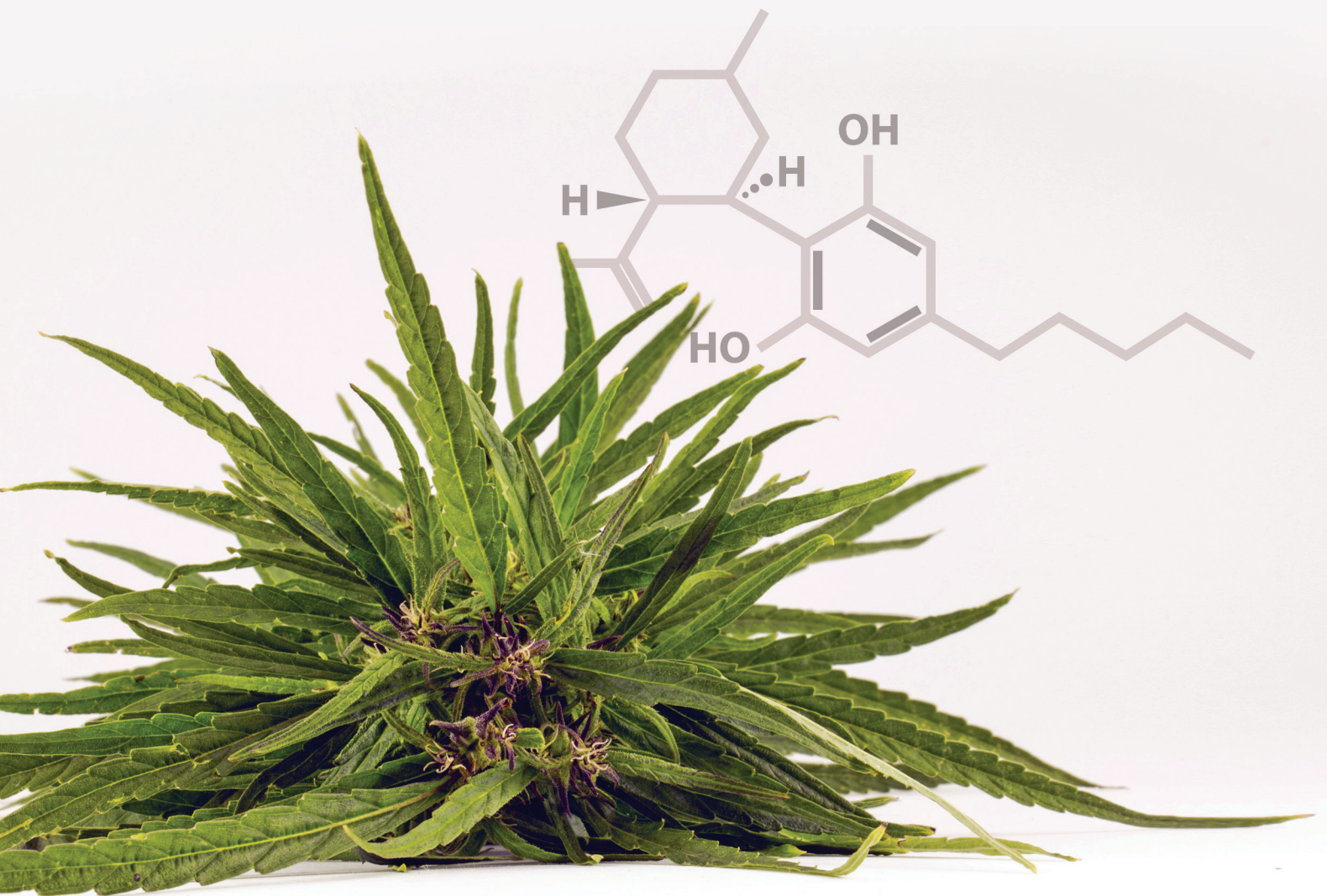

Cannabis Lab Solutions

Processing for Success



AMERICAN-MADE

MANUFACTURED WITH PRIDE IN VINELAND, NEW JERSEY

Ace Glass Incorporated is a leader and innovator in the manufacture of premium scientific glassware, lab equipment, and glass apparatus.

Capabilities

We manufacture glass reactors as small as 100mL to as large as 200L in size. We have **over 13,000 products**, including some that are cannabis specific. Whatever your laboratory glassware needs, we can meet them. We have been doing just that for satisfied customers worldwide for over 80 years. We would love to add your success story.

Industries

We are a key supplier to numerous industries including pharmaceuticals, environmental, energy, cosmetics, food & beverage, life sciences, manufacturing, academia, and cannabis processing.

