Introduction to Vaporizing

Officer Dick Downey's
Re-education Protocol

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What is Vaporization?

Unlike smoking with direct flame, vaporizing heats the cannabis within a temperature range just below the point of combustion where smoke is produced. At this point, the medically active cannabinoids and terpenes are emitted with little or none of the carcinogenic tars from normal combustion of the actual plant material. This means that the smoke will be cooler and much more potent than smoking a conventional joint, for example.

Types

There are typically 2 basic ways vaporizers function - 1) Conduction, where the material (cannabis, hash, etc.) is in direct contact with the heat source; and, 2) Convection, where heated air is forced through the material to vaporize the trichomes.

Note: There is also a very rare third type called a Radiation, which uses radiant energy either produced by electricity or a light source to provide heat.

Cost

In general, the conduction type will be much more affordable, with a few exceptions. The conduction versions are available in portable and desktop models. The convection versions are only available in desktop models, though there are a few manufacturers working on portable convection.

Features

When deciding which type of vaporizer you want (conduction / convection), you should also consider the range of temperature settings the unit offers. You may prefer to get a vaporizer that has a wide range of temperatures to get the most out of vaporizing. Some other important features to consider include battery setup (some have replaceable batteries, some don't) and battery life per charge under normal use, integrity of the materials used (medical-grade glass vs. metal or plastic, etc.), and ease of maintenance. And if you have any dexterity limitations that might prevent you from using one easily, it is probably worth going to a shop that sells a wide variety of vaporizers and so you can physically handle them to get a real feel for each one.

Vaping & Temperature

When using a vaporizer, you should start at the lowest temperature and work your way up the temperature range as you go. 190C / 374F is about the highest you can go before reaching plant material combustion.

Concentrates & Vaporizers

If you're thinking about using a vaporizer for concentrates, like hash oils, shatter, wax, etc., some vaporizers can vaporize flowers, concentrates and oils. Most vaporizers currently on the market typically don't accommodate all three of these forms, but some do, and more options are always entering the marketplace.

Many dispensaries currently offer battery operated vaporizer pens that are preloaded with a liquid concentrate, typically Butane Hash Oil (BHO). Some of these pens are disposable while others are reusable. There are some pen versions emerging in the market that can handle wax and other forms of concentrate and this trend is likely to grow.

Which Type Should You Buy?

Conduction

The pros of conduction include portability, affordability, simpler design and faster warm up times. The cons of conduction include a higher risk of reaching combustion-level heat, the need to stir the cannabis often for even heating and the vapor is usually not as high quality and as thick compared to convection.

Convection

The pros of the convection include more accurate temperature control, more even heating, a cleaner, higher quality vapor and a lower risk of reaching combustion. The cons of convection include a higher price point, slower warm up times and lack of easy portability.

Boiling Points of Common Cannabinoids, Terpenes and Flavonoids

The chart on the next page lists several common cannabinoids and their vaporization temperature ranges and boiling points. This source of this chart comes from the Storz & Bickel for their Volcano vaporizer.

You can use these temperatures as a reference when vaporizing.

Note: This chart recognizes that vaporization typically starts happening before the compound's boiling point.

