Automatic Cannabis Inspection and Tracking
Increases Cannabis Profitability & Reporting Accuracy
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Introduction

The cannabis market is showing explosive growth. This is happening despite the lack of federal legislation in the US that would legalize all forms of cannabis usage nationwide.

For example, the US market for legal cannabis products crossed the $10b mark in 2018, with some bold researchers predicting a market size reaching $100b by the end of the 2020s. The US cannabis market has posted solid double-digit yearly growth the past ten years. This growth trend will likely accelerate as the number of states approving all forms of marijuana usage extends beyond the current eleven states plus Washington DC.

As the market grows, so does regulatory agency cannabis tracking requirements. For example, some states and countries require the cannabis provider to be able to track the product from “seed to sale.” That requirement alone means the provider must invest in tracking hardware and software to remain in compliance.

Cannabis package labeling requirements are frequently imposed on the provider by government agencies. In addition to specific warning label contents, some locations also require specific forms of packaging such as re-sealable child proof/resistant packaging, airtight containers, smell-proof bags, etc.

What does all of this market growth and increasing regulation mean to the average cannabis packager? Traditional cannabis packagers that entered the market early are finding the investments required to remain in compliance while keeping up with increasing demand difficult. Packagers that got into the market later tend to take a more business-oriented approach to setting up the processes and procedures necessary to maintain a large-scale healthcare packaging organization.

Many of the recent players in the cannabis market have come from the pharmaceutical market. They understand track and trace regulations, and the hardware and software investments necessary to respond to increasing market demand. Let’s look at some of the cannabis hardware and software packaging solutions that provide increased profitability and reporting accuracy.
Automatic Weighing Applications and Solutions

Checkweighing Application Example – Marijuana Pre-rolls, Bags and Edibles Packaging
The two checkweighers shown in Figure 1 are examples of belted checkweighers. The units shown here operate from left-to-right. The first belt on the left is the in-feed conveyor, which feeds the second belt on the weigh bed conveyor. This is where the marijuana pre-roll cannabis bag or edible package is weighed. The checkweigher is setup to precisely measure the product’s weight and check it against the weight range parameters programed into the checkweigher. If the product weighed falls outside these parameters then it is removed from the packaging line at the machines out-feed conveyor. A variety of reject options and reject bins are available with the checkweigher. The HC-M class of checkweigher can weigh products at speeds up to 250 ppm, while the HC-A can operate at 600 products per minute. Statistics are gathered for each product that moves through the checkweigher. The information can be accessed remotely for reporting purposes. The checkweighers have a filler feedback capability. This enables the checkweigher to communicate to the package filler located up line from the checkweigher, and automatically make filling adjustments should a string of products start measuring outside the acceptable package weights. The bottom line advantage is that the checkweigher eliminates costly product overfill. Other advantages include accurate production reporting, elimination of product under fill, and enhanced brand protection due to increased packaging accuracy.

![Figure 1 - Checkweighers – Models HCM and HC-A](image)

Checkweighing Application Example – Cannabis Flower Jars, CBD Oils, and Tinctures
The HC-A-IS model checkweigher shown in Figure 2 is ideal for precisely measuring the weights of products in round jars and vials. The HC-A-IS checkweigher uses an indexing star wheel rather than a belt conveyor to bring the products to the checkweigher. As such, the star wheel design is well suited to round, cylindrical product packages like the flower jars, aerosol cans, and the small bottles used for CBD and hemp oils and tinctures. Different star wheel configurations are available that enable the weighing of one, two, three, or as many as four products at a time. The single-position star wheel machine is called the HCA-IS, and it can run at speeds up to 100 parts per minute. The dual-position design in the HS-A-IS-D with a top speed of 180ppm. The three-position machine version is called the HC-S-IS-T with an operating speed of 300 ppm, while the four-position machine is called the HC-A-IS-Q with a throughput speed of 400ppm. The star wheel comes in two parts, and has a tool-less design to enable quick changeovers to run product of a different size through the checkweigher. The product weighing takes place at the 12-o’clock position of the start wheel. The weigh cell(s) that takes the product weight measurements is located underneath the indexing star wheel. This checkweigher is designed to easily integrate into existing production lines, and operated by removing the products from the line for weighing, and returning the product to the line after an acceptable weigh is captured.
Track and Trace Solutions

Introduction
As the cannabis market continues to grow and evolve, protecting your products against tampering and counterfeiting is critical. Additionally, as a manufacturer, you are faced with evolving packaging safety rules and traceability regulations. Tackling these challenges is not an easy task. However, with our flexible traceability solutions and wide-ranging experience with regulatory compliance projects, we will support you in achieving seed-to-sale product tracking compliance and quickly adapting to meet the ever-changing rules and requirements.

Cannabis Seed-to-Sale Solutions – Product in Boxes
Figure 3 shows a version of our HC-A checkweigher that incorporates the product management and serialization features of TQS-SP shown to left side of Figure 4. The TQS-HC-A checkweigher expands the serialization capabilities to include a final completeness check by means of weight. Optional TQS-HC-A modules integrate the functionalities of our compact tamper evident technology and country-specific vignette applicator.