Partnerships



Quality Cannabis begins with Quality Glassware



FLOWER TO THE PEOPLE

HIGH ON SUCCESS

Begin building your budding empire.
Visit our website today!



A Rhyming Story Of Cannabis Glory

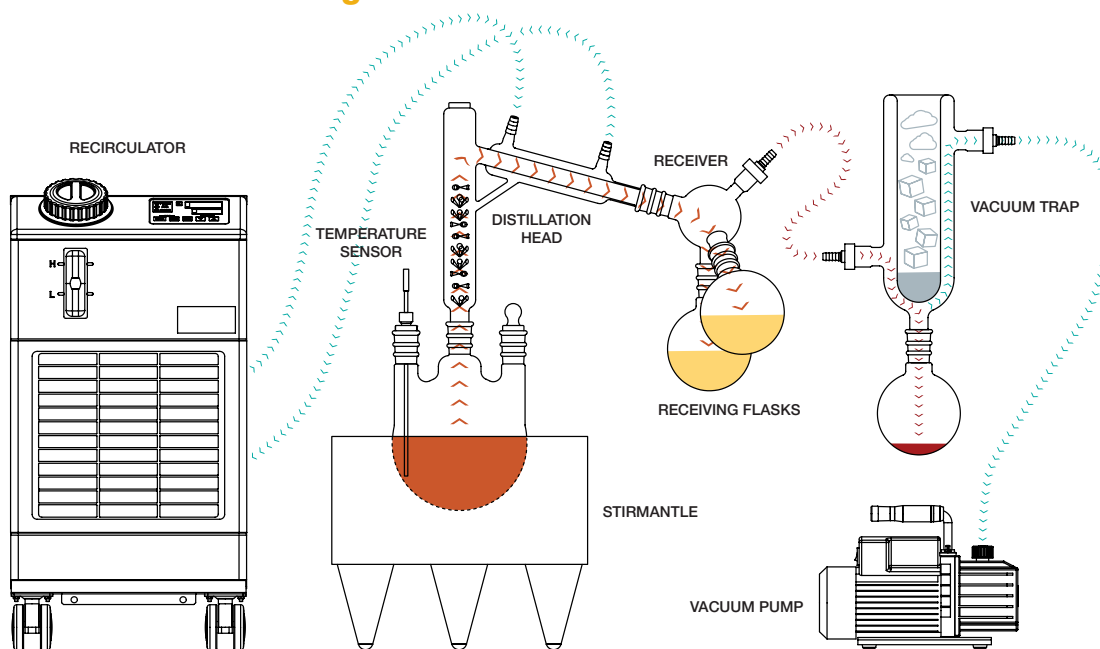
For Quality Cannabis - World Class...Your process equipment must surpass...Your processing peers who think they have won...By getting cheap glassware and boasting a ton...But now you know better; you made your mistakes...Through handshakes and headaches and dealing with fakes...So start your equipment to make your first pass...And TRUST your processing needs to good ol' Ace Glass.

That's Grow Business

In the pages beyond this one, you will find quality scientific glassware and associated equipment including the parts needed for the short path distillation set-up below.

The items listed are specifically designed for the cannabis industry. However, as times change, we are changing with them, and that means we are innovating and updating to fit the needs of the agile cannabis processor. So, make sure to check out our website to see the latest and greatest for YOUR laboratory.

Basic Distillation Processing



The set-up above is a general or basic distillation kit. You will find many accessories and upgrades available to suit your specific needs.

EXTRACTION

ETHANOL WARM/HOT EXTRACTION, WINTERIZATION

The process that uses a solvent to strip the parent plant material of the target compounds.

12855 SERIES REACTOR

Ethanol Extraction/Winterization

Jacketed reactor base systems can be used for ethanol extraction and winterization processes and are designed specifically to operate at hot to very low temperatures. For safe handling/use of ethanol we configured this reactor for an explosion-proof stir motor (not included). The base system includes:

- Mobile Support Stand
- Jacketed Glass Vessel
- Reactor Head with Lid
- Bearing, Agitators & Stir Shaft
- Clamps
- Bottom Outlet Valve with EPDM O-Rings



Ethanol

C_2H_6O is a colorless, volatile, and flammable liquid at room temperature. Ethanol is the intoxicating agent in liquors, widely used as a solvent, and in fuel. It is also called ethyl alcohol or grain alcohol. As a chemical solvent, it is primarily used in a variety of testing laboratories, during chemical synthesis, and in different manufacturing processes.

