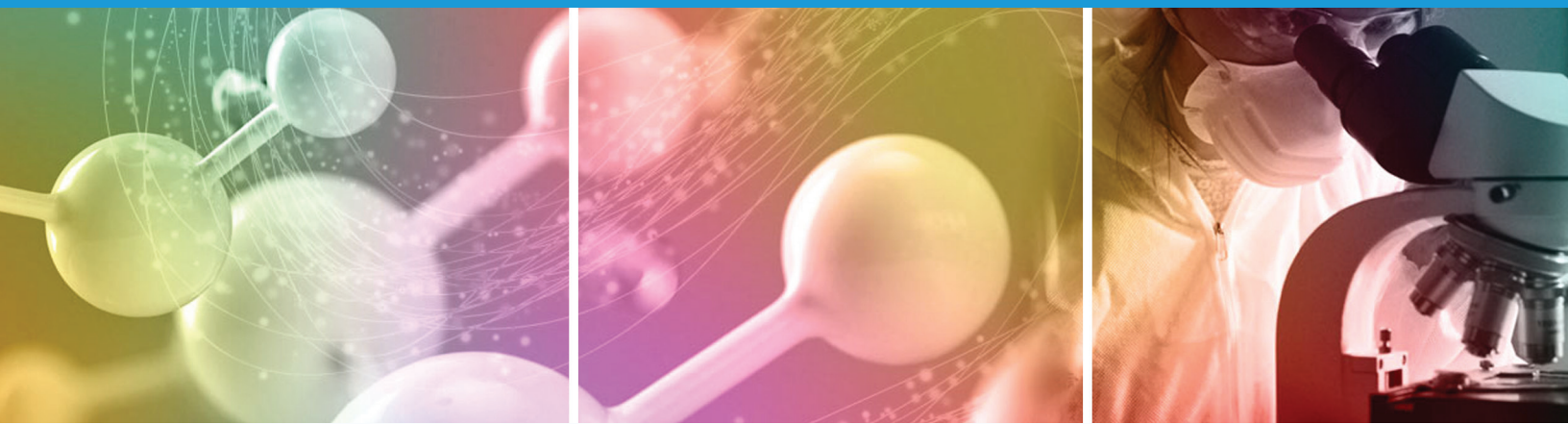


QUARTZLIMS



One **LIMS**
ALL Labs



**QUARTZ IMAGING
CORPORATION**
FOR A FASTER, SMARTER LAB

Quartz LIMS Feature Summary

Quartz LIMS

A single LIMS system that can support all of your organization's lab types. It can also be separated into individual LIMS systems based on the type of samples and analysis done in each lab.

1. System Objective – A Faster, Smarter Lab

- ▲ Automate routine tasks
- ▲ Automatically enforce business & security rules
- ▲ Improve communication
- ▲ Increase on-time performance
- ▲ Identify bottlenecks
- ▲ Increase productivity
- ▲ Keep samples and data organized
- ▲ And more

2. Background

- ▲ The first Quartz LIMS system was deployed in 1997
- ▲ It is designed to be highly configurable to match your desired workflow and terminology
- ▲ The integration of Quartz PCI (on instruments and other PCs) with our server LIMS software delivers value to analysts and lab management that no other system can provide
- ▲ The Quartz LIMS system is most often installed on your own servers to ensure data security or at your option provided as a cloud service
- ▲ The system is designed such that the configuration work is done a separate "layer" and the core code is not touched which increases system stability and reliability
- ▲ Any custom development, such as complex business rules, is done in separate modules not in the core code
- ▲ We provide Webhooks, APIs and if necessary custom code to integrate with external systems, such as MES systems

3. Administrative Tools

- ▲ System information and logs
 - ▲ Instrument Status
 - ▲ Email Queue
- ▲ Managers
 - ▲ App Settings
 - ▲ Volume Manager
 - ▲ Instrument Manager
 - ▲ Picklist Manager
 - ▲ Job Type Manager
 - ▲ Keyword Manager
 - ▲ Rejection Reason Manager
 - ▲ Task Recipe Manager
 - ▲ Status Workflow
 - ▲ Priority Workflow
- ▲ Security - At a granular level determine who can do what and who can see what. FA-LIMS can utilize Active Directory, LDAP, Windows logins and Windows Groups or you can set up security groups in FA-LIMS
 - ▲ Group Manager
 - ▲ User Manager
 - ▲ Role Manager
 - ▲ Security Template Manager
- ▲ Billing Code Manager
- ▲ Feedback Manager – Users can provide feedback on a Job
- ▲ Procedures Manager – For procedures documents
- ▲ Job/Sample Recipe Manager

