

Student Technology Fee

Grant Proposal

2010.002

2009-10

Tracy Brown 

Approved

Denied

Comment: _____

Diana Hamilton 

Approved

Denied

Comment: _____

Gary Gatch 

Approved

Denied

Comment: _____

Mike McDonald/James Leonards

Approved


Denied

Comment: 

Dale Martin

Approved

Denied

Comment: 

PF #1

2010.002

Student Technology Fee
Grant Proposal Request Form
Fiscal Year 2009-10
Northwestern State University of Louisiana

ALL BLANKS MUST BE FILLED COMPLETELY

Prepared by: April N. French, Ph.D. For: Dept. of Chemistry & Physics

Department/Unit: Chemistry & Physics College: Science & Technology Campus: Natchitoches

Which NSTEP Goals/Objectives does this project meet? #1, 3, 7 & 8

Requested equipment will be located/installed/housed? Building: Fournet Room: 206, 209, 212

Are department property policies and procedures in place for requested equipment? Yes

Which individual will be responsible for property control of the requested equipment?

Signature: April N. French Date: October 26, 2009

Grant Proposal Requested Amount: \$ \$25,434.07 Budget Attached (circle one): YES NO

Grant delivered to Student Technology located in Watson Library, Room 113. Date _____

The grant proposal must include all specifications, description, model number, quotation, cost, state contract number, and vendor for each item. If the proposal does not include all requested information, it will be returned to requestor.

1. Describe target audience.

All Louisiana Scholars' College and Northwestern students who take the following laboratories sessions: CHEM1091 (pre-nursing); CHEM1031/CHEM1041 (general chemistry); CHEM3011/3021 (organic); CHEM4041 (biochemistry). Students in these sections are generally chemistry, biology, pre-nursing, rad. tech., or physics majors.

2. Describe project/initiative for which you are requesting funds.

Chemistry laboratories rely on many pieces of basic laboratory equipment/technology to perform common, repetitive measurements and tasks. This basic equipment includes using balances, stirring hotplates, and rotary evaporators (rotovaps). This equipment is used by every student in the laboratory during most every lab, and many pieces have failed to function. Students in these labs complain about the amount of time spent waiting to use the equipment, as not enough are available for use.

The rotovap in particular is a bottleneck to completing laboratories during the class period. The rotovap is designed to take a low boiling solvents and evaporate it off by using increased pressure, increased temperature, and increased surface area to reduce the time spent waiting on the solvent to evaporate. In addition, the rotovap is able to contain potentially harmful solvents from evaporating into the open air. This piece of equipment is designed to completely evaporate a standard sample in less than 5 minutes. But in classes as large as 25, 5 minutes can become a wait time of 125 minutes, as only one student's sample can be evaporated at a time. We'd like to increase the number of rotovaps available for use in the lab, as well as add a vacuum pump to the existing rotovaps and to the new one to additionally increase the speed students' samples can be evaporated.

With this project we would like to replace aging balances and stir plates as well as upgrade and update rotary evaporation technology available for student use in these labs. Three Ohaus Pro Precision Electronic balances and 14 stirring hotplates will be added to the CHEM 1031/1041 lab (rm. 212). Five Ohaus Scout Balances will be added to the CHEM 1091 lab (rm. 206) to replace aging and non-functioning balances. The rotovap and three vacuum pumps will be used in the CHEM 3011/3021 lab (rm. 209/210)

3. State measurable objectives that will be used to determine the impact/effectiveness of the project.

- *Objective 1: Enhancement of Student Instruction in Laboratory Course*
Balances, hotplates, and rotovaps are essential components of modern chemistry laboratory courses. They allow chemists to make precise measurements, evenly heat and mix solutions, and quickly evaporate of solvents used in a reaction. This equipment will provide students with up-to-date laboratory skills, reflective of the equipment found in industrial settings in which they will later be seeking employment. The equipment will allow each student to become more competent with the use of the equipment in a technological workforce which relies heavily on instrumentation to obtain data in an efficient manner.
- *Objective 2: Increase student's attitude toward lab experiences*
Students often feel frustrated because of the amount of time spent waiting in the labs. With an increase in the number of available pieces of equipment, the amount of time they spend waiting will substantially decrease. This should affect their attitudes toward being in lab, as many students recognize the importance of using modern technology in their preparations to become scientists, nurses, and health professionals and that it enhances their employability and feeling that they are having a "real" (aka feels like I'm working in industry) experience.
- *Objective 3: Increase student's using time effectively*
With this equipment, more students will be able to obtain measurements and samples at a time, decreasing the amount of time they will spend waiting in line. By increasing the number of available pieces of equipment in lab, we will be able to help students proceed quicker through the laboratory procedure so they can spend more time thinking about the chemistry involved in the experiment. This should have the indirect effect of increasing the "feel-good" factor, as students will be able to complete experiments within the allotted class period and potentially complete earlier.

