Cannabis Supply Chain Solutions.  
The Future is Finally Here.
TCSI and its team of certified professionals work closely with the clients to meet all MMPR LP regulations and customizes the clients Operational Procedures, Quality Assurance programs, Security Designs & Site Plans, Standard Operating Procedures (SOPs), Corporate Requirements, Record Keeping, Notification Letters, Security Clearance Documents plus Activities and Substances to be specified on the Licence.

Needs assessments to qualify your company to become a Licensed Producer (LP), Expertise in Quality Assurance, Security, Research and Development, Management Services, Record Keeping, Business Strategies all in a “living and evolving” business plan.

TCSI has a professional team of specialists including Environmental Consultant (Specializing in Quality Assurance), Security Design Specialist, Laboratory, Record Keeping, Accountant Firm, Lawyer, Medical Professionals, Doctors, Pharmacists, Trades, Insurance Brokers, Clone Bank, and a Government Liaison Specialist, all Representing the Medical Marihuana and Cannabis Industry.

We provide a consultation framework offering a network of resources via individualized services.

- Needs Assessments to Qualify your Company to become an LP under MMPR
- Expertise in Research and Development - Management Services - Business Plans
- Business Strategies all in a “living and evolving” business plan.

**FINANCIAL**
- Insurance
- Mortgages
- Real Estate
- Business Advisors
- Internet Specialists
- Accountants
- Book Keepers
- Tax Advisors
- Marketing & Sales
- Financial Planners
- Investment

**MEDICAL**
- Patients
- Doctors
- Specialists
- Researchers
- Developers
- Pharmacists
- Clinics (Chiropractors)
- Clinics (Massage, Reiki)
- Clinics (Acupuncture)
- Wellness Centres
- Therapists

**TRADES**
- Contractors
- Engineers
- Architects
- Builders
- Lawyers
- Suppliers
- Security Advisors
- Fire Safety
- Horticulturists
- Organic Prod.
- Designers

Contact Our Offices and Book Your Appointment Today for a Personal Presentation

John@TrichomeConsultingServices.com Ph: 250-575-4725 admin@TrichomeConsultingServices.com

“Our mission is to create a medically legal corporate business environment”
About TRiQ

Whole System Solutions for the Cannabis Supply Chain

TRiQ Benefits

• 60 Years Combined Cannabis Industry Experience
• Cutting-Edge Software, Equipment and Consulting Provides All-Inclusive Supply Chain Solutions

What is TRiQ?

TRiQ (pronounced “trike”) stands for Trichome Intelligence. Trichome Intelligence is the deep understanding of the cannabis trichome’s delicate nature. Through this understanding, we developed lean production methods that offer customers advanced cannabis operational processes, software and equipment to maximize product quality. Strict regulations and traceability are two reasons cannabis operations will want to adopt lean production methods to save cost, time, and improve efficiency.

Why choose TRiQ?

TRiQ is the leading cannabis supply chain solution provider for the worldwide legal cannabis industry. We provide commercial marijuana growing technologies and support for each phase along the product life cycle to enhance our customers’ quality and efficiency.

Visit TRiqSystems.com or call an expert consultant at 250-575-4725 to learn more about cannabis cultivation solutions for both small and large farming enterprises. Browse our different cannabis growing software suites, and learn more about how consulting services can bring decades of experience in cannabis cultivation to your farm.
Full Canopy System
This first-of-its-kind, innovative greenhouse system was developed by TRiQ Development Alliance. It consists of a balanced hoist gutter system that optimizes the use of space, energy, labor and more. No more rows, it’s a full canopy without spaces.

Automated Systems
When automated systems and mechanization are integrated with TRiQsoft software, you have a lean process that greatly reduces labor cost and allows for the management of much larger greenhouse operations. Environmental controls that maintain a low humidity level and a blackout fabric curtain system, helps growers to maximize crop yields, achieve considerable savings on water and fertilizer costs, save energy, and at the same time meet industry regulations.

