

# ***BEGINNERS GUIDE TO CBD***

**8 Keys to Understanding CBD**

**Robert Mitchell**

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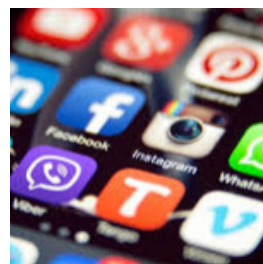




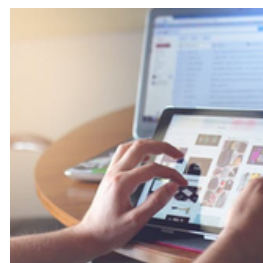
# Introduction

## Introduction

Whether scrolling through social media profiles, searching the internet or listening to the radio on your daily commute, being bombarded with advertisements for CBD is becoming less of the exception and more of the expected.



These advertisers make bold claims as to the purported benefits, some real and some exaggerated of this miraculous substance known as CBD. Although I am a huge proponent of CBD and its potential for optimizing one's wellness pursuit, before diving into how CBD could be beneficial, one should first gain a rudimentary grasp of what CBD is, what to look for in a product to ensure it is safe and potent, as well as learn how to choose a quality CBD manufacturer.



### In this Guide, you will learn:

- CBD Basics
- How To Separate Myths from Facts
- The Differences Between an Oil, Tincture or Edible
- The Differences Between Full-Spectrum, Broad-Spectrum and Isolates
- What Terpenes Are and Why They Matter
- CBD Extraction Methods and Why They Matter
- What a CoA is and How to Correctly Interpret It
- Specifics to Look for When Choosing a CBD Manufacturer

Essentially, at the completion of this Guide, you will have a solid understanding of these basic CBD essentials. So sit back, kick up your feet, grab a cup of coffee (preferably infused with CBD) and scroll onward to begin your journey towards achieving optimal wellness naturally.





# CBD 101

## What is CBD?

Cannabidiol or CBD, is a naturally occurring compound found in cannabis, used for centuries as medicine for many ailments. Researchers are now testing the plant for its potential ability to improve mood, help with anxious feelings or distress (1), reduce joint and muscle aches (2), chronic discomfort (3), proper sexual function (4), and many more.



A safe, non-addictive substance, CBD is one of more than a hundred “phytocannabinoids,” which are unique to cannabis and endow the plant with its robust therapeutic profile. Unlike its cousin tetrahydrocannabinol (THC), it's not psychoactive.

The fact that CBD is therapeutically potent as well as non-intoxicating makes it an appealing treatment option for those who are cautious about trying cannabis for the first time.

## How does CBD work?

Cannabidiol can be taken into the body in multiple ways, such as CBD oils, tinctures, edibles, gummies, etc. It may be supplied as CBD oil containing only CBD as the active ingredient (no added tetrahydrocannabinol- THC). CBD does not have the same psychoactive properties as THC and does not cause mind-altering effects.

CBD and THC interact with our bodies in a variety of ways. One of the main ways they impact us is by mimicking and augmenting the effects of the compounds in our bodies called “endogenous cannabinoids” - so named because of their similarity to the compounds found in the cannabis plant. These “endocannabinoids” are part of a regulatory system called the “endocannabinoid system”.





The discovery of the endocannabinoid system has significantly advanced our understanding of health and disease and plays a crucial role in regulating a broad range of physiological processes that affect our everyday experience - our mood, our energy level (5), our intestinal fortitude, immune activity, blood pressure, bone density, glucose metabolism, how we experience pain, stress (6), hunger, and more.

## Is CBD Legal?

Yes! Under the 2014 and the recently passed 2018 Farm Bill, CBD derived from Hemp, that has less than 0.3% THC by dry weight, is federally legal. Our products comply within these guidelines. We also offer THC-Free Isolate CBD Oil for an alternative option.

## Chapter References

1. <https://www.ncbi.nlm.nih.gov/p...>
2. <https://www.ncbi.nlm.nih.gov/p...>
3. <https://www.ncbi.nlm.nih.gov/p...>
4. <https://www.ncbi.nlm.nih.gov/p...>
5. <https://www.ncbi.nlm.nih.gov/p...>
6. <https://www.ncbi.nlm.nih.gov/p...>





# CBD Facts and Myths

## Myth #1: CBD is Illegal

False. Under the 2014 and the recently passed 2018 Farm Bill, CBD derived from Hemp, that has less than 0.3% THC by dry weight, is federally legal.



## Myth #2: CBD Will Get Me High.

False. No! CBD is 100% non-psychoactive, meaning it doesn't negatively impact your mind or mental processes. In other words, CBD does not get you 'high,' stoned, faded, or any other term you care to use. There is no mental fog or haziness caused by CBD.

Cannabis, however, is a complex plant family that contains many other cannabinoids – most of which do not get you high, like CBD. Some cannabis plants are bred for high CBD content exclusively – these plants are known as 'hemp'(1) – and only contain trace amounts of THC (below 0.3% to be exact, according to federal regulations)(2) The combination of high CBD content and extremely low levels of THC is what makes the products derived from hemp plants non-psychoactive.

