Worried About QA/QC in an In-house Cannabis Extraction Testing Lab? Automate Processes Using LIMS

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What is the Cannabis Extraction Process?

The most potent compounds are extracted from the plant. These extracts can be used to make edibles, oils, pills, etc.

The 5 Steps:

1. Collecting & Milling
2. Extraction
3. Activation & Decarboxylation
4. Winterization
5. Third Party Testing

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Forms of Cannabis Extracts or Concentrates

CRUMBLE
Dried oil with a honey-comb like consistency

BADDER/BUDDER
Concentrates whipped under heat to create a cake-batter like texture

SHATTER
A translucent, brittle, & often golden to amber colored concentrate made with a solvent

DISTILLATE
Refined cannabinoid oil that is typically free of taste, smell & flavor. It is the base of most edibles and vape cartridges

CRYSTALLINE
Isolated cannabinoids in their pure crystal structure

DRY SIFT
Ground cannabis filtered with screens leaving behind complete trichome glands. The end-product is also referred to as kief

ROSIN
End product of cannabis flower being squeezed under heat and pressure

BUBBLE HASH
Uses water, ice, and mesh screens to pull out whole trichomes into a paste-like consistency

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Methods for Consuming Extracts

Cannabis extracts have multiple uses and benefits and may be consumed in different ways depending on the indication and purpose.

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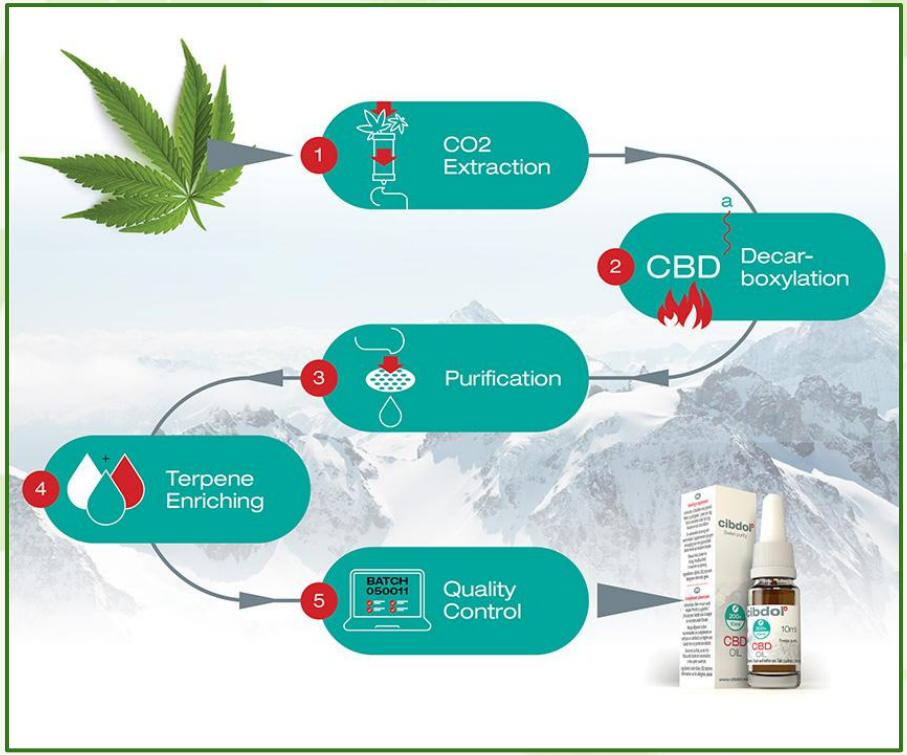
Cannabis Extracts/Products Undergo 3rd Party Testing

A Colorado-based CBD products manufacturer decided to send its extracts to a 3rd party testing lab for quality analysis.



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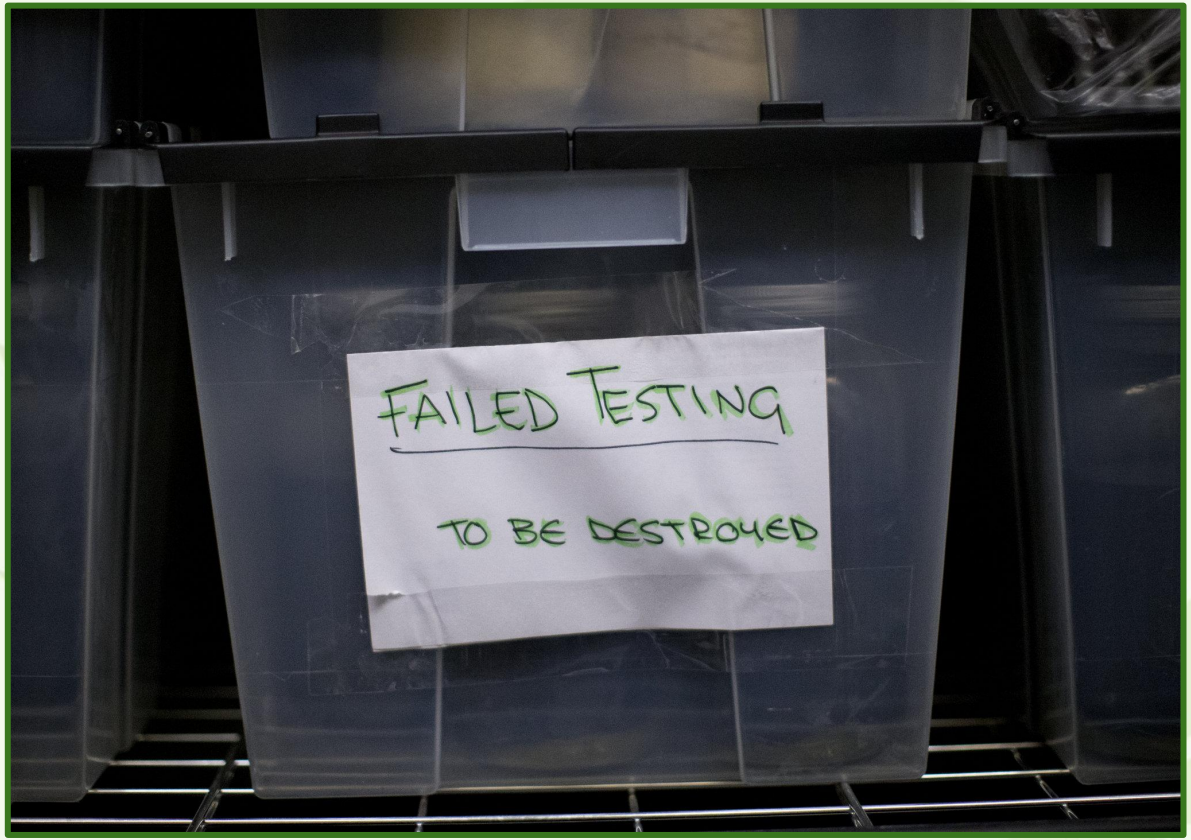
And What if the Test Results Failed...