Cannabis Seed-to-Sale Solutions – Product in Bottles
TQS-SP-Bottle showed in the center of Figure 4 prints auxiliary codes and verifies bottles and vials. The TQS-SP machine shown on the left is machine used for box-type packaging. A sample tracking code and a tamper-evident seal for boxes is shown in Figure 5. Both machines have code printers located either on the underside or the top of the container (visible only under UV light, if required). The TQS-SP-Bottle and TQS-SP machines both verify the previously serialized bottle, vial or box labels. ConfigureFast is a software feature in the machine that enables you to quickly and easily configure all sub-components, like the printer and camera, from a single interface.

Cannabis Seed-to-Sale Solutions – Product Cases
The TQS-CP machine, shown to the right in Figure 4 has a machine operator that places the packaged products layer-by-layer in the shipment carton. Each completed layer is then photographed from above by the fully integrated camera. The camera automatically moves to the preset height for packing in order to always ensure the proper focus distance. After the defined number of layers and product units has been reached, the aggregation level is completed and a carton tracking label is automatically generated. The machine also manages the next packaging level (for example, shipment cartons on pallets). The aggregation of the pallets can be managed in parallel by the optional TQS-MP-EXT.
As the cannabis market continues its extraordinary growth, the WIPOTEC-OCS product weighing, inspection and seed-to-sale tracking solutions will be there to help.

The rapid increase in cannabis demand is forcing cannabis packagers to move beyond manual packaging and to seek out faster and more accurate packaging solutions. Automating the cannabis packaging process using checkweighers provides several advantages to the producer. The first advantage is that checkweighers enable cannabis packages to remove the guesswork from the packaging process. Checkweighers automatically ensure that each individual marijuana blunt, bag, edible product, cannabis flower jar, CBD oil bottle or tincture container has the precise amount of product inside. This helps the cannabis producers maintain and possibly increase profitability by preventing costly product overfill errors. Conversely, checkweighers prevent under fill situations that can damage a company brand name.

Checkweighers come in a variety of configurations. The goal of any checkweigher product transport design is to make the product movement as smooth as possible over the weigh cell in order to achieve the most accurate product weight possible. Belted check weighers are made up of three belts; infeed, weighing conveyor, and out-feed. Belted checkweighers are great for pre-rolls, bags, boxes, low-profile cans, and pouches. Checkweighers with an indexing wheel are ideal for round, cylindrical product containers like tincture bottles, vials, jars, and tall cans.

Cannabis product tracking provisions are getting serious. Cannabis producers sometimes need to document the entire supply chain path, or what is often call seed-to-sale product tracking. The healthcare industry has been doing this for years. Pharmaceutical manufacturers operate under a wide variety of international track and trace regulations that requires the manufacturer to be able to locate any drug produced anywhere in the supply chain. It is extremely likely that cannabis products will be subject to these same national and international track and trace requirements. Some states and countries are already starting to demand this track and trace capability from producers and packagers of cannabis products.

Wipotec track and trace machines are in use in over 2,000 pharmaceutical installations around the world. Our TQS hardware and software comes in a wide variety of form factors, and can handle virtually any type of cannabis checkweighing, product marking, and seed-to-sale tracking requirement.
About WIPOTEC

WIPOTEC was founded over thirty years ago in the town of Kaiserslautern in Southwest Germany. We are an ISO 9001 certified company with over 100 subsidiaries and partners operating around the world. Our largest subsidiary is in the USA and was founded more than twenty years ago as OCS Checkweighers. It is now known as WIPOTEC-OCS and based in metro Atlanta. WIPOTEC-OCS has engineers, service technicians and project managers located across North America, and a major USA spare parts depot to ensure the best possible service and support for our American customers.

We are a weighing and inspection technology company built on ideas and innovation. Our first big idea was the EMFR weigh cell. The company founder and CEO is Mr. Theo Düppre and while working at the Technical University of Kaiserslautern (TUK), Mr. Düppre invented the Electro Magnetic Force Restoration weigh cell. Mr. Düppre is very active in managing the day-to-day activities of the company.

Other innovations such as the Active Vibration Compensation technology we discussed in this paper were developed in response to solving a customer’s unique product weighing or inspection problem. Many times over the past thirty years our engineers have worked in partnership with our customers to develop a machine solution that exactly matches the customer’s specific application requirements.

We make over 85% of the content used to construct WIPOTEC machines in our Kaiserslautern factory. This level of vertical integration enables us to support our machines for a much longer time period compared to our competitors. Our in-house approach to producing our own machine sub-components enables us to be very flexible when it comes to producing custom solutions.

From the smallest weigh cell used in one of our healthcare checkweighers, to the largest weigh bridge used in our widest in-motion scale or catchweigher all WIPOTEC products are built to stand up to the harshest application environments. We have checkweigher and catchweigher installations around the world that have been running in factories and parcel sorting centers for decades. We are very proud of this fact.

Additional product lines include are our X-Ray and Vision inspection machines that are ideal for ensuring the safety of our food supply by detecting foreign bodies and performing other package and product inspection tasks. Our line of TQS pharmaceutical serialization and aggregation machines are helping to ensure a safe and secure supply of medications. These machines help drug companies to effectively track and trace all medications from their point of origin to their point of distribution to the patients in order to prevent drug counterfeiting.▲