To reiterate, the cannabis plant family contains multiple cannabinoids, however, only THC provides the traditional high associated with cannabis. Marijuana plants provide high THC concentrations, while hemp produces high levels of CBD. CBD, the second most prevalent cannabinoid, is non-psychoactive and doesn't induce any 'high' at all.

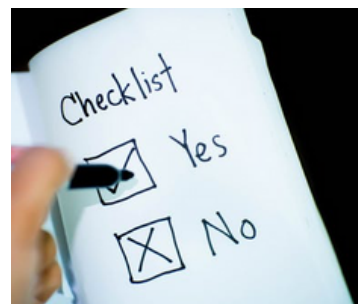
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1. <https://keytocannabis.com/blog...>
2. <https://www.congress.gov/bill/115th-congress/house-bill/2>



# To Eat or Not to Eat... Tinctures and Oils vs. Edibles

CBD products come in many different forms and can be used in various ways. It's a little overwhelming to try and figure out where to start. The most appropriate delivery system for therapeutic cannabis such as CBD, is one that provides an optimal dose for a desired duration with few unwanted side effects.




**Oils** are herbal remedies in which the active ingredients of cannabis are **dissolved in a carrier oil**, such as coconut oil, hemp oil, grape seed oil or a blended oil.



**Tinctures** are herbal remedies in which the active ingredients of cannabis are **dissolved in alcohol or another solvent**. Their effect, duration, and dosing are similar to that of edibles. However, edibles are a slower onset than tinctures.

**Edibles** are foods or snacks cooked with cannabis-infused oil, butter or ghee. The effects of orally consumed cannabis can last 4 to 6 hours —considerably longer than inhaled cannabis. But the onset of effects is much slower (30-90 minutes) than for inhaled cannabis or sublingual sprays. The slow onset and longer duration make edibles well suited for treating chronic conditions that require a steady dose of medicine throughout the day.



The biggest risk with orally administered cannabis is over consumption. The longer time of onset makes it more difficult to titrate dosage. One should proceed cautiously by taking a small dose of an edible and waiting at least an hour before deciding if more is needed. Edibles may not be appropriate for someone suffering from nausea, vomiting or lack of appetite. (1)

## Sublingual Method of Tinctures

Sublingual means under the tongue. By applying a few drops of cannabis tincture or CBD oil under the tongue, the user will experience the beneficial effects within about 20 minutes. In contrast, to simply swallowing the oil or tincture this method avoids the first pass effect of the liver. By absorbing the cannabinoids under the tongue the effect is not altered, diminished, or time delayed by digestive processes.

Sublingual application facilitates cannabinoids entering the bloodstream faster with predictable results. It's not just more efficient than eating cannabis it's also a whole lot easier to dose with a tincture in a dropper bottle. (2)



## CBD Oil

CBD oil is the most widely available sublingual tincture on the market. The best products utilize carrier oils to improve both the taste and the bioavailability of the organic CBD oil. Infusing carrier oils also makes it possible to produce a variety of concentrations of CBD oil.

Moreover, as the CBD oil is sourced from hemp and non-psychoactive, **CBD oil is legal in the United States** and in most European countries.

Supplementing Cannabidiol with a few drops of CBD oil under the tongue is already a top wellness trend of 2019. (3)

## So which is best?

To answer this question, you have to consider what you want to get out of the experience. Sublingually dosing a cannabis or CBD tincture is an extremely efficient, easy, and discreet way to use. This is especially true if you are on the go. The faster effects are often favored by those looking for fast onset or for maintaining an ongoing therapeutic application.

Oral ingestion of cannabis, on the other hand, does not offer quick results. What it does offer are longer, often stronger results. The problem with it is that it can be hard to dose evenly between portions.

So which is the best? The method of cannabis consumption that suits your current needs.

## Chapter References

- 1 <https://www.ncbi.nlm.nih.gov/p...>
- 2 <https://www.royalqueenseeds.co...>
- 3 <https://www.royalqueenseeds.co...>

# CBD – Full-Spectrum or Isolate?

## What's the difference?

CBD is now more popular than ever, and the benefits are leading users to inquire about the different types of CBD and what they can do for the mind and body. One of the most common questions is "What's the difference between full-spectrum and CBD isolate?"

### What is Full-Spectrum CBD?

Many people are familiar with cannabidiol (CBD), but there are actually dozens of cannabinoids found in hemp, which have shown many benefits in scientific studies. Full-spectrum CBD refers to cannabidiol derived from the whole plant, meaning it contains CBD, Terpenes and other phytocannabinoids, such as THC, CBC, and CBN and is known for creating an "entourage" effect. A Full-Spectrum product contains all of these beneficial cannabinoids and other compounds found in the plant, so you don't miss out on any of the benefits.



### What is Broad-Spectrum CBD

Broad Spectrum CBD is similar to Full-Spectrum, as it also contains other phytocannabinoids and some terpenes, but it **DOES NOT** contain **THC** as the THC has been removed during the refining process.





## What is CBD isolate?

CBD isolate is a pure, crystalline powder that contains 99% pure CBD. CBD isolate contains only CBD. All the plant matter contained in the hemp plant, including oils, waxes, chlorophyll, and more are removed, offering a finished product that's CBD and nothing more.(1)



## Which one is best?

CBD users find benefits to both full-spectrum CBD products and CBD isolate. Full-spectrum extract is preferable over CBD isolate for some CBD users due to having more antioxidants, other cannabinoids, terpenes, and healthy fatty acids that commonly result from the whole-plant extraction process.

