

Request for Reconsideration after Final Action

The table below presents the data as entered.

Input Field	Entered
SERIAL NUMBER	85069744
LAW OFFICE ASSIGNED	LAW OFFICE 117
MARK SECTION (no change)	
GOODS AND/OR SERVICES SECTION (007)(current)	
INTERNATIONAL CLASS	007
DESCRIPTION	
Vacuum pumps, namely rotary vane, Cole principle, roots blowers and oil-less for evaporation and freeze drying (lyophilization); automated laboratory glassware washers; industrial machinery for generating a stream of filtered, dehumidified and thermally controlled gas for industrial use	
FILING BASIS	Section 1(a)
FIRST USE ANYWHERE DATE	At least as early as 02/26/2010
FIRST USE IN COMMERCE DATE	At least as early as 02/26/2010
GOODS AND/OR SERVICES SECTION (007)(proposed)	
INTERNATIONAL CLASS	007
DESCRIPTION	
Vacuum pumps, namely rotary vane, Cole principle, roots blowers and oil-less for evaporation and freeze drying (lyophilization); automated laboratory glassware washers; industrial machinery for generating a stream of filtered, dehumidified and thermally controlled gas for industrial use	
FILING BASIS	Section 1(a)
FIRST USE ANYWHERE DATE	At least as early as 02/26/2010
FIRST USE IN COMMERCE DATE	At least as early as 02/26/2010
"The substitute (or new, if appropriate) specimen(s) was/were in use in	

STATEMENT
TYPE

commerce at least as early as the filing date of the application" *[for an application based on Section 1(a), Use in Commerce]* OR "The substitute (or new, if appropriate) specimen(s) was/were in use in commerce prior either to the filing of the Amendment to Allege Use or expiration of the filing deadline for filing a Statement of Use" *[for an application based on Section 1(b) Intent-to-Use]*.

SPECIMEN FILE NAME(S)

ORIGINAL PDF FILE SPU0-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec.pdf

CONVERTED PDF FILE(S) (1 page) \\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0002.JPG

ORIGINAL PDF FILE SPU0-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec2.pdf

CONVERTED PDF FILE(S) (16 pages) \\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0003.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0004.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0005.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0006.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0007.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0008.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0009.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0010.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0011.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0012.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0013.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0014.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0015.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0016.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0017.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0018.JPG

SPECIMEN DESCRIPTION a trade show display and a brochure associating the mark with the goods and providing ordering information.

GOODS AND/OR SERVICES SECTION (009)(current)

INTERNATIONAL CLASS 009

DESCRIPTION

Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents; namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; temperature controlled baths and traps for laboratory use, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for laboratory use, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; freeze and vacuum dryers for laboratory research applications; laboratory equipment for generating a stream of filtered, dehumidified and thermally controlled gas for laboratory use; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices; namely, automatic valves and actuators; programmable computer based control systems for scientific apparatus and instruments comprised of display screen, control panel, microprocessor, human-machine interface (HMI), programmable logic controllers (PLC) and graphical user interface (GUI) software; replacement component parts for all the aforesaid goods; vacuum pumps for laboratory use, namely rotary vane, Cole principle, roots blowers and oil-less vacuum pumps

FILING BASIS Section 1(a)

FIRST USE ANYWHERE DATE At least as early as 02/26/2010

FIRST USE IN COMMERCE DATE At least as early as 02/26/2010

GOODS AND/OR SERVICES SECTION (009)(proposed)

INTERNATIONAL CLASS 009

TRACKED TEXT DESCRIPTION

~~Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents; Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents, namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; temperature controlled baths and traps for laboratory use, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for laboratory use, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; freeze and vacuum dryers for laboratory research applications; laboratory equipment for generating a stream of filtered, dehumidified and thermally controlled gas for laboratory use; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices, namely, automatic valves and actuators; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices; programmable computer based control systems for scientific apparatus and instruments comprised of display screen, control panel, microprocessor, human-machine interface (HMI), programmable logic controllers (PLC) and graphical user interface (GUI) software; namely, automatic valves and actuators; replacement component parts for all the aforesaid goods; vacuum pumps for laboratory use, namely rotary vane, Cole principle, roots blowers and oil-less vacuum pumps~~