Bio-Security
MaiaCulture tissue culturing and TRiQ expert consulting can help your cannabis operation establish best practices to prevent contamination of growing plants and all product materials from pests, disease, and human and general environmental pathogens.
Drying technology
The CannTrol Vulcan50 cannabis drying machine kills up to 99% of mold and automates the drying process with TRiQsoft Cultivation and Processing software integration. Combined with the TRiQ carts, greenhouse productivity is increased, and worker strain and labor time reduced.

Serialized Bins
Coming soon. Improve your facility with serialized bins tracked by TRiQsoft. Optimize and standardize curing, defer processing and store raw and finished materials in bulk with shelf-life stability.

Testing & Extraction
TRiQsoft software integrates with the TriQoptiq in-house cannabis analyzer for compliance, KPI analysis and standardization via internal quality assurance. TRiQsoft integrates with Supercritical CO2 extractors to give you automated extraction.
Greenhouses Are the Future of Cannabis Cultivation.

Greenhouse businesses are growing cannabis product of same or better quality than indoor grown. Larssen LTD and TRiQ Inc. offers the world’s most advanced cannabis production and processing facilities—producing higher yields, lower costs and higher quality.
Groundbreaking Design

Larssen LTD, a greenhouse industry engineering company based in Denmark and Canada, has partnered with TRiQ, Inc. to offer worldwide cannabis greenhouse construction, expansion and renovation. Larssen LTD’s professional technical consultants offer more than 20 years’ experience.

TRiQ Development Alliance

TRiQ Inc., Larssen LTD and Mountain High Greenhouse Construction LLC have formed the TRiQ Development Alliance to build, design, engineer and outfit state-of-the-art cannabis production and processing facilities. Larssen LTD is a Danish company whose professional engineers have 25+ years experience in the greenhouse industry and have spearheaded greenhouse projects on four different continents. Mountain High Greenhouse Construction LLC is a U.S. company whose 25 years of success in greenhouse construction spans the globe. Together, this dynamic team offers the most technologically-advanced greenhouses in the world.

State of the Art Facilities

TRiQ Inc. will apply 60 years combined legal cannabis industry experience to the design in collaboration with Larssen’s engineering knowledge by interfacing with the client and managing the process, including applying TRiQ’s whole system solution philosophy to the design, optimization of business processes and integration of supporting equipment, systems and software.

If you are a commercial cannabis grower ready to explore a production system that will lower operating costs and increase profits, visit TRiQSystems.com or call us at 250-575-4725. We will design and engineer a cutting-edge greenhouse grow system to meet your needs.
CannTrol Vulcan50

Introducing the World’s First Intelligent Cannabis Drying Machine.

CannTrol Vulcan50 Benefits

- Kills up to 99% of Molds, Including Aspergillus, Botyrtis & More
- Automates and Optimizes Cannabis Drying Processes
- TRIQsoft Integrated for Data Capture & Batch Analysis
What is the CannTrol Vulcan50?

CannTrol Vulcan50 is the world’s first cannabis drying technology. Its components consist of heating, cooling, drying, venting and humidifying capacities. It can dry approximately 50 lbs of dry material and approximately 250 lbs of wet material in 7-10 days. Best of all, it’s fully automated to run customizable drying schedules. It comes pre-configured with a cannabis drying schedule that can kill 99.9% of molds. Fully integrated with TRiQsoft Cultivation and Processing software, the CannTrol Vulcan50 can be run via the cloud from anywhere in the world with an internet connection. You can receive email alerts regarding the drying process. Dry phase data points are all stored in your software license.

Why Choose the CannTrol Vulcan50?

By standardizing the drying process, you get consistent quality and more efficient operations. Save time by tracking the machine’s performance and the data from each batch of a varietal in TRiQsoft remotely. Prevent costly recalls from failed microbial tests by killing harmful molds.

TRiQsoft Integration

TRiQsoft integration allows automation of equipment like the CannTrol Vulcan50. Our philosophy at TRiQ is based on the vision of a whole system solution for our clients. We build, program, and identify only the best of solutions and integrate them via programmable logic controllers (PLCs) and application programming interfaces (APIs). The result—a technologically optimized business solution. See the integration pages for more information.