Certificates of Analysis Received	Tested Batches	Failed Batches
10,695	10, 695	1,904

Tested Batches By Category	Tested Batches	Failed Batches By Category
Flower:	5,355	567
Inhalable (cartridges, waxes, etc.):	3,361	686
Other (edibles, tinctures, topicals, etc.):	1,979	651
Total:	10,695	1,904

*Reasons For Failure	Failed Batches By Category
Label Claims:	1,279
Pesticides:	403
Microbial Impurities:	114
Residual Solvents:	99
Homogeneity:	25
Foreign Material:	6
Moisture:	36
Total:	1,962

Re-extraction ~ A Real Problem

Rejection of extracts by a 3rd party lab causes

- Re-extraction costs
- Delay in product delivery
- Loss of customers and revenue

3rd party testing disadvantages over in-house

- Time delays (as you await the results)
- Higher costs for all tests
- Lab backlog - During crunch times such as regulatory changes, back of queue
- GMP intermediate step testing

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The Benefit In-turn??

#1

So, setting up an in-house testing lab can save you from the re-extraction costs and results come back faster!

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Another Application of Cannabis Extraction

R&D, New formulations, or Reformulating

Process enables cannabis brands and manufacturers to formulate products for targeted physiological responses and delivers consistent experiences for consumers time after time.

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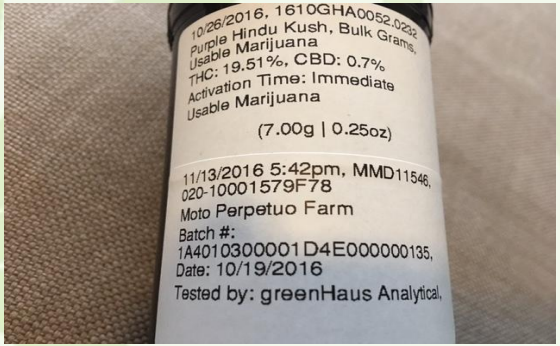
Formulation or Reformulation Requires Testing

Manufacture of cannabis dosage formulations

Avoid false claims of cannabis product reformulations



Meet label accuracy standards

Avoid patient risk of adverse effects

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Examples of Reformulation

Linalool, a terpene also found in lavender, provides anti-anxiety effects.
α-Pinene, which is also produced in rosemary, can be invigorating and lead to mental alertness.

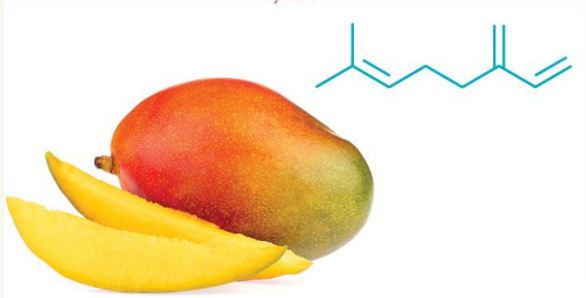
α-Bisabolol

Aromas and flavors: Coconut, fruity, nutty
Health effects: Antibacterial, anti-inflammatory

Linalool

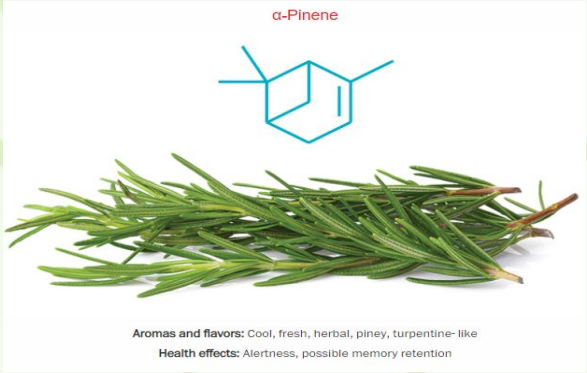
Aromas and flavors: Floral, rose, woody
Health effects: Antianxiety, sedative