FINAL DESCRIPTION

Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents, namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; temperature controlled baths and traps for laboratory use, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for laboratory use, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; freeze and vacuum dryers for laboratory research applications; laboratory equipment for generating a stream of filtered, dehumidified and thermally controlled gas for laboratory use; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices, namely, automatic valves and actuators; programmable computer based control systems for scientific apparatus and instruments comprised of display screen, control panel, microprocessor, human-machine interface (HMI), programmable logic controllers (PLC) and graphical user interface (GUI) software; replacement component parts for all the aforesaid goods; vacuum pumps for laboratory use, namely rotary vane, Cole principle, roots blowers and oil-less vacuum pumps

FILING BASIS	Section 1(a)
FIRST USE ANYWHERE DATE	At least as early as 02/26/2010
FIRST USE IN COMMERCE DATE	At least as early as 02/26/2010
STATEMENT TYPE	"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce at least as early as the filing date of the application" [for an application based on Section 1(a), Use in Commerce] OR "The substitute (or new, if appropriate) specimen(s) was/were in use in commerce prior either to the filing of the Amendment to Allege Use or expiration of the filing deadline for filing a Statement of Use" [for an application based on Section 1(b) Intent-to-Use].
SPECIMEN FILE NAME(S)	
ORIGINAL PDF FILE	<u>SPU1-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec.pdf</u>
CONVERTED PDF FILE(S) (1 page)	<u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0019.JPG</u>
ORIGINAL PDF FILE	<u>SPU1-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec2.pdf</u>
CONVERTED PDF FILE(S) (16 pages)	<u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0020.JPG</u> <u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0021.JPG</u> <u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0022.JPG</u> <u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0023.JPG</u> <u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0024.JPG</u> <u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0025.JPG</u>

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0026.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0027.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0028.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0029.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0030.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0031.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0032.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0033.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0034.JPG
\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0035.JPG

**SPECIMEN
DESCRIPTION**

a trade show display and a brochure associating the mark with the goods and providing ordering information.

GOODS AND/OR SERVICES SECTION (011)(current)

**INTERNATIONAL
CLASS**

011

DESCRIPTION

Industrial apparatus for evaporating volatile solvents namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; freeze dryers (lyophilizers); vacuum dryers; condensers, namely continuous running condensers, solvent waste condensers and exhaust condensers; recirculating fluid chillers for use in industrial applications, namely with lasers, plasma etchers, diffusion pumps, graphite furnaces, reaction vessels, sputtering equipment, vacuum systems, electron microscopes and power supplies; temperature controlled baths and traps for use in laboratory and industrial applications, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for use in industrial applications, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; centrifugal evaporators for use in biological, pharmaceutical, environmental and industrial applications; industrial freeze and vacuum dryers for use in biological, pharmaceutical, educational, agricultural and industrial applications; electromechanical gas generators, namely, multi-purpose gas generators which generate a stream of filtered, dehumidified and thermally controlled gas for industrial or commercial use; replacement component parts for all the aforesaid goods

FILING BASIS

Section 1(a)

**FIRST USE
ANYWHERE DATE**

At least as early as 02/26/2010

**FIRST USE IN
COMMERCE DATE**

At least as early as 02/26/2010

GOODS AND/OR SERVICES SECTION (011)(proposed)

**INTERNATIONAL
CLASS**

011

TRACKED TEXT DESCRIPTION

Industrial apparatus for evaporating volatile solvents namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; freeze dyers (lyophilizers); vacuum dryers; condensers, namely continuous running condensers, solvent waste condensers and exhaust condensers; recirculating fluid chillers for use in industrial applications, namely with lasers, plasma etchers, diffusion pumps, graphite furnaces, reaction vessels, sputtering equipment, vacuum systems, electron microscopes and power supplies; ~~temperature controlled baths and traps for use in laboratory and industrial applications, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps;~~ temperature controlled immersion and direct contact probe coolers for use in industrial applications, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; centrifugal evaporators for use in biological, pharmaceutical, environmental and industrial applications; industrial freeze and vacuum dryers for use in biological, pharmaceutical, educational, agricultural and industrial applications; replacement component parts for all the aforesaid goods; ~~electromechanical gas generators, namely, multi-purpose gas generators which generate a stream of filtered, dehumidified and thermally controlled gas for industrial or commercial use~~