Learn more about the CannTrol Vulcan50 at TRiQSystems.com or call us at 250-575-4725 to find out how this automated drying system can benefit your farming enterprise.
Cultivation and Processing Management Software for the Cannabis Industry

TRiQsoft Benefits

- Only Food Grade Traceability
- Only Cannabis Production Business Management Software for Cultivation, Processing and Manufacturing
- Integrates with Leading Production Equipment Solutions
- **FREE** Unlimited Basic Support, Software Updates, Basic Configuration and Training

TRiQsoft, the leading cannabis industry software solution, is compliant with Washington State’s strict regulations and traceability requirements and is MMPR compliant with Canada and most world territories.
What is TRiQsoft?

TRiQsoft is the most powerful cannabis production software in the world born of a partnership between FarmSoft and TRiQ Inc. It embodies TRiQ’s 60 years of cannabis business experience and FarmSoft’s years of serving producers of over 100 different agricultural commodities worldwide. Not only is TRiQsoft a compliance software, it’s a cannabis production business management software for Cultivators, Processors and Manufacturers. Most importantly, TRiQsoft gives you:

- Seamless integration with regulatory body software portals, such as Washington State and Colorado, to pass vital compliance data to their database.
- Visibility into your operation with a granularity to understand every cost center in the production process so you can maximize profit and reduce costs.
- Every standard operating procedure, best management practice, recipe or formula can be stored and applied to TRiQsoft’s task-based management system.

Go paperless with TRiQsoft while having all of your sensitive data stored in a centralized location for running reports to analyze key performance indicators (KPIs).

TRiQsoft can be hosted on your computer or our cloud.

Why Choose TRiQsoft?

TRiQsoft concentrates on improving quality, traceability, and cultivator, processor and manufacturer profit. By integrating best practices, international standards, and traceability mechanisms into the solutions, TRiQsoft clients receive improved profit and traceability, and a rapid return on investment. Here’s how:

- Understand your costs of goods down to every penny.
- Analyze data to improve quality and yield.
- Comply with state regulations on traceability.
- Avoid expensive product recall with food-grade level traceability—know precisely which of your products must be recalled rather than recalling the whole crop!

Get an operational advantage over competitors by using TRiQsoft—the most advanced enterprise resource planning software (ERP) on the market.

Learn more at TRiQsystems.com or call a TRiQ cannabis production expert at 250-575-4725 to discuss how TRiQsoft’s software modules can assist you with recording each planting, configuring the lifecycle for varieties, quality control, traceability, and much more.
Superior, rapid quality control testing for your production process

TRiQoptiq™ Benefits

- Most Respected Cannabis Extraction Equipment Manufacturer
- Industrial Grade
- Automated and Integrated with TRiQsoft
What is the TRiQoptiq™?

The TRiQoptiq™ cannabis analyzer from LT Industries and TRiQ is a small and rugged machine designed for use in medical and adult-use cannabis cultivation, processing and manufacturing operations. There are over 400 cannabinoids, and the analyzer can sense any cannabinoid with a concentration of 1mg/mg or greater. Whatever the analytical need – flower, extract, or edible product – the TRiQoptiq™ meets consumer and regulator demand for higher quality, complete testing and accurate product labeling.

Two ways the TRiQoptiq™ helps your cannabis production facility succeed:
1. Internal quality assurance
2. Test strains to ensure they are performing as expected

What it measures:
- D9-Tetrahydrocannabinol (THC)
- C1-Tetrahydrocannabinolic Acid (THCA)
- Cannabidiol (CBD)
- Cannabigerol (CBG)
- Cannabinol (CBN)
- Cannabidiolic Acid (CBDA)
- Moisture
- beta-Caryophyllene
- Linalool
- beta-Myrcene
- D-Limonene

The TRiQoptiq™ can be used as a bench-top or in-process tool. It can measure key cannabis properties rapidly and accurately.

The TRiQoptiq™ is not recommended for mobile testing facilities and dispensaries. It does not test for mold spores or heavy metals.

Why Choose the TRiQoptiq™?

Complicated sampling procedures are a thing of the past. Simply load your sample in the TRiQoptiq™ and press “Enter” on the controlling computer. You’ll receive analytical results in seconds. Full networking capability allows data to be accessed wherever needed. The TRiQoptiq™ user interface provides customized screens, clear result reporting, customizable printed reports, and data-logging.