4. Indicate how each project objective will be evaluated.

1. The CHEM 1031/1041, CHEM 1091, and CHEM 3011/3021 labs will be inspected to insure that the requested equipment was properly installed and utilized in the course of the experiments.
2. Students will be asked about their feelings toward using new and functioning equipment in the lab, over the equipment that was used previously. This is especially useful in the CHEM 1041 and CHEM 3021 which are continuations of CHEM 1031 and CHEM 3021 where students would have had previous experiences using the old equipment and waiting to use the single rotovap.
3. Course sections will be inspected to see if students are spending reduced amounts of time waiting to use the balances, hot plates, and rotovap.
4. The effectiveness of this project will also be determined by the student retention between general chemistry I and II, whereby the lab is a pre and/or co-requisite to the course.

5. If funded, which NSTEP <http://www.nsula.edu/nstep/NSTEP.pdf> objective(s) will the funding of this project advance. How will funding of the project advance the University and College/unit technology plan?

NSTEP Objectives:

- **Objective #1: To improve access to technology by students, faculty, and staff at NSU**
Purchase of this equipment will give chemistry students and faculty access to functional, modern equipment which will allow them to complete basic tasks in chemistry laboratories and as part of research in chemistry. The rotovap in particular is a vital tool in chemistry labs to speed isolation of materials produced.
- **Objective #3: To upgrade laboratories with modern technology**
The equipment will help students gain necessary skills using modern tools commonly found in the workplace environment. This will help better prepare our students to work in a chemical lab as they will already have experience using this technology.
- **Objective #7: To encourage technology initiatives by faculty, staff, and students**
With this equipment, students and faculty will have a work environment in which they can conduct research and encourage more technological initiatives that needed to continue conducting innovative research. This would include acquiring more technology, like an NMR (nuclear magnetic resonance) spectrometer which can be used to identify molecules created using the equipment purchased with this proposal.
- **Objective #8: To encourage innovation and research**
Having up-to-date laboratory equipment provides students and faculty with facilities that are conducive to conducting innovative research. Quality research in the sciences requires technology that is functional, precise, and fast to allow scientists to work at a pace conducive to innovative research. This equipment will help maintain a work environment which research can occur.

Science & Technology / University Goals

- **Goal 1: NSU will endeavor to create and maintain a responsive, student-oriented environment.**
In response to complaints from students about equipment not functioning in the laboratories, we are looking to update and replace this equipment. This proposal is in response to student comments and to help them interact with modern, functional equipment.
- **Goal 2: NSU will provide programs, services, and operations throughout the**

University of high quality and effectiveness.

We are required by the American Chemical Society (ACS) professional standards to maintain technology reflective of modern industrial labs and to conduct research with our students to further their understanding of science. This proposal will help maintain teaching and research facilities used by students to further their understanding of chemistry and science.

- **Goal 3: NSU will strive to enhance institutional viability through effective enrollment management.**

With functioning laboratory equipment, we hope to retain students through both semesters of general chemistry (1031/1041) and organic chemistry (3011/3021). Students who work with new and functioning equipment have more positive attitudes toward science and feel more like "real" scientists. These positive attitudes can be translated into continuing onto higher level coursework.

- **Goal 4: NSU will promote economic development, community services, and an improved quality of life in the region.**

Graduating students who are prepared to work in a technology workforce strengthens the economic development of Louisiana as our students can apply their knowledge to solve future problems.

6. Provide a justification for funding of this project. Estimate the number of student that will be served per academic year and in what ways. Please indicate also any unique needs of the target group.

1. Impact on Curriculum and Instruction

Upgraded and updated laboratory equipment will help faculty members provide students with laboratory skills reflective of those required in the workplace. This will increase the quality of student's laboratory experiences during the first two years of the chemistry sequence for not only chemistry majors, but biology, pre-med, pre-dentistry, and rad.tech, pre-nursing majors as well. Students will use hotplates, balances, and rotovaps to explore chemistry and chemical reactions. These tools allow students to be trained on the use of basic modern chemical equipment and to develop basic laboratory skills necessary to function in industry. These students will receive a laboratory experiences not focusing on the short-term knowledge, but will develop an inquiry skills needed as a scientist.

2. Impact on Quality of Students

We expect the new equipment will improve student's interactions with laboratory equipment and help them gain necessary and basic laboratory skills. By helping students gain laboratory experience, they will be more confident when they enter the workplace, thereby increasing student satisfaction and employability. We expect that by upgrading laboratory equipment and reducing the amount of wait time in the lab to use this basic equipment, it will encourage more students in these courses to pursue careers in science, technology, or mathematics.