4. Searching

- ▲ Search for Data or Job
- ▲ Search on any field in the database
- ▲ Use of keywords
- ▲ Full text indexing
- ▲ Retrieve reports and individual data items
- ▲ Display all data from a Job in a convenient format

5. Management Reporting

- ▲ Chart Manager
- ▲ Dashboard Publisher
- ▲ KPIs
- ▲ Case Loading
- ▲ Sample Inventory
- ▲ Tool Utilization
- ▲ General Data Export
- ▲ Gatekeeper Reports

6. Lab Management

- ▲ Quota Management
 - ▲ Ticket Allocation
 - ▲ Quota Allocation
- ▲ Job Statuses
 - ▲ Can be a few or numerous statuses per Job Type, named and defined for your requirements
 - ▲ Emails can be sent to target audience with each status transition

7. Interfaces to Other Systems

- ▲ Interfaces to import, look up and/or export data via another system or database
- ▲ Can read existing barcodes generated by other systems in order to facilitate look-up
- ▲ Create Jobs, Samples and other data from other systems
- ▲ Send status updates to other systems
- ▲ Support for big data and analytics solutions
- ▲ Bring legacy data into Quartz LIMS database

8. Field/Form Manager

- ▲ Option available to allow you to change forms and fields on your own

9. Outsourcing

- ▲ Track details for Jobs or Samples sent to external labs or other internal labs

10. Multiple Sites

- ▲ Can support any number of worldwide sites
- ▲ Data warehouse to share data amongst approved users at other sites

11. Language Support

- ▲ International language support for data input, including support for a number of Asian languages

12. Enterprise Service and Assurance Program

- ▲ Provides priority service level, free upgrades to new versions and some hours of free configuration changes to existing features
- ▲ Mandatory in the first year

13. Other

- ▲ Sample/Inventory location tracking
- ▲ Taskboards – Each taskboard has its own list of tasks (think of post-its on a board)
- ▲ Lab Information web pages (e.g., news, contacts etc.)
- ▲ Job Feedback submission function
- ▲ Procedure Library for managing standards and procedures
- ▲ Sortable and filterable columns in various views
- ▲ Auto-complete fields
- ▲ Custom color picker for field background or text highlighting
- ▲ Distribution Lists
- ▲ Auto Close Jobs
- ▲ Quartz LIMS supports 1D and 2D barcodes
- ▲ Optional Gatekeeper – Instrument booking and instrument access control

14. The Quartz LIMS Process

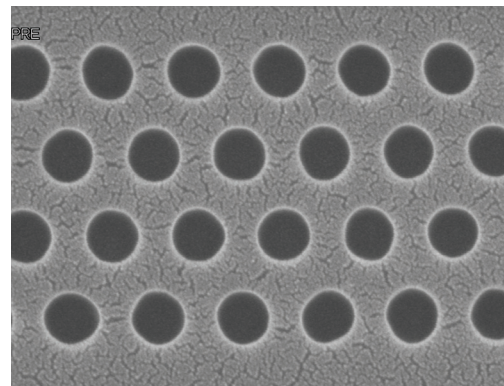
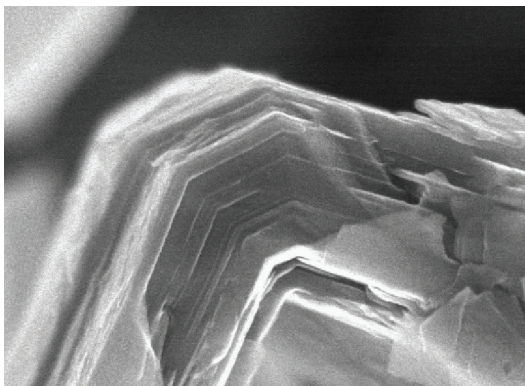
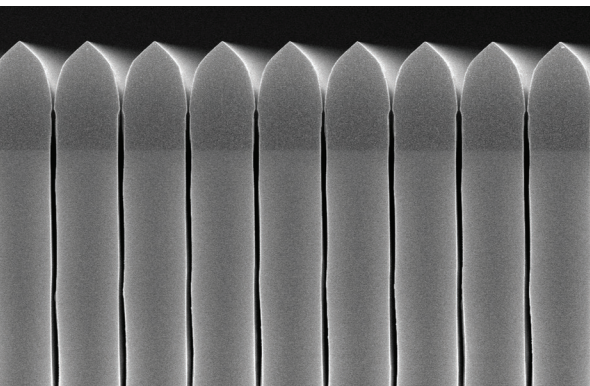
- ▲ After contracts completed and PO received, we meet with you in web meetings to develop a highly detailed Software Requirements Specifications (SRS) document to finalize how the system will work for you, what it will look like and the terminology to be used
- ▲ The same team that you work with on the SRS will configure your Quartz LIMS system and be responsible for ongoing support