Save time and money, and maintain critical quality control, with these benefits:
- Remote Access allows for easy support and effortless system updating and calibration.
- TRiQoptiq™ is fully integrated with TRiQsoft to provide for centralized data analysis of strain growth performance and final finished product results.
- Quickly determine your product’s potency, composition and quality.
- Reduce your lab expenses and testing times compared to traditional assays.

Learn more at TRiQsystems.com or call a TRiQ cannabis production expert at 250-575-4725 to explore these or any other products and services comprising our whole system solution.
Tissue Culture Gels designed by our cannabis tissue expert, Bill Carrington

Maia Culture Benefits

- Tested and TRIalled with Cannabis by Experts
- Commercial Orders and Rates
Welcome to the most advanced cannabis growing products on the market.

What is MaiaCulture?

MaiaCulture is the industry’s only cannabis specific tissue culture supplies. Tissue culture is an advanced method of storage and propagating plant genetics under laboratory conditions to grow higher quality cannabis plants in smaller spaces with less water and light – but an even bigger benefit is that it breeds out molds, viruses and more.

Why Choose MaiaCulture?

Genetics can be stored alive safely for decades allowing propagation of identical starts. Tissue culture is superior to cloning and provides many benefits to the cannabis farmer:

- Thousands of plants can be cultured at one time with less money and less space.
- Avoid expensive mother room electrical and labor costs.
- Unlike cloning, tissue culture protects strains from genetic drift.
- Avoid the risk of contaminated mother plants passing pests and disease to their clones.
- Since tissue culturing requires little space, you can easily maintain hundreds of strains.

Tissue culturing gives you these advantages over your competitors:

- Your cannabis plants will hold genetic structure better.
- Tissue cultured plants have more vigor than cuttings.
- Tissue culturing rids genetics of pest and disease so your starts are clean.
- All of these benefits put together can provide for a better yield.
- By protecting your genetic stock, you protect your brand.

Best of all, Maia tissue culturing products integrate with TRiQ’s signature marijuana software, TRiQsoft.

Learn more at TRiQsystems.com or call a TRiQ cannabis production expert at 250-575-4725 to explore these or any other products and services comprising our whole system solution.
Complete Cannabis Nutrients designed by our cannabis nutrition specialists

MaiaGrow is a synthetic and mineral based liquid fertilizer composed of the purest ingredients to allow for rapidly absorbable cannabis plant nutrition. The proprietary blend of minerals and chemicals are formulated specifically for medical cannabis nutrition from propagation through flowering. The formula was designed by Bill Carrington of TRiQ Inc. for the purpose of producing the best possible cannabinoid profiles.

MaiaGrow is not available at garden stores. It is exclusively available through TRiQ and can be drop shipped direct to your facility.

Learn more at TRiQsystems.com or call a TRiQ cannabis nutrition expert at 250-575-4725 to explore these or any other products and services comprising our whole system solution.
Increase Productivity and Reduce Cost and Worker Strain With TRiQcarts

What is The TRiQcart?

Commercial cannabis growers rely on TRiQcarts that increase greenhouse productivity, and reduce worker strain and labor time. Each cart measures 32”W x 44”L x 72”H. When Grade A cannabis is harvested, growers hand trim one foot branches that are hung on the cart hanger bar hooks. The innovative design has hooks spaced an inch apart along the bar and the bar itself slides so that the hanger bars can slide in and out of the cart—making them flexible for any flower size.

The versatile carts have interchangeable hanger bars and screens so that machine harvested Grade B material can be placed on screens in the cart. The screens can be inserted every 6” of cart elevation.

But that’s not all. Harvest crops directly on to carts that serve as the drying infrastructure in your drying chamber.

Why Choose The TRiQcart?

TRiQcarts are the perfect answer to harvesting crops. Quickly move cannabis product using the least amount of labor.

The TRiQcart offers your grow operation many benefits, including:

- Reduce (lean) waste movement and process whilst improving handling to maintain quality.
- Reduce cross contamination of plant pathogens with Grade A flowers at point of harvest.
- Optimize drying chamber space for maximum load and even drying.
- Food-grade and industrial grade.
- Serialized for traceability and compliance with TRiQsoft.
- Carts are adjustable and configurable for various size flower widths and lengths.

