

THE COLD CURE

**FREEZE DRYER TECHNOLOGY IS HELPING TO
SPEED UP THE DRYING AND CURING PROCESS.**

BY BENJAMIN M. ADAMS // PHOTOS BY JUSTIN CANNABIS



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“There are a series of benefits: energy efficiency, avoiding mold going through the process, and preservation.”

- Alejandro Cerdas



Developers are in the middle of a race to see how they can apply freeze dryer technology to dry and cure weed faster, taking a process that could have taken weeks into something that is pretty much instantaneous. Drying cannabis after it's harvested removes the moisture from the flowers so they can be properly smoked or vaporized and typically takes anywhere from 10 to 14 days. After that, the flowers are cured, a week to month-long process which removes additional moisture and helps preserve the buds and retain their flavor and potency. With freeze drying technology, what once could take weeks can be done in a day or within a matter of hours.

Typical drying and curing involves hang-dried buds, Mason jars, burping, and a whole array of commercial tools to make the finishing process possible, but freeze dryer technology is changing things fast. But does the process really work? Is the bud any good? Will more cannabis companies look to adopt this technology in the future? *High Times* checked in

with experts on this relatively new method for drying and curing. There are an array of differences in tools that can be used to dry, freeze dry, cure, or prepare for curing—with some, in particular, designed specifically for drying cannabis.

“It's a different technology,” Oaksterdam instructor Jeff Jones tells *High Times*, noting that the freeze-drying process to traditionally dried and cured cannabis is like comparing personal production preferences such as hand-trimmed weed versus machine-trimmed weed. The texture of the flower differs, but not really the size, potency, or nug structure.

Jones taught about the medical cannabis field in California for well over 20 years, co-founding the Oakland Cannabis Buyers' Cooperative (OCBC) in 1995 and helping to shape Oaksterdam. While he admits it's not the same as hang-dried cannabis and traditionally cured flowers, Jones believes there is a place for freeze-dried weed in the cannabis space.

Several companies are leading the charge toward finding the most efficient solutions to faster drying and curing periods. Avoiding hang-drying systems can also help mitigate other problems such as mold.

WAVE, a company building freeze dryer machines out of Vienna, Austria, is one of the companies utilizing this innovative technology. General manager of WAVE Freeze Dryers USA Alejandro Cerdas is a seasoned vet in the cannabis industry and says that freeze drying cannabis makes the post-production process more energy efficient and provides other benefits as well.

“There are a series of benefits: energy efficiency, avoiding mold going through the process, and preservation,” Cerdas says.

Each company we spoke to provides machines with different benefits, often using patent-pending technology. >>



WAVE'S FREEZE DRYER TECHNOLOGY IN ACTION.

THE TECHNOLOGY BEHIND FREEZE DRYING



Traditional freeze dryers work with cannabis by freezing the flower, then often reducing the pressure and applying heat to allow the frozen water in the bud to change directly to a vapor, i.e., sublimate. With this in mind, each company provides different processes.

“You basically start with your material and then that’s slightly frozen and then put under a vacuum, and basically sublimation occurs,” WAVE CEO Dan Berlin says. “The ice goes straight to vapor. It skims over the water phase. And we slowly raise the temperature through the process and gently remove water. And we’re trying to leave the flower at about 11-12% [moisture] when we pull it out—unlike traditional freeze drying when you go and take all the water out for when you have freeze-dried berries or things like that. With cannabis, we’re trying to

effectively cure it so that you don’t have to go through the whole drying and curing phase.”

Cryo Cure’s patented design, on the other hand, has several key differences from traditional freeze-drying methods—something the company likes to distinguish for people who are new to freeze-drying methods.

“We’re trying so hard to educate the public on the differences of freeze drying versus Cryo Curing because both utilize a freeze dryer, but the final results couldn’t be any more different,” Cryo Cure CEO Tracee McAfee says explaining that the system keeps more trichomes and terpenes intact than traditional freeze drying.

According to the company, the Cryo Cure system’s freeze temps and drying times are more fine-tuned to cannabis than similar products. Cryo Cure process is to freeze the cannabis or industrial hemp to -20 to -30 degrees Fahrenheit for no less than 10 hours to preserve the shape and integrity of the flowers, and select models have a built-in freezer for this purpose. The frozen product is placed into the material chamber under vacuum pressure, similarly to other freeze dryer models.

Keirton Inc. and Trichome Technologies combine the drying and extracting process in their machine while maintaining quality and preserving terps—launching Velos Cold Cure process and Velos Essence. Velos Essence can capture essential oils for use in vape cartridge flavors, edibles, beverages, fragrances, and pharmaceuticals.

“Velos Essence is a patent-pending process that we have on extracting terpenes, the full terpene profile, so monoterpenes and everything from fresh cannabis,” Keirton Inc. CEO Jay Evans says.