Myrcene



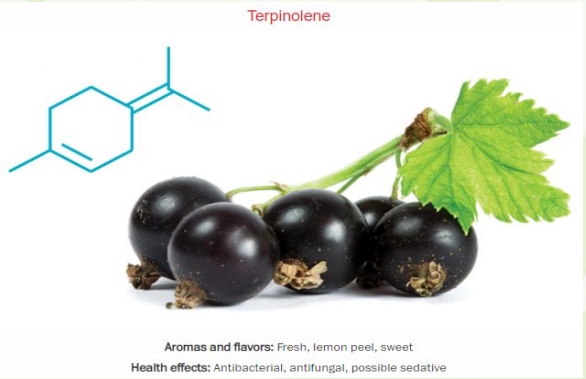
Aromas and flavors: Celery-like, herbaceous, turpentine- like, woody
Health effects: Analgesic, sedative, relaxing

α-Pinene

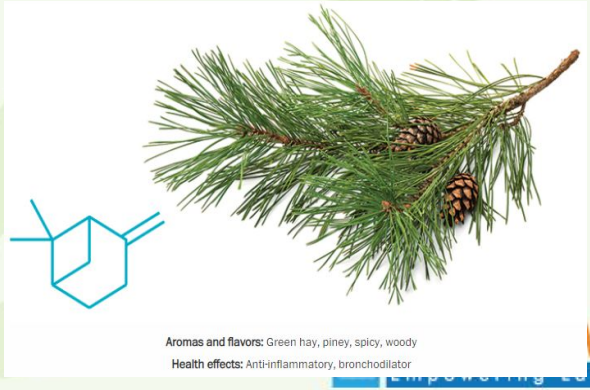


Aromas and flavors: Cool, fresh, herbal, piney, turpentine- like
Health effects: Alertness, possible memory retention

Terpinolene



Aromas and flavors: Fresh, lemon peel, sweet
Health effects: Antibacterial, antifungal, possible sedative



Aromas and flavors: Green hay, piney, spicy, woody
Health effects: Anti-inflammatory, bronchodilator

The Benefit In-turn??

#2

Scientific formulation offers the following benefits:

Optimized cannabinoid profiles
Consistent dosing and formulations
Rapid onset of action
Metabolic predictability
Improved safety and effectiveness

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Good Manufacturing Practices ~ The Requirements

"Whether you're growing or extracting, do it the right way...!"

- Defined standard operating procedures to establish controlled and consistent performance
- Prompt and accurate documentation of work for compliance and traceability
- Properly maintain facility and equipment
- Define, develop and prove job competency

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The Benefit In-turn??

#3

Higher yields
Better product consistency
Reduced liability

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Benefits of an In-house Testing Lab

Extraction

- Determine true potency of flower going into extractions
- Determine true extraction efficiency with these numbers
- Determine potency of crude oil right out of the extraction

Post Processing

- Determine in REAL TIME where a product is in the decarboxylation process
- Determine potency after various processes: short path distillation, rotovap, etc.
- Track the progression of post processing potency
- Determine where and when CBN is being produced

Formulation

- Determine starting concentration of oil to be formulated in REAL TIME without waiting days for test results.
- Make real time adjustments to final formulations
- Ensure consistent and accurate potency is met with each final product

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What's Next?

Extraction labs decide to open an in-house testing lab to first test the extracts and products themselves, and then forward the sample to another testing laboratory to verify it's safety and effectiveness.

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How Does a LIMS Help??

Quality Assurance

- Ensuring data integrity
- Following internal quality auditing practices

Quality Control

- Ensuring the quality of the cannabis sample
- Ensuring maintenance and calibration of testing equipment used
- Following good documentation and record-keeping practices by laboratory personnel
- Following Good Manufacturing Practices (GMP) to ensure products are consistently produced through controlled processes according to quality standards