FINAL DESCRIPTION

Industrial apparatus for evaporating volatile solvents namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; freeze dyers (lyophilizers); vacuum dryers; condensers, namely continuous running condensers, solvent waste condensers and exhaust condensers; recirculating fluid chillers for use in industrial applications, namely with lasers, plasma etchers, diffusion pumps, graphite furnaces, reaction vessels, sputtering equipment, vacuum systems, electron microscopes and power supplies; temperature controlled immersion and direct contact probe coolers for use in industrial applications, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; centrifugal evaporators for use in biological, pharmaceutical, environmental and industrial applications; industrial freeze and vacuum dryers for use in biological, pharmaceutical, educational, agricultural and industrial applications; replacement component parts for all the aforesaid goods

FILING BASIS	Section 1(a)
FIRST USE ANYWHERE DATE	At least as early as 02/26/2010
FIRST USE IN COMMERCE DATE	At least as early as 02/26/2010
STATEMENT TYPE	"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce at least as early as the filing date of the application" [for an application based on Section 1(a), Use in Commerce] OR "The substitute (or new, if appropriate) specimen(s) was/were in use in commerce prior either to the filing of the Amendment to Allege Use or expiration of the filing deadline for filing a Statement of Use" [for an application based on Section 1(b) Intent-to-Use].
SPECIMEN FILE NAME(S)	
ORIGINAL PDF FILE	<u>SPU2-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec.pdf</u>
CONVERTED PDF FILE(S)	<u>\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0036.JPG</u>

(1 page)

ORIGINAL PDF
FILE

SPU2-121575983-
152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec2.pdf

CONVERTED
PDF FILE(S)
(16 pages)

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0037.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0038.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0039.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0040.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0041.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0042.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0043.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0044.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0045.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0046.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0047.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0048.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0049.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0050.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0051.JPG

\\TICRS\EXPORT11\IMAGEOUT11\850\697\85069744\xml6\RFR0052.JPG

SPECIMEN
DESCRIPTION

a trade show display and a brochure associating the mark with the goods and providing ordering information.

GOODS AND/OR SERVICES SECTION (037)(no change)

GOODS AND/OR SERVICES SECTION (042)(no change)

SIGNATURE SECTION

DECLARATION
SIGNATURE

/pjh/

SIGNATORY'S
NAME

P. Jay Hines

SIGNATORY'S
POSITION

Counsel

DATE SIGNED

04/27/2011

RESPONSE

/pih/

SIGNATURE**SIGNATORY'S
NAME**

P. Jay Hines

**SIGNATORY'S
POSITION**

Counsel

DATE SIGNED

04/27/2011

**AUTHORIZED
SIGNATORY**

YES

**CONCURRENT
APPEAL NOTICE
FILED**

NO

FILING INFORMATION SECTION**SUBMIT DATE**

Wed Apr 27 15:42:58 EDT 2011

TEAS STAMPUSPTO/RFR-12.157.59.83-20
110427154258015360-850697
44-480922257ee743d8c68bfd
b9491b48d58-N/A-N/A-20110
427152514179776PTO Form (Rev. 4/2000)
OMB No. 0651-0047 (Exp. 08/31/2004)**Request for Reconsideration after Final Action****To the Commissioner for Trademarks:**Application serial no. **85069744** has been amended as follows:**CLASSIFICATION AND LISTING OF GOODS/SERVICES****Applicant proposes to amend the following class of goods/services in the application:****Current:** Class 007 for Vacuum pumps, namely rotary vane, Cole principle, roots blowers and oil-less for evaporation and freeze drying (lyophilization); automated laboratory glassware washers; industrial machinery for generating a stream of filtered, dehumidified and thermally controlled gas for industrial use
Original Filing Basis:**Filing Basis: Section 1(a), Use in Commerce:** The applicant is using the mark in commerce, or the applicant's related company or licensee is using the mark in commerce, on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(a), as amended. The mark was first used at least as early as 02/26/2010 and first used in commerce at least as early as 02/26/2010, and is now in use in such commerce.**Proposed:** Class 007 for Vacuum pumps, namely rotary vane, Cole principle, roots blowers and oil-less for evaporation and freeze drying (lyophilization); automated laboratory glassware washers; industrial machinery for generating a stream of filtered, dehumidified and thermally controlled gas for industrial use

