Instructions for Use

AutoMate 2500 Family System

For *In Vitro* Diagnostic Use

CE

B67471H
November 2024

Manufactured by
Beckman Coulter, Inc.
250 S. Kraemer Blvd.
Brea, CA 92821 U.S.A.

BECKMAN COULTER

Instructions for Use
AutoMate 2500 Family System
PN B67471H (November 2024)

Trademarks

Find us on the World Wide Web at:
www.beckmancoulter.com

EC REP

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Rx Only

Original Instructions

Revision History

This document applies to the latest software listed and higher versions. When a subsequent software version changes the information in this document, a new issue will be released.

Following are the release dates for the original language English Instructions for Use. Localized versions have followed at different times but always correspond to the latest released version of the English manual.

B67471 Version H, November 2024

Auto*Mate* software version 4.4.

- Added Swiss-authorized representative label to the safety notice section
- Added content to System Options
- Updated part numbers for the screw cap secondary tubes
- Deleted order numbers for the Virkon disinfectant
- Added information about the Mikrobac® tissues and the Clorox® disinfecting wipes
- Added information for cleaning the buttons on the recapper control panel

B67471 Version G, August 2023

Auto*Mate* software version 4.3.1.

- Updated part numbers for screw cap secondary tubes

B67471 Version F, December 2021

Auto*Mate* software version 4.3.1. Documentation update for IVDR compliance.

- Restructured introductory section.
- Added content to About This Product
- Added content to System Options
- Added content to Intended Purpose and Intended Use
- Added content to Disclaimer Regarding Void Liability in case of Off-label Use
- Added new Disclaimer Regarding Personal Identifier Information
- Added new Warranty, Service and Legal Information
- Added content to EC Declaration by the Manufacturer
- Added content to Compliance Information
- Added new Electromagnetic Compatibility section
- Added new Software Usage Environment section
- Restructured Safety Instructions andSafety Recommendations section
- Updated Glossary of Symbols Used in AutoMate 2500 Family System Labels section
- Corrected minor spelling and formatting errors throughout the document

B67471 Version E, June 2021

Auto*Mate* software version 4.3.1.

- Added additional cautions and information to Tubes
- Added additional cautions and information to About MTPs
- Added additional information to Fill up disposable tips
- Added additional information to Spare parts and consumables

B67471 Version D, October 2020
Auto*Mate* software version 4.3.1.

As part of Auto*Mate* Software Version 4.3.1, changes were made to the following sections

Updated Document Front End:

- Safety instructions

Updated Chapter: System Overview.

- Account Control Feature
- Packing dimensions of the Auto*Mate* 1200 and 2500
- Packing Dimensions of the Auto*Mate* 1250 and 2550
- Weight of the Auto*Mate* 1200 and 2500
- Weight of the Auto*Mate* 1250 and 2550
- Electrical Requirements of the Auto*Mate* 1200 and 2500
- Electrical Requirements of the Auto*Mate* 1250 and 2550
- Compressed Air Requirements
- Technical Data for Auto*Mate* 1200 and 2500
- Technical Data for Auto*Mate* 1250/2550
- Throughput

Updated Chapter: Run the System.

- Program
- Components for Users
- Info
- Operator Accounts
- User Logged On
- Operating Options
- Tube Type and Cap Color
- DavidCan Task Bar Icon
- Log On To Auto*Mate*2500 Family Software
- Log Off Auto*Mate* Software
- Automatic Logoff
- Initialize the system
- Remove Single Tube from Conveyor Belt 01
- Remove Sample Tube from Robot Grippers
- ETS-2 Printer Components
- ETS-3 Printer Components
- ETS-3 Printer Control Panel

Created new Chapter: Run the System as an Advanced User.

- Manage User Accounts
- Components For Advanced Users
- Tools Menu for Advanced Users
- Service Mode
- Configuration Manager
- Rack Wizard
- Restrict Tube or Cap Identification
- Create a backup of Auto*Mate* 2500 System and the log files
- Import a system backup
- Camera Active
- Volume Detection
- Flash Update

Updated Chapter: Maintenance

- Maintenance Schedule
- Load or replace label liner rolls on ETS-2 printers
- Load transfer ribbon
- Clean the label sensor
- Clean the printhead of the ETS-2 printer
- Clean the print rollers of the ETS-2 printer
- Clean the ETS-3 Printer
- Turn Off The ETS-3 Printer
- Clean the Print Roller of the ETS-3 Printer
- Clean the Printhead of the ETS-3
- Clean the tamp pad of the ETS-3 printer
- Clean the label sensor of the ETS-3 printer
- Load Or Replace Label Liner Rolls On ETS-3 Printers
- Replace the transfer ribbon of the ETS-3
- Test Mode Using the Pre-dispense Key without Print on the ETS-3 Printer

Updated Chapter: Troubleshooting

- ETS-3 Printer Error Messages
- Manual Intervention Operation Sequence
- System Freeze
- Complete Power Outage in the Lab

B67471 Version C, November 2019
Auto*Mate* software version 4.1.9.

Updated laser product label in

- Glossary Of Custom Labels Used In Auto*Mate* 2500 Family Systems: Added list of custom labels.

Additional safety cautions were added to the following sections:

- Glossary Of Custom Labels Used In Auto*Mate* 2500 Family Systems: Added list of custom labels.
- Drawer Handling
- Program
- Systems with MTP
- About MTPs

Updated instructions in:

- Load And Replace Label Roll

Removed gripper and pump syringe maintenance tasks:

- Maintenance Schedule

Reintegrated content from Auto*Mate* 2500 Reference Manual.

- Environmental Requirements And Emissions
- Overview of Sample Processing
- Bar Code Label Design
- Processing Aliquots
- Handling of rejected tubes

Version Synchronization

In older versions of the IFU, the version letter of international languages other than English have varied, but the sequence of releases always follows the revision history laid out in the English language version of the document.

B67471 July 2018

Auto*Mate* software version 4.1.9.

As part of Auto*Mate* Software Version 4.1.9, changes were made to the following sections

- Maintenance Schedule: Added new compressor maintenance step and clarified impacted compressors.
- Add Oil: specified impacted compressor.
- Compressor Types: listed new compressor.
- Check Oil Level: specified impacted compressor.
- Empty the drain bottle: specified impacted compressor.
- Safety instructions: added note about California Proposition 65.
- Depressurize compressor (with and without shut off valve): added instructions for new compressor.
- EC Declaration by the Manufacturer: added RoHS compliance information.

As part of the update, the following new sections were added:

- No Order Buffer Rack: described new feature.
- Clean air intake filter: created new compressor maintenance step.
- No Order Buffer Rack Frequently Full: added troubleshooting for new feature.
- Troubleshooting the No Order buffer rack: added troubleshooting for new feature.
- No Order buffer rack full: added troubleshooting for new feature.
- No Order buffer rack cannot be found: added troubleshooting for new feature.

B67471 February 2017

Auto*Mate* software version 4.1.5.

Changes were made to the following sections:

- Exchange the Film Cassette: Added pathway to instructional video stored on Auto*Mate* PC.
- Remove Parafilm Jam: Added pathway to instructional video stored on Auto*Mate* PC.
- Start the System: Corrected information on computer position
- Replace Gripper Jaws Of The Tube Gripper: Updated image to represent current system parts

New sections added:

- System Freeze: Added instructions on recovering from a system freeze.
- Camera Inspection Window: Added description of the camera inspection window.
- Tubes: Added topic describing the useable range of tube dimensions for the Auto*Mate* 2500 Family systems
- Glossary Of Standard Symbols Used In Auto*Mate* 2500 Family System Labels: Added list of standard symbols in use in current labels.
- Glossary Of Custom Labels Used In Auto*Mate* 2500 Family Systems: Added list of custom labels.
- Position Of Labels On Auto*Mate* 2500 Family Systems: Added figure displaying position of labels referred to in label glossary topics.
- Compliance Information: Added topic describing new compliance label

Removed topics:

- Removed topics describing position of old labels on the Auto*Mate* 2500 Family Systems.
- Removed topic describing Recycling Label.

B67471 May 2016

Auto*Mate* software version 4.1.5.

Changed maintenance schedule in order to reflect cleaning requirements for EZ Pipettor. Daily cleaning is no longer required. Daily visual inspection instead and cleaning only as required. Changes were made to the following sections:

- Maintenance Schedule
- Clean the Tip Carrier of EZ Pipettor (GEN 2)

B67471 March 2016

Auto*Mate* software version 4.1.5.

Minor editorial changes.

- Aliquot Module Maintenance: Changed part number of syringe kit from ODL08201 to ODL08211.
- Consumables and Spare Parts: Removed B59017 Safe Sampling Closer (500 µl) and B59018 Safe Sampling Closer (1000 µl). They are not available.

B67471 December 2015

Auto*Mate* software version 4.1.5.

- No changes in Graphical User Interface.
- Consumables and Spare Parts: B59017 Safe Sampling Closer (500 µl), B59018 Safe Sampling Closer (1000 µl).
- Secondary Screw Cap Tubes refit for aliquoter module available.
- Filter tips that come in a gray rack available for the aliquoter.
- Non-essential operational information removed to The Auto*Mate* 2500 Family Reference Manual.

B67471 June 2014

Auto*Mate* software version 4.1.3.

- New EZ Pipettor hardware: cleaning procedure and troubleshooting.

B67471 February 2014

Auto*Mate* software version 4.1.3.

B67471 February 2013

Auto*Mate* software version 4.1.1.

B67471 June 2011

Auto*Mate* software version 4.1.

B67471 May 2010

Auto*Mate* software version 4.0.

B67471 May 2007

Auto*Mate* software version 3.0.

Contents

Contents

Introduction

About This Manual

This manual describes the usage and maintenance of Auto*Mate* 2500 Family hardware and software version 4.4.

The Auto*Mate* 2500 Family system is delivered with an electronic Instructions for Use manual on the software CD. The version of the manual on the software CD is linked to the version of the software.

Important

Refer to the Beckman Coulter website regularly for updated technical documentation.

Newer versions of the IFU are available for download via the Beckman Coulter website. The newer versions can contain revised operating instructions and maintenance steps, but can also contain information about newer software versions that are not installed on your system.

To download a new manual, go to www.beckmancoulter.com. If you open the page for the first time, select your region and country to continue.

In the navigation menu, select **Support** > **Search for Technical Documents**. Use the search terms provided in the table to locate the Auto*Mate* 2500 Family Instructions for Use.

Table 1 Document Search Terms

Menu Option	Search Term
Document Categories	Instrument IFU
Document Subcategories	Manual
Product Lines	Automation
Product Series	Auto*Mate* 2500 Family
Products	Auto*Mate* 2500 Family Sample Processing Systems

To order a printed copy of this manual, contact your Beckman Coulter Representative.

Purpose and Target Group

This manual is addressed to operating staff. Operating staff roles include:

- Physicians
- Chemists and biologists
- Trained laboratory staff

All operating staff must be trained to use Beckman Coulter products on behalf of the owner. These persons must be authorized by the owner for the fulfillment of their tasks.

The operator is responsible for the user maintenance procedures.

Information and Documentation Obligations

Comply with these documentation obligations:

- This manual must always be accessible to all operators of the system.
- Before operating the Auto*Mate* 2500 Family system, all operators must read and understand this manual.
- All operators must observe the safety precautions in this manual.
- All operators must be adequately informed about the modules of the Auto*Mate* 2500 Family system and their principle of operation.

Definitions of Terms and Abbreviations Used in this Documentation

AU	Analyzer Unit
BTU	British Thermal Unit, energy unit, 1 BTU = 1,055 Joule
LIS	Laboratory Information System
MSDS	Material Safety Data Sheets
MTP	Microtiter Plates
Rack ID	The bar code identifying the rack, typically a four-digit number Bar code type: "NW-7 with checksum" (also referred to as "Codabar with checksum")
Sample	Tube containing a specific material like serum, urine or others to perform the tests on
TTP	Thermal Transfer Printing
TTU	Tube Transfer Unit
UPS	Uninterruptible Power Supply

About This Product

The Auto*Mate* 2500 Family is a series of semi-open pre- and post-analytical sample processing and sorting systems. The system automates the process of sorting, decapping, and archiving samples. The tube and cap type and cap color of a sample is identified.

The system identifies and opens closed, bar coded sample tubes. The system then distributes them from an input section to an output section under the control of a

Laboratory Information System (LIS). The system aliquotter produces bar coded secondary sample tubes which are then sorted to the output section.

The system is available in four different configurations:

- Auto*Mate* 1200 – Standard Sorter (ODL25120)
- Auto*Mate* 1250 – Sorter with Aliquot Module (ODL25125)
- Auto*Mate* 2500 – High Speed Sorter (ODL25250)
- Auto*Mate* 2550 – High Speed Sorter with Aliquot Module (ODL25255)

Figure 1 Auto*Mate* 2500 Family System with Aliquot Module

Three optional features can be fitted to the Auto*Mate* 2500 Family system.

- Recapper module
- MTP reader and base frame (Aliquot module only)
- Screw cap secondary sample tubes (Aliquot module only)

The Recapper module is an optional feature installed at the rear of the system. The Recapper module provides resealing of decapped containers with Parafilm for temporary storage after sorting.

The MTP reader and base frame is an optional feature installed into the Aliquot module. The MTP option permits the Auto*Mate* 1250 or 2550 systems to dispense samples into a microtiter plate, and allows the individual bar code label of the microtiter plate to be read.

Note

You can find detailed information on technical data of the Auto*Mate* 2500 Family system in chapter System Overview.

Additionally, there are three accessory devices which can complement your Auto*Mate* 2500 family system.

- Sorting Drive or Sorting-Drive Plus
- iPAW (intelligent Peri-Analytical Workstation)
- ISB (Intelligent Sample Bank)

Sorting-Drive is a software system installed on a separate PC or virtual machine that facilitates the LIS connection to Auto*Mate* 2500 Family systems. The Sorting-Drive system provides more flexibility in creating and changing sorting profiles.

iPAW is a separate modular solution which provides a physical workstation for manual sorting and label printing. The iPAW is combined with the Sorting-Drive software client for sample tracking and workload statistics.

The Intelligent Sample Bank (ISB) software is an application used for long-term archiving and tracking of aliquot samples. ISB complements the Sorting-Drive and iPAW workflow management software.

Note

You can find detailed information on the features and technical data of the Auto*Mate* 2500 Family accessories in their respective Instructions for Use, available from the Beckman Coulter website.

For the Russian Market Only

Contraindications: N/A

Possible Side Effect: N/A

System Options

Depending on your system configuration, the following features can be available:

Standard Features

- The system permits the use of any sample tube within a prescribed range of physical properties.
- The system permits input of up to 300 sample tubes. Continuous sample reloading is possible even while the system is running.*
- The tube inspection unit can identify sample tube type, size, and cap color. The tube inspection unit uses a read-through label volume detection feature. The tube inspection unit can therefore determine the liquid level within a labeled sample tube to calculate the sample volume. The sample volume for the sample tube containing whole blood cannot be determined. For sample tubes containing whole blood, a predetermined volume must be sent from the LIS, or volume detection must be turned off.
- The decapper can decap primary tubes, and can decap both screw caps and rubber caps.
- The sample conveyor belt can handle various primary tube sizes and types at the same time.

* You can use an output drawer as an input drawer to increase sample tube processing by up to 150 tubes per drawer. Contact your Beckman Coulter Representative for more information.

- Two bar code readers are integrated into robot 1 and robot 2. The bar code readers can read several standard bar code label types, and can be configured to read others.
- The output area can hold up to 1,080 sample tubes on six independent output drawers.
- The system can only be used when an operator is logged on. The account control feature restricts access to troubleshooting and customization options to trained individuals.

Aliquot Module Features

- The aliquot module is installed in Auto*Mate* 1250 and Auto*Mate* 2550 systems.
- The module can produce up to seven aliquots (secondary tubes) from an existing tube.
- The aliquot module cannot process sample tubes containing whole blood.
- The module labels secondary tubes with an integrated printer, using configurable bar code label formats.
- The module includes a Microtiter Plate (MTP) option which creates clones of probes using a special plate type for distribution and analysis. The MTP option requires Sorting-Drive version 4.1.2 or higher.

Cybersecurity

- Auto*Mate* 2500 can only be run on a Windows 10 image, supplied by Beckman Coulter or its authorized representative, which supports a set of privacy and security features to ensure protection of electronic protected health information (ePHI) and resistance to malware software. The software version includes the listed features.
  - BitLocker (optional): Customers can choose to activate BitLocker (for Sorting-Drive and Auto*Mate* 2500 on Windows 10) and VeraCrypt (for iPAW on Windows 7) to encrypt PC hard drives. Encrypt the hard drives to protect unauthorized access to ePHI if hard drives are lost or stolen.
  - Windows Firewall: The firewall filters connections to the system and blocks illegitimate programs.
  - Whitelisting: An anti-malware solution that prevents unauthorized programs from running on Beckman Coulter systems.

Recapper (Optional)

- The recapper recaps tubes with Parafilm, a translucent flexible film.
- The recapper can recap primary and secondary tubes for archiving.

Throughput

	Auto*Mate* 1200	**Auto*Mate* 1250**	**Auto*Mate* 2500**	**Auto*Mate* 2550**
Sorting throughput	800 tubes/h	800 tubes/h	1,200 tubes/h	1,200 tubes/h
Aliquot throughput (ratio of primary to secondary tubes 1:1, volume transfer 300 µl)		Up to 600 tubes/h (primary and secondary)		Up to 600 tubes/h (primary and secondary)
Aliquot throughput with 10 % aliquoted to a secondary tube		780 primary and secondary tubes/h		870 primary and secondary tubes/h

Intended Purpose and Intended Use

Intended Purpose

The Auto*Mate* 2500 Family systems are a series of semi-open pre- and post-analytical handling systems that automate the process of sorting, decapping, and archiving sample containers. After configuration by authorized service personnel, the Auto*Mate* 2500 Family system can identify the sample tube type, cap type, and cap color of a sample tube.

If the optional Aliquot module is installed, the Auto*Mate* 2500 Family system can also create aliquots of samples in labeled secondary tubes, and can detect whether the required sample volume has been aliquoted.

If the optional Recapper module is installed, the Auto*Mate* 2500 Family system can also reseal a decapped tube with Parafilm for temporary archiving.

Detailed considerations:

- Specification of the analyte or marker to be determined:
  - Not applicable. The Auto*Mate* 2500 family systems do not measure specific analytes or markers.
- Function screen/monitor/diagnose, or aid in diagnosis, prognosis and prediction:
  - Not applicable. The Auto*Mate* 2500 family systems do not utilize any functions as screen/monitor/diagnose, or aid in the diagnosis, prognosis and prediction of any disease.
- Disorder, condition to that is intended to be detected, defined, or differentiated:
  - Not applicable. The Auto*Mate* 2500 family systems do not detect, define, or differentiate any disorder or condition. The Auto*Mate* 2500 family systems sort and process samples for performing sample analysis or archiving.

- Automation:
  - The Auto*Mate* 2500 family systems are for use in laboratory settings for automation of the repetitive tasks of sample accession and preparation prior to processing, and additionally preparation of samples for archival.
- Qualitative, semi-qualitative, or quantitative:
  - Not applicable. The Auto*Mate* 2500 family systems do not measure specific analytes or markers and therefore do not have a testing method.
- Type of specimen:
  - Not applicable. The Auto*Mate* 2500 family systems are designed to automate repetitive processes for sample preparation prior to processing and reduce the amount of manual handling of biological specimens of human blood, serum, plasma, cerebrospinal fluid and/or urine samples that are intended to be subjected to in-vitro diagnostic testing.
- Testing population:
  - Not applicable. The Auto*Mate* 2500 family systems do not analyze specific analytes or markers and therefore are not relevant to testing population.
- For companion diagnostics, the target population and the associated medicinal products - if applicable:
  - Not applicable. The Auto*Mate* 2500 family systems do not analyze specific analytes or markers and therefore do not have any companion diagnostics, target populations or associated medicinal products.

Intended Use

The use of this product is authorized for trained professionals working in an indoor laboratory environment in combination with a completed user training by Beckman Coulter or its local representatives.

The owner is responsible for providing the operators with regular training and instruction to perform their duties correctly. It is also the responsibility of the owner to maintain adequate lighting and ventilation in the laboratory to support the operator in their use of the Auto*Mate* 2500 Family system.

The owner is responsible for the regular and correct maintenance of the system by the laboratory personnel. The owner is also required to coordinate with Beckman Coulter, or its local representatives, to arrange the regular servicing of the system by authorized Field Service Engineers. Failure to maintain and service the system correctly or according to the prescribed schedule can result in sub-optimal performance, equipment failure, and potential health hazards.

Operating a system which is unfit for use or attempting an unauthorized repair of a system covered by the warranty is considered a violation of the intended use. The owner assumes liability for any injury or damage to property resulting from violation of the intended use.

Disclaimer Regarding Void Liability in case of Off-label Use

Important

Only use Auto*Mate* 2500 Family systems for the intended use.

Any use of Auto*Mate* 2500 Family systems not explicitly defined as compliant with the intended use is regarded as a violation of the intended use. Any use or operation of Auto*Mate* 2500 Family systems beyond the intended use renders warranty and liability claims null and void.

Violation of the intended use includes:

- Modifications to the system installation or configuration
- Use of accessories not approved by Beckman Coulter
- Operation of the system by untrained staff
- Access to the system by untrained staff
- Use of system accounts by unauthorized or untrained individuals.
- Manipulation of safety devices
- Disregard of the warnings and cautions in this manual
- Disregard of applicable standards, guidelines, and other provisions
- Disregard of the service and cleaning instructions in this manual

Important

Do not enable remote access to any of the Auto*Mate* 2500 Family PCs (including the Sorting-Drive Plus, Sorting-Drive Professional or iPAW PC) or install any other software! Doing so can disrupt correct operation of the PC.

Disclaimer Regarding Personal Identifier Information

The Auto*Mate* 2500 Family system can be configured to store images of tubes when operational. The images may capture personal identifiable information (PII), such as patient date of birth, patient name, or other information.

Important

Do not use Auto*Mate* 2500 Family as an image processing or storage system. Store and process any images on a secondary system.

Warranty, Service and Legal Information

Warranty

The system is covered by and subject to the provisions of the warranty included in your contractual agreement for the system or its reagents. The customer is responsible for

routine preventive maintenance procedures. Repairs arising from the failure to perform these maintenance procedures at the indicated time intervals are made at the discretion of Beckman Coulter, and at the customer's expense.

Service and Coverage

If any problems occur in the system during the warranty period, call your Beckman Coulter representative. Provide the serial number or system ID number and a complete description of the problem.

Service Life

The service life of an Auto*Mate* 2500 Family system is a minimum of 5 years. For disposal of the system, contact a Beckman Coulter Representative.

Telephone Service for USA and Canada

For United States and Canada customers, contact Beckman Coulter Customer Support toll-free at (800) 854-3633. Beckman Coulter Customer Support is available 24 hours a day to customers in the continental United States, Alaska, Hawaii, and Canada.

Telephone Service for International Customers

For international customers, contact your local Beckman Coulter Customer Support.

Information regarding Installation and Verification

Refer to your Beckman Coulter Representative for more information regarding your installation and verification. Third-party instrument installation, setup, testing, and support are the sole responsibility of the third-party representative of the vendor. For questions related to the instrument, contact the representative of the instrument vendor.

Declaration for Russian Customers

1. The manufacturer guarantees the conformity of manufactured products to requirements of normative and technical documentation. Safety and quality of products is guaranteed throughout the entire shelf life.
2. The manufacturer is responsible for product defects, except for defects that have arisen because of violation of the rules of use, transportation and storage conditions, or a third party or *force majeure*.
3. The manufacturer will replace the product at its own expense, if technical and functional (consumer properties) do not comply with the regulatory and technical documentation, if these disadvantages were caused by latent defect in materials or workmanship by the product manufacturer.

For product quality, please contact the manufacturer's representative in the Russian Federation.

EC Declaration by the Manufacturer

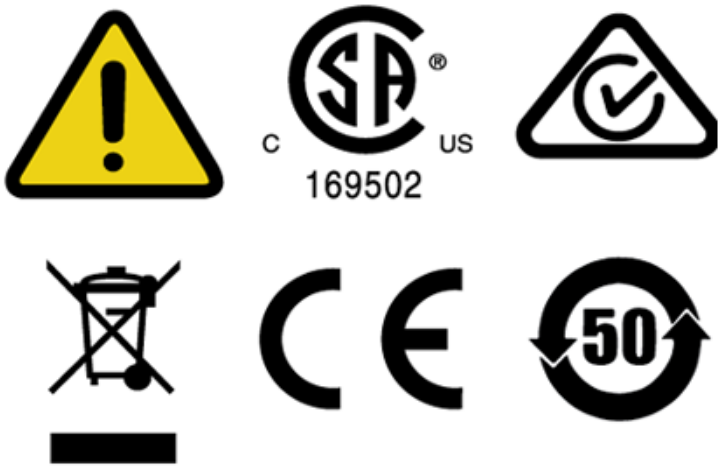
The Auto*Mate* 2500 Family systems conforms to the following EU directives:

- 2006/42/EC concerning Machinery
- 2014/35/EU concerning Low Voltage Equipment
- 2014/30/EU concerning Electromagnetic Compatibility
- 2011/65/EU concerning RoHS
- 2017/30/EU In Vitro Diagnostic Regulation (IVDR)

CE

Compliance Information

Figure 2 Compliance label



Recycling

The compliance label is required in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive of the European Union. The presence of this label indicates that:

1. The device was put on the European Market after August 13, 2005
2. The device is not to be disposed of via the municipal waste collection system of any member state of the European Union

Customers must understand and follow all laws regarding the correct decontamination and safe disposal of electrical equipment. For Beckman Coulter products bearing this label, contact your dealer or local Beckman Coulter office for details on the take-back program that facilitates the correct collection, treatment, recovery, recycling and safe disposal of these products.

For the Japan Market:

This system is considered an industrial waste, subject to special controls for infectious waste. Prior to disposal of the system, refer to the "Waste Disposal and Public Cleaning Law" for compliance procedures.

C-Tick Mark

The C-Tick mark is intended for use on products that comply with the applicable Electromagnetic Compatibility (EMC) standards in the Australian or New Zealand market.

CE Mark

This symbol indicates conformity with the provisions of the applicable EU directives.

CSA Mark

This symbol indicates that the product was tested and has met the certification requirements for electrical, plumbing and/or mechanical products in Canada and the United States.

ROHS

This symbol indicates that this electronic information product contains certain toxic or hazardous elements, and can be used safely during its environmental protection use period. The number in the middle of the logo indicates the environmental protection use period (in years) for the product. The outer circle indicates that the product can be recycled. The logo also signifies that the product should be recycled immediately after its environmental protection use period has expired. These labels and materials declaration table (the Table of Hazardous Substance's Name and Concentration) meet People's Republic of China Electronic Industry Standard SJ/T11364-2006 Marking for Control of Pollution Caused by Electronic Information Products requirements.

Electromagnetic Compatibility

This device complies with the emissions and immunity requirements as specified in the EN/IEC 61326 series of Product Family Standards for a “basic electromagnetic environment". Such equipment is supplied directly at low voltage from public mains network. This equipment is not intended for residential use.

This device generates, uses, and can radiate unintentional radio-frequency (RF) energy. If this device is not installed and operated correctly, this RF energy can cause interference with other equipment. It is the responsibility of the end user to ensure that a compatible electromagnetic environment for the device can be maintained in order that the device will operate as intended.

In addition, other equipment can radiate RF energy to which this device is sensitive. If one suspects interference between this device and other equipment, Beckman Coulter recommends the following actions to correct the interference:

- Evaluate the electromagnetic environment before installation/operation of this device.
- Do not operate this device close to sources of strong electromagnetic radiation (e.g. unshielded intentional RF sources), as these can interfere with proper operation.

Examples of unshielded intentional radiators would be handheld radio transmitters, cordless phones and cellular phones.

- Do not place this device near medical electrical equipment that can be susceptible to malfunctions caused by close-proximity to electromagnetic fields.

This device has been designed and tested to CISPR 11, Class A emission limits. In a domestic environment, this device may cause radio interference, in which case, you may need to take measures to mitigate the interference.

Environmental Requirements and Technical Specifications

Environmental Requirements And Emissions

Table 4 Environmental requirements

	Auto*Mate* 1200 / 1250 / 2500 / 2550
Altitude	Must not exceed 2,000 m (6,562 ft)
Ambient temperature	+18°C to +32°C (64°F to 89°F)
Ambient humidity	40 to 80% relative humidity, no condensation
Transport and storage temperature	-30 to +60°C (-22 to +140°F)
Transport and storage humidity	10 to 95% relative humidity, no-condensation
Location	Indoor use only; no direct sunlight or severe drafts. A level floor that does not vibrate
Pollution degree	2

Table 5 Auto*Mate* 1200 and 2500 emissions

	Auto*Mate* 1200 / 2500	**Auto*Mate* 1250 / 2550**
Average heat output	1,030 BTU/h	1,480 BTU/h

Technical Specifications

Figure 3 Auto*Mate* 1200 and 2500: Front view, side view without recapper, side view with recapper

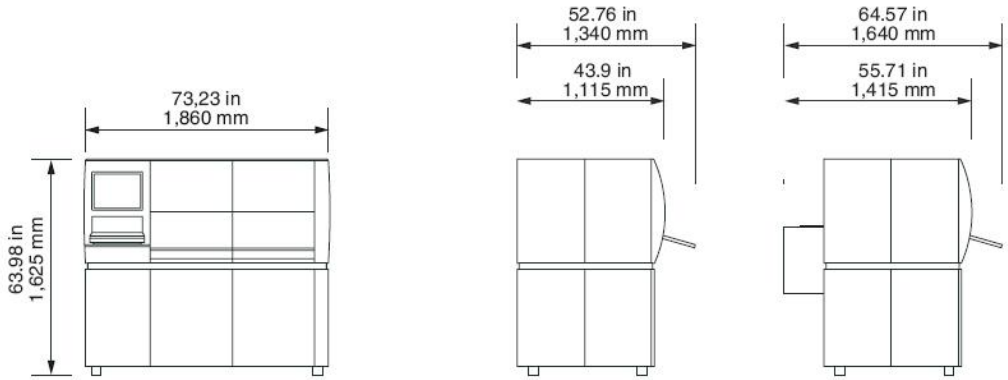


Figure 4 Auto*Mate* 1200 and 2500: Outline without and with recapper

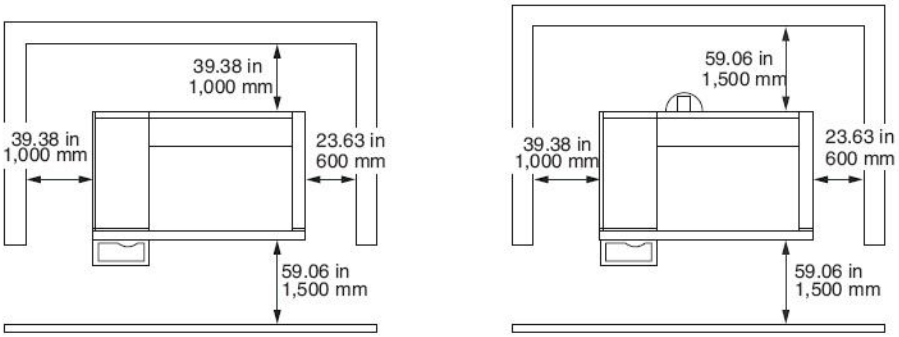


Figure 5 Auto*Mate* 1250 and 2550: Front view, side view without recapper, side view with recapper

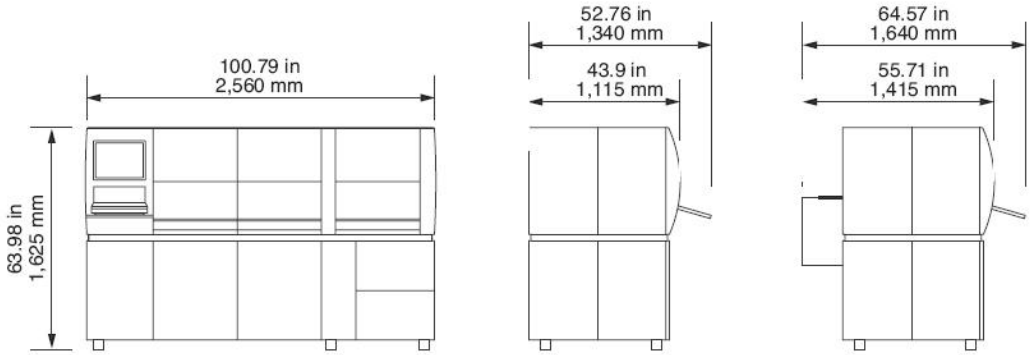
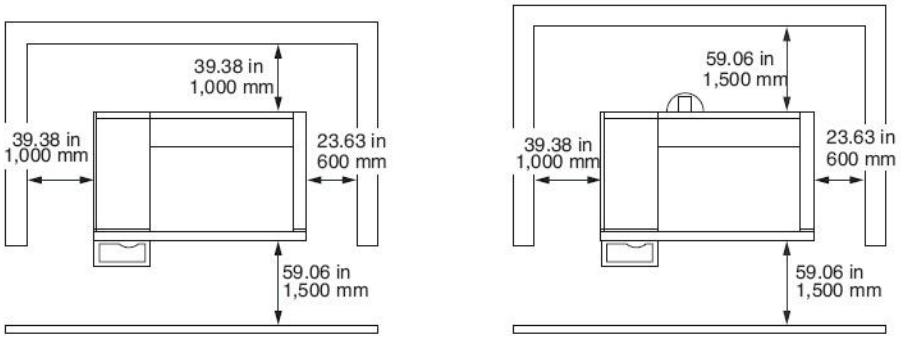


Figure 6 Auto*Mate* 1250 and 2550: Outline without and with recapper



Software Usage Environment

The Auto*Mate* 2500 Family software installed on the Auto*Mate* 2500 Family system PC is not intended for use on any other computers or devices.

Important

All software installation and upgrade activities on the Auto*Mate* 2500 Family system PC must be performed by your Beckman Coulter Representative. For all matters relating to the Auto*Mate* 2500 Family system PC, contact your Beckman Coulter Representative for support.

Weight of the Auto*Mate* 1200 and 2500

Net weight: 480 kg (1,058 lbs)

Gross weight: 730 kg (1,610 lbs) including packaging

Weight of the Auto*Mate* 1250 and 2550

Net weight: 720 kg (1,590 lbs)

Gross weight: 1040 kg (2,290 lbs) including packaging

Packing Dimensions for the Auto*Mate* 1200 and 2500

W x H x D 2,200 x 1,760 x 1,470 mm (86.6 x 69.3 x 57.9 in)

Packing Dimensions of the Auto*Mate* 1250 and 2550

W x H x D: 3,000 x 2,150 x 1,500 mm (118.1 X 84.6 x 59.1 in)

Electrical Requirements of the Auto*Mate* 1200 and 2500

The line voltage must be free of power surges (overvoltage category II), power changes, and loss of power for the protection of the electronic circuits.

Table 6 Electrical requirements

	Auto*Mate* 1200	**Auto*Mate* 2500**
Electrical consumption	360 W (system fully loaded)	480 W (system fully loaded)
System current (SC)	1.5 A (system fully loaded)	2.2 A (system fully loaded)
Voltage	100-240 VAC [±10%]	100-240 VAC [±10%]
Frequency	50 / 60 Hz [±1%]	50 / 60 Hz [±1%]
Power line	16 A (Europe) or 20 A (North America)	16 A (Europe) or 20 A (North America)

Electrical Requirements of the Auto*Mate* 1250 and 2550

The line voltage must be free of power surges (overvoltage category II), power changes, and loss of power for the protection of the electronic circuits.

Table 7 Electrical requirements

	Auto*Mate* 1250	**Auto*Mate* 2550**
Electrical consumption	360 W (system fully loaded) 920 W (system fully loaded and air compressor running)	480 W (system fully loaded) 1040 W (system fully loaded and air compressor running)
System current (SC)	1.5 A (system fully loaded)	2.2 A (system fully loaded)
SC and air compressor	4.0 A	4.7 A
Air compressor start current	10.0 A (~300 ms) (approx. 10 times/hour if system is fully loaded)	10.0 A (~300 ms) (approx. 10 times/hour if system is fully loaded)
Voltage	100-240 VAC [±10%]	100-240 VAC [±10%]

Table 7 Electrical requirements (Continued)

	Auto*Mate* 1250	**Auto*Mate* 2550**
Frequency	50 / 60 Hz [±1%]	50 / 60 Hz [±1%]
Power Line	System and compressor, each 16 A (Europe) or 20 A (North America)	System and compressor, each 16 A (Europe) or 20 A (North America)

Compressed Air Requirements of the Auto*Mate* 1250 and 2550

- Type (compressor type dependent on local power specification)
- Flow volume: 50 l/min
- Pressure: Maximum 8 bar (116 PSI)

Read all product manuals

Read all product manuals and consult with Beckman Coulter-trained personnel before you operate the system. Do not perform any procedure before you carefully read all instructions. Always follow the product labels and the recommendation from the manufacturer. For more information, contact Beckman Coulter.

Incident reporting in the European Union

For a patient, user, or third party in the European Union and in countries with identical regulatory regime (Regulation 2017/746/EU on In vitro Diagnostic Medical Devices); if, during the use of this device or as a result of its use, a serious incident has occurred, please report it to the manufacturer and/or its authorized representative and to your national authority.

Symbols and Warnings

Alerts for Danger, Warning, Caution, Important, Note, and Tip

Danger

Danger indicates a hazardous situation which, if not avoided, would cause death or serious injury.

Warning

Warning indicates a potentially hazardous situation which, if not avoided, could cause death or serious injury. Warning can indicate the possibility of erroneous data that could cause an incorrect diagnosis.

Caution

Caution indicates a potentially hazardous situation which, if not avoided, could cause minor or moderate injury. Caution can also alert against unsafe practices, or indicate the possibility of erroneous data that could cause an incorrect diagnosis.

Important

Important indicates important information to follow.

Note

Note indicates notable information to follow.

Tip

Tip indicates information to consider.

Symbols Used

The following symbols are used in our documentation.

Symbol	Meaning
	**Biological risk** This symbol warns of biohazardous material or risk of being contaminated.
	**Caution** This symbol indicates a potential hazard which, if not avoided, could result in minor or moderate injury.
	**Electrical hazard** This symbol denotes an area of the system that should under no circumstances be accessed as an electric shock risk exists.
	**Laser radiation** This symbol warns that a laser is part of the device. To avoid eye injuries do not look directly into the laser beam.
	**Hand injury** This symbol indicates areas where there is a risk of injury to fingers or the hand due to instrument movement.
	Wear Gloves
	Wear Eye Protection
	Disconnect Mains Plug

Safety Instructions

Observe the following safety instructions when working on the system:

Warning

California Proposition 65. This product can expose you to chemicals known to the State of California to cause cancer and reproductive harm. For more information go to www.P65Warnings.ca.gov.

Caution

To avoid injury, inspect your working environment for edges, corners, or protruding parts before working on the system.

Caution

Disconnect system from the mains when working on electrical cabinet. The electrical cabinet contains live wires even when the main switch is turned off. These wires have visible, yellow markings near all connection points.

Caution

When lifting safety covers, lock the cover in the raised position before releasing it to avoid injury.

Caution

Risk of injury caused by heavy load. During installation, you risk injuring your hands, fingers and back while handling heavy loads. To avoid these risks, carry or transport the system or parts of the system following the specified transportation instructions.

Caution

Avoid direct contact with patient samples, disposable pipette tips, used caps, any machine components that come in contact with sample fluids, and liquid waste. Always wear gloves and other protective gear to protect yourself from infection. Before troubleshooting the system with open doors and covers, remove patient samples. Handle all liquid waste as potentially infectious. Some liquid waste can require special treatment before disposal. Follow your laboratory procedure.

Caution

If you come into direct contact with sample fluid, thoroughly wash the affected area and consult a physician. Immediately wipe off any contaminants from the system. Clean the system using approved liquid disinfectant. After working on the system, clean your hands thoroughly.

Caution

Use Non Bio-hazardous Substitutes only when Performing Tests. Take protective measures if you have to test the system using patient samples. Use protective equipment for your eyes, nose, and mouth, such as safety glasses or a visor or mask.

Caution

Biological risks and hand injury when removing samples. If it is necessary to remove a sample tube manually from the robot grippers, take care not to come into contact with the sample.

Caution

Exceeding the maximum fill level can contaminate the device and samples.

Caution

While the system is running, only use the input and output drawers to load racks and tubes. Do not reach into the system to manually insert or remove tubes while the system is running! If you need to remove tubes manually, for example in case of an error, stop the system first.

Important

Do not enable remote access to any of the Auto*Mate* 2500 Family PCs (including the Sorting-Drive Plus, Sorting-Drive Professional or iPAW PC) or install any other software! Doing so can disrupt correct operation of the PC.

Caution

While the system is in operation, do not touch or go close to any moving parts. Close protective guards and covers during operation. Failure to close covers correctly can cause injury or incorrect results.

Safety Recommendations

Avoid Problems Caused by Power Failure

To avoid the problems caused by a power failure and to protect sample data, Beckman Coulter recommends using a UPS (uninterruptible power supply).

Software Restart is Mandatory after Intended or Unintended Power Interruptions

After any intended or unintended power interruption, restart and reinitialize the Auto*Mate* 2500 Family system and restart all software applications.