6810 SERIES APPARATUS

Giant Soxhlet Extraction

The complete giant extraction apparatus is ready for your extraction needs with cycling rates that may double the rate of conventional Soxhlet extractors. Extractor bodies and condensers comes in multiple sizes. The largest apparatus has a height approaching seven feet. Apparatus includes:

- Bulb Type Condenser
- Extractor Body
- Giant Extractor Flask (1L, 5L or 12L)
- Adapter (12L only)
- *Stands and Mantle NOT included*



DISTILLATION

SHORT PATH, FRACTIONAL

Separate mixtures by exploiting differences in the boiling points of the various components.

6815 SERIES SYSTEMS

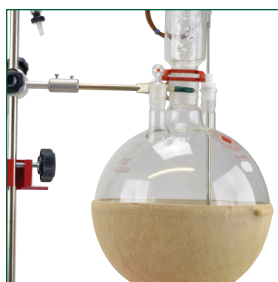
Short Path Distillation

Short path distillation system packages are available for vacuum applications such as cannabinoid distillation. Packages are modular in design to accommodate those not needing complete turn-key systems. Modules include support, tubing and vacuum trap packages. The base system includes:

- 3 Neck Round Bottom Flask (2L, 5L, 12L, or 22L)
- Glas-Col® StirMantle, Control, and Stirbar
- Temperature Control w/Temperature Probe
- Distillation Head
- Cow Receiver with (3) Receiving Flasks
- Various Adapters, Clips, Ace-Safe Connectors, and a Stopper



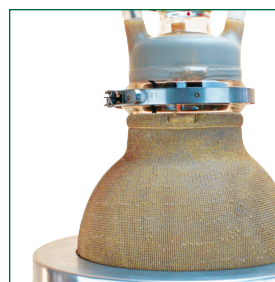
Upgraded Base Packages



Instatherm® Heating Package

- 3 Neck Round Bottom Instatherm® Flask (2L, 5L, 12L, or 22L)
- Plus all the same peripherals and equipment as our standard one piece systems

Note: Heating mantle NOT needed with the use of Instatherm



Two-Piece Flask Package

- Round Bottom Flask (5L or 12L)
- 3 Neck Head
- Flask and Head available with or without Instatherm® coatings

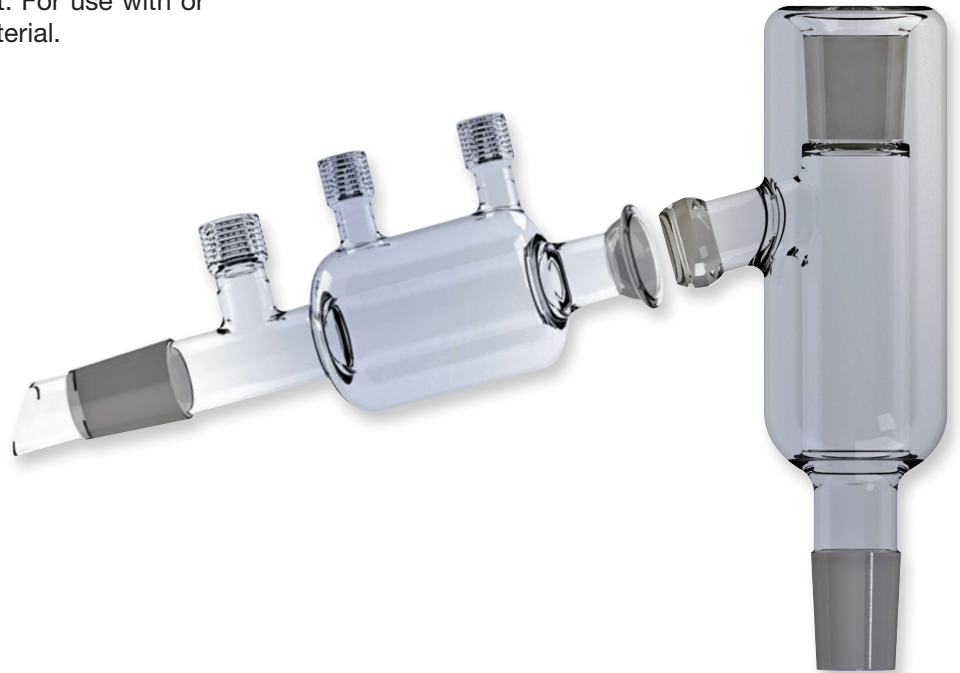
 **Glas-Col**
Tools for Scientists®

DISTILLATION HEAD

Two-Piece Design

6815 systems feature our 6602 vacuum jacketed straight through column and 6603 Liebig condenser, with vacuum monitoring port. The two-piece design simplifies cleaning and the O-Ring ball and socket joint allows for some adjustability over a standard taper joint. For use with or without customer supplied packing material.

