

# How to Successfully Navigate Lab Planning and Build Outs for Solventless Processing

Eric Vlosky, 2021

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## Executive Summary

This white paper aims to educate readers about the steps that are involved to launch a solventless extraction business or division as efficiently and cost effectively as possible. There are scarcely any segments of the cannabis industry as exciting to prospective business owners as solventless concentrates and infused products. Predictably, with so many would-be business owners eager to enter the market or looking for expansion opportunities with their existing laboratories, information about how to successfully launch a solventless cannabis processing laboratory, especially one that is capable of producing true top shelf SKUs, is in high demand. Given the funding and maze-like legal navigation required to get any cannabis license at all, early fact finding and planning is essential to keep costs to a dull roar and to have a clear pathway to future profitability. The complexities of state-by-state or municipality-based licensing, while pertinent, are not discussed in-depth here. Those interested in starting a new business, adding a solventless division, prospective investors, as well as extraction industry enthusiasts will be able to learn here the nuances and general order of operations to launch a solventless extraction lab. While the focus is on THC-dominant processing, CBD and hemp are also considered.

## Budgeting and Order of Operations

Starting a solventless processing lab, or any cannabis extraction operation for that matter, is no simple feat, but is not as difficult in most places as it is sometimes made out to be. As those who have been in the thick of it for a while will tell anyone, ample patience and thorough, down-to-the-inch planning are the cornerstones of success. Under this state of understanding, the prospect of launching a lab is tantalizing to many for a variety of reasons, from the lure of high profits to the desire to make premium cannabis concentrates that outshine their competitors. In fact, in Colorado, the world's most mature recreational cannabis market, the growth of concentrate and infused product sales continues to accelerate every year as more consumers seek new experiences from different brands (MJBizDaily & Schaneman, 2021). This trend is seemingly consistent across virtually all maturing markets where point of sale data is more or less accurately collected.

The first step in all of this, whether a business is launching a new solventless processing division to make ice water hash and rosin, or is a new brand looking at its first processing space, is budgeting. The aspirations of any business are inextricably linked to what

amounts of capital they have access to or aim to acquire, which then tends to govern just about everything else. If your goal is to launch a boutique brand, the money required is going to be considerably less than a business seeking a multistate footprint. To illustrate the example of how wide of a range there is here, according to the 2020 MJBiz Factbook, the most common startup costs, all in, for cannabis manufacturing businesses range from \$288k all the way up to \$2m, with the median landing at \$570k (Marijuana Business Daily, 2020, 210). While this paper does not deeply consider licensing considerations on a country or state-by-state basis, it is extremely important to research and understand exactly how much a license is likely to end up costing in your intended location. The sum costs to acquire a processing license vary dramatically by state and country when all factors are properly taken into account.

The great news for businesses looking to get into solventless processing is that typically the budget necessary to get started tends to be significantly less than other forms of solvent-based extraction. This is due in part to lower equipment costs across the board, but also because many of the architectural safety considerations that flammable, pressurized solvents require are not necessary, such as C1D1 rooms. When it comes to establishing what your budget could ultimately be, the following factors should be carefully considered:

- What are your long term brand aspirations and what kind of market footprint is necessary to achieve them?
- How much does your operation plan to process in a given week, month, or year? Does the license you seek limit your processing capacity?
- Are you planning to construct a new building, or are you looking for space to lease?
- Do you have an expansion plan that clearly lays out possible growth phases? If not, why?
- What does the location you intend to operate charge for the license you are planning to get?

Preparing extensively for what your processing brand would like to deliver to the market over the next 1, 3, and 5 years is one of the best possible ways to trim the costs of future construction updates and additions. This is easier to do when you have established which kinds of solventless SKUs you plan to create with your lab. In most cases, processing fresh frozen cannabis into live hash rosin is the best place to start, which then opens up pathways to live rosin cartridges and a variety of other exotic solventless concentrates. Similarly, if edibles or infused products are also part of your business plan, even if it's much further down the road, ensuring that you have space to build a kitchen for example is important. For those planning to automate their edibles production, the costs required can reach half a million dollars or more quickly, not to mention the extra additional square footage that's necessary for such equipment. Even though many of the details and timelines will change over time to react to the market and any capital constraints, the more that is mapped out at the very beginning, the more successful your brand is likely to be.