Equipment Damage due to Failure to meet Power Requirements

Before connecting the system to the power line, check that the voltage and frequency ratings of your power line match those indicated on the device label.

Disconnect Mains Plug

Caution

Always disconnect mains plug when working on electronic parts or on parts connected to the power supply.

Read Documentation

Read and understand the documentation before operating the system.

Machine Safety Labels

The following sections give you an overview about the different safety relevant labels on the system and their meaning.

Glossary of Symbols Used in Auto*Mate* 2500 Family System Labels

Symbol	Description
	**Caution** This symbol indicates the need for the user to consult the instructions for use for important cautionary information such as warnings and precautions that cannot, for a variety of reasons, be presented on the medical device itself. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.4.4*
	**Warning; Biological hazard** This symbol indicates a warning of a biological hazard. *ISO 7010. Graphical Symbols - Safety colors and safety signs. #W009* **Supplemental Product-Specific Manufacturer Information** This symbol indicates a caution to operate only with all covers in position to decrease risk of personal injury or biohazard. This symbol indicates the use of biohazardous materials in the area. Use caution when working with possible infectious samples. Wear Personal Protective Equipment (PPE) such as gloves, eye shields, and lab coats. Handle and dispose of biohazardous materials according to your laboratory procedures.
	**Warning; Laser Beam** This symbol indicates a warning of a laser beam. *ISO 7010. Graphical Symbols - Safety colors and safety signs. #W004* **Supplemental Product-Specific Manufacturer Information** This symbol indicates that there can be laser light radiation in the area. Take precautions to prevent exposure.
	**Warning, Hot Surface** This symbol indicates a warning of a hot surface. *ISO 7010. Graphical Symbols – Safety colors and safety signs. #W017* **Supplemental Product-Specific Manufacturer Information** This symbol indicates that there is a hot surface or component (such as a lamp) in the area that, if touched, can cause a burn.

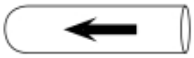
Symbol	Description
	**Warning; Sharp elements** To warn of a sharp element. *ISO 7010. Graphical Symbols for electrical equipment in medical practices. #W022* **Supplemental Product-Specific Manufacturer Information** The sharp elements symbol indicates that there are sharp moving parts in the area. Only operate the system when all covers are in position and use caution to reduce the risk of personal injury. While the system is operating, do not touch the sharp parts of the system. Do not insert fingers or hands into any system opening.
	**Manufacturer** This symbol indicates the medical device manufacturer. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.1.1* **Supplemental Product-Specific Manufacturer Information** This symbol indicates who the legal manufacturer of the product is.
	**Date of Manufacture** This symbol indicates the date when the medical device was manufactured. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.1.3*
	**Serial number** This symbol indicates the manufacturer's serial number so that a specific medical device can be identified. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.1.7*
	**Catalogue Number** This symbol indicates the manufacturer's catalogue number so that the medical device can be identified. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.1.6*

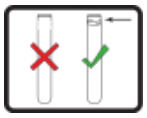
Symbol	Description
Made in *Country of Origin*	**Country of Origin Symbol** This symbol indicates the country that the product was manufactured in.
EC REP	**Authorised representative in the European Community** This symbol indicates the authorized representative in the European community. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.1.2*
CH REP	**Swiss-authorized representative** This symbol indicates the authorised representative in Switzerland.
	**Consult instructions for use** This symbol indicates the need for the user to consult the instructions for use. *ISO 15223-1. Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General Requirements. #5.4.3*
IVD	**In vitro diagnostic medical device** This symbol indicates a medical device that is intended to be used as an in vitro diagnostic medical device. *ISO 15223-1: Medical devices. Symbols to be used with medical device labels, labelling and information to be supplied. General requirements, clause 5.5.1*

Symbol	Description
RxOnly	**RxOnly Symbol** This symbol is recognized by the US FDA as an alternative to the following statement: Caution: Federal law restricts this device to sale by or on the order of a licensed practitioner. *21 CFR 801.109(b)(1)*
	**Warning; Crushing of hands** This symbol indicates a warning of a closing motion of mechanical parts of equipment. *ISO 7010. Graphical Symbols for electrical equipment in medical practices. #W024* **Supplemental Product-Specific Manufacturer Information** Use caution to avoid injury to hands when close to equipment with moving mechanical parts.

Glossary of Labels Used On Auto*Mate* 2500 Family Systems

Label	Meaning Of Label	Figure Callout[1]
	Consult the Instructions For Use. The instructions for use can be obtained by contacting your local Beckman Coulter representative or obtained electronically at: www.beckmancoulter.com/ifu	(19)
	Caution - risk of injury from moving parts.	(1,5)
	Warning; Hot Surface. Consult the instructions for use.	(13)
	Warning; Sharp Element.	(6) [2]
	Warning; Biological Hazard.	(4) [2]

Label	Meaning Of Label	Figure Callout[1]
Not depicted	Auto*Mate* 2500 Family Name Rating Plate. Conveys information regarding the specific Auto*Mate* 2500 Family System.	(8)
Not depicted	Auto*Mate* 2500 Family Name Rating Plate (China). Conveys information regarding the specific Auto*Mate* 2500 Family System in Chinese.	(8) [5]
	Proposition 65 Warning Label. Conveys information about Proposition 65. Only applied to systems in the United States of America.	(8) [6]
	Warning; Biological Hazard. Caution - risk of injury from moving parts. Consult the Instructions For Use.	(2,10-12,17,23)
	Normal working pressure of compressor is 6 bar / 87 psi.	(3)[3]
	Do not rotate manually.	(7) [2]
	Stop the system before opening protective covers. When lifting a protective cover, make sure that it locks in the raised position before releasing it.	(14)
	Fully extend drawers before accessing trays to prevent contact with moving parts.	(18)
	Tube direction.	(21) [3]

Label	Meaning Of Label	Figure Callout[1]
	Screw cap secondary tubes only!	(22) [4]
	Caution. Class 2 Laser radiation when open. Do not stare into the beam.	(15,16,20)
	Compliance label. Refer to Compliance Information for details.	(9)

[1] The numbers detailed in **Figure Callout** correspond with the callout numbers displayed in the figure within Position of Labels on Auto*Mate* Systems.

[2] These labels are only present on **Auto*Mate* 2500 Family Systems** with the optional **Recapper** module installed.

[3] These labels are only present on **Auto*Mate* 1250** and **Auto*Mate* 2550** Systems.

[4] This label is only present on **Auto*Mate* 1250** and **Auto*Mate* 2550** Systems which have been refitted according to **MOD 11564: Auto*Mate* 2500 Family Screw Cap Secondary Tubes**.

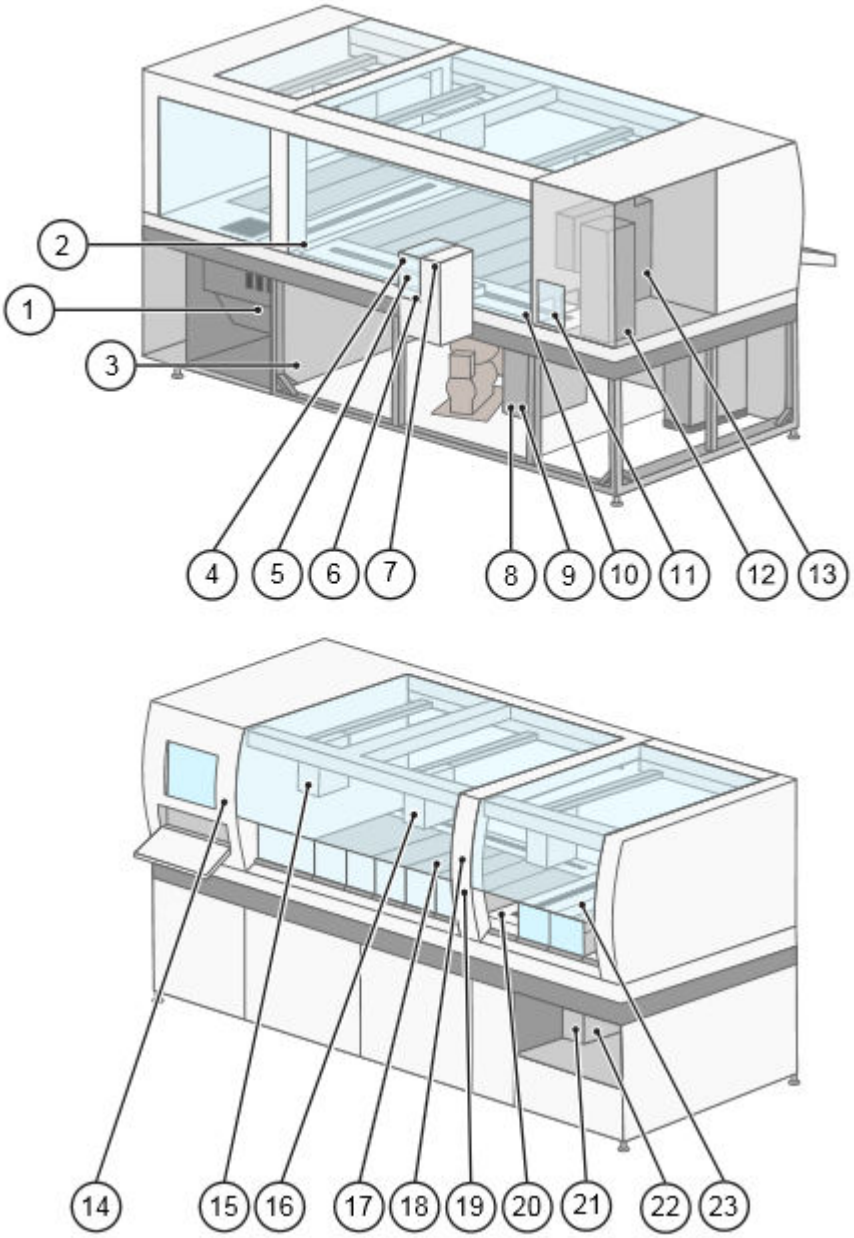
[5] This label is only present on systems operating in China.

[6] This label is only present on systems operating in the United States of America.

Position of Labels on Auto*Mate* 2500 Family Systems

The Figure shows the positions of labels on the rear (top image) and front (bottom image) of the Auto*Mate* 2500 Family Systems. The numbers in the figure correspond with each label listed in the Glossary of Labels on Auto*Mate* 2500 Family Systems.

Figure 7

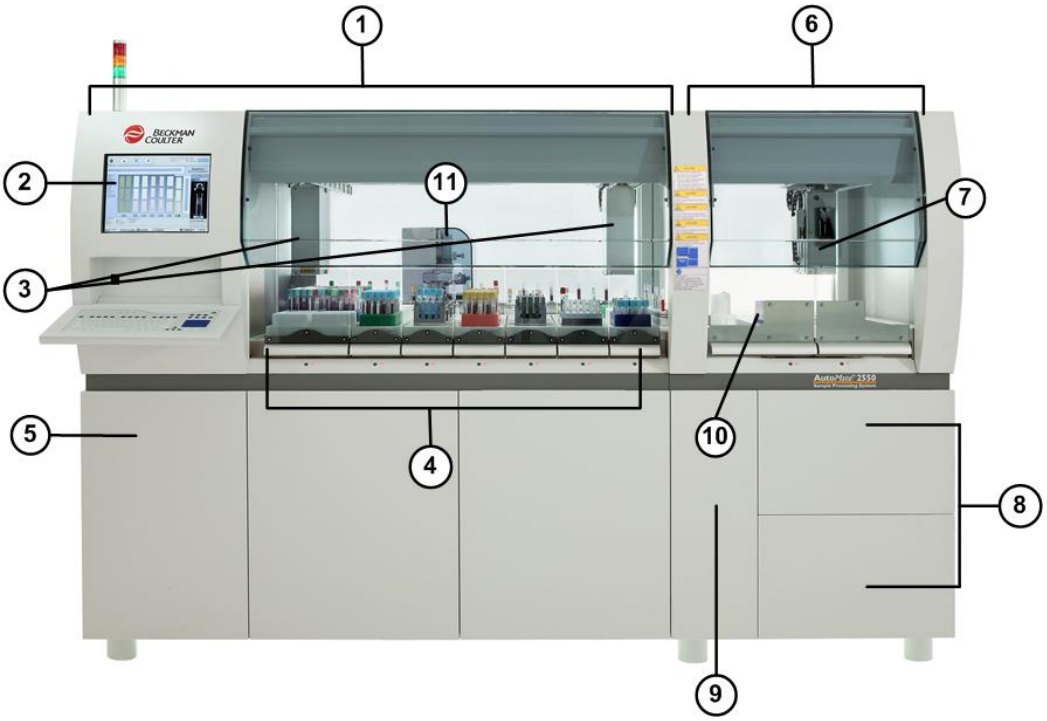


CHAPTER 1

System Overview

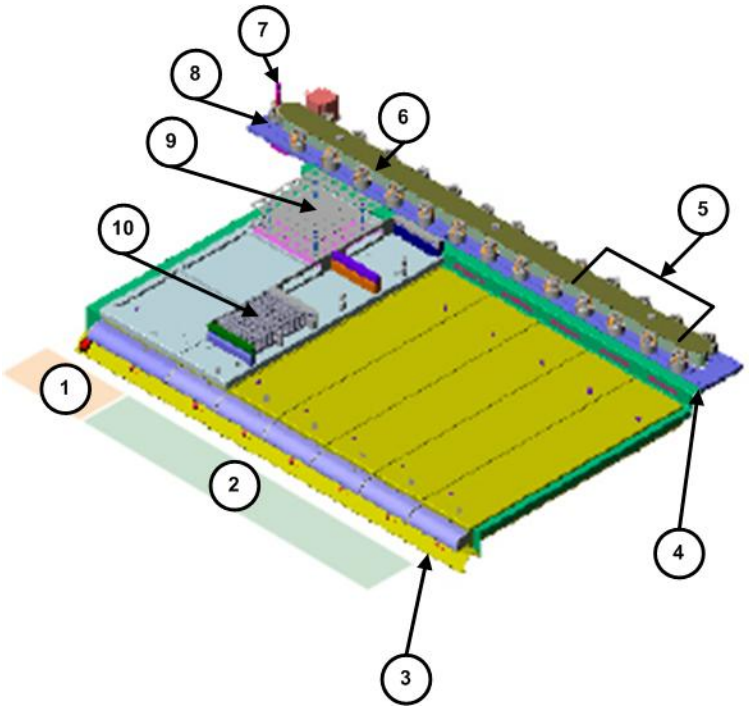
System Features

Figure 8 Auto*Mate* 2500 Family System with aliquot module



1	Sorter module	2	Touch screen	3	Robot 1/Robot 2
4	Drawers	5	PC	6	Aliquot module
7	Robot 3	8	Tube drawer and printer drawer	9	Waste container
10	Pipette tips	11	Recapper (optional)		

Figure 9 Functional overview



1	Input area	2	Output area	3	Button to open drawer
4	Conveyor belt	5	Get position for tubes by Robot 2	6	Put position for tubes by Robot 1
7	Decapping position	8	Tube Inspection Unit / Volume detection	9	Input rack
10	Rack				

Account Control Feature

To use an Auto*Mate* 2500 Family system, log on with your username and password. Depending on the level of access assigned to you, you are able to use particular menu items, graphical user interface elements, and some system parameters.

There are four levels of access.

- **User**
- **Advanced User**
- **Service**
- **Admin**

A **User** is an individual who uses the Auto*Mate* 2500 Family system regularly, but is not trained or authorized to access configurable system functions. Each **User** account is assigned with a unique username and password. A **User** cannot create or delete other **User** accounts.

An **Advanced User** has received training and is authorized to use some features of the system for troubleshooting or workflow customization. Each **Advanced User** account is assigned with a unique username and password, and is granted permission to create or delete **User** and **Advanced User** accounts.

The **Service** account is only for use by Beckman Coulter Field Service Engineers (FSE). Access to the **Service** account by laboratory personnel is not permitted. The **Service** account cannot be changed or deleted. The **Service** account can create or delete **User** and **Advanced User** accounts.

The **Admin** account is only for use by Beckman Coulter Research and Development. There is only one **Admin** account configured on the system, and the password is not provided to the customer or to Beckman Coulter Field Service Engineers. The **Admin** account cannot be changed or deleted. The **Admin** account is granted permission to create or delete **User** and **Advanced User** accounts.

Sample Processing

Overview of Sample Processing

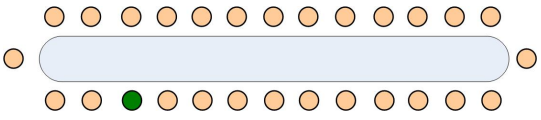
1 Load empty racks onto the output drawers.

2 Place all tubes to be distributed onto racks in the input area.

3 Start processing. The gripper of robot 1 picks up the first tube.

4 The bar code reader in robot 1 identifies the tube. Bar code labels contain the sample ID and sample type information.

5 Robot 1 places the tube in a tube holder on conveyor belt 1.



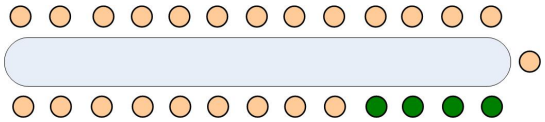
6 By default, the tube inspection unit automatically identifies the tube and cap type by shape and color. The volume level is detected and the tube volume is calculated. The system is configured with the tube characteristics used in the lab:

— Tube type
— Tube dimensions
— Cap color (optional)

7 The Auto*Mate* 2500 Family system sends a query to the LIS with the tube information identified. The LIS replies with processing instructions, indicating where to place the tube, the number of secondary tubes to create (up to a maximum of seven), and decapping and recapping requirements.

8 Conveyor belt 1 transports the tube to the decapper. If instructed by the LIS, the sample tube is decapped. Auto*Mate* 2500 and 2550 systems have a double decapper for higher throughput. The caps are dropped into a disposable waste bag for safe disposal and to minimize the risk of contamination.

9 Conveyor belt 1 continues to transport the tube to robot 2 (positions marked green):



Robot 2 places each tube on its target rack. If instructed by the LIS, robot 2 places tubes onto conveyor belt 2 for aliquoting.

Note

When a tube is placed at its target destination, the Auto*Mate* 2500 Family system sends a status record to the LIS.

The system shows the tube as a colored dot on the conveyor belt on screen.

Different colors represent the tube status. The combination of fill color and border color of the circles indicates the status. Select a sample tube at its position on screen when the Auto*Mate* 2500 Family system is stopped and view detailed information about the tube.

Tube Status Overview

Different colors represent the tube status. The combination of fill color and border color of the circles indicates the status. Select a sample tube at its position on screen when the Auto*Mate* 2500 Family system is stopped and view detailed information about the tube.

Table 13 Tube status indicators on-screen

Tube indicator	Description
	Black outline: The tube has a cap.
	Red outline: The tube has no cap.
	X: The tube was recapped. Fill color depends on tube status.
	The tube is available in the input area. The color changes when the system places the tube on the conveyor belt.
	The tube is only to be distributed.
	The tube was decapped.
	The tube has no bar code label or could not be identified.
	The tube is destined for an error rack.
Auto*Mate* 1250/2550 only:	

Table 13 Tube status indicators on-screen (Continued)

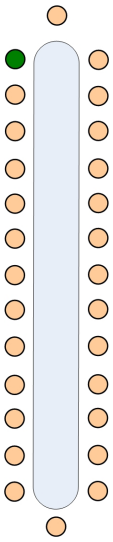
Tube indicator	Description
	A primary tube to be aliquotted. The red outline indicates that this tube was decapped.
	An empty secondary tube.
	A secondary tube processed by the Aliquot module.
	A reserved secondary tube position on conveyor belt 02 for aliquot sampling by Robot 3.
	The tube has a warning. Manual post processing might be necessary. Refer to the tube information window for warning information and further instructions.

Important

Place primary tubes on input racks. Standard input racks allow for tubes diameters of 14 mm and 17 mm, respectively. To avoid errors, place tubes in the correct input rack. If you need a custom rack solution, contact your Beckman Coulter Representative for support.

Processing Aliquots

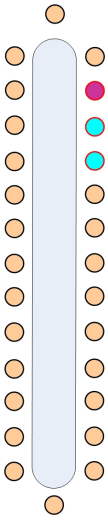
1 Robot 2 places a primary sample tube into a tube holder at the place position on conveyor belt 2.



The printer prepares a label with the sample ID and adheres it to an empty secondary container from the tube drawer. These bar code labels have the same ID as the primary tube*.

Conveyor belt 2 transports the primary sample tube to the position where the tube lift places the prepared secondary sample tubes after the primary tube.

Example: One primary sample tube (magenta) followed by two secondary sample tubes (light blue).



* A Beckman Coulter representative can change this setting for you. You can print labels with any bar code or no bar code at all.

2 Robot 3 aliquots the sample from the primary sample tube to the secondary sample tubes. The aliquot volume of each secondary sample tube is determined by the LIS (or Sorting-Drive[**]).

Robot 3 uses a disposable pipette tip for each aliquot to prevent cross-contamination. After sampling by robot 3, conveyor belt 2 moves the sample tubes to the pick up position of robot 2. Robot 2 places the sample tubes on their destination racks. Sample tubes that require further processing are placed on an input rack. A Beckman Coulter Representative can configure the sorting destinations, such as buffer rack or conveyor belt 1.

Note

The Auto*Mate* 2500 Family system sends the workplace number and position of each tube to the LIS.

3 If a recapper is installed, the sample tube can be recapped with adhesive film.

Handling Rejected Tubes

Note

The Auto*Mate* 2500 Family system can distribute tubes the tube inspection unit rejects, for example because the shape, cap or cap color are unknown to the system. Your Beckman Coulter Representative can configure this feature.

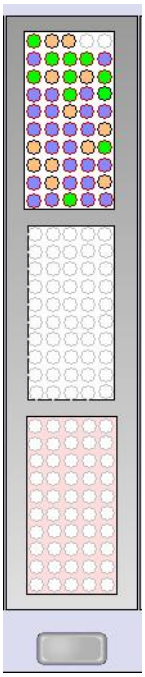
Important

Activating this feature can require changes to the LIS. Refer your LIS provider to the Auto*Mate* Online Specification for configuration.

- If the feature is active, the Auto*Mate* 2500 Family system ignores LIS requests to decap and recap rejected tubes. Manual post-processing of tubes can be required, for example to decap or recap tubes. If the LIS requests empty secondary containers, manual aliquoting can be required.
- The Auto*Mate* 2500 Family system marks tubes which require manual post-processing with a warning. You can identify these tubes on-screen by an orange dot.
- Read the warning in the tube information dialog for manual post-processing instructions.
- If the feature is active, primary tubes with a cap can be placed on conveyor belt 2. The primary tube is not sampled by the Aliquot module and is only placed here to prepare empty secondary containers. A primary tube with a cap is marked on-screen as an orange circle.

[**] Sorting-Drive is data management software for use in clinical laboratories.

Figure 10 Sample tubes with a warning identified by an orange circle on a distribution workplace



Drawer Handling

Important

Do not force the drawers open. You can damage the drawers. Use the buttons on the drawers or the drawer buttons in the software user interface to open the drawers.

Caution

Cross-contamination. Close drawers in a smooth, controlled action. Uncontrolled drawer closure at high velocity can disturb samples, and can cause splashing.

Drawers

The drawers in the upper section of the Sorter module are for processing sample tubes. The drawers in the upper section of the Aliquot module include the drawer for pipette tips and MTPs.

The drawers can be opened by pressing the drawer request button. When pressed, the button sends a request to stop or complete all ongoing activities for that drawer, and when all activities are complete, the drawer opens.

The status indicator LED displays the availability of the drawer. The LED displays in one of three colors; red, yellow, and green. If a drawer in either the Sorter or Aliquot modules is in use by the system, the LED on the specific drawer displays as red.

If the drawer request button is pushed and a distribution is running, the system registers the action. The LED turns orange, indicating that the request has been registered but that the system must complete distribution activities first.

After distribution is complete, the drawer is released. The LED turns green.

Aliquot Module Consumable Drawers

The drawers beneath the aliquot module contain the label printer, secondary container, and the tip waste container. The label printer drawer is accessed to replace the secondary container label roll. The secondary container drawer is accessed to reload the system with secondary containers. The tip waste container must be accessed to dispose of aliquot tip waste.

The three drawers are accessed via the Auto*Mate* 2500 Family system software, using the three buttons to the right of the Start and Stop button.

The buttons for opening the consumable drawers (printer, secondary container, waste) are only active while the Auto*Mate* 2500 Family system is stopped.

Figure 11 Consumable drawers while at Auto*Mate* 2500 Family system is at stop

While the Auto*Mate* 2500 Family system is running a distribution, the buttons for the consumable drawers are deactivated and shown in gray.

Figure 12 Consumable drawers while running a distribution

Refer to Fill Up the Consumables or Empty the Waste Container for instructions.

Base Frame and Rack Types

A base frame is the mechanical interface between the drawer beneath and the rack on top. It can accommodate different types of racks.

Figure 13 Base frame with positioning guides for racks (for example AU NE tray)

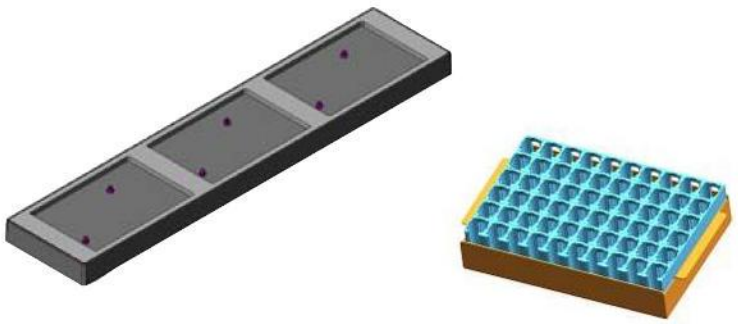
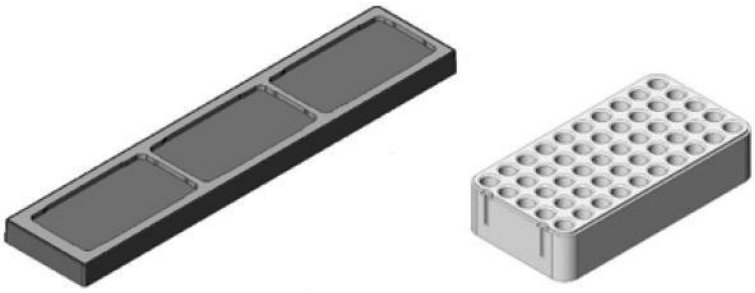


Figure 14 Base frame without positioning guides to be used only with racks (for example 50-position rack)

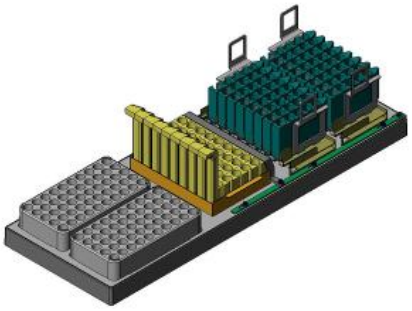


Several standard racks are available:

- Input sample racks
- Racks to be placed directly on an analyzer
- Auto*Mate* trays to integrate a batch of analyzer racks
- Racks for archiving
- Racks for manual workbenches (standard)
- Racks for disposable tips to prevent cross-contamination
- MTPs (option)

Different racks can be used in combination, such as an input base frame for two 50 position racks, one Centaur tray and two Aero trays:

Figure 15 Input base frame for two 50 position racks, one Centaur tray and two Aero trays



MTP racks are also an option.

Figure 16 Microtiter plate

A camera captures digital images to identify tube type, cap size, cap color (optional), and sample volume (optional).

The system is controlled by software that runs on embedded Microsoft Windows. Use the touch screen or the keyboard below the monitor to operate the software.

Note

For detailed information on base frames, racks, and trays, contact your Beckman Coulter Representative.

Placement of Rack on Base Frame

Important

Place racks on the correct position on the base frame. Pins and indentations guide the rack into the correct position. The rack should sit flat and not be tilted.

Figure 17 Pins and indentations

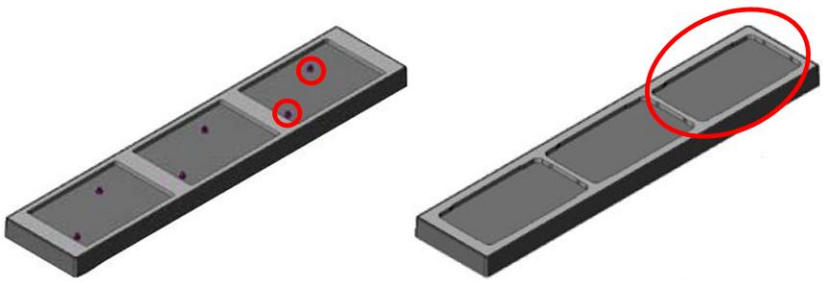
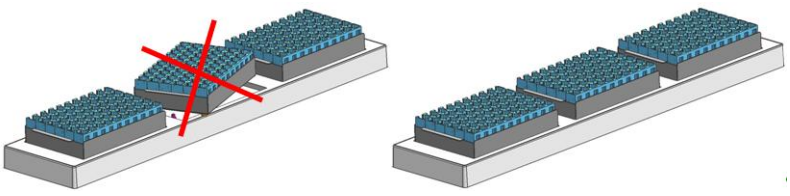


Figure 18 Wrong position and correct position



Important

Use tubes with the diameter and height specified for the rack. Consider label thickness on the tube when determining the tube diameter.

Tubes

Primary tubes

Tubes must fulfill the specifications for processing on the Auto*Mate* 2500 Family systems.

Caution

Risk of cross-contamination, sample loss, and system damage. The use of consumables which do not meet the specification requirements is not permitted by Beckman Coulter. The owner accepts liability for any loss of sample, injury to personnel, or damage to equipment or property resulting from the use of unsupported consumables.

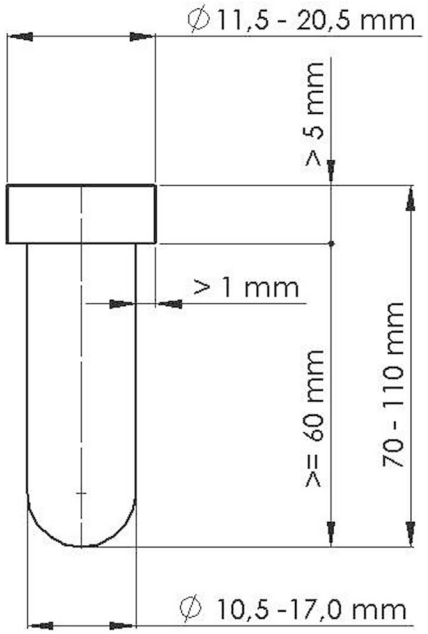
Table 14 Tube Specification for Primary Tubes

Characteristic	Specification
Outer diameter	10.5 mm to 17.0 mm, for recapping <15.7
Inner diameter	>10.5 mm for aliquoting
Tube height	70 mm to 110 mm including cap, 60 mm to 105 mm decapped ≥60 mm from bottom to lower rim of cap for decapping
Shape	Tapering sides. Rounded or flat bottom. For aliquoting: Single-walled, no false bottom. No tubes with inlays, adapters, or tube-in-tubes.
Material	Plastic
Cap types	Rubber and screw caps with tapering sides.
Cap color	Monochrome caps, including white multi-colored caps (speckled)
Outer cap diameter	11.5 mm to 20.5 mm

Table 14 Tube Specification for Primary Tubes (Continued)

Characteristic	Specification
Cap height	>5 mm
Cap protrusion	>1 mm
Maximum tube fill level	≥15 mm gap between liquid surface and upper rim

Figure 19 Tube specification for primary tubes



Secondary Tubes (ODL03587)

Secondary tubes used in the Auto*Mate* 2500 Family systems have a diameter of 13 mm and a height of 75 mm. Secondary tubes are labeled with adhesive labels using a direct printing process. After labeling, a secondary tube cannot be stored at temperatures below 0 °C.

⚠ Caution

Risk of cross-contamination or sample loss. Do not store labeled secondary tubes at temperature below 0 °C. Tube integrity and label adhesion is not guaranteed at lower temperatures which can result in a loss of sample traceability.

Table 15 Secondary Tube Properties

Characteristic	Specification
Material	Polystyrene
Supported Label	Thermo direct only
Supported Caps	Parafilm only
Post-Analysis Storage Temperature	0 °C to 50 °C

Screw Cap Secondary Tubes (B72304)

Screw cap secondary tubes are an optional feature which can be installed into an Auto*Mate* 2500 Family system. Screw cap secondary tubes have the same dimensions as the secondary tubes, but can be securely capped with a high density polyethylene cap. Screw cap secondary tubes are labeled with adhesive labels using a thermal transfer printing process. After labeling, a screw cap secondary tube cannot be stored at temperatures below -80 °C.

Caution

Risk of cross-contamination or sample loss. Do not store labeled screw cap secondary tubes at temperature below -80 °C. Tube integrity and label adhesion is not guaranteed at lower temperatures which can result in a loss of sample traceability.

Table 16 Screw Cap Secondary Tube Properties

Characteristic	Specification
Material	Polypropylene
Working Volume	5 ml
Maximum Centrifugation	5000 × *g*
Supported Label	Thermo-transfer labels only
Supported Caps	B72305 Screw Caps. Refer to the important note below.
Post-Analysis Storage Temperature	-80 °C to 50 °C

Important

Screw cap secondary tubes and caps issued after July 2023 are not compatible with older screw cap secondary tubes and caps. Incompatible tube and cap combinations cannot be completely sealed and sample leakage can occur. Confirm the Sarstedt part

numbers on the packaging when changing consumables and do not use tube and cap combinations other than those pairings listed here:

Table 17 Compatible Screw Cap Secondary Tube and Cap Combinations

Item	Part no.	Sarstedt Item Number	Compatibility
Screw cap secondary tubes (4 × pack of 500 tubes)	B72304	Tube: 60.504.300 (old)	Cap: 65.163.300 only
		Tube: 60.504.015	Cap: 65.643.001 only
Screw caps (5 × bag of 1000 caps)	B72305	Cap: 65.163.300 (old)	Tube: 60.504.300 only
		Cap: 65.643.001	Tube: 60.504.015 only

Bar Code Label Format for Primary and Secondary Tubes

The system supports the following bar code label formats. You can use different formats in combination.

- Codabar (NW7)
- Code39
- Code93
- Code128
- EAN
- EAN128
- UPC
- 2 of 5 interleaved

The system supports these characters: A to Z, a to z, 0 to 9 and hyphen (-).

Bar Code Label Design

Label size

The standard label size is 40 x 30 mm. Other sizes may require adjustments to the printer. Contact your Beckman Coulter representative for support.

One label roll contains 5,500 labels

Bar code label layout

You can modify the layout. You can use different layouts for different purposes, such as depending on primary tube information or tube destination. Six different default print formats are available.

UTF8 code supported

The Auto*Mate* 2500 Family systems support UTF8 encoding. You can print bar code labels with character sets such as Simplified Chinese.

Figure 20 Examples of different bar code label layouts

Note

When printing and affixing bar code labels, confirm that:

- Labels are affixed firmly and do not protrude from the tube.
- Labels are positioned correctly.
- Labels are legible, the text is not smudged.

Pump System

Systems with an aliquot module (Auto*Mate* 1250 and Auto*Mate* 2550) have a pump system for aliquoting.

Figure 21 Generation 1 pump (GEN1) and EZ Pipettor pump (GEN2)

Aliquot volume range of the pump: 30 µl to 900 µl

Note

If you need to aliquot more than 900 µl, multi-aspiration or dispensation is possible.

Important

The pump must be operated with an approved tip rack. Do not use any other tip racks.

Figure 22 Example: pipette filter tips (B24687)

Table 18 Accuracy of pump

Volume (µl)	CV * (%)	Accuracy (±%)
≥ 30	25	15
≥ 50	10	10
≥ 200	3	5

*CV: Coefficient of Variance

Pipette Tips

Disposable tips prevent cross-contamination. Conductive pipette tips permit precise level detection.

- Tip volume: 1,200 µL
- Tips per rack: 140
- Racks per drawer: 3

CHAPTER 2

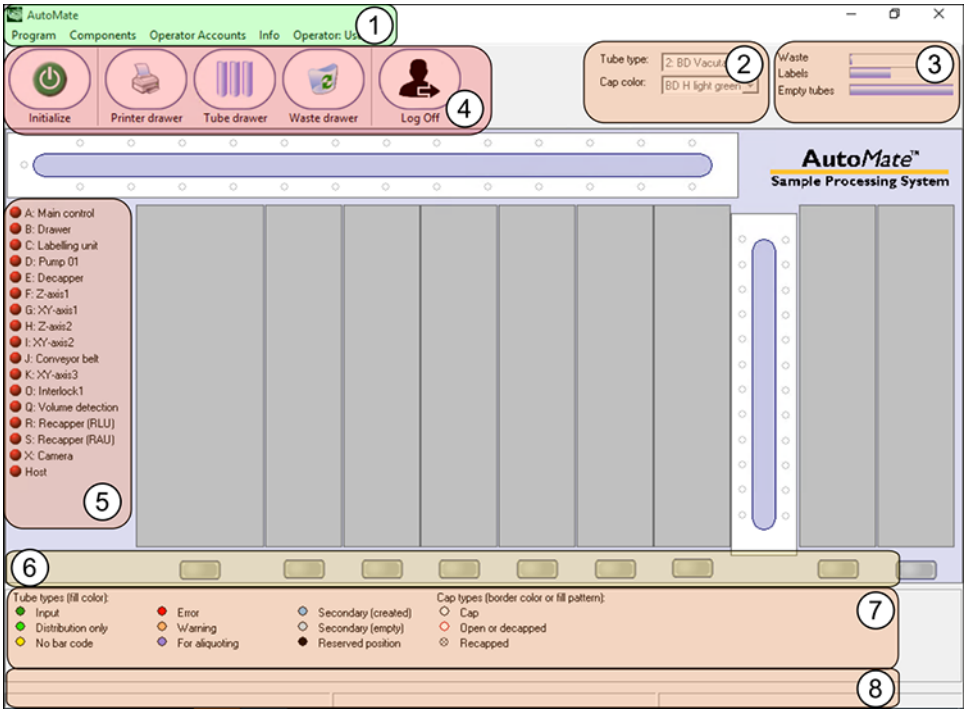
Run the System

Introduction to Run the System

This chapter describes how to use the system while logged on as a **User**. For information regarding the differences in operator access level for the **Advanced User**, refer to the next chapter.

Graphical User Interface

The user interface is the direct link between the user and the Auto*Mate* 2500 Family system. It allows direct and indirect access to all functions. The user interface can be organized into several functional groups.



1	System Menus	5	System Communication Status
2	Tube Type and Cap Color Selection	6	Open Drawer
3	Consumable Status	7	Sample Tube Distribution Status
4	Operating Options	8	Sample Tube Distribution Status

Note

If you have problems with the display of language-specific characters or want to use the interface in an unavailable language, contact your Beckman Coulter Representative. Do not change the Regional Settings in Windows; correct system function cannot be guaranteed!

System Menus

The system menus let you control non-routine functions. These functions are available if the system is in stop mode.

Program

The **Program** menu contains the following submenus:

Menu Name	Description
Initialize	Initialize all system components. All components are listed with their status. **Stop** allows you to stop the procedure. **Caution** **Stop does not immediately stop the robot movement. Current robot movements are completed.** **Note** When initializing a single component or all components, a dialog asks you to confirm the initialization process. **No** is the default option. Select **Yes** to continue with initialization. After stopping initialization, press **Start** to continue or **Close**.
Service Mode	**Service Mode** is a tool used by field service engineers for error analysis and investigation. **Service Mode** is also used by the **Advanced User** to perform some troubleshooting activities. The **User** cannot access **Service Mode**. **Caution** **Risk of system malfunction. Do not use Service Mode unless you are a trained Advanced User. The system behavior can be compromised by unauthorized modification.**
Counter	Reset the counters for waste, labels, and empty tubes.
Exit	Close the application.

Components For Standard Users

The **Components** menu allows a **User** to initialize components, and access some system tools.

Table 21 Components menu and submenus

Menu	Submenu	Description
Decapper	**Initialize**	Initialize the decapper.
	Open gripper	Creates a dialog to open the grippers automatically.
Recapper	**Active**	Activate or deactivate the recapper. The system prompts you to reinitialize the recapper on activation.
	Initialize	Initialize the recapper.
	Start Maintenance Mode	Activates Maintenance mode for the Recapper.
Robot 1	**Initialize**	Initialize Robot 1.
	Open gripper	Moves the robot to the unload position and creates a dialog to open the grippers automatically.
Robot 2	**Initialize**	Initialize Robot 2.
	Open gripper	Moves the robot to the unload position and creates a dialog to open the grippers automatically.
Robot 3/Pump	**Initialize**	Initialize Robot 3 and pump.
	Change tip	Moves Robot 3 to the tip stripper, disposes of the tip, and then picks up a new tip.
Tube Inspection Unit	**Initialize camera**	Initialize the camera.
Aliquot Module	**Initialize**	Initialize the label unit of the aliquot module.
	Initialize Printer	Initialize the printer.

