

Fall 2023 Round Summary

We are pleased to present the findings from the 19th iteration of The Emerald Test™ Inter-Laboratory Comparison Proficiency Test (ILC/PT) program, which is specifically tailored to the analytical needs of the cannabis and hemp testing sectors. Initiated in 2014, Emerald Scientific has reliably executed biannual PTs in collaboration with ISO 17043 accredited manufacturers each year.

Marking a decade of continuous service, The Emerald Test™ has progressively expanded its repertoire of testing matrices, providing laboratories, manufacturing entities, government bodies, and regulatory authorities with a platform to validate and showcase their analytical prowess. Our initiative is to bolster analytical proficiency and accountability, thereby setting a benchmark in the industry for cannabis and hemp assay validations and offering critical data analysis pertinent to each participant's quality assurance protocols.

The data summarized here reflects the efforts of The Emerald Test™ team, our expert Advisory Panel, and the program's participants, to elevate methodological accuracy and promote robust scientific inquiry, thus ensuring product safety as participants continue improving methods and practices while promoting good science and accurate product information to enhance consumer safety and understanding.

Fall 2023 Test Updates

Results from the proficiency test were reported directly to the assigned ISO 17043 accredited provider as determined by the corresponding Manufacturer A or B. The majority of PTs were available in a matrix typically encountered within commercial engagements facilitating realistic testing scenarios. The addition of cannabinoid analytes such as Delta 8 Tetrahydrocannabinol, and the broadened scope of existing assays, underscores our commitment to adapt and introduce novel testing paradigms in response to the industry's evolving demands. Future rounds of The Emerald Test™ will integrate further analytes, matrices, and sample volumes to align with the sector's growth trajectory.

This session we introduced our first non-cannabis assay assessing tryptamines in a mycological matrix. Although participation was limited, the insights gleaned will inform and support the testing needs of this growth industry currently thriving in multiple markets. The academic and independent researcher communities stand to gain

substantial knowledge in this area of study. We anticipate heightened engagement in subsequent testing iterations to ascertain product quality and dosing precision, with quality assurance advancements being pivotal for the market's safety and stability.

All Emerald Badge awards are based on the recommendation of the ISO accredited manufacturer with guidance from The Emerald Test™ Advisory Panel. Discrepancies or issues specific to a particular PT will be meticulously evaluated on an individual basis.

Testing Facility Participation Overview Fall 2023

Fall 2023 enrollment saw participation from 91 analytical laboratories specializing in cannabis and hemp, representing a diverse geographical spread across 26 U.S. states and six international jurisdictions. Notably, there has been a substantial uptick in international engagement, with marked increases from Europe, South America, and Asia, reflecting a global commitment to standardized testing protocols.

It is of particular interest that, despite some laboratories not submitting their results, the proficiency tests administered led to the issuance of 362 Emerald Badges, correlating to an overall pass rate of 77%. This statistic underscores a trend where laboratories are not only partaking in a broader array of tests but are also successfully quantifying a wider spectrum of analytes across various sample matrices.

This iteration of the Emerald Test has continued to illustrate a widening in the scope of entities utilizing the program. International governmental bodies are now participating alongside U.S. regulatory agencies, equipment manufacturers, method developers, cultivators, extraction operatives, and producers of consumer goods. This signifies a growing recognition of the intrinsic value of rigorous scientific practices across the entirety of the product lifecycle, from cultivation to consumer.

PT Manufacturer Reports

Manufacturer A

A total of 78 laboratories (down from 98 in the 2023 Spring round) participated using a variety of methods including HPLC, GC, and ICP.

Evaluations of 2411 (down from 2601 in the 2023 Spring round) yielded a combined 82% acceptance (down from 86% in the 2023 Spring round). Not all labs tested every parameter.

Production uncertainties were less than 0.5% of the stated assigned values. Both homogeneity and stability were valid throughout the study.

Part 38786 Tryptamine PT (mushroom matrix) only had 3 labs purchase and submit data. Also new to this study was Part 38513 Florida Pesticide PT in Hemp Bud which performed in line with previous Absolute Grade PT results. In general, any deviations in PT results from historical results would be owed to variables such as participants, components reported, or other non-related assigned value activity.

Individual results were supplied in PDF and sent directly to the laboratory and their licensing, regulatory entity or ISO AB as requested by the laboratory. Two labs did inquire about the appeal process, both were not valid and thus not elevated to a formal appeal.

One inquiry related to Part 38786 Tryptamine PT (mushroom matrix). Stability was questioned and resolved to the customers satisfaction as Absolute shipped replacements to demonstrate that stable assigned values were maintained from CT to OR. Both customer and supplier are interested in future performance of this PT as it is still considered experimental until more data can be assessed. Absolute did discuss with the lab that a best practice approach would be to assay new sample designs as soon as they are received and thus minimizing any questions due to stability. We trust a full analysis of this study will assist each laboratory in their quality objectives.

Manufacturer B

Overall participation in most samples decreased by ~59% as compared to the Spring 2023 round.

A total of 11 samples were offered in this study. The samples were prepared and validated internally and confirmed fit for intended purpose prior to study open. Samples were confirmed stable throughout the study.

All quantitative samples were evaluated using robust statistical protocol; EPA Bi-weight.

Quantitative Microbiology: Quantitative Chemistry (Pesticides) Qualitative Microbiology Panels

z<3 after log transform

z<2 with 10%/110% defaults 99.6% Correct

The PT round generated in aggregate 894 data points yielding a combined 97.8% acceptance rate compared to historical 93.0% acceptance rate.

Conclusion and Forward Outlook for The Emerald Test™

The 2023 Spring round of The Emerald Test™ observed a contraction in overall enrollment figures, a trend that mirrors broader industry dynamics including laboratory closures and sector-wide challenges. However, this downturn was partially mitigated by

an increased demand for Quick Turn Assessments and Express PTs, which cater to specialized requirements for timeliness, specific analyte requirements, and test design. The annual engagement comprised 148 distinct entities spanning 33 states and 10 countries, indicating a sustained, diverse interest in the program.

The Emerald Test™ ILC/PT program is distinguished by its governance through an advisory panel comprised of chemists, accreditation experts, laboratory proprietors, and industry luminaries. This structure ensures the program remains congruent with the evolving needs and technical capabilities of the industry while upholding its foundational principles of integrity and impartiality. As we proceed, there is a concerted plan to enhance the breadth of our advisory panel, reinforcing the inclusion of a wide range of perspectives from the scientific domain. The aim is to harness the collective expertise of our panelists to further refine and advance The Emerald Test™ program.

With an orientation towards progressive development, our ambition is to augment the suite of tests on offer and to collaborate closely with our manufacturing partners to conceive and implement new testing paradigms that are relevant to the various regulated markets we cater to. The next iteration of The Emerald Test™ ILC/PT is slated to commence enrollment on the 5th of February 2024.

We extend our sincere gratitude to our collaborators within the cannabis and hemp community for their unwavering engagement and support. The enduring participation of numerous laboratories in both the spring and autumn rounds is a testament to their dedication to quality control, adherence to regulatory frameworks, and commitment to consumer protection. This cooperative spirit, characterized by transparent communication and shared expertise, amplifies our collective knowledge, and propels us towards sustained accomplishments for all stakeholders.

Regards,

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