15. ROI

- ▲ Customer feedback indicates that you should experience a payback period of within 12 months of deploying Quartz LIMS

16. Configurability

- ▲ Because Quartz LIMS is designed to be highly configurable it is very easy for us to add new features and functions to your Quartz LIMS system



Quartz LIMS Features for Microscopy Labs (FA-LIMS)

Quartz LIMS is the only Laboratory Information Management System that handles images as first-class passengers. Suitable for labs that are involved with imaging such as Failure Analysis and Materials Characterization labs.

1. System Hierarchy

- ▲ System has 6 main levels (which can be renamed):
 - ▲ Project
 - ▲ Job
 - ▲ Sample (can have multiple sample levels)
 - ▲ Task
 - ▲ Session
 - ▲ Document

2. Job Request Submission

- ▲ Can give right to submit a Job Request to anyone in or outside of your organization
- ▲ Can support multiple Job Types
- ▲ Each Job Type can have its own workflow, set of forms and status workflows
- ▲ The Security Template of the Requestor can be automatically applied to Job Request
- ▲ Enforce security rules such as ITAR compliance requirements
- ▲ Attach documents to the Request and can restrict the file types allowed
- ▲ Can make certain fields mandatory
- ▲ Copy Job function for repeating same/similar Job Request
- ▲ Can create different classifications of Requestors and allow some to request specific work and others only high-level requests with someone in the lab to determine the work to be done
- ▲ Calculate estimated completion date
- ▲ Job/Sample Recipe – predefined request for specific types of work to be done

3. Lab Management

- ▲ Can configure Job Request approval process from simple to complex
- ▲ Each Job Type can have its own workflow (e.g., is review required?)
- ▲ Can assign Lead Analyst, Job Owner and/or other team members
- ▲ Requests can be organized by Priority type
 - ▲ Typically a new Job would be placed in the Job Queue at the bottom of that Priority and above lesser Priorities
 - ▲ Lab managers can change Priority and position in the queue
- ▲ Task Manager assigns specific tasks to a Job (includes Task recipes) with additional information included or added to the Task (e.g., Assigned to, time to complete, etc.)

4. Job Queue Views

- ▲ Examples:
 - ▲ by Job Type
 - ▲ by Priority
 - ▲ by Job Status
 - ▲ by sub-lab/department
 - ▲ Combination of above or other fields
- ▲ Use of color coding (e.g. Status or Job near target completion date etc.)
- ▲ Columns can be arranged per user and maintained
- ▲ Transpose the view
- ▲ User defined filters for Job Queues