However, CBD isolate does have something to offer CBD users that full-spectrum extract does not. The fact that full-spectrum extracts invariably contain low levels of THC means that some users prefer to play it safe and stick to pure CBD by itself, out of fear of failing a drug test or experiencing a form of "high", although both of these occurrences have been found to be fairly unlikely.(2)

## The Entourage Effect

In 1998, a landmark paper was released in the European Journal of Pharmacology (3) which made a huge impact on the CBD industry, naming the "Entourage Effect" (4), a theory that suggests the full range of cannabinoids in full-spectrum products made from cannabis have wide-ranging synergistic effects that are potentially more therapeutic than CBD isolate. The decision really is up to the user.

## Chapter References

1. <https://www.cbdschool.com/how-...>
2. <https://www.fundacion-canna.es/en/education>
3. <https://pdfs.semanticscholar.o...>
4. [https://en.wikipedia.org/wiki/Entourage\\_effect](https://en.wikipedia.org/wiki/Entourage_effect)

# What Are Terpenes and Why Do They Matter?

A terpene is an aromatic oil found in plants. There are over 100 different identified terpenes in the cannabis plant, and while the differences can be subtle, much progress has been made in making classification of terpenes and their effects easy for patients and consumers to understand. Broadly, terpenes can be broken down into sweet, sour, spicy, or bitter — with each category further breaking down into more specific smells.



In addition to providing a different aromatic experience, certain terpenes have additional medical benefits and can also have the ability to affect your mood. (1) Example: Linalool, most commonly found in lavender, is a terpene also found in cannabis products like CBD. The Linalool terpene is airy, light, and floral – known for reducing stress and anxiety for users. It's also been known to help treat oncoming seizures.(2)

## Common Terpenes Found in CBD Products:

Limonene - aromatic in citrus, lemon; improves mood and known to help relieve nausea (3)

Myrcene - musky and woody; anti-inflammatory, used as a sedative and for pain relief (4)

A-Pinene - smells of pine and mountain woods; known to help improve energy, focus, and memory (5)

Caryophyllene - aromas of pepper and spices; known for anti-inflammatory, anti-depressant; anti-anxiety (6)

Linalool - lavender scent; best known for anti-anxiety, sedative, and anti-bacterial properties (7)

Humulene - smells of wood and earth; reportedly good for antiinflammatory, chronic pain relief, and appetite suppressant. (8)

CBD is non-psychoactive and non-intoxicating, when inhaled or ingested it interacts with CB1 and CB2 receptors that affect many different parts of our body.

CBD also acts as an agonist on the receptors that metabolize cannabinoids, so it blocks THC from the receptors by taking its place. In some hospitals, patients admitted for consuming an excess of cannabis are treated with CBD to reduce the effects of THC.

Too much of any one component of cannabis can thwart a beneficial high and reduce the synergistic Entourage Effect. (9) The THC to CBD ratio is a key player in any cannabis experience. Finding the right balance for your body and your particular needs is critical.

Although concentrated cannabis has historically been used since ancient Moroccan and Chinese civilizations, cannabis has become exponentially more concentrated in the past several decades. We now have cannabis plants that are producing flower with two to three times higher cannabinoid and terpene potency than forty years ago. Concentrates have also become more concentrated including products that are 95-99% pure CBD. Different products are entering the cannabis market every day.



## Chapter References

- 1 <https://www.ncbi.nlm.nih.gov/p...>
- 2 <https://www.ncbi.nlm.nih.gov/p...>
- 3 <https://www.ncbi.nlm.nih.gov/p...>
- 4 <https://www.ncbi.nlm.nih.gov/p...>
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- 8 <https://www.ncbi.nlm.nih.gov/p...>
- 9 <https://www.leafly.com/news/ca...>

# CBD Extraction Methods Decoded

## How is CBD Made?

**CBD** or Cannabidiol is a naturally occurring compound found in cannabis. A safe, non-addictive substance, CBD is one of more than a hundred "**phytocannabinoids**" which are unique to cannabis and endow the plant with its robust therapeutic profile (1).

Ok, CBD is a phytocannabinoid, but how is this compound obtained from cannabis?

All CBD containing products contain oil rich in CBD. This oil, sometimes referred to as PCR Hemp Oil (**PhytoCannabinoid Rich**) is obtained by "extracting" the CBD from the hemp plant. **Extract** (extracted, extracting, extracts) as defined by Webster's Dictionary, is a verb meaning:

**a:** to withdraw (something, such as a juice or a constituent element) by physical or chemical process, (2).

This is why you'll often see "hemp extract" on the product label and in the ingredients list. Once the extraction has occurred, the oil is ready to be added to a multitude of products, including CBD Oils, Tinctures, Topicals, Edibles, Capsules, Beauty products and more.