3. Impact on Faculty Development

This project will allow faculty, particularly in the case of the additional rotovap and addition of vacuum pumps, to develop new laboratories and improve older laboratory procedures. It will also always faculty the opportunity to include more challenging procedures that require accuracy and precision not offered by the equipment currently available in the labs. Faculty will be able to teach students the skills required of scientists in solving inquiry-based, open-ended problems. This will enhance the pedagogy in the

laboratory to take students from having a cookbook laboratory experience, to having authentic experiences as scientists. Even for faculty, having functional equipment allows them to carry out high-quality research with more efficiency and for their results to be high caliber for presentation and publication at a national level.

4. Cost Effectiveness

- It is estimated that the general chemistry sequence (CHEM 1031/1041) has 20 students per sections and 8 sections per year, totally approximately 160 students.
- The organic laboratory sequence (CHEM 3011/3021) has approximately 15 students per section and 4 sections per year, totally approximately 60 students
- Biochemistry (CHEM 4041) has approximately 20 students per section and 2 sections per year, totally 40 students.
- The introductory chemistry course (CHEM 1091) has approximately 15 students per section and 4 sections per year, totally 60 students.
- Overall, this proposal will serve 320 students and with a budget of \$25,434.07 we consider \$79.48 per student a bargain to provide students with the skills to be successful in a technological workforce.

7. List those individuals who will be responsible for the implementation of the project/initiative and indicate their demonstrated abilities to accomplish the objectives of the project.

PI **Dr. April N. French**, Assistant Professor of Chemistry, holds a PhD. in chemistry, specializing in chemical education and organic chemistry from the University of Kansas, Lawrence, KS. She was hired at NSU immediately upon graduation and has spent the last three years at this institution. Since joining the NSU faculty she has taught pre-Nursing general chemistry and pre-nursing organic and biochemistry, pre-nursing's introduction to chemistry laboratory, and organic chemistry laboratory.

8. Describe any personnel (technical or otherwise) required to support the project/initiative.

Drs. Darrel Fry, Walter Flomer, and Gillian Rudd also use the labs in which the equipment will be located. They will also be responsible for its general operation and upkeep.

9. Provide a schedule for implementation and evaluation.

The equipment requested is available through the state contractor Fisher Scientific. As such, purchase and implementation should be feasible within the Spring semester of 2010.

The evaluation methods (see #4) will indicate whether the proposal has been successful in providing students with up-to-date laboratory skills through using modern chemical technology in the lab. Informal attitude surveys will be conducted to see if students feel that they have a reduced waiting time to use equipment.

As improved recruitment of quality students is an aspect of the proposal, numbers of incoming students, as well as their GPAs and ACT scores, will demonstrate whether this has been achieved. Finally, numbers of students enrolling in our entire lab based pre-professional programs, numbers that subsequently applied to the programs, and percent success rates will provide a complete picture of the project's impact on our curriculum.

10. Estimate the expected life of hardware and software. Explain any anticipated equipment/software upgrades during the next five years.

Most of the laboratory equipment has an expected lifetime of 10 years, excluding minor problems or accidents, in which the department can replace one or two items per year. The equipment comes with a warranty to cover non-consumable parts and labor to correct defects in workmanship and/or materials when defects have not been caused by misuse or abuse.

- Ohaus Adventurer balance comes with a two year warranty
- Ohaus Scout balance comes with a five year warranty
- Cimarec stirring hotplate comes with a two year warranty
- Buchi rotovaporator
- Buchi vacuum pump comes with a one year warranty

11. Explain in detail a plan and policy that will be in place to ensure property security/controls for any equipment received through a Student Technology Fee. If you are requesting equipment that will be either/or checkout to students or moved within the department, you must provide a checkout/loan policy.

All materials obtained through this project will be protected under the Department of Chemistry & Physics removable property guidelines (and tagged with the NSU bar code). All of the laboratories are kept locked when they are not in use. The instruments being purchased are generally stored on the counter top, away from the doors to the laboratories.

Attach two (2) letters of support for the project from the following individuals: the requesting department's Dean, the appropriate Vice President (for non-academic units), or the SGA President from the requesting campus (for student requests).

Student Technology Fee Grant Proposal Checklist:

- Yes Is all information requested provided (items 1 – 11)?
- Yes Is a detailed budget attached?
- Yes Is all specifications, description, model number, quotation, cost, state contract number, and vendor provided for each item?
- Yes Are your two (2) letters of support attached?
- NA If equipment is to be checked-out/loaned, is your policy attached?