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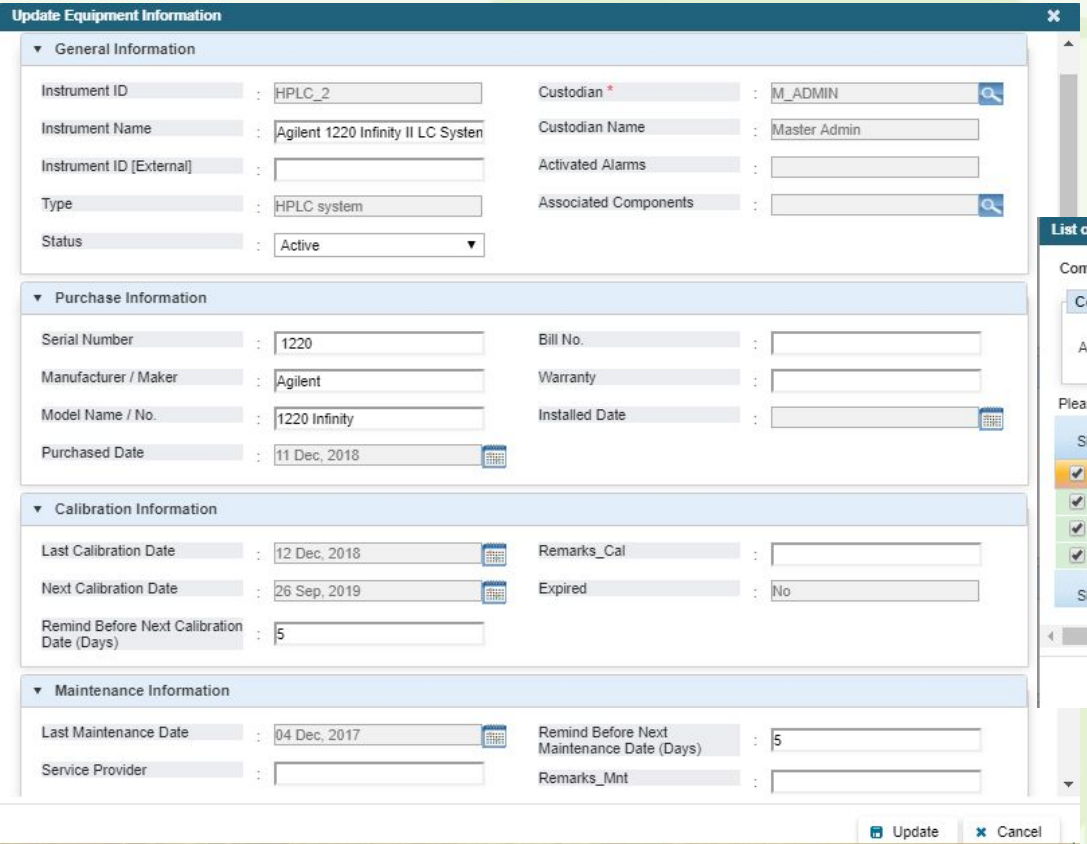
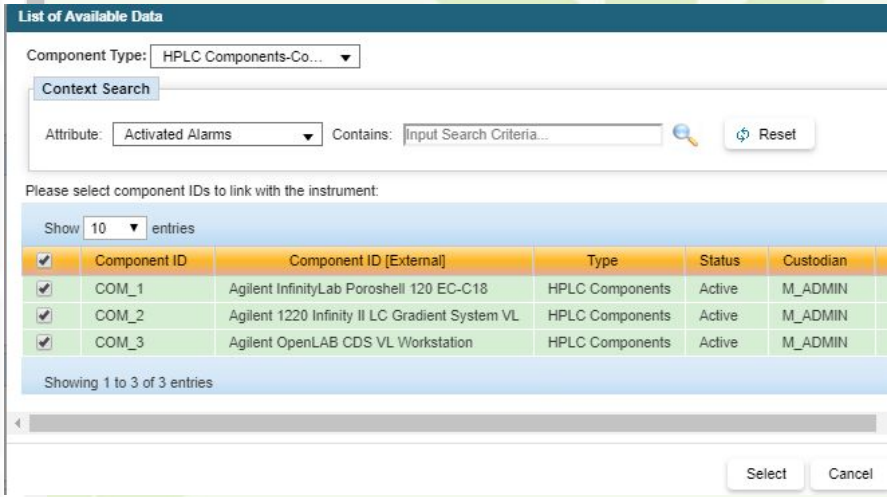
Equipment: Instrument Calibration and Maintenance