Terpenes are the chemical properties within cannabis that give the plant its taste and smell. These volatile hydrocarbons also play a role in pot’s effects and are classified by the number of carbons units they contain with monoterpenes containing two isoprene units.

“You get about an 80% extraction, so then that flower can be used for other extractions and the terpenes can be added in after extraction,” Evans explains. “So a lot of extraction processes, the monoterpenes are damaged. This pulls them all off organically.”

Velos also has a new product up its sleeve, which is still in development. Even burping, the process of allowing moisture and CO2 to escape during the curing process, can be automated.

“It’s called the Cure Puck,” Evans says. “It’s a device, and it’s not released yet, it’s a device that connects to a traditional bin or tote, that will automatically monitor the gasses inside of the tote, along with temperature and humidity, and burp the tote when those gasses reach a certain level.” >>

ALEJANDRO CERDAS PULLS OUT TRAYS FROM A WAVE FREEZE DRYER.



SAVING TIME & IMPROVING EFFICIENCY



“We can take post-harvest drying from traditionally 10-14 days, or 10-20 days depending on how it’s done, to one day.”

- Jay Evans

The final cure using freeze dryers takes 24 hours or less—nearly all the companies we spoke with provide similar timetables, ranging from about 12-24 hours. Using the technology usually means money for businesses trying to improve efficiency. Getting bud from harvest to the finished stage can now be completed within a matter of days.

“It could be two or three days maybe, you know, and then it can get packaged,” says Cerdas. “It doesn’t need much of the [normal] process.”

But you can’t always expect the same results from a freeze dryer system unless the settings are set to

the specific needs of cannabis flower as you don’t want them to dry out as much as other traditionally freeze-dried materials.

“Traditional freeze-drying methods, even by using freeze dryers, work as long as they can be controlled—if you know the right parameters, so it preserves the terpenes,” said Greg Baughman, who co-founded Cryo Cure with McAfee. “So in a nutshell, what we do is we are able to skip the hanging phase of drying and you go right into a final cure. So our machine replaces that seven to two weeks of hanging, drying in a room and takes that down to between 12 and 16 hours, depending on the density of the cultivar.”

Traditional freeze dryers are designed to remove all of the moisture—not what we want for smokable flower.

“So that’s where our secret sauce lies, is that we’ve dialed in the perfect recipe to make sure that you don’t remove all any of the terpenes and all of the moisture,” Baughman says. “We started realizing that there’s not that many people who manufacture refrigerators out there in the selection. You know, we went through every single manufacturer and they’re all made for different things and they specialize in different industries.”

If a person uses a traditional freeze dryer, they’re not going to be designed specifically for batches of cannabis flower. And companies like Cryo Cure have mitigated many of these problems already to become more cost-effective purchase for growers.

“Downtime equals dollars,” Baughman says.