- Distillation Column
- Distillation Condenser



12857 SERIES ADD-ON

Large Scale Distillation & Solvent Recovery

Add-on kits are designed to work with any Ace Glass large scale reactor that is using our 12842 Series Universal Stand. Please contact technical support for customization options. Add-on package consists of:

- Side Shelf with Support Rods
- 22L Spherical Receiving Flask
- Adapters
- Reflux/Distillation Splitter
- Condenser
- Tubing, Fittings, and Clamps
- *Base Reactor System and Motor NOT Included*



Upgrading Your Bench-Scale Process to Kilo-Scale

- Swap your unjacketed flask for a jacketed flask.
- For heating/cooling, switch your heating mantle out for a recirculating unit.
- Place your distillation set-up onto our 12842 Series Universal Stand.
- Add the 12857 package to larger processing set-ups to increase your yields.

LAUDA

Julabo

PolyScience
Temperature Control Solutions



Did you Know?

Solvents are expensive. The high cost of those solvents makes solvent recovery a perfect way to save money. Solvent recovery is not only cost-effective but also eco-friendly.

CUSTOM SYSTEMS

Large Scale Filter Reactor

Ranging from 10L-150L, this large scale filter reactor comes with a filter base designed to remove solvents without removing the solid portion of your product. It also allows for easy removal of the product as the filter base easily drops down without removing the flask. Three of the main applications of this versatile reactor are recrystallization, decarboxylation.

Recrystallization is one of the most cost-effective ways to increase purity of the cannabis product to 99.5% or better. Our large scale jacketed filter reactor simplifies this process by allowing distillate to be stirred with warm solvent. The solution is then cooled within the same reactor and the crystals that form upon cooling are filtered using pressure, vacuum, or both.

- Fully customizable to meet your needs
- The universal stand can be equipped with hazard-rated motor
- A swinging support base is available to support the filter base
- Manufacturing in the USA

Large Scale Filter Reactors...

are the tool you didn't know you needed!



6384/6386 SERIES

Bench Scale Filter Reactor

Complete filter reactor assembly allows single or multi-step reactions and filtrations in the same vessel. The unit features heavy wall glass, interchangeable filters, mechanical agitation, and Duran flanges. Unjacketed or jacketed configurations are available with capacities from 150mL to 6000mL.

Our pressure versions feature Ace-Thred connections instead of standard taper joints. Rated 35psig at 100°C. Support stand, base, shelf and clamps are not included.

- Jacketed/Unjacketed Reactor Body w/O-Ring
- Head and Clamp
- Bearing, Stir Shaft, and Agitator
- Ace-Thred™ Bottom Adapter w/O-Ring
- Filter Support and Screen
- Bottom Drain Valve



3709/3710 SERIES

Filtration Apparatus

Filtration apparatus is for 75mm OD membranes or filter paper. It is ideal for solvent recycling and other filter applications. Where temperature control is required, we offer a jacketed funnel. All threaded apparatus eliminate need for clamps.

- 5L Bottle
- GL80 Wide Mouth
- Interchangeable Fritted Disc
- Ace-Safe Connector for Vacuum Connection
- 1L Jacketed or Unjacketed Funnel
- PTFE Threaded Center Adapter
- Autoclavable



12560 SERIES

Buchner Filter Funnels - Table-Top, Polyethylene

Filter large volumes quickly with a polyethylene plastic table-top buchner funnel.

- Removable hose barb connector
- Fixed or removable filter plates for easy cleaning
- Various porosity ranges available
- Diameters up to 36" for large volumes



CHROMATOGRAPHY

SEPARATION & PURIFICATION

Separating a mixture into its individual components, those components can be thoroughly analyzed.

COLUMNS

Chromatographic Separation

5820 Chromatography columns (right) with upper and lower internal Ace-Threds come in a variety of lengths and internal diameters. Epoxy coating also available for extra protection.

For rapid preparative separations with moderate resolution, look to our 5871 flash chromatography system (left). Available with epoxy coating for extra protection. Comes complete with:

- Vacuum Flow Adapter
- Reservoir
- Chromatography Column (with or without filter disc)



MEASURING & COLLECTING

BOTTLES, BEAKERS, CYLINDERS, & FLASKS

Glassware designed to aid in procedures and unique situations in your cannabis processing.

BEAKERS

Collecting, Dispensing, & Heating

Borosilicate glass beakers are simple containers used for pouring, stirring, and heating liquids. Most beakers have a small spout and graduations to aid in the easy and correct transfer of liquids. To keep your liquids heated, an Instatherm™ version is available.