Table 21 Components menu and submenus (Continued)

Menu	Submenu	Description
Conveyor Belt 01	**Delete all tubes**	Deletes all tubes on Conveyor Belt 1. **Warning** **Risk of sample loss. Confirm that tubes are removed after deletion. If tube holders are not empty, tube collision and sample spillage can occur.** **Caution** **Risk of delayed results. Rerun any unprocessed tubes as new samples. Traceability is lost when samples are deleted before distribution.**
Conveyor Belt 02	**Delete all tubes**	Deletes all tubes on Conveyor Belt 2. **Warning** **Risk of sample loss. Confirm that tubes are removed after deletion. If tube holders are not empty, tube collision and sample spillage can occur.** **Important** Risk of delayed results. Rerun any unprocessed tubes as new samples. Traceability is lost when samples are deleted before distribution.

Info

Select **Info**, submenu **System Info** to view information about your software version and licenced options.

Select **Info**, submenu **Help** to open the Instructions for Use as a dialog with links to the documents in all available languages.

Operator Accounts

The **Operator Accounts** menu provides access to the **Logoff** option.

The **Logoff** option performs the same function as the **Logoff** button on the system interface. When the system is running a distribution, the **Logoff** option is unavailable until the system is idle.

Operator Identification

The graphical user interface includes an indicator of which operator is logged on. The name of the operator is displayed next to the **Logged On**. If no operator is logged on, **None** is displayed.

Operating Options

	**Initialize**	After starting the system, select this button to initialize the system.
	**Start**	After initializing the system, the **Initialize** button becomes the **Start** button. The system is in stop mode when this button is visible. Select this button to start operating the system.
	**Stop**	While the system is operating, the **Start** button becomes the **Stop** button. Select this button to immediately stop all system activity. The system completes the current action, such as recapping a tube, before stopping.
	**Logoff**	When an operator is logged on, the **Logoff** button can be used to logoff. It is only possible to logoff if the system is idle. If the system is running a distribution or is initializing, the option to log off is not enabled.

Caution

If the system configuration uses MTPs: If Stop is selected while the tip of robot 3 contains sample fluid to be dispensed into the MTP, the system switches into safety mode. The sample fluid is dispensed at a reduced speed before the system stops. The same happens if the system stops because of an error by any component other than robot 3 or the pump. A semi-transparent safety message covering the whole screen alerts you that the system stop is delayed. If necessary, select Emergency Stop in the message dialog to immediately stop the system. After selecting this option, a warning message warns you that the remaining sample fluid in the tip can contaminate the

MTPs or tip racks. If an error in robot 3 or the pump caused the system to stop, dispose of the MTP or tip rack highlighted on the screen to prevent contamination.

Caution

Risk of contamination: Despite the implemented safety run behavior, a rare situation can occur where robot 3 stops above an MTP with sample fluid in the changeable tip, for example during an electrical power outage. If the system configuration uses MTPs, inspect the position of robot 3 before resuming operation. If robot 3 stopped above an MTP, dispose of the MTP located under the pipettor tip.

Note

Automatic restart after reloading! After all sample tubes are distributed in operating mode, all robots stop moving. The system remains in operating mode. When you load new sample tubes onto the input drawer and close the drawer, the system resumes processing immediately. Only operate the system with all doors and covers closed.

Consumables Drawer Buttons

Refer to Lower Consumable Drawers (Aliquot Module).

Tube Type and Cap Color Selection

The active tube inspection unit settings are displayed in the tube type and cap color selection menus. The menus are locked to **Automatic Detection** for the **User**. Operators with higher access levels can access more options from the two menus.

Consumable Status

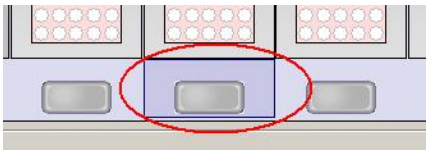
You can see the consumable status for labels, tubes, and the waste container in the right upper corner.

Refer to Status Bars of Consumables and Waste for detailed instructions.

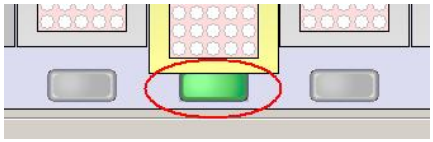
Open Drawer

1 To open a drawer, select the gray drawer button (at the bottom of the drawer displayed) on the screen.

2 The color of the button changes when the cursor rolls over it.



3 If the drawer is open, the button is green.



System Communication Status

The system indicates the status of communication between the PC and the Auto*Mate* 2500 Family system on the left side of the screen. These indicators purely informational.

Green

After initialization, green indicates that initialization of the component was successful. In operating mode, green indicates that communication is idle.

Red

After initialization, red indicates that the component failed to initialize. Reinitialize the individual component. In operating mode, red indicates that communication is active.

Note

When initialization is complete, all indicators should be green. If not, reinitialize the individual component from the **Components** menu. During operation, the indicators flash from green to red, which indicates active communication.

Sample Tube Distribution Status

The area below the drawers on screen shows the sample tube indicator dots. These indicators track the sample tubes on screen along conveyor belts 01 and 02, and after distribution to the target racks.

Note

Refer to Tube Status Overview for descriptions of each status color.

Status Bar

During initialization, the status bar displays which component is being initialized.

During normal operation, the status bar displays collision warnings. If the system is configured correctly, all collisions are automatically resolved after a short time. When a collision is cleared, the collision warning disappears from the status bar. The alert in the status bar is purely informational.

If a collision is not automatically resolved and the collision warning does not disappear, initialize the full system to resolve the issue.

If the collision warning does not disappear after initialization, contact your Beckman Coulter representative.

DavidCan Task Bar Icon

When the Auto*Mate* 2500 Family system PC is running, an icon for the DavidCan application is displayed in the Windows taskbar.

Caution

Risk of system malfunction. Do not open the DavidCan application. The application is only intended to be used by your Beckman Coulter Representative.

Camera Inspection Window

Important

The inspection window has to be kept minimized during operation. To prevent interface errors, do not close or exit this window.

The camera inspection window always runs in the background. This window shows tube images as they are captured by the camera in the tube inspection unit. The name of the cap color and tube type identified are displayed at the bottom of this window.

Preconditions Before You Start

Caution

Always run the Auto*Mate* 2500 Family system with all covers locked and the doors and interlock doors closed and secured to prevent injury.

Before you start the application confirm that:

- The system has been completely cleared. All tubes have been removed from output workplaces, from the conveyor belts, and from grippers of any robot or tube lift.
- The Sorting Drive software is running on the Sorting-Drive Server PC.
- Workplace numbers are correctly assigned to the corresponding workplace.
- The waste container and the cap waste container are empty.
- The label printer is on. Label rolls are loaded.
- Enough secondary tubes and pipette tips are available.
- The recapper has enough Parafilm.

Input Drawer

- Confirm that there is a minimum of one sample tube on the input drawer.
- In laboratories with high sample throughput, always work with a fully loaded sample tube rack to prevent interruptions in the distribution process.
- Confirm that all tubes are placed safely in the input rack.

Output Drawer

Important

Before you start the sorting process, always confirm that all output drawers are supplied with empty racks. Do not start a sorting process without any racks on the base frame. Otherwise, sample fluid might be lost and contaminate the machine.

Systems with Optional Modules

MTP Rack Reader

Confirm that the Auto*Mate* 2500 Family system is connected to a Sorting-Drive system with software version 4.2.1 or higher.

Confirm that the host communication is running. If the communication is interrupted, completely open the drawers used for MTPs and close them. Otherwise you can lose MTP definitions.

Caution

Risk of cross contamination. The MTP feature can only be used on an Auto*Mate* 1250 or 2550 system connected to a Sorting-Drive system running software version 4.2.1 or higher. Using the MTP without a connected Sorting-Drive can result in sample handling errors and cross contamination.

Recapper

Caution

If a recapper is installed on an Auto*Mate* 2500 Family system, the robots move in a different path. Remove sample tubes from the workplaces by manually opening the drawers. Avoid moving parts. While the system is in operation, do not touch or go close to any moving parts. Close protective guards and covers during operation. Failure to close covers correctly can cause injury or incorrect results.

Start the System

Caution

Always run the Auto*Mate* 2500 Family system with all covers locked and the doors and interlock doors closed and secured to prevent injury.

1 Turn on the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

2 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

A beep followed by two more beeps indicate that the system is ready to be initialized.

3 Open the door below the keyboard and switch on the PC on the right side.

Figure 23 The PC is located behind this door

4 After the operating system has loaded, locate the Auto*Mate* icon on the desktop. Use the touch screen and tap the icon twice to start the main application.

5 Log on to the Auto*Mate* 2500 Family software by entering your username and password.

6 The start screen displays prompting you to initialize. Select **OK** to confirm.

Note

When the system is initializing, conveyor belt 01 completes a full rotation and all tube positions on it are checked for available tubes. Any tube detected on conveyor belt 01 is displayed as a yellow dot (meaning tube without bar code label) on conveyor belt 01 on the screen. Tubes that are unexpected at a position are marked yellow and automatically placed on the error rack by robot 2. The system automatically scans for tubes on conveyor belt 1. Only a Beckman Coulter Representative can deactivate this default setting. If a tube was physically available before initialization, is expected by the software, but cannot be found on conveyor belt 01, a message prompts you to locate and remove the tube.

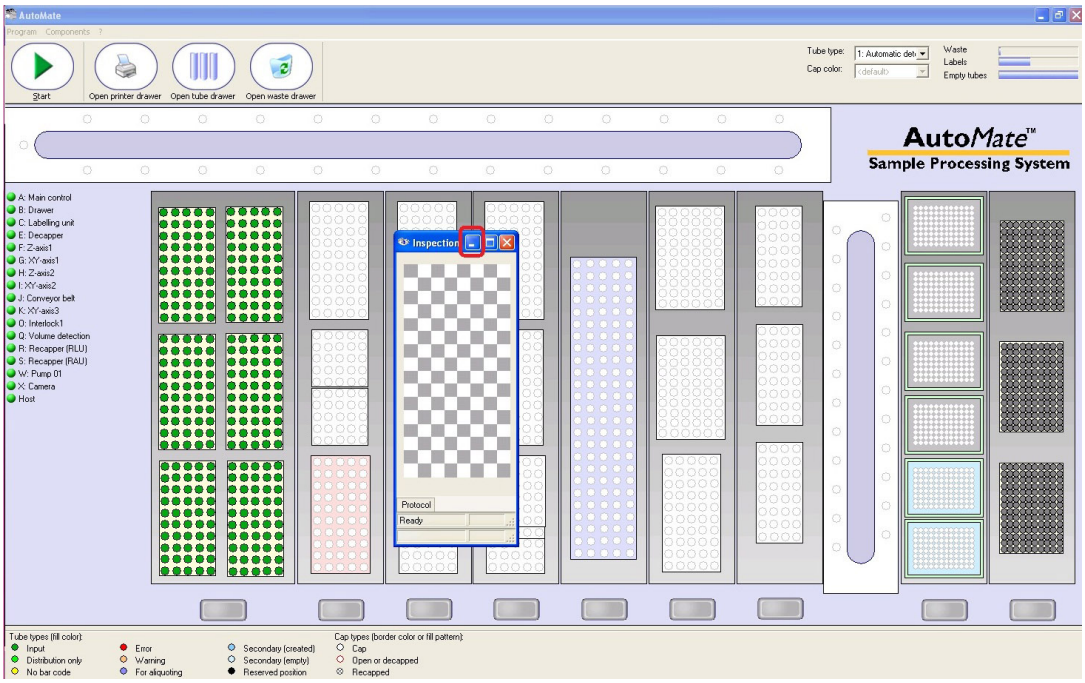
7 Initialization begins. The progress and initialization status of each component is displayed in a separate dialog. After successful initialization, the dialog closes automatically.

Note

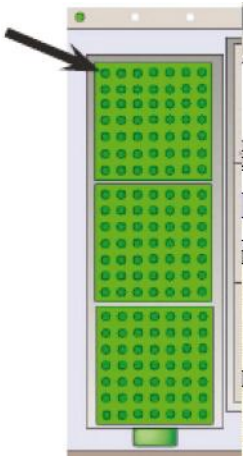
For guidance on any software messages during initialization, refer to Troubleshooting, Software Messages During Initialization.

8 Confirm that all hardware components in the System Communication Status section of the GUI are green, which indicates successful initialization.

9 Minimize the camera dialog with the checkered background by touching anywhere on the main screen other than the checkered box. Closing the dialog causes an error message when the first tube reaches the camera.



10 Begin loading tubes in input racks, from left to right and rear to front, in the position shown by the arrow. Avoid leaving positions empty in the racks.



11 Load the filled input racks or tubes and close the input drawer.

12 Press the Start icon.

Note

After all tubes are sorted, the robots stop moving and the input drawer opens. The system is still in operating mode. When new tubes are loaded into the input drawer and the drawer is closed, the system resumes sorting. Follow all safety precautions when operating, troubleshooting, or maintaining the Auto*Mate* 2500 Family system. Always operate the Auto*Mate* 2500 Family system with all covers closed.

Important

Shut down the PC and restart the Auto*Mate* 2500 Family software daily to guarantee stable processing.

Note

After pressing the start button, a confirmation dialog prompts you to confirm. Select **Yes** to start.

Start the System with Sorting-Drive Connected

1 Switch on the Sorting-Drive Server PC.

2 Start the Sorting-Drive Server software.

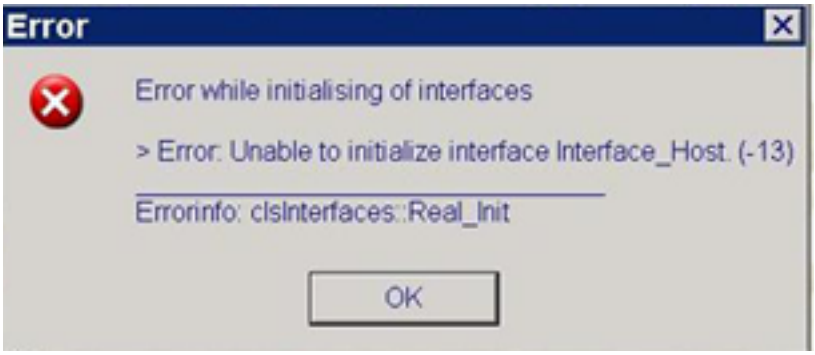
Note

Refer to the Sorting-Drive Client Instructions For Use for instructions regarding Sorting-Drive use.

3 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

4 Start the AutoMate 2500 system.

5



If this message displays during startup, confirm that

— Sorting-Drive Server is running.
— The connection between the Auto*Mate* 2500 Family system and Sorting-Drive is active.

Log On To Auto*Mate* 2500 Family Software

The Auto*Mate* 2500 Family software requires you to log on to the system in three different scenarios.

- Log on is required after the software has been restarted.
- Log on is required after the software has been idle for a defined period of time.
- Log on is required after the previous operator has logged off.

Figure 24 Log On Dialog

1. **Operator name**
2. **Password**
3. **Reveal or hide password**
4. **OK** and **Cancel**

1 Enter your operator name (1).

Important

Operator names are case-sensitive.

2 Enter your password (2).

Important

Passwords are case-sensitive.

3 Select **OK** or **Cancel** (4). If you select **Cancel**, the software closes.

Automatic Logoff

When the system has completed the current distribution and is left unattended for a defined period, an operator is automatically logged off to secure the system.

The time before automatic logoff occurs can be configured in discussion with your Beckman Coulter Service Representative. The minimum time for automatic logoff is 5 minutes, and the maximum time is 600 minutes.

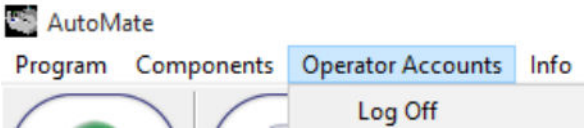
Log Off Auto*Mate* Software

When you have finished using the Auto*Mate* 2500 Family software, log off to secure the system. You can log off using the **Log off** button on the interface, or access the **Log off** option from the **Operator Accounts** menu.

Figure 25 Log Off Button

You can also log off from the **Operator Accounts** menu.

Figure 26 Operator Accounts menu



1 Select **Operator Accounts** option in the software menu.

2 Select **Log off** from the **Operator Accounts** menu.

Startup Checklist

1 Turn on the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

2 Remove all tubes from the output drawers and conveyor belt. Close all covers and doors.

3 Run the Sorting-Drive Server software on the Sorting-Drive Server PC.

4 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

5 Switch on the PC.

6 Use the touch screen and tap the icon twice to start the main application.

7 Log on to the Auto*Mate* 2500 system with your username and password.

8 Initialize the system.
Confirm that all hardware components in the System Communication Status section of the GUI are green, which indicates successful initialization.

9 Minimize the camera dialog.

10 Load tubes into input racks and close the drawer.

11 Confirm that there are enough tubes in the tube drawer, labels in the printer, and pipette tips in the tip drawer.

12 Confirm that the waste container and cap removal container are empty.

13 Press the **Start** icon.

System Initialization

All components of the system can be initialized automatically in sequence, or can be individually initialized for troubleshooting purposes.

Initialize the System

1 Select the **Initialize** option in the **Program** menu.

2 Confirm initialization by selecting **Yes**.

Initialize Individual Components

3 Select the **Initialize** option in the **Program** menu.

Important

Individual components can also be directly initialized from the **Components** menu.

4 Select the required individual component from the list and select **Initialize**.

5 Confirm initialization by selecting **Yes**.

Before You Start Distribution

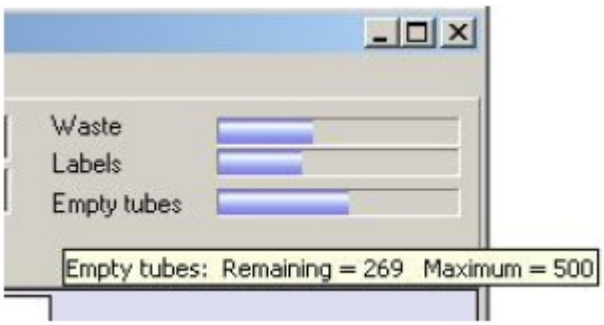
Status Bars of Consumables and Waste (Aliquot Module)

Before you start sorting, inspect the status bars in the top right corner of the user interface. They indicate the fill levels of the consumables and of the waste container.

Ideally, the waste container is empty whereas labels and secondary tubes (empty tubes) are completely filled up.

View Status Bar Information

Move the cursor over the consumables for the current level information. If using the touchscreen, take your finger away from the screen to view the information.



Fill Up Consumables or Empty Waste Container

Important

Use only Beckman Coulter approved consumables in your Auto*Mate* 2500 Family system. The use of unauthorized consumables in the Auto*Mate* 2500 Family system is a violation of the intended use.

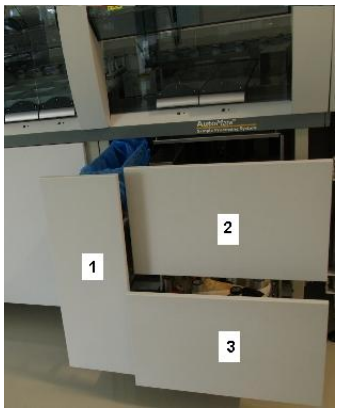
1 If you need empty the waste container or fill up the consumables during operation of the system, open the respective drawer:

— Waste container

— Tubes drawer (secondary tubes)

— Printer drawer (labels)

2 Empty the waste container or fill up the consumables:



— Waste drawer (1)
— Tubes drawer (2)
— Printer drawer (3)

3 Select the corresponding status bar to reset the counter.

4 Select **OK** to confirm.

Fill Up Disposable Pipette Tips

Important

Only use Beckman Coulter approved tips (B01376, B24687) in the Auto*Mate* 2500 Family System.

Unless the racks are completely empty, no action is required. The system automatically requests new disposable tips when all tips are used. The drawer opens automatically (approximately 2 cm) for you to refill.

Figure 27 Disposable pipette filter tips

Important

When filling up the tips, confirm that all tips are correctly placed in the rack and that no tip is protruding.

Run Distribution

To distribute samples, select **Start**. The system is in operating mode.

Note

Automatic restart after reloading! After all sample tubes are distributed in operating mode, all robots stop moving. The system remains in operating mode. When you load new sample tubes onto the input drawer and close the drawer, the system resumes processing immediately. Only operate the system with all doors and covers closed.

Select **Stop** or press `Esc` to immediately stop the distribution.

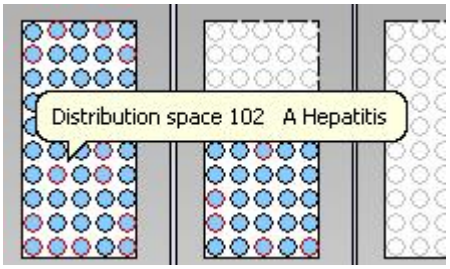
Distribution Information

The system provides information about the base frame, workplace, and consumables during the distribution.

Detailed Workplace Information

A workplace is a destination for sorted sample tubes. It provides data that helps you to navigate between different destinations.

If a mouse is used, moving the mouse cursor across a workplace or a base frame displays detailed information concerning this place.



Three different types of information characterize a workplace.

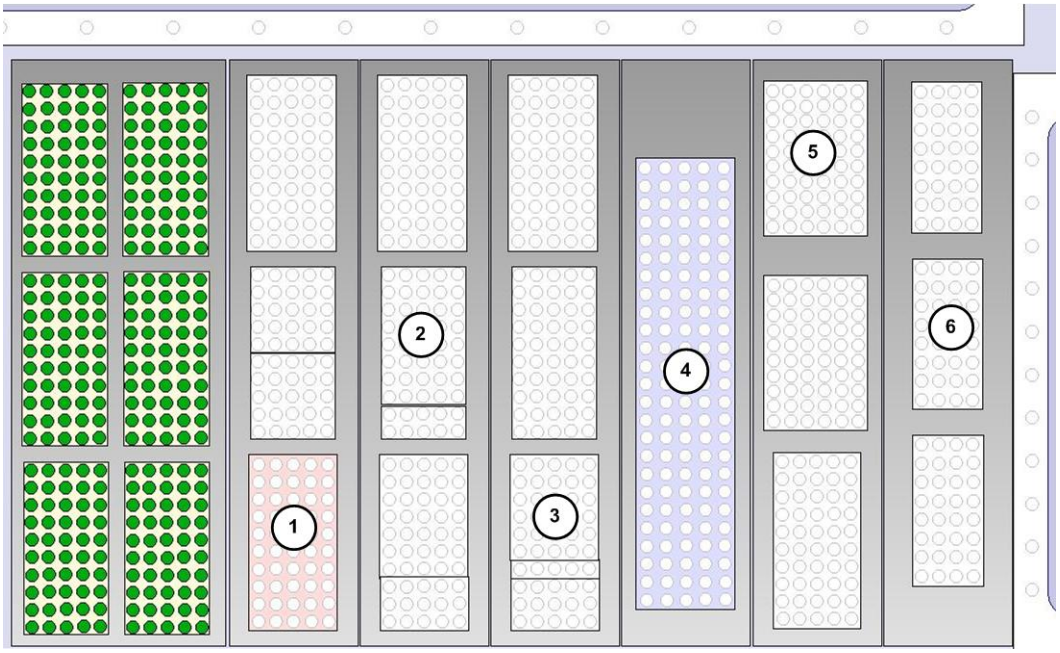
- Workplace type (for example, distribution space)
- Workplace number (for example, 102)
- Workplace name (for example, A Hepatitis).

Workplace ID

The Auto*Mate* 2500 Family system uses unique workplace IDs to identify distribution destinations. Distribution destinations can be automatic or manual analyzer systems. Workplace IDs can be any chosen three digit number, with some exceptions.

⚠ Caution

Do not use the following workplace numbers: 0, 101-110, 777 and 888. The system uses these numbers internally.



1	Special sample treatment: Error (0)	2	External destination: Hematology (410)
3	External destination: Send outs (200)	4	Special sample treatment: Archive rack (130)
5	Special destination: AU 680 (310)	6	Special destination: UniCel DxI 800 (320)

Workplace Name

The workplace name provides information about the purpose of a workplace. All alphanumeric characters are permitted.

Tip

Beckman Coulter recommends that workplaces are named with meaningful names which are easy to understand.

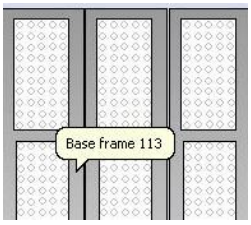
Examples:

- Analyzers as destinations:

  - AU640
  - AU2700
- Special sample treatment:
  - Frozen
  - No Order
- External destinations:
  - Chem. Pathology
  - Send Outs
  - General Hospital

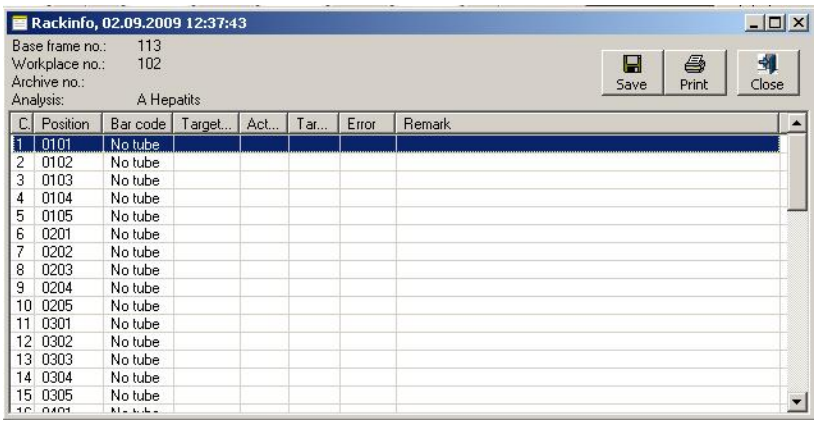
Base Frame Information

To view base frame information, roll the cursor over a base frame on screen. A tool tip shows the base frame ID. A unique ID identifies every base frame. The ID is physically encoded by a set of up to 7 small magnets located on the rear side of the base frame. Auto*Mate* 2500 Family systems use base frame IDs for internal identification.



Rack Information

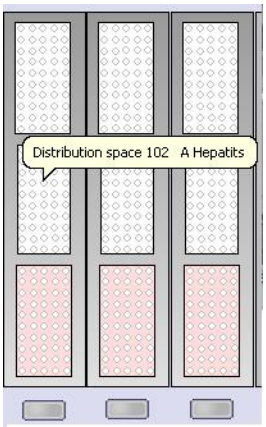
To access **Rack Information** with detailed information on all tubes available on a workplace, select **Rack-Info**. You can also access this view by double clicking a workplace.



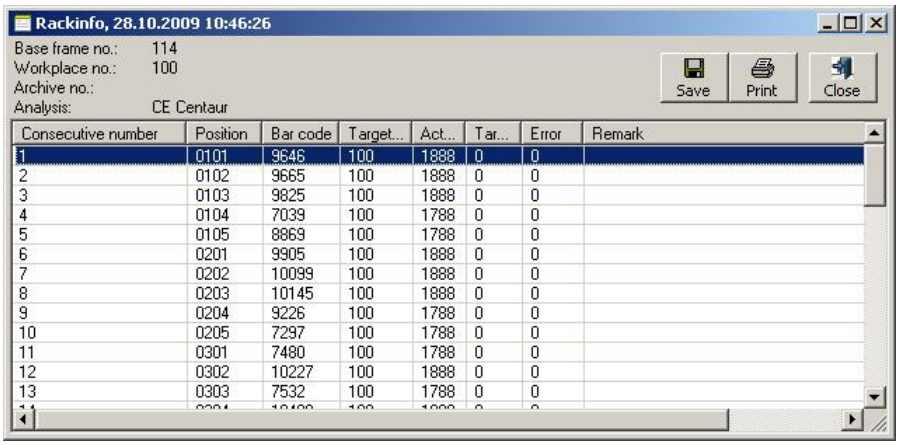
Detailed Information on Sample Tubes

Select a workplace to open detailed information about the sample tubes located on that workplace.

Figure 28 Sample tubes on a workplace

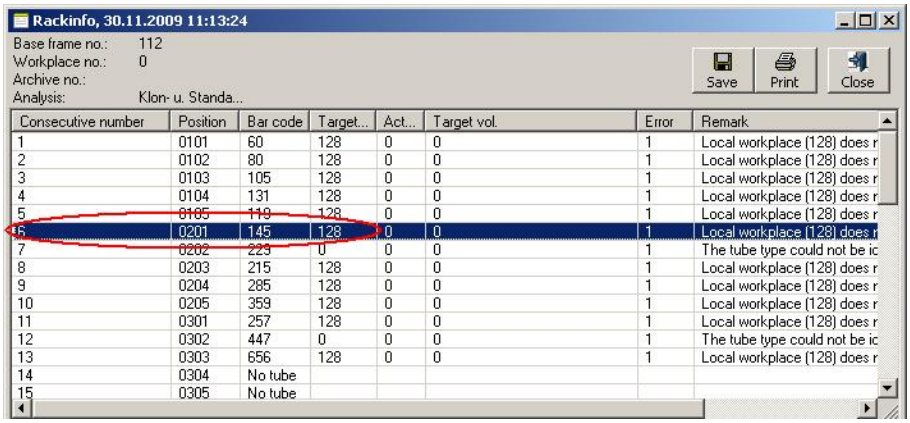


The following **Rack-Info** dialog presents information about all tubes available on that workplace.

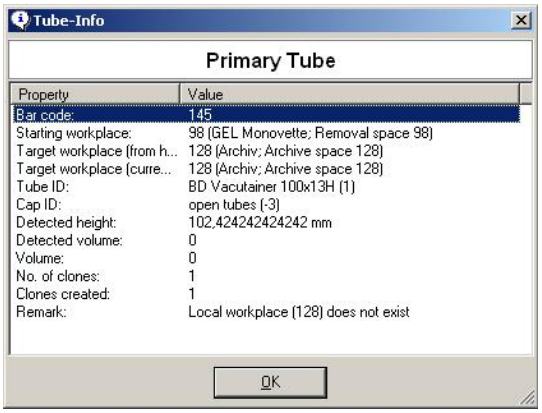


Consecutive number	Position	Bar code	Target...	Act...	Tar...	Error	Remark
1	0101	9646	100	1888	0	0	
2	0102	9665	100	1888	0	0	
3	0103	9825	100	1888	0	0	
4	0104	7039	100	1788	0	0	
5	0105	8869	100	1788	0	0	
6	0201	9905	100	1888	0	0	
7	0202	10099	100	1888	0	0	
8	0203	10145	100	1888	0	0	
9	0204	9226	100	1788	0	0	
10	0205	7297	100	1788	0	0	
11	0301	7480	100	1788	0	0	
12	0302	10227	100	1888	0	0	
13	0303	7532	100	1788	0	0	

Touch any item of tube information twice, and an extra dialog opens, presenting detailed information about the tube.

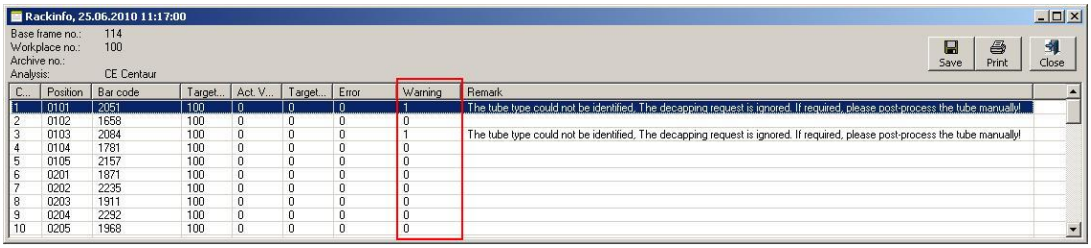


The following dialog displays detailed information about a specific sample tube. Sorted workplace, aliquot volume, and error information can be found here.



Rack and Tube Information Warning

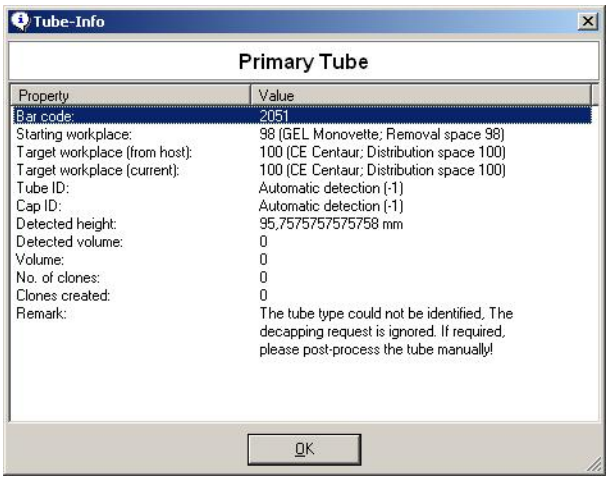
The **Rack Information** view shows the **Warning** column.



Warnings are indicated by:

- 0: No warning
- 1: Warning

Select a tube with a warning to view detailed remarks about the warning in **Tube Info**.



Actions During Distribution

This section describes user actions during routine operation and interventions.

Drawers

Important

Do not force the drawers open. You can damage the drawers. Use the buttons on the drawers or the drawer buttons in the software user interface to open the drawers.

Caution

Cross-contamination. Close drawers in a smooth, controlled action. Uncontrolled drawer closure at high velocity can disturb samples, and can cause splashing.

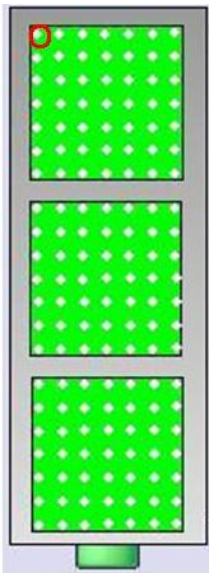
Input Drawer

Input Rack

The system anticipates racks that are fully loaded with unsorted tubes after the drawer is closed. If only a few tubes are available for distribution, place these tubes on the rack closest to conveyor belt 1, starting at the front left position.

The system automatically confirms placements on the input drawer. The input drawer turns green to confirm the status.

Figure 29 Open input drawer - start inserting tubes at this position



Load New Tubes

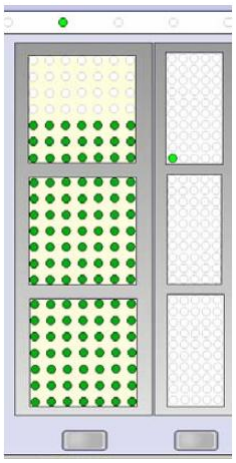
1 Wait until the Auto*Mate* 2500 Family system has distributed all tubes on the input drawer. The drawer opens automatically when all input racks are empty.

2 Replace empty racks with full ones. Avoid gaps between tubes in racks. Fully loaded racks are not mandatory. Close the drawer.

Note

Robot 1 stops processing a rack after detecting three consecutive positions without a tube. A Beckman Coulter Representative can change the number of positions if necessary.

3 When the Auto*Mate* 2500 Family is in operating mode, it immediately starts distributing tubes.



Important

Do not access the input drawer during the distribution process! Stop the system and reset the input drawer.

Resupply Partially Filled Input Drawer

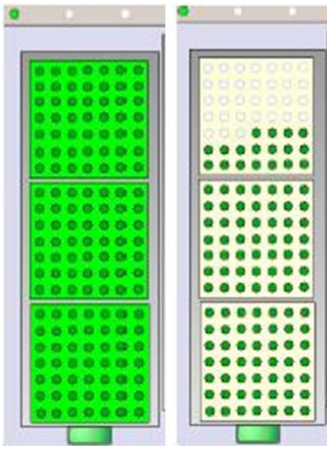
1 Select the button on screen to open the drawer.

2 Load tubes behind partially filled racks or replace empty racks.

3 To continue sorting where the system stopped, select all of the racks that have been processed, including the last rack that was being processed.

4 Close the drawer. The system resumes sorting from the first position of the input rack.

5 As the tubes are removed from the positions of the input rack, each tube place changes from green to white, indicating a tube removal. If the process is interrupted, the system can continue from the next available green spot.



Output Drawer

Replace Output Rack

During routine operation, replace all full output racks with empty racks, after the drawer opens. After loading racks, close the drawer. The Auto*Mate* 2500 Family system resumes processing.

The system provides two modes to handle workplaces:

- Manual mode: Requires manual confirmation of any operator interaction by clicking the related workplace on the screen.
- Automatic mode: Requires no manual confirmation.

Confirm Workplace in Manual Mode

1 Select the button on screen to open the drawer. The drawer LED is orange until all robots stop moving. The LED changes to green and the drawer opens.

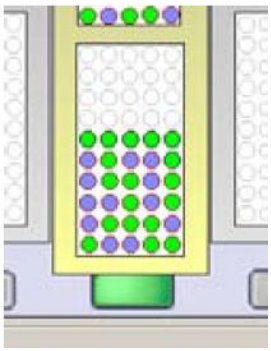
Note

The drawer opens automatically when all tube positions on a workplace are full.

Caution

Fully extend drawers before accessing racks to prevent collision with moving components.

Figure 30 Workplace is full and drawer opens automatically



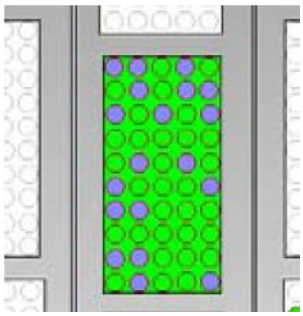
2 While the drawer is open:

a. Remove the tubes or full racks from the workplace.

b. Add empty racks as needed.

c. Select the workplace on screen. The workplace color changes to green.

Figure 31 Workplace selected



3 Continue routine operation.After you close the drawer, the system distributes tubes from position 1. Position 1 is the start position for this example workplace and can be defined for each workplace.

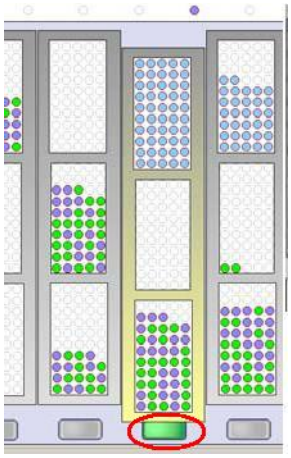
4 Close the drawer. The workplace is cleared and available for tube distribution. Confirm that the workplace displayed on screen matches the workplace on the drawer.

Note

After you close a drawer without confirming a workplace, the system keeps the layout of distributed tubes and continues distributing from the next available position.

Remove Single Tubes or Racks that are not Finished

1 Select the button on screen to open the drawer.



2 If the drawer is still in use, the system does not release it. The LED below the drawer is orange.

3 After processing all tubes, the system temporarily removes the drawer from the sorting layout. The drawer opens automatically. You can remove single tubes or complete racks.

4 The LED below the drawer changes to green.

5 After you close the drawer, the LED changes to red indicating that the drawer is in use.

Remove Single Tube from Conveyor Belt 01

Warning

Risk of sample loss. Confirm that tubes are removed after deletion. If tube holders are not empty, tube collision and sample spillage can occur.

Caution

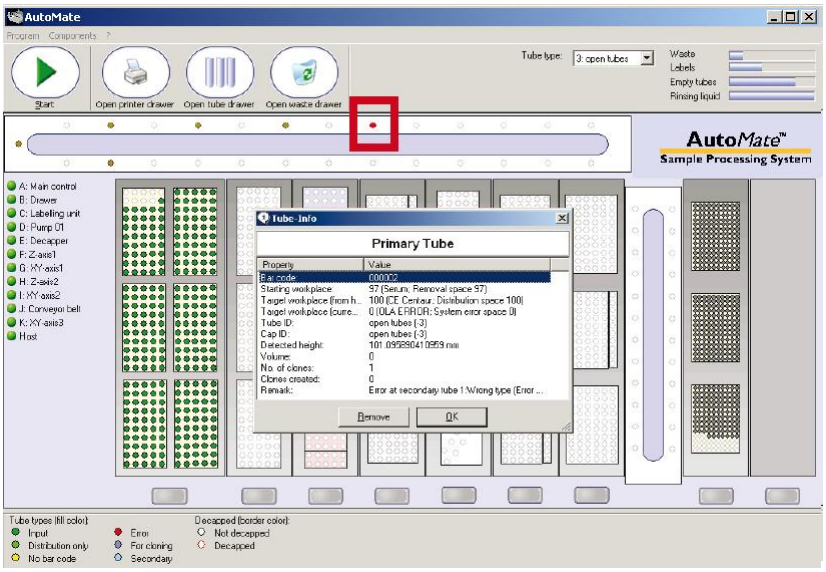
Risk of delayed results. Rerun any unprocessed tubes as new samples. Traceability is lost when samples are deleted before distribution.

1 Stop the system.

Note

When working on a system with a recapper, wait 30 seconds to allow the recapper interlock to release the door and allow access to conveyor belt 01.

2 Select the tube to remove on conveyor belt 01 on screen.



3 Physically remove the selected tube from the conveyor belt.

4 Select **Remove**. The system prompts you to delete the tube at current position.

5 Confirm with **Yes** to delete the tube at the current position.

6 The tube disappears from the screen.

7 Process the tube according to laboratory policy.

Remove Sample Tube from Robot Grippers

Warning

Risk of sample loss. Confirm that tubes are removed after deletion. If tube holders are not empty, tube collision and sample spillage can occur.

Caution

Risk of delayed results. Rerun any unprocessed tubes as new samples. Traceability is lost when samples are deleted before distribution.

1 Stop the system.

Caution

Always run the Auto*Mate* 2500 Family system with all covers locked and the doors and interlock doors closed and secured to prevent injury.

2 Select **Components**>**Robot 1** or **Robot 2**> **Open Gripper**.

3 The robot moves forward to the unloading position. The system alerts you to **Open gripper**.

4 Before confirming, open the main cover. Hold the tube. Confirm with **OK**. The robot does not move in any direction. The gripper opens.