## 3 Types of CBD Extraction Methods

- CO2 (Carbon Dioxide) Extraction
- Steam Distillation
- Solvents (Natural and Hydrocarbon)

The below information was taken from <https://www.cbdoil.org/cbd-ext...>

## Carbon Dioxide (CO<sub>2</sub>) Extraction

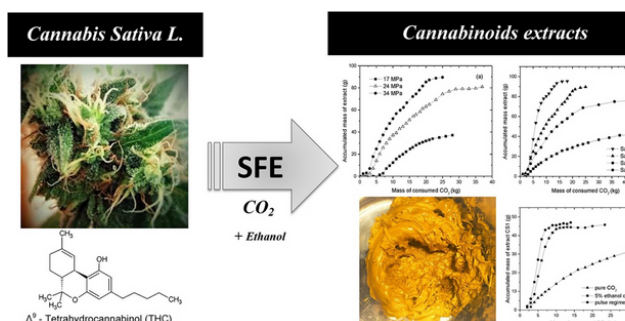
CO<sub>2</sub> extraction uses supercritical carbon dioxide to separate the CBD oil from the plant material. “Supercritical” refers to the CO<sub>2</sub> containing properties of both a liquid and a gas state, which is why you’ll sometimes see this method referred to as Supercritical Fluid Extraction (SFE).

During CO<sub>2</sub> extraction, a series of pressurized chambers and pumps are used to expose CO<sub>2</sub> to high pressure and very low temperatures, resulting in an extracted oil containing high amounts of CBD.

- At the start of extraction, one chamber will hold pressurized CO<sub>2</sub>, while a second pressurized chamber holds the hemp plant.
- The CO<sub>2</sub> is then pumped from the first chamber into the second. The presence of supercritical CO<sub>2</sub> breaks down the hemp also in the chamber, causing the oil to separate from the plant material.
- Finally, the CO<sub>2</sub> and oil are pumped together into a third chamber. The gas evaporates, leaving an extract of pure CBD oil behind.

While it requires expensive specialized machinery, CO<sub>2</sub> extraction is the **preferred method** for making CBD products. It’s extremely safe and efficient at producing high concentrations of CBD in the resulting oil— as much as 92% according to one analysis.

The precise nature of CO<sub>2</sub> extraction also makes it suitable for producing specific concentrations of CBD oil. Manufacturers can simply adjust the solvent and pressure ratios to achieve the desired concentration of CBD.



The CO2 extraction process is also widely used to create many other products besides CBD oil, such as decaffeinating coffee or tea, or extracting essential oils for use in perfumes.

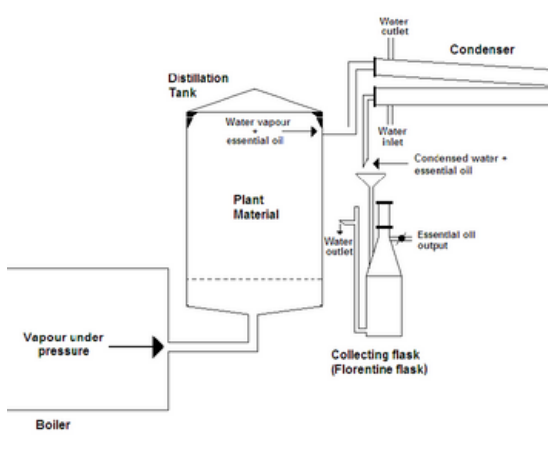
## Steam Distillation

With steam distillation, steam causes the CBD oil to separate from the hemp plant. The hemp plant is contained in a glass flask, with an inlet and an outlet. The inlet connects to another glass container, beneath the plant flask, that contains water that is set to boil. The outlet connects to a condenser tube.

- As the water heats up, the steam travels upwards into the plant flask, separating the oil vapors that contain CBD.
- These vapors are then captured in a tube that condenses them into oil and water.
- Once collected, the oil and water mixture is distilled to extract the CBD oil from the water.

The steam distillation technique is tried and true, having been used to extract essential oil for centuries, but it's less preferred than CO2 extraction due to its inefficiency. Steam distillation requires significantly larger amounts of hemp plant, and it's more difficult to extract exact amounts of CBD concentration using this method.

There's also an element of risk with this method. If the steam gets too hot, it can damage the extract and alter the chemical properties of the cannabinoids it contains.





## Solvent Extraction (Hydrocarbons and Natural Solvents)

Solvent extraction follows a similar process to steam distillation, except that it uses a solvent rather than water to separate the CBD oil from the plant material. This creates a resulting mixture of the CBD oil with the solvent. The solvent then evaporates, leaving pure CBD oil behind. Solvent extraction uses either **hydrocarbons** or **natural solvents**.

Solvent extraction is more efficient than steam distillation, and it's also less expensive. However, the solvents used in **hydrocarbon extraction** (including naphtha, petroleum, butane, or propane) create cause for concern. The solvent residue can be toxic and increase one's cancer risk if they aren't fully eliminated during the evaporation step—which doesn't always happen. Some studies have found traces of petroleum or naphtha hydrocarbons residue in CBD products that used solvent extraction.

To avoid the risk of toxic residue, solvent extraction can use natural solvents instead, such as olive oil or ethanol. These solvents are just as effective at extracting CBD oil, but remove the risk of toxic residue.