The phases that each cannabis extraction business will take to get off the ground vary in size and complexity but tend to proceed in a fairly consistent order. The major steps

involved and a general order of operations for taking a solventless processing lab from concept to reality follow along these lines:

1. Budget determination, taking expansion and phased rollouts into account.
2. Finalizing of the business plan, which must take SKUs (of all types of extraction) into account in the short, medium, and long term *prior* to facility design, along with acquisition of an equipment list that will be needed to create them.
3. Preliminary facility design, either in conjunction with new construction or an existing space, and in some cases a pro forma may be required as well at this stage.
4. Hiring of architects and engineers, who review facility designs and incorporate that into a holistic facility design plan that accounts for everything from building codes to where material will enter and exit, and so on.
5. Revisions, which will include layering in HVAC, electrical, plumbing, and a variety of other facility requirements depending on local laws.
6. Initial standard operating procedures are created next, or in conjunction with step 7, and typically cover how each planned extraction method will be performed, among just about everything else the lab does on a daily basis.
7. All of this is then typically submitted to the city for review, and adjustments are commonly made to the facility design based on if specific local ordinances were followed exactly or not.
8. After adjustments have been made, if necessary, anywhere from 2 weeks to 6+ months may elapse before approval is granted to begin construction.
9. Construction begins after approval has been granted, taking into account everything detailed in the construction documents and building plans.
10. Finally, once construction has been completed, equipment has been purchased and installed, the final walkthrough takes place and a license is commonly granted thereafter if everything is as it was planned - if not, further adjustments may be required before a final license will be issued.

This entire process can take anywhere from 6 to 12 months, or longer, as the number of interdependent factors is immense. In states where license requirements are very strict, this timeline may be sped up slightly as the volume of applicants who do not pass muster are quickly turned down in favor of well prepared ones.

### Lab Planning and Building Considerations

In order to properly plan a lab, the option of building vs. leasing and how much square footage is going to be available is going to dictate everything else. While new construction is more expensive upfront, it offers a lot more latitude when it comes to building a space that is perfectly conducive to extracting cannabis or hemp. This isn't feasible for most businesses unless they have considerable funding, so leasing space is a very common route, but one that still frequently comes with plenty of construction work to ensure that the space is meeting all necessary building codes that are required for extraction.

Regardless of your location, there are some general code requirements that apply across the board. For example, the IBC (International Building Codes) are followed by all architects

and engineers in the United States, and anyone you hire to do building work should be familiar with them. If they aren't, beware. It's important to partner with your local building regulators to ensure you don't miss any of the nuances adopted by your specific municipality. For example, the city you operate in might very well have stricter requirements than the state lays out. No matter how annoying or expensive it may seem, you always have to comply with the strictest requirements set forth by the city or municipality you plan to operate in. In addition, you may need to purchase equipment that allows your facility to meet GMP requirements. Not all locations require this, but Canada does and many states in the US may follow in the future as regulations become more rigorous. For more on GMP and how Health Canada treats processing labs, see the supplemental link at the end of this paper for more information. If you plan to operate in Canada, this is required reading top to bottom.

For virtually all solventless processing labs, making ice water hash from fresh frozen cannabis and then pressing it into various rosins or ultimately cartridges are their primary pathways for SKU creation. This requires RO water filtration, a room that is able to be cooled if possible, plenty of ice, and some early determinations about processing throughput to decide how much equipment will satisfy the business plan's goals. If a lab is planning to process hemp or CBD instead, chances are pursuing dry sift as the primary method of extraction is typically advisable, or simply pressing high quality, CBD-heavy strains into rosin may be the route of choice. While this white paper does not extensively cover possible SKUs and material allocation, other white papers and webinars that we've created do, and we highly encourage readers who are new or unfamiliar with the wide range of possible solventless products to study those materials, which are linked at the end of this paper.

In general, the following minimum square footage allotments are what we suggest for businesses looking to get into solventless processing. Things like break rooms, entry ways, places to do admin work, and restrooms must be considered at this stage along with what equipment will go where.

#### Boutique - 500 - 1,000 sq. ft.

- Approximately 30,000 grams or less of fresh frozen per day processing capability

Right around 500 sq. ft. is the absolute minimum that a boutique processing company can get away with, but that also requires maximizing every nook and cranny. Having a space of close to 1,000 sq. ft. is advisable as this enables more growth opportunities as the company expands, but many very successful solventless brands operate in this range.

#### Mid Size - 1,000 - 2,000 sq. ft.

- Approximately 60,000 - 120,000 grams of fresh frozen per day processing capability

This is where most companies tend to find a reasonable middle ground for cost as well as future expansion opportunities. This gives an extraction brand some room to grow as well as more operating space to avoid highly cramped working areas. If you plan to run multiple shifts or take on white label processing, having any less space is going to pose serious challenges.

### High Output - 2,000 - 2,500+ sq. ft

- Approximately 150,000+ grams of fresh frozen per day processing capability

For operations that are looking to scale aggressively, create high unit volume early, and need space to grow to accommodate more anticipated SKUs, 2,000 - 2,500 sq. ft. is suggested. This size of space enables growth for multiple areas of solventless processing, accommodates adequate storage, and enables larger employee gathering spaces.

Beyond raw square footage and expansion plans, there are quite a few other things to factor in as well in order to have the highest likelihood of success with solventless extraction. Here are some aspects of planning and construction that are commonly overlooked, but which can have costly consequences down the road if they were not baked into the original plans.

