Methods & Devices Used to Create Cannabis Concentrates

Cannabis World Conference and Business Exposition
New York, NY
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My Background

- US Navy – Nuclear Submarine Mechanic
- Ohio State - Bachelors and Masters Welding Engineering
- Edison Welding Institute - Director of Welding and Testing Labs
Brief History of Apeks

Founded in 2001 manufacturing botanical oil extraction systems
- Headquartered in Johnstown, Ohio

• 2009(ish)
  - Medical Marijuana industry discovered Apeks

• 2012
  - Introduced Patented Valveless Expansion Technology

• 2013
  - 90% of customers in marijuana industry

• 2014
  - Denver, CO Service Center for training and service
  - First CO2 extractor to complete Colorado Engineering Peer Review

• 2015
  - Moved to 17,000 sq ft manufacturing facility, 400+ CO2 systems nationwide
Concentrates and Edibles are Taking Over!

Percentage of Total State Menu Items by Product Category

- **Arizona**: 55% for Concentrates, 20% for Clone, 24% for Flower, 14% for Other, 5% for PreRoll, 2% for Seeds.
- **California**: 52% for Concentrates, 33% for Clone, 22% for Flower, 14% for Other, 4% for PreRoll, 4% for Seeds.
- **Colorado**: 56% for Concentrates, 36% for Clone, 27% for Flower, 14% for Other, 5% for PreRoll, 0.4% for Seeds.
- **Michigan**: 33% for Concentrates, 21% for Clone, 28% for Flower, 19% for Other, 2% for PreRoll, 0.6% for Seeds.
- **Oregon**: 58% for Concentrates, 19% for Clone, 24% for Flower, 18% for Other, 2% for PreRoll, 0.3% for Seeds.
- **Washington**: 43% for Concentrates, 16% for Clone, 24% for Flower, 14% for Other, 10% for PreRoll, 0.6% for Seeds.
How are Concentrates Made: 3 Basic Steps

Extraction → Post Processing → Packaging
Step 1 – Extraction Methods: Pros and Cons

• Mechanical – Keif, Bubble Hash
  • Pros – cheap, low tech
  • Cons – low yields, labor intensive

• Solvent – Butter, Olive or Coconut Oil
  • Pros – simple, uses standard kitchenware
  • Cons – difficult to scale, can’t separate extract from solvent

• Solvent – Ethanol and Hydrocarbons (butane, propane)
  • Pros – low equipment cost, high yields, faster extraction times
  • Cons – high facility cost, explosive, chlorophyll, bad perception

• Solvent – CO2
  • Pros – pure extraction, no residual solvent, selectivity
  • Cons – high equipment cost, slower extraction times
Step 1 – Extraction = Raw Material

Subcritical CO2
• Low Temp
• Low Pressure
• Slower extraction
• Terpene preservation

Supercritical CO2
• High Temp
• High Pressure
• Faster Extraction
• More wax
Step 2 – Post Processing

- Post processing after extraction is required for nearly every product type:

- Vape Pens
  - Plant fats and waxes typically separated
  - Dilution to reduce viscosity is typical

- Dabbing products – shatter, crumble, honeycomb, wax
  - Usually done with vacuum oven

- Edibles and Infused Products
  - Emerging area with huge potential

- Capsules, transdermal patches, tinctures
Post Processing for Vape Pens

• 3 Basic Types
  • Raw and Natural
  • Dewaxed
  • Fractionally Distilled

• Flavor is important

• Color is important

• Terpene re-addition

Cutting Agents
• Propylene Glycol
• Vegetable Glycerin
• Coconut oil
• Hemp seed oil
• Terpenes

“Finding a good pen is hardest challenge”
Winterizing (Dewaxing)

Supplies needed
• Rotary Evaporator
• Freezer
• Ethanol
• Vacuum Flask
• Filter Paper
• Buchner Funnel

Pros
• Increases Potency
• Works better in vape pen
• Thins the oil
• Removes Water

Cons
• Loss of Flavor
• Use of Solvents
Dabbing Products

Various methods and consistencies

- Manual Separation
- THCA
- Low Pressure and Temperature
- Fresher the Better
Edibles and Infused Products

- Max yield extraction parameters
- Dewaxing is optional
- Flavor is not important
- Color is not important
- Decarboxylate at some point
  - Activates THC
Short Path Distillation

Why Further Refinement?
• Making “Clear” products
• High Levels of pure THC > 90%

Suggestions
• Hard Vacuum
• Temperature Control

Kugelrohr short-path distillation apparatus
CO2 Final Product Examples
Learn more – Apeks Demo Days

- [www.apekssupercritical.com/events](http://www.apekssupercritical.com/events)
- April 6 – Apeks manufacturing facility, Johnstown OH
- April 18, 19, 20, 21 – Denver Service Center, Denver CO
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