Learn more at TRiQsystems.com or call a TRiQ cannabis production expert at 250-575-4725 to learn how harvest carts can provide scalability to your operation.
**BioFlora® Humega®**

Humega when mixed with other fertilizers, complexes fertilizers by attaching them to a carbon molecule. OMRI Listed Humega may aid in the availability of micronutrients. It promotes soil aeration and water penetration by encouraging the flocculation of soil particles and thereby reducing runoff. Nutrients are stabilized in the rhizosphere where they remain available over a longer period of time. The carbon and humus in Humega helps build the soil profile. Humega when mixed with other fertilizers, complexes fertilizers by attaching them to a carbon molecule which then helps increase their absorption rate.

**Organic BioLink® All-Purpose Fertilizer 0-5-5**

Microbial fermentation and enzyme hydrolysis are used to manufacture these fine liquid fertilizers. Nutrients in these liquids are organically complexed. Both are labeled for most crops including trees, vegetable and nursery plants. May be applied through drip irrigation. 0-5-5 is derived from mined rock phosphatel and potassium sulfate. Use to correct phosphorus and/or potassium problems where nitrogen is not recommended. Phosphorus and potassium in this are completely water-soluble.

**Organic BioLink® Food Web Activator 1-0-0**


**Bio S.I.™ Ag SELECT Beneficial Soil Microbes & Mycorrhizae**

A soil inoculant with a broad and diverse spectrum of naturally occurring beneficial microbes and Mycorrhizae for rebuilding the soil. Bio S.I. Ag SELECT will bring your entire farm to a more productive, vigorous and balanced state. This leads to the use of fewer chemicals, less fertilizer and better utilization of soil nutrients and water.
Bridgewell Resources® Archipelago Bat Guano 0-7-0
A natural organic Phosphate fertilizer (0-7-0) sustainably mined from caves in Indonesia, fossilized bat guano has a long and successful history as a natural source of phosphate, calcium and iron. Guano can be applied by incorporating into soil, compost or potting mixes. It can be brewed to a tea or mixed with water to make a foliar spray, which can be applied directly to the soil under drip lines (some precipitants remain in solution).

Native Nutrients™ Fish On! 2-4-.2
Fish On! 2-4-0.2 is the finest, most potent, liquid organic fish fertilizer produced in the Pacific Northwest. Processed in a state of the art facility located just a few miles from local fisheries in the Coos Bay, Oregon area. All processing equipment is new and able to process and use 100% of the fresh fish carcasses received on a daily basis from the local fish processing industry.

Prime Dirt N-Texx® Soil Inoculant with Humus
A liquid bio-soil enhancer containing microbes formulated to enhance microbial activity in the soil, increase nutrient uptake of the plant, develop greater root mass, and improve water infiltration. Enhances fertilizer program by increasing plant nutrient uptake. Reduces crusting of topsoil while increasing root mass growth.

AG Products™ Pure Protien Dry™ Primo Aminos™
A powerful organic fish fertilizer containing amino acids and beneficial enzymes. It is a complete nutrient for plants and microbes with 15-1-1 (15% nitrogen content), high PPM (parts per million) of iron and zinc, rich macro- and micro-nutrients and beneficial microorganisms, and the highest amino acid profile (> 80%) of any organic fertilizer on the market.

Source to Source Foundation 21 & Pound It
Foundation 21 - A blend of amino and organic acids in a humic acid base solution. Apply to improve fertilizer efficiency through increased root growth affected by feeding rhizosphere specific bacteria which product plant growth stimulating phytohormones. Pound It - A blend of low molecular weight humic acids and high quality water soluble seaweed extract. Designed to improve nutrient uptake, support root growth and relieve plant stress caused by heat, cold, drought, salinity, heavy crop load, or other environmental conditions.