Budget

All equipment is available from state contractor Fisher Scientific.

Fisher Scientific
 2000 Park Lane Drive
 Pittsburgh, PA 15275
 800-766-7000
 www.fishersci.com

Item	Catalog #	Units	Price Each	Total Price
Ohaus Adventurer - Pro Precision - Electronic Balance - 200g Capacity, 0.001 g readability	01-919-212	5	\$1,125.14	\$5,625.70
Ohaus Scout Pro Balance 200g Capacity, 0.01g readability	S67074	5	\$219.23	\$1,096.15
ThermoScientific Cimarec Digital Stirring Hotplace	11-675-909Q	14	\$348.19	\$4,874.66
Buchi Rotary Evaporator, R-215A, Basic, 24/40, With safety coated glass, Jack/bath, 120V, 60Hz	05-403-540	1	\$4,966.14	\$4,966.14
Buchi V-700 Vacuum Pump	05-402-105	3	\$2,957.14	\$8,871.42

7280
 - 3
 7282
 - 5
 7282
 - 14
 - 1 7280
 - 1 7280

\$17,269.51
 \$25,434.07

Grand Total

Justification:

1. Ohaus Adventurer – Pro Precision Electronic balance provides a large weighting capacity, appropriate for the size of samples students use in the laboratory. Its ability to read out to 0.001g will provide enough precision to see small changes in mass associated with air and water sensitive reactions.
2. Ohaus Scout Pro Balance provides a large weighting capacity, appropriate for the size of samples used in teaching laboratories. The ability to read to 0.01g is reflective of its use in the pre-nursing course where the focus isn't on the precision of measurements, as much as knowing how much of a sample they used, while still allowing for small amounts to be weighted out.
3. ThermoScientific Cimarec Digital Stirring Hotplates allow scientists to multi-task common tasks (heating and stirring) while not being tied to the lab bench.
4. Buchi Rotary Evaporator (rotovap) with safety coated glass and hot water bath will provide fast and efficient evaporation of organic solvents. The safety-coated glass will provide additional protection for students in case glassware breaks while on the rotovap.
5. Buchi Vacuum Pump provides a vacuum pull on the rotovap, allowing for faster evaporations. The addition of the pump to the system is found in modern chemical laboratories. Providing a pump on our rotovaps will help train our students on modern technology they will be employing on their jobs.

Ohaus* Adventurer* Pro Precision Electronic Balances




Simple operation for basic weighing, with the accuracy and range to support more advanced applications, too.

QuadraStance* feature keeps balance stable on any surface. SmarText* software guides user through set and application.

01-919-211

- Ohaus Adventurer Pro Precision Electronic Balances

Click  in the table below to view accessories.

Description

Key Features

- Capacity ranges from 51g to 8100g
- Balances stabilize within 1 1/2 to 3 seconds, depending on model
- Weigh-below hook enables determination of density and specific gravity
- In difficult working situations, filtering to compensate against vibration and disturbances can be preprogrammed
- Standard overload and underload indicators alert operator when load changes are necessary
- Programmable energy-saving auto shutoff; low-battery indicator
- GLP/GMP capabilities such as data storage and output options for properly documenting balance activities to meet good practice requirements; include date, time, balance I.D., user I.D., project I.D., and reference
- Bidirectional RS-232 serial interface enables data transfer to a computer
- Custom two-line backlit LCD enhances viewing and displays additional reference information—allows you to simultaneously view reference and actual weight

Operation

- Operate with included AC adapter or four "AA" batteries (not included)
- Available with or without InCal internal calibration; InCal ensures weighing accuracy by allowing you to calibrate the balance prior to use without needing external weights
- Without InCal, calibration is digital with external weights
- Easy-to-use SmarText software utilizes text prompts to guide users through application use and balance setup

Weigh Modes/Units

Weighing modes include basic weighing, animal weighing, parts counting, percent weighing, check weighing, totalizing, and display hold

- Measurements can be read in custom units or in a variety of standard units: milligram, gram, kilogram, ounce, pound, carat, pennyweight, ounce troy, grain, Newton, Hong Kong tael, Singapore tael, Taiwan tael, momme, tical, bath, mesghal, and tola

Design

- QuadraStance design incorporates four feet to provide superior footprint stability on any surface
- Stainless-steel weighing platform resists corrosion; protective in-use cover
- Integral security bracket accommodates most security cables
- Simple three-button menu navigation promotes speedy setup
- Ergonomic leveling system with up-front level indicator
- Model AV53 comes with round draftshield for precise operation in drafty environments
- Models AV-213 and AV-313 include square, frameless draftshield with removable doors for unobstructed access to materials being weighed and for easy cleaning

Specifications & Ordering Information:

External calibration weights sold separately; contact your Customer Service Representative.

