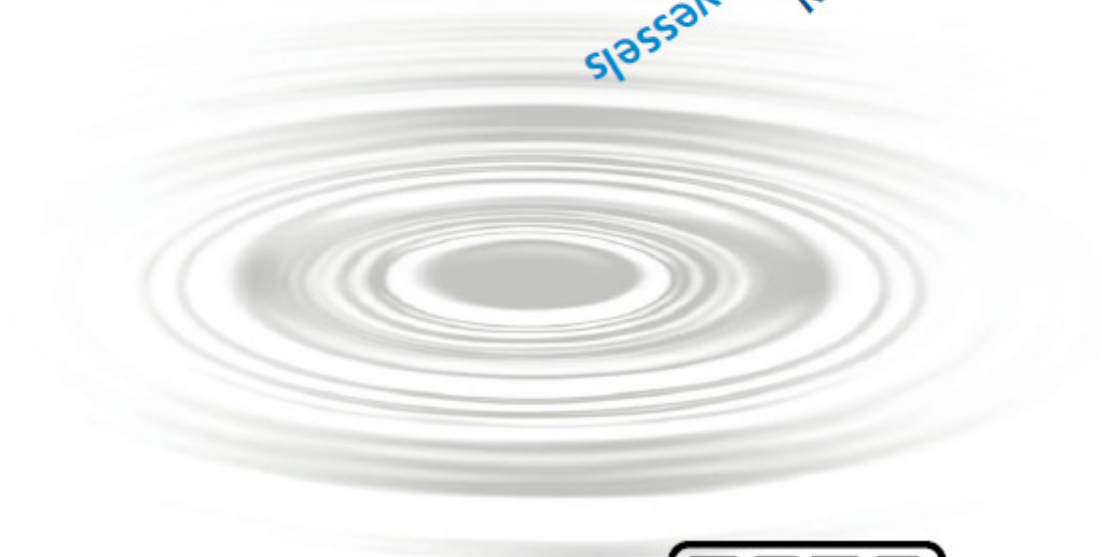


Pope Scientific, Inc.
wiped-film stills
fractional distillation systems
process vessel systems
pilot & processing plants
toll processing services
dewars & glass equipment
nutsche filter-dryers
portable pressure vessels
engineered systems for science & industry



Pope Scientific Inc.

Since 1963, Pope Scientific has been at the forefront of manufacturing chemical processing equipment, engineered systems and laboratory apparatus for science and industry. Today Pope is internationally known – with specialized technical expertise in design and manufacturing of chemical processing equipment as well as toll processing services.

Pope's products/services include:

- Wiped-Film Molecular Stills and Evaporators
for Heat-Sensitive Materials
- Fractional Distillation Systems and
Components for High-Purity Separations
- Portable Pressure Vessels, Process Systems and Nutsche Filter-Dryers
- Turnkey Pilot and Processing Plants
- Custom Toll Processing and Distillation/Evaporation Services
- Dewars and Specialty Lab Glass

Pope Process Vessel Systems

Whether you require a system to handle High Purity materials and pharmaceuticals or toxic, corrosive chemicals, Pope is your source for all turnkey vessel projects.

You Tell us what you want – an off the shelf vessel, or a complex system that can handle 500mL to 1000+ L.



400L Turnkey Process Reactor System

Pope Process Vessel Systems

We have what you need, from the basic vessels to custom process systems with mixers, heaters, valves, instrumentation, and more. Our application engineers are on hand to address all equipment design and processing issues – and we take responsibility for the *entire* design.