TRiQ Inc. is pleased to introduce the best fertilizers, supplements and nutrition boosters for your cannabis plants and the environment. Learn more at TRiQsystems.com or call a TRiQ cannabis production expert at 250-575-4725.
Worldwide Consulting

Access the cannabis industry’s most experienced growers, processors and managers

TRiQ Inc. provides cannabis supply chain solutions to cultivators, processors and dispensaries anywhere worldwide where medical or recreational cannabis is legal. Our consultants have a combined industry experience of 60+ years. If you’re a cannabis growing facility, processing facility, or dispensary, take advantage of our extensive experience and cutting-edge technologies to dominate your competition in this fast-growing industry.

Supply Chain Consulting
We take a whole systems view of your operation from your suppliers to the customer with a focus on “leaning” the processes to produce the lowest costs and highest quality. We will work with your team to develop strategies and tactics to increase your competitive edge.

Cultivation Consulting
Our team has experience in all areas of cultivation including: Tissue Culture, Propagation, Lamp Grown, Sun Grown or Greenhouse Grown.

Processing Consulting
Cannabis has been processed in various ways for centuries, but the attention to detail in quality and the minimization of processes has not been a focus until now. We can help you optimize your processing and packing to get the consistency and quality you need to stay with the changing market. Sun Grown requires a long shelf life due to seasonal production—we can help you develop a strategy to preserve the freshness for the entire year to maintain consistency.

Tissue Culturing
TRiQ’s expert team of consultants built an extensive knowledge of cannabis plant metabolism and physiology, crop growth in the field, and processing of the harvested crops as the first licensed producer of medical cannabis in California. We can help your legal marijuana operation overcome its challenges to become a market leader.
Facility Design
Because we are a whole system solution provider, we see the supply chain view, but also the small details of how each facility should follow in the same philosophy of operational excellence. We are aware of every wasted motion, the critical aspects of environmental conditions, security issues, staff safety and work flow planning.

Feasibility Consulting
You may be thinking about entering the industry or a new aspect of it, we can help you in your initial stages to save you money by determining feasibility of the endeavor.

Process and Best Management Practices Consulting
If you’re up and running and want to streamline and standardize operations, we can partner with your team to reach your goals of operational excellence.

R&D Consulting
Research and development is paramount to remaining innovative in your company and we can help you identify those research strategies, implement and track results.

General Training
We can work with you and your team to identify needed areas of training, developing strategies and implementing training programs.
Hardware Integration

TRiQsoft Integrates with Leading Equipment and Software Solutions

Integration Benefits

• Flexibility of Software Solutions
• Integration with Serialized and Scannable Hardware Components
  Eases Traceability Requirements in the Production Processes by Cutting Data Entry Costs and by Reducing Human Error
• Automation of Equipment Through TRiQsoft
• Centralized Big Data Capture from Equipment Function and Business Processes
About our Hardware Integration

Our philosophy at TRiQ is based on the vision of a whole system solution for our clients. We build, program, and identify only the best of solutions and integrate them via programmable logic controllers (PLCs) and application programming interfaces (APIs). The result—a technologically optimized business solution.

Integration with software and equipment gives you these benefits:

- Makes both software and equipment stronger products and the knowledge derived drives constant innovation.
- It allows automation of equipment, like the CannTrol Vulcan50, through TRiQsoft.
- Centralized big data capture from equipment function and business processes.
- Integration with serialized and scannable hardware components eases traceability requirements in the production processes by cutting data entry costs and by reducing human error.

Take advantage of our whole system methods and technologies, and dominate your competition in this fast-growing industry.

Learn more at TRiQsystems.com or call a TRiQ cannabis production expert at 250-575-4725 to explore products and services comprising our whole system solution.
KPI Reporting

Real world benefits that other solutions can only allude to

Yield Monitoring
Choose from many tools to analyse the yield from each cultivation area, by plant, cultivation batch and more.

Environmental Monitoring
Choose from multiple environment and other activity monitoring tools to keep on top of cultivation trends and KPI’s.

Monitor Applications and Fertigation
Monitor fertilizer activities from any location via tablet or PC.
Labor Cost Monitoring
Track labor KPI’s such as the cost per each unit of weight produced and more.

Business Wide KPI Monitoring
Monitor business wide KPI’s to gague performance and profitability.

TRiQsoft concentrates on core industry challenges including traceability, cost monitoring and control, budgeting, reporting and KPI analysis, and resource and employee accountability.

