

INDUSTRY

application

Cannabis manufacturer upgrades tableting equipment to improve product quality



Dixie Brands, Denver, CO, manufactures and distributes products infused with tetrahydrocannabinol (THC) and cannabidiol (CBD). Founded in 2009, the company broke into the cannabis industry with its THC-infused soda, the Dixie Elixir. "When we started manufacturing the elixir, the only space we had for our business was a small kitchen in Colorado," said Ari Cohen, vice president of operations at Dixie. "Now, we are operating in five US states and expect to double our manufacturing and distribution capabilities this year as well as establish an international presence in Canada and Latin America."

The company's offerings now include more than 100 products across 15 different product categories including edibles, tinctures, topicals, extractions, CBD-infused wellness products, and pet dietary supplements. While their flagship liquid product remains popular, Dixie's THC- and CBD-based mint tablets are gaining ground in the solid oral dosage product segment. "The tablet is a convenient and familiar dosage form," said Cohen. "Our mints provide a low, consistent dose and can be discreetly stored in a pocket or purse, making them an ideal cannabis product for many consumers."

In 2017, Dixie began manufacturing two solid oral dosage product lines with its recreational Orange Awakening mints (Photo 1), which contain 5 milligrams of THC, and medicinal Synergy Mixed Berry mints, which contain 5 milligrams of CBD and 5 milligrams of THC, providing both the medicinal effects of the CBD, such as pain relief, with the psychoactive effects of THC.

Challenges and solutions

Both lines of cannabis mints are considered microdose tablets and pose several manufacturing challenges for the company because of their small size. The Orange Awakening and Synergy mints have a target weight of 0.35 gram, and because they are marketed as chew-

able products, the tablets require 5 to 6 kilograms of compaction pressure to both maintain structural integrity and remain soft enough for consumers to chew. The machinery that Dixie had been using to manufacture the mints could not provide consistent tablet weight or hardness across product batches, resulting in overly soft, poor-quality tablets.

"Our primary concerns for our tablets are maintaining homogeneity across the entire batch so that we pass our potency lab testing and maintaining the appropriate tablet hardness, both of which have been challenges for us in the past," said Cohen.

Luckily, a Dixie technician had previously worked with Rosario Cipolla, the western region senior sales executive at tableting equipment supplier Elizabeth, McKeesport, PA, and suggested that Cohen reach out to him for assistance.

"When we first met with Dixie in March 2017 to troubleshoot the tablet manufacturing issues, we noticed right away that they were using an old, non-GMP Stokes B2 model press that was not capable of producing the quality microdose tablets required for these particular formulations," said Cipolla. To meet Dixie's manufacturing needs, he suggested they purchase the Eli-



Photo 1: Dixie's Orange Awakening product requires a consistent tablet weight and hardness for dose uniformity and chewability, which necessitates a tablet press that can provide accurate weight control.

za-Press 200 (EP-200) D-size tooling tablet press (Photo 2), which is suitable for R&D and small-batch manufacturing. "We determined that this press would meet and even exceed Dixie's manufacturing needs," said Cipolla. "Not only is it an affordable machine, but the press features can be modified to meet increasing batch demands in the future."

Three weeks after the purchase order was released, Elizabeth delivered the tablet press and provided technical support during and after installation.

The difference between the machines was immediately noticeable. "By using the newer press, Dixie was able to improve its tablet weight control and tablet hardness without having to make changes to the formulation," said Cipolla.

Cohen agreed. "Our old Stokes press was like driving a 1970s Cadillac; it was a classic machine, but it wasn't appropriate for where we needed to go. Now we have a brand-new Honda that's a real workhorse. One of the best features is that the

EP-200 counts the tablets to ensure we are meeting our target output, and it also helps us with compliance, loss prevention, and quality assurance." Dixie later bought several EP-200 tablet presses with B/D combination tooling (Photo 3).

This partnership between client and vendor is especially important when it comes to cannabis-based products.

Beyond tablet manufacturing

In addition to providing the appropriate machinery for Dixie's manufacturing needs, Elizabeth also offered valuable troubleshooting and training.

"Every step of the way, Rosario and his team were able to solve our tableting issues while providing clear explanations, so we could also learn

how to identify and fix these types of issues," said Cohen. "Most of our employees come from a culinary background and don't have tableting experience. Elizabeth was instrumental in helping us scale what we were doing, get the proper equipment in place, and teach us how to properly operate these machines. Because of this assistance, we are now producing quality tablets at a fast pace and have expanded our offerings to include three more types of mints" (Photo 4).

Cipolla also determined that Dixie had been unknowingly over-polishing their punches, so he trained the Dixie manufacturing team to maintain their compression tooling. Cohen mentioned that in between Cipolla's frequent visits, Elizabeth sends training videos to Dixie so the company can continue its tablet tooling and manufacturing education with present and future employees. "The support we get from Elizabeth is above and beyond any other company we've worked with," he says.

Cipolla says that his company aims to be more than just a vendor of tablet presses and tooling, with



Photo 2: The EP-200 D-size tablet press uses 8 stations with D tooling to produce up to 14,400 tablets per hour.



Photo 3: The B/D combination turret shown accepts B and D tooling, providing manufacturing flexibility.



Photo 4: Once the tableting issues with the initial two mint product lines were resolved, Dixie had the experience and equipment to expand their tablet offerings with different flavor profiles and ratios of CBD and THC.

the goal of creating a partnership with its clientele. "We want to create a lasting business relationship. As demand for Dixie's products increases, we can supply them with additional equipment in a timely manner and modify features on future presses to meet their manufacturing needs. The work doesn't end after purchase and installation."

According to Cohen, this partnership between client and vendor is especially important when it comes to cannabis-based products because of the various state regulations. "When we press the tablets, each one needs to have a state-designated THC symbol, which can be challenging when you have small tablets like our mints, which are 9 to 16 millimeters long." Elizabeth designed tablet punches that pressed the THC symbol on one side and the Dixie logo on the other, complying with state regulations, ensuring patient safety, and

providing product differentiation (Photo 5). "The cannabis industry is fairly new, and adding THC and CBD to any product is difficult," said Cohen. "We've been in busi-

ness for 10 years now and making tablets for half that time, but we are still learning. Luckily, we have a great vendor in our corner willing to teach us and help us grow." T&C



Photo 5: To comply with state regulations and increase product differentiation, Elizabeth designed tablet punches that pressed the THC symbol on one side and the Dixie logo on the other.

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