10 Gallon Dockable Pharmaceutical Dispensing System

Pope Process Vessel Systems



Pope Portable Reactor / Evaporator System
for Food Grade Material



Pope Portable Reactor System

Pope Process Vessel Systems

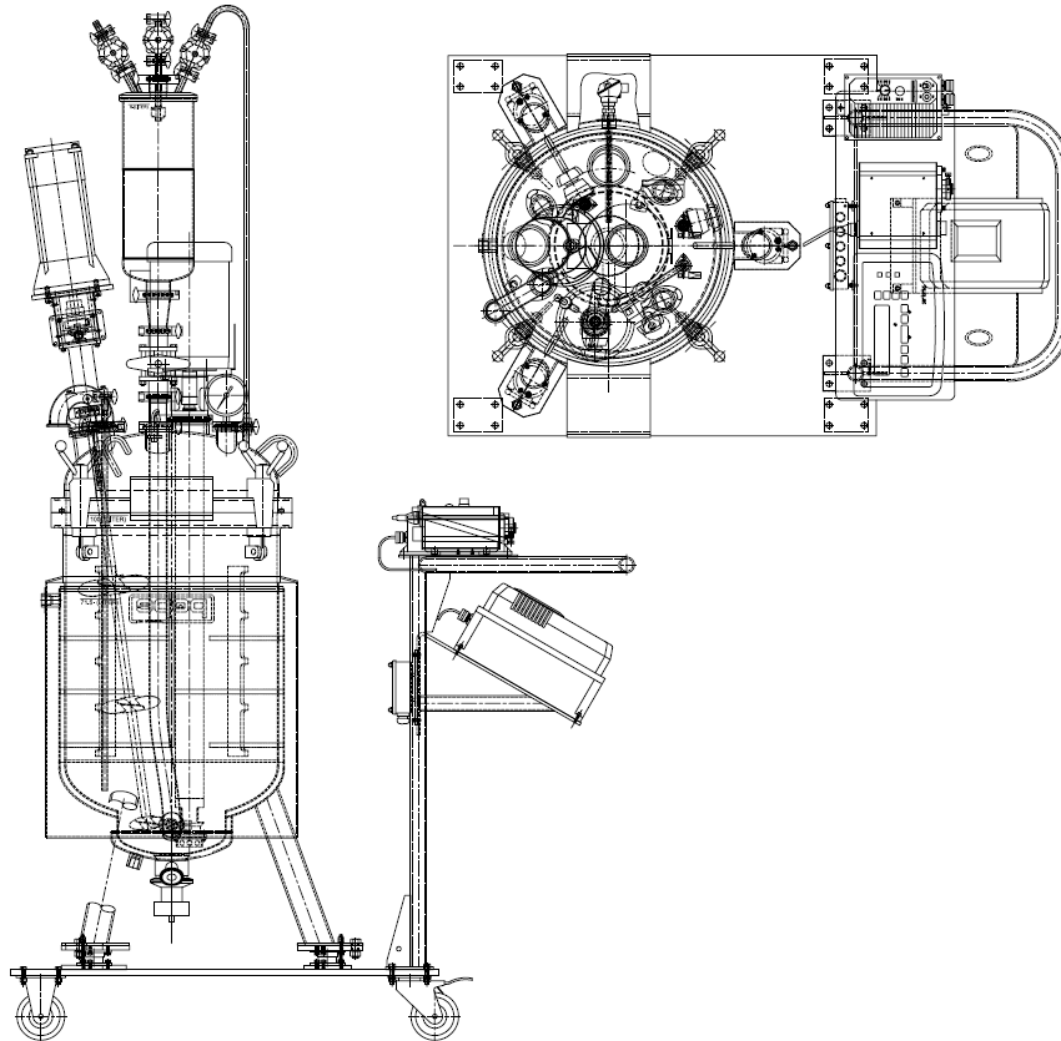


Portable Fermentation Reactor



Heated Reactor / Filter System

Pope Mechanical Drawings



Pope Portable Pressure Vessels

Pope's ASME stainless steel portable pressure vessels can handle a wide range of sanitary, high purity, or hazardous substances safely and conveniently in sizes from 5 to 400 L.



Pope Portable Nutsche Filter-Dryers



- The Nutsche is the optimal next step in scale up laboratory filter purification. Convenient, portable ASME pressurizeable units and systems are offered in sizes from 2 to 200+ Liters and various diameters.

Pope Portable Nutsche Filter-Dryers

- Nutsche Filter-Dryers are ideal for critical high purity and pharmaceutical applications.
- Fabrication Materials include:
 - 316L Stainless Steel
 - Hastelloy
 - Teflon-coated Steel
- You can filter solids, wash, mix, re-slurry, and dry in a single compact unit. Many standard and custom designs are available.



55 Gallon- 24" Nutsche Filter

Benchtop Nutsche Filter-Dryer with Agitator

To minimize contamination and exposure, high purity chemicals, pharmaceutical intermediates, specialty solids, etc., are efficiently filtered, washed, reslurried and dried in this portable lab scale Nutsche filter device with special manually turned agitator. Design allows withdrawal of filter cake utilizing removable bottom head and filter support assembly. The unit can be pressurized to aid solvent removal. Drying can be enhanced by adding vacuum and heating capability.