Filing Basis: Section 1(a), Use in Commerce: The applicant is using the mark in commerce, or the applicant's related company or licensee is using the mark in commerce, on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(a), as amended. The mark was first used at least as early as 02/26/2010 and first used in commerce at least as early as 02/26/2010, and is now in use in such commerce.

Applicant hereby submits a new specimen for Class 007. The specimen(s) submitted consists of a trade show display and a brochure associating the mark with the goods and providing ordering information..

"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce at least as early as the filing date of the application" *[for an application based on Section 1(a), Use in Commerce]* OR **"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce prior either to the filing of the Amendment to Allege Use or expiration of the filing deadline for filing a Statement of Use"** *[for an application based on Section 1(b) Intent-to-Use].*

Original PDF file:

SPU0-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec.pdf

Converted PDF file(s) (1 page)

Specimen File1

Original PDF file:

SPU0-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec2.pdf

Converted PDF file(s) (16 pages)

Specimen File1

Specimen File2

Specimen File3

Specimen File4

Specimen File5

Specimen File6

Specimen File7

Specimen File8

Specimen File9

Specimen File10

Specimen File11

Specimen File12

Specimen File13

Specimen File14

Specimen File15

Specimen File16

Applicant proposes to amend the following class of goods/services in the application:

Current: Class 009 for Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents; namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; temperature controlled baths and traps for laboratory use, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for laboratory use, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; freeze and vacuum dryers for laboratory research applications; laboratory equipment for generating a stream of filtered, dehumidified and thermally controlled gas for laboratory use; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices; namely, automatic valves and actuators; programmable computer based control systems for scientific apparatus and instruments comprised of display screen, control panel, microprocessor, human-machine interface (HMI), programmable logic controllers (PLC) and graphical user interface (GUI) software; replacement component parts for all the

aforesaid goods; vacuum pumps for laboratory use, namely rotary vane, Cole principle, roots blowers and oil-less vacuum pumps

Original Filing Basis:

Filing Basis: Section 1(a), Use in Commerce: The applicant is using the mark in commerce, or the applicant's related company or licensee is using the mark in commerce, on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(a), as amended. The mark was first used at least as early as 02/26/2010 and first used in commerce at least as early as 02/26/2010, and is now in use in such commerce.

Proposed:

Tracked Text Description: ~~Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents;~~ Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents, namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; ~~namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators;~~ temperature controlled baths and traps for laboratory use, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for laboratory use, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; freeze and vacuum dryers for laboratory research applications; laboratory equipment for generating a stream of filtered, dehumidified and thermally controlled gas for laboratory use; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices, namely, automatic valves and actuators; ~~low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices;~~ programmable computer based control systems for scientific apparatus and instruments comprised of display screen, control panel, microprocessor, human-machine interface (HMI), programmable logic controllers (PLC) and graphical user interface (GUI) software; ~~namely, automatic valves and actuators;~~ replacement component parts for all the aforesaid goods; vacuum pumps for laboratory use, namely rotary vane, Cole principle, roots blowers and oil-less vacuum pumps

Class 009 for Scientific apparatus and instruments, namely laboratory apparatus for evaporating volatile solvents, namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; temperature controlled baths and traps for laboratory use, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for laboratory use, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; freeze and vacuum dryers for laboratory research applications; laboratory equipment for generating a stream of filtered, dehumidified and thermally controlled gas for laboratory use; low and high temperature apparatus for rapidly recycling of temperature for testing electronic components, circuit boards and electromechanical devices, namely, automatic valves and actuators; programmable computer based control systems for scientific apparatus and instruments comprised of display screen, control panel, microprocessor, human-machine interface (HMI), programmable logic controllers (PLC) and graphical user interface (GUI) software; replacement component parts for all the aforesaid goods; vacuum pumps for laboratory use, namely rotary vane, Cole principle, roots blowers and oil-less vacuum pumps

Filing Basis: Section 1(a), Use in Commerce: The applicant is using the mark in commerce, or the applicant's related company or licensee is using the mark in commerce, on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(a), as amended. The mark was first used at least as early as 02/26/2010 and first used in commerce at least as early as 02/26/2010, and is now in use in such commerce.