Track your equipment and its components along with calibration status





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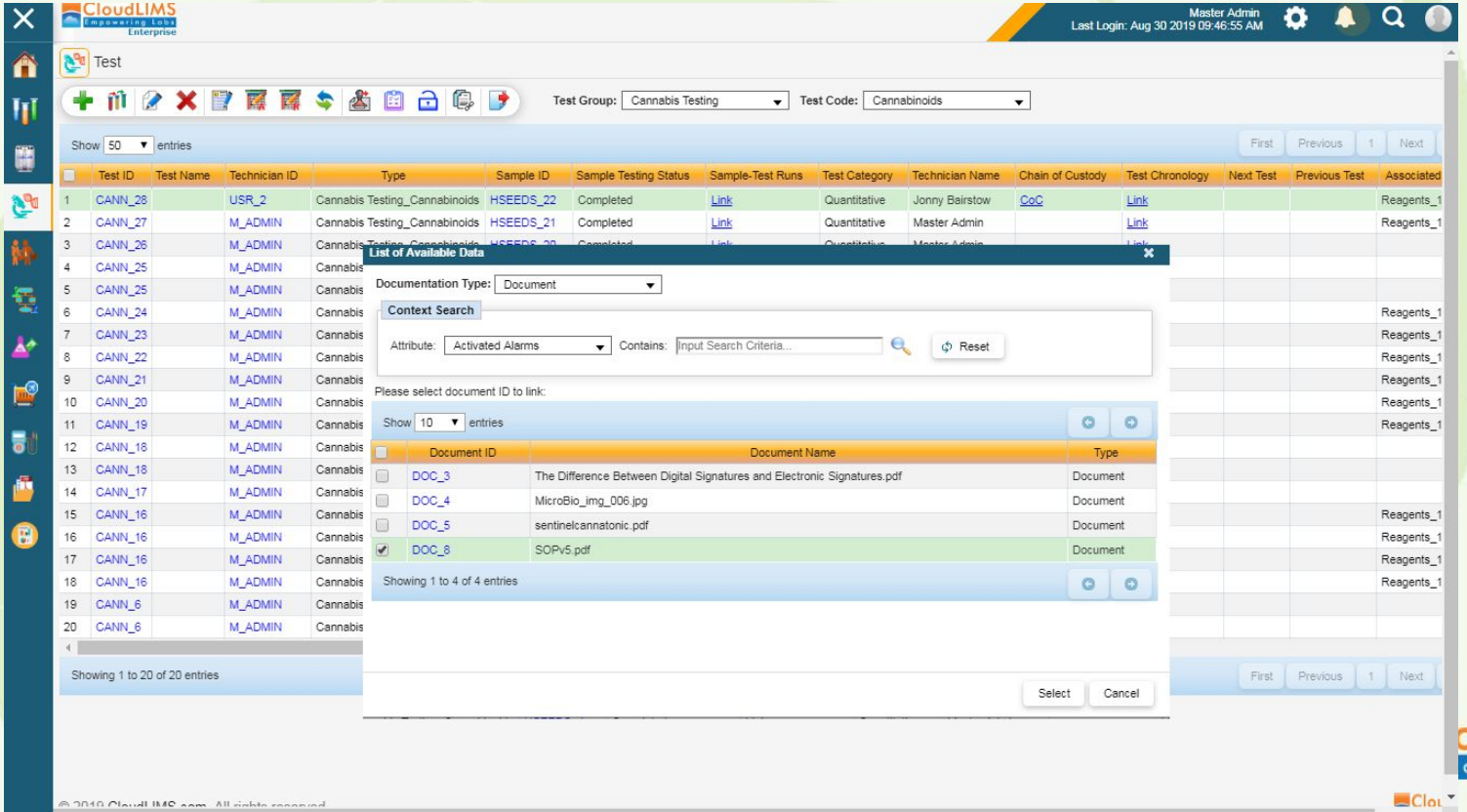
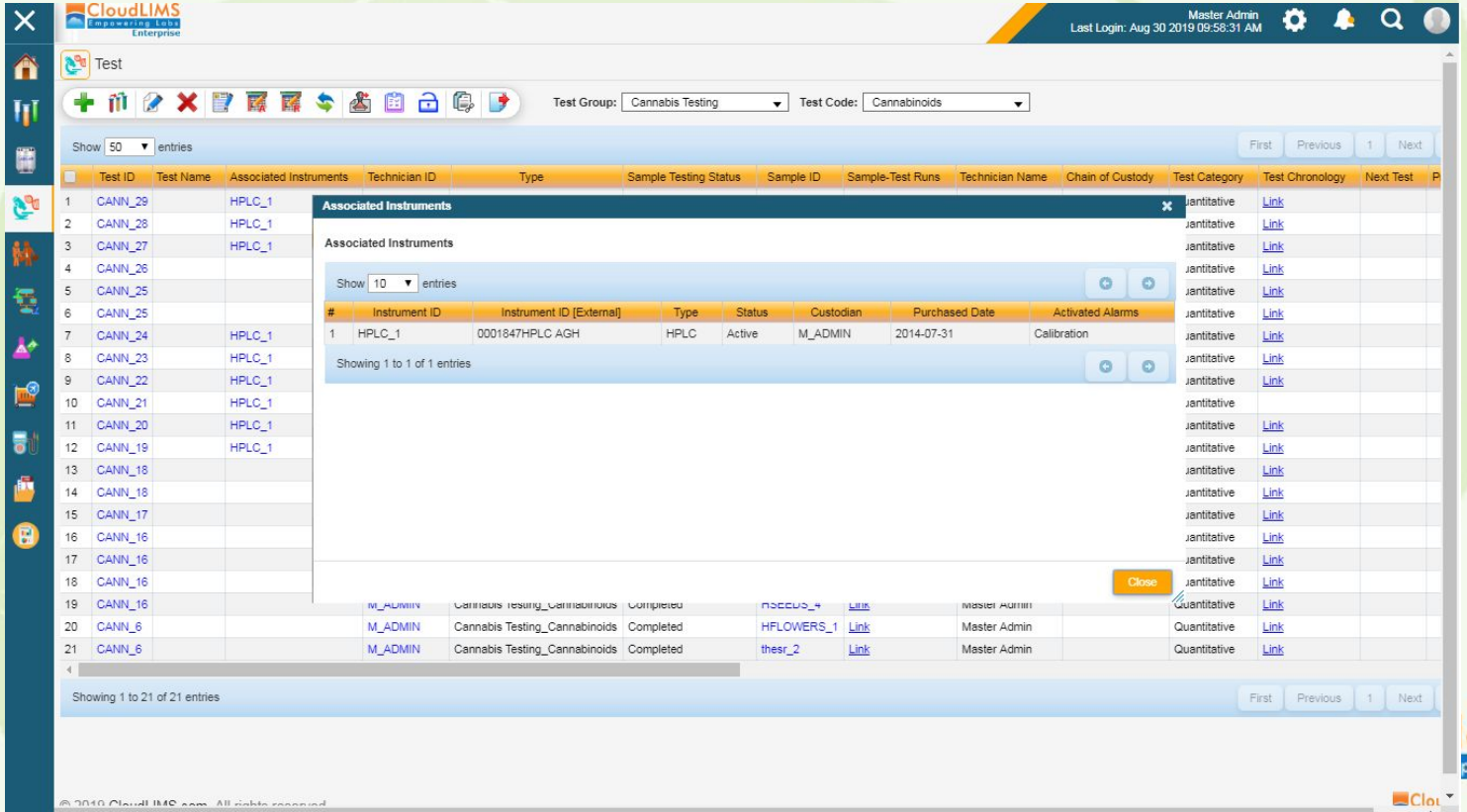
Test and Calibration Methods: Associating Docs