Unit size as shown is 6" in diameter with 4 liter capacity – alternate sizes are available. ASME certification is optional. Offered in stainless steel, Hastelloy, or alternate metals; pharmaceutical grade mechanical and electro-polish finishes; Teflon or alternate coatings. Custom design features include temperature control options, jacketing, valving, special porting, sprayers, sight glasses, instrumentation, pumps, alternate mixer types, etc., plus a wide variety of filter media.

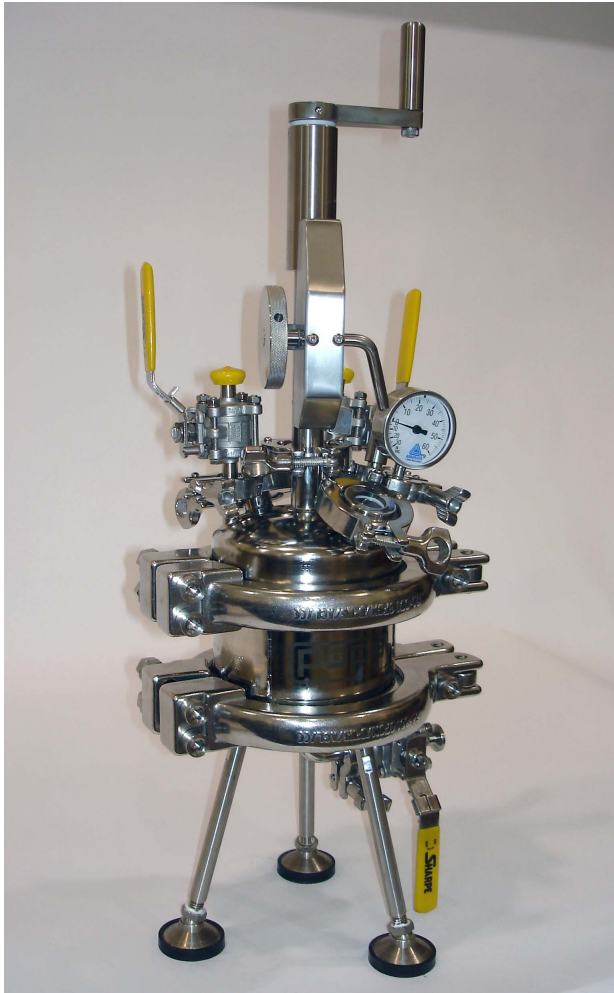


BASIC PROCESS DESCRIPTION AND CHARACTERISTICS

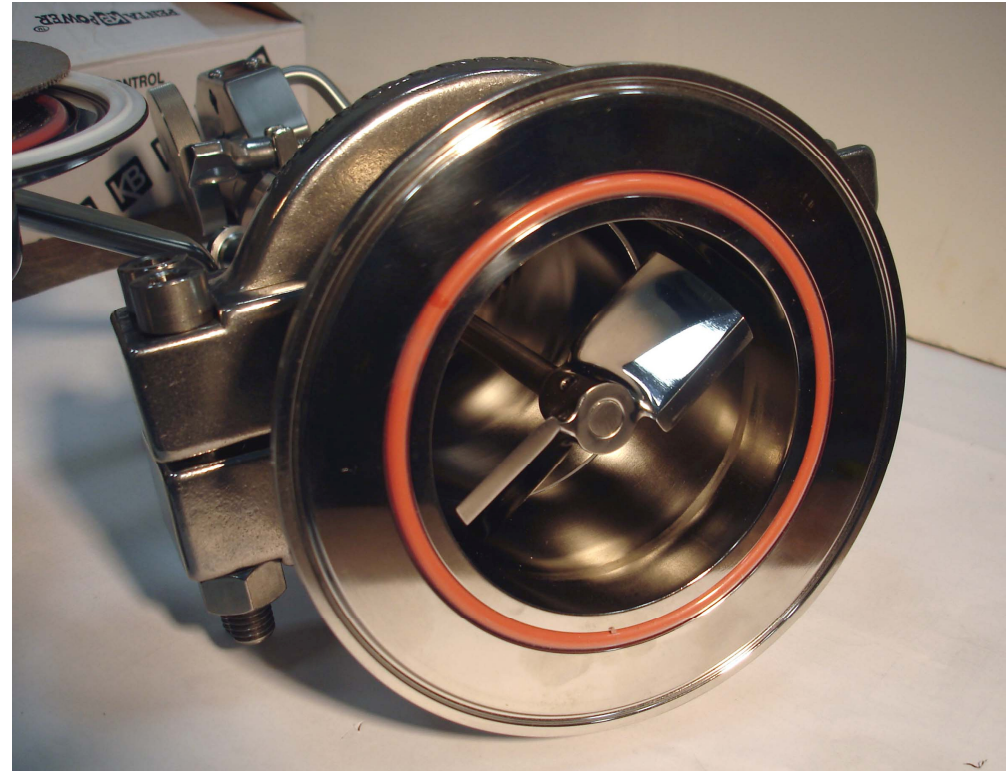
During use, it is typical for lumps to develop after the wet filter cake has begun to dry, resulting in inefficient drying. To break up the lumps, the agitator is able to be slowly lowered down into the cake by a lockable hand wheel while rotating it in one direction with a top mounted handle. The cake is broken up and churned using the specifically designed blade to break and churn in one direction. After raising the agitator, it is reversed in rotation and lowered down to the top of the cake, re-smoothing it into an even, crackless form. This process can be repeated until the filter cake is dried to the required specification.

