemens Healthineers, we pioneer breakthroughs in healthcare. For everyone. Everywhere. Sustainably. As a leader in medical technology, we want to advance a world in which breakthroughs in healthcare create new possibilities with a minimal impact on our planet. By consistently bringing innovations to the market, we enable healthcare professionals to innovate personalized care, achieve operational excellence, and transform the system of care.

Our portfolio, spanning in vitro and in vivo diagnostics to image-guided therapy and cancer care, is crucial for clinical decision-making and treatment pathways. With the unique combination of our strengths in patient twinning,* precision therapy, as well as digital, data, and artificial intelligence (AI), we are well positioned to take on the greatest challenges in healthcare. We will continue to build on these strengths to help overcome the world's most threatening diseases, enable efficient operations, and expand access to care.

We are a team of more than 71,000 Healthineers in over 70 countries passionately pushing the boundaries of what is possible in healthcare to help improve the lives of people around the world.

**Personalization of diagnosis, therapy selection and monitoring, aftercare, and managing health.*

Actin, Aptio, Atellica, Dade, INNOVANCE, Pathromtin, PSI, Thromborel, and all associated marks are trademarks of Siemens Healthcare Diagnostics Inc., or its affiliates. All other trademarks and brands are the property of their respective owners.

CS-5100 System refers to Automated Blood Coagulation Analyzer CS-5100. CS-2500 and CA-600 refer to Automated Blood Coagulation Analyzer CS-2500 and CA-620/CA-660 respectively.

Aptio Automation is manufactured by Inpeco SA and is exclusively distributed by Siemens Healthcare Diagnostics Inc.

Product availability may vary from country to country and is subject to varying regulatory requirements. Please contact your local representative for availability.

This brochure is intended for use outside the U.S. (OUS) only. Display or promotion to U.S. audiences is prohibited.

References:

1. Favaloro E, Lippi G, Adcock D. Preanalytical and postanalytical variables: the leading causes of diagnostic error in hemostasis? *Semin Thromb Hemost.* 2008;34:612-34.
2. Lippi G, Blanckaert N, Bonini P, et al. Haemolysis: an overview of the leading cause of unsuitable specimens in clinical laboratories. *Clin Chem Lab Med.* 2008;46(6):764-72.
3. Lippi G, Banfi G, Buttarello M, et al. Recommendations for detection and management of unsuitable samples in clinical laboratories. *Clin Chem Lab Med.* 2007;45(6):728-36.
4. Favaloro EJ, Lippi G, Funk (Adcock) D. Pre-analytical variables in coagulation testing associated with diagnostic errors in hemostasis. *Labmedicine.* 2012 Feb;43(2).
5. Woolley A, Kitchen S (Sheffield Teaching Hospitals, UK). Assessment of throughput/workflow of routine coagulation testing using the high throughput coagulation analyser—Sysmex® CS-5100. Poster. NHS Foundation Trust.
6. Bai B, Christie DJ, Gorman RT, Wu JR. Comparison of optical and mechanical clot detection for routine coagulation testing in a large volume clinical laboratory. *Blood Coagul Fibrinolysis.* 2008 Sep;19(6):569-76.
7. Lippi G, Plebani M, Favaloro EJ. Interference in coagulation testing: focus on spurious hemolysis, icterus, and lipemia. *Semin Thromb Hemost.* 2013;39:258-66.
8. Woolley A, Golmard J-L, Kitchen S. Effects of haemolysis, icterus and lipaemia on coagulation tests as performed on Stago STA-Compact-Max analyser. *Int J Lab Hem.* 2016;38(4):375-88.
9. Woolley A, Tabuchi Y, Kitchen S. Test specific assessment of effects of haemolysis on citrated blood samples using Sysmex CS series analyzers. Poster. ISTH 2015.
10. Lawrie A, Iseppi J, Mackie I, Machin S. Evaluation of a high throughput multi-wavelength blood coagulation analyser—Sysmex CS-5100. *Sysmex J Int.* 2011;21(1):1-9.

Siemens Healthineers Headquarters

Siemens Healthineers AG
Siemensstr. 3
91301 Forchheim, Germany
Phone: +49 9191 18-0
siemens-healthineers.com

Published by

Siemens Healthcare Diagnostics
Products GmbH
Specialty Lab Solutions
Emil-von-Behring-Strasse 76
35041 Marburg, Germany