Certifications: CE marked UL listed, cCSA approved

Warranty: Two-years (US and Canada)

Service agreement available.

Model	AV53 ¹	AV213 ²	AV313 ²	AV212 ³	AV412	AV812
Readability	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g
Weighing Range	0 to 51g	0 to 210g	0 to 310g	0 to 210g	0 to 410g	0 to 810g
Taring Range	0 to 51g	0 to 210g	0 to 310g	0 to 210g	0 to 410g	0 to 810g
Repeatability (Std. Deviation)	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g
Linearity	±0.002g	±0.002g	±0.002g	±0.02g	±0.02g	±0.02g

Stabilization Time	2 1/2 sec.	3 sec.	3 sec.	1 1/2 sec. †	3 sec.	3 sec.
Pan Size	3 7/8 in. (10cm)	4 3/4 in. dia. (12cm)	4 3/4 in. dia. (12cm)	4 3/4 in. dia. (12cm)	5 3/4 x 6 1/4 in. (14.9 x 16.2cm)	5 3/4 x 6 1/4 in. (14.9 x 16.2cm)
Pan Size (with InCal)	---	4 3/4 in. dia. (12cm)	4 3/4 in. dia. (12cm)	4 3/4 in. dia. (12cm)	6 5/8 x 7 1/8 in. (16.8 x 18cm)	6 5/8 x 7 1/8 in. (16.8 x 18cm)
Dimensions (L x W x H)	10 x 7 5/8 x 5 5/8 in. (25.4 x 19.3 x 14.5cm)	11 3/4 x 8 3/4 x 7 1/2 in. (30 x 22 x 19cm)	11 3/4 x 8 3/4 x 7 1/2 in. (30 x 22 x 19cm)	10 x 7 5/8 x 2 3/4 in. (25.4 x 19.3 x 7.2cm)	10 x 7 5/8 x 2 3/4 in. (25.4 x 19.3 x 7.2cm)	10 x 7 5/8 x 2 3/4 in. (25.4 x 19.3 x 7.2cm)
Dimensions (L x W x H), with InCal	---	11 3/4 x 8 3/4 x 7 1/2 in. (30 x 22 x 19cm)	11 3/4 x 8 3/4 x 7 1/2 in. (30 x 22 x 19cm)	11 3/4 x 8 3/4 x 3 1/4 in. (30 x 22 x 8.5cm)	11 3/4 x 8 3/4 x 3 1/4 in. (30 x 22 x 8.5cm)	11 3/4 x 8 3/4 x 3 1/4 in. (30 x 22 x 8.5cm)
Net Weight	3 1/8 lb. (1.4kg)	7 1/4 lb. (3.3kg)	7 1/4 lb. (3.3kg)	2 5/8 lb. (1.2kg)	3 1/4 lb. (1.5kg)	3 1/4 lb. (1.5kg)
Net Weight (with InCal)	---	8 1/4 lb. (3.7kg)	8 1/4 lb. (3.7kg)	6 3/4 lb. (2.6kg)	7 1/2 lb. (3.4kg)	7 1/2 lb. (3.4kg)
Electrical Reqs.	AC Adapter (included) or 4 "AA" batteries	AC Adapter (included)	AC Adapter (included)	AC Adapter (included) or 4 "AA" batteries	AC Adapter (included) or 4 "AA" batteries	AC Adapter (included) or 4 "AA" batteries
Electrical Reqs. (with InCal)	---	AC Adapter (included)	AC Adapter (included)	AC Adapter (included)	AC Adapter (included)	AC Adapter (included)

Ohaus* Scout* Pro Balances



Portable, accurate, and reliable balances designed using teacher-requested improvements.


Take performance to a new level with milligram readability, higher resolution, more weighing units, and overload protection up to 200 lb. (90.7kg) to protect against rough handling and shock.

Includes:

- AC adapter

Required Accessories: Four "AA" batteries, not included

S67076

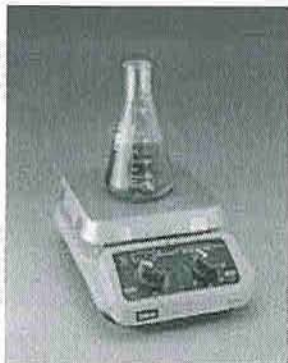
Click  in the table below to view accessories.