POPE SCIENTIFIC INC., has been providing chemical processing and laboratory equipment worldwide for over 40 years – with specialized technical expertise in design and manufacturing of chemical processing equipment, as well as toll processing services. Our ability to work with a wide variety of customer applications providing off-the-shelf or customized products has made Pope known internationally. Consult with our experienced staff about your application.

Pope Portable Nutsche Filter-Dryers



1-Liter 4" Nutsche w/ Agitator



1-Liter 4" Nutsche Showing Agitator

Pope Portable Nutsche Filter-Dryers



3-Piece Nutsche



Rotatable Nutsche Filter System

Pope Motor Driven Mixer Assemblies



Pope Mixers for
Demanding Applications

Pharmaceuticals

BioTech

Foods & Flavors

Cosmetics

Polymers

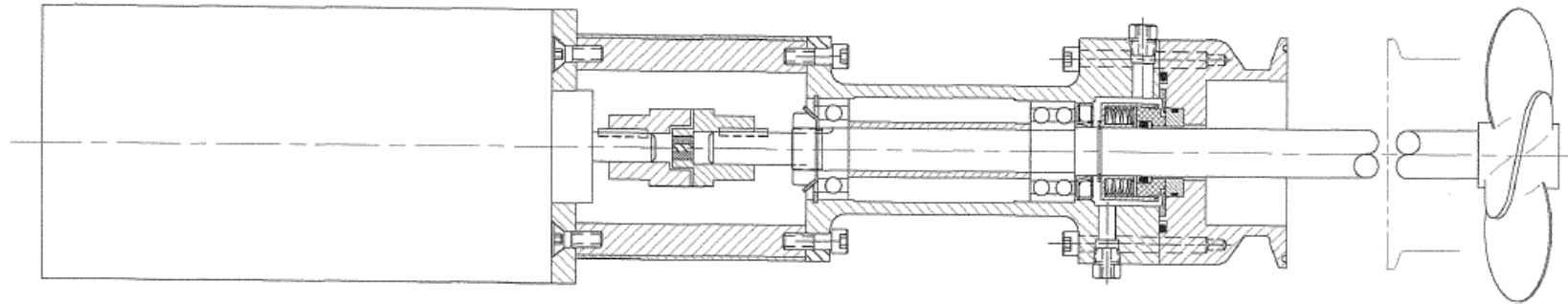
High purity speciality chemicals

General processing and R&D

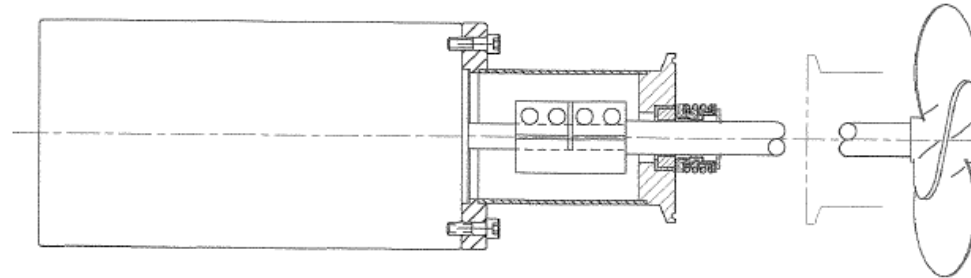
Many others



Pope Motor Driven Mixer Assemblies



SERIES 800 MIXER



SERIES 600 MIXER

Pope Motor Driven Mixer Assemblies

The Pope Series 600 Mixer is the ideal choice for less demanding applications where space is at a premium. As with all Pope mixers, you may select from a wide range of motors, seals, impellers, and other options to match your exact specifications.



