# **Successful implementation of Chromalite™ media to produce THC-free CBD oil**

**A Case Study**

**Need:** Product to remediate CBD to reach “THC-free” levels for manufacturing of CBD consumer products

**Solution:** PCG600M polymeric chromatography media for final THC remediation

**Results:** THC-free CBD oil (< 0.1% THC) at an attractive produced cost point

**Background**

BOSS LLC, an equipment provider and remediation company in the hemp space, required a solution for their cannabinoid processing to satisfy the market need for a THC-free CBD oil to be used in consumer products. With a qualified and experienced leadership team, BOSS knew they needed to reach the most economical process feasible to keep up with long-term market trends and purity demands.

After BOSS tried multiple types of chromatography media that produced undesirable outcomes, such as high pressure/high CAPEX equipment or too much solvent during operation to reach the purity levels required, they turned to Purolite’s Chromalite™ product line. Chromalite™ PCG600M was successfully implemented within their simulated moving bed design to start biomass to maximize yield and product margin. This evaluation produced results that met BOSS’s production need of 85 kg/hour in a demonstration plant that surpassed expectations. The planning to upgrade the capacity to 150 kg/hour has already begun.

**The Solution**

BOSS’s process solution is outlined in patent #10,799,546, and summarized quickly in Figure 1.

Figure 1. BOSS's patented THC-Free CBD process

The overall process is centered on maximizing efficiency and preserving the precious cannabinoids in the extract. Each step is crucial in increasing efficiency, with the idea that as you increase your production scale, these inefficiencies become more and more burdensome.

**“Quote from BOSS”**

When evaluating the final purification step, PCG600M chromatography was ideal based on low-temperature processing and simplicity in requiring only a single solvent. This step helped minimize cannabinoid degradation byproducts and solvent use. Boss began the engineering with a simple pulse test of the actual extract on a single column of chromatographic media. From this data, full-scale performance could be modeled, as shown in Figure 2.