Description

- Internal overload protection
- Built to withstand the harsh environments of the field and the classroom
- Sealed front panel and molded spill ring to protect electronic components
- Two-button keypad with user interface and easy-to-use menu system
- Menu and calibration lock protection
- Above-balance density/specific gravity weighing (on balances up to 4000g capacity)
- Automatic specific gravity calculation in weighing mode
- Totalization allows repeated summing to the limit of the display, not just the balance capacity
- Encapsulated strain gauges protect against corrosion and humidity
- Integral shipping lock protects during transport
- Integral security bracket protects against theft
- Features an integrated weigh-below hook
- Operate using either an AC adapter or four "AA" batteries (not included)
- User-selectable power-saving auto-off feature conserves batteries
- Optional USB or RS-232 interfaces can be added at any time to upgrade connectivity

Warranty: Five years

Thermo Scientific Cimarec Digital Stirring Hotplates



Ideal for repetitive procedures demanding precision and safety

StirTrac* technology optimizes stirring speeds and unique HOT TOP alert provides added protection. Available in three sizes.

See details

Includes: Detachable line cord; stirring models also supplied with 0.38 dia. x 2 in.L (1 x 5.1cm) TFE-coated stir bar.

Description

Performance Features

- Microprocessor-controlled feedback technology maintains consistent, repeatable temperature settings from 5° up to maximum
- Digital display and large control knob enables precise temperature control
- Flat top and high-wattage heating elements provide superior heat transfer and fast time-to-boil
- Various sizes offered to handle different sample volumes
- Rugged cast aluminum body is stable and durable
- StirTrac* technology allows smooth low-speed stirring, consistent speed control and stronger magnetic coupling
- StirTrac braking brings stir bar to immediate stop for quick flash removal
- Integrated ring stand holder to accommodate 0.5 in. diameter (1.3cm) support rod

Safety Features

- Hot surface alert protects from accidental burns; light activates when heating surface is above 50°C (122°F)
- Unit displays HOT OFF until unit reaches 50°C (122°F) or below, even when heat control is turned off
- Cast-aluminum base diverts spills from internal electronics
- Low-profile design and stable, rugged base prevents tipping and spillage

Ceramic Top Models

- Clean easily and resists alkalis and acids
- Seamless, reflective white surface aids sample visibility
- Heat to higher temperatures than aluminum tops

Aluminum Top Models

- Rugged and chip-resistant for superior durability
- Allow uniform heat distribution across surface

Certifications: CSA approved. CE marked

Warranty: Two years

Buchi* V-700 Vacuum Pumps



Oil-Free

A chemically resistant, 2-stage, dual-head PTFE diaphragm pump designed for use with all gases and vapors typically found in the lab. With a flowrate of 1.8m³/hr. and an ultimate vacuum of <10mbar, it covers a wide range of classical laboratory applications.

See details

Includes: All options come with V-700 Vacuum Pump, sound absorber, main cable and operating instructions. See table for packages with additional components.

05-402-100

Description

- Compact, space-saving design
- Built-in carrying handle for convenient portability
- Oil-free—minimizes contamination risks
- Nearly maintenance-free
- Removable housing with built-in tools
- PEEK/glass head for extreme chemical resistance and instant visual detection of contaminants
- Extremely quiet operation
- All models for 120V 50/60Hz or 240V 50/60Hz

Choice of Control Options

Needle Valve Option —For Manual Operation

- Recommended only for R-210, R-215 and older Rotavapor* models without controller
- Woulff Bottle recommended
- No data interface

V-850 Professional Controller—For Standard Applications

- Vacuum or speed control of set pressure
- Intuitive controls with timer
- USB data interface
- Library with 43 solvent presets to simplify parameter selection

V-855 Advanced Controller—Programmable for Special Distillation Tasks

- Stores up to 15 processes
- Easy/Vac automatic process control
- Automatic distillation
- Repeat function

V-801 EasyVac Controller— For Automatic Evaporation of individual solvents or complex solvent mixtures

- Automatically finds start point and optimally regulates pressure until distillation is complete
- Recommended only for R-210, R-215 and older Rotavapor models without controller
- Woulff Bottle recommended
- Can determine the end point for a distillation
- Provides fast, gentle evaporation during distillation

V-802 LabVac Controller—For Central Vacuum Control System

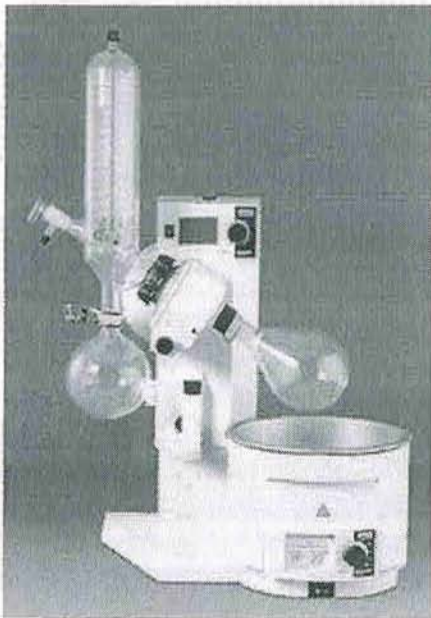
- Laboratory vacuum system for multiple consumers
- Switches pump on and off to provide required vacuum with minimum energy use
- CONT mode operates pump continuously to create as low a vacuum as possible irrespective of the consumers connected
- Adapts to different systems with a wide range of tubing, adapter cables for valves from other manufacturers, and connection pieces
- Recommended only for R-210, R-215 and older Rotavapor models with V-850 or V-855 controller