Pope 600 Mixer in Sanitary Mount in 4" Diameter 1-Liter Vessel.

Pope Motor Driven Mixer Assemblies

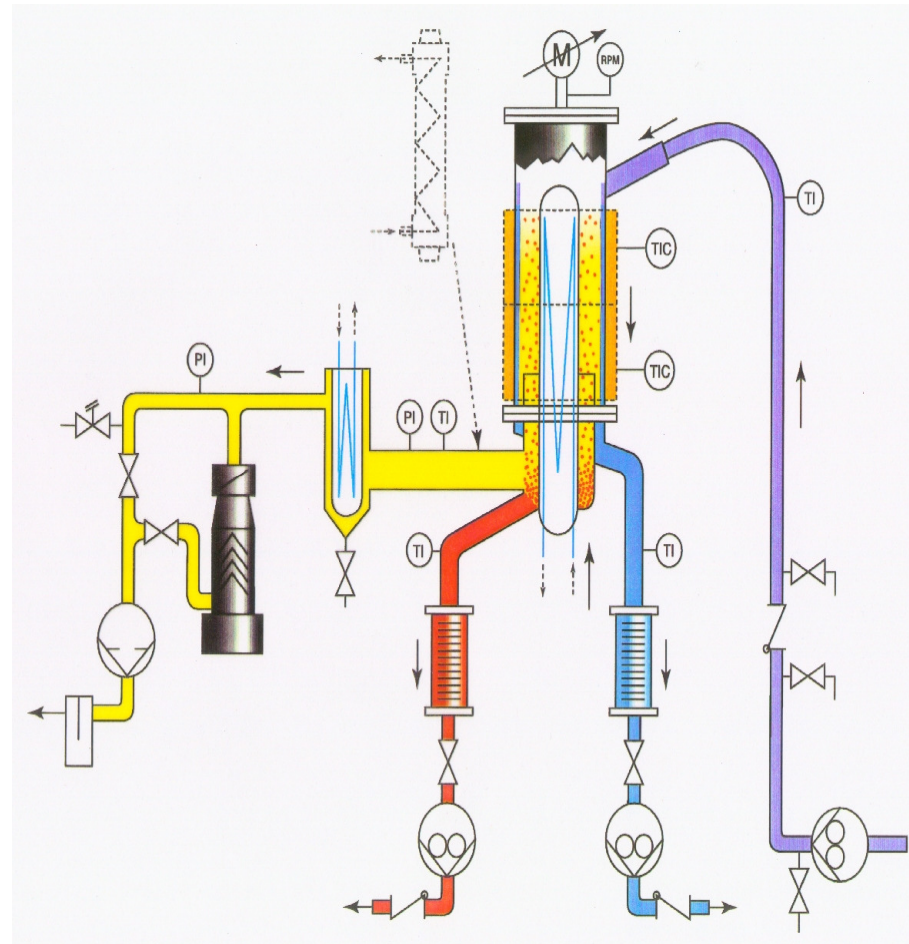
The High-Performance Series 800 Mixer is designed for the most demanding applications, such as strict sanitary, temperature and pressure extremes, high chemical compatibility, and other uses. You may specify the type of motor, various optional seals, and even your impeller type.



Pope Series 800 Mixers in 6-Gallon Removable Head Vessels. Featuring both electric and air driven motors.

Wiped Film Evaporators and Molecular Stills

- Ideal for Heat Sensitive Materials
- Versatile
 - Concentration/Evaporation
 - Molecular Distillation
 - Solvent Stripping / Degassing
 - Deodorization / Decolorization
- Efficient
 - High Vacuum
 - Short Residence Time
 - Minimum Product Decomposition with Maximum Yield and Quality
- Flexible
 - Laboratory, Pilot, and Production Scale Equipment
 - Variety of Materials of Construction
 - Glass
 - Stainless Steel
 - Hastelloy
 - Titanium



Pope Bench-top Wiped Film Evaporators and Molecular Stills

- Pope 2" Glass Wiped Film Molecular Still / Wiped Film Evaporator
- Ideal for Feasibility Testing / Experimental Use
- Processes up to 1-2 kg of Feed per hour.
- Glass Construction
 - Glass Pieces constructed on site at Pope Scientifics' in house Glass Shop.