5 After you have retrieved the tube, close the main cover.

6 The system prompts you to initialize the robot. Reinitialization is optional.

7 If there were any problems before the tube was removed, reinitialize the robot by selecting **Components**>**Robot 1** or **Robot 2**>**Initialize**.

8 If you want to remove a tube from Robot 2 as well, Robot 1 must be initialized to clear the removal position for Robot 2. If you do not initialize Robot 1, the system collision protection prevents the removal of the second tube.

9 After the robot is initialized, select **Start** to resume distribution.

Replace Pipette Tip after Error

After a motion or pump error, replace the pipette tip.

1 Select **Components**> **Robot 3**> **Change tip**.

2 Robot 3 moves to the tip disposal position and drops the existing tip.

3 Robot 3 moves to the tip carrier position and picks up a tip.

4 Continue routine operation.

Note

After three failed attempts to pick up a tip, the drawer opens automatically. Place a full tip rack on the drawer and close it. The robot automatically attempts to pick up a tip.

Aliquot Module Operation

Safety Precautions

Caution

Sharp edges can cause hand injury. When working inside the aliquot module, use a flashlight to illuminate the operating area and reduce the risk of scratches from sharp edges.

Reload Secondary Tubes

When the secondary tube container is empty, the tube drawer opens automatically. The system alerts you. Confirm by selecting OK.

Note

A series of videos are installed on the Auto*Mate* 2500 Family system PC to help you with this task.

- On Windows XP operating systems, the videos are in `D:\OperatorTrainingVideos\OT1_Refill_Secondary_Tubes`
- On Windows 10 operating systems, the videos are in `This PC > Videos > OperatorTrainingVideos > OT1_Refill_Secondary_Tubes`

The first time you open a video, configure Windows Media Player. Select **Recommended settings** and **Finish**.

1 Remove the empty container:

2 Locate a new secondary tube container.

3 Place the container with tubes on a clean workplace. Confirm that the open side is facing up.

4 Unwrap the container.

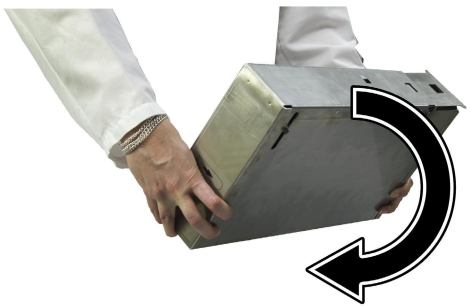
5 Confirm the tube direction before loading the container. Use the sticker on the top front of the container as a guide:

6 Position the metal tube container over the open tube container and slide it down completely. Do not leave any space.

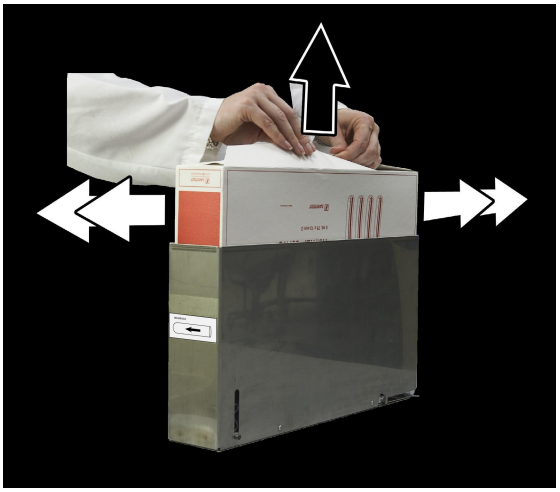
Note

Confirm that the open cardboard box reaches the bottom of the metal container before turning it over. Confirm that the distance between the fully inserted cardboard box and the open side of the metal container is approximately 3 cm (1 in).

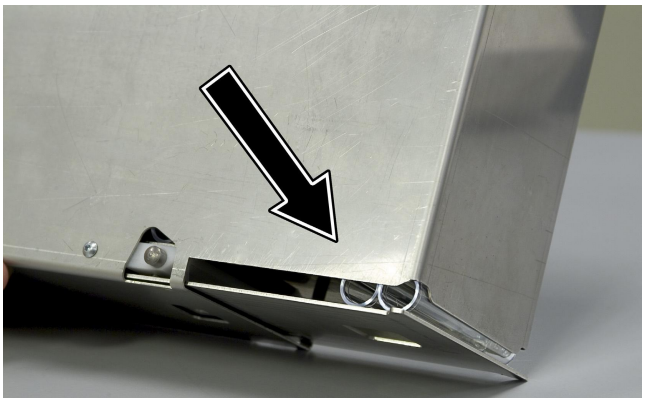
7 Turn the metal container open side up:



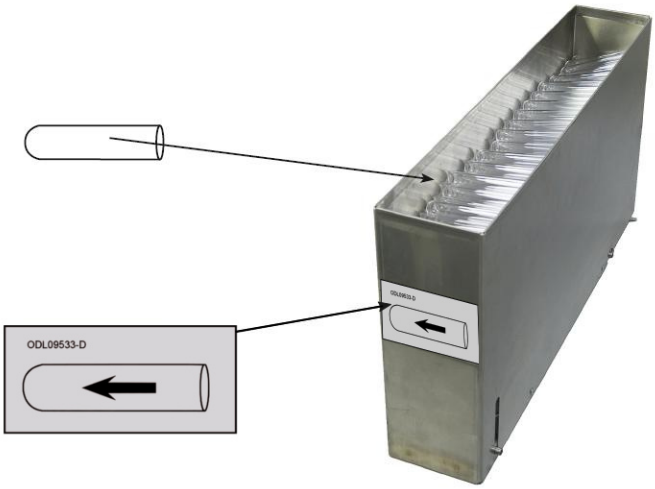
8 Open the package carefully and gently shake it while removing the paper. Do not move the package so that tubes slide in the wrong direction.



9 Confirm that there are two tubes in the bottom slot:



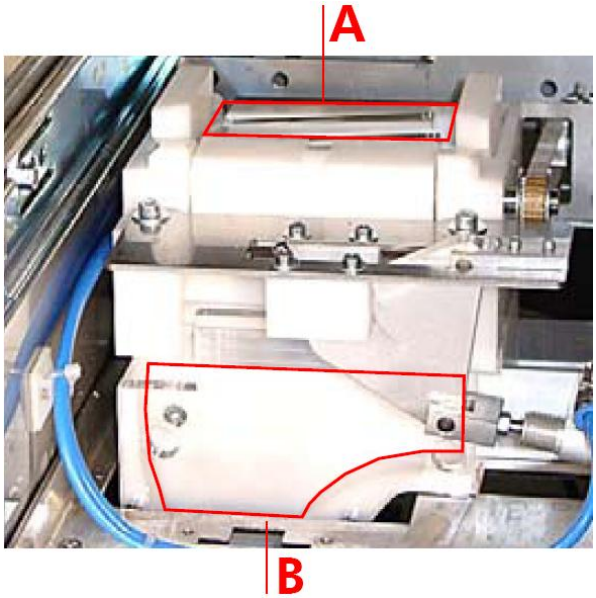
10 Confirm that the tubes are oriented correctly.



11 Replace the container in the drawer. Close the drawer.

12 While transporting and placing the container inside the drawer, avoid squeezing the container.

13 Confirm that no tubes are in the input section (A) or tube hopper (B). The hopper is the area directly below the tube drawer. The hopper funnels tubes into the labeler gripper. The tube lift picks up tubes and places them on conveyor belt 2.



14 To avoid breaking tubes, close the drawer carefully. Confirm that the drawer is fully closed.

15 Reset the tube counter. Select **Program**> **Counter**> **Empty Tubes**.

16 Select **OK** to confirm.

17 The status bar is updated.

Screw Cap Secondary Tubes

Auto*Mate* 1250 and 2550 Family instruments can be modified to handle Screw Cap Secondary Tubes (SCSTs). After modification, the Auto*Mate* 2500 Family system can no longer handle standard secondary tubes. Only one type of screw cap secondary tube is approved for use and can be purchased from Beckman Coulter. Screw cap secondary tubes can also be used as a primary tube. However, screw cap secondary tubes can only be labeled with thermal transfer labels, and cannot be recapped with Parafilm by the Auto*Mate* 2500 Recapper.

Important

Screw cap secondary tubes and caps issued after July 2023 are not compatible with older screw cap secondary tubes and caps. Incompatible tube and cap combinations cannot be completely sealed and sample leakage can occur. Confirm the Sarstedt part

numbers on the packaging when changing consumables and do not use tube and cap combinations other than those pairings listed here:

Table 24 Compatible Screw Cap Secondary Tube and Cap Combinations

Item	Part no.	Sarstedt Item Number	Compatibility
Screw cap secondary tubes (4 × pack of 500 tubes)	B72304	Tube: 60.504.300 (old)	Cap: 65.163.300 only
		Tube: 60.504.015	Cap: 65.643.001 only
Screw caps (5 × bag of 1000 caps)	B72305	Cap: 65.163.300 (old)	Tube: 60.504.300 only
		Cap: 65.643.001	Tube: 60.504.015 only

Reloading SCSTs

The procedure for reloading the screw cap secondary tubes is the same as for standard secondary tubes. However, the tube stack pack is smaller than the stack pack for standard secondary tubes, and tubes can become misaligned. Exercise caution during tube loading to prevent tube misalignment.

Figure 32 Screw Cap Secondary Tube Stack Pack

Figure 33 Screw Cap Secondary Tubes loaded incorrectly

Empty the Waste Container

Caution

Avoid direct contact with patient samples, disposable pipette tips, used caps, any machine components that come in contact with sample fluids, and liquid waste. Always wear gloves and other protective gear to protect yourself from infection. Before troubleshooting the system with open doors and covers, remove patient samples. Handle all liquid waste as potentially infectious. Some liquid waste can require special treatment before disposal. Follow your laboratory procedure.

Caution

If you come into direct contact with sample fluid, thoroughly wash the affected area and consult a physician. Immediately wipe off any contaminants from the system. Clean the system using approved liquid disinfectant. After working on the system, clean your hands thoroughly.

When the waste container is full of tubes and tips, the drawer opens automatically. The system alerts you.

---

1 Open the waste container:

2 To remove the bag, lift the wire holder at the front. Secure the bag. Follow your laboratory procedure for biohazardous waste disposal. Insert a new waste bag into the container. Replace the wire holder.

3 Close the drawer. Select **OK** to confirm..

4 The system prompts you to reset the counter.

5 Select **OK** to confirm. The counter is reset.

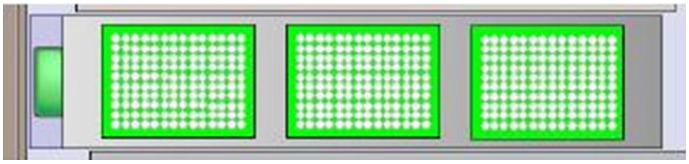
Reset the Label Counter

When the label roll is empty, the printer drawer opens automatically.

1. Remove the empty label roll.
2. Put a new label roll into the printer.
3. Reset the label counter: Select **Program** > **Counter** > **Labels**.
4. The system prompts you to reset the counter.
5. Select **OK** to confirm. The counter is reset.

Reload Pipette Tips

When the pipette tips are empty, the drawer turns green on-screen and opens automatically.



To manually open the drawer, select the drawer button on-screen or press the drawer button on the machine. The drawer LED is orange until the robot stops moving. The LED turns green when the drawer is ready to open.

1. Remove the empty tip racks.
2. Load full tip racks onto the drawer. Load the racks starting at the front.

Important

Only tips supplied by Beckman Coulter are validated for use.

3 Confirm that Robot 3 correctly picks up the pipette tips. If the robot does not pick up the tips correctly, the robot is misaligned. If necessary, contact your Beckman Coulter Service Representative.

Caution

Risk of cross contamination if Robot 3 is misaligned and cannot pick up new tips correctly.

Printer Overview

There are two models of printer in use on Auto*Mate* 1250 and 2550 systems. Older Auto*Mate* 1250 and 2550 systems can carry a CAB ETS 2 label printer. Newer systems, or older systems which have been upgraded, carry a CAB ETS 3 label printer.

Both the CAB ETS-2 and ETS-3 label printers have two operating modes:

- Thermal transfer printing using transfer ribbon (ODL22049)
- Direct thermal printing

Thermal transfer printing (TTP) is not temperature sensitive.

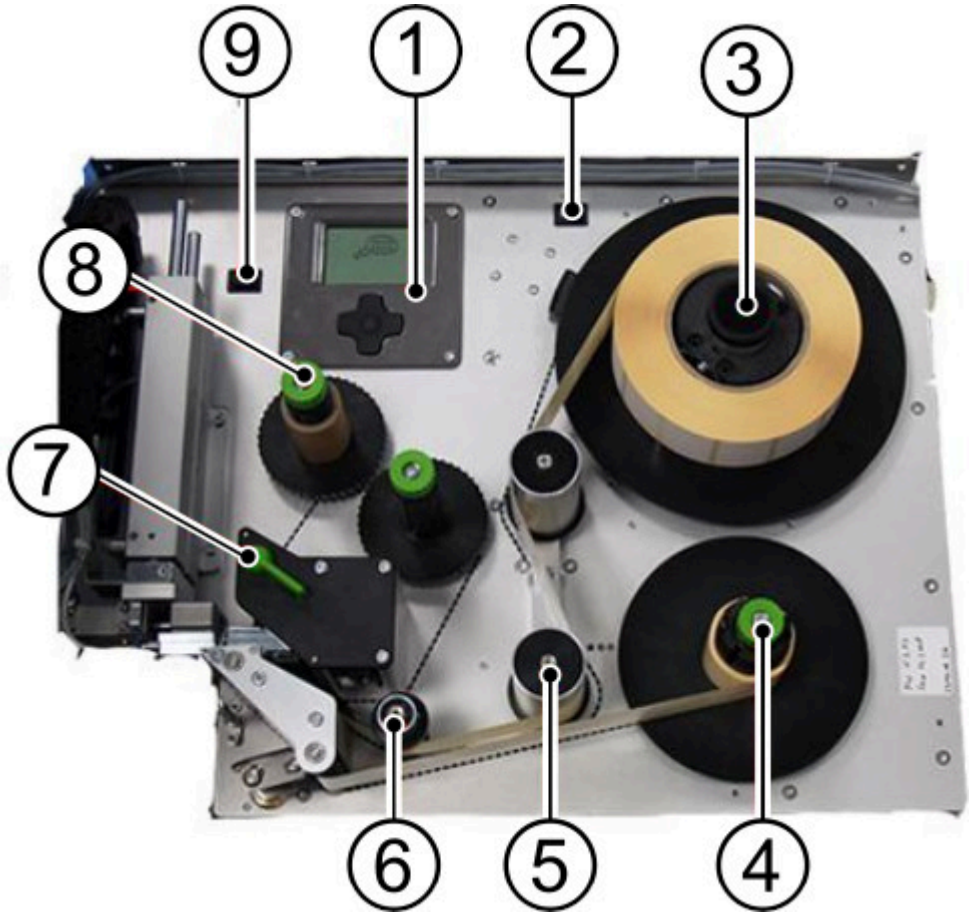
The label printer is located in the printer drawer on the bottom of the aliquot module.

Figure 34 Auto*Mate* 2550 System

ETS-2 Printer Components

The CAB ETS 2 and CAB ETS 3 printers have similar operating principles, but the physical arrangement of their components is different. In comparison to the ETS-2, the ETS-3 printer includes a color display, no longer has a moving core adapter, and has a different label liner feed path.

Figure 35 CAB ETS 2 Printer Components

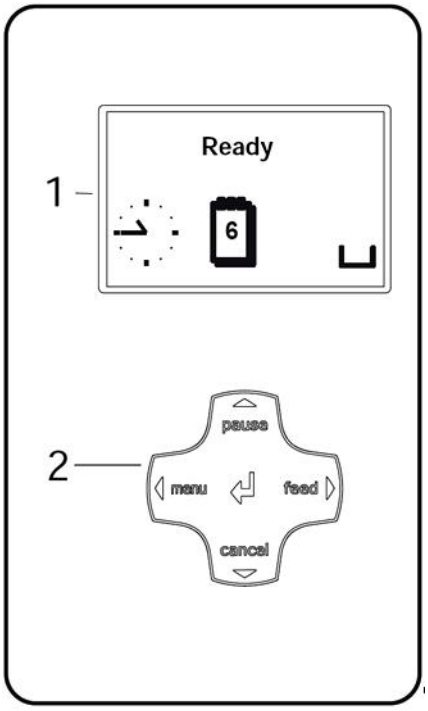


1. Control panel
2. Power switch
3. Core adapter
4. Internal rewinder
5. Pendulum guide
6. Axle
7. Printhead locking lever
8. Ribbon supply
9. Pre-dispense key

CAB ETS 2 Control Panel

The CAB ETS 2 control panel has a graphic display (1) and navigator pad (2) with five keys. Refer to the graphic display for the status of the printer and print job, error messages, and printer settings. Use the navigator pad in the online menu or the offline menu. The online menu is the normal operating mode. The keys light up white in this mode. The keys light up yellow in offline mode. Use offline mode to modify printer settings, such as language. The active key always lights up.

Figure 36 Control panel



- Menu: Enter the menu
- Cancel: Reset alerts
- Feed: Forward the label
- Pause: Scroll up in the offline menu

Contact your Beckman Coulter Representative for support with printer setup, tests, or updating firmware.

Printer States

Table 25 Printer states

State	Display	Description
Ready	Ready and configured display icons such as time and date.	The printer is ready to receive data.
Printing label	Printing label and the number of the printed label in the print job.	The printer is processing a print job. The system can send data for a new print job. The new print job is queued to start when the previous job finishes.

Table 25 Printer states (Continued)

State	Display	Description
Pause	Pause and this icon 	The operator interrupted the print job.
Recoverable error	 The type of error and the number of labels in the print queue.	An error occurred that the operator can recover. The print job can resume after the error is resolved.
Non-recoverable error	 The type of error.	An error occurred that cannot be resolved without canceling the print job.
Critical error	 The type or error.	An error occurred during the system test. • Switch off the printer and then on again. • Press **Cancel**. If this error persists, contact your Beckman Coulter representative.
Power save mode	 The keys are not lit.	If the printer is not used for awhile, it automatically switches to power save mode. To exit power save mode, press any key on the navigator pad.

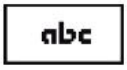
Icons on Graphic Display

Depending on your printer configuration, any of these status icons can appear in the status line of your printer display. To configure the status line, contact your Beckman Coulter representative.

Table 26 Icons on the graphic display

Icon	Description
	Time
	Date
	Digital date and time display
	Ribbon supply
	WiFi signal strength
	Ethernet link status
	Printhead temperature

Table 26 Icons on the graphic display (Continued)

Icon	Description
	Debug window for abc programs
	An abc program controls the lower display line
	User memory in the clock circuit
	Used memory
	Input buffer
	Memory card access
	Printer is receiving data

Key Functions

The keys change according to the printer state:

- Active functions light up white in print mode (e.g. menu or feed).
- Active functions light up orange in the offline menu (e.g. arrows, key 8).

Table 27 Key functions in print mode

Key		Display	State	Function
Menu	Lights	Ready	Ready	To the offline menu.
Feed	Lights	Ready	Ready	Feed a blank label.
Pause	Lights	Ready	Ready	After completing a print job, the printer goes into **Pause** state.
		Printing label	Printing label	Interrupt print job, printer goes into **Pause** state.
		Pause	Pause	Continue the print job, printer goes into **Printing label** state.
	Flashes		Correctable error	Resume the print job after resolving the error, printer goes into **Printing label** state.
Cancel	Lights	Ready	Ready	Clear internal memory; the last label can no longer be printed.
		Printing label	Printing label	Press briefly to • cancel the current print job. Press and hold briefly to • cancel the current print job and delete all print jobs.
		Pause	Pause	
			Correctable error	

Table 27 Key functions in print mode (Continued)

Key		Display	State	Function
	Flashes		Irrecoverable error	
	Lights		Error	Call help - concise information for rectifying the fault will be displayed.

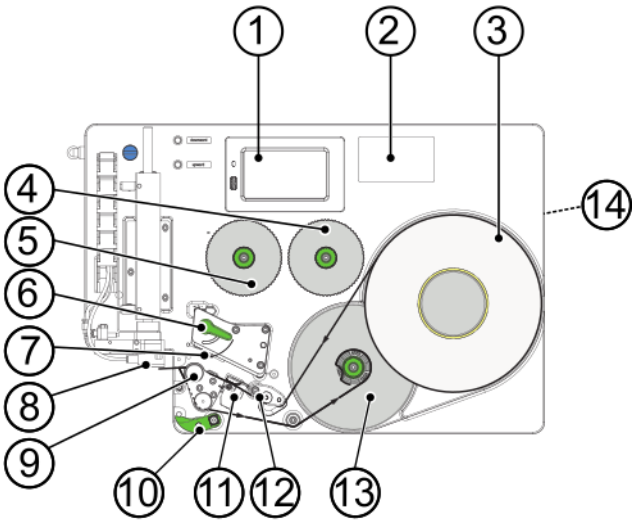
Table 28 Key functions in offline mode

Key	Menu	Parameter setting	
		Parameter choice	**Numeric value**
↑	Return from a submenu		Increase in the number at the cursor position.
↓	Enter a submenu		Decrease in the number at the cursor position.
←	Menu option to the left	Switches to the left	Cursor shift to the left.
→	Menu option to the right	Switches to the right	Cursor shift to the right.
↵	Confirm the selected menu option Press and hold for 2 sec: Leave the offline menu	Confirm the selected value. Press and hold for 2 sec: Cancel. Do not change the value.	

ETS-3 Printer Components

The CAB ETS 2 and CAB ETS 3 printers have similar operating principles, but the physical arrangement of their components is different. In comparison to the ETS-2, the ETS-3 printer includes a color display, no longer has a moving core adapter, and has a different label liner feed path.

Figure 37 CAB ETS 3 Printer Components



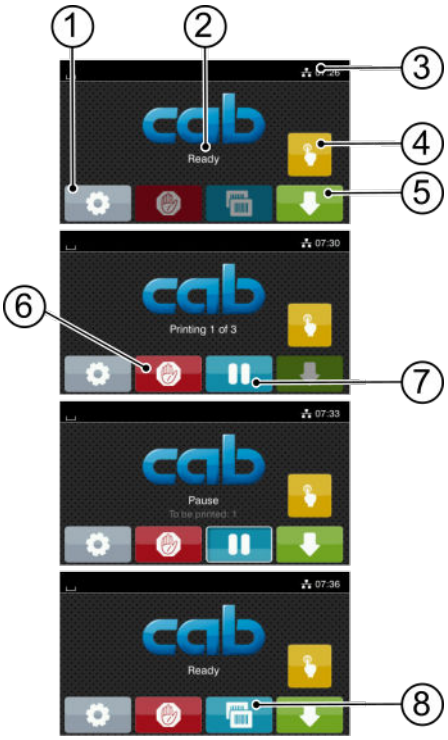
1. Control panel
2. Instructional label describing ribbon and liner feed paths
3. Core adapter
4. Ribbon adapter
5. Ribbon rewinder
6. Printhead locking lever
7. Printhead
8. Tamp pad
9. Print roller
10. Pinch roller
11. Light guide
12. Pendulum guide
13. Liner rewinder
14. Power switch (side of printer)

ETS-3 Printer Control Panel

The CAB ETS-3 control panel has a touchscreen display. The printer displays text in English depicting the status of the printer, print job, and error messages.

Display Changes During Printer Operation

Figure 38 Display Features of the ETS-3 Printer During Operation



1. Settings: Opens the settings menu.
2. Printer Status: Displays the current print job, or whether the printer is paused or ready.
3. Status Line: Displays more information about printer status.
4. Pre-Dispense: Dispense a label without a print job.
5. Feed: Forward the label liner.
6. Cancel: Cancels current print job or error alert.
7. Pause: Pauses printing.
8. Repeat: Repeats the last print job.

When no print jobs are stored in printer memory and the printer is idle, the display interface shows the Settings (1), Pre-dispense (4), and Feed (5) buttons as selectable. The printer status display as **Ready**.

When a print job is in process, the display interface shows the Settings (1), Cancel (6), Pause (7), and Pre-dispense (4) buttons as selectable. The printer status display as **Printing x of y**, where **x of y** is the number of the print job actively being printed relative to the queue.

When a print job is paused, the display interface shows the Settings (1), Cancel (6), Pause (7), Pre-dispense (4) and Feed (5) buttons as selectable. The printer status display as **Pause To be printed: y**, where **y** is the number of print jobs in the queue.

When print jobs are stored in printer memory and the printer is idle, the display interface shows the Settings (1), Repeat (8), Pre-dispense (4), and Feed (5) buttons as selectable. The printer status display as **Ready**.

Icons on the Status Line

Depending on your printer configuration, any of the listed icons can be displayed in the status line. To configure the status line, contact your Beckman Coulter Representative.

Table 29 Icons on the status line of the ETS-3 printer

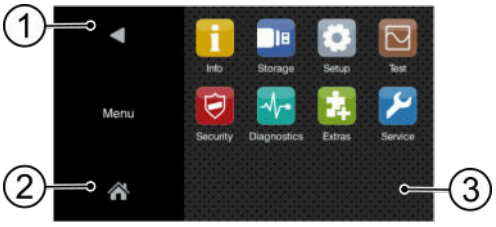
Icon	Description
	Ethernet connection active
	USB connection active
	USB memory installed
	SD memory card installed
	The **Save data stream** function is active
	Displays the current data transfer as a falling drop
	Gray: Bluetooth adapter installed, white: Bluetooth connection active
	WiFi signal strength
	An abc program controls the lower display line
	Digital date and time display
	The remaining length of the ribbon supply roll is insufficient

Using The Settings Menu

To open the settings menu, select the settings button from the display. The menu has a tree structure, with multiple levels of options for different parameters. Individual options can be

selected using the touchscreen, and you can return to a higher level of the menu or the default screen using the buttons on the left side of the screen.

Figure 39 Settings Menu



1. Return to the previous menu screen
2. Return to the default display
3. Options panel: All selectable options are listed here

Within the individual options, different parameters can be activated, deactivated, and changed. The controls for changing parameters are provided in the table. Do not change parameters without consulting your Beckman Coulter Representative.

Table 30 Icons on the status line of the ETS-3 printer

Icon	Description
	Return to the default display.
	Return to the previous menu screen.
	Scroll bar for rough parameter value setting
	Parameter is disabled, selecting the button enables the parameter
	Parameter is enabled, selecting the button disables the parameter
	Increases the parameter value by one step.
	Decreases the parameter value by one step.
	Save the parameter value change and return to the previous menu screen.
	Do not save the parameter value change and return to the previous menu screen.

Detailed Rack Information

Error Racks

Using multiple error racks for different purposes provides intelligent error rack management. A minimum of one error rack is mandatory.

Important

You cannot start a distribution without an error rack. If no error rack is available, the system alerts you.

Archive Racks

How to Use Archive Racks

Archive racks can be used to rerun patient samples later and confirm a sample result. Unlike normal distribution racks, archive racks require a unique ID. You can use a combination of alphanumeric characters as a rack ID. Because archive racks are normally stored in a cold environment, the ID is necessary to retrieve an archive rack.

Process Archive Rack

1. Light blue indicates archive racks on the screen. Select the button on screen to open the drawer.
2. Select the archive rack. Enter the rack ID and confirm with **OK**.
3. Close the drawer.
4. Press the **Start** icon.

Note

If you forget to enter the rack ID, the drawer opens automatically when you select **Start**. Enter the rack ID, confirm and close the drawer.

Recapper Buffer Rack

If a recapper is installed, use a buffer rack for interim sample tube storage. The system needs a storage location to handle tubes when the throughput is high.

Note

Do not put tubes from the buffer rack onto the input drawer. Process these tubes according to your laboratory procedures.

Note

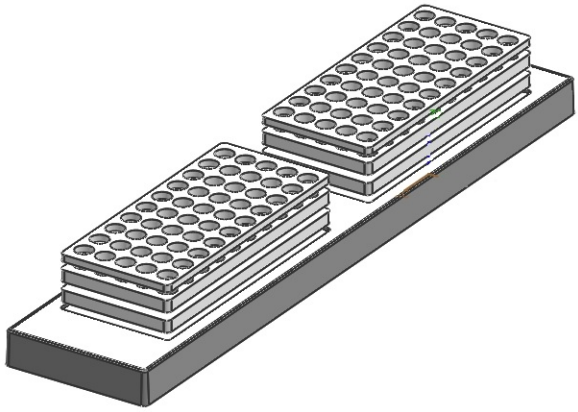
The size of the buffer rack is calculated to process up to two tubes that are recapped per patient sample. To handle a greater volume of tubes, the buffer rack size can be increased. Contact your local Beckman Coulter representative for support.

Use only racks that fit the tubes used. If the tube holder diameter of the rack is too large for the sample tube, the misalignment of the vertical tube position can cause robot gripping issues.

If resealing sample tubes with different diameters on the recapper, use the following racks for the buffer:

- Auto*Mate* racks (A29314) for diameters 10.5 mm to 16 mm on the base frame (A92900)

Figure 40 Racks used on a buffer rack



If you process tubes with the same diameter, use the rack type that is intended for this tube only.

If no buffer rack is available when you start the Auto*Mate* 2500 Family system, the software alerts you to configure a buffer rack.

Contact your Beckman Coulter representative to configure a buffer rack.

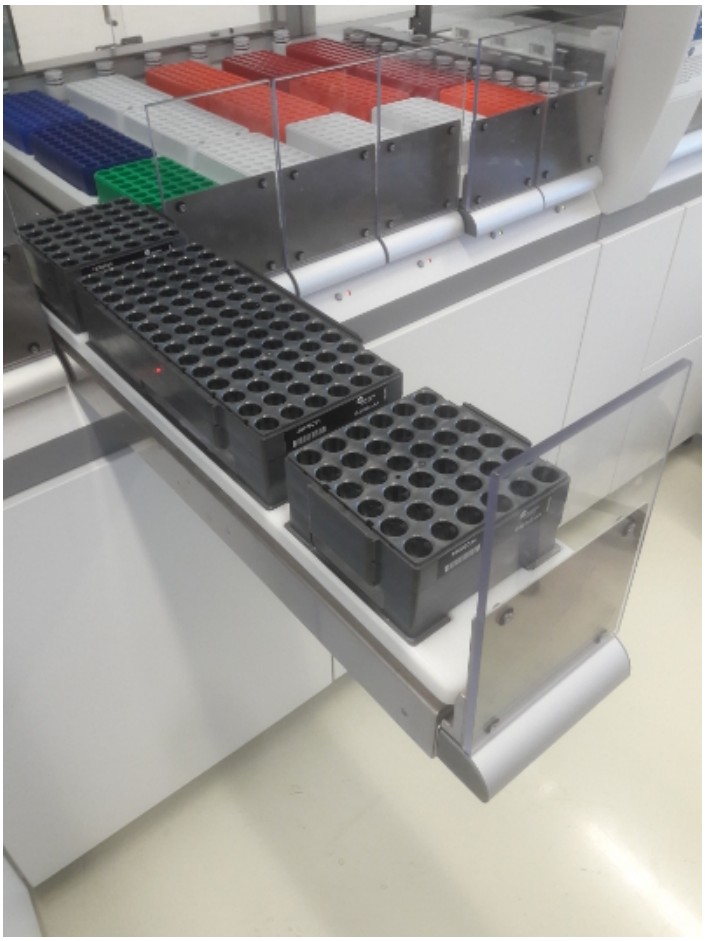
No Order Buffer Rack

The **No Order** buffer rack is an optional feature which allows an Auto*Mate* 2500 Family system to handle samples without any specified test order. When processed, a sample without test orders is placed in the defined **No Order** buffer area on one of the output base frames. After a customer-specified time period, the Auto*Mate* 2500 Family system automatically reprocesses the sample. If a test order is found during reprocessing, the sample is sent to the necessary workplace. After a customer-specified maximum time

period, if a test order is still not found, the Auto*Mate* 2500 Family system sends the sample to an error workplace.

The **No Order** buffer rack can only be configured using the C27009 base frame and two specific racks, B43843 and B43840. These racks support all tube types permitted by the Auto*Mate* 2500 Family system.

Figure 41 C27009 base frame, B43843 and B43840 racks



Important

The system does not read sample bar code labels when reprocessing a sample from the no order buffer rack. Do not manually replace samples in the no order buffer rack.

Important

Robot 01 moves to pick up samples from the No Order buffer rack for reprocessing, even if the input drawer is open, according to the specified time period.

Microtiter Plates (MTPs)

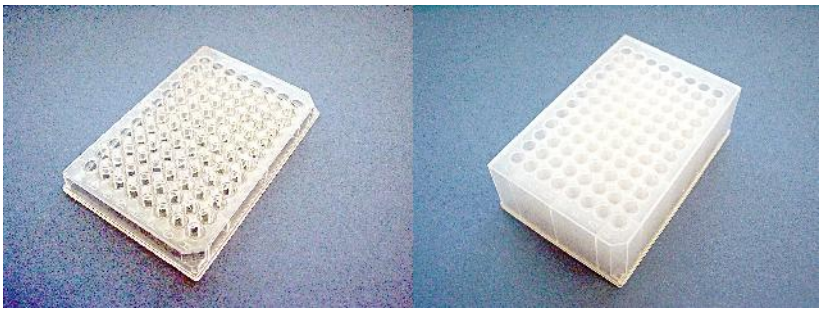
About MTPs

MTPs are used for both sample analysis and archiving.

Caution

Risk of sample loss. Polypropylene MTP racks may be damaged by storage at temperatures below -80 °C. Do not store MTP racks at temperatures lower than -80 °C.

Figure 42 MTP examples



Caution

Biological risk of sample cross contamination with MTP option. Use disposable tips when using high viscosity samples to avoid sample contamination by Robot 3. Carefully assess analysis results obtained from highly sensitive tests, such as PCR. Confirm all positive results with a fresh sample.

Caution

Risk of cross contamination. The MTP feature can only be used on an Auto*Mate* 1250 or 2550 system connected to a Sorting-Drive system running software version 4.2.1 or higher. Using the MTP without a connected Sorting-Drive can result in sample handling errors and cross contamination.

Important

Only use one type of MTP per base frame for reliable operation. Your Beckman Coulter representative configures robot 3 for one type of MTP on a base frame. Using MTPs that are not configured for the base frame can cause problems.

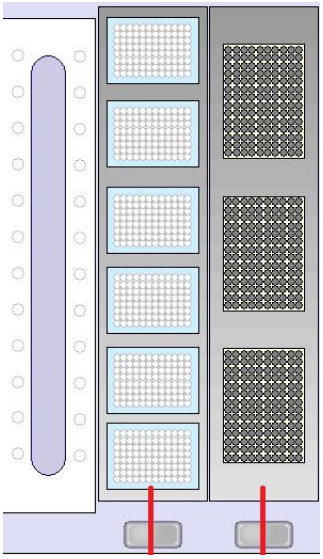
MTP Location

Caution

To prevent contamination of pipette tips, place MTPs to the left of the pipette tip rack on the aliquot module. Do not combine MTPs and tip racks on the same drawer.

The location of MTPs is fixed when a rack reader is installed.

Figure 43 MTP location: MTPs left, pipette tips right



MTP Operating Modes

Manual Mode

During manual operation, enter MTP ID numbers for each plate before starting distribution.

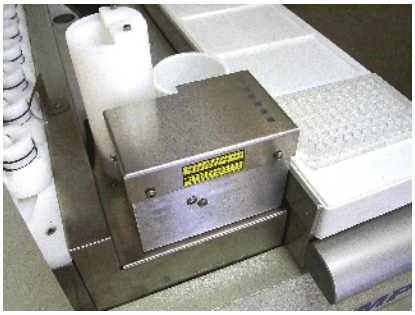
Automatic Mode

Note

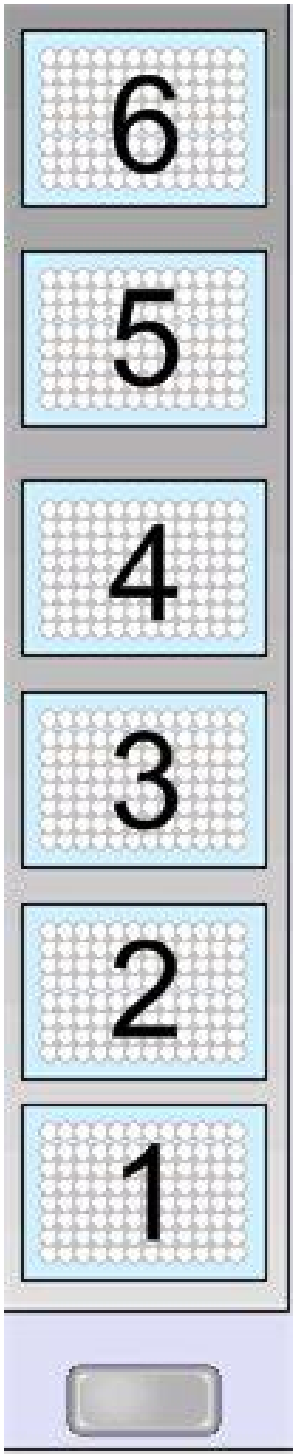
On systems that use a rack reader and MTPs, confirm that host communication is running. If host communication is interrupted (host timeout message or host communication error message), contact your network administrator. If the problem persists, contact your Beckman Coulter representative.

Important

Use MTPs with bar code labels in automatic mode. The rack reader detects MTP IDs when a drawer is closed.



The LEDs on the rack reader light up to signal that the drawer is opening. After closing the drawer, the LEDs flash to signal that the racks were identified.

MTP	LED indicator	Description
		Rack 6 OK
		Rack 5 OK
		Rack 4 OK
		Rack 3 OK
		Rack 2 OK
		Rack 1 OK

Caution

Fully extend drawers before accessing racks to prevent collision with moving components.

Note

Fully extend drawers before closing. A sensor detects the drawer extension. If the drawer is not completely extended, the running lights remain on. Try again.

Note

Do not close the drawer too fast. If the drawer is closed too fast, the running lights remain on.

Note

The rack reader scans MTP bar code labels after the Auto*Mate* 2500 Family system is initialized.

Handling MTPs

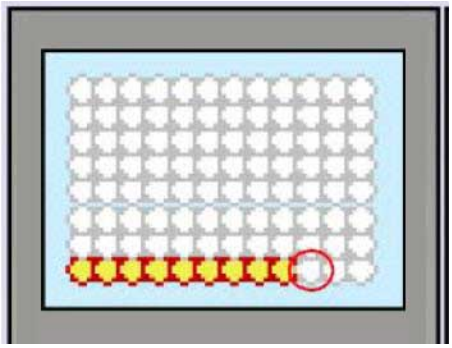
MTPs are handled like normal distribution racks.

Processing unfinished MTPs

Unfinished MTPs are handled differently when placed in the system for a second run.

1. If you interrupt processing on an MTP and want to continue the next day, the LIS recognizes this MTP.
2. The LIS confirms the MTP ID and position.
3. Positions that are filled are marked yellow on screen.
4. The LIS informs the Auto*Mate* 2500 Family system which position to continue dispensing samples. This position is visible on screen.

Figure 44 Processing a second MTP run



Placing unfinished MTPs in manual mode

When you place unfinished MTPs for a second run in manual mode, follow these steps:

1 Use the same MTP IDs. Enter the IDs and start position.

2 Return the MTP to the same position used.

Caution

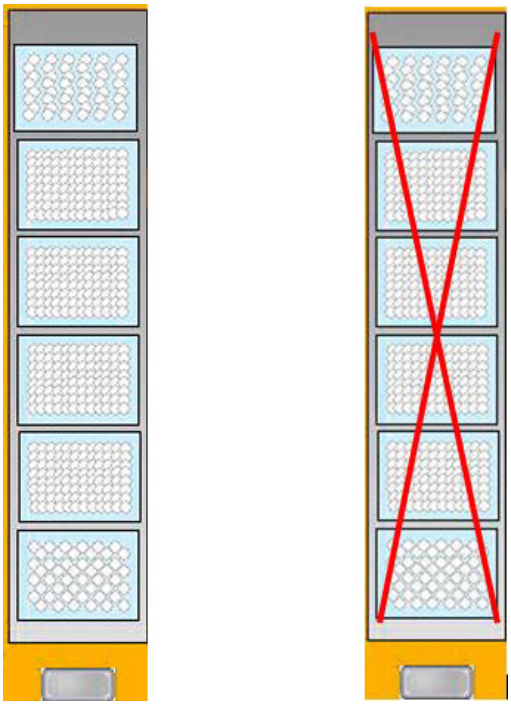
Risk of sample mismatch. When using unfinished plates a second time, place the plates in same position previously used to prevent a sample mismatch in the system.

MTP Display

The MTP module status is displayed on screen. Display options described can differ depending on your MTP configuration.

After drawer initialization, the background color changes to orange.

Figure 45 MTPs during initialization



If the MTP drawer displays a red X, communication is being tested with the LIS. The LIS queries the following information:

- Are the MTP bar code labels known?

  — The LIS only accepts MTPs that it recognizes.
- If an MTP is introduced for the second time: Is the MTP in the same position as the first run?

  — The LIS determines the plate position (1 to 6) from the first run. If the MTP is in a different position, the LIS rejects it.
- Where is the next free dispensing position?

  — The LIS determines the new start position. Positions that are used turn yellow.
- Is this MTP finished?