5. Quartz PCI and Data Acquisition

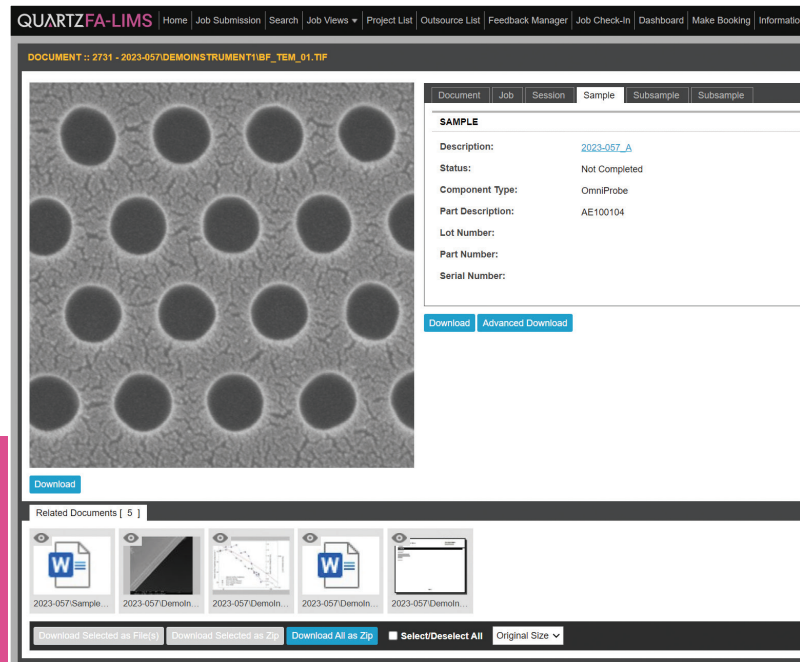
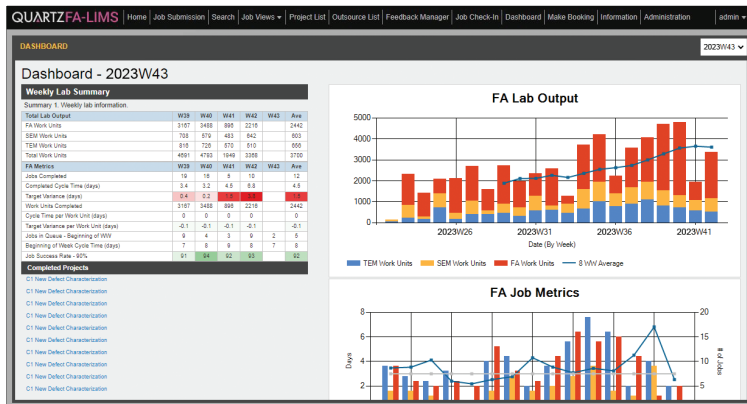
- ▲ Direct connection between Quartz LIMS and PCI Lab for data acquisition from all imaging and non-imaging instruments
- ▲ Any type of data file can be uploaded through the web browser
- ▲ Tools for annotation and display of image data
- ▲ Virtual Printer Driver for 'printing' data, such as charts and graphs, to PCI and/or Quartz LIMS database
- ▲ Send To icon on desktop for inputting single files or entire folders

6. Job/Lab Reports

- ▲ Powerful Report Generator in PCI
- ▲ Custom templates make it fast and easy to populate report with data and associated metadata
- ▲ Can export to PowerPoint (for further narration) or as a PDF

7. Other

- ▲ Sub-Jobs – with parent-child relationship determined by factors such as re-do work, same samples, etc.
- ▲ Wafer Library for semiconductor customers to manage inventory and tracking of wafers and coupons, and visualize coupon data from a Wafer Map.
- ▲ Integrate individual Quartz LIMS systems with other Quartz LIMS lab systems (for example send Jobs from Reliability lab to Failure Analysis lab)



Quartz LIMS is the only 'Image Smart' LIMS system available

The integration of PCI with Quartz LIMS delivers performance and value that no other LIMS system can come close to.

Quartz LIMS Features for Chemical Analysis Labs (CH-LIMS)

1. System Hierarchy

- ▲ System has 6 main levels (which can be renamed):
 - ▲ Project
 - ▲ Job
 - ▲ Sample (can have multiple sample levels)
 - ▲ Task
 - ▲ Session
 - ▲ Document

2. Lab Management

- ▲ Can configure Job Request approval process from simple to complex
- ▲ Each Job Type can have its own workflow (e.g., is review required?)
- ▲ Can assign Lead Analyst, Job Owner and/or other team members
- ▲ Requests can be organized by Priority type
 - ▲ Typically a new Job would be placed in the Job Queue at the bottom of that Priority and above lesser Priorities
 - ▲ Lab managers can change Priority and position in the queue
 - ▲ Task Manager assigns specific tasks to a Job (includes Task recipes) with additional information included or added to the Task (e.g., Assigned to, time to complete, etc.)