However, natural solvent extraction is not without its downsides. When natural solvents like ethanol are used, chlorophyll may also be extracted. This gives the resulting oil an unpleasant taste. If the CBD is used in capsules or topicals, this isn't a big deal, but many CBD products are eaten or inhaled (such as gummies, tinctures, vape oils), so this can make them harder to sell.

The larger problem with natural solvents, though, is that they don't evaporate very well. As a result, the CBD extract contains a lower concentration of CBD than it would with other methods.

## What Is the Best Extraction Method for CBD Oil?

There are pros and cons to each extraction method. At Safe Harbour Wellness, we recommend CO<sub>2</sub> extraction. While it is the most expensive extraction method, it consistently produces the highest concentration of CBD, resulting in a quality product.

It's also one of the safest extraction methods, leaving behind no neurotoxic residue.

Extraction Method	Pros	Cons
CO <sub>2</sub> Extraction	Efficient Highest concentration of CBD Easier to adjust concentration No toxic residue No chlorophyll	Expensive
Steam Distillation	Inexpensive No toxic residue No chlorophyll	Inefficient Inconsistent concentration of CBD Potential for heat to damage CBD oil
Hydrocarbon Solvent Extraction	Efficient Inexpensive Consistent concentration of CBD No chlorophyll	Potential for toxic solvent residue
Natural Solvent Extraction	Efficient Inexpensive No toxic residue	Presence of chlorophyll affects taste Lower concentration of CBD

When purchasing CBD products, find out which extraction method the company uses, as this can be an indicator of the quality and value of their products. Products that use CO2 extraction may be more expensive, but they also tend to be higher-quality.

CBD products made using other extraction methods can be safe and high-quality as well, but there can be more risk with these products. Specifically, CBD products that were made using hydrocarbon extraction may contain solvent residuals. And while steam distillation and natural solvent extraction are lower-risk, they can produce lower or inconsistent amounts of CBD, which can affect the cost/mg value of your CBD product.

Beyond their extraction method, also confirm that the company uses a third-party lab to test the concentration of the CBD in their products, as well as the safety of the other ingredients. Any reputable manufacturer will make these test results readily available on their website, with their product packaging, or upon request. The test results will show the potency of the CBD and other cannabinoids (described in milligrams). They'll also reveal any potential contaminants, as well as the presence of any solvent residue, if the product used hydrocarbon solvent extraction.

## What Happens After Extraction?

After extraction, the resulting CBD oil is described as “**full spectrum**.” This means that other cannabinoids besides CBD, including CBDA, CBDV, THC, and others, are still present. As long as the product is sourced from hemp, the amount of THC will be 0.3% or less (which makes it legal anywhere in the U.S.).

Full-spectrum CBD oils also contain other beneficial elements from the plant material, such as terpenes and amino acids. Many people prefer full-spectrum CBD oil because of the “entourage effect.”

While this effect has not been proven, some users believe that the CBD is able to engage the endocannabinoid system more effectively when more cannabinoids are present.

However, some people would rather have no THC in their oil, even in very low, legal amounts. These people prefer CBD isolates. To create CBD isolate, the extract is cooled and further purified into crystalline isolate form. This results in a white, flavorless powder. Because it contains only CBD, CBD isolate is less expensive per milligram, contains no THC, and has no flavor or odor.

Finally, regardless of whether it is turned into a CBD isolate or remains full-spectrum, the CBD oil is added to other substances to create various CBD products, (3).

## Chapter References

1. <https://www.safeharbourwellness.com>
2. <https://www.merriam-webster.com>
3. <https://www.cbdoil.org/cbd-ext...>



# How to Read a Certificate of Analysis

## What is a Certificate of Analysis?

A Certificate of Analysis (CoA) is a laboratory report on the chemical make-up of a product. A CoA for CBD shows the contents and potency of the cannabinoids, as well as the presence of other tested compounds, such as terpenes, heavy metals, etc., while also ensuring the hemp extract contained within, meets the federal legal guidelines of containing less than 0.3% THC per product or batch.



**PROVERDE LABORATORIES** Test Certificate

Certificate ID: 10089-219 Received: 7/30/19 Scan QR Code for verification

Client Sample ID: 1706mg - PS - Mint Lot Number: 507006-02 Matrix: Tincture - MCT Oil

Authorization: Jon Podgorni, Lab Manager Signature: Jon Podgorni Date: 7/30/2019

The data contained within this report was collected in accordance with the requirements of ISO/IEC 17025:2015. I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results apply only to the test article listed in the report. Replicate samples may be represented as separate entries in this report.

**CN: Cannabinoid Profile & Potency [W1-10-17 & W1-16-17-01]** Analysis: GC Test Date: 7/24/2019

The client sample was analyzed for plant-based cannabinoids by Liquid Chromatography (LC). The collected data was compared to data collected for certified reference standards at known concentrations.

ID	Weight %	Concentration (mg/mL)
THC	0.04	0.34
THC-A	ND	ND
CBD	5.59	51.59
CBDV	0.02	0.16
CBG	ND	ND
CBG-A	0.03	0.26
CBN	ND	ND
THC-A	ND	ND
CBGA	ND	ND
DB-THC	0.01	0.13
THC-THC	ND	ND
Total	5.69	52.52
Max THC	0.04	0.34
Max CBD	5.59	51.59

Limit of Quantitation (LOQ) = 0.011 wt%

Max THC and Max CBD are calculated values for total cannabinoids after heating, assuming complete decarboxylation of the acid to the neutral form. It is calculated based on the weight loss of the acid group during decarboxylation. Max THC = (THC-A + THC) \* 1.1. This calculation does not include other cannabinoid isomers (eg. DB-THC, and more THC). ND = None Detected above the limits of detection (LLD).