Applicant hereby submits a new specimen for Class 009. The specimen(s) submitted consists of a trade show display and a brochure associating the mark with the goods and providing ordering information..

"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce at least as early as

the filing date of the application" *[for an application based on Section 1(a), Use in Commerce]* OR "The substitute (or new, if appropriate) specimen(s) was/were in use in commerce prior either to the filing of the Amendment to Allege Use or expiration of the filing deadline for filing a Statement of Use" *[for an application based on Section 1(b) Intent-to-Use]*.

Original PDF file:

SPU1-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec.pdf

Converted PDF file(s) (1 page)

Specimen File1

Original PDF file:

SPU1-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec2.pdf

Converted PDF file(s) (16 pages)

Specimen File1

Specimen File2

Specimen File3

Specimen File4

Specimen File5

Specimen File6

Specimen File7

Specimen File8

Specimen File9

Specimen File10

Specimen File11

Specimen File12

Specimen File13

Specimen File14

Specimen File15

Specimen File16

Applicant proposes to amend the following class of goods/services in the application:

Current: Class 011 for Industrial apparatus for evaporating volatile solvents namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; freeze dyers (lyophilizers); vacuum dryers; condensers, namely continuous running condensers, solvent waste condensers and exhaust condensers; recirculating fluid chillers for use in industrial applications, namely with lasers, plasma etchers, diffusion pumps, graphite furnaces, reaction vessels, sputtering equipment, vacuum systems, electron microscopes and power supplies; temperature controlled baths and traps for use in laboratory and industrial applications, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps; temperature controlled immersion and direct contact probe coolers for use in industrial applications, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; centrifugal evaporators for use in biological, pharmaceutical, environmental and industrial applications; industrial freeze and vacuum dryers for use in biological, pharmaceutical, educational, agricultural and industrial applications; electromechanical gas generators, namely, multi-purpose gas generators which generate a stream of filtered, dehumidified and thermally controlled gas for industrial or commercial use; replacement component parts for all the aforesaid goods

Original Filing Basis:

Filing Basis: Section 1(a), Use in Commerce: The applicant is using the mark in commerce, or the applicant's related company or licensee is using the mark in commerce, on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(a), as amended. The mark was first used at least as early as 02/26/2010 and first used in commerce at least as early as 02/26/2010, and is now in use in such commerce.

Proposed:

Tracked Text Description: Industrial apparatus for evaporating volatile solvents namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; freeze dyers (lyophilizers); vacuum dryers; condensers, namely continuous running condensers, solvent waste condensers and exhaust condensers; recirculating fluid chillers for use in industrial applications, namely with lasers, plasma etchers, diffusion pumps, graphite furnaces, reaction vessels, sputtering equipment, vacuum systems, electron microscopes and power supplies; ~~temperature controlled baths and traps for use in laboratory and industrial applications, namely thermal cycling baths, Charpy impact testing, embryo freezers and vapor traps;~~ temperature controlled immersion and direct contact probe coolers for use in industrial applications, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; centrifugal evaporators for use in biological, pharmaceutical, environmental and industrial applications; industrial freeze and vacuum dryers for use in biological, pharmaceutical, educational, agricultural and industrial applications; replacement component parts for all the aforesaid goods; ~~electromechanical gas generators, namely, multi-purpose gas generators which generate a stream of filtered, dehumidified and thermally controlled gas for industrial or commercial use~~