3. Job Queue Views

- ▲ Examples:
 - ▲ by Job Type
 - ▲ by Priority
 - ▲ by Job Status
 - ▲ by sub-lab/department
 - ▲ Combination of above or other fields
- ▲ Use of color coding (e.g. Status or Job near target completion date etc.)
- ▲ Columns can be arranged per user and maintained
- ▲ Transpose the view
- ▲ User defined filters for Job Queues
- ▲ The number of rows displayed in a View is configurable

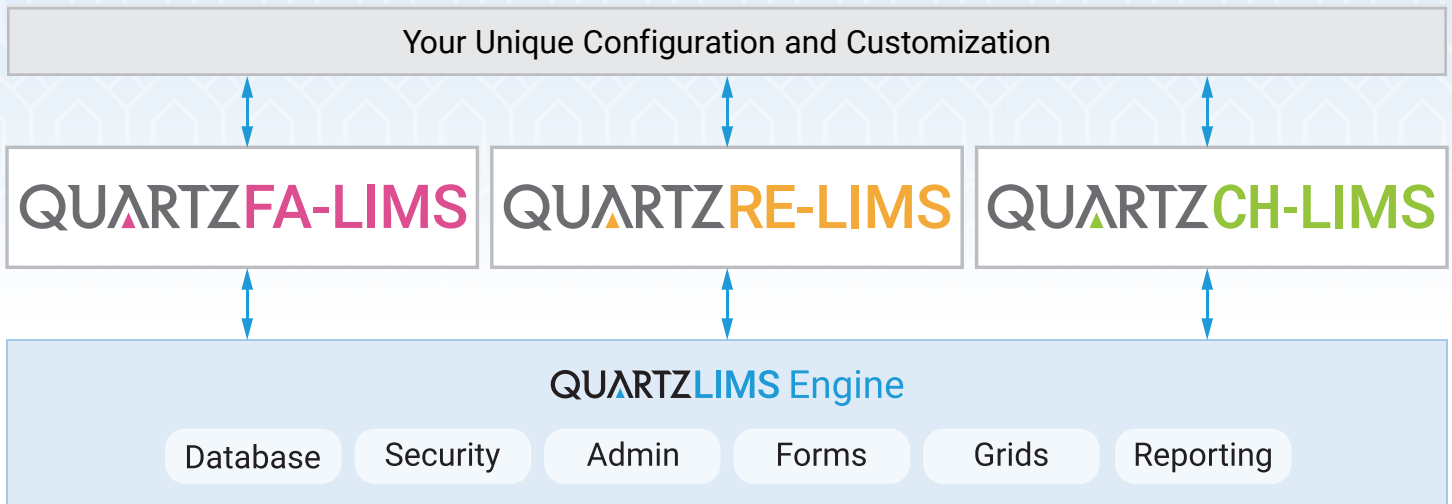
4. Data Acquisition and Analysis

- ▲ Data can be extracted from the CSV and Excel files produced by various instruments, including validating and performing calculations with the data
- ▲ Supports multiple chemical analysis techniques such as IC-PMS and IC
- ▲ Computed fields
- ▲ Computed Header
- ▲ Sample Data Import Page contains a file upload control allowing the user to add data collected from various types of Instruments.
- ▲ Comprehensive Sample Data Review
- ▲ Detection Limits
- ▲ rValue Limits
- ▲ Results Computation and Release
- ▲ Chem File Selector and Archiving

5. Other

- ▲ Sub-Jobs – with parent-child relationship determined by factors such as re-do work, same samples, etc.
- ▲ Integrate individual Quartz LIMS systems with other Quartz LIMS lab systems (for example send Jobs from Reliability lab to Chemical Analysis lab)

Quartz LIMS Architecture



- ▲ All of the Quartz LIMS components operate on the same database and they all use the same administration and security tools
- ▲ This allows for great flexibility on how Quartz LIMS can be deployed throughout your company's labs
- ▲ Quartz LIMS is the only LIMS system that handles images as first-class passengers
- ▲ We are experts in providing highly configurable LIMS systems that can support many types of data, whether your lab works with individual samples or batches of samples

Trust the Experts in LIMS for High Technology



QUARTZ IMAGING CORPORATION
FOR A FASTER, SMARTER LAB

6190 Agronomy Rd, Suite 406, Vancouver, BC Canada V6T 1Z3
Phone: +1 (604) 488-3911 • Fax: +1 (604) 488-3922
inform2@quartzimaging.com • www.quartzimaging.com
Quartz Imaging Corporation is a member of Quartz Innovation Group.