ISO 17025, Rev. 1, DEC 15, 0003 420 Fortune Blvd • Milford, MA 01757 • 617-223-3356 www.ProVerdeLabs.com Page 1 of 2

These reports are important for consumer safety and peace of mind, as they provide critical information needed to make an informed purchasing decision.

## Why are CoAs important?

In an unregulated industry, consumers need to be careful about what company they are buying from. Knowing the exact potency and ingredients is critically important to safely make an informed purchasing decision.

As widespread adoption of CBD is new to the marketplace, there is little oversight in the CBD industry as a whole. This lends way for unethical companies to make unsubstantiated claims, with little fear of recourse. Sadly, it is not uncommon for their products CBD potency, falsely claim a product is full spectrum when it is actually a broad spectrum or isolate, as well as inaccurately report whether their product does or does not contain THC. In fact, The **Associated Press** put out a report that **found 128 of the 350 CBD products tested by American law enforcement agencies contained synthetic marijuana as did 10 of the 30 tested by the AP directly (1).**

Despite this inconvenient lack of oversight, there is a surefire way to ensure one is purchasing a quality product. One must refuse to purchase any product from any company that does not perform third party laboratory testing or fails to make these test results (CoAs) easily accessible to their consumers.

## How Do I Read a CoA?

The first item you should notice on a CoA is the company who performed the lab test. It is imperative to verify that the company performing the test is not the same company you are purchasing the product from, in order to avoid any bias or conflict of interest in the report.



On the top left of this example CoA, information regarding the product's identification is found, which includes the batch number of the product tested. On the top right is the company that manufactured or is selling the product. In the middle, you will find a QR code. This QR code is utilized as a quick and convenient way to view a product's CoA by scanning the code with your smart phone to verify the authenticity of the report. Further, the lab manager's signature is provided to verify the report is authentic and correct.

## Heavy Metal Analysis

Safe Harbour Wellness, LLC. Certificate ID: 54490-119 Material Q2 2019 (Concentrate/Extracts - CO2)

HM: Heavy Metal Analysis (WT-10-13)					Analyst: JFD		Test Date: 5/16/2019	
This test method was performed in accordance with the requirements of ISO/IEC 17025. These results relate only to the test article listed in this report. Reports may not be reproduced except in their entirety.								
54490-HM								
Symbol	Metal	Conc. <sup>1</sup>	Units	MDL	Use Limits <sup>2</sup>		Units	Status
As	Arsenic	ND	µg/kg	4	200	1500	µg/kg	PASS
Cd	Cadmium	ND	µg/kg	1	200	500	µg/kg	PASS
Hg	Mercury	ND	µg/kg	2	100	1500	µg/kg	PASS
Pb	Lead	ND	µg/kg	2	500	1000	µg/kg	PASS

1) ND = Not detected to Lowest Limits of Detection (LLD)  
 2) MA Dept. of Public Health: Protocol for MMJ and MIPs, Exhibit 4(a) for all products  
 3) USP exposure limits based on daily oral dosing of 1g of concentrate for a 110 lb person.

The Heavy Metal Analysis, checks for heavy metals present within said product. "Conc" is the concentration of the metal found within the tested sample. "Ingestion" is the amount of heavy metals that is deemed safe to ingest per day, as reported by the Department of Health.

## Pesticide Analysis

The Pesticide Analysis, lists a number of common pesticides contained or absent in the tested sample. Consumers need to make sure the "Results" states "ND" (not detected) and the "Status" states "PASS". This demonstrates that no pesticides were detected within the sample.

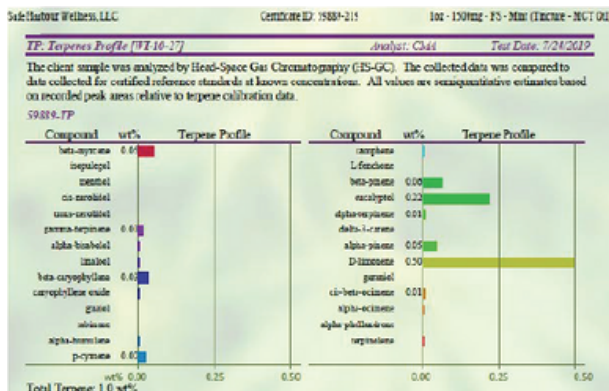
Safe Harbour Wellness, LLC. Certificate ID: 14499-189 Material Q2 2019 (Concentrate/Extracts - CO2)