Learn more at TRiQsystems.com or call a TRiQ cannabis software expert at 250-575-4725 to get these real world benefits across your entire farming enterprise.
This chart illustrates how the CannTrol Vulcan50 drying machine runs its patent pending “dry curve” schedule. The dry curve can be programmed for various different schedules utilizing the machine’s functionalities which include: heating, cooling, dehumidifying, venting and most importantly, humidifying. Adding humidity during the kill phase of a dry curve arrests the drying process and prevents the effects of evaporative cooling. This allows heat penetration to the flower core sufficient for an effective thermal spore kill process, while keeping heat exposure to an absolute minimum. Humidifying in the kill phase also keeps the flowers from drying too fast which can lock up chlorophyl and make the finished product harsh to smoke. Below are lab results from The Werc Shop™ demonstrating the dry curves effect on killing artificial inoculations of botrytis and aspergillus at unnaturally high levels. The results also highlight that the dry curve has little or no effect on THC, CBD and Terpenes.

Utilize the CannTrol Vulcan50 drying machine to get control of the drying stage of your product life cycle to ensure quality and consistency. Take advantage of the CannTrol Vulcan50’s integration with TRIQsoft to monitor and record data. Whether running CannTrol’s proprietary dry curve or your very own, TRIQsoft will empower your company with data specific to your operation - allowing you to graph drying performance per strain/batch, along with microbial test results to find the “sweet spot” for your various strains. TRIQ and CannTrol are passionately dedicated to the research and development of ideal dry curves. Any modifications resulting from our research will be made available to CannTrol Vulcan50 owners, to be downloaded from our website. For those users who maximize performance by way of our software integration, your CannTrol Vulcan50 will be updated automatically through TRIQsoft.
Thermal Therapy for Control of Molds

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Pathogens</th>
<th>Temp (°F)</th>
<th>Time (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Mold</td>
<td>Aspergillus spp.</td>
<td>136.4</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>140</td>
<td>12-15</td>
</tr>
<tr>
<td>Brown Rot</td>
<td>Monilinia fructigen</td>
<td>109.4</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>113</td>
<td>05</td>
</tr>
<tr>
<td></td>
<td>Monilinia laxa*</td>
<td>118.4*</td>
<td>6-12*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>126.5</td>
<td>02</td>
</tr>
<tr>
<td>Gray Mold</td>
<td>Botrytis cinerea</td>
<td>111.2</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>113</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>114.8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>118.4</td>
<td>05</td>
</tr>
<tr>
<td>Penicillium Mold</td>
<td>Penicillium spp.</td>
<td>54.4</td>
<td>04</td>
</tr>
<tr>
<td>Rhizopus Rot</td>
<td>Rhizopus stolonifer</td>
<td>114.8</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>118.4</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>140</td>
<td>6-8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>158</td>
<td>1-5</td>
</tr>
<tr>
<td>Colletotrichum Rot</td>
<td>Colletotrichum gloeosporioides</td>
<td>113</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>46</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47</td>
<td>09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>49</td>
<td>04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
<td>01</td>
</tr>
<tr>
<td>Snow Mold</td>
<td>Fusarium spp.</td>
<td>45</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
<td>1-3</td>
</tr>
<tr>
<td>Mucor Mold</td>
<td>Mucor spp.</td>
<td>55</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
<td>10</td>
</tr>
</tbody>
</table>

Values represent the different temperatures and times, obtained from research articles, required for the inactivation of various molds. In vitro assays have shown that Aspergillus spp. can be inactivated at 140°F for 15 minutes, while Mucor spp. can be inactivated at 140°F for 10 minutes. * Indicate In-vitro assay.

In vitro assays have shown that the vegetative cells and conidia of most molds are inactivated when exposed to 140°F (3). However, different molds can be inactivated at different temperatures and times. For example, Black Mold caused by Aspergillus spp. require a higher temperature of 140°F for 15 minutes while Brown Rot caused by Monilinia spp. require a lower temperature of 109.4°F for 15 minutes (1,2,3,4,5,6,7). In general, there is a linear relationship between the amounts of time and the temperature requires for the inactivation of various molds. For examples, at a higher temperature, a shorter time duration is required.