### **Coolable Room for Ice Water Extraction**

Keeping the area where your ice water extraction will happen cold is considered a gold standard best practice in solventless, but that doesn't mean you need a traditional cold room itself, which can get costly. If you are not planning to wash every single day or don't have a lot of space to work with, you can save money by having a room that is engineered to cool down to 55°F when needed, but can also be run at normal room temperatures at other times.

### **Noise**

Solventless extraction labs typically need compressed air to run the advanced, automated pneumatic rosin presses that are prized by top tier producers. Many air compressors can be quite noisy, especially for employees who have to work around them day in and day out. If possible, it's strongly advised to put your lab's compressed air in a separate area, whether in a shed outside of the lab if possible or in a closet, for example. Routing pneumatics requires some planning but is worth it in the long run for the sanity and comfort level of your staff.

### **Simply Winging It**

A lot of business owners who are just getting started in cannabis or hemp sometimes underestimate just *how* specific local ordinances and inspectors tend to be about facility compliance. Even though revisions and changes to space plans and construction are common, enormous amounts of money can be saved by hiring professional designers, architects, and building engineers who are highly knowledgeable. Small details that are unaccounted for during the space planning phase can blossom into huge problems during construction, costing much more than if the right people were hired at the beginning.

### **Storage**

Another space design element that is often overlooked is storage. Will you be packaging in the same space as your extraction? How frequent are your deliveries of material? Buying empty jars and boxes in bulk is a great cost saving measure, but requires shelf space. Same goes for freezer space with fresh frozen. If you aren't getting deliveries often and need to store a lot of cannabis or CBD at one time, make sure that your space plan has adequate storage.

## Common Mistakes

There is no surefire way to get through the licensing process for a solventless lab without having to be flexible. The municipality you intend to operate in might be more willing to work with you, or less, and the same goes for individual inspectors. These are factors that can't be controlled for, but by paying as close attention as possible to the ones that can be managed is an excellent way to reduce the time and cost it takes to become operational. In addition to the building and space planning considerations above, here are a handful of common mistakes we see time and time again.

- 1) **Not determining an equipment list early.** While it may seem counterintuitive, your equipment list is actually one of the very first things that is needed before a building has been selected or starting a build out. It may change somewhat, but because you should already know what SKUs you're after, this should come early in the lab planning process.
- 2) **Poor size planning.** Make sure that from the very beginning, your team is factoring in expansion and growth, even if it's likely to be modest. On the flipside, paying for more space than you conceivably need can be especially expensive when utility, leasing, and construction costs over the long term are factored in. It is certainly difficult to envision where the business might be in 5 years, but before you sign a 10 year lease for an undersized or oversized space, make sure that at least your general growth phases are outlined.
- 3) **Failure to understand that solvent-based extraction is vastly different.** While it may sound obvious, many operators do not take into account just how different solventless processing is from its solvent-based counterparts. Everything from construction to venting to managing waste could be a completely different process depending on your local regulations with other forms of extraction that rely on pressurized, flammable chemicals.
- 4) **Ceiling height.** For solventless processing and ice water hash production specifically, ceiling height can play a crucial role in figuring out whether you will be gravity draining your hash or if you need pneumatic hash safe pumps to move water around. Another factor with ceiling height and coolable or cold rooms is that having too high of a ceiling means massive and unnecessary energy expenditures to keep those extra cubic feet cool at the ceiling which aren't being utilized.
- 5) **Putting the wrong equipment in your cooled room.** Certain pieces of equipment give off heat passively while running, such as ice makers and even freezers, which will increase the amount of electricity you have to spend to keep a given room cold for your ice water hash washing. Other items that should be placed elsewhere include warming ovens and rosin presses.

## Conclusion

Solventless concentrates and infused products are among the most sought after in today's cannabis market, but require high quality material and attention to detail to make properly. To do so, having a laboratory that is set up from the very beginning for solventless's specific requirements is essential to maximize profitability and throughput. Scaling the ice water hash, sift, and rosin extraction processes becomes significantly easier with even modest foresight for phased growth, which is sometimes an afterthought. As is commonly said in business, time is money, and vice versa. The added time spent revising applications and facility plans to ensure they meet local regulations, if done poorly early on, can cost a lot more than many business owners or investors expect. By planning a solventless processing lab with the steps and considerations in this white paper, operators and business owners can help themselves avoid unnecessary expenses before, during, and after acquiring their extraction license.

## **Supplemental White Papers and Links**

- [Rosin Versatility: Leveraging Diverse Solventless SKUs to Attract Customers](#)
- [Live Rosin Process Management: Strain Selection, Ice Water Hash, and Finished SKUs](#)
- [Good Production Practices Guide for Canada](#)

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