PST: Pesticide Analysis (WT-10-13)							Analyst: JFD		Test Date: 5/16/2019	
The client sample was analyzed for pesticides using Liquid Chromatography with Mass Spectrometry detection (LC/MS/MS). The method used for analysis was based on the California method for pesticide analysis (CM-1000).										
14499-PST										
Analyte	CAS	Result	Units	LLD	Limit (ppb)	Status				
Azinphos Methyl	62495-15-3	ND	ppb	0.20	100	PASS				
Azinphos Methyl	62495-15-3	ND	ppb	0.20	100	PASS				
Azinphos Methyl	131868-53-4	ND	ppb	0.10	40000	PASS				
Bifenthrin	149877-41-4	ND	ppb	0.10	2000	PASS				
Bifenthrin	82657-04-3	ND	ppb	0.20	300	PASS				
Cyfluthrin	68359-37-5	ND	ppb	0.20	1000	PASS				
Deltamethrin	1596-84-5	ND	ppb	10.00	10	*				
Disulfoton	153233-91-1	ND	ppb	0.10	1500	PASS				
Fluorfenox	72490-01-8	ND	ppb	0.10	10	PASS				
Imidacloprid	35754-44-0	ND	ppb	0.10	10	PASS				
Imidacloprid	138260-41-3	ND	ppb	0.10	3000	PASS				
Malathion	80671-89-0	ND	ppb	0.10	9000	PASS				
Permethrin	76738-42-0	ND	ppb	0.10	10	PASS				
Piperonyl Butoxide	51-63-4	ND	ppb	0.10	8000	*				
Pyrethrin	8003-34-7	ND	ppb	0.1	1000	PASS				
Spinetoram	160314-95-4	ND	ppb	0.1	3000	PASS				
Spiromesifen	285194-90-1	ND	ppb	0.10	12000	PASS				
Spiromesifen	203113-25-1	ND	ppb	0.10	11000	PASS				
Thiophanate Methyl	141317-21-7	ND	ppb	0.10	30000	PASS				

\* Testing limits for residues established by the State of California, CCR, Title 16, Division 14, Chapter 1, Section 1111. ND indicates "none detected" above the lower limit of detection (LLD). Analytes marked with (\*) indicate analytes for which an analysis was observed for a specified matrix sample.



## Terpenes Profile



The Terpenes Profile Analysis, shows what terpenes were detected within the sample and its relative weight percent. Terpenes are aromatic oils that give cannabis its unique smell and flavor. Some terpenes promote relaxation while others promote focus.

## Analysis of Volatile Organic Compounds

The Analysis of Volatile Organic Compounds, shows what gas may have come in contact with the final product of said sample. "ND" stands for "not detected". The consumer needs to ensure each of the compounds' "Status" is "PASS".

**VOC: Analysis of Volatile Organic Compounds (WT-10-28)**      Analyst: CH4      Test Date: 7/24/2019

The client sample was analyzed by Head-Space Gas Chromatography (HS-GC). The collected data was compared to data collected for certified reference standards at known concentrations.

59889-VOC

Compound	CAS	Amount <sup>1</sup>	Limit <sup>1</sup>	REL	Status
Propane	74-98-6	ND	1,000 ppm	200	PASS
Isobutane	75-28-5	ND	1,000 ppm	200	PASS
Butane	106-97-8	ND	1,000 ppm	200	PASS
Methanol	67-56-1	ND	3,000 ppm	200	PASS
Pentane	109-66-0	ND	5,000 ppm	200	PASS
Ethanol	64-17-5	ND	5,000 ppm	200	PASS
Acetone	67-64-1	ND	5,000 ppm	200	PASS
Isopropanol	67-63-0	ND	5,000 ppm	200	PASS
Acetonitrile	75-05-8	ND	410 ppm	200	PASS
Hexane	110-54-3	ND	290 ppm	200	PASS
Heptane	142-82-5	ND	5,000 ppm	200	PASS

<sup>1</sup>) ND = Not detected at a level greater than the Reporting Limit (RL)  
<sup>2</sup>) In ppm, based on CO2-monomethylamine for volatile compounds, adopted by the Massachusetts Department of Public Health on 3/13/14.  
 Release/Process limits are based on limits established for state of Colorado.

## Cannabidiol Profile & Potency

The Cannabidiol Profile & Potency, is one of the most important parts of the CoA, as it shows consumers exactly which cannabinoids are present and the potency of the CBD and THC contained within.

**CN: Cannabidiol Profile & Potency (WT-10-17 & WT-10-17-01)**      Analyst: LG      Test Date: 7/24/2019

The client sample was analyzed by gas chromatography-mass spectrometry (GC-MS). The collected data was compared to data collected for certified reference standards at known concentrations.

59889-CN

ID	Weight %	Concentration (mg/mL)
THC	0.04	0.58
THCV	ND	ND
CBD	5.19	51.59
CBDV	0.02	0.16
CBDG	ND	ND
CBC	0.03	0.16
CBN	ND	ND
THCA	ND	ND
CBDA	ND	ND
CBGA	ND	ND
DB-THC	0.01	0.13
THC	0.04	0.58
Total	5.69	52.32
Max THC	0.04	0.38
Max CBD	5.19	51.59

Limit of Quantitation (LOQ) = 0.011 wt%

Max THC (and Max CBD) are calculated values for total cannabinoids after having assumed complete decarboxylation of the acid to the neutral form. It is calculated based on the weight loss of the acid group during decarboxylation. Max THC = (THC + THCA) \* THC. This calculation does not include other cannabinoid sources (eg. DB-THC, and THCV). THCV = Max THC above the limit of detection (LLD).