2" Bench Top Glass Wiped Film Molecular Still with optional Additional External Condenser

Pope Pilot Scale Wiped Film Evaporators and Molecular Stills

- Available in either 4" or 6" Diameter, based on desired feed rates.
- Feed rates of up to 10 to 20 kg per hour, depending on the material of construction and the material to be processed.
- Various available materials of construction, from Glass to Stainless Steel, to rare Alloys.
- Available with discrete controls for motor speeds, or with fully functional PLC control systems.



6" Stainless Steel Molecular Still with additional External Condenser – Explosion Proof.

Pope Pilot Scale Wiped Film Evaporators and Molecular Stills



- 4" Stainless Steel Molecular Still w/ Glass Feed and Discharge



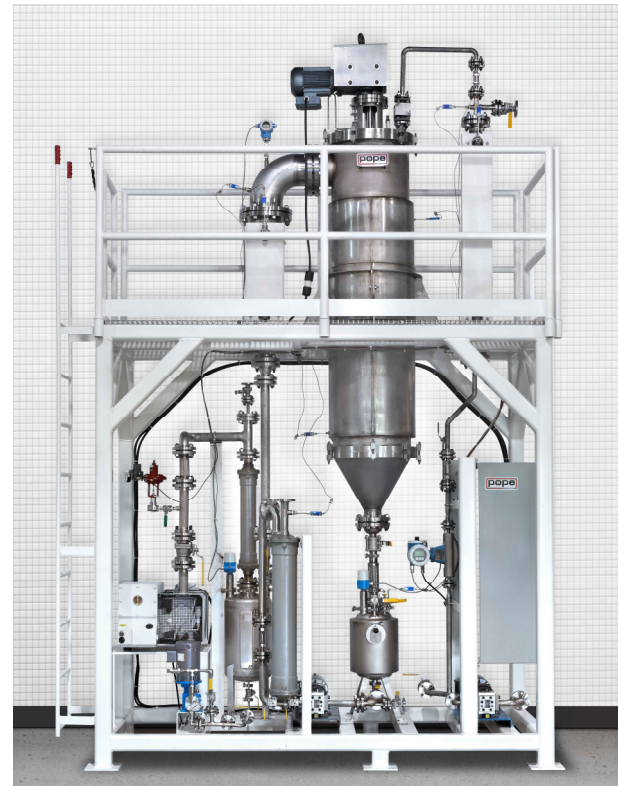
- 9" Molecular Still Turnkey Pilot Plant

Pope Production Scale Wiped Film Evaporators and Molecular Stills

- Available in either 12" or 20" Diameter, based on desired feed rates.
- Feed rates of up to 100 to 200 kg per hour, depending on the material to be processed.
- Various available materials of construction, from Stainless Steel, to rare Alloys.
- Available with discrete controls for motor speeds, or with fully functional PLC control systems.
- Toll Processing and Feasibility Testing are available at the Pope Scientific Plant in Saukville, WI USA.



12" Molecular Still with Passive Degasser



20" Wiped Film Evaporator Turnkey Pilot Plant

Pope Hybrid Wiped Film Evaporators



6" Turnkey Hybrid Wiped Film Evaporator Pilot Plant

- Pope's Hybrid Wiped Film Evaporator combines the low residence time of a WFE with the fractionating ability of a standard fractional distillation column.
- Ideal for heat sensitive materials that still require a high degree of fractionation.
- Control systems vary from individual discrete controls to fully programmable PLC process control modules.

Pope Hybrid Wiped Film Evaporators



2" Glass Hybrid Still



3-Stage 12" Hybrid Turnkey Processing Plant

Pope Hybrid Wiped Film Evaporators



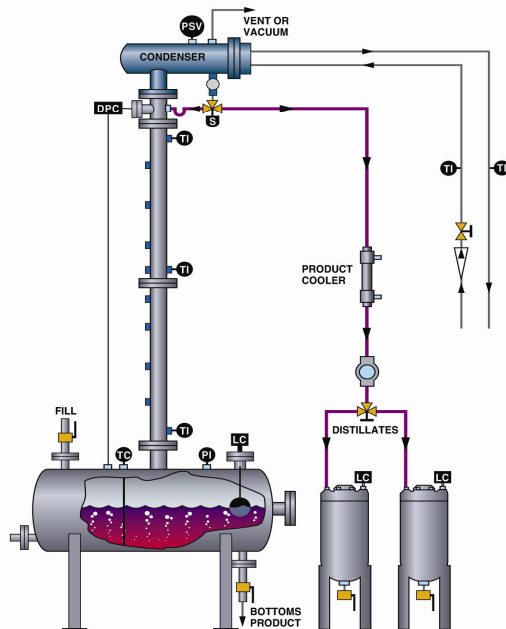
4-Stage Hybrid Wiped Film Evaporator Fully Turnkey Pilot Plant.