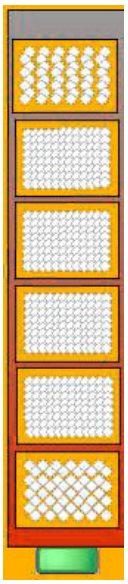
  — If so, replace with a new MTP.

Note

If any problems are identified during the communication test, an error message alerts you.

When the drawer is open, the background color changes to red.

Figure 46 MTP drawer open



All other drawers are displayed yellow when open. Red emphasizes the importance of this drawer, because it affects many sample tubes.

Confirm MTPs

When all positions on an MTP are filled, the drawer opens automatically. Confirm each complete MTP.

Confirm MTP in automatic mode

In automatic mode, MTPs are confirmed automatically. Replace the complete MTPs and close the drawer.

Note

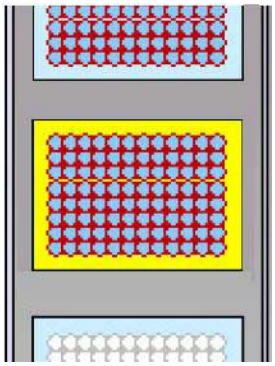
Do not close the drawer too fast. If the drawer is closed too fast, the running lights remain on.

Confirm MTPs in Manual Mode

1 Replace a complete MTP.

2 Before closing the drawer, select the MTP that was replaced on screen.

3 The outline of the MTP turns yellow. You have selected this workplace as a position to continue with a new MTP.



4 The system prompts you to enter a unique ID for the new MTP.

5 Close the drawer. Continue routine operation.

CHAPTER 3

Run The System As An Advanced User

Introduction to Run the System as an Advanced User

Warning

Risk of system malfunction. Do not use the tools and features described in this section without the supervision or instruction of a Beckman Coulter Representative. Unauthorized modification can compromise system behavior and patient samples.

Warning

It is your responsibility to confirm that any User or Advanced User is correctly trained and understand the restrictions on the system options and features accessible to their operator level. Misuse of the Auto*Mate* 2500 Family system by untrained operators can compromise the system and patient samples, and can invalidate your warranty.

As an **Advanced User**, you can use the system in the same way as a **User**. However, you can also access the accounts management dialog, and several Auto*Mate* 2500 system options and features.

As an **Advanced User**, you can use the accounts management dialog to create, edit, and delete operator accounts of the **User** and **Advanced User** levels.

As an **Advanced User**, you can access some system tools and options which are not available to the **User**. The tools and options available for the **Advanced User** must only be used under the supervision or instruction of a Beckman Coulter Representative. Changes made to any system tools and options by the **Advanced User** will persist for all subsequent operators, even after a system restart.

Warning

Risk of delayed sample. It is the responsibility of the laboratory to communicate all changes made to the Auto*Mate* 2500 Family system to all operators who use the Auto*Mate* 2500 Family system. If the necessary system capabilities are turned off, work orders requiring those capabilities can remain incomplete.

Manage Operator Accounts

Warning

It is your responsibility to confirm that any User or Advanced User is correctly trained and understand the restrictions on the system options and features accessible to their operator level. Misuse of the Auto*Mate* 2500 Family system by untrained operators can compromise the system and patient samples, and can invalidate your warranty.

As an **Advanced User**, you can create or delete operator accounts of the **User** or **Advanced User** levels. All operators who are designed as a **User** or an **Advanced User** are listed in the **Accounts Management** dialog. You can manage the creation or deletion of new accounts from the **Accounts Management** menu.

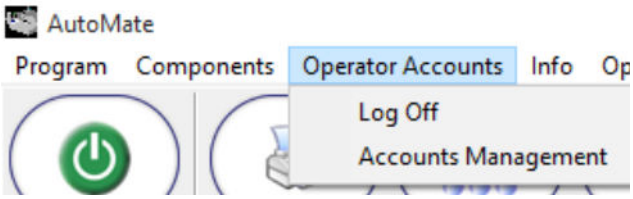
Important

If an operator forgets their password, create a new account and delete the existing account. There is no loss of system information or configuration parameters when a user is deleted.

Manage Operator Accounts

1 Go to the **Operator Accounts** option in the software menu and select **Accounts management**.

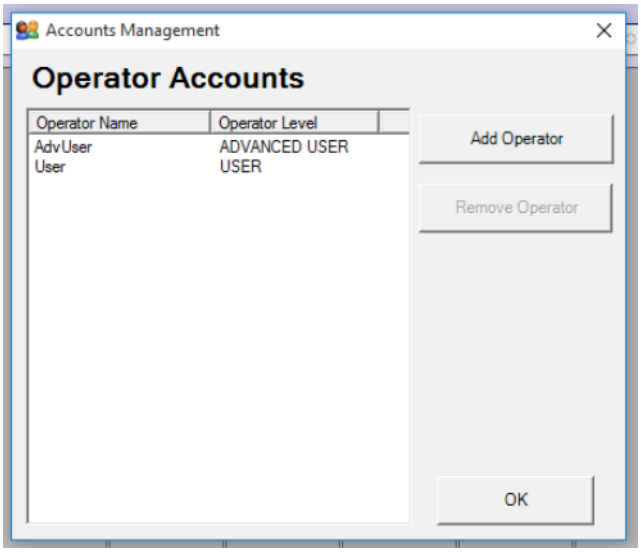
Figure 47 Select **Accounts management**



2 Create a new operator account.

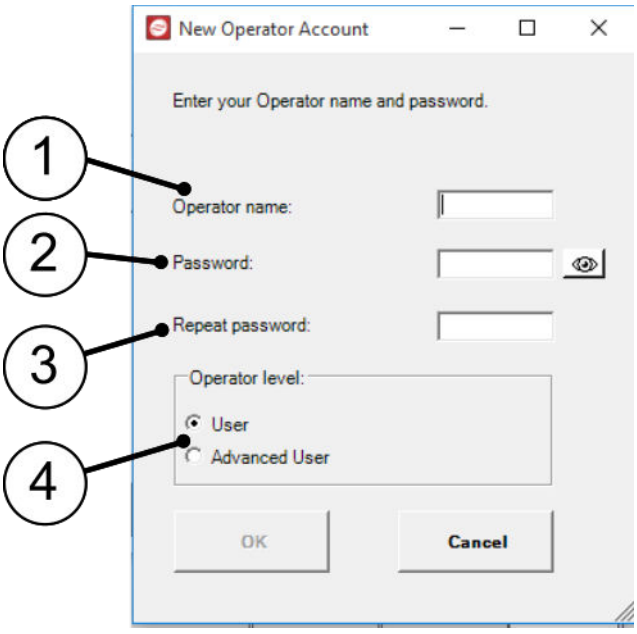
a. Select **Add Operator** from the **Accounts management** dialog.

Figure 48 Manage operator accounts



b. Enter the new operator name into the **Operator Name** box. Use only alphanumeric characters when creating a new operator name, and remember that the operator name is case-sensitive.

Figure 49 Account Creation Dialog



1. **Operator Name**
2. **Password**
3. **Repeat Password**
4. **Operator Level** selection

c. Enter a password for the new operator in the **Password** box. Use only alphanumeric characters or approved symbols when creating a new password, and remember that the password is case-sensitive.

d. Enter the same password into the **Repeat Password** box. The system alerts you if the passwords do not match or use illegal characters.

e. Select the level of the operator. You can select between a **User** or an **Advanced User**.

Important

Do not permit an operator to access the system without the correct training.

f. Select **OK** to confirm, or **Cancel** if you no longer want to continue.

3 Delete an existing operator account

a. Select the operator account that you want to remove from the list of operators.

b. Select **Remove Operator** from the **Accounts management** dialog.

c. Select **OK** to confirm, or **Cancel** if you no longer want to continue.

Components Menu For Advanced Users

Caution

Risk of system malfunction. Do not use the Components menu tools without direct or remote supervision from Beckman Coulter. The system behavior can be compromised by unauthorized modification.

As an **Advanced User**, you can access additional options from the **Components** menu. The **Components** allows you to initialize individual components of the Auto*Mate* 2500 Family system.

Table 32 Component Menu Options

Menu	Submenu	Description
Tube Inspection Unit	**Camera**	Contains the **Camera Active** tool, which can be used to turn on or turn off the camera.
Aliquot Module	**Volume Detection**	Contains the **Volume Detection Active** tool, which can be used to turn on or turn off the volume detection mode.
	Aliquot Active	Turns the Aliquot module on or off.

Tools Menu For Advanced Users

Caution

Risk of system malfunction. Do not use the Tools menu options without direct or remote supervision from Beckman Coulter. The system behavior can be compromised by unauthorized modification.

As an **Advanced User**, you can access the **Tools** menu when the software is running in **Service Mode**. The **Tools** menu allows you to access the the **Update Flash** and **System Backup** tools of the Auto*Mate* 2500 Family system.

Table 33 Table of Menu Features for Advanced Users

Menu	Submenu	Description
Tools	**Update Flash**	This menu option allows an **Advanced User** to reset the module control programming.
	System Backup	This menu option contains the following sub-menu items. • Export system backup This option exports a backup of important system files to a specific location. • Import system backup This option imports an existing backup of important system files. • Extract to... This option extracts all the contents of a previous backup file to a specified file directory.

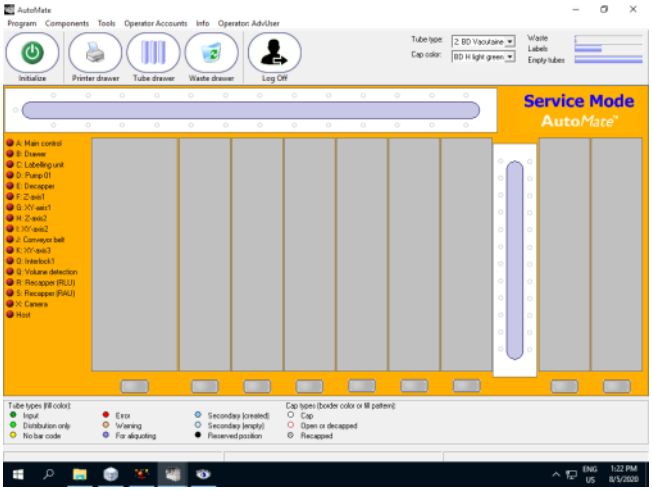
Service Mode

Caution

Risk of system malfunction. Do not use Service Mode unless you are a trained Advanced User. The system behavior can be compromised by unauthorized modification.

As an **Advanced User**, you can switch the system to run in **Service Mode**. **Service Mode** is a special mode of the system used primarily by Beckman Coulter Field Service Engineers. When a system is running in **Service Mode**, the user interface turns from gray to orange. When the system is running in **Service Mode**, the robots move with reduced speed and some advanced system configuration tools are available in software menus.

Figure 50 Service Mode



Important

In some troubleshooting scenarios, Beckman Coulter can instruct you to run the system in **Service Mode** until a Beckman Coulter Representative can arrive on site. If Beckman Coulter recommend **Service Mode** as a temporary countermeasure to permit the continued sorting of samples, an **Advanced User** must always be logged on.

Configuration Manager

Caution

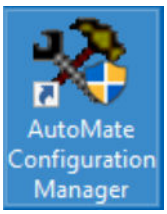
Risk of system malfunction. Do not use Configuration Manager without direct or remote supervision from Beckman Coulter. The system behavior can be compromised by unauthorized modification.

As an **Advanced User**, you can access **Configuration Manager**. **Configuration Manager** is a tool used primarily by Beckman Coulter Field Service Engineers. **Configuration Manager** allows an authorized individual to alter specific parameters which can change the behavior of the Auto*Mate* 2500 Family System. **Advanced Users** can only access some parameters in **Configuration Manager** .

Access Configuration Manager

1 Shut down the Auto*Mate* 2500 Family software.

2 Open **Configuration Manager** from the icon on the desktop.



Rack Wizard

Warning

Risk of system malfunction. Do not use Rack Wizard without instruction or supervision from Beckman Coulter. The system behavior and samples can be compromised by unauthorized modification.

Rack Wizard is a tool used by the field service engineer for configuration of the tube workplace. **Rack Wizard** is available to the **Advanced User** through the **Tools** menu.

Important

In some troubleshooting scenarios, Beckman Coulter can instruct you to open **Rack Wizard**. Beckman Coulter can remotely support the **Advanced User** in using **Rack Wizard** to investigate tube placement and pickup errors.

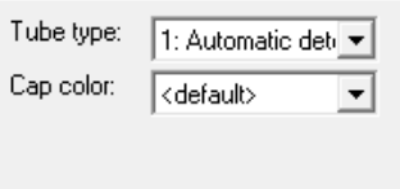
Restrict Tube Or Cap Identification

Caution

Risk of sample delay. When Automatic detection is not selected, certain tubes may not be recognized and sent to the error rack. Tubes can only be recognized by reverting to Automatic detection mode. Manual selection of tube type and cap color is only to be used in consultation with your Beckman Coulter Representative.

When using the Auto*Mate* 2500 Family software as a **Advanced User**, the Tube Type and Cap Color Selection menus can be changed from **Automatic detection** to specific combinations of tubes and caps. If you select a single tube and cap combination from the menus, the system assigns the specified values to every sample.

Figure 51



Important

Settings changed by the **Advanced User** persist on logoff. If you do not intend for a subsequent **User** to use the system with features such as the camera, volume detection, and automatic tube or cap color detection turned off, turn these features back on before you log off.

Create A Backup Of Auto*Mate* 2500 System And The Log Files

Caution

Risk of system malfunction. Do not use System Backup tools without instruction or supervision from Beckman Coulter. The system behavior and samples can be compromised by unauthorized modification.

This topic describes the procedure for an **Advanced User** to back up Auto*Mate* 2500 Family system configuration files and system log files.

1. Log on as an **Advanced User**.
2. Switch to **Service mode**.
3. Go to the **System back up** section of the **Tools** menu.
4. Select **Export** from the menu.
5. In the **System Backup** dialog, leave the check boxes for **Configuration Files** and **Log Files** checked.
6. Confirm the dates listed in the **Log files** section of the dialog. Confirm that the dates correspond to your last Auto*Mate* 2500 Family system software start.
7. If Beckman Coulter require you to provide CAN-exe log files, select the corresponding check box.
8. Do not select the **Split to multiple disks** check box.

9 Select **Export**.

10 Wait for the progress bar to complete. An alert message informs you when the backup is complete.

Import A System Backup

This topic describes the procedure for an **Advanced User** to import back up Auto*Mate* 2500 System configuration files.

Caution

Risk of system malfunction. Do not use System Backup tools without instruction or supervision from Beckman Coulter. The system behavior and samples can be compromised by unauthorized modification.

1 Log on as an **Advanced User**.

2 Go to **Service mode**.

3 Go to the **System backup** section of the **Tools** menu.

4 Select **Import**.

5 Go to the location where the previously exported backup files are stored.

6 Select the backup file you want to import.

Camera Active

Caution

Risk of system malfunction. Do not use the Camera Active without direct or remote supervision from Beckman Coulter. The system behavior can be compromised by unauthorized modification.

The **Advanced User** and the Beckman Coulter Field Service Engineers can use the **Camera Active** tool to turn the camera on or off. **Camera Active** is available to the **Advanced User** through the **Components** menu.

When the camera is turned off, **Automatic Detection** of tube type and cap color is no longer possible. The system software disables **Automatic Detection** and will default to the first tube and cap combination listed in the **Tube Type** and **Cap Color** selection menus.

Volume Detection Active

Caution

Risk of delayed result. Do not use Volume Detection without direct or remote supervision from Beckman Coulter. The system behavior can be compromised by unauthorized modification.

As an **Advanced User**, you can turn off **Volume Detection** using the **Volume Detection Active** tool in the **Components** menu. If **Volume Detection** is turned off, the system does not report the measured volume to the Laboratory Information System or the Sorting-Drive. If **Volume Detection Active** is re-enabled, the system prompts you to reinitialize the volume detection unit.

Warning

Risk of delayed result. If Volume Detection is turned off, the system processes the sample order without checking the available sample volume. Depending on sample order, sample volume can be depleted in this scenario, preventing further analysis.

Important

Settings changed by the **Advanced User** persist on logoff. If you do not intend for a subsequent **User** to use the system with features such as the camera, volume detection, and automatic tube or cap color detection turned off, turn these features back on before you log off.

Flash Update

Caution

Risk of system malfunction. Do not use the Flash Update without instruction or supervision from Beckman Coulter. The system behavior can be compromised by unauthorized modification.

The **Flash Update** tool is used by Beckman Coulter Field Service Engineers to reset the programming of the system control modules. **Flash Update** is available to the **Advanced User** through the **Tools** menu.

Important

In some troubleshooting scenarios, Beckman Coulter can instruct you to use the **Flash Update** tool. Beckman Coulter can remotely support the **Advanced User** in using the **Flash Update** tool.

CHAPTER 4

User Maintenance

Introduction to Maintenance

Caution

Electrical Hazard. Power off the Auto*Mate* 2500 Family system before any interventions. This general rule applies to all preventive maintenance activities.

The Auto*Mate* 2500 Family systems depend on the interaction of sensitive mechanical components and electronics to operate without failure. To guarantee the correct operation of all components, clean the system regularly. The preventive maintenance tasks described here are founded on practical experience with the system. Comply with all maintenance recommendations to avoid operating issues.

Safety Precautions During Maintenance

Caution

Avoid direct contact with patient samples, disposable pipette tips, used caps, any machine components that come in contact with sample fluids, and liquid waste. Always wear gloves and other protective gear to protect yourself from infection. Before troubleshooting the system with open doors and covers, remove patient samples. Handle all liquid waste as potentially infectious. Some liquid waste can require special treatment before disposal. Follow your laboratory procedure.

Caution

If you come into direct contact with sample fluid, thoroughly wash the affected area and consult a physician. Immediately wipe off any contaminants from the system. Clean the system using approved liquid disinfectant. After working on the system, clean your hands thoroughly.

Caution

When lifting safety covers, lock the cover in the raised position before releasing it to avoid injury.

Caution

Wear protective clothing and follow universal precautions as dictated by local or national regulations (CLSI GP17-A2, ISO15190 or 29CFR 1910.1030).

Maintenance Operation Sequence

Before performing any maintenance task, excluding printer consumable loading, follow the task sequence described in this topic.

Important

For printer consumable loading (transfer ribbon, label roll), the Auto*Mate* 2500 family system must be stopped, but does not need to be turned off.

1 To stop the Auto*Mate* 2500 Family system, press **Stop**

2 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

3 Close the Auto*Mate* 2500 Family system software application.

4 Turn off the PC.

5 Turn off the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

Caution

Always disconnect mains plug when working on electronic parts or on parts connected to the power supply.

6 Start maintenance activities.

Note

When finished, remove all liquids and cleaning tools from the vicinity of the Auto*Mate* 2500 Family system.

7 Turn on the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

8 Switch on the PC.

9 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

10 Press **Start**

Cleaning and Decontamination

How to Clean the System

1 Use a solution of antibacterial soap and water. Alternatively, you can use an ammonia-free antistatic window cleaning solution containing less than 5% anionic surfactant.

2 Inspect the covers and panels. Confirm that all screws are in position and tight.

3 Starting at one end of the system, wipe all surfaces with a damp absorbent tissue. Do not soak the system.

4 Dry the system with an absorbent tissue to remove any moisture.

5 Confirm that no cleaner residue is left in the guiding rails of the sliding doors.

6 Inspect the area around the system. Clear away any items that are not needed.

Recommended Disinfectant for Decontamination

We recommend Mikrobac® Tissues (outside the United States) and Clorox® Disinfecting Wipes (within the Unites States).

Virkon®* is also suitable for normal cleaning, refer to How to Apply Virkon. Virkon® does not damage the Plexiglas panels. You can also use any other laboratory disinfectant solution that does not contain any prohibited agents.

Distributors of Virkon Disinfectant

Order Virkon from your local distributor.

Europe

In Europe, the product is available under the product names RelyOn and Virkon Starter Set.

United States

In the United States, refer to the DuPont website.

Southeast Asia and Pacific

Refer to the following list of distributors for Southeast Asia and Pacific:

Country	Distributor name
Australia	MedCon Pty. Ltd.
Indonesia	PT Usaha Karyatama Mandir
India	Vishal Surgicals
Korea	Bando New Pharma
Sri Lanka	Mediquipment Pvt Ltd.
New Zealand	Global Science & Technology
Singapore	PharmaCon (Pte) Ltd

* Virkon® is a registered trademark of Antec International - A DuPont Company. ® and ™ indicate trademarks or registered trademarks of DuPont or its affiliates.

Country	Distributor name
Thailand	Orex Trading Company
Taiwan	Three Power Tech Co.Ltd.

How to Apply Virkon

This description is a summary of the cleaning procedure. Carefully read and comply with all instructions and information provided with the product.

1. Remove surface contamination.
2. Prepare 1.0% DuPont™ RelyOn™Multi-Purpose Disinfectant Cleaner according to the instructions. Add 1 tablet (5 g) to 500 mL (17 fl. oz).
3. Apply the solution using a mop, sponge, brush, or spray bottle until the surface is visibly clean.
4. Wait 10 minutes to let the surface air dry.
5. If treating fungal contamination of non-food contact surfaces, follow these instructions substituting a 2.0% DuPont™ RelyOn™ Multi-Purpose Disinfectant Cleaner solution.

List of Prohibited Cleaning Agents

Important

Do not use any cleaning agents or disinfectant solutions that contain any of the agents below. If you are not sure whether a cleaning agent is suitable, contact your Beckman Coulter representative. Using non-approved cleaning agents can impact the warranty on your system. All of the following agents can damage or corrode the Plexiglas panels, and alloy or brass parts:

- Bleach (sodium hypochlorite)
- Aromatic hydrocarbons (such as Xylene, Benzene, Toluene)
- Chlorinated hydrocarbons
- Esters (such as Ethyl acetate)
- Ethers (such as Ethyl ether)
- Ketones (such as Acetone)
- Amyl alcohol
- Butanol
- Methylene chloride
- Dibutyl phthalate

- Dioctyl phthalate
- Concentrated acids or alkalis (such as concentrated vinegar)
- Nitrocellulose lacquer

Maintenance Schedule

The following table shows required periodic maintenance tasks. Make copies of the blank form on the following pages to manage maintenance routines for the system.

The tasks are performed at a higher frequency in high volume environments, which are defined as systems which process more than 8000 samples per day.

General Maintenance Tasks	Completed
1. Clean the System Task Duration: 10 min Frequency: Daily for standard and high volume systems.	

Decapper Maintenance Tasks	Completed
2. Remove tubes and caps from the decapper area Task Duration: 1 min Frequency: Daily for standard and high volume systems.	
3A.Clean the Decapper Cap Slide System: Auto*Mate* 1200, Auto*Mate* 1250 Task Duration: 5 min Frequency: Daily for standard and high volume systems.	
3B. Clean the Components of the Waste Hopper System: Auto*Mate* 2500, Auto*Mate* 2550 Task Duration: 5 min Frequency: Daily for standard and high volume systems.	

Recapper Maintenance Tasks	Completed
4. Clean the Complete Recapper Task Duration: 10 min Frequency: Weekly for standard and high volume systems.	
5. Check the application unit of the Parafilm Task Duration: 5 min Frequency: Daily for high volume systems. Weekly for standard systems.	
6. Check the O-rings for Parafilm transport Task Duration: 10 min Frequency: Daily for high volume systems. Weekly for standard systems.	
7. Inspect the guidance of the O-rings for dirt Task Duration: 2 min Frequency: Daily for high volume systems. Weekly for standard systems.	

Robot Maintenance Tasks	Completed
8. Clean the gripper clips (pads) Task Duration: 1 min Frequency: Daily for standard and high volume systems.	
9. Replace the gripper clips (pads) Task Duration: 2 min Frequency: Weekly for high volume systems. Monthly for standard systems.	
10. Check and clean the bar code reader window Task Duration: 10 min Frequency: Daily for high volume Systems. Weekly for standard systems.	

Robot Maintenance Tasks	Completed
11. Inspect the guidance of the O-rings for dirt Task Duration: 2 min Frequency: Daily for high volume systems. Weekly for standard systems.	
12.Clean the TIU Mirror Task Duration: 5 min Frequency: Daily for high volume systems. Weekly for standard systems.	

Conveyor Belt Maintenance Tasks	Completed
13. Clean and Vacuum the Conveyor Belts Task Duration: 2 min Frequency: Daily for standard and high volume systems.	
14. Check Guide in Conveyor Belt Base Plate for Damage Task Duration: 2 min Frequency: Daily for standard and high volume systems.	

Aliquoter Maintenance Tasks	Completed
15. Replace the Aliquoter Syringe System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 2 min Frequency: Every six months for high volume systems. Every year for standard systems.	
16A. Inspect Tip Carrier (GEN 1) System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Daily for standard and high volume systems.	
16B. Inspect the EZ Pipettor. System: AutoMate 1250, AutoMate 2550 Task Duration: 1 min Frequency: Daily for standard and high volume systems.	

Aliquoter Maintenance Tasks	Completed
17A. Clean the Tip Carrier (GEN 1) System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 45 min Frequency: Weekly for high volume systems. Monthly for standard systems.	
17B. Clean the Tip Carrier of the EZ Pipettor (GEN 2) System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 10 min Frequency: Daily for standard and high volume systems.	
18. Check the Air Tightness of the System System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 4 min Frequency: Monthly for standard and high volume systems.	
19. Check the TTU Module System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 2 min Frequency: Daily for high volume systems. Weekly for standard systems.	
20. Remove fallen secondary tubes and debris System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Daily for standard and high volume systems.	

Planet Air Compressor Maintenance Tasks	Completed
21A. Check the Oil Level, if required: Add Oil. System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Weekly for all systems.	
21B. Empty the Drain Bottle Task Duration: 1 min Frequency: Weekly for standard and high volume systems.	

Jun Air 87R-4P Compressor Maintenance Tasks	Completed
22A. Clean Air Intake Filter System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 5 min Frequency: Weekly for all systems.	

ETS-2 Printer Maintenance Tasks	Completed
23. Clean the Rollers System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 5 min Frequency: Weekly for all systems.	
24. Clean the Printhead System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Monthly for all systems.	
25. Clean the Label Sensor System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Monthly for all systems.	
26. Replace the Label Roll System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 2 min Frequency: when required.	
27. Replace the transfer ribbon System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 2 min Frequency: when required.	

ETS-3 Printer Maintenance Tasks	Completed
23. Clean the rollers System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 5 min Frequency: Weekly for all systems.	
24. Clean the printhead System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Weekly for all systems.	
25. Clean the label sensor System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Monthly for all systems.	
25. Clean the Tamp Pad System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 1 min Frequency: Monthly for all systems.	
26. Replace the label roll System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 2 min Frequency: when required.	
27. Replace the transfer ribbon System: Auto*Mate* 1250, Auto*Mate* 2550 Task Duration: 2 min Frequency: when required.	

Sorter Module Maintenance

Clean the Decapper Cap Slide (Auto*Mate* 1200/1250)

1 Open the decapper access door.

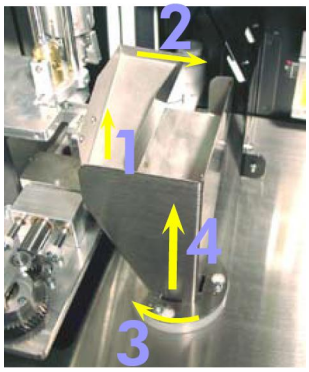
2 Remove the small cap slide:

a. Flip the front edge (1) of the small cap slide up.

b. Remove the cap slide by carefully pulling it out to the right (2).

c. Turn the waste chute slightly clockwise (3) and lift it (4) to remove.

3 Clean the components of the decapper with a moist absorbent tissue and a mild detergent. Wipe dry before replacing.



Clean the Components of Waste Hopper (Auto*Mate* 2500/2550)

1 Turn the waste hopper clockwise (1) and lift (2) to remove.

2 Clean the components of the waste hopper with a moist absorbent tissue and a mild detergent. Wipe dry before replacing.

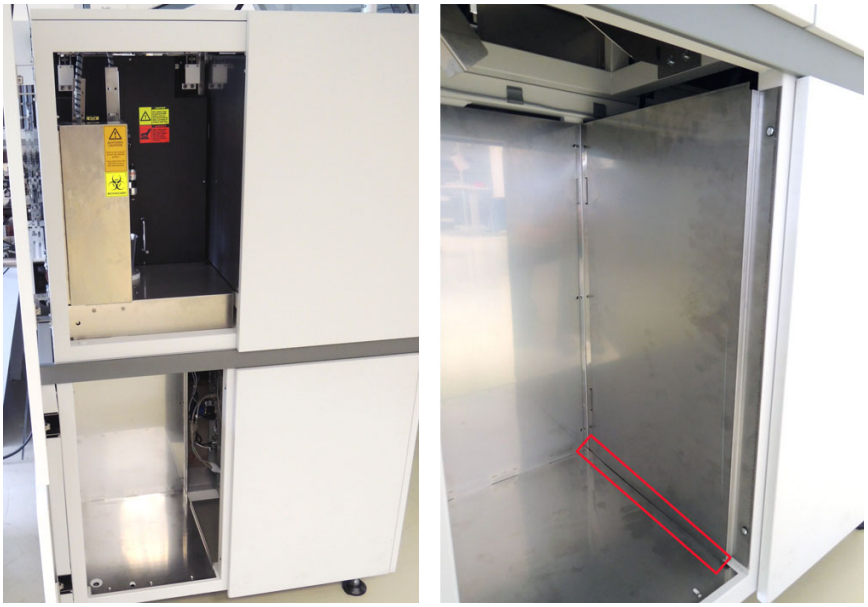
Note

Auto*Mate* 2500 and 2550 systems have two hoppers:

Clean the Decapper Waste Area

When cleaning the decapper waste area in the compartment below the decapper, follow all safety advice.

Figure 52 Decapper waste area beneath decapper



Caution

Risk of hand injury caused by sharp edges. When cleaning this area, keep your hands away from the seam between the metal wall and the metal base sheet. The metal wall is flexible; hands can slip through a gap in this area and be exposed to sharp edges. Always wear gloves while cleaning. Follow all safety instructions.

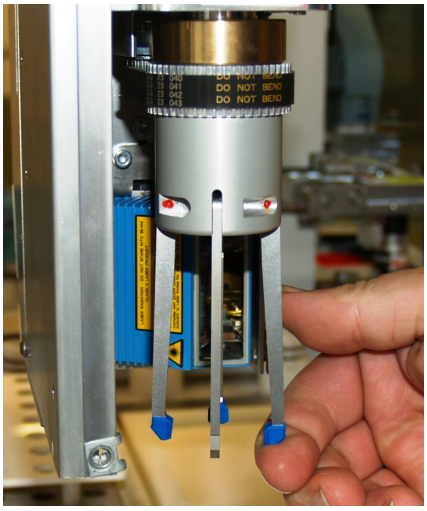
Robot Gripper Maintenance

Clean the gripper clips (pads)

If the robot gripper clips are sticky, wipe the clips with a moist absorbent tissue.

Replace the gripper clips (pads)

If the robot gripper clips are damaged or lost, replace the clips. Order number ODL05112 (8 pcs.) or ODL25112 (80 pcs).



Check and clean the bar code reader window

Check the bar code reader window for contamination. If necessary, clean the bar code reader with a moist absorbent tissue. Use a cleaning agent suitable for plastic.

Clean TIU Mirror

Clean TIU Mirror - Auto*Mate* 2500 and Auto*Mate* 2550
This topic describes the cleaning procedure of the TIU mirror.

Estimate Labor:

5 minutes

Required Materials:

- Disposable protective gloves and cotton gloves
- Optical paper
- Isopropanol or dishwashing liquid detergent

Prepare Instrument

1 Close the instrument software. Then shut down the PC.

2 Completely turn off the power of the instrument using the red main switch.

Procedure

Important

Turn off the power of the system before servicing. Whenever service or maintenance is necessary, it is mandatory to turn off the power of the system 30 minutes before opening the cover of the TIU.

Note

When working on the TIU system, always wear lint-free, cotton gloves over disposable protective gloves to protect yourself from infection, or to avoid traces of grease on the mirror or on the lamp surface.

Note

For cleaning use a fresh, clean, lint-free, absorbent tissue or optical paper. Any dust particles can scratch the delicate coatings of the glass surface.

1 Remove the cover of the TIU.

2 Clean the mirror:

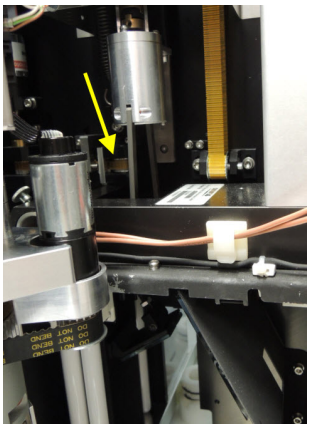
a. Soak an absorbent tissue with isopropanol and wipe the mirror.

b. If smears are still present, repeat the procedure.

c. Wipe carefully using dry optical paper.

3 Inspect the mirror:

a. Inspect if the linear bearing of the X-axis is running smoothly.



b. If necessary, lubricate the linear bearing.

c. Turn on the system.

d. Confirm that the mirror surface is clean and intact.

4 Put on the cover.

Conveyor Belt Maintenance

Clean and Vacuum Conveyor Belts

Always keep the conveyor belts clean!

Inspect the conveyor belts for sample residue and plastic abrasion.

Caution

Clean the conveyor belts immediately after a tube crash or sample fluid spills. Risk of sample cross-contamination. Clean and dry the areas in between the tube holders very carefully. You can remove individual tube holders. Clean tube holders with a soft brush and warm running water.

Note

A series of videos are installed on the Auto*Mate* PC to help you with this task.

- On WindowsXP operating systems, the videos are in `D:\OperatorTrainingVideos\OT2_Conveyor Belt 0102 Cleaning`
- On Windows 10 operating systems, the videos are in `This PC > Videos > OperatorTrainingVideos > OT2_Conveyor Belt 0102 Cleaning`

The first time you open a video, you must configure Windows Media Player. Select **Recommended settings** and **Finish**.

Tube Holders

Remove Individual Tube Holders

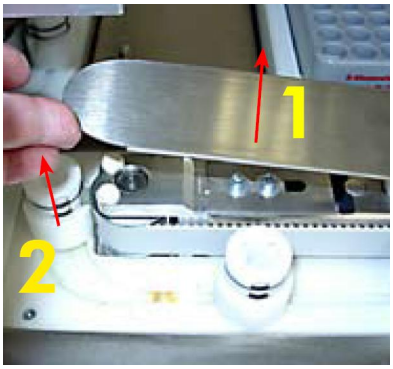
1 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

2 Remove the screw on conveyor belt 01. Access the conveyor belt from the back of the system.

Note

Do not bend the metal excessively. A Beckman Coulter representative can help you remove the entire cover for thorough cleaning.

3 Lift the cover sheet (1) and move the tube holders to position (2) to remove them.



4 On conveyor belt 02, remove the two thumb screws (3). Lift the cover. Slide the tube holder to the removal position (4).

5 Completely lift the cover sheet. Remove the tube holder from the removal position.

6 Move the tube holders along the conveyor belts manually. Confirm that all tube holders move without scratching the white frame material. If a tube is in contact with the frame material, confirm that the tube holder is set in its correct position.

7 At the turning points, confirm that the tube holders do not touch the top metal cover.

8 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

Remove All Tube Holders

1 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

2 Search for the reference tube holder with the black mark. Each conveyor belt has one reference tube holder.

Reference tube holder from the side and from below

3 Mark the reference tube holder position on the conveyor with a water resistant marker.

4 Each tube holder has a screw on the bottom. The screw has a 0.5 mm gap between the screw head and the tube holder base. If this gap is clogged with residue, the system cannot identify the conveyor belt positions.

5 If there is heavy residue buildup under the tube holders, remove all tube holders.

6 Use a vacuum cleaner to clean the area.

7 Soak all tube holders in a detergent solution for a minimum of 30 minutes. Scrub the tube holders using a soft brush and warm running water.

8 After drying, replace the tube holders on the conveyor belt.

- **a.** Insert a secondary tube into the reference tube holder.
- **b.** Replace the tube holder onto the conveyor belt. Confirm that the reference tube holder magnet is in the correct position.
- **c.** Remove the secondary tube.
- **d.** Repeat the previous steps for all tube holders.

9 Move all tube holders to the lowest position on the conveyor belt.

10 Move the tube holders along the conveyor belts manually. Confirm that all tube holders move without scratching the white frame material. If a tube is in contact with the frame material, confirm that the tube holder is set in its correct position.

11 At the turning points, confirm that the tube holders do not touch the top metal cover.

12 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

Inspect Guide of Conveyor Belt Base Plate

1 Inspect the start point of the guide for damage. Confirm that the tube holder slides in without resistance.

2 After each cleaning, apply a few drops of silicone oil to the surface of the base plate.

Aliquot Module Maintenance

Pipettor Maintenance

The inspection and cleaning procedure depends on the type of pipettor installed.

The term **pipettor** refers to the whole module on robot 3 used to aliquot and dispense sample liquid without the pump. The term **tip carrier** refers to the cylindrical metal part that picks up and carries the pipette tip.

Generation 1 pipettor (GEN 1)

The generation 1 (GEN 1) pipettor has a fixed tip carrier that remains on the pump module while cleaning.

EZ Pipettor (GEN 2)

The generation 2 pipettor is called **EZ Pipettor**. It is called EZ (easy) because it is easy to remove the tip carrier for cleaning. This pipettor has a quick-release turnable lever and retaining nut.

Figure 53 GEN 1 pipettor

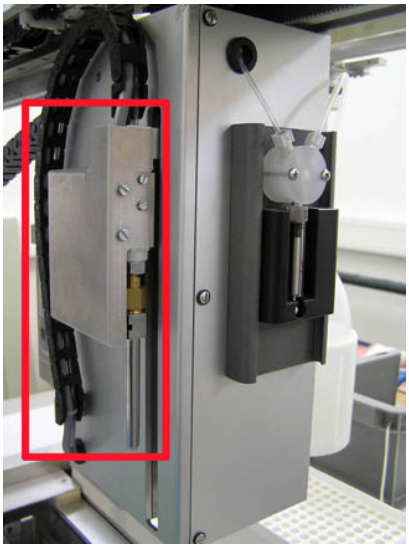
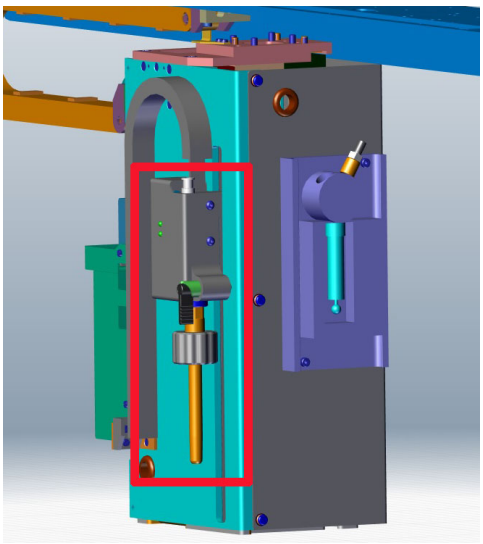


Figure 54 GEN 2 pipettor



Unlike the fixed GEN 1 tip carrier, the removable GEN 2 tip carrier has a turnable lever used as quick release for cleaning.

Recommended Cleaning Solution

The cleaning agent rea-sol is recommended for both GEN 1 and GEN 2 tip carriers.

rea-sol is a cleaning agent for laboratory use. It is capable of removing stains from oil, fat, serum, blood, protein on metal, plastic, and rubber. The cleaning agent does not corrode metal, including chrome plated steel, rubber, or plastic, and is suitable for ultrasonic baths.

Order rea-sol from Beckman Coulter using this order number:

- ODL20596: 1 L rea-sol

You can use other common laboratory cleaners with the same compatibility. Do not use any cleaners that contain prohibited agents!

Caution

Wear protective clothing and follow universal precautions as dictated by local or national regulations (CLSI GP17-A2, ISO15190 or 29CFR 1910.1030). Avoid contact with cleaning agents. After direct contact, thoroughly rinse the affected area. Consult a physician if skin irritation persists. Always follow the instructions in the product data sheet.

Pipettor (GEN 1)

Inspect the Tip Carrier (GEN 1)

Note

This procedure is only for the GEN 1 tip carrier. For GEN 2 tip carriers, refer to Clean the Tip Carrier of the EZ Pipettor (GEN 2).

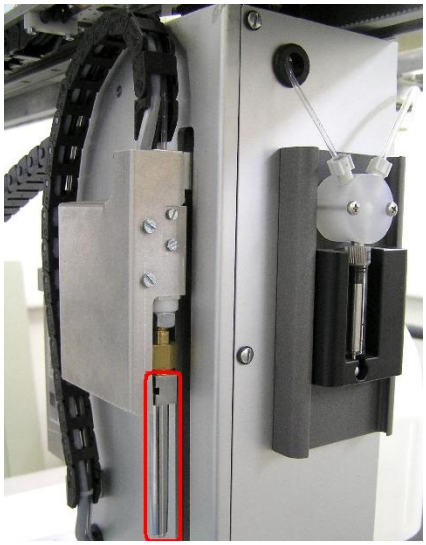
Immediately clean any contamination that you see during routine operation, for example after error recovery. We recommend inspecting and cleaning the system at the end of each working day. Do additional inspections and cleaning as needed.