Easily access the appropriate instructions for operation, handling of instruments and testing samples to ensure the personnel is using only latest/compliant methods



Associated Instruments: Testing the Quality of Results

At the time of association of an instrument with a test, indicate that the instrument was properly calibrated before test was conducted



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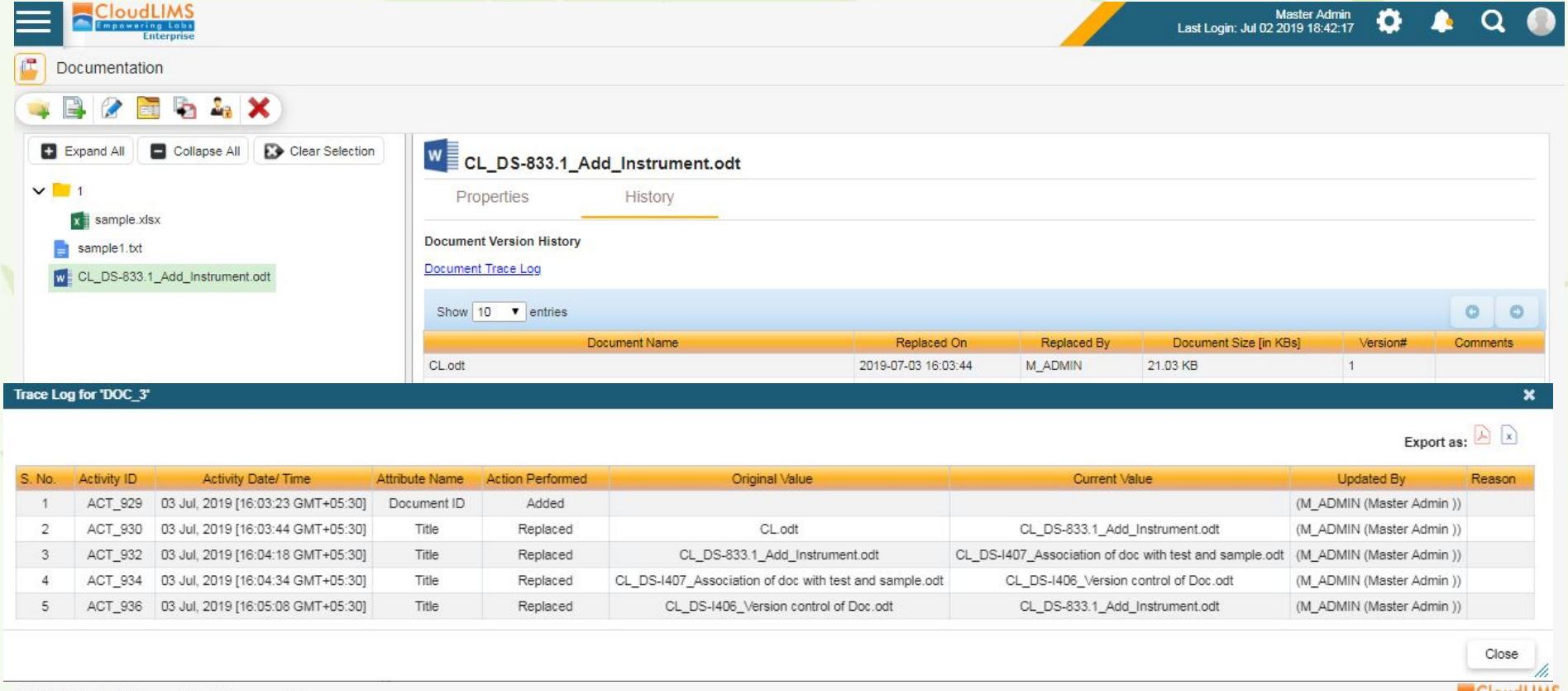
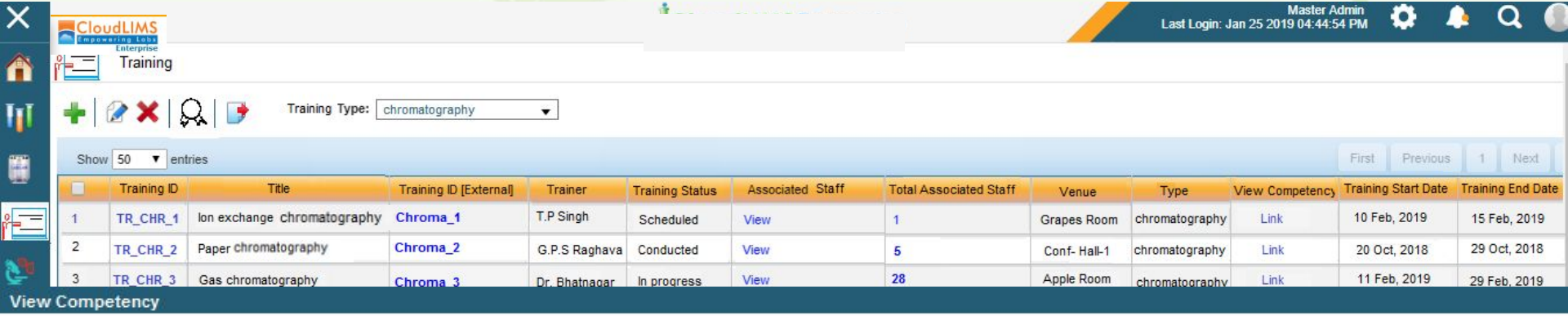
Manage Documents with LIMS