Specifications & Ordering Information:

All models listed are dual voltage: operate on 120V 50/60Hz or 240V 50/60Hz.

Warranty: One year

Buchi* Rotavapor* R-215 Basic Rotary Evaporators for 120V



Buchi R-215 Basic with V Condenser Assembly 05-402-257

Compact, modular systems with digital display of vapor temperature and rotation speed

R-215 Basic Models offer:

- Digital LCD readout of vapor temperature and rotation speed
- Rotary evaporator with rotation control knob
- Quick-action jack
- Glassware
- Combi-clip to secure flask during operation

Versatile, expandable operation

- Modular systems for distillation of all solvents
- Perfect for hard-to-handle materials that bump and foam
- Available with integrated vacuum controllers to automate distillation and handle time-pressure gradients
- Choice of 7 condenser assemblies for numerous applications
- Handle flask sizes from 50 to 4000mL
- Optional plastic safety coating on glassware resists solvents; protects you and your sample against breakage hazards
- Chemical-resistant PTFE sealing system is practically maintenance-free
- Optional water/oil heating bath has a 1300w heating capacity; can also be used as a stand-alone bath; has a temperature range from 20° to 180°C; digital display of both the set and actual temperatures
- Motorized quick-action jack raises and lowers evaporator; automatic release to top position in case of power failure
- Electronically controlled variable-speed sparkless motor provides high, constant torque from 20 to 280rpm

See details

Includes:

- Digital LCD readout of vapor temperature and rotation speed
- Rotary evaporator with rotation control knob
- Quick-action jack
- Glassware, including specified condenser, 1L receiving flask, standard-glass 1L evaporating flask
- Combi-Clip to secure flask during operation
- Other components as specified in ordering table

Required Accessories: Vacuum pump or system and associated connections.

Alert: Direct exposure of plastic-coated glassware to chlorinated solvents and aggressive reagents should be avoided.

F I S H E R H E A L T H C A R E
Q U O T A T I O N

OCTOBER 23, 2009

PAGE: 1

ACCOUNT NBR: 757495-001
QUOTE NBR: 9296-2131-84
TERMS: NET 30 DAYS
DUE DATE:
SALES REP: KARAN STEPHENS

REQUESTOR: APRIL FRENCH
PHONE: 3183575248
FOB: DESTINATION
AUTHORIZED BY: KARAN STEPHENS

CUST REF NBR QUOTE / FRENCH

NORTHWESTERN STATE UNIV
CENTRAL RCVING
727 COLLEGE AVE

FISHER SCIENTIFIC COMPANY LLC
9999 VETERANS MEMORIAL DRIVE
HOUSTON TX 77038

NATCHITOCHEES LA 71497
ATTN: X

PHONE: (800) 640-0640
FAX: (800) 290-0290

*** PRICES ARE FIRM THRU 12/22/09 ***
PLEASE REFER TO THE QUOTE NBR ON ALL CORRESPONDENCE
THANK YOU FOR YOUR INTEREST IN FISHER HEALTHCARE

NBR	QTY	UN	CATALOG NBR	DESCRIPTION	UNIT PRC	EXTD PRC
1	5	EA	01 919 212	BALANCE, PRECISION, OHAUS LIST PR: 1,640.00 MKT: A	1,125.14	5,625.70
2	5	EA	S67074	SCOUT PRO 200GX.01G LIST PR: 334.00 MKT: M	219.23	1,096.15
3	14	EA	11 675 909Q	STIRRING HOT PLATE CIMAREC LIST PR: 441.15 MKT: M	348.19	4,874.66
4	1	EA	05 403 540	ROTAVAPOR R-215, 100-120V LIST PR: 6,129.80 MKT: A		4,966.14
5	3	EA	05 402 105	VACUUM PUMP V-700, WOLFF BOT LIST PR: 2,957.14 MKT: A	2,957.14	8,871.42
MERCHANDISE TOTAL						25,434.07

WE NOW OFFER HIGHLY COMPETITIVE FINANCING WITH LOW MONTHLY PAYMENTS, PLEASE CONTACT YOUR LOCAL SALES REPRESENTATIVE FOR MORE INFORMATION.