---

1 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

2 To avoid cross-contamination, remove the base frames that hold the pipette tips.

3 To inspect the tip carrier, move robot 3 to the front of the system.



4 Carefully inspect the outside and bottom of the tip carrier for any sample residue.

5 If the tip carrier is contaminated with sample residue, clean the tip carrier.

Clean the Tip Carrier (GEN 1)

You need a wide neck glass laboratory container, minimum capacity 100 mL (3.5 fl oz), maximum diameter 60 mm (2.35 in), maximum height 105 mm (4.1 in). Available from Duran Group and other suppliers.

⚠ Caution

Wear protective clothing and follow universal precautions as dictated by local or national regulations (CLSI GP17-A2, ISO15190 or 29CFR 1910.1030). Avoid contact with cleaning agents. After direct contact, thoroughly rinse the affected area. Consult a physician if skin irritation persists. Always follow the instructions in the product data sheet.

⚠ Caution

Do not apply compressed air to the valve tubing! Only use compressed air on the tip carrier.

1 Prepare a 1% solution of rea-sol (1% rea-sol and 99% demineralized water) in the glass laboratory container.

2 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

3 Disconnect the left tube from the pump valve to allow the cleaning liquid to enter the tube.

Important

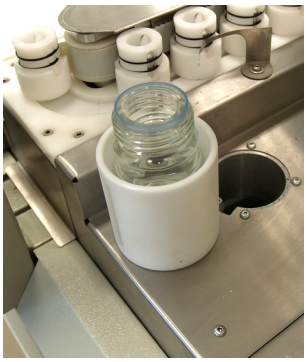
While cleaning and rinsing, do not allow any liquid to touch the clot detection module housing (marked red).

4 Remove the base frames.

5 To remove the tip stripper, turn it counterclockwise and lift it.

6 Clean the tip stripper.

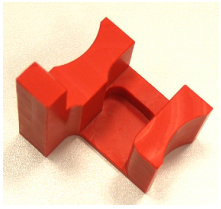
7 Place the bottle in the bottle holder.



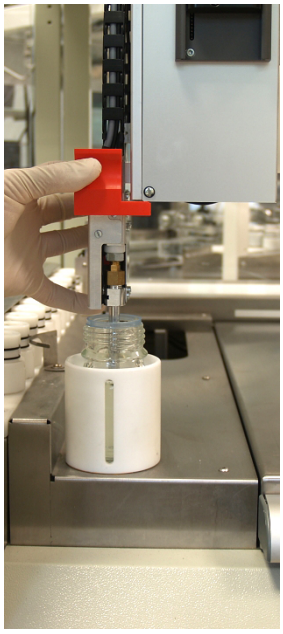
8 Position the robot above the bottle.

9 Take the retaining block and push the tip carrier completely down into the bottle with the cleaning solution.

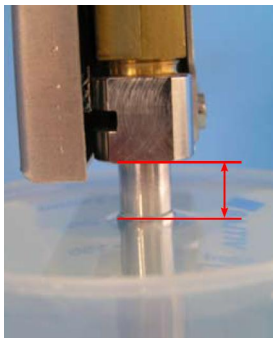
Figure 55 Retaining block (B07475)



10 Insert and fix the retaining block between the tip carrier and pump housing to lock the tip carrier in position.



11 Immerse the tip carrier 20 mm to 30 mm (about 1 inch) in the cleaning solution. Always leave a gap of 10 mm to 20 mm (0.5 in) between the liquid and the housing of the clot detection.



12 Leave the tip carrier in the cleaning solution. After about 30 minutes, remove the tip carrier from the liquid and rinse several times with demineralized water.

13 Dry the tip carrier with a lint-free absorbent tissue. Dispose of the rea-sol solution according to your laboratory procedure. Follow all instructions in the product data safety sheet.

If all contamination was removed, skip the next steps.

If the tip carrier still has residues, proceed with the next steps.

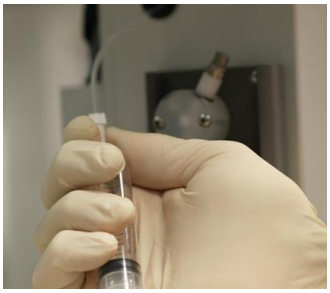
14 More time can be necessary to eliminate tough residue. Immerse the tip carrier in cleaning solution as long as needed or use an ultrasonic bath. The ultrasonic bath can be placed on the pipette tip drawer after removing the base frames.

15 Remove the tip carrier from the cleaning solution or ultrasonic bath. Rinse several times with demineralized water.

16 To speed up the cleaning process, you can rinse several times in solvent, such as ethanol or isopropanol.

17 Thoroughly dry the tip carrier. Carefully dry the outside and underneath using absorbent tissue.

18 Carefully inject air through the tubing with a hand-held syringe. Only use the syringe on the tubing removed for this procedure.



19 Raise the tip carrier with one hand. Apply compressed air to the tip carrier for about 10 seconds. Position the compressed air nozzle about 10 cm (3 to 4 in) from the tip carrier opening. No droplets should be visible at the base of the tip carrier.

Important

Only apply compressed air to the pipettor tip carrier!

20 Replace the tubing on the valve. Tighten the white screw by hand.

Figure 56 Flare end

21 Inspect the area for contamination. Do not damage the flared end of the tubing while replacing.

22 Replace the pipette tip base frames on the Auto*Mate* 2500 Family system.

23 Be sure that the entire system is dry. Press **Start**

Wait for the sequence of three beeps.

24 Press **Start**

25 Initialize the system.

26 Check the air tightness of the system.

Check Air Tightness of the System (GEN 1)

1 If possible, complete a test run before resuming routine operation. Use a dummy sample or run samples in a test environment.

2 Stop the Auto*Mate* 2500 Family system after the first tube has been sampled by robot three. Observe the pipette tip. Confirm that it does not leak and no droplets are visible.

3 If droplets appear, the system has a leak. Inspect the connection that was opened while cleaning.

4 Leaks must be found and repaired. If the problem persists, contact your Beckman Coulter representative.

5 If no leak is found, resume routine operation.

Clean the Tip Carrier of EZ Pipettor (GEN 2)

Cleaning intervals

Visually check the cleanliness of the tip carrier once a day, ideally at the end of routine operation. As per design, the filter tips make the EZ Pipettor very easy to maintain as daily cleaning is not required. The tip carrier of the pipettor should only be cleaned if dirt is visible. Also clean the tip carrier to recover from a motion error of the aliquot module indicated by the system.

Discontinuous operation

The EZ Pipettor is shipped with two tip carriers. Alternate using the two tip carriers. You can continue operating the system with one tip carrier while cleaning the other one. It takes about 30 minutes to clean a tip carrier and you do not have to interrupt operation.

Parts required for cleaning

- ODL20596 rea-sol cleaning agent. Do not use bleach!
- B37552 EZ Pipettor cleaning kit: Set of 3 cleaning brushes
- Laboratory glass container
- Dry, clean, lint-free absorbent tissue
- Compressed air (canned air or from laboratory supply)

Optional spare parts for EZ Pipettor

- B37545 spare tip carrier with 10 O-rings
- B37553 set of 10 O-rings

⚠ Caution

Avoid direct contact with patient samples, disposable pipette tips, used caps, any machine components that come in contact with sample fluids, and liquid waste.

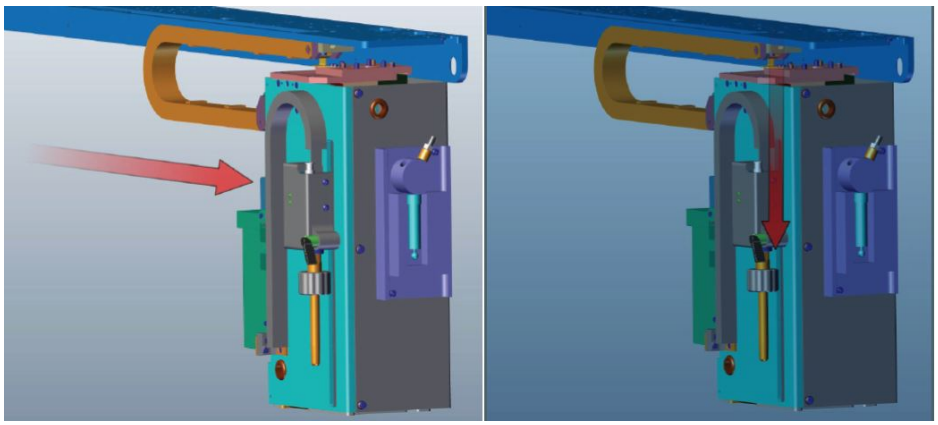
Always wear gloves and other protective gear to protect yourself from infection. Follow all safety precautions and safety notices.

1 Close the Auto*Mate* 2500 Family system software application.

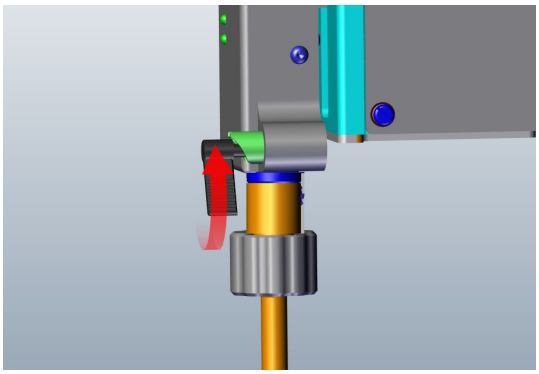
2 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

3 Remove the pipette tip base frames.

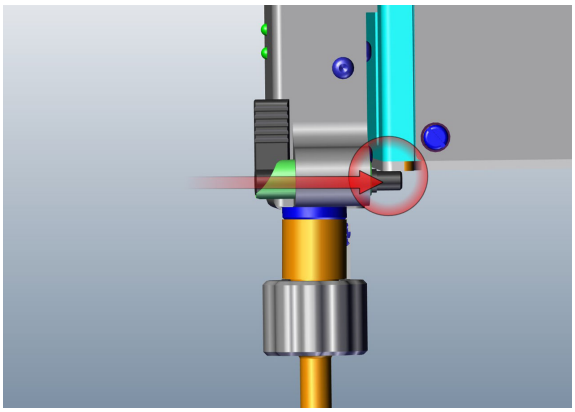
4 Move robot 3 forward and down.



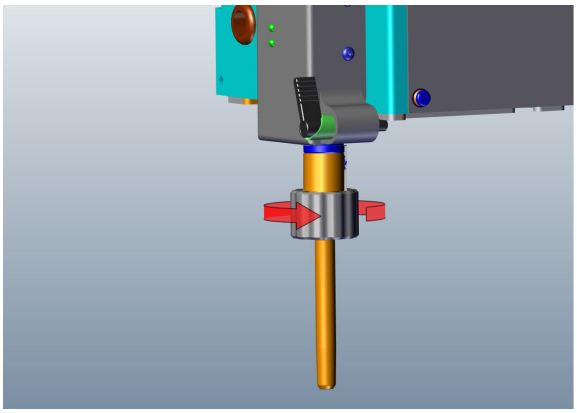
5 Turn the lever up to lock the pump in place.



6 When turned up, the locking pin moves to the right. It locks the pipettor in position so that the integrated spring mechanism does not release the pipettor.



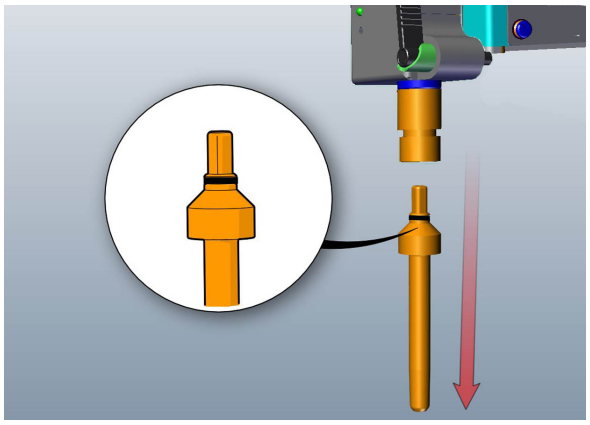
7 Hold the tip carrier firmly. Turn the retaining nut counter-clockwise (also indicated on top of the retaining nut).



8 Remove the tip carrier. Confirm that the O-ring is still inserted in the groove on the tip carrier. If the O-ring is missing or looks damaged, replace it with a new one. If the O-ring is missing, check if it is stuck in the retaining nut or in the centering unit. Remove it.

Important

The correct O-ring position guarantees that the pipettor can operate without failure. The O-ring should be placed in the groove on the tip carrier. Do not operate the pipettor without an O-ring.



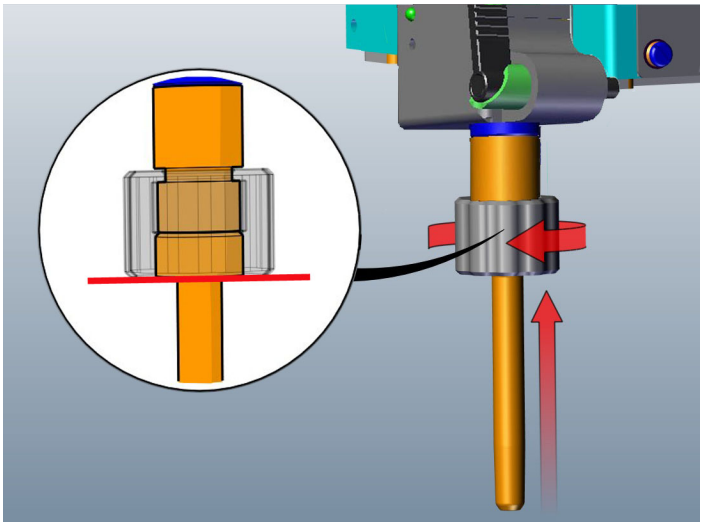
9 Immerse the tip carrier in a 1 % cleaning solution of rea-sol (1% rea-sol, 99% demineralized water).

10 While the tip carrier is immersed in the cleaning solution, mount the clean second tip carrier on the pipettor to continue processing samples.

a. Push the tip carrier up gently so that the shaped end of the tip carrier securely fits into the socket.

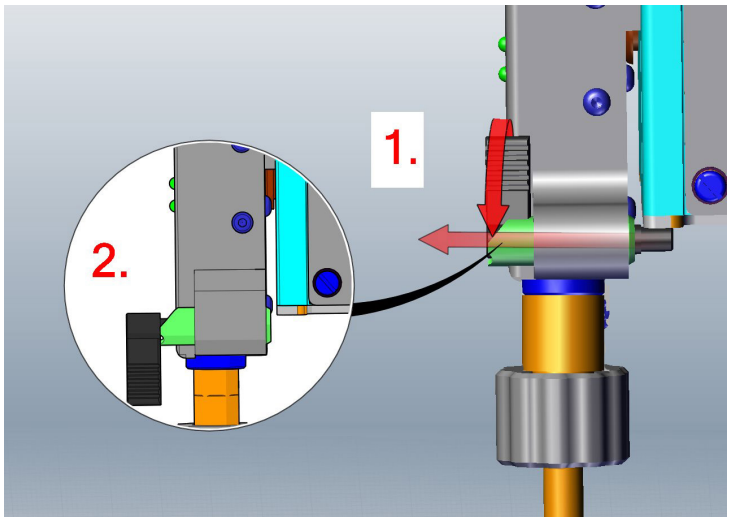
b. Hold the tip carrier with one hand. Turn the retaining nut only. Turn it as far as it will comfortably go. In its final position, the bottom of the nut should be aligned

with the thread of the tip carrier (left picture). The thread of the tip carrier should not be visible (right picture).



11 Check that the tip carrier is positioned correctly. Firmly hold the centering unit (the part just above the retaining nut) with one hand. With the other hand, try moving the tip carrier gently back and forth. The tip carrier should not move. If the tip carrier moves, remove and remount it.

12 To unlock the pipettor, push the lever down completely so that the locking pin moves to the left [1]. When the lever is in this position [2], the pipettor can move up freely. Confirm that the locking pin does not scratch against the housing.

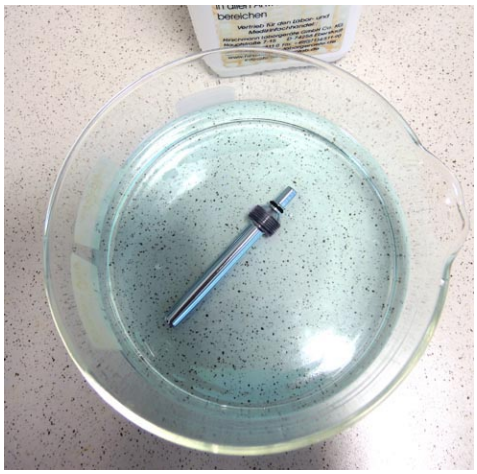


13 Replace the base frames for the pipette tips on the system.

14 To resume processing: Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.. Wait for the sequence of three beeps.

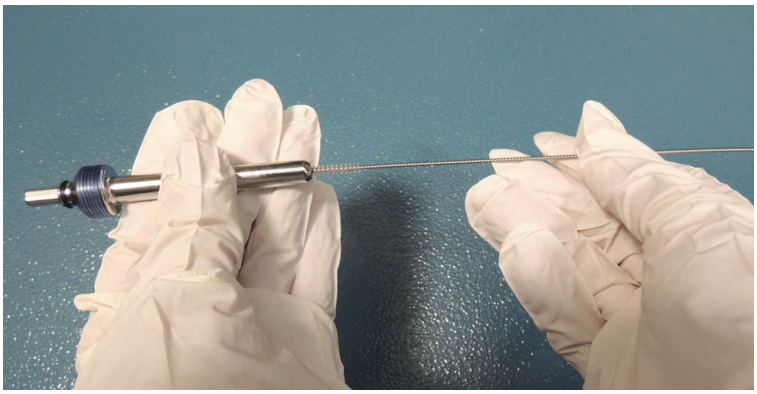
15 Press **Start**

16 Remove the tip carrier from the cleaning solution after 30 minutes.

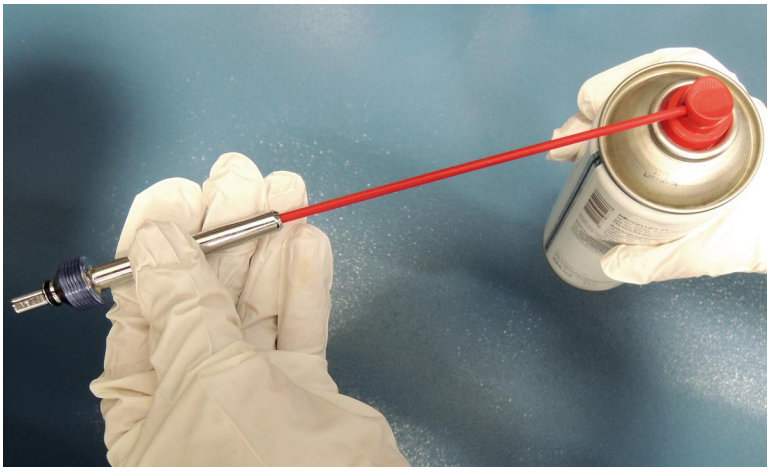


17 Dry the exterior with a lint-free absorbent tissue.

18 Clean inside the tip carrier duct using a cleaning brush (B37552).



19 Apply compressed air to the tip carrier duct to remove residue and dry the duct.



20 When the next cleaning is due, use this tip carrier on the system while cleaning the other tip carrier.

Check TTU Module

Check the TTU module for contamination. Clean it if necessary and if the module contains tube fragments.

Air Compressor Maintenance

Warning

High temperatures can cause burns. To prevent burn injuries, do not touch the compressor or motor during operation.

Warning

Flammable liquids can cause fires or explosions. Do not spray any flammable liquid around the compressor during operation or while it is still warm after operation. There is a high risk of fires and explosions in enclosed rooms.

Compressor Types

Your system may have one of the following compressor models installed.

- EKOM DK 50-10M 230V
- Jun-Air Quiet Air 6-4
- PlanetAir L-S50-4
- Jun-Air 87R-4P

Important

Jun-Air are now owned by PlanetAir. When replacing a defective compressor, be aware that packaging and branding can change.

Figure 57 Jun Air Compressor, model 6-4 with shut-off valve

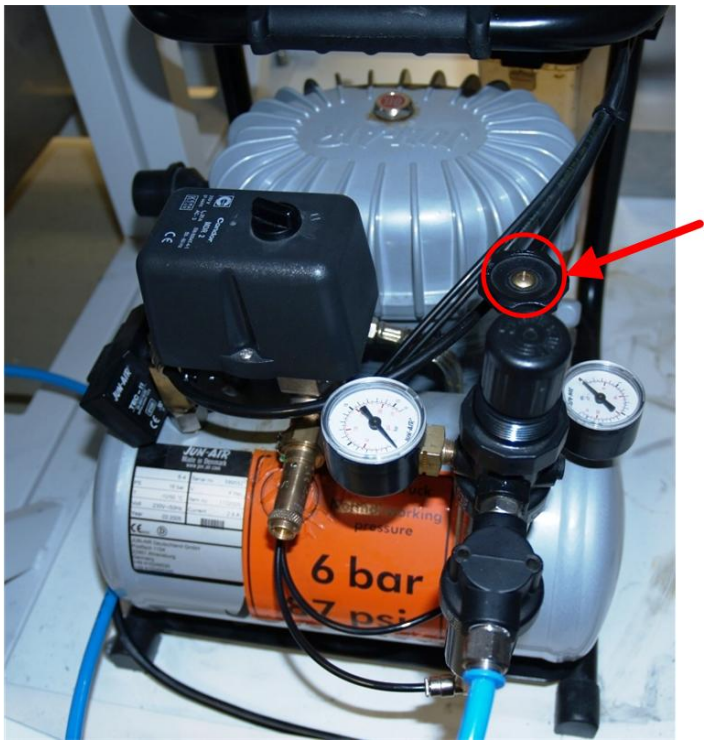


Figure 58 Jun Air Compressor, model 6-4 without shut-off valve

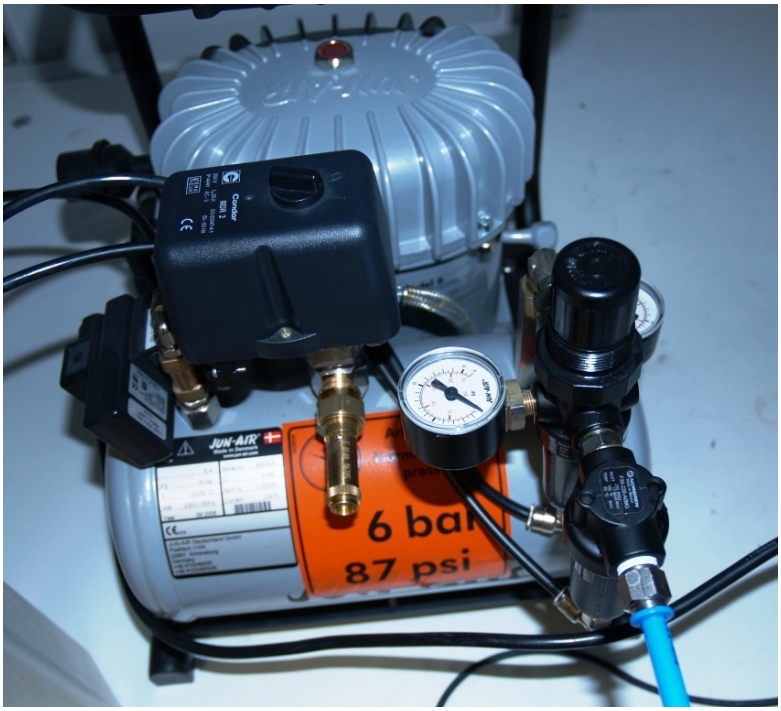


Figure 59 Planet Air L-S50-4 compressor

Figure 60 Jun-Air 87R-4P Compressor

Depressurize Compressor

Depressurize Compressors with or without Shut-off Valve (Jun Air models)

1 Turn the switch from 'I' to '0' to switch off the compressor.

Figure 61 Jun Air Quiet Air 6-4

Figure 62 Jun Air 87R-4P

2 Turn the compressor vent valve counterclockwise to depressurize the compressor.

Figure 63 Jun Air Quiet Air 6-4

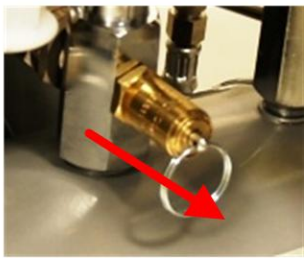
Figure 64 Jun Air 87R-4P

3 Inspect the manometer to confirm that the compressor is completely depressurized. The needle points to zero or less.

Depressurize Silverline Planet Air Compressor

1 Turn the switch from I to O to turn off the compressor.

2 To open the valve, pull the ring in the direction indicated.



3 Inspect the manometer to confirm that the compressor is completely depressurized. The needle points to zero or less.

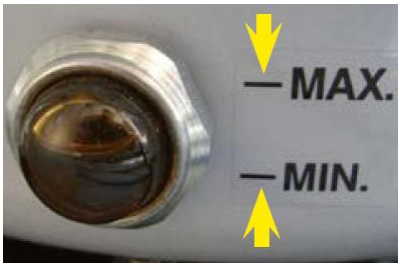
Resume Compressor Operation

1. Close the vent valve. Confirm that the ring valve is closed.
2. Turn the switch from '0' to 'I'. Switch on the compressor to build up pressure.
3. Inspect the manometer. The appropriate pressure level is 6 bar.

Check Oil Level

Inspect the oil level through the porthole at the base of the Planet Air compressor. The procedure is not required for oil-free Jun-Air compressors.

Figure 65 Oil level porthole and level indicators



Add Oil

Caution

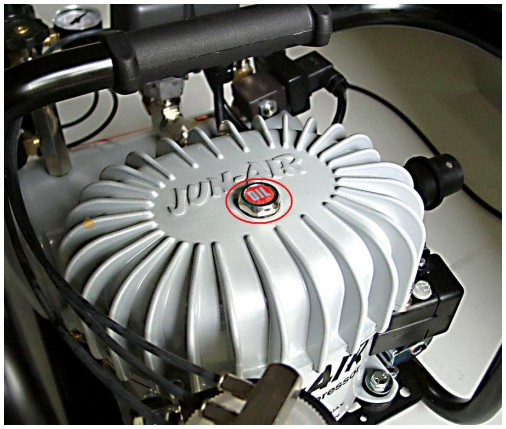
Before adding oil, switch off the air compressor.

Note

You can use oil ODL04373 for all compressor types. The procedure is not required for oil-free Jun-Air compressors.

1 Check oil level.

2 If the oil level is low, add oil (part number ODL04373). Remove the bolt marked OIL on top of the compressor using a 22 mm wrench.



Empty the Drain Bottle

The Planet Air compressor has an automatic condensation drain system. Regularly empty the drain bottle. This procedure does not apply to the Jun-Air 87R-4P compressor.

1 Switch off and depressurize the compressor.

2 Unscrew the drain bottle. Empty the bottle. Dispose of the contents according to your laboratory procedure.

⚠ Caution

Risk of pollution from condensate! Condensate from the compressor collects in a plastic container. National regulations specify the treatment and disposal of oil-contaminated condensate. Comply with all national regulations on laboratory biosafety.

Figure 66 Waste bottle of the automatic drain system

3 Remount the drain bottle.

Clean Air Intake Filter

This monthly maintenance procedure applies only to the Jun-Air 87R-4P compressor.

1 Turn off the Auto*Mate* 2500 Family system and the air compressor.

2 Disconnect the air compressor from the electrical supply.

3 Remove the air intake filter from the front of the compressor.

Figure 67 Remove the filter

4 Clean the filter using warm, soapy water. Dry the filter before reinstalling.

5 Install the cleaned filter. Confirm that it is installed correctly in the cover of the compressor.

6 Reconnect the compressor to the electrical supply.

7 Turn on the Auto*Mate* 2500 Family system and air compressor.

ETS-2 Printer Maintenance

Important

Be sure that you have correctly identified the model of printer installed on your Auto*Mate* 2500 Family system. There are differences in handling, maintenance, and usage between the older ETS-2 and newer ETS-3 models.

Clean the ETS-2 Printer

Danger

Risk of death by electric shock! Switch off the ETS-2 printer before performing any maintenance work.

Clean the printer every month. Clean the thermal print head every quarter. Regular cleaning guarantees consistent, high-quality print results and prevents premature wear of the print head.

Important

Aggressive cleaning agents can damage the printer. Do not use abrasive cleaning agents or solvents to clean the external surfaces or modules.

- Remove dust and paper from the print area using a soft brush or vacuum cleaner.
- Clean the cover of the printer with a standard cleaning agent.

Clean The Print Roller Of The ETS-2 Printer

This topic describes how to clean the print roller of the ETS-2 printer. Dirt accumulation on the print rollers can impair the media transport and print quality.

Procedure

1. Select the **Stop** button on the software interface.

2. Wait for the current distribution action to complete.
3. Select the printer drawer button on-screen.

4. Turn off the printer using the power switch on the printer surface.
5. Lift the print head.
6. Remove the label roll and the transfer ribbon.
7. Remove any deposits on the print roller with roller cleaner and a lint-free absorbent tissue.
8. Lower the print head.

Clean the Print Head of the ETS-2 Printer

This topic describes how to clean the print head of the ETS-2 printer.

Cleaning intervals:

- For direct thermal printing: Clean after every media roll change
- For thermal transfer printing: Clean after every ribbon roll change

Residues accumulate on the print head during printing and can cause printer problems, such as differences in contrast or vertical stripes.

Important

Do not damage the printhead when cleaning! Do not use sharp or hard objects on the print head. Do not touch the protective glass layer of the print head.

Caution

Risk of injury from the hot printhead line. Do not start cleaning until the printhead has cooled.

1. Select the **Stop** button on the software interface.

2. Wait for the current distribution action to complete.
3. Select the printer drawer button on-screen.

4. Turn off the printer using the power switch on the printer surface.
5. Lift the print head.
6. Remove labels and transfer ribbon from the printer.
7. Clean the print head surface with a cleaning pen or cotton swab dipped in pure alcohol.
8. Allow the print head to dry for 2 to 3 minutes before using the printer.

Clean the Label Sensor of the ETS-2 Printer

This topic describes the procedure to clean the label sensor of the ETS-2 printer. Paper dust can accumulate on the label sensor and cause problems with label detection.

Important

Do not damage the label sensor when cleaning! Do not use sharp or hard objects or solvents to clean the label sensor.

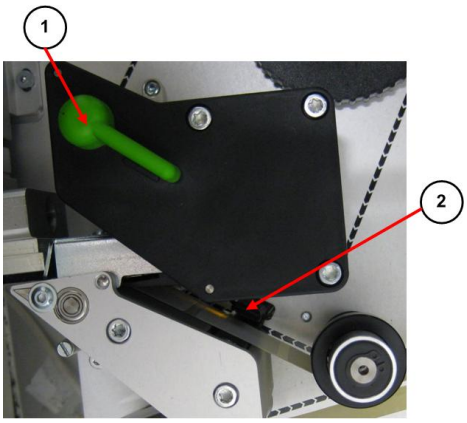
1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Turn off the printer using the power switch on the printer surface.

5 Turn the lever (1) counterclockwise to lift the printhead.



6 Remove labels and transfer ribbon from the printer.

7 Clean the label sensor and sensor components (2) with a brush or cotton swab soaked in pure alcohol.

8 Reload labels and transfer ribbon.

Load Or Replace Label Rolls On ETS-2 Printers

Summary

This topic describes the procedure to remove an empty label roll from the ETS-2 printer, and to replace the empty roll with a new label roll.

Note

Dispose of the wound-up roll according to your laboratory procedure and all relevant legal requirements. The roll can contain negative prints of patient data from the bar code labels.

Procedure

1 Select the **Stop** button on the software interface.

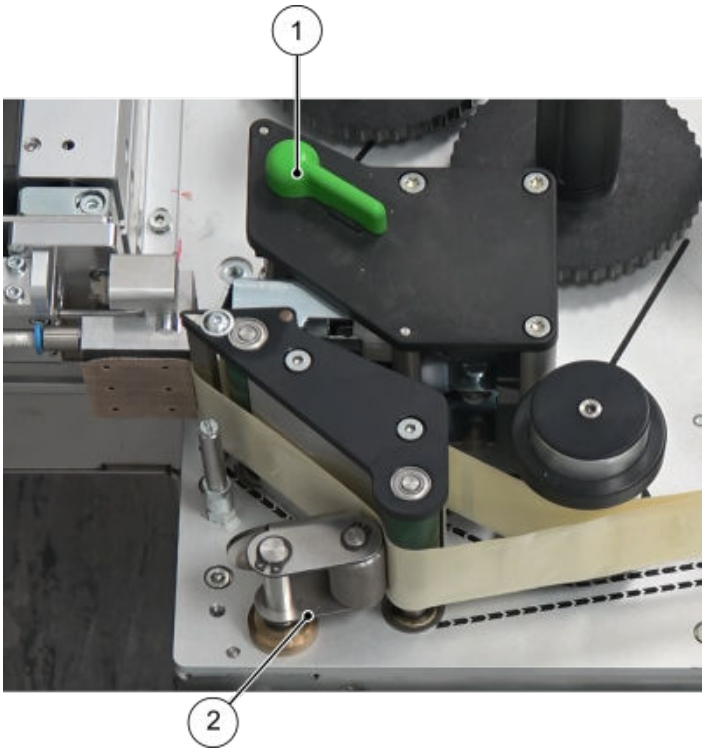
2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Turn off the printer using the power switch on the printer surface.

5 Turn the printhead locking lever (1) counterclockwise to lift the printhead.

Figure 68 Printhead locking lever and pinch roller



6 Lift the pinch roller (2) off the rewind assist roller by turning it counterclockwise.

7 Remove the existing empty label roll.

a. Hold the internal rewinder firmly and turn the green knob clockwise. The rewinder spindle relaxes and the liner is released.

b. Unspool and remove the liner roll from the internal rewinder.

c. Remove the cardboard roll from the core adapter.

8 Prepare the new label roll for loading.

a. Unwind approximately 60 cm of the liner from the label roll.

b. Remove the labels from the unwound liner.

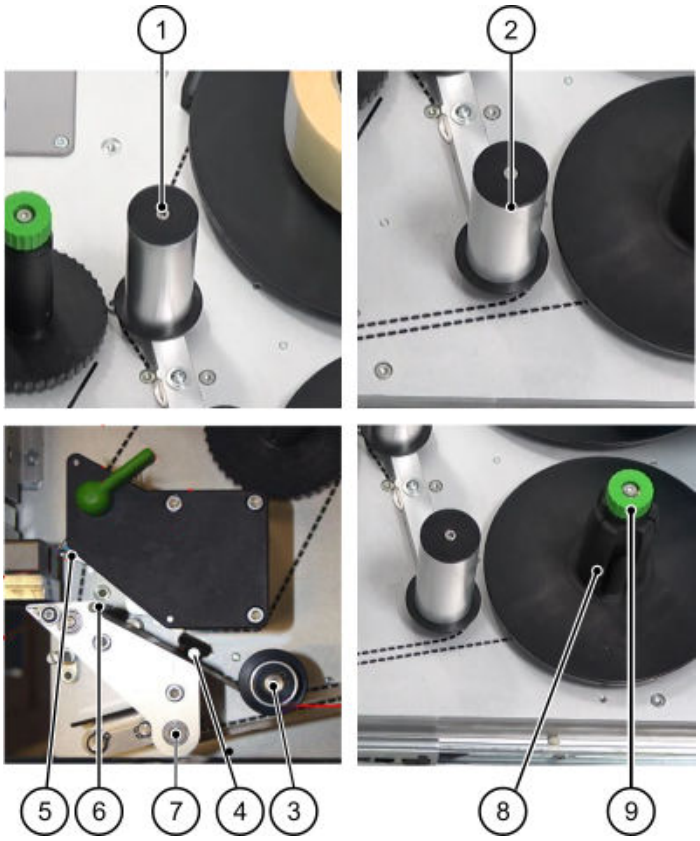
9 Load the new label roll onto the core adapter.

Important

When loading the roll, apply force to the cardboard roll. Do not apply force to the liner roll directly.

10 Guide the unwound liner along the path from the core adapter to the internal rewinder. The dotted line on the base of the printer marks the path for the liner.

Figure 69 Path of unwound liner on printer



1. Upper pendulum guide roll
2. Lower pendulum guide roll
3. Axle
4. Label sensor
5. Printhead
6. Print roller
7. Rewind assist roller
8. Liner bracket
9. Turn knob

a. Guide the liner around the two rolls of the pendulum guide (1, 2).

b. Guide the liner below the axle (3) and through the label sensor (4). The liner exits between the printhead (5) and the print roller (6).

c. Guide the liner around the bottom of the printhead, and pass it between the rewind assist roller (7) and the pinch roller.

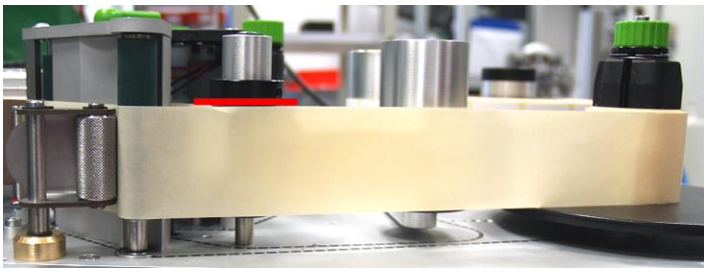
d. Confirm that the liner passes below the axle, and feed it to the internal rewinder.

e. Slide the liner under one of the brackets of the internal rewinder (8).

f. Clamp the liner under the bracket by tightening the green knob (9), turning it in a counterclockwise direction.

11 Close the pinch roller by turning it clockwise and position it against the liner. Confirm that the roller is aligned to the center of the liner.

Figure 70 Correct placement of pinch roller.



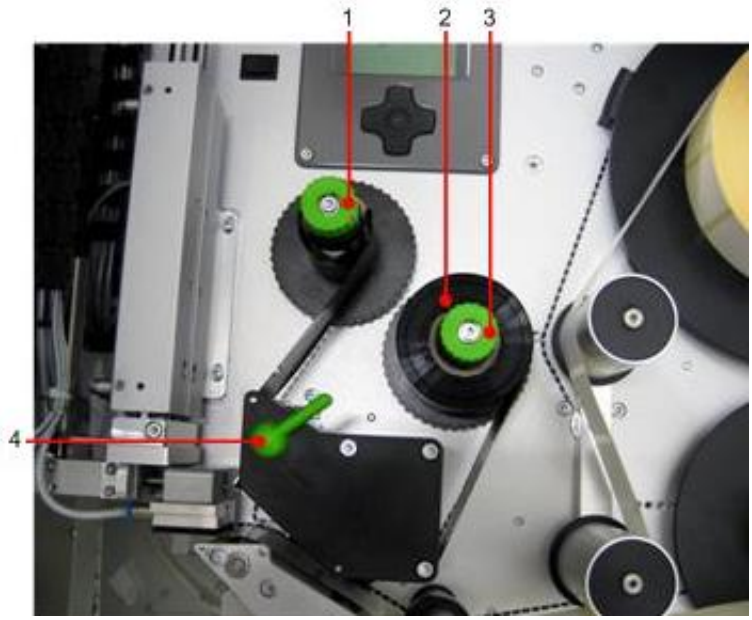
12 Turn the printhead locking lever clockwise.

13 Turn on the printer.

14 Test the printer to confirm that labels print correctly.

Load Transfer Ribbon on ETS-2 Printer

Figure 71 Feed path of the transfer ribbon



1. Transfer ribbon feed hub
2. Transfer ribbon roll
3. Ribbon supply hub
4. Printhead locking lever

1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Turn off the printer using the power switch on the printer surface.

5 Before loading the transfer ribbon, clean the printhead.

6 Turn the printhead locking lever (4) counterclockwise to release the printhead. The lever is shown open in the illustration.

7 Slide the transfer ribbon roll (2) onto the ribbon supply hub (3) until it stops. The colored coating of the ribbon faces towards the labels when unwinding.

8 Hold the transfer ribbon roll (2) firmly and turn the knob on the ribbon supply hub (3) counterclockwise until the transfer ribbon roll is secured.

9 Slide the transfer ribbon core (cardboard roll) onto the transfer ribbon take-up hub (1). Secure it by turning the green turn knob counterclockwise.

10 Guide the transfer ribbon through the print component as shown in Load Transfer Ribbon.

11 Use adhesive tape to secure the starting end of the transfer ribbon to the transfer ribbon core (cardboard roll) on the transfer ribbon take-up hub (1). Confirm that the transfer ribbon feed hub turns counterclockwise.

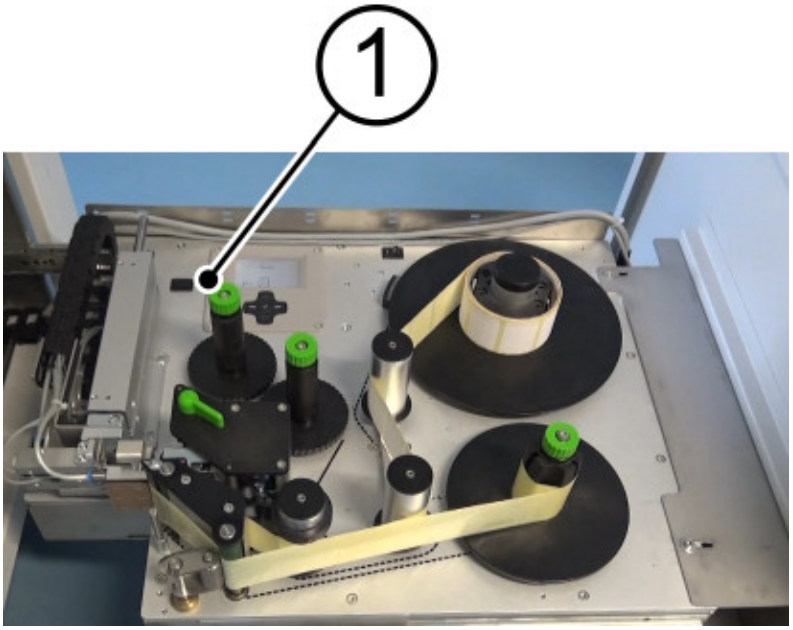
12 Turn the transfer ribbon feed hub (1) counterclockwise to smooth the feed path of the transfer ribbon.

