Hemp and Cannabis oil

Case Study

KEY FACTS

- **Country:** Greece
- **Year:** 2021
- **Customer:** National and Kapodistrian University of Athens
- **Application:** Separation of cannabinoids from crude oil / cannabis extracts and enriched CBD isolate
- **Product:** Short Path Distillation System for Laboratory Use; Type VKL 70-4 FDRR
- **Key Benefit:** Pure product / quality / high concentrated / heat sensitive / no decomposition

Purification of hemp by short path evaporation

Laboratory distillation system for high quality and heat sensitive products

A laboratory in Greece uses a VTA short path distillation system for the separation of cannabinoids from hemp oil. The purified oil has a concentration of approx. 87 % CBD, with a high yield and low thermal stress (Note: this is material dependent and not guaranteed).

Customer Profile

The Laboratory "Development of bioactive natural products" (part of the National and Kapodistrian University of Athens) is specialized in the field of research and development of aromatic and medicinal plants for over 20 years. The team is equipped with state of the art equipment for the identification and isolation of active ingredients from plants.

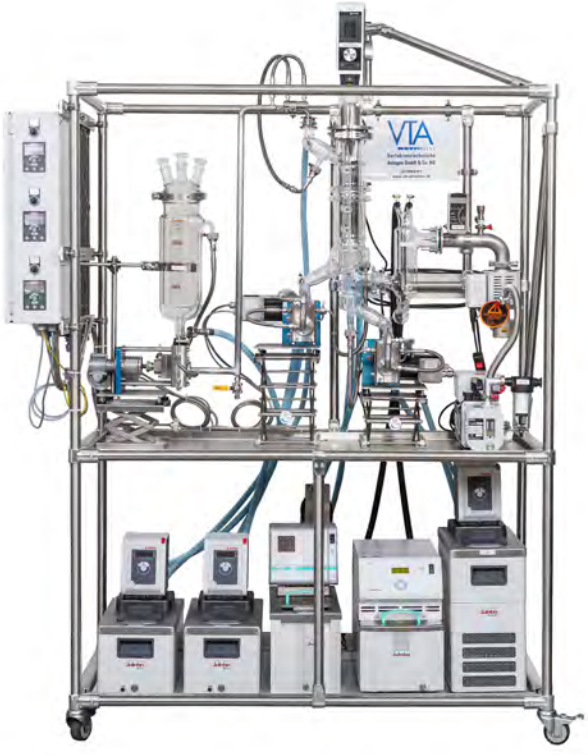
Challenges

The Greek government legalized the development and processing of hemp in 2018 under several conditions. According to the Greek law, the entire quality control of the production has to be performed within a single and enclosed area: no intermediate products are allowed to leave the site, i.e. only seeds can enter the site and only final product can get out of it. At the time, the customer did not have the possibility to purify the hemp oil. Distillation at atmospheric conditions would damage the product, because the cannabinoid CBD has a high boiling point.

Solution

Lab Manager Prof. Skaltsounis contacted VTA's partner company Hellamco shortly after the legalization of hemp in Greece. In March 2021, the two companies installed and commissioned the **short path distillation unit VKL 70-4 FDRR** in Prof. Skaltsounis lab. It's one of the first distillation units ever installed in Greece for this purpose. The main component of the system is a **glass evaporator** (made of borosilicate glass) with a heat exchange area of **0.04 m^2** designed for a throughput of **1-2 liter/hour**. The valuable oil is heated to 150 -220 °C for a very short time. At the pressure of **0.001 mbar** the cannabinoid can be separated from light boiling components like terpenes and in a second run from high boiling substances. The unit is a standalone system on a moveable steel frame.

VTA also works with Root Sciences in North America in the cannabis and hemp processing market. Together, they optimized the systems for continuous production and developed features, like GMP documentation and control systems. Hellamco and VTA trained Prof. Skaltsounis' team in the operation of the unit.



Short Path Distillation System VKL 70-4 FDRR

Results

- High quality enriched hemp extract: 86 - 88% CBD (Note: this is material dependent and not guaranteed).
- Gentle distillation at significantly lower temperature and short residence time
- Observation of product behaviors like foaming, fouling and film distribution during distillation (by key components made of borosilicate glass)
- Easy to operate the unit with the training from Hellamco and VTA
- Continuous production with the unit for 24/7

CBD powder after downstream process

Distillation system in the laboratory of the University of Athens

Prof. Alexios-Leandros Skaltsounis, Lab Manager

"We are able to produce high-quality purified distillate with a CBD concentration of 86-88% at a very high yield."

"We are working also in other projects for the isolation of natural products such as squalene and hydroxytyrosol from olive oil wastes and we strongly believe that we will have the opportunity to develop many other applications."

"We are pleased we had not only the systems but also the process experience of VTA and Hellamco. We are now operating the system for one year successfully."

VTA Verfahrenstechnische Anlagen GmbH & Co. KG

VTA is your partner for demanding process solutions of high-end thermal separation tasks and supplies small, standardized laboratory units up to tailor-made, skid-mounted industrial size facilities. Testing, engineering and manufacturing is managed inhouse at the headquarters in Germany. As a service, VTA offers contract distillation and pastillation on a toll processing plant. With VTA products and services a successful production in various industrial sectors is guaranteed.

Core competencies

- Thin Film / Wiped Film Distillation
- Short Path Distillation
- Horizontal Thin Film Distillation
- Thin Film Drying
- Fractionation
- Glass Lined Evaporators
- Laboratory Units
- Pilot Units

Hellamco Scientific Equipment

Hellamco is one of the leading suppliers of analytical and processing equipment for laboratories in Greece and the neighbor countries. The company offers professional pre- and after-sales support to customers in the chemical, biological, food and environmental sectors. Since the foundation in 1998, the company grew rapidly consisting now of 20 specialists, mainly chemists, biologists and engineers located in Athens and Thessaloniki. Hellamco provides their customers with the equipment for the cultivation, processing, quality control, research and packaging of hemp and cannabis.

More information on www.hellamco.gr
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