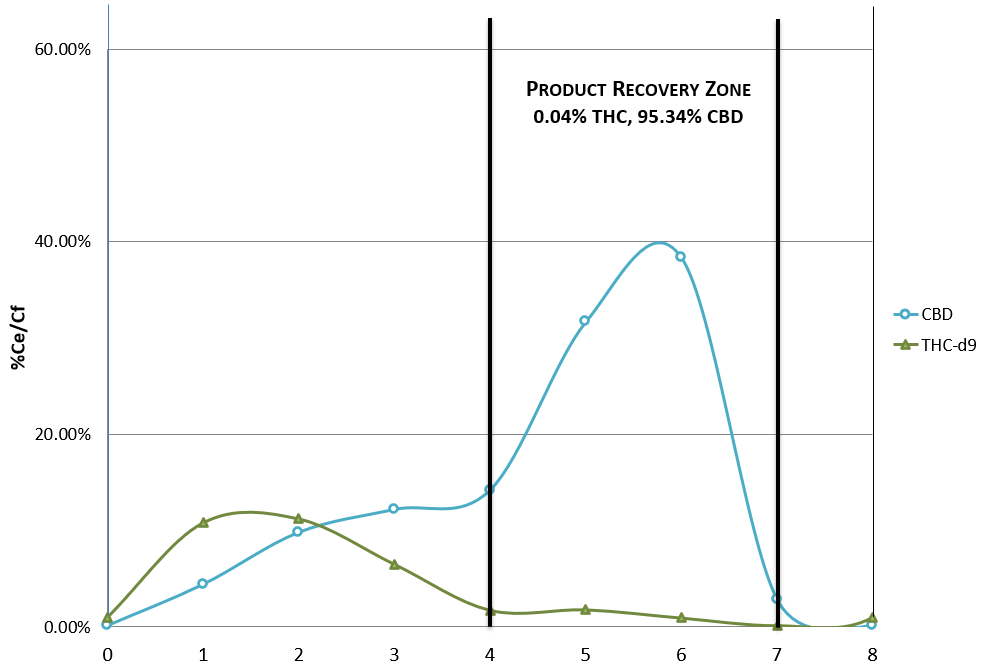


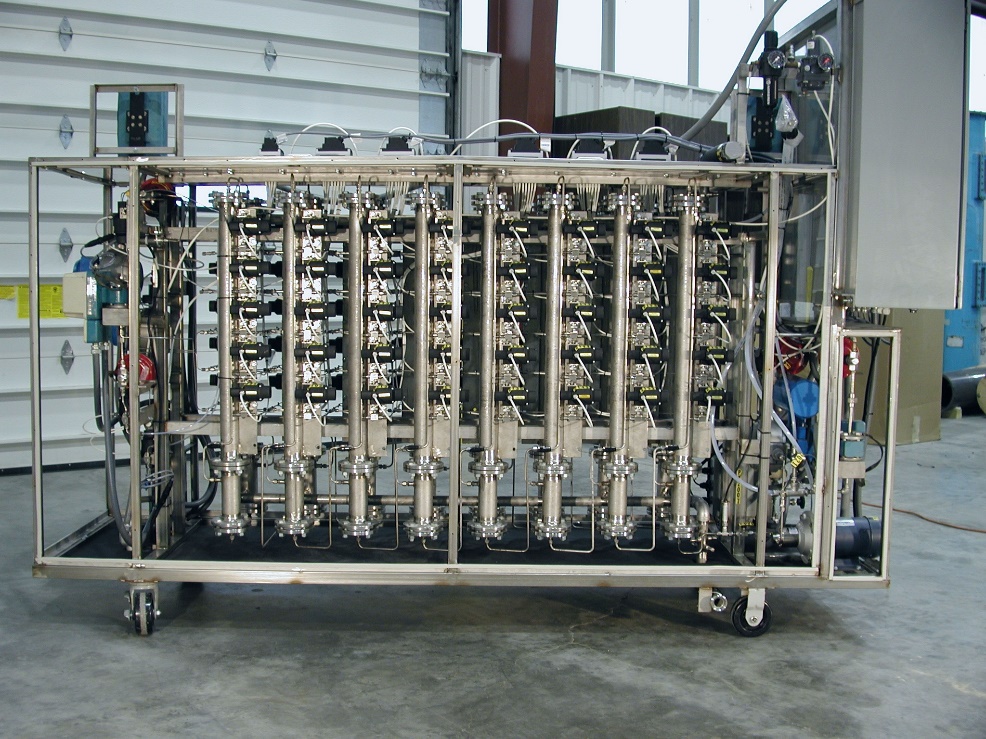
Figure . Simulated full scale elution profile from initial pulse test data. PCG600M with 90% ethanol desorbent.

Alternative C18 silica media were also tested but were found to be unfavorable for many factors. These media require high pressures to run and therefore require bulkier equipment to withstand these pressures. This outcome means that the added material costs would add up significantly in a simulated moving bed design with multiple vessels. The Chromalite™ media can reach high purity CBD without the need for high-pressure chromatography equipment.

The robust and inert polymer matrix also offered advantages over C18 silica by extending useful media life and avoiding unwanted chemistries that could lead to quality excursions. This factor was ideal for BOSS, who was looking to be involved in the business for years to come and wanted to minimize media replacement costs while always maintaining high quality.

After their initial media evaluations, the pulse test data gave the group confidence to pursue their 85 kg/hour demonstration unit using Chromalite™ PCG600M for their final THC remediation step. The third-party certificate of analysis on their final product confirmed the final product purity was below 0.1% THC -- well below regulatory levels of most mainstream markets. The purification levels reached were ideal for BOSS’s further downstream processing achieving non-detect THC levels for more conservative global markets. Based on the data using Purolite’s product, the new system was built, and operation began in <insert date here>.

At 85 kg/hour, BOSS is already profitable in their CBD production and increasing production to 150 kg/hour is underway.



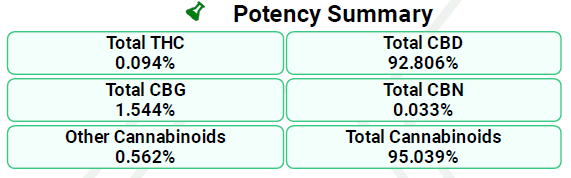


Figure . Third party certificate of analysis results on demonstration plant product purity.

**Why Chromalite™**

The decision to use Chromalite™ within BOSS’s final purification step relied on several metrics:

1. High purity reached
2. Lower CAPEX to high-pressure alternatives
3. Robust, inert media to maximize media life and avoid adverse chemistries
4. Purolite technical support and manufacturing capabilities

Purolite is proud to support BOSS’s patented process and excited play a critical role in their scale-up efforts.