Pope Fractional Distillation Systems and Components

- Continuous and Batch Models are available.
- Throughputs from 0.01 to 100+ Gallons per Hour
- Glass or Stainless Steel Construction, rare Alloys are also available.

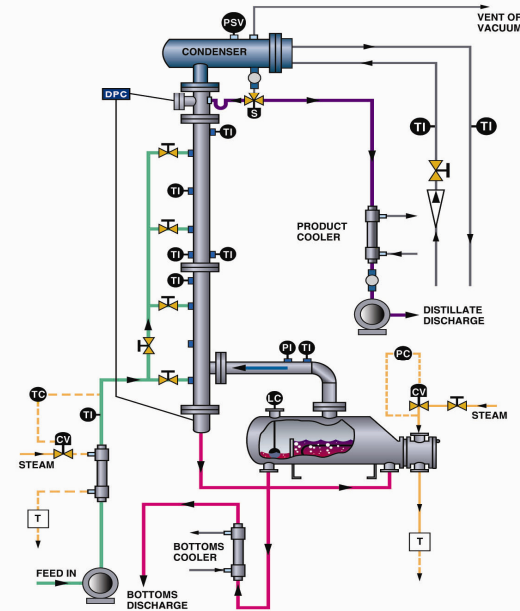
Batch Mode

When relatively small quantities of liquid are to be processed, when an extremely high level of purity is required or when more than 2 solvents need to be separated, batch mode is preferable.



CONTINUOUS Mode

When large or continuous quantities of liquid are to be processed and/or when an extremely high level of purity is not required, continuous mode is preferable.



Pope Batch Fractional Distillation Systems

- Pope Batch Fractional Distillation Systems are available in Batch Sizes ranging from 5 Liters to 100+ Gallons.
- Ideal for Multi-Component Separations
- Column Diameters range from 2" up to 12". Larger Diameters are available upon request.
- Many Varieties of Structured and Random Dump Tower Packings are available in a wide range of materials. ProPAK Protruded Metal Packing is the Pope Standard packing.
- Process Control Packages range from Discrete Controls to fully turnkey PLC options.



6" Diameter Column Batch Distillation Pilot Plant



12" Diameter Column, 250 Gallon Batch Still

Pope Continuous Fractional Distillation Systems

- Pope Continuous Fractional Distillation Systems are available in sizes to handle flow rates from 0.01 to 100+ Gallons per Hour.
- Ideal for Large Quantity Separation. Ideally run on a 24 hr Schedule
- Column Diameters range from 2” up to 12”. Larger Diameters are available upon request.
- Many Varieties of Structured and Random Dump Tower Packings are available in a wide range of materials. ProPAK Protruded Metal Packing is the Pope Standard packing.
- Process Control Packages range from Discrete Controls to fully turnkey PLC options.