Temperatures	Cannabinoids	Treatments	+	Compounds	Treatments
Range 140° - 257°f **248°f**	Tetrahydrocannabinol **THCA** Acid Conversion	1) Requires ***30 mins.*** in the oven. 2) When eaten raw (***unheated***:) ➢Anti-inflammatory, ➢Anti-epileptic, and ➢Anti-proliferic.	+	Cannabigerol **CBG** (Converted CBGA)	*Conversion occurs while curing.* ➢Anti-inflammatory, ➢Analgesic, Anti-bacterial, ➢Anti-fungal, Bone stim., ➢and Anti-proliferic.
Range 176° - 275°f **266°f**	Cannabidiol **CBDA** Acid Conversion	1) Requires ***60 mins.*** in the oven. 2) When eaten raw (***unheated***:) ➢Anti-proliferic, and ➢Anti-inflammatory. ➢Not fully elucidated.	+	β-caryophyllene – 1st Med Vapour During CBD conversion.	Anti-malarial, Cytoprotective, and Anti-inflammatory. *Increases **CBD**, and **CBN** content.*
Range 212° - 293°f **284°f**	Cannabichromene **CBCA** Acid Conversion	1) Requires ***60 mins.*** in the oven. 2) When eaten raw (***unheated***:) ➢Anti-bacterial, and ➢Anti-fungal. ➢Not fully elucidated.	+	β-sitosterol – 2nd Med Vapour During CBC conversion.	Anti-inflammatory, and 5-α-reductase inhibitor. *Increases **CBC**, and **CBE** content.*
Boil Point 315°f **311°f**	Tetrahydrocannabinol **THC** Delta 9 (Δ-9)	➢Anti-inflammatory, ➢Apetite stimulant, ➢Anti-emetic, ➢Anti-proliferic, and ➢Anti-oxidant.	+	α-pinene – Daytime Meds	With **CBD**, treats **MRSA**, Anti-inflammatory, Bone stimulant, Anti-biotic, Bronchodilator, and Anti-neoplastic.
Range 320° - 356°f **329°f**	Cannabidiol **CBD** Excludes Δ-8	➢Most conditions listed, excluding the following: ➢Anti-insomnia, ➢Anti-fungal, and ➢Apetite stimulant.	+	β-myrcene – Daytime Meds Δ-3-carene	Analgesic, Anti-biotic, Anti-mutagenic, and Anti-inflammatory. Anti-inflammatory.
Boil Point 351°f **347°f**	Tetrahydrocannabinol **THC** Delta 8 (Δ-8)	*The **Δ-8** cannabinoid model lead to the **HU-210** from Hebrew University.* ➢Non-psychoactive. ➢Neuroprotective, ➢and Anti-emetic.	+	eucalyptol limonene ρ-cymene apigenin	Blood blood flow stimulant. Anti-depressant, & Agonist. Anti-biotic, & Anti-candidal. Estrogenic, & Anxiolytic.
Boil Point 365°f **365°f**	Cannabinol **CBN** THC degradation	***CBN** increases with the prolonged exposure to **heat, oxygen**, and **time**.* ➢Anti-spasmodic, ➢Anti-insomnia, and ➢Analgesic.	+	cannaflavin A – Nighttime Meds – Moron Favourite	COX inhibitor, and LO inhibitor. *Pending device temperature error.*
Boil Point - Theory **383°f**	Cannabielsoin **CBE** CBD degradation	***CBE** increases with the prolonged exposure to **heat, oxygen**, and **time**.* *Likely to contain cannabinoids other than CBE. Intended to show the* **maximum medicinal temperature.**	+	linalool – Nighttime Meds – Club Favourite	Sedative, Anti-depressant, Anxiolytic, and Immune potentiator (like limonene.)
High Benzene Level **401°f**	* Hydrocarbons * **Benzene** * Avoid vapours *	WARNING Toxic Vapours at 392°f. ***Harmful smoke toxins begin:*** www.canorml.org/health/vaporizers	+	terpinen-4-ol – Smoke ≥ Vapour borneol	Antibiotic, and AChE inhibitor (like ρ-cymene.) Antibiotic.
Boil Point < 428°f **428°f**	Tetrahydrocannabivarin **THCV** Blocks THC	➢Euphoriant, Anti-THC. ➢Analgesic, ➢Anti-diabetic, ➢Anorectic, and ➢Bone stimulant.	+	α-terpineol – Smoke ≥ Vapour – Ready to consume	Sedative, Anti-biotic, Anti-oxidant, and Anti-malarial. *Reduce toxins by consuming.*
Boil Point 428°f **428°f**	Cannabichromene **CBC** Includes THCV	➢Anti-proliferative, ➢Anti-bacterial, ➢Bone stimulant, ➢Anti-inflammatory, ➢and Analgesic.	+	pulegone quercetin – Smoke ≥ Vapour	Sedative, and Anti-pyretic. Anti-mutigenic, Anti-viral, Anti-oxidant, and Anti-neoplastic.

Quick Reference Medical Chart -> Vapourizer Cannabinoid Temperature Dial™ Æ 2014, Virtually Real Applications