Remotely monitor Vulcan50 drying performance via the cloud from anywhere in the world.

**Humidification Capacity**
- 30 lb/hr
- 3.6 gal/hr
- 10.2 kW
- Potable water required. De-ionized or reverse osmosis water is unacceptable.
  Electrode steam generation requires dissolved minerals to carry current between electrodes.

**Cooling Capacity**
- 8,000 Btu/hr total
- 7,000 Btu/hr sensible
- 1,000 Btu/hr latent
- Conditions: entering air at 80F DB, 35% RH
- Approx. 45 oz. of R407C

**Electrical Connection**
- 208-230V/3ph/60Hz
- MCA: 82A
- FLA: 65A
- MOCP: 90A
Outdoor Air Required

After the heat up phase, the chamber is vented at a rate of 3,000CFM for 10 minutes or less. During the drying cycle, approximately 1/3 of the time the condenser fan will circulate 3,000CFM of outside air over the condenser to maintain the chamber temperature. The amount of time outside air is circulated over the condenser during the drying phase will depend on the outside air temperature. Cold climates will require less time than hot climates.

Heat Exchangers

There are three heat exchangers in the Vulcan50: one condenser and two evaporators. The heat exchangers are made of heavy wall copper tubing and aluminum fins. The evaporators are piped in parallel and are in a separate air stream from the condenser. They are also coated with Electrofin coating to resist corrosion.

Electrical Certification

All electrical components will be certified by QPS. [http://www.qps.ca/ProductCertification.html](http://www.qps.ca/ProductCertification.html)

Fan Operation

Figure 1 shows the condenser fan static pressure as a function of airflow. When ventilating the chamber, the static pressure is expected to be between 0.25 inwg and 0.35 inwg. During the drying phase when outside air is circulated over the condenser, the static pressure is expected to be closer to 0.20 inwg. The condenser fan motor is reversible and has three speeds. Each direction can operate at its own speed. Figure 1 show the performance for each speed.

There are two air streams in the Vulcan50. The condenser fan cycles air over the condenser, electric resistance heater, and humidifier. A separate fan cycles air over the evaporator whenever the compressor is running. The condenser fan is reversible and has two independently controlled vent motors above and below the fan to control the direction of the airstream. The following renderings show the control of airflow during each phase of the drying process.
Vulcan50 Tech Specs (Continued)

- Opens to allow airflow in/out of ductwork.
- Motor controlling upper vents.
- 12 KW heater.
- Wiring to electrical panel mounted on wall.
- Fan draws air across the evaporator.
- Air intake for evaporator.
- Air intake for condenser.

Dimensions:
- 3'-6"
- 3'-6"
Vulcan50 Tech Specs (Continued)

Heat Up Phase

Chamber air is cycled over the electric resistance heater and electrode steam humidifier to increase the dry bulb temperature to 140°F and relative humidity to 70%.

Ventilation Phase

After the heat up phase, the chamber is evacuated. Air is drawn back through the duct and is exhausted outside. An intake vent (not shown) directly behind the exhaust vent allows air to enter the chamber after passing through an air filter.
Drying Phase – Heat Reclaim

Once the chamber is evacuated, the drying process begins. Air is cycled over the evaporators (blue) at a rate of 250CFM and is cooled below the dew point. Water condenses on the evaporators and collects in the drain pan below before eventually draining outside.

Heat is reclaimed via the condenser in the second air stream that evenly distributes the exhaust air through the duct at a rate of 2,500CFM to 3,500CFM. The high flow rate of the condenser fan ensures near uniform chamber air conditions, eliminating the need for an evaporator fan duct.

Drying Phase – Heat Rejection

During the drying phase, heat is added to the chamber through the action of the compressor and fan motors. In order to maintain a constant temperature, heat from the condenser is periodically rejected outside. Outside air enters the Vulcan50 through the lower vent, picks up heat from the condenser, and is exhausted through the upper vent. Once the drying process begins, no outside air interacts with the chamber air.

While heat from the condenser is rejected outside, the evaporator continues to cool and dehumidify the chamber air. Once the chamber temperature drops back down below the setpoint, the upper and lower outside vents close and the condenser heat is reclaimed once again.
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