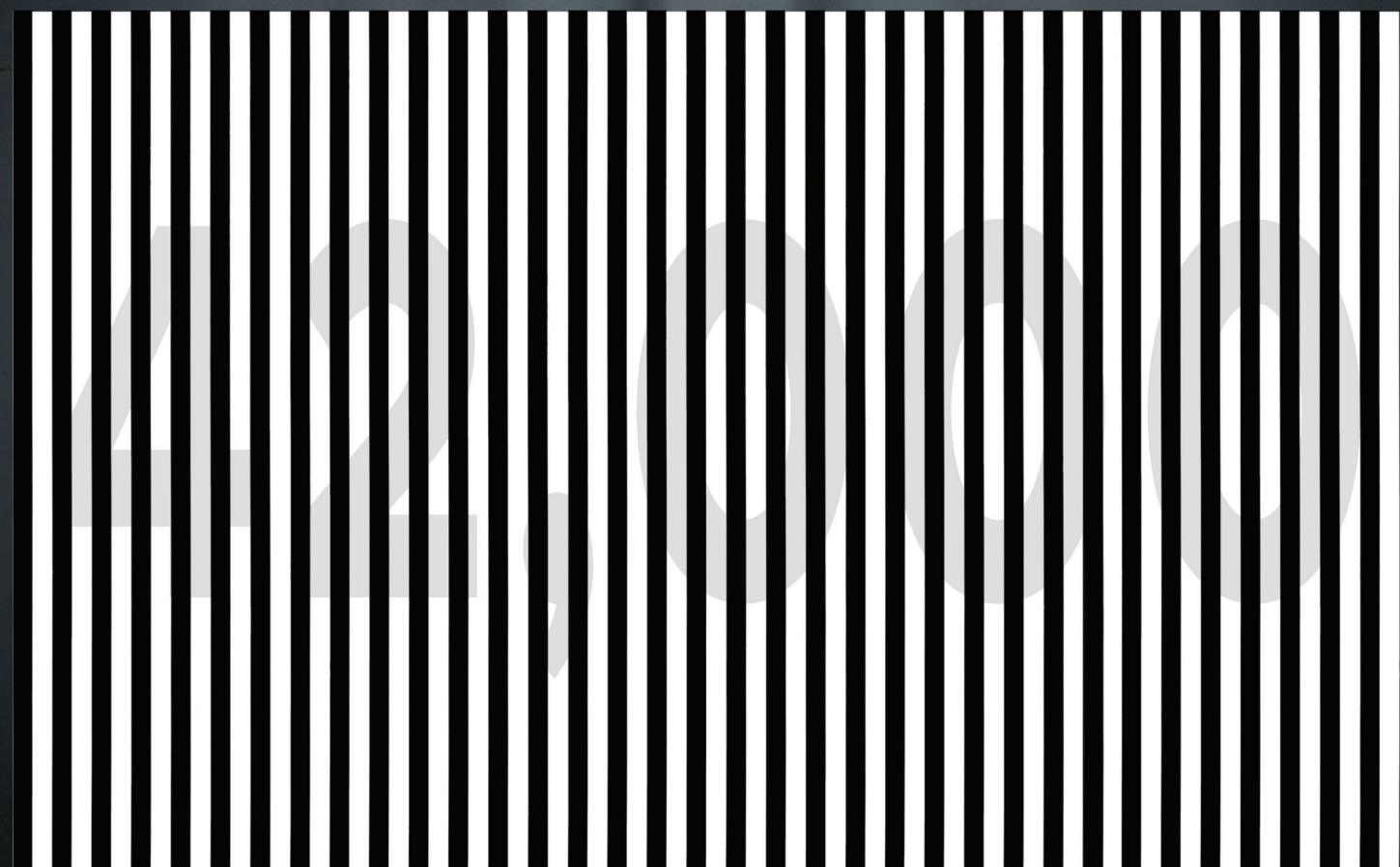
The Velos Cold Cure process offers a similar timetable, marking potentially huge improvements in efficiency.

“We can take post-harvest drying from traditionally 10-14 days, or 10-20 days, depending on how it’s done to one day,” says Evans. >>



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WHAT'S THE BUD LIKE?



While the size of the buds stays the same, some say that the texture is slightly different. The freeze-dried flower can range from a light popcorn texture and weight to being almost indistinguishable from hang-dried cannabis. The flower's quality depends on which machine and process you decide to use. Cerdas says WAVE is not simply freeze drying the flower because freezing the flower creates irreparable damage to the cell walls.

Typical freeze drying will "eventually produce a flower that has a look and feel like popcorn, and it will crumble," he explains. "With that damage comes the horrible issue of losing a big amount of terpenoids through the cold boil produced by the combo of vacuum and temperature."

Cerdas prefers to call his cannabis "sharp dry" instead of freeze dried.

"Basically, the sharp dry flower feels, smokes, and behaves very similar to regular hang-dried flower," he says.

The difference in texture might not be as important to everyone, particularly those whose primary interest is keeping cannabis fresh for as long as possible.

"What I can say about this freezing is that it's not going to capture 100% of the market, but it will have a niche much like Folgers Coffee and any processing materials for shelf-ready

storage," Jones says. "Because if you wanted to put this material into your bug out bag and have it for two years, I'm not going to call my herb that I just put myself there good because it's not going to taste good. It's going to be totally stale and the consistency will shift."

WAVE's freeze dryer models also appeal to extraction artists because the texture of the original flower does not matter so much.

"We have some folks using the equipment for bubble hash in the extraction business," Cerdas says. "And that's always interesting because the benefit it will bring in is completely different from what has happened in the past: As I mentioned, we've not found a way of using the equipment without using the conventional freeze drying process—which we found damages the flowers. And you get that weird taste and feel that people really don't like."

Others agree with the difference in texture, but consider it to be better.

"There's definitely a difference: number one, the color and the look is much better than traditionally dried flower," Cerdas says. "The terpene profile is often better. The thing that traditional customers are not used to is the texture. It's different."

One perk of freeze-dried cannabis is its

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- Greg Baughman

ability to be stored for long periods of time.

"It's got to be kept in a lightproof and airtight container and it'll last a long time," Cerdas says. "We have some samples that we've had in the cupboard for about three years. It looks just the same. We take little pieces off. Yeah. Whenever we have customers that come over demos, we pull it out and we said, you know, like, 'Wow, that's good.' And again, that's two years old!"

It remains to be seen how the consumer marketplace will react to freeze-dried cannabis, but the benefits in terms of saving time on the producer's end are undeniable. **HT**

wave.cc

 cryocure.com

keirton.com

HANG-DRIED CANNABIS



FREEZE-DRIED CANNABIS

