Hemp Extract and CBD Oil Filtration

CBD is derived from the hemp plant, pictured here.

How Eaton's solutions for improving the CBD oil production process leads to premium outputs.

Cannabidiol, commonly referred to as CBD and also known as hemp oil, is one of many chemical compounds derived from the cannabis plant.

Since the CBD oil industry is growing rapidly due to its growing usage in food, pharmaceuticals, supplements, nutraceuticals, and cosmetics, the need to process larger quantities of CBD oil is also increasing.

This requires effective extraction and filtration methods for varying quantities of the oil – a challenge manufacturers of CBD oil are currently facing as they work to keep both safe, efficient, and low-cost in design. What's more, these processes must also be effective for small and large batches while simultaneously reducing product loss and increasing yield.

Strict quality control standards are becoming more important to consumers as well, and there is a need to put a Good Manufacturing Practice (cGMP) in place for ensuring products are consistently produced and controlled according to top quality standards. Within cGMP, extraction and filtration processes must be carefully selected and managed.

After all, when the quality affects the customers' end CBD oil products, consistency is critical. And, because that consistency hinges on the production process, it's important to select the right filtration equipment and technologies.

Various configurations of filters for easy scale-up are required and filter media need to meet quality guidelines of the Food and Drug Association (FDA). Cleaning in Place (CIP) is another key feature for filtration systems.

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How to produce premium hemp extract and golden CBD oil

There are many methods to extract cannabidiol or hemp oil, the most common being ethanol and CO_2 extractions. For both methods, filtration plays an important role.

Eaton recommends a two-step process for purification. The first step is the clarification filtration which can be done in two stages:
Stage 1: Coarse particles, plant residues and value-reduced fats and waxes are removed. For this, pure cellulose BECOPAD 580 and BECO CPS range depth filter sheets are ideal due to their high dirt-holding capacity and a wide retention rating spectrum from 8 to 40 µm.
Stage 2: The second stage in clarification is the polishing filtration. The pure cellulose filter sheet BECOPAD and BECO Standard range are ideal due to their high separation efficiency. For pharmaceutical applications, corresponding high-purity filter media are available with low extractable ions.

The second step after clarification filtration begins with using an activated carbon filter like BECO CARBON ACF 02 with a carbon content of 1,000 g/m² which provides a particularly high adsorption capacity, removes color due to chlorophyll and corrects color and taste.

Learn more about Eaton filtration solutions for manufacturing stable, high-quality, intense cannabinoid products with a clear, golden character.

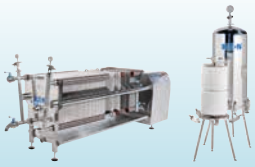
Eaton's solutions for CBD oil production:

- Clarifying filter media with high dirt-holding capacity for removal of plant residues and fatty lipids/waxes
- Low ion content and high-purity cellulose BECOPAD P or BECO PR filter media for pharmaceutical applications
- Reliable chlorophyll removal with BECO CARBON ACF 02 filter medium with immobilized activated carbon
- FDA-compliant filter media
- Easy scale-up options with filter system designs for start-ups and full-scale manufacturers
- cGMP compliant enclosed filter systems with CIP and SIP capability

Extraction and winterzation (cold treatment)

Step 1

Coarse filtration



BECOPAD® 580 or BECO® CPS depth filter sheets | or | BECODISC® or BT stacked disc cartridges

Removal of coarse particles, fatty lipids/waxes

High dirt-holding capacity

Polishing filtration

BECOPAD or BECO Standard depth filter sheets* | or | BECODISC or BS stacked disc cartridges*

Removal of fine particles, fatty lipids/waxes

Purity and high efficiency

Step 2

Activated carbon treatment

BECO CARBON™ ACF depth filter sheets | or | BECODISC BC stacked disc cartridges

Chlorophyll removal, color and off-flavor correction

High adsorption performance

Further process steps

Scale-up

From laboratory to full-scale production

Production scale

BECO INTEGRA® PLATE enclosed plate and frame filters »

« BECO INTEGRA DISC enclosed stacked disc cartridge housings

Pilot scale

BECO INTEGRA PLATE enclosed plate and frame filters »

Lab scale

« BECO INTEGRA LAB enclosed laboratory filtration systems BECO MiniCap™ capsules

CIP and SIP capable enclosed filter systems compliant with cGMP

Eaton products meet national and international quality standards, such as the LFGB (Food, Commodity and Feed Act) in Germany, FDA (Food and Drug Administration) guidelines in the USA and European Directive (EU) 10/2011 for plastic materials and articles, as well as subsequent amendments (EU 2020/1245).

*High pure pharma grades with low extractable ions available.

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