



B/R 9600 High Efficiency Distillation Systems

High Purity
Solvent
Recycling



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9600 High Purity Solvent Recycling Systems

The 9600 is a high purity solvent recycling system designed for recycling high purity solvents in 1 to 300 liter batches.

• **High Efficiency:** These fractional distillation columns have up to 50 theoretical plates. Distillation columns can be stacked for even higher efficiencies. High efficiency distillation columns mean high purity solvent.

• **Customized to Recycle Your Waste:** The 9600 can be configured according to your needs. Choose your:

- ☐ Boiler Size – 1 to 300 liters
- ☐ Boiler Material – Glass or stainless steel
- ☐ Distillation Column Type – Packed or spinning band types
- ☐ Distillation column packing or spinning band material – stainless steel, Teflon, glass and many more
- ☐ Receivers – Glass, stainless steel or provide your own
- ☐ Condenser Cooling – Circulating bath or tap water
- ☐ System Mounting – Enclosure Cabinet or Mounting Rack

• **Easy to Use:** Microprocessor Control fully automates the distillation process from beginning to end, minimizing the time needed to operate the equipment. Easy programming of parameters and standard protocols makes you feel like a distillation expert. Heating, collection of distillate and shut down of the equipment at completion are all done automatically.

Common Recycling Applications:

- Acetonitrile
- Methanol
- Trichlorobenzene (TCB)
- Hydrofluoroethers
- Many More



Automations and Accessories

Controller

The controller eliminates most of the lab technician's monitoring time from the distillation process. Call up your recycling protocol from one of 20 available programs and let the controller perform the distillation. Just answer some safety reminders and then the recycling program runs automatically and unattended.

Each fraction has programmable open and close temperature cut points, heat rates, and reflux ratio. The controller allows easy editing of each of the parameters while the distillation is in progress. The system automatically shuts down at the end of the distillation.

Optional PC Control

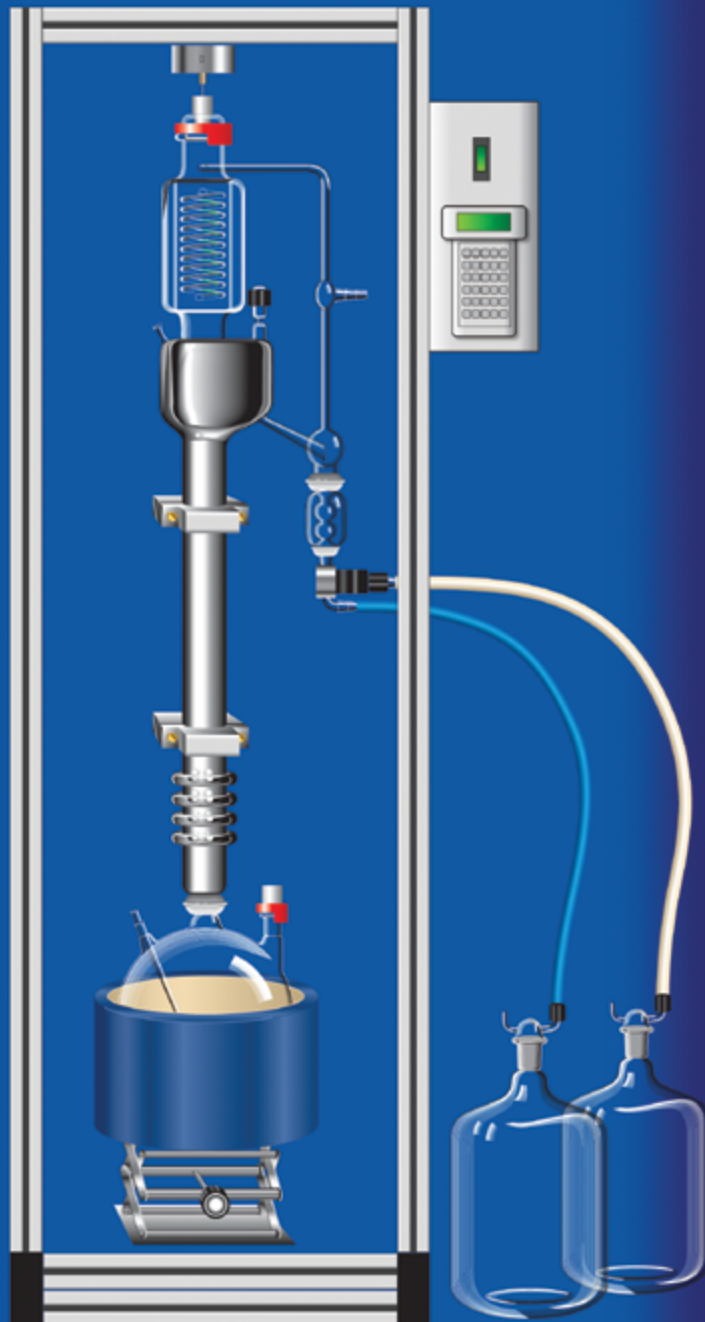
The recycling systems can be controlled with a PC (optional). PC control is easy to use and keeps a complete record of each use of the recycler.