TELL US ABOUT YOUR RECENT CUSTOMER-SERVICE EXPERIENCE BY COMPLETING A SHORT SURVEY. THIS SHOULD TAKE NO LONGER THAN THREE MINUTES. ENTER THE LINK INTO YOUR BROWSER AND ENTER THE PASSCODE SHOWN.

<http://survey.medallia.com/fishersci> PASSCODE: USA-PGH-CS1

PART OF THERMO FISHER SCIENTIFIC

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PRICES: All prices are quoted F. O. B. shipping point for the indicated firm period. Customer shall pay all federal, state, municipal or other sales or use tax or any other taxes upon the Products or services provided to Customer by Distributor. Distributor reserves the right to make additional charges for special packaging, shipping and handling required to comply with manufacturers' specification, applicable DOT or other regulations, or to meet Customer requirements.

Distributor expressly disclaims any representation or warranty concerning "most favored customer" pricing which may appear in any Customer's documents in connection with the sale of any Products by Distributor to Customer.

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DELIVERY: All shipping dates are approximate. Distributor reserves the right to substitute alternate Products with equivalent specifications for those ordered. Customer shall have the right to return any substituted Products at no charge by following Distributor's return goods policy.

PRODUCT WARRANTY AND INDEMNITY: To the extent possible, Distributor will make available to its Customers the manufacturers' warranties for Products purchased by Customer, without recourse to Distributor. Distributor warrants to Customer that during the manufactures specified warranty period, Distributor or manufacturer will, upon prompt notification and compliance with Distributor's instructions, repair or replace, at Distributor's sole option, any Product which is defective in material or workmanship. No employee, agent or representative of Distributor has the authority to bind Distributor to any oral representation or warranty concerning any Product sold. Any oral representation or warranty made prior to the purchase of any Product and not set forth in writing and signed by a duly authorized officer of Distributor shall not be enforceable by Customer. Distributor makes no warranty and shall have no obligation with respect to expendable or consumable parts and supplies nor with respect to damage caused by resulting from accident, misuse, neglect, or unauthorized installation, alterations or repairs to the Products.

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Except as otherwise expressly set forth herein, Distributor disclaims any obligation to defend or indemnify Customer, its officers, agents, or employees, from any losses, damages, liabilities, costs or expenses which may arise out of Distributor's acts or omissions or the sale or use of the Products provided to Customer by Distributor.

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Gillian E. A. Rudd, Ph.D. MRSC CChem.
Department of Chemistry and Physics,
Northwestern State University,
Natchitoches, LA 71497
Tel: 318 357 5232 Fax: 318 357 4219
Email: rudd@nsula.edu



26th October, 2009

Dear Committee Members:

I am pleased to write this letter of support for the grant proposal submitted by Dr. April N. French to obtain updated balances, stirring hotplates, and a new rotovap with vacuum pumps. Dr. French's proposal is a reasonable request to enhance the technical resources and enhance the laboratory experiences for students enrolled in Chemistry 1031/1041, Chemistry 3011/3021, Chemistry 1091, and Chemistry 4041.

Purchase of this equipment will help faculty upgrade and modernize experiments, as well as increase student efficiency in the lab. The new equipment will allow students to have experiences using the same kind of technology they will find when they enter the workforce upon graduation, increasing their employability.

Thank you for serving on this committee and for your careful consideration of this proposal.

Very truly yours,

A handwritten signature in blue ink that reads "Gillian E. A. Rudd".

[Gillian E. A. Rudd, Associate Professor of Chemistry]



COLLEGE OF SCIENCE & TECHNOLOGY
OFFICE OF THE DEAN



October 23, 2009

To Members of the Student Technology Selection Committee:

As the temporary department head of the Department of Chemistry & Physics and as Dean of the College of Science and Technology, I am pleased to send this letter as proof of my support for the technology grant proposal submitted by Dr. April N. French. Dr. French's proposal is a reasonable request to enhance the technical resources and enhance the laboratory experiences for students enrolled in Chemistry 1031/1041, Chemistry 3011/3021, Chemistry 1091, and Chemistry 4041. The acquisition of the laboratory equipment, including balances, hotplates, and a new rotary evaporator system with vacuum pumps, creates opportunities for the Chemistry and Physics Department to upgrade and modernize experiments, as well as to provide an efficient use of student's laboratory time. The new equipment will allow students to have experiences using the same kind of technology they will find when they enter the workforce upon graduation, increasing their employability.

Thank you for serving on this committee and for your careful consideration of this proposal.

Very truly yours,

Austin L. Temple Jr., Ph.D.
Dean, College of Science and Technology