BOTTLES

Collecting & Storing

Borosilicate glass bottles are more resistant to temperature change than standard mason glass jars and give greater assurance of your content's integrity. Some popular lab bottle styles include wide mouth, straight sided, square sided, and coated. Bottles are available in case packs or individually, with or without caps.

CYLINDERS

Measuring & Mixing

Narrow cylindrical glass cylinders are for measuring or mixing. Graduated cylinders can be more accurate and precise than laboratory flasks and beakers. They are available with or without a pouring lip for transferring liquids.



FLASKS

Collecting, Heating, Mixing, & Processing

Round bottom, Buchner, Rotary Evaporator and Volumetric are the most commonly used types of flasks. They are ideal for a wide variety of tasks in your laboratory, such as measuring, mixing, heating, distilling, and extracting.

VACUUM EQUIPMENT

TRAPS, TUBING, PUMPS, & MONITORS & GAUGES

Reduce the pressure, thereby lowering the boiling point. By reducing the boiling point, the solvent evaporates at a much lower temperature, which reduces sample degradation.

TRAPS

Vacuum Glassware

Vacuum traps prevent unwanted vapors from entering the vacuum pump by condensing them into liquid form. If the vapors make it to the vacuum pump, they can contaminate it and reduce its lifespan. The most common style in the cannabis industry is the Dewar vacuum trap shown here.



TUBING

Nalgene™ & Tygon S3™

Heavy-walled PVC vacuum tubing is meant specifically for vacuum applications and can withstand higher pressures. It is light weight, transparent, food grade, non-toxic, and meets USDA, USP VI, and FDA standards.

PUMPS

Wet & Dry

Vacuum pumps in short path distillations are used to distill cannabinoids more quickly and at a lower temperature while creating an airtight environment within the glassware. Vacuum pumps come in “wet” oil versions or dry versions.



MONITORS & GAUGES

Digital & Handheld

Vacuum gauges are used to observe the vacuum levels. They provide data to help find an optimal vacuum for your distillation.

STIRRING & MIXING

STIR MOTORS & STIRMANTLES

Equipment used for agitating material during processing.

MOTORS

Overhead

Mixing is an important part of many tasks found in industrial laboratories. Overhead stirrers are the best fit for mixing large volume or high viscosity applications. Stir motor options range from analog to digital and to hazardous duty for application with flammable solvents.



MAGNETIC STIRRERS

Plates

Regulate stirring speeds from 100-1500rpm, high enough for high viscosity solutions. The top plate is chemically resistant. Short path systems using Instatherm® flasks use stir plates, instead of stir mantles for their needed agitation.

STIRMANTLES

Aluminum Housed

Electromagnetic stir mantles are typically used with aqueous solutions like water, while the motor driven units use a powerful magnet for more viscous solutions like oils. Stir mantles can deliver up to 400°C internal operating temperature.



CONTROL

Combination

Stir controllers regulate stirring and heating when used in conjunction with Glas-Col® Stirmantles. Two or three (to power additional top mantle) power outlet versions are available with universal J, T, and K probe inputs.



TEMPERATURE CONTROL

CONTROLS, HEATING WRAPS, MANTLES, & RECIRCULATORS

Instruments used to control, maintain, and/or regulate temperatures.

CONTROL UNITS

Control & Monitor

Temperature controllers regulate resistive heaters such as stirrers, mantles and heating tape by raising and lowering the delivered voltage. Available in single and multiple power outlet versions to cover differing temperature ranges via J, T, or K probe inputs.



HEAT GUNS

Industrial

Heat guns in industrial-strength models are available through Ace Glass, delivering up to 27 CFM. Temperatures vary with the model, as measured one inch from the nozzle, in the range of 200°F and 600°F.

MANTLES & WRAPS

Girdles, Tops, Cords, & Tapes

Fabric tops lay on the uncovered section of a flask above a stirrermantle. Fabric girdles are placed on a non-jacketed reactor to heat the solvents or reactions. Heating cords and tapes are used to maintain temperature or heat odd lengths and shapes of glass tubes or metal pipes.



RECIRCULATORS

Heating & Cooling

Recirculators regulate and control heating and cooling, when using jacketed glassware. They can go as low as -60°C to as high as 200°C. Most units can accomplish rapid heating as well.





TAILOR-MADE GLASS

DON'T LET YOUR EXISTING GLASSWARE LIMIT YOUR RESEARCH OR PRODUCTION.

WE CAN HANDCRAFT ANY PIECE TO MEET YOUR NEEDS.



Contact us today to learn more about our *full line of Glassware and Scientific Equipment!*



ACE GLASS INCORPORATED



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