Optional Receivers

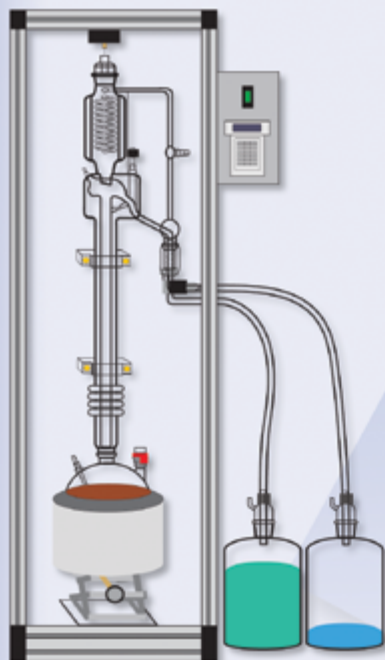
Receivers are available in various sizes. Receivers can be glass or stainless steel.

Optional Circulating Baths

The 9600 requires cooling for the condenser. Circulating baths can be used instead of cold tap water. Circulating baths give more precise control of the cooling water temperature and saves water.

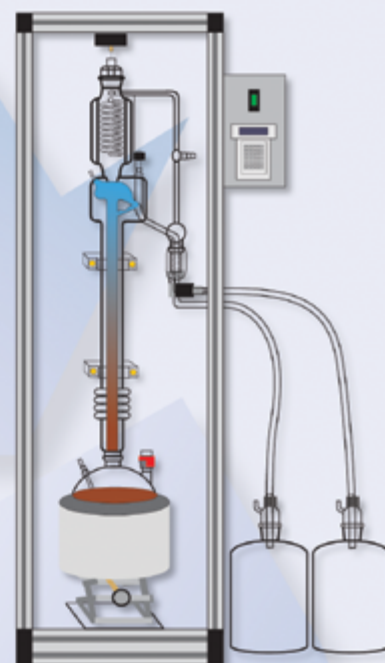


The Solvent Recycling Process

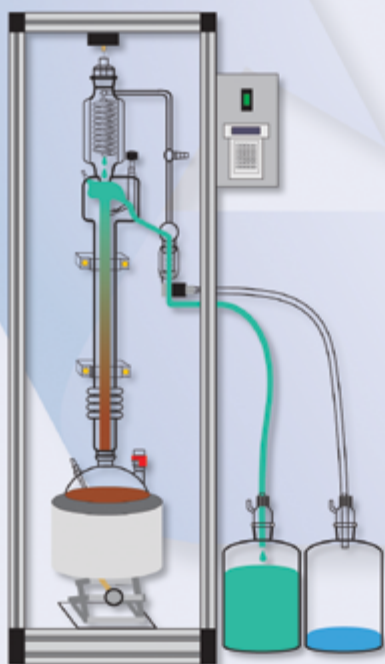


1 Fill boiling flask with waste mixture and press start.

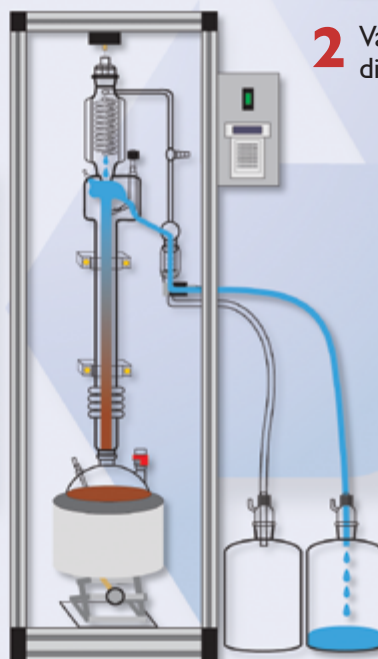
5 Recycling process stops automatically when complete. High boiling contaminants left in boiling flask.