2 Stage Continuous Distillation Pilot Plant

Pope Continuous Fractional Distillation Systems

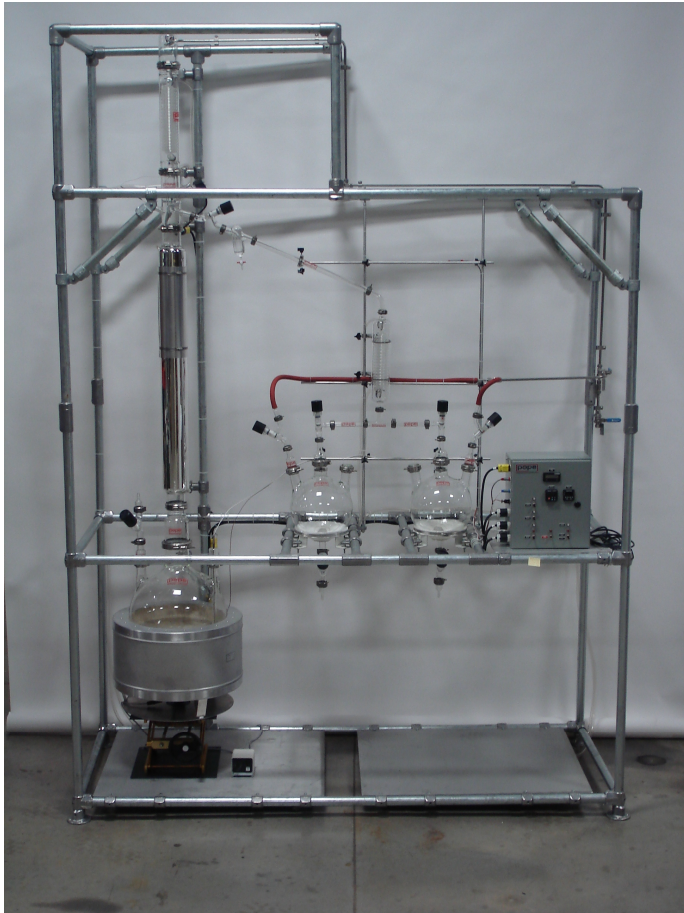


2 Stage 2" Continuous Fractional Distillation System



Turnkey Continuous Fractional Distillation Pilot Plant

Pope Autocol™ Batch Fractional Distillation Systems



50-Liter Turnkey Autocol™

- Ideal for small batches where high purity is desired
- Ideal for multi-component solvent recovery for recycle.
- Available in 5-Liter, 12-Liter, 22-Liter, and 50-Liter Designs.
- Materials of construction include Glass, Teflon, and Stainless Steel as standard. Glass Packing is available upon request
- Available with discrete controls, or with a fully programmable PLC data logging control system for turnkey operation.

Custom Toll Processing and Distillation/Evaporation Services

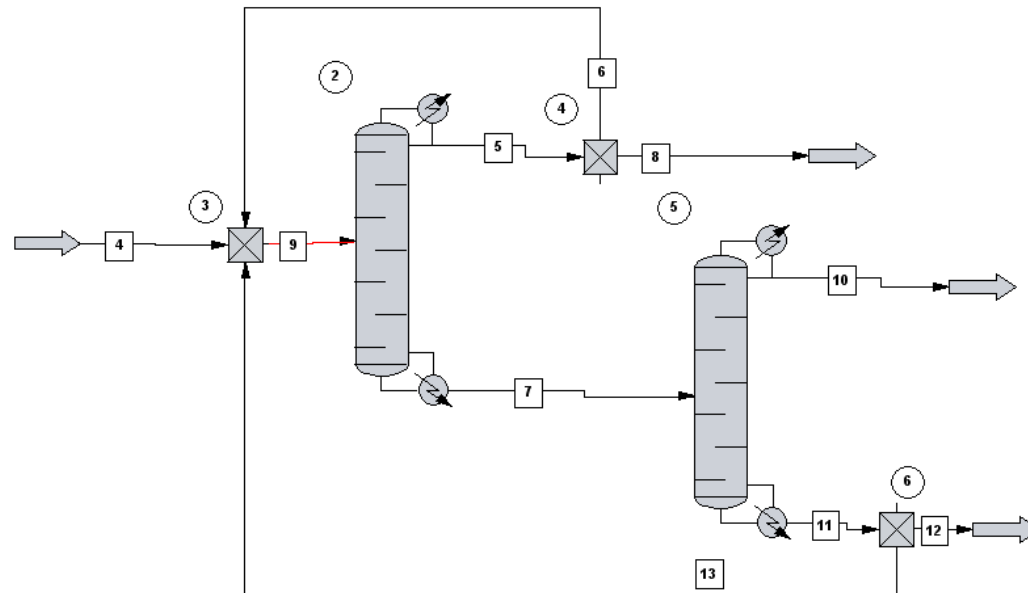


Pope Scientifics' 20" Wiped Film Molecular Still with Passive Degasser Toll Processing Unit.

- Pope Scientific is recognized world wide as a leader in difficult thermal separations.
- Our 44,000 square foot facility was specifically designed to accommodate a dedicated toll processing / feasibility testing facility, complete with technicians and toll processing operators.
- Adjacent areas house our fully featured lab for testing and process development, as well as an area for large equipment production.

Pope Scientific Process Simulation Software

- Using state-of-the-art software packages, Pope Scientific can now model your specific process in order to best determine feasibility and necessary equipment size.
- Our trained engineering staff is ready to assist you with the analysis of your application today.





Pope Scientific, Inc.

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[popeinc.com](http://www.popeinc.com)

Pope Scientific, Inc.

engineered systems for science & industry

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fractional distillation systems

portable pressure vessels

process vessel systems

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pilot & processing plants

toll processing services

dewars & glass equipment