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One of the biggest complaints in the cannabis vaping community is the burnt aftertaste associated with cartridges. This foul taste is often accompanied by a harsher hit which can cause some users to prematurely dispose of their cartridge - wasting product and money. Excessive coughing, throat irritation, and shortness of breath have also been reported. Vuber Technologies is a cannabis vaping company from Spokane, WA who is the sole proprietor of the quartz cartridge. Vuber wanted to know why their customer reviews are seemingly void of these complaints.

## **Ceramic vs Quartz**

Vuber's quartz cartridge and a popular ceramic cartridge were sent to an ISO-certified lab that specializes in vapor analysis. The results were shocking, ceramic produced 129% more harmful or potentially harmful constituents (HPHCs) and shed 329% more silica particles as compared to its quartz counterpart. These findings offer explanations for the differences between these two materials as they relate to a cannabis user's medicinal and recreational experience.

As opposed to smoking, vaping has been referred to as a "safer" method of cannabis consumption but our results indicate that this statement is dependent on the type of cartridge used. While the designs of cartridges make them look different, the only real distinguishing factor is the heating element which is responsible for wicking and vaporizing cannabis oil.

There are three general compositions for atomizers; ceramic, quartz, or a combination of both, each of which has a unique set of characteristics and properties that shape the functionalities of the cartridge. It's estimated that 95% of cartridges in dispensaries are ceramic. This product became the market standard, not because of its superior performance, but because it was one of the only options available when vaping was introduced to the cannabis world.

Ceramic cartridges are produced from a variety of companies each of whom have a unique recipe for their heating element. The compositions of these atomizers will vary which is why we sent a popular ceramic heating element to a lab for X-ray fluorescence testing - a technique used to determine the elemental composition of materials. The results identified 18 metal oxides, aluminum oxide was the main component, making up nearly two-thirds of that particular heating element. Knowing this information was particularly helpful in understanding why ceramic shed more particles and produced more degradants.

Recent research has warned that vapor produced from e-cigarettes contain silica and heavy metal particles(1). Since one of the biggest proponents of vaping is harm reduction, Vuber wanted to see if there were any significant differences in the amount of shedding between ceramic and quartz to determine if there was a safer option. Despite being made almost entirely out of silica, quartz shed 3179 particles, significantly less than its ceramic counterpart that shed 13,644 particles.

Burning is the most common complaint associated with vaping - a symptom caused when cartridges overheat, producing a revolting taste. When considering the insulating properties of ceramic, it's easy to understand how the overheating occurs. Ceramic retains heat which is why it's used as an insulator for electronics - it protects the surrounding components by absorbing heat. Since ceramic is the industry standard, it has been indirectly scrutinized by researchers conducting vapor studies. It's been determined that the advertised heat settings for a particular ceramic cartridge is grossly inconsistent with data gathered from laboratory studies. These extremely high-temperature ranges cause the fragile terpenes/cannabinoids to degrade into HPHCs as evident by the reported burnt taste.

### **About [Vuber Technologies](#)**

Vuber Technologies is a Washington-based, family-oriented business that was built from the ground up. We hold over twenty patents for our cartridges and batteries, continuously testing these products against the market to ensure we are providing the highest quality vaporizers with a flare for safety, style, and performance. Our VuberEarth initiative is dedicated to establishing the first cannabis battery stewardship program in the Pacific Northwest to address the excessive waste that disposable pens create.

For information on Vuber Technologies, visit: [www.vubervaporizers.com](http://www.vubervaporizers.com), or call: (206) 582-2899

### **Citations**

(1) <https://respiratory-research.biomedcentral.com/articles/10.1186/s12931-021-01737-5>

### **Additional Information**

#### [Reported CCELL Temp](#)

[Oar, Michael A, et al. "Thermography of Cannabis Extract Vaporization Cartridge Heating Coils in Temperature- and Voltage-Controlled Systems during a Simulated Human Puff." PloS One, 26 January 2022.](#)



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