2 Vapor rises through distillation column.



4 Clean solvent collected.



3 Contaminants (low boiling material) collected.

Spinning band distillation:

All distillations attempt to separate a lower boiling material (A) from a higher boiling material (B). Spinning band distillation uses a helix rotating at high speeds inside the distillation column. The rotating band forces vapors into intimate contact with the condensate on the wall of the distillation column. This intimate contact takes place in a very thin layer that is refreshed thousands of times per minute. As a result, spinning band distillation gives a very efficient separation in a short distillation column.

High Efficiency: The spinning band gives the highest efficiency for a given distillation column height. So spinning band will give the best distilled purity possible.

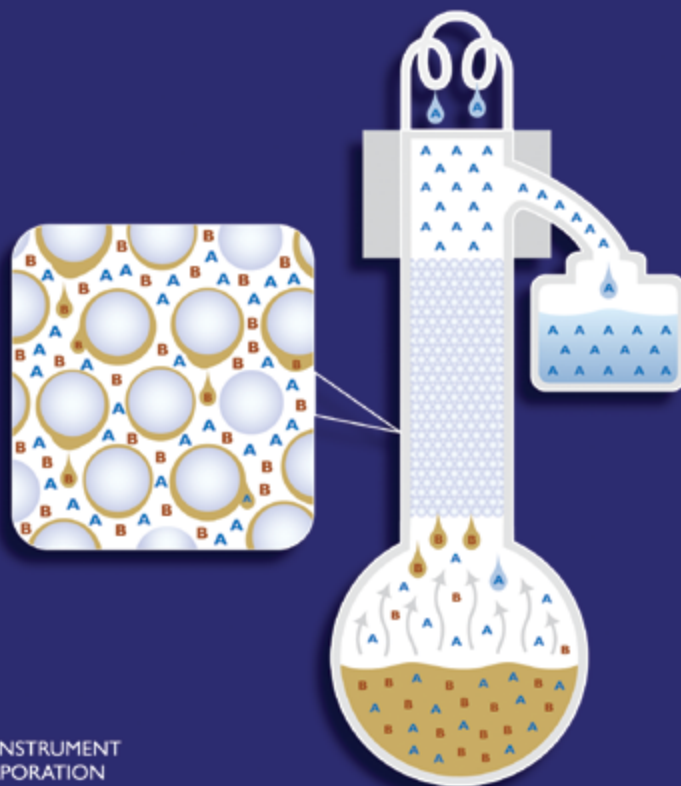
Low Hold Up: Less than 3 ml of material remains in the column at the end of the distillation. Spinning band is ideal for recycling more than one solvent in the same distillation column.

Packed column distillation:

All distillations attempt to separate a lower boiling material (A) from a higher boiling material (B). Packed columns are “packed” with a material that creates a large surface area within the distillation column. Vapors rise through the column, are condensed by the condenser and fall back down the column. This material is called the condensate. The descending condensate “wets” the packing. Ascending vapors rise through the wet packing and are forced into intimate contact with the condensate. This intimate contact causes the vapor to become enriched in the lower boiling material. This process is often called rectification.

Good Throughputs: Packed columns give higher throughputs with very good separation

High Hold Up: Typically 50 to several 100 ml of pure solvent remains in the column packing after the distillation is complete. This makes packed columns ideal for recycling high volumes of a single solvent.





B/R Instrument Corporation

B/R Instrument was founded in 1966 by Roger Roark, Sr. and Harry Brown, Jr. The name B/R comes from the first letter of each founder's last name, **B**rown and **R**oark – **BR**. Originally a manufacturer of general glassware, the company began to specialize in the manufacture of spinning band distillation systems in 1968 under a DuPont patent. Since then the company has grown steadily in the distillation and laboratory equipment markets and now distributes products to customers throughout the world.

Located in Easton, Maryland on the beautiful Eastern Shore of the Chesapeake Bay, the B/R facility encompasses 14,700 square feet (1,370 square meters) and houses manufacturing, sales, engineering, service and administrative divisions.



**B/R INSTRUMENT
CORPORATION**

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You save more than money when you recycle!

The life cycle of a solvent has a surprisingly large CO₂ footprint.

Fossil fuel has to be burned to create the solvent from crude oil. After the solvent is used it is hauled to an incinerator where it is burned. Making the solvent and disposing of the solvent both create significant amounts of CO₂.

The average lab uses 100 liter (26 gallons) per week of solvent.

CO ₂ produced per year to make this solvent	7540 kg (16600 lbs)
CO ₂ produced per year incinerating this solvent	13000 kg (28660 lbs)
Total CO ₂ footprint for this solvent per year	20540 kg (45260 lbs)

That is 20 tons of CO₂ emissions per year just from one lab that does not recycle their solvents.

When you make the decision to recycle solvents you will save more than just money. You will be playing an important part in protecting the world we live in.

Thank You!

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