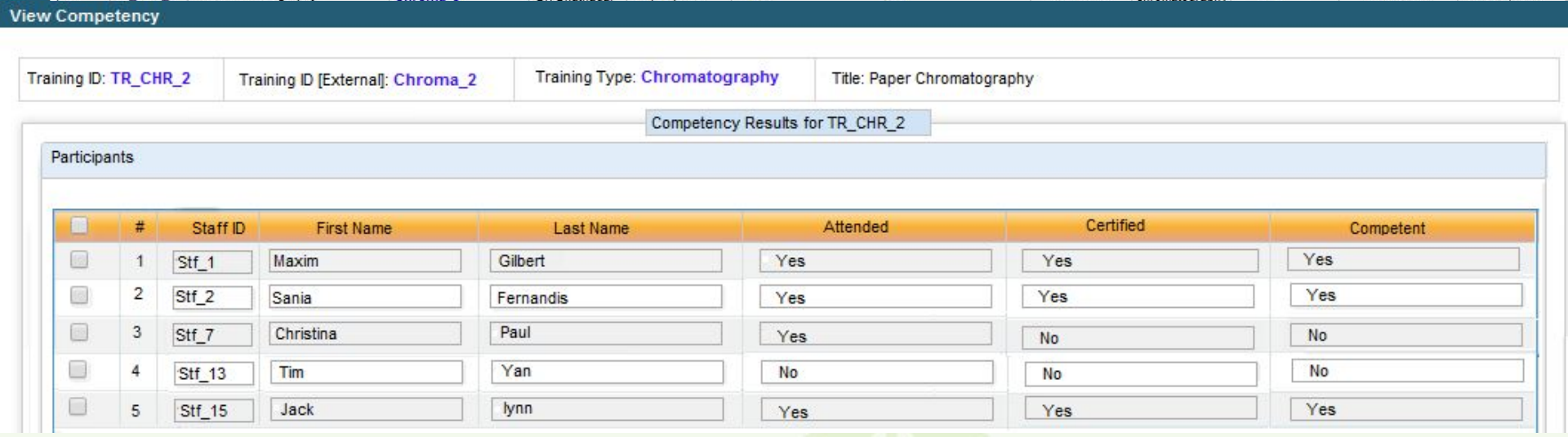
Maintain and track all SOPs



Manage Staff and Training with LIMS

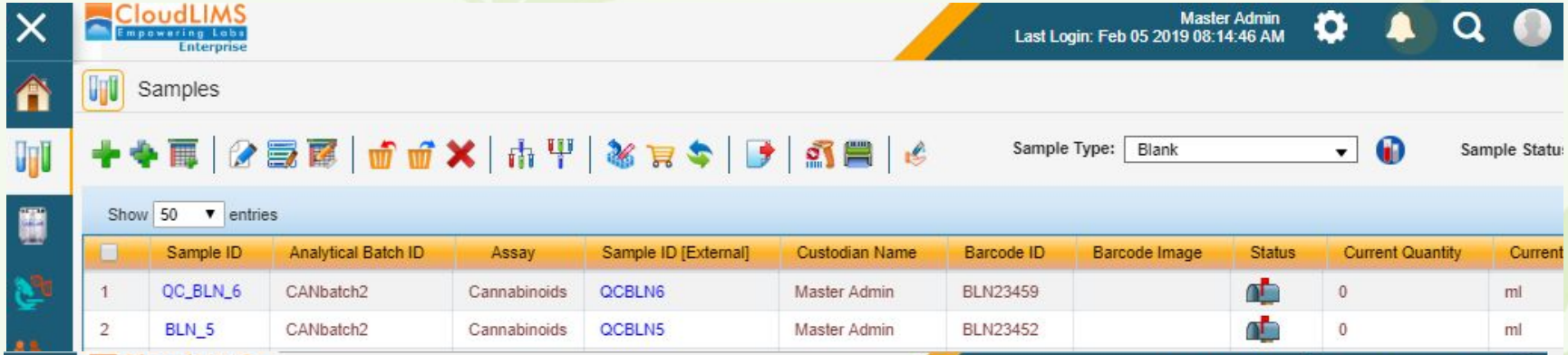
Manage staff and training records, and mark their competency