13 Turn the lever (4) clockwise to lock the printhead.

Test Label Printer

Test Mode Using the Pre-dispense Key without Print

Figure 72 ETS-2 Printer in test mode



When using the ETS-2 printer, you can simulate a print job without printing a label or connecting to a computer. Press the feed key and the pre-dispense key (1) alternately.

- Press the feed key: A blank label is fed. The vacuum at the pad and the supporting air (blow tube) are switched on. After the pad picks up the label, the supporting air is switched off.
- Press the pre-dispense key (1): The pad is removed from the labeling position. A sensor signals when the labeling position is reached. The vacuum is switched off and the label is affixed onto the product. The pad returns to the start position.

Test Mode Using Pre-dispense Key with Print

Use this method to test the labeler with real print data using the pre-dispense key.

1 Send a print job.

2 Press the pre-dispense key. A label is printed. The vacuum at the pad and the supporting air (blow tube) are switched on. After the pad picks up the label, the supporting air is switched off.

3 Press the pre-dispense key again. The pad is moved to the labeling position. A sensor signals when the labeling position is reached. The vacuum is switched off and the label is affixed onto the product. The pad returns to the start position. If the label is manually removed from the pad after the first step, this step is repeated when you press the pre-dispense key again.

ETS-3 Printer Maintenance

Important

Be sure that you have correctly identified the model of printer installed on your Auto*Mate* 2500 Family system. There are differences in handling, maintenance, and usage between the older ETS-2 and newer ETS-3 models.

Clean the ETS-3 Printer

Clean the ETS-3 printer every month. Clean the thermal print head every quarter. Regular cleaning guarantees consistent, high-quality print results and prevents premature wear of the print head.

Caution

Risk of injury. Take care when opening the printer drawer and performing printer maintenance tasks. Moving parts can cause injury to the operator.

Important

Aggressive cleaning agents can damage the printer. Do not use abrasive cleaning agents or solvents to clean the external surfaces or modules.

- Remove dust and paper from the print area using a soft brush or vacuum cleaner.
- Clean the cover of the printer with a standard cleaning agent.

Prepare the ETS-3 Printer

When performing maintenance on the ETS-3 printer, the Auto*Mate* 2500 Family system must be paused.

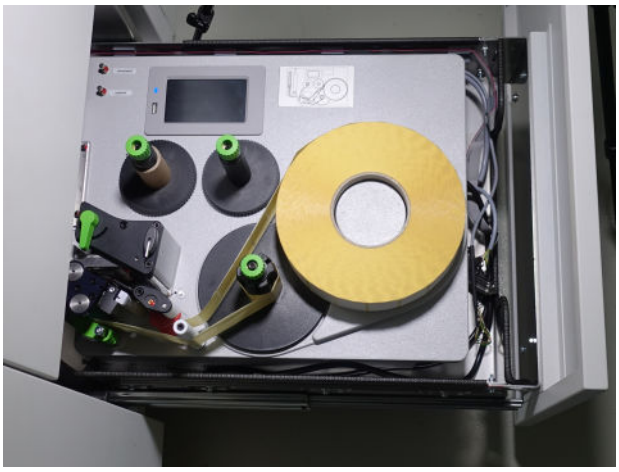
1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Extend the printer drawer.

Figure 73 CAB ETS-3 Printer



Clean the Print Roller of the ETS-3 Printer

This topic describes how to clean the print rollers of the ETS-3 printer. Dirt accumulation on the print rollers can impair the media transport and print quality.

Important

When the printhead has been open and closed, even if no loading or maintenance action has been taken, perform a label print test to confirm the printhead is still correctly aligned.

Procedure

1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

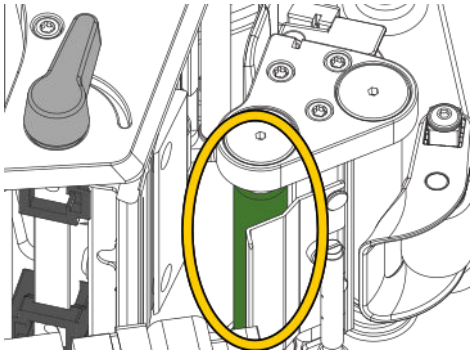
3 Select the printer drawer button on-screen.

4 Open the printhead locking lever to lift the printhead.

5 Remove the label roll and the transfer ribbon.

6 Remove any deposits on the print roller with roller cleaner and a lint-free absorbent tissue.

Figure 74 Print Roller of the ETS-3 Printer



7 Close the printhead locking lever to lower the printhead.

8 Test the printer to confirm that labels print correctly.

Clean the Printhead of the ETS-3 Printer

This topic describes how to clean the printhead of the ETS-3 printer. The printhead is cleaned weekly.

Residues accumulate on the printhead during printing and can cause printer problems, such as differences in contrast or vertical stripes.

Important

When the printhead has been open and closed, even if no loading or maintenance action has been taken, perform a label print test to confirm the printhead is still correctly aligned.

Important

Do not damage the printhead when cleaning! Do not use sharp or hard objects on the printhead. Do not touch the protective glass layer of the printhead.

1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Open the printhead locking lever to lift the printhead.

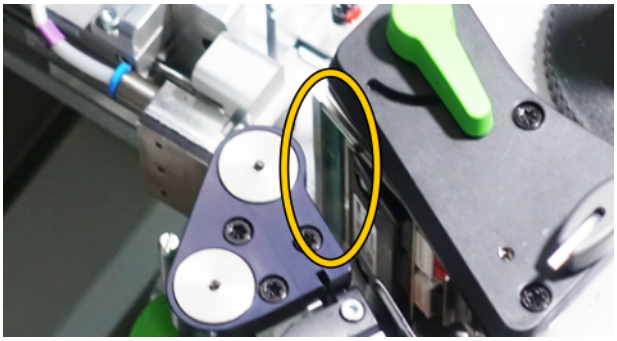
5 Remove labels and transfer ribbon from the printer.

6 Clean the printhead surface with a cotton swab dipped in isopropyl alcohol (70%).

Caution

Risk of injury from the hot printhead line. Do not start cleaning until the printhead has cooled.

Figure 75 ETS-3 Printhead Surface Marked In Yellow



7 Allow the printhead to dry for 2 to 3 minutes before using the printer.

8 Reload the labels and transfer ribbon.

9 Close the printhead locking lever to close the printhead.

10 Test the printer to confirm that labels print correctly.

Clean The Tamp Pad Of The ETS-3 Printer

This topic describes how to clean the tamp pad of the ETS-3 printer. Over time, dust and label material particles can accumulate on the tamp pad surface.

1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Remove any debris from the surface of the tamp pad with a soft brush or vacuum cleaner.

Figure 76 Tamp Pad of the ETS-3 Printer

Clean The Label Sensor Of The ETS-3 Printer

This topic describes the procedure to clean the label sensor of the ETS-3 printer. Paper dust can accumulate on the label sensor and cause problems with label detection.

Important

Do not damage the label sensor when cleaning! Do not use sharp or hard objects or solvents to clean the label sensor.

Important

When the printhead has been open and closed, even if no loading or maintenance action has been taken, perform a label print test to confirm the printhead is still correctly aligned.

1. Turn the printhead locking lever counterclockwise to lift the printhead.
2. Remove labels and transfer ribbon from the printer.
3. Clean the label sensor and sensor components with a cotton swab soaked in isopropyl alcohol (70%).
4. Reload labels and transfer ribbon.
5. Close the printhead locking lever to lower the printhead.
6. Test the printer to confirm that labels print correctly.

Load Or Replace Label Liner Rolls On ETS-3 Printers

Summary

This topic describes the procedure to remove an empty label liner roll from the ETS-3 printer, and to replace the empty label liner roll with a new label liner roll.

Caution

The printhead can be hot after sustained usage. Allow the print head to cool before exchanging the label liner roll.

Important

Dispose of the wound-up roll according to your laboratory procedure and all relevant legal requirements. The empty liner roll can contain negative prints of patient data from the bar code labels.

Important

When the printhead has been open and closed, even if no loading or maintenance action has been taken, perform a label print test to confirm the printhead is still correctly aligned.

Procedure

1. Select the **Stop** button on the software interface.

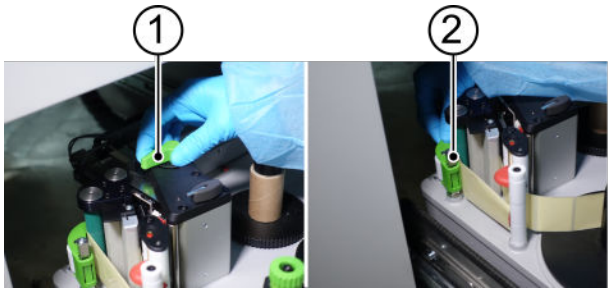
2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Prepare the printer for label liner roll replacement.

a. Turn the printhead locking lever (1) counterclockwise to lift the printhead.

Figure 77 Printhead locking lever and pinch roller



1. Printhead locking lever
2. Pinch roller

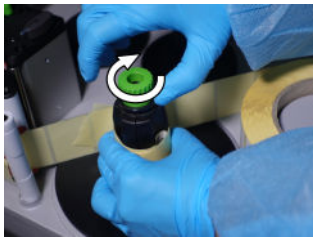
b. Lift the pinch roller (2) off the roller by turning it counterclockwise.

5 Remove the existing empty label liner roll.

a. If you are removing a partially empty label liner roll, cut the empty liner material between the pinch roller and the label liner rewinder, and wrap the empty label liner around the label liner rewinder.

b. Hold the label liner rewinder firmly and turn the green knob clockwise. The label rewinder spindle relaxes and the liner is released.

Figure 78 Release the Label Liner



c. Remove the label liner roll from the label liner rewinder.

d. Remove the cardboard roll from the core adapter.

---

6 Prepare the new label liner roll for loading.

Figure 79 Prepared Label Roll

a. Unwind approximately 60 cm of the liner from the label liner roll.

b. Remove the labels from the unwound label liner.

---

7 Load the new label liner roll onto the core adapter.

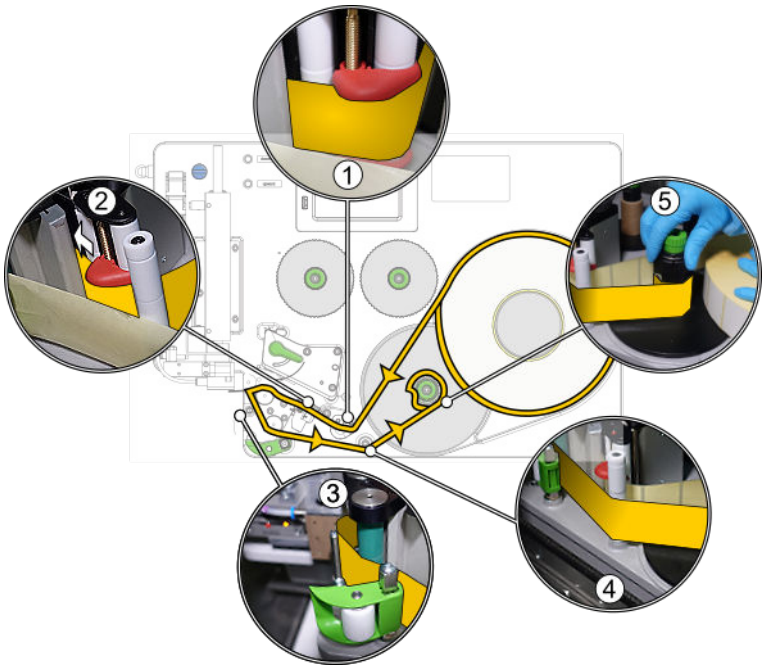
Figure 80 Load New Label Liner Roll

Important

When loading the roll, apply force to the cardboard roll. Do not apply force to the label liner roll directly.

8 Guide the unwound liner along the path from the core adapter to the label liner rewinder. The feed path is additionally described in a diagram on the printer.

Figure 81 Path of unwound liner on printer



a. Guide the liner around the pendulum guide, between the two red clips (1).

b. Slide the liner through the light guide (2)

c. Confirm that the liner passes between the print roller and the metal tube (3).

d. Confirm that the liner passes on the inside of the pinch roller (3).

e. Confirm that the liner passes around the white axle (4)

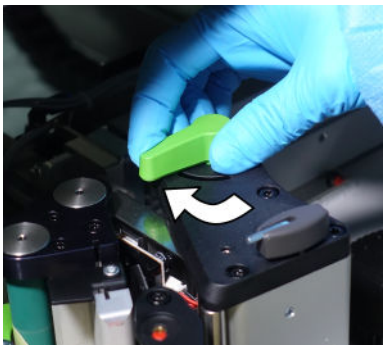
f. Slide the liner under one of the brackets of the liner rewinder (5).

g. Clamp the liner under the bracket by tightening the green knob (5), turning the knob in a counterclockwise direction.

9 Close the pinch roller by turning it clockwise and position it against the liner. Confirm that the roller is aligned to the center of the liner.

10 Turn the printhead locking lever clockwise to close the printhead.

Figure 82 Close the Printhead Locking Lever



11 Test the printer to confirm that labels print correctly.

Load Transfer Ribbon on ETS-3 Printer

This topic describes the procedure to load the transfer ribbon on the ETS-3 printer.

Important

When the printhead has been open and closed, even if no loading or maintenance action has been taken, perform a label print test to confirm the printhead is still correctly aligned.

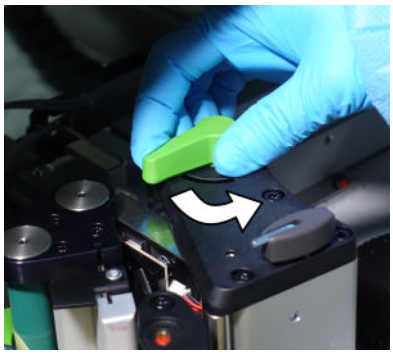
1 Select the **Stop** button on the software interface.

2 Wait for the current distribution action to complete.

3 Select the printer drawer button on-screen.

4 Turn the printhead locking lever counterclockwise to lift the printhead.

Figure 83 Open the Locking Lever



5 If you are exchanging an empty ribbon, loosen the green knobs on the ribbon adapter and liner rewinder and remove the empty ribbon material.

6 Load the transfer ribbon.

Figure 84 Feed path of the transfer ribbon

Important

The colored coating of the ribbon faces towards the labels when unwinding.

a. Slide the transfer ribbon roll onto the ribbon adapter until it stops. Hold the transfer ribbon roll firmly and turn the knob on the ribbon adapter (1).

b. Feed the transfer ribbon along the feed path of the printer (2). Confirm that the ribbon does not pass through the light guide.

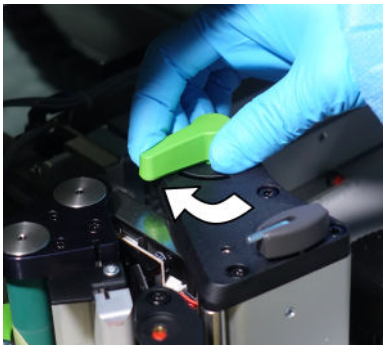
c. Use adhesive tape to secure the loose end of the transfer ribbon to the transfer ribbon rewinder (3).

d. Slide the transfer ribbon core onto the transfer ribbon rewinder (4). Secure the ribbon firmly to the rewinder by turning the green turn knob counterclockwise.

e. Turn the transfer ribbon adapter counterclockwise to smooth the feed path of the transfer ribbon. The ribbon must be tight along the feed path.

7 Turn the printhead locking lever clockwise to close the printhead.

Figure 85 Open the Locking Lever

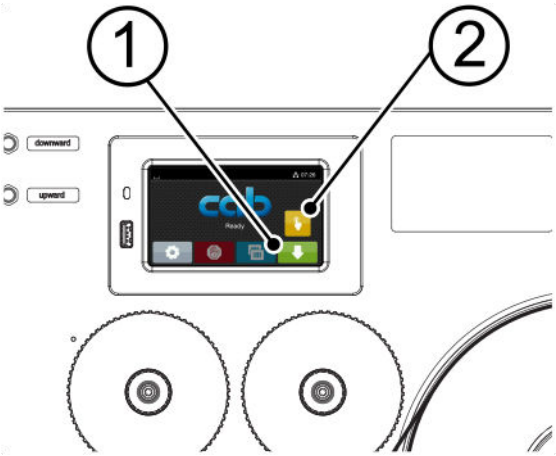


8 Test the printer to confirm that labels print correctly.

Test Label Printer

Test Mode Using the Pre-dispense Key without Print on the ETS-3 Printer

Figure 86 ETS-3 Printer in test mode



When using the ETS-3 printer, you can simulate a print job without printing a label or connecting to a computer. Press the feed key (1) and the pre-dispense key (2) alternately.

- Press the feed key: A blank label is fed. The vacuum at the pad and the supporting air (blow tube) are switched on. After the pad picks up the label, the supporting air is switched off.
- Press the pre-dispense key (1): The pad is removed from the labeling position. A sensor signals when the labeling position is reached. The vacuum is switched off and the label dispensed. Position an object at the labeling position to receive the label. The pad returns to the start position.

Spare Parts and Consumables

Order all consumables from Beckman Coulter. .

Sample Tube Consumables

ODL03587: Secondary tubes

- The secondary tubes are required for aliquoting and are single use only. Before use, store the box of tubes in a cool, dry place away from direct sunlight.

B72304: Screw cap secondary tubes (4 × pack of 500 tubes)

- The screw cap secondary tubes are required for aliquoting and are single use only. Before use, store the box of tubes in a cool, dry place away from direct sunlight.

Important

System modification by a Beckman Coulter Representative is required to use screw cap secondary tubes on your Auto*Mate* 2500 Family system.

B72305: Screw caps (5 × bag of 1000 caps).

- Screw caps are only for use with screw cap secondary tubes, and are single use only. Before use, store in a cool, dry place, away from direct sunlight.

ODL02156: Thermo direct labels

- The thermo direct labels are required for printing thermal direct labels on secondary tubes. Before use, store label rolls in a cool, dry place away from direct sunlight. The recommended storage conditions for the label rolls are between 15 °C and 25 °C, and approximately 50 % relative humidity. Extremes of temperature and humidity may compromise the adhesive properties of the label material.

ODL02153: Thermo transfer labels

- The thermo transfer labels are required for printing thermo transfer labels on screw cap secondary tubes. Before use, store label rolls in a dry place away from direct sunlight. The recommended storage conditions for the label rolls are between 20 °C

and 24 °C and approximately 45 to 55 % relative humidity. Extremes of temperature and humidity may compromise the adhesive properties of the label material.

Important

For information about post-analytical sample storage conditions of labeled tubes, refer to Tubes

System Spare Parts and Consumables

B24687: Pipette filter tips

- The pipette tips are required for aliquoting. B24687: pipette filter tips are single use only. Prior to use, store the box of tubes in a cool, dry place away from direct sunlight.

ODL22049: Transfer ribbon

- The transfer ribbon is required for printing thermo transfer labels on secondary tubes. Prior to use, store the transfer ribbon in dry conditions away from direct sunlight. The recommended storage conditions for the ribbon material are between 10 °C and 35 °C, and 30 - 80 % relative humidity. Do not store the transfer ribbon in such a way that the ribbon is placed under additional pressure

ODL20554: Parafilm cassette

- If the recapper option is installed, the Parafilm cassette is a required consumable. Prior to use, store the Parafilm cassette in a cool, dry place away from direct sunlight. The recommended storage conditions for the Parafilm cassette are between 7 °C and 32 °C, and 50 % relative humidity.

ODL25112: Gripper clip kit

- A pack of grippers for the robot fingers.

ODL09220: ELO touch pen

- An interface device for the touchscreen.

ODL02504: Base frames for pipettes on aliquoter module

ODL04376: Box for tubes

C26867: Bode Mikrobac®[1] Tissues (outside the United States)

C71022: Clorox®[2] Disinfecting Wipes (within the United States)

[1] Mikrobac® is a registered trademark of Bode Chemie GmbH, Hamburg, Germany.
[2] Clorox® is a registered trademark of The Clorox Company, Oakland, California, USA.

MTP Spare Parts and Consumables

B38295: Microtube rack: 48 microtubes, 500 µL

- One box containing 64 microtube racks. Prior to use, store the box in a cool, dry place away from direct sunlight.

B39439: Microtube rack: 48 microtubes, 1000 µL

- One box containing 54 microtube racks. Prior to use, store the box in a cool, dry place away from direct sunlight.

B38296: Color codes for microtube racks

- Colored chips can be inserted into a slot on the side of the microtube rack for quick visual identification. Eight different colors are available. One pack includes 10 different colored chips.

B97417: Biosampling Systems automatic plate closer.

- The automatic plate closer can automatically seal an entire microtube rack. The automatic plate closer can be used on both 500 and 1000 µL racks.

B39825: SSK multipurpose tool for microtube racks

- The tool can seal and open individual microtubes. One box contains ten tools.

B39824: Special reintroduction rack (SRR)

- The special reintroduction rack can be used to reintroduce microtubes into storage after they have been removed from the original plate.

Service Maintenance Counter

Based on time elapsed and lab throughput a built-in maintenance counter determines when the next service maintenance is due. A message notifies you when service maintenance is due soon (**Maintenance is recommended**) or when it is overdue (**Maintenance is required**).

Contact your Beckman Coulter service representative.

CHAPTER 5

Recapper Operation and Maintenance

Overview

The recapper seals sample tubes with Parafilm for storage and in-house transport. Parafilm provides short-term protection against sample leakage and evaporation, so that samples can be retested.

Recapper Design

Parafilm is delivered on a carrier tape and placed in a Parafilm cassette. The carrier tape is wound around a separate reel. The Parafilm supply reel is integrated in a closed cassette for quick replacement. One cassette can be used to seal about 2,000 samples. The Parafilm is automatically peeled off from the paper carrier tape.

Caution

If a recapper is installed on an Auto*Mate* 2500 Family system, the robots move in a different path. Remove sample tubes from the workplaces by manually opening the drawers. Avoid moving parts. While the system is in operation, do not touch or go close to any moving parts. Close protective guards and covers during operation. Failure to close covers correctly can cause injury or incorrect results.

Important

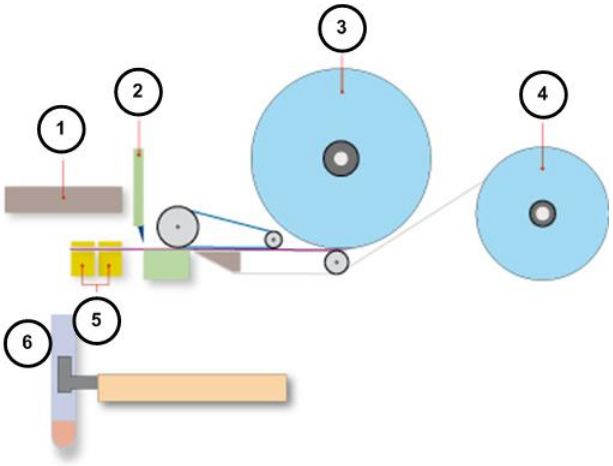
Store Parafilm between 7°C (45°F) and 32°C (90°F) and at a maximum relative humidity of 50%. Parafilm can be stored for at least 2 years without any quality degradation.

Recapper Operation

The recapper cuts the Parafilm to the required length. The film gripper grips the film and stretches it. The tube gripper lifts the tube and pushes it with the film through the rotating brushes. The film is stretched to cover the tube. The brushes wrap it around the tube.

During initialization, the Auto*Mate* 2500 Family system detects the Parafilm supply level. If it is empty, the system prompts you to load a new cassette.

Figure 87 Recapper operation



1	Parafilm applicator	2	Parafilm cutting blade	3	Parafilm supply reel
4	Take-up reel	5	Parafilm gripper	6	Sample tube

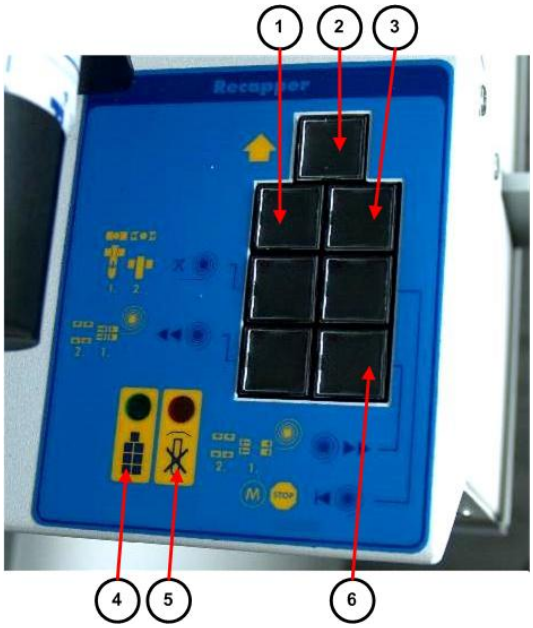
Note

When working with the recapper, confirm that all recapped tubes are closed with Parafilm when removing racks from the system.

Recapper Control Panel

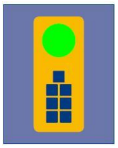
The recapper control panel contains two LED indicators and the operating controls. Some of the control buttons have two functions. The blue symbol identifies the primary function and the yellow symbol identifies the secondary function. To activate the secondary function, press `Shift` and the control button.

Figure 88 Recapper control panel

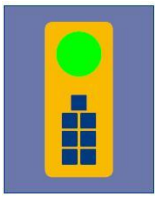
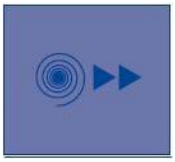


1	No function	2	Shift	3	No function
4	LED keyboard active	5	LED recapper error	6	Operating controls

LEDs on the Recapper Control Panel

Symbol	Description
	All LEDs OFF: Normal operation
	Green LED ON: Control panel active
	Red LED ON: Fault condition

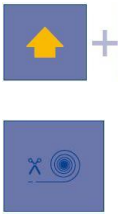
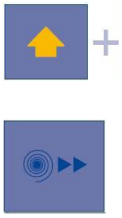
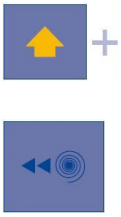
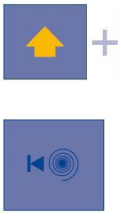
Primary Function of the Buttons

Symbol	Description
	Advance Parafilm
	Green LED ON: Control panel active
	Rewind Parafilm (rewind max. 4mm)
	Cut Parafilm
	Set to home position

Shift

Press the `Shift` button  to access the secondary function of each button. Press `Shift` at the same time as the function button.

Secondary Function of the Buttons

Symbol	Description
	Deposit tube and open tube gripper
	Converge film grippers
	Open film grippers
	Turn off motors

Deactivate Recapper

1 To stop the Auto*Mate* 2500 Family system, press **Stop**

2 Select **Components** > **Recapper** > **Active**. The check mark next to **Active** disappears.

3 The recapper is now disabled.Press **Start**

Exchange the Film Cassette

Important

Use only the original Beckman Coulter film cassettes, order number ODL20554.

Note

A series of videos are installed on the Auto*Mate* 2500 Family system PC to help you with this task.

- On Windows XP operating systems, the videos are in `D:\OperatorTrainingVideos\OT4_Parafilm_Exchange`
- On Windows 10 operating systems, the videos are in `This PC > Videos > OperatorTrainingVideos > OT4_Parafilm_Exchange`

The first time you open a video, you must configure Windows Media Player. Select **Recommended settings** and **Finish**.

The parafilm roll is going to deplete.The system alerts you.

1 Select **Start maintenance**. A message is displayed notifying you that the recapper maintenance mode is active.

Note

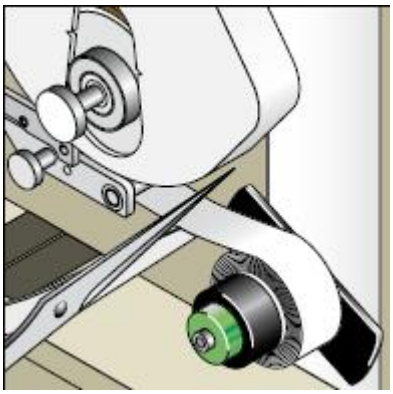
Do not select **OK** before you finished servicing the recapper.

2 Wait for 30 seconds after starting the maintenance mode to allow the interlock to release the door. Then open the sliding door left to the recapper on the rear of the Auto*Mate*.

3 Open the recapper hood.

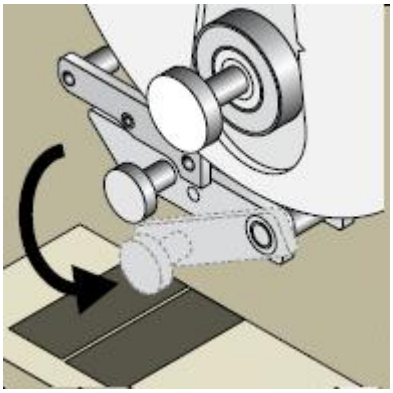
4 Cut off the paper backing:

Figure 89



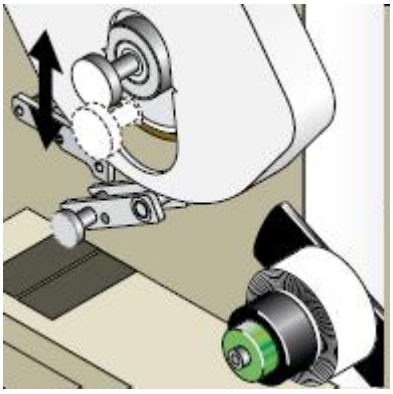
5 Pull on the release knob of the guide table, then fold the guide table to the lower lock position:

Figure 90



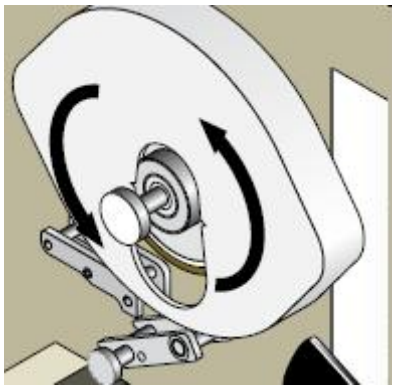
6 Pull on the release knob of the film cassette and push the roll to the upper lock position:

Figure 91



7 Turn the cassette a short distance counterclockwise until you feel it come free. Then remove the cassette by pulling it towards the front:

Figure 92

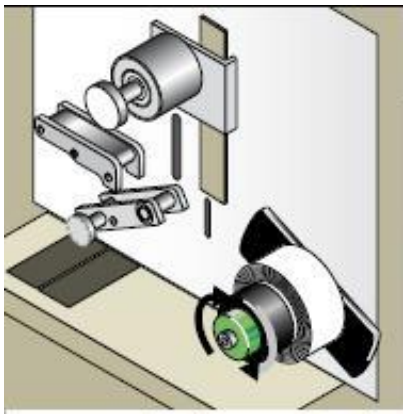


8 Turn the green clamping screw on the backing paper mandrel clockwise as far as it will go:

Important

Never rotate the black take-up manually as this will cause damage of the rotation unit!

Figure 93



9 Remove the paper backing from the mandrel.

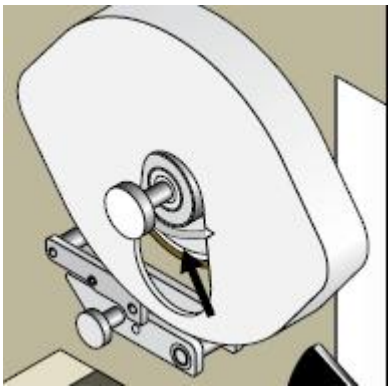
10 Remove the adhesive strip from the new film and unwind a length of film.

11 Place the new film cassette on the cassette holder and turn the cassette clockwise until you feel it lock into place:

Figure 94

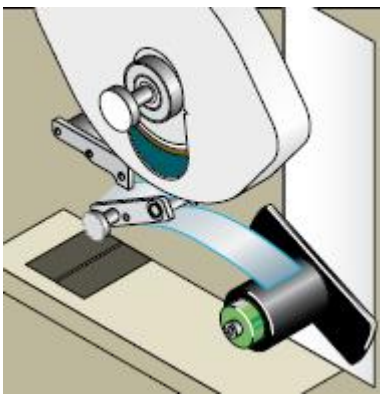
12 Break off the tab of the cassette:

Figure 95



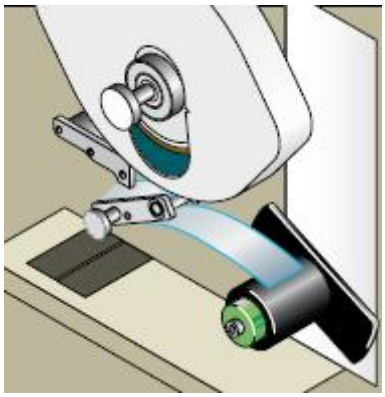
13 Unwind a length of film (approx. 80 cm) and guide the film round the guide table:

Figure 96



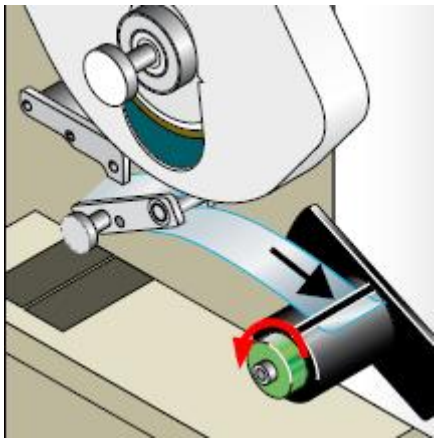
14 Peel the film off the paper backing. Wind the paper onto the wind-up reel and push the beginning under the clamp on the wind-up reel:

Figure 97



15 Turn the green clamping screw counterclockwise as far as it will go to clamp the beginning of the backing paper:

Figure 98

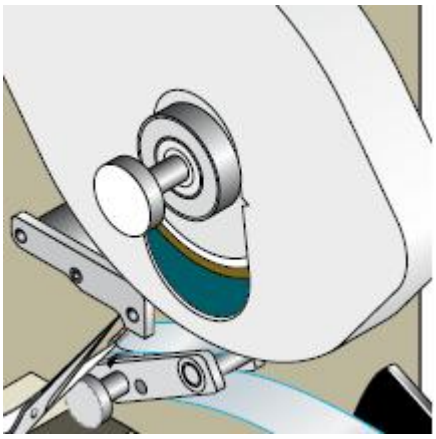


Important

Never rotate manually the black take-up as this will cause damage of the rotation unit!

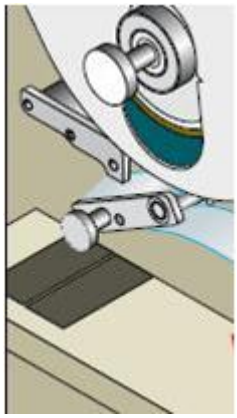
16 Cut off the film at the mark on the guide table:

Figure 99



17 Pull on the release knob of the guide table, then fold the guide table back to the upper lock position:

Figure 100



18 Press the  button to initiate the manual film transport and hold the button depressed until the film appears at the brushes (visual check).

19 Cut off the film with the  button and remove the strip from the brushes

20 Pull on the release knob of the film cassette and push the roll to the lower lock position.

21 Close the recapper hood and the sliding door to the left of it.

22 On the touch screen, select **OK** to confirm that you have finished servicing the recapper.

23 Select **Yes** to confirm the initialization prompt that appears.

Note

The Auto*Mate* 2500 Family system can be put into operation only when the sliding doors to the left and right of the recapper are closed.

Recapper Maintenance

Clean the Recapper

Clean the complete recapper module weekly.

1 Use a solution of antibacterial soap and water. Alternatively, you can use an ammonia-free antistatic window cleaning solution containing less than 5% anionic surfactant.

2 Inspect the covers and panels. Confirm that all screws are in position and tight.

Note

Before cleaning the buttons on the recapper control panel, wring the disinfectant wipe to remove excess fluid from it.

3 Starting at one end of the system, wipe all surfaces with a damp absorbent tissue. Do not soak the system.

4 Dry the system with an absorbent tissue to remove any moisture.

5 Confirm that no cleaner residue is left in the guiding rails of the sliding doors.

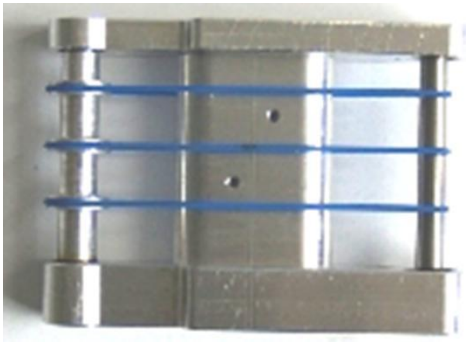
6 Inspect the area around the system. Clear away any items that are not needed.

Inspect the Parafilm Applicator

Inspect the Parafilm applicator. Refer to the procedure to remove a Parafilm jam.

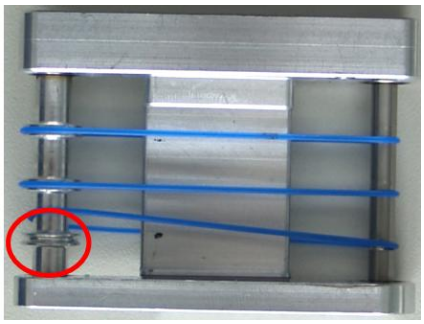
Inspect the O-rings for Parafilm Transport

Confirm that all three o-rings are on the Parafilm guide. Inspect the o-rings for damage.



Inspect the O-ring Guides for Contamination

If the o-ring guides contain contamination, clean with an absorbent tissue or a cotton swab and pure alcohol.



Recapper Troubleshooting

As an **Advanced User**, you can fix some common problems with Parafilm on the Recapper. Error messages inform you when one of these errors occurs. If necessary, you can also replace the O-rings. Do not attempt to perform these tasks if you are not an **Advanced User**.

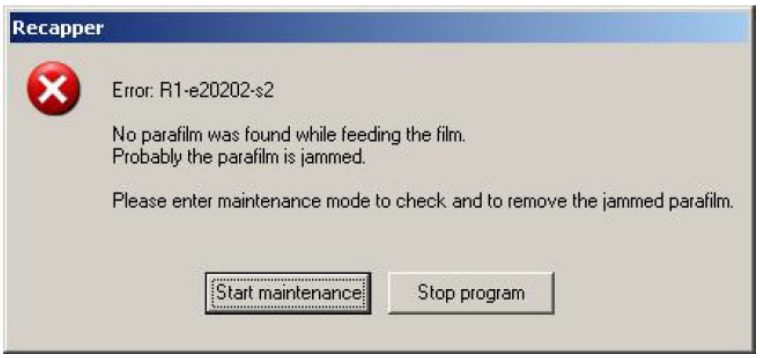
Error Messages

Software error messages indicate problems in the recapper operation. Follow instructions in the error messages to resolve the issue.

No Parafilm Found

Problem

The system alerts you.



Cause

Film is jammed near the brushes or the pressure plate.

Solution

Remove the Parafilm jam.

Remove Parafilm Jam

If film is jammed at the brushes or the pressure plate, the Auto*Mate* 2500 Family system stops. Compare No Parafilm Found.

Note

A series of videos are installed on the Auto*Mate* 2500 Family system PC to help you with this task.

- On Windows XP operating systems, the videos are in `D:\OperatorTrainingVideos\OT5_Parafilm_Jam`
- On Windows 10 operating systems, the videos are in `This PC > Videos > OperatorTrainingVideos > OT5_Parafilm_Jam`

The first time you open a video, configure Windows Media Player. Select **Recommended settings** and **Finish**.

---

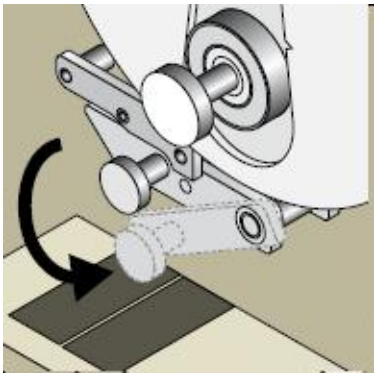
1 Select **Start maintenance** to activate maintenance mode on the Auto*Mate* system.

---

2 Wait 30 seconds after starting maintenance mode. The interlock releases the door. Open the sliding door on the left of the recapper at the rear of the Auto*Mate*.

3 Open the recapper hood.

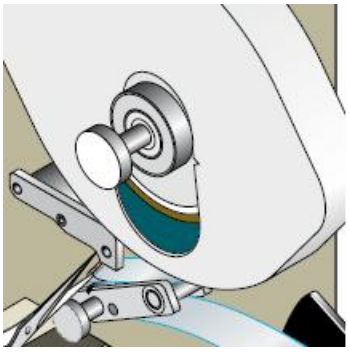
4 Pull on the release knob of the guide table. Fold the guide table to the lower lock position.