The "ID" lists the cannabinoids the lab tested for. Under "Weight %" if it shows "ND" it stands for Not Detected. This is equally important if the consumer is buying an isolate product as "isolate" implies an isolated ingredient, which in the CBD space translates to a product being THC-FREE.

The right side of the below screenshot shows a bar graph corresponding to the relative amounts of the different cannabinoids in the product. If more than one form of CBD is present, then the product is considered either a "broad spectrum" or "full spectrum" product. The difference between the two, being that a full spectrum product will also contain trace amounts of THC, whereas a broad spectrum will be THC-FREE.

## Chapter References

1. CBD Tainted with Substance that causes death, Comas, Insanity | by Dan Robitzki | Published in Futurism.com | September 16, 2019





## 3 Popular Ways to Consume CBD

CBD is available in many forms, each with its own specific advantages and drawbacks. There are three main ways to consume CBD; Orally, Topically or via Inhalation (Vaping). For the purposes of this article, we will focus on oral and topical administration.

### Orally

Taking CBD orally, is considered to be the most effective way to consume CBD Products. There are several oral delivery methods, but the two most popular are sublingual administration (under the tongue) in the form of an oil or tincture, as well as via an oral ingestion of liquid gel capsules or traditional capsules.



### Oils and Tinctures

Sublingual administration of CBD Oils or CBD Tinctures, via a dropper, is an easy way to measure out your own dosage and ensure the maximum absorption of CBD is achieved, due to the higher bio-availability of the carrier medium. You can easily titrate the dosage up or down depending on your preference or needs.

### Liquid Gel Capsules and Traditional Capsules

Liquid Gel Capsules and Traditional Capsules are considered the most convenient delivery route, but possess a lower bio-availability than both Oils and Tinctures. This translates to less of the CBD within the product being absorbed by your system, due to first pass metabolism. When choosing between the two capsule types, Liquid Gel Capsules would be the preferred option as they are available in both Full Spectrum or Isolate options and have higher bio-availability than Traditional Capsules.

Both capsule types are equally convenient and pre-measured, which makes proper dosing on the go easily achievable. Capsules take a bit longer to take effect than oils, but also tend to be longer lasting.

## Edibles

Edibles are another orally administered option to consider when choosing your ideal CBD delivery method. There are many different forms of CBD Edibles, including CBD-infused Gummies, CBD-infused Chocolates and more.

## Topically

Topical products are a wonderful option for a more site specific and focused approach to CBD administration. Topicals come in many different forms including Roll-Ons, Rubs, Body Butters and Salves. Each are a useful solution for localized problem area application.

The Topical Category also contains many different cosmetic beauty products, which includes CBD-Infused cosmetics such as facial creams, moisturizers, anti-aging cremes, body butters and more.

## Layering

Layering is a term coined by veteran CBD users and refers to the combined approach to CBD administration. Many report a layered approach to their CBD application as being preferred over the use of any singular medium. For example, one may opt to take a CBD Oil, followed by a capsule with topical application at problem areas.

The takeaway is **there is no right or wrong way to take your CBD**, so feel free to experiment!

# How do I know what company to choose?

Finding the right CBD Manufacturer can be a difficult choice, as there are many options out there; some good and some not so much. This difficulty is further compounded by the lack of oversight in the current CBD regulatory climate. The good news is, as CBD becomes more widely adopted, more and more states are implementing regulations to ensure consumer quality and safety standards.



In the meantime, know there are several reputable companies that truly desire to produce quality products with the goal of providing a solid ancillary to your wellness tool kit. In order to ensure you have the best opportunity of making the correct choice, always remember to:

- Research the company by reviewing their website, paying close attention to whether or not they post their Certificates of Analysis, are updating them correctly and are easily accessible to consumers.
- Verify that a 3rd Party Laboratory is utilized for all testing, in order to avoid any potential bias in the results posted.
- Review their product labeling, looking for clear identifiers of potency and ingredients.
- Ensure the packaging contains a scannable QR code, for ease of access to the company's Certificates of Analysis for each final product batch, as well as for the bulk hemp utilized to create the product.
- Verify the labeling clearly lists the country of origin- ie. Made In The U.S.A. The soil quality the hemp is grown on is critical, due to hemp being a bio-accumulator, meaning it will extract both nutrients and toxins from the soil. Ensuring you are comfortable with the posted country of origin's farming regulations is key to peace of mind and uncontaminated products.





We hope you gained value from this e-book! With the many supplement options available, we certainly can appreciate a position of caution when considering aligning with someone new, and as such, ask that you afford us the opportunity to “WOW” you as your “Wellness Partner” and earn the privilege of being your “go to” for wellness products of uncompromising quality. We hope that you learned a lot, will consider joining us on our quest to give, love and serve and allow us to be your “Safe Harbour” in this sea we call Wellness.

Should you decide we are worthy of serving your wellness needs, please visit [www.SafeHarbourWellness.com](http://www.SafeHarbourWellness.com) and subscribe to our newsletter to receive special discounts, offers and continued learning.

If we may be of service to you in anyway, please feel free to contact us anytime.

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