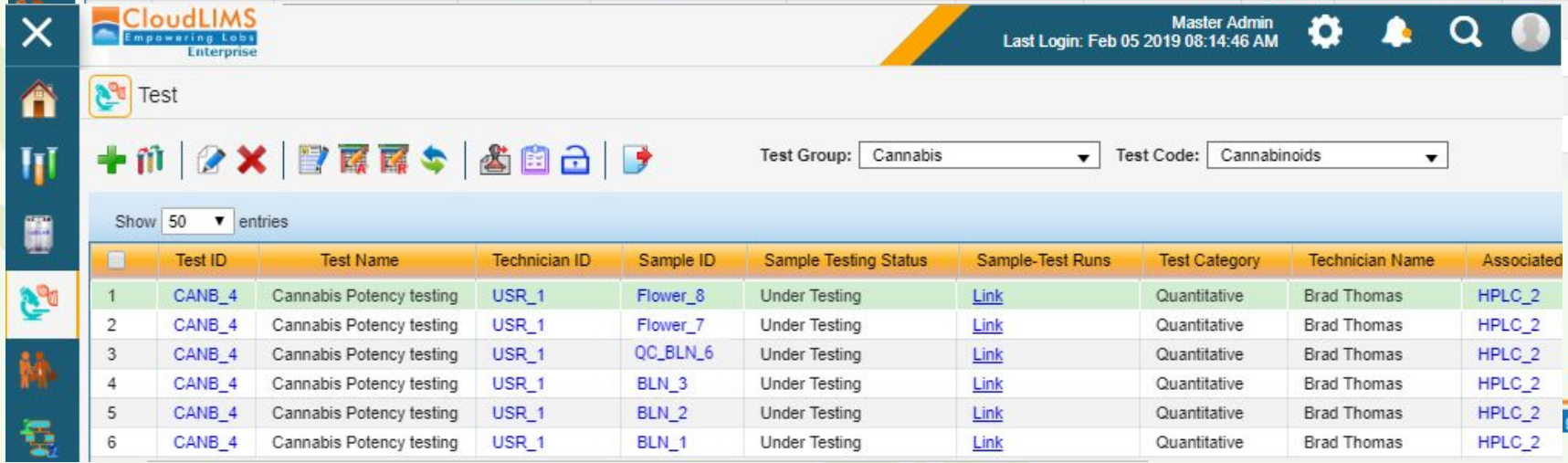




Manage Quality Control Samples With LIMS

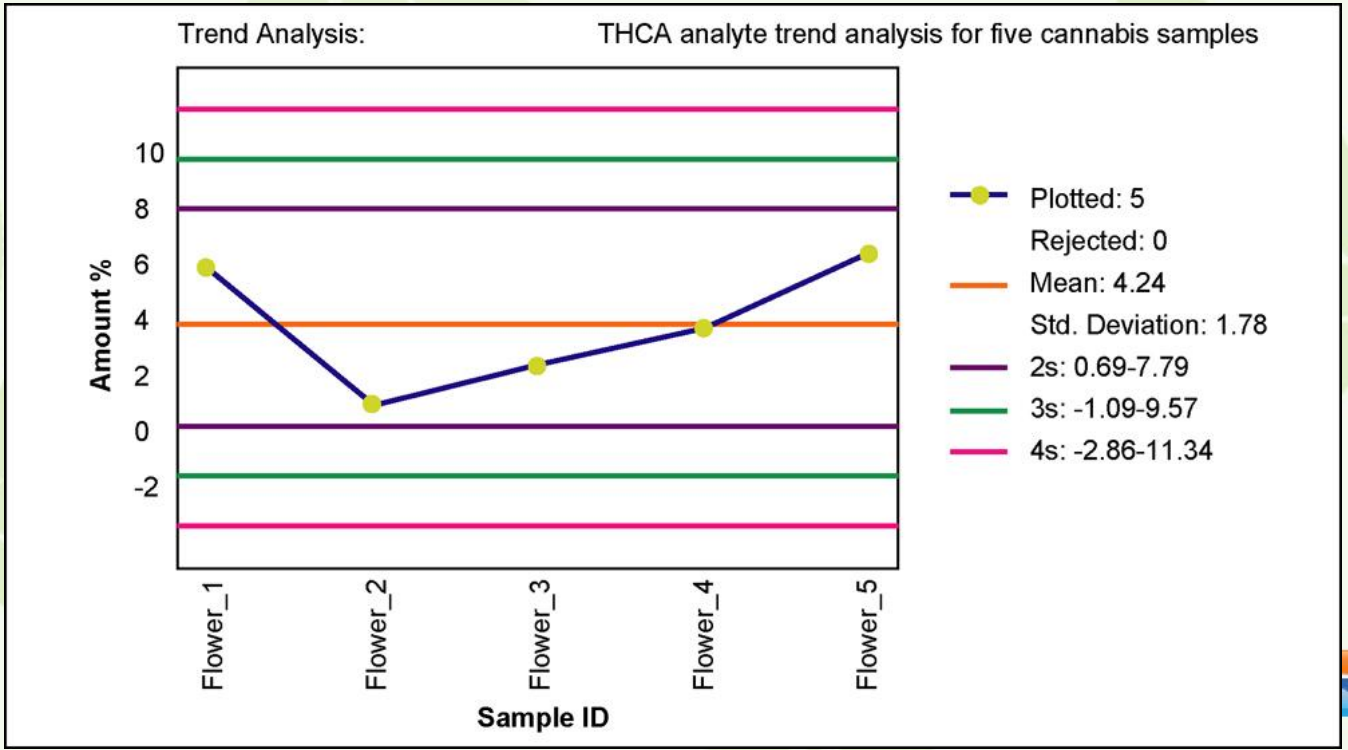
Manage quality control samples for traceability





Trend Analysis

Trend analysis enables a laboratory to monitor variation in results and take corrective actions. You can compare the result of an analyte tested for multiple samples with your QC samples over a specified period.



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Trend Analysis ~ Benefits to Your Lab

- Enable optimization of extraction process for higher yields with maximum throughput
- Visualize GMP based consistency in product potency, CBD/terpene profile, and other factors
- Provides a detailed overview of performance to laboratory and help take corrective actions

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LIMS Benefits

RESULTS
ACCURACY

PRODUCTIVITY

QUALITY

LOWER COSTS

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Finally, the Extraction Lab Is Happy!

- Observes a reduction in compliance failures
- High throughput and higher yields
- Wider product range through reformulation
- Reputation for consistency among customers

Thank You!

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