5 Press and hold **Shift** and advance the Parafilm gripper with  . Hold both buttons until the gripper reaches the front position and stops moving.

6 Inspect the Parafilm gripper for small pieces of Parafilm. Remove any Parafilm debris you find.

7 Cut the film at the mark on the guide table and remove the film strip.



8 Press and hold **Shift** and move the Parafilm gripper back with  . Hold both buttons until the gripper reaches the end position and stops moving

9 Pull on the release knob of the guide table. Fold the guide table back to the upper locked position.

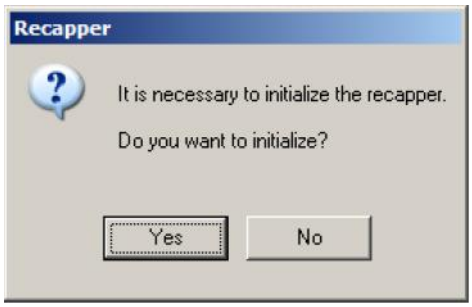
10 Press  to start manual film transport. Hold the button until the film is visible at the brushes.

11 Press  to cut the film. Remove the strip from the brushes.

12 Close the recapper hood and the sliding door to the left side.

13 Select **OK** to confirm the Auto*Mate* software prompt.

14 Select **Yes** to start initialization.



15 Continue routine operation.

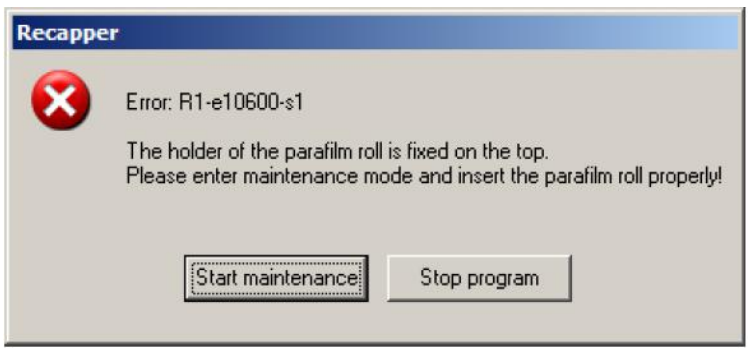
Note

The Auto*Mate* 2500 Family system can only resume operation when the sliding doors to the left and right of the recapper are closed.

Holder of Parafilm Roll is Fixed on the Top

Problem

The system alerts you.



Cause

After inserting the parafilm cassette, the holder of the parafilm was not moved down.

Solution

Set the roll holder to the lower locked position.

O-rings for the Parafilm Transport Damaged

If the o-rings that guide the Parafilm are damaged or cut, replace them. The recapper includes a pack of three replacement parts.

Note

A video is installed on the Auto*Mate* 2500 Family system PC to help you with this task.

- On Windows XP operating systems, the videos are in `D:\OperatorTrainingVideos\OT3_Replace_Recapper_Orings`
- On Windows 10 operating systems, the videos are in `This PC > Videos > OperatorTrainingVideos > OT3_Replace_Recapper_Orings`

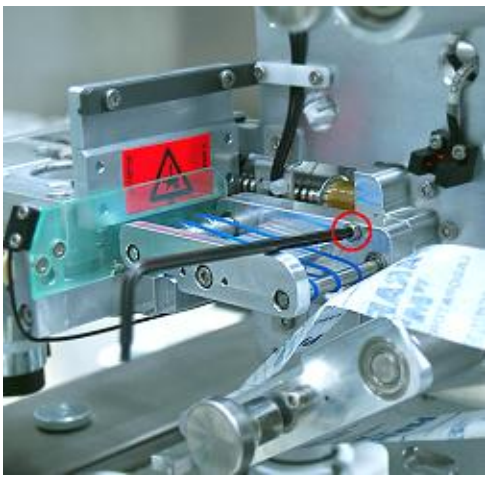
The first time you open a video, configure Windows Media Player. Select **Recommended settings** and **Finish**.

---

1 Unscrew the Torx 10 screw and remove the Parafilm guide.

Note

Do not damage the fiber-optic cables.



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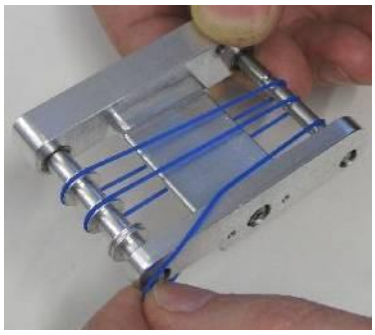
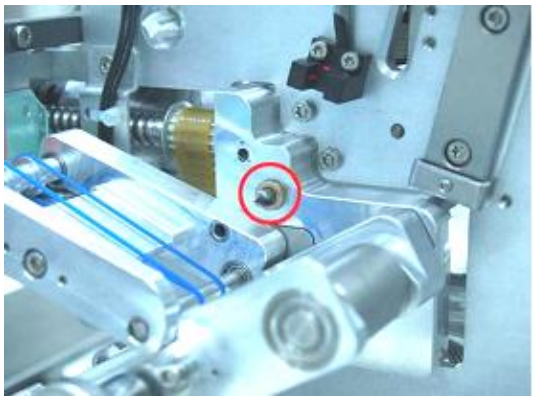
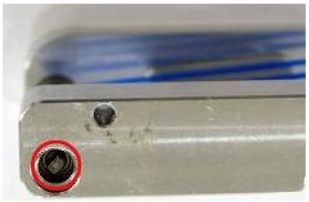
2 Replace the damaged o-rings (ODL20015).



3 Reinstall the Parafilm guide.

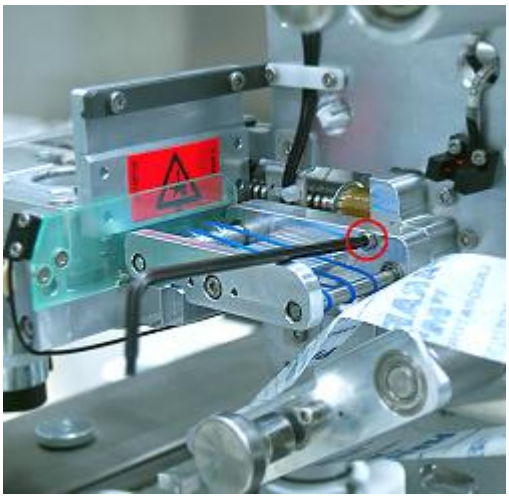


4 Align the rectangular shaped end of the shaft along which the O-rings run with the fitting piece on the end of the driving shaft:



5 The ends of the two shafts fit into each other.

6 Push the Parafilm guide upwards into the highest possible position. Tighten the screw.



CHAPTER 6

Troubleshooting

General Information

Errors are described which can occur during operation. Follow the instructions to resolve issues. If the problem persists, contact your Beckman Coulter representative.

Note

Message alerts in the system software contain unique IDs. Refer to the title bar of the message dialog. When contacting Beckman Coulter, provide this ID for support.

Caution

If sample fluid is spilled and contaminates the machine, remove all racks and tubes from the system. Immediately wipe off any contaminants from the system. Clean the system using approved liquid disinfectant.

Caution

Wear protective clothing and follow universal precautions as dictated by local or national regulations (CLSI GP17-A2, ISO15190 or 29CFR 1910.1030).

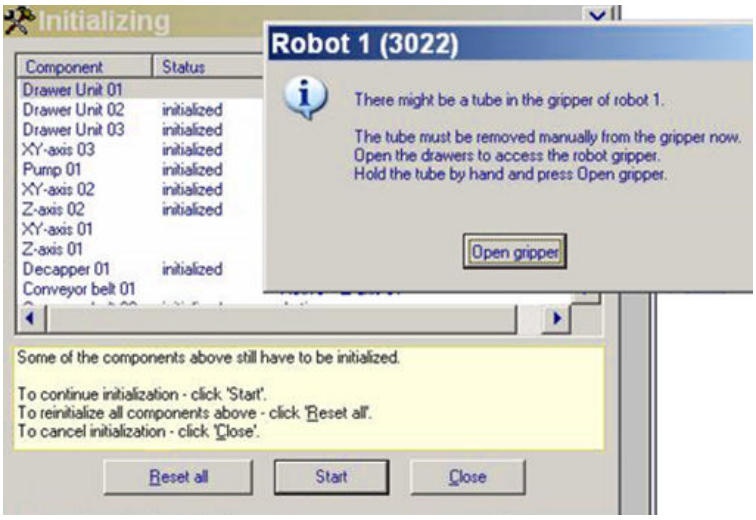
Error Recovery During Initialization

If initialization of the system or a single component is interrupted, the system prompts you:

- To continue initialization, select **Start**.
- To reinitialize all components, select **Reset all**.
- To cancel initialization, select **Close**.

Error: Robot 1 (3022) There might be a tube in the gripper of robot 1

Figure 101 Tube found in robot gripper during initialization



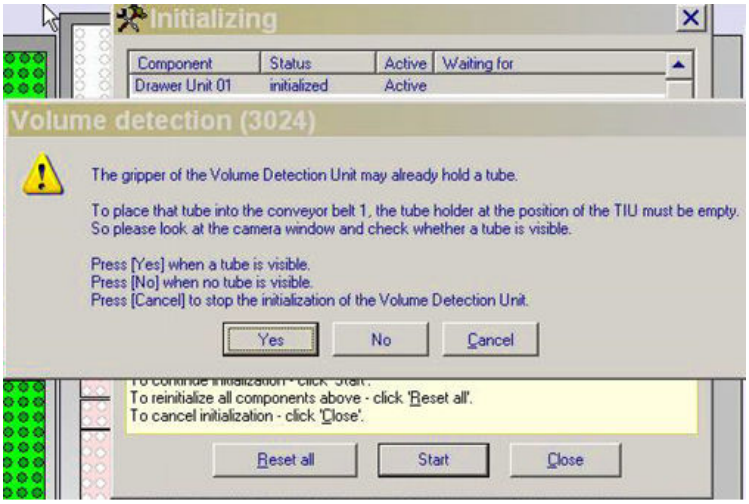
1 Follow the instructions in the alert.

2 When finished, select **Start** to continue initialization.

Error: Volume Detection (3024)

If the TIU gripper contains a tube during initialization, initialization stops and the system alerts you:

Figure 102 Tube detected in gripper of volume detection unit (TIU)



1 Follow the instructions in the alert.

2 When finished, select **Start** to continue initialization.

Error: Tube expected in robot gripper cannot be found

If a tube is expected in the robot gripper during initialization but cannot be found, the system prompts you to search for the lost tube in the system. When finished, select **Start** to continue initialization.

Complete Power Outage in the Laboratory

Problem

The Auto*Mate* 2500 Family system is not running with an uninterruptible power supply (UPS). The PC needs to be restarted and tubes are still on the system.

Cause

Complete power outage at the laboratory.

Remedy

1 Turn off the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

Ensure that the instrument remains at standstill.

2 Manually remove all tubes from the workplaces and the conveyor belts.

3 Inspect the area in and around the instrument for tubes that might have been dropped during the power outage. Remove any tubes.

4 Turn on the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

5 Log on to the Auto*Mate* 2500 family system software.

6 Press **Start**

7 In the LIS, check the tube status of the tubes you removed. Modify if necessary. In this situation, it is the operator's responsibility to process the tubes according to laboratory procedure.

8 If you cannot run or initialize the system, contact your Beckman Coulter representative.

Tubes Lost at Robot 1 During Operation

Problem

Robot 1 lost a tube.

The system displays one of the following alerts:

Figure 103 Volume detection alert

Figure 104 Robot 2, Z-axis alert

Cause

The bar code label is incorrectly applied to the tube. When Robot 1 tries to pick up the tube, the bar code label adheres to the gripper and the tube cannot be placed on the conveyor belt.

Remedy

1 Remove the tube from conveyor belt 01.

2 Confirm that the bar code label is correctly applied to the tube. If necessary, reapply the bar code label to the tube.

3 Replace the tube on the input rack.

System Freeze

Problem

The Auto*Mate* 2500 Family system PC freezes. The PC requires restarting and tubes are still on the system.

Cause

System malfunction.

Remedy

1 Turn off the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

Confirm that the instrument remains at standstill.

2 Manually remove all tubes from the workplaces and the conveyor belts.

3 Inspect the area in and around the instrument for tubes that might have been dropped when the software crashed. Remove any tubes.

4 Turn on the system using the main power supply switch at the rear of the Auto*Mate* 2500 Family system .

5 Log on to the Auto*Mate* 2500 family system software.

6 Press **Start**

7 In the LIS, confirm the tube status of the tubes you removed. Modify if necessary. In this situation, it is the responsibility of the operator to process the tubes according to laboratory procedure.

8 If you cannot run or initialize the system, contact your Beckman Coulter Representative.

Signal Light (Option)

If your system has a signal light, you are alerted to any error by a change in light color and an acoustic signal.

	Red indicates an error. The system stops processing. Manual intervention is necessary. You hear an acoustic warning signal.
	Yellow indicates that manual intervention is necessary.
	Green indicates that the Auto*Mate* 2500 Family system is running.

Manual Intervention Operation Sequence

Follow these steps when a manual intervention is necessary.

1 To stop the Auto*Mate* 2500 Family system, press **Stop**

2 Turn off the Auto*Mate* 2500 Family system using the switch under the monitor.

3 Follow the specific troubleshooting instructions to resolve the issue.

4 Turn on the Auto*Mate* 2500 Family system using the switch under the monitor.

5 Log on to the Auto*Mate* 2500 family system software.

6 Wait until initialization is finished. Press **Start**

Aliquot Module Troubleshooting

Certain errors cause the aliquot module to stop operating. Keep a vacuum cleaner in the laboratory to clean broken tube debris from the conveyor belts to prevent transport blockages.

⚠ Caution

Danger of crushing! The pneumatic plungers may still be under high pressure, even if the system is switched off or disconnected from the mains.

Waste Container is Full

Refer to Empty the Waste Container.

Troubleshooting Label Printer

The label printer is an essential component of Auto*Mate* 2500 Family systems with an aliquoter for printing secondary bar code labels. The printer alerts you of errors on the printer display. Follow all instructions provided in the printer error messages.

Turn off the power the printer. Confirm that label liner is inserted correctly and the printer rollers are clean. Follow the cleaning advice in Printer Maintenance.

For support, contact your Beckman Coulter Representative.

Printer Error States

The Auto*Mate* 2500 system reports a general error if a printer error occurs. The specific error code and error information is displayed on the printer display. If an error is displayed which is not described in this manual, or if the recommended solution does not resolve the error, report the printer error state to your Beckman Coulter Representative.

ETS-2 Printer Error Messages

To clear printer errors:

- Select **Cancel** to clear the error results.
- Select the feed button to synchronize the label feed. Manually remove the peeled labels.
- Select **Pause** to quit the error state.
- After error correction, the printer tries to reprint the missing label.

Table 51 Applicator error messages in the printer display

Message	Cause	Remedy
Air pressure ins.	Compressed air is switched off.	Check the shutoff valve.
Host stop/error	Labeling process was interrupted by a stop signal via PLC interface.	If necessary, label the tube manually.
Label not depos.	Label was not affixed to the tube; after the pad has moved back the label still sticks on the pad.	If possible, label the tube manually.
Lower position	Pad did not reach the labeling position within 2 seconds after the movement of the pad was started.	Contact your Beckman Coulter representative.
Reflection sensor blinking	The switch state of the upper sensor at the cylinder has not changed from the start of the labeling process to the signal from the labeling position sensor.	Contact your Beckman Coulter representative.

Table 51 Applicator error messages in the printer display (Continued)

Message	Cause	Remedy
Upper position	Pad did not reach the starting position within 2 seconds after the pad left the labeling position; or pad has left the starting position unauthorized.	Contact your Beckman Coulter representative.
Vacuum plate empty	Label was not picked up properly by the pad; or label fell off the pad before it could be placed onto the tube.	If possible, manually affix the label to the tube. If the error reoccurs, contact your Beckman Coulter representative.

Caution

The pad moves immediately to the start position. The pad movement can crush fingers. Do not reach into the area of the moving pad. Keep long hair, loose clothes, and jewelry out of the way.

- After error correction, the printer tries to reprint the missing label.
- In application mode, select **Apply/Print** to send the signal **Print first label** or select the pre-dispense key before starting the cyclic operation.

ETS-3 Printer Error Messages

To clear printer errors:

- Select **Cancel** to clear the error results.
- Select the feed button to synchronize the label feed. Manually remove the peeled labels.
- Select **Pause** to quit the error state.
- After error correction, the printer tries to reprint the missing label.

Table 52 Error messages in the printer display

Message	Cause	Remedy
Air pressure ins	Compressed air is switched off.	Check the shutoff valve.
No Label Found	There are labels missing on the label roll.	Press Feed repeatedly until the printer recognizes the next label on the liner.
Out of paper	Out of label roll.	Load labels
Out of ribbon	Out of transfer ribbon.	Insert new transfer ribbon.

Table 52 Error messages in the printer display (Continued)

Message	Cause	Remedy
Pinch roller open	Pinch roller at the rewind guide roller is not locked.	Close the pinch roller.
Print head open	Print head locking lever is open.	Close the print head locking lever.

Caution

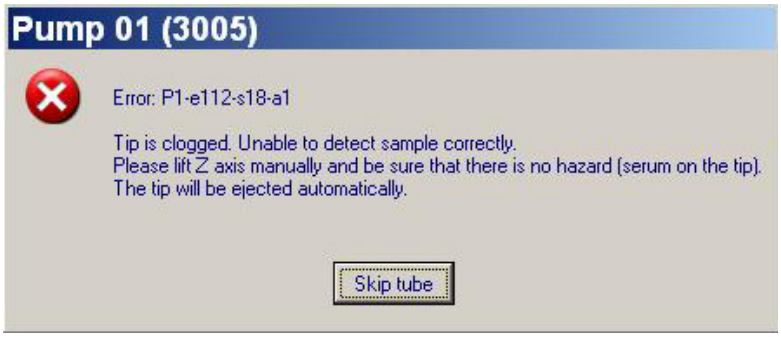
The pad moves immediately to the start position. The pad movement can crush fingers. Do not reach into the area of the moving pad. Keep long hair, loose clothes, and jewelry out of the way.

Error: Pump 01 (3005) Tip is Clogged

Problem

The pipette tip on robot 3 is lowered down into the tube. The system alerts you: *Tip is clogged. Unable to detect sample correctly.*

Figure 105 Error: Pump 01 (3005)



Cause

This error indicates a problem with the liquid level detection (LLD). There can be multiple causes:

- Only a clot is detected in the tube, but no liquid. Follow the procedure to resolve the issue.
- The liquid level detection (LLD) is defective. Contact your Beckman Coulter Representative.

Remedy

1 The pipette tip is lowered to the bottom of the tube. Hold the tube with one hand. At the same time, manually move the pipetting unit of robot 3 up. It remains in the upper position after you release it.

Caution

Biohazardous material can be spilled or cause contamination! Hold the tube firmly to prevent the pipettor pulling the tube up as it moves. The pipette tip can be stuck in the clot. If the tube drops, spilled sample fluid can cause biohazardous contamination.

2 Select **Skip tube** on-screen.

3 Continue routine operation.

4 The pipette tip is automatically ejected. The tube is marked as faulty and sent to the error rack.

5 Clean the tip carrier.

6 If the problem persists, the LLD module might be defective. Contact your Beckman Coulter Representative.

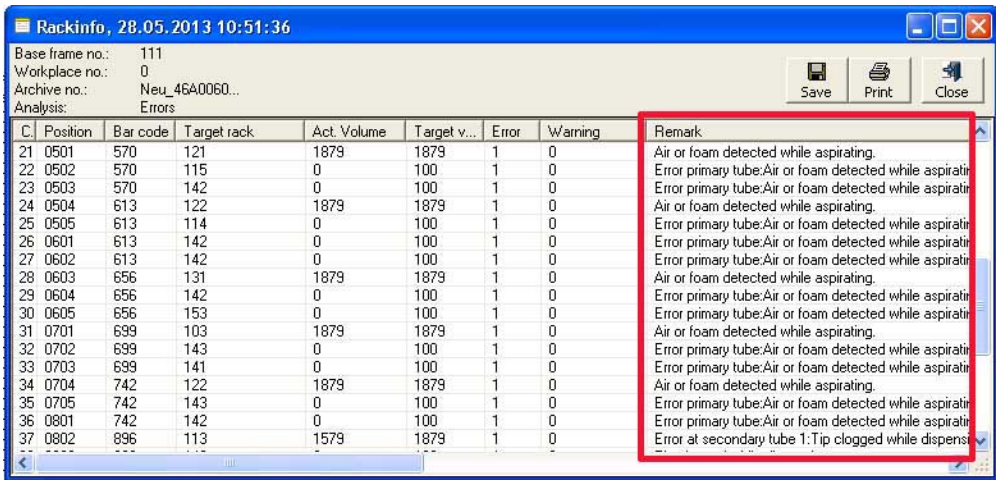
Aspiration Errors – Many Tubes Sent to Error Rack

Problem

Many tubes are placed on the error rack. When pipetting, the pump returns the liquid to the primary tube instead of dispensing it into secondary containers. The error remark column in the error rack info dialog displays errors that are not plausible.

Example: **Air of foam detected while aspirating** displayed under **Remark**.

Figure 106 Remark column in **Rack Info**



Remedy

To check Rack Info, select the error rack on-screen. Refer to the table here for the action required, depending on the error indicated.

Table 53 Error remarks in **Rack Info**

Remark	Action
Air or foam detected while aspirating.	• Clean the Tip Carrier of the EZ Pipettor • Replace the Pump Syringe • Contact your Beckman Coulter representative
Tip clogged while aspirating or Tip clogged during suckback after aspirating or Tip clogged while dispensing	• Visually inspect the sample tubes and confirm if they contain clots or fibrin • Clean the Tip Carrier of the EZ Pipettor • Replace the Pump Syringe • Contact your Beckman Coulter representative
No liquid found in tube before deepest search position. Possible failure of Liquid Level Detection.	Contact your Beckman Coulter representative

Tubes Drop out of the Drawer at the Rear of the System

Problem

Unused secondary tubes occasionally drop out of the back of the tube drawer into the rear of the machine.

Cause

This usually happens after opening and closing the tube drawer.

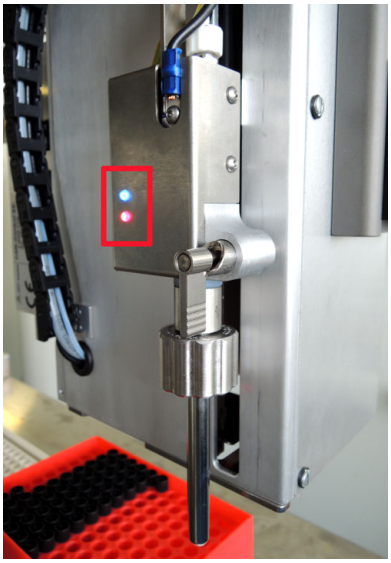
Remedy

Dispose of all dropped tubes. If you need to refill the drawer, select **Open tube drawer** on-screen. Fill the tubes in the direction shown on the label inside the drawer.

LED Status Indicator On (EZ Pipettor)

Two LEDs (one blue and one red) on the housing of the pipetting unit indicate the status of the module.

Figure 107 EZ Pipettor status LEDs



When switching the system on, both the blue and the red LEDs are lit. The red LED turns off when aliquoting begins and remains off during operation.

The blue LED remains on permanently. It only flashes during an error that a lit red LED signals. The intervals in which the blue LED flashes indicates the type of error.

If the red LED does not turn off after aliquoting begins or it lights during operation, contact your Beckman Coulter Representative.

Important

The error is not resolved by component initialization.

Tube Jam at the Tube Hopper Outlet

Problem

Tubes are jammed in the tube hopper outlet.

Figure 108 Tube Jam

Cause

The top tube cannot drop through the hopper because the previous tube blocks the path.

Remedy

1. Access the rear of the aliquot module.
2. Push the top tube upwards and hold it.
3. Move the TTU towards the tube lift get-position so that you can reach the tube.
4. Remove both tubes.
5. Initialize the aliquot module. Select **Components**> **Aliquot module**> **Initialize**.

Tube Jam Inside the Tube Hopper

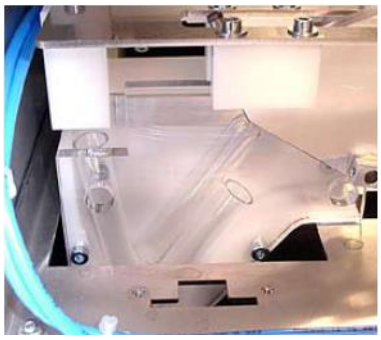
Problem

Tubes are jammed inside the tube hopper.

Cause

Tubes are jammed in the top section of the tube hopper.

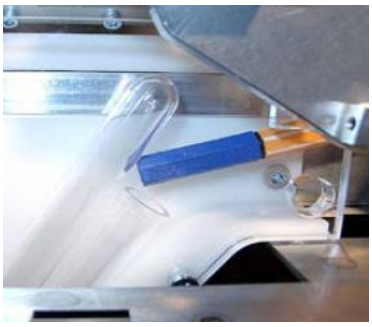
Figure 109 Tube jam



Remedy

1	Access the rear of the aliquot module.
2	Manually clear tubes from the TTU to clear the path through the hopper.
3	Access the front of the aliquot module.
4	Pull out the tube drawer completely.
5	Insert a pen or similar object into the tube hopper from the right side.
6	Push against the tubes until the hopper is completely empty.

Figure 110 Clearing a tube jam



7	Collect and dispose of all tubes that fall into the rear of the aliquot module.
8	Close the tube drawer.

Tube Jam at the Tube Hopper Inlet

Problem

Tubes are jammed in the tube hopper inlet.

Cause

Tubes are jammed in the inlet section of the tube hopper.

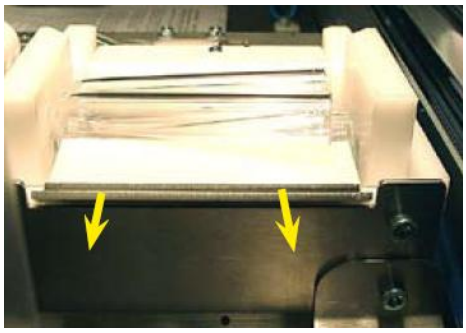
Remedy

1 Open the tube drawer.

2 Access the sliding door at the rear of the aliquot module.

3 Use the rectangular opening to access a slider assembly with your hand.

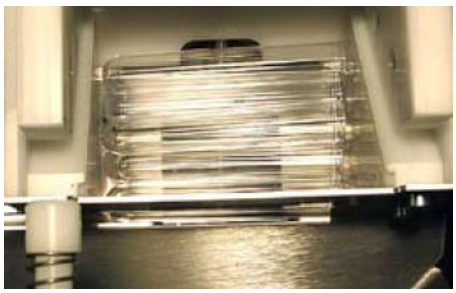
Figure 111 Top view of the tube hopper with the slider assembly in its default position



4 Pull out the slider completely. Tubes start falling out.

5 Empty the tubes.

Figure 112 Remove the tubes.



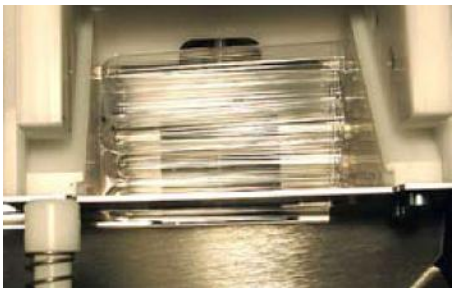
6 If the tube jam is cleared, skip step 7 to step 15. Continue with step 16.

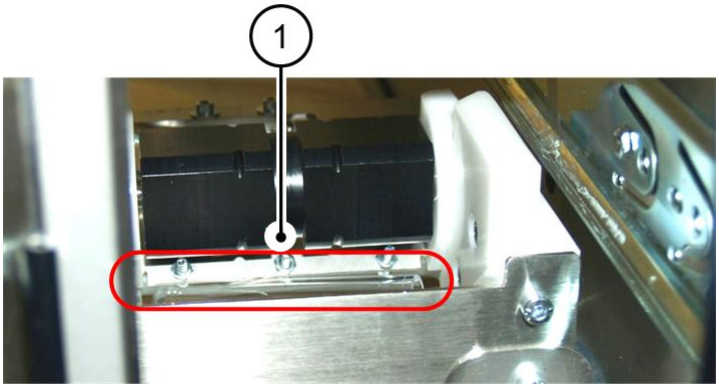
7 If tubes are still jammed, depressurize the compressor.

Warning

When the compressor is under pressure, the piston exerts force on the tube. To avoid injury, do not try to remove any jammed tubes before depressurizing the compressor.

Figure 113 Remove the tubes.





8 Turn the switch from ‘I’ to ‘0’ to switch off the compressor.

Figure 114 Jun Air Quiet Air 6-4

Figure 115 Jun Air 87R-4P

9 Turn the compressor vent valve counterclockwise to depressurize the compressor.

Figure 116 Jun Air Quiet Air 6-4

Figure 117 Jun Air 87R-4P

10 Wait until the compressor is depressurized. The compressor stops releasing air. The jammed tube is released.

11 Remove the jammed tube.

12 Replace the slider in the slotted guidance.

13 Close the vent valve. Confirm that the ring valve is closed.

14 Turn the switch from '0' to 'I'. Switch on the compressor to build up pressure.

15 The compressor starts automatically. It stops automatically after the operating pressure is reached.

16 Collect and dispose of all tubes that fall into the rear of the aliquot module.

17 Close all sliding doors. Close the tube drawer.

18 Initialize the aliquot module. Select **Components**> **Aliquot module**> **Initialize**.

19 Initialize the printer. Select **Components**> **Aliquot module**> **Initialize printer**.

Tube Feeding Interrupted

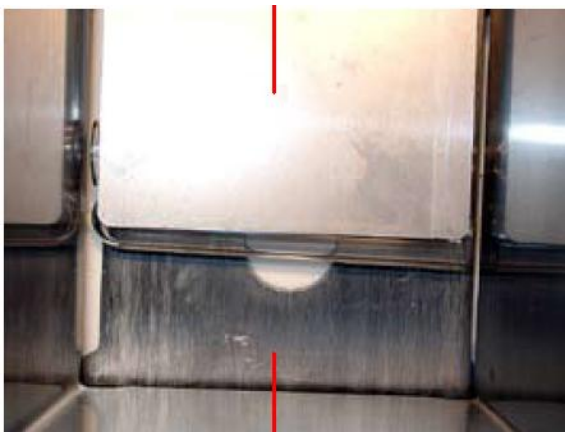
Problem

Tube feeding is interrupted.

Cause

When the tube drawer is closed too hard, single tubes can get stuck in the container mechanics.

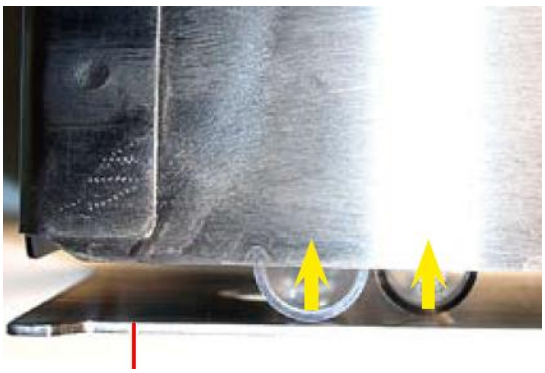
Figure 118 Top feed plate



Glider plate inside the tube container, viewed from above.

Instead of being on top of the top feed plate, tubes are located between the top feed plate and the glider plate.

Figure 118



Glider plate viewed from the side of the tube container.

Remedy

1 Remove all tubes between the top feed plate and glider plate.

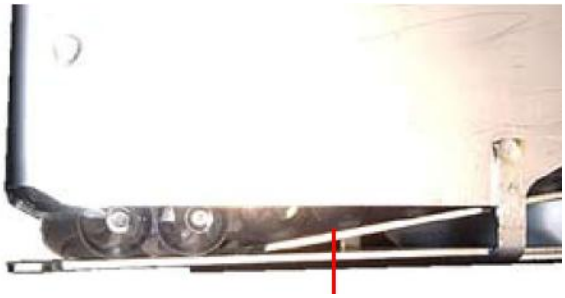
2 Return the container to its working position.

Caution

Carefully close the drawer to avoid breaking tubes.

3 The container is as shown here.

Figure 120



Top feed plate, correct position

Tube Fragments in the TTU Module

Problem

The aliquot module does not work correctly. The system presents various alerts about the aliquot module.

Cause

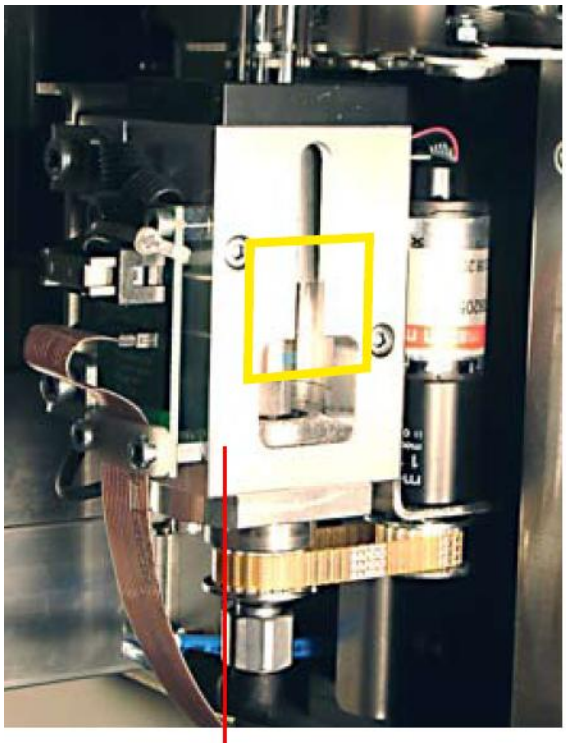
The TTU module contains fragments of broken tubes. Possible reasons:

- The tube packaging contained fragments.
- The tube drawer was closed too fast or too firmly and tubes were broken.

Remedy

1 Slide the TTU manually to the position where the tube lift grips the labeled tube to lift it to the conveyor belt.

Figure 121



Tube Transfer Unit (TTU)

2 If you find a tube in the TTU, remove it manually.

3 Thoroughly clean the area with a vacuum cleaner.

4 Initialize the aliquot module. Select **Components**> **Aliquot module**> **Initialize**.

Tube Present Sensor Problems

For maximum safety when processing secondary tubes, two sensors confirm the height position and placement of secondary tubes on conveyor belt 2.

If a sensor detects a problem, the system alerts you about the error. The Auto*Mate* 2500 Family system stops immediately. Error messages display in the following two situations:

Problem

If a tube is missing after the tube lift places a tube, the system alerts you:

Cause

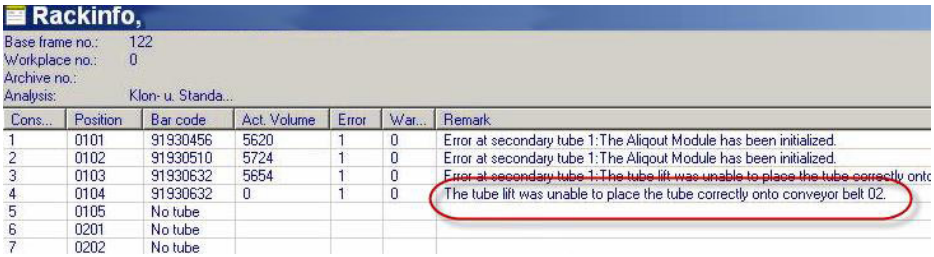
A tube is missing after the tube lift places a tube.

Remedy

1. Locate the missing secondary tube and remove it.
2. Remove the associated primary tube and any secondary tubes on-screen. Physically remove these tubes from conveyor belt 02. You can reprocess the primary tube. Follow your laboratory procedure.

Problem

A sample tube was sent to the error rack. Open the tube info for the tube. Read the information under **Remarks**.



Cause

If the height of a secondary tube is out of range or the tube is upside down, all associated primary and secondary tubes are sent to the error rack.

Remedy

1. You can reprocess the primary tube. Follow your laboratory procedure.
2. If the error persists, confirm that the height detection sensor is working. Contact your Beckman Coulter Representative.

Troubleshooting Microtiter Plates (MTPs)

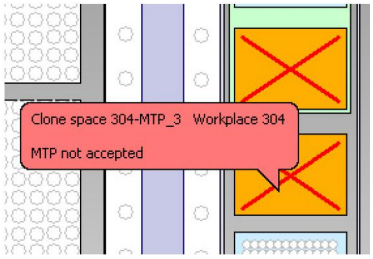
The system alerts you about MTP errors either as Auto*Mate* 2500 Family system messages or messages from the LIS. The LIS confirms the position and number of all MTPs when a drawer is closed, so that several error conditions can occur. We cannot provide a list of all possible error messages. System alerts provide instructions on actions to take. Contact your Beckman Coulter representative for support.

MTP Not Accepted

Problem

MTPs are not accepted:

Figure 122 MTP Not Accepted



Cause

The LIS does not recognize the MTPs. The LIS has a batch list of all MTP numbers that are available for the laboratory.

Remedy

Use MTPs that are known to the LIS.

Duplicate Plate Error

Problem

The same MTPs are used on different systems. You have two or more Auto*Mate* 2500 Family systems with MTP rack readers. MTPs are processed on system 1, removed and placed on system 2. If you do not place new MTPs on system 1, the MTPs placed on system 2 are rejected. The system alerts you about a duplicate plate error.

Cause

The information about the MTPs on system 1 is stored in Sorting-Drive Server. If no other plates are placed on system 1, this information is not updated. When the plates are moved to system 2, Sorting-Drive detects a conflict. It cannot allow plates that it expects on system 1 to be placed on system 2 at the same time.

Remedy

Sorting-Drive needs be updated that the plates have been removed from system 1, so that you can place them on another system.

To move MTPs from one system to another system for processing, always replace the MTP positions with new MTPs on the first system. Sorting-Drive is updated on the MTP positions and allows you to move these MTPs to a different system.

Troubleshooting The No Order Buffer Rack

No Order Buffer Rack Is Full

Problem

The **No Order** buffer rack is full

Cause

The maximum number of samples that can be loaded into the **No Order** rack has been reached.

Remedy

Open the drawer and empty the rack.

No Order Buffer Rack Frequently Full

Problem

The **No Order** buffer rack is frequently full

Cause

This can reflect configuration problems in the buffer rack, specifically relating to the reprocessing time, and the maximum reprocessing time per sample. Alternatively, the problem can be the result of the LIS workflow chosen.

Remedy

Contact your local Beckman Coulter representative for support.

No Order Buffer Rack Cannot Be Found

Problem

The **No Order** buffer rack option has been installed, but when starting the Auto*Mate* 2500 Family system, a warning is given that the **No Order** buffer rack cannot be found.

Cause

The correct base frame is not installed, or the **No Order** workplace is not activated.

Remedy

Confirm that the correct base frame is installed and the **No Order** workplace is activated. If the problem is not resolved, contact your local Beckman Coulter representative for support.

Camera Troubleshooting

Inspect Tube Pictures

If a Beckman Coulter Representative asks you to inspect the camera, follow these steps.

1 Select **Camera** at the bottom of the screen to open the camera inspection window.

2 Open the inspection window:

Figure 123 Camera inspection window

Note

Keep the inspection window minimized during operation. To prevent interface errors, do not close or exit this window.

3 Continue with any additional steps requested by your Beckman Coulter Representative.

Error: The Cap Color ID "-2" could not be found in the file `tubes.ini`

Problem

Tubes are sent to the error rack and the system alerts you:

The Cap Color ID “-2” could not be found in the file `tubes.ini`

Cause

The camera software cannot distinguish two different colors and the tube type and cap ID are identical.

Remedy

Try processing the tubes again. If the problem persists, sort the tubes manually.

APPENDIX A

AutoMate 2500 Family Documents

Related Documents

Your Beckman Coulter documentation can be found on our website at www.beckmancoulter.com.

- Auto*Mate* 2500 Family Instructions for Use
- Sorting-Drive Client Instructions for Use
- iPAW Instructions for Use
- ISB Instructions for Use

Glossary

Aliquot — The method to create a full or a partial set of secondary tubes from the primary tube.

Aliquot Tube — The tubes into which a sample is divided to run the sample on more than one instrument

at the same time, or for storage.

Auto*Mate* 2500 Family —

Beckman Coulter laboratory automation product line for sorting and aliquoting samples.

LIS — Laboratory Information System.

Primary tube — The tube that arrives from the customer. The tube is labeled with a unique barcode and entered into the LIS. Every tube that enters the system (i.e. is placed on an input rack) is treated as a primary tube.

Rack — A framework for holding sample tubes.

Sample — A biological specimen of serum, whole blood, urine, plasma, or cerebrospinal fluid for use in chemistry, immunoassay, hematology or coagulation tests.

Secondary Tube — Tube into which a portion of a sample is transferred so that the system can process the sample on more than one analyzer at the same time, or send a portion to storage.

Test order — Analysis performed on a specimen, e.g. HIV or hepatitis. This data is stored in the LIS and provided to Sorting Drive/iPAW.

Test Volume — The test volume is the amount of sample required to run the test on an instrument.

WP-Id. — Workplace ID. Output destination on the Auto*Mate* 2500 and iPAW instruments.

www.beckmancoulter.com