Class 011 for Industrial apparatus for evaporating volatile solvents namely, centrifugal, rotary, vortex and nitrogen blow-down evaporators; freeze dyers (lyophilizers); vacuum dryers; condensers, namely continuous running condensers, solvent waste condensers and exhaust condensers; recirculating fluid chillers for use in industrial applications, namely with lasers, plasma etchers, diffusion pumps, graphite furnaces, reaction vessels, sputtering equipment, vacuum systems, electron microscopes and power supplies; temperature controlled immersion and direct contact probe coolers for use in industrial applications, namely nuclear Magnetic Resonance (NMR) instruments, gas chromatographs and electronic component testing; centrifugal evaporators for use in biological, pharmaceutical, environmental and industrial applications; industrial freeze and vacuum dryers for use in biological, pharmaceutical, educational, agricultural and industrial applications; replacement component parts for all the aforesaid goods

Filing Basis: Section 1(a), Use in Commerce: The applicant is using the mark in commerce, or the applicant's related company or licensee is using the mark in commerce, on or in connection with the identified goods and/or services. 15 U.S.C. Section 1051(a), as amended. The mark was first used at least as early as 02/26/2010 and first used in commerce at least as early as 02/26/2010, and is now in use in such commerce.

Applicant hereby submits a new specimen for Class 011. The specimen(s) submitted consists of a trade show display and a brochure associating the mark with the goods and providing ordering information..

"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce at least as early as the filing date of the application" *[for an application based on Section 1(a), Use in Commerce]* OR **"The substitute (or new, if appropriate) specimen(s) was/were in use in commerce prior either to the filing of the Amendment to Allege Use or expiration of the filing deadline for filing a Statement of Use"** *[for an application based on Section 1(b) Intent-to-Use].*

Original PDF file:

SPU2-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec.pdf

Converted PDF file(s) (1 page)

Specimen File1

Original PDF file:

SPU2-121575983-152514179 . MAKING TIME FOR SCIENCE Class 7 9 and 11 Spec2.pdf

Converted PDF file(s) (16 pages)

Specimen File1

Specimen File2

Specimen File3
Specimen File4
Specimen File5
Specimen File6
Specimen File7
Specimen File8
Specimen File9
Specimen File10
Specimen File11
Specimen File12
Specimen File13
Specimen File14
Specimen File15
Specimen File16

SIGNATURE(S)

Declaration Signature

If the applicant is seeking registration under Section 1(b) and/or Section 44 of the Trademark Act, the applicant has had a bona fide intention to use or use through the applicant's related company or licensee the mark in commerce on or in connection with the identified goods and/or services as of the filing date of the application. 37 C.F.R. Secs. 2.34(a)(2)(i); 2.34 (a)(3)(i); and 2.34(a)(4)(ii); and/or the applicant has had a bona fide intention to exercise legitimate control over the use of the mark in commerce by its members. 37 C.F. R. Sec. 2.44. If the applicant is seeking registration under Section 1(a) of the Trademark Act, the mark was in use in commerce on or in connection with the goods and/or services listed in the application as of the application filing date or as of the date of any submitted allegation of use. 37 C.F.R. Secs. 2.34(a)(1)(i); and/or the applicant has exercised legitimate control over the use of the mark in commerce by its members. 37 C.F.R. Sec. 2.44. The undersigned, being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. Section 1001, and that such willful false statements may jeopardize the validity of the application or any resulting registration, declares that he/she is properly authorized to execute this application on behalf of the applicant; he/she believes the applicant to be the owner of the trademark/service mark sought to be registered, or, if the application is being filed under 15 U.S.C. Section 1051(b), he/she believes applicant to be entitled to use such mark in commerce; to the best of his/her knowledge and belief no other person, firm, corporation, or association has the right to use the mark in commerce, either in the identical form thereof or in such near resemblance thereto as to be likely, when used on or in connection with the goods/services of such other person, to cause confusion, or to cause mistake, or to deceive; that if the original application was submitted unsigned, that all statements in the original application and this submission made of the declaration signer's knowledge are true; and all statements in the original application and this submission made on information and belief are believed to be true.

Signature: /pjh/ Date: 04/27/2011

Signatory's Name: P. Jay Hines

Signatory's Position: Counsel

Request for Reconsideration Signature

Signature: /pjh/ Date: 04/27/2011

Signatory's Name: P. Jay Hines

Signatory's Position: Counsel

The signatory has confirmed that he/she is an attorney who is a member in good standing of the bar of the highest court of a U.S. state, which includes the District of Columbia, Puerto Rico, and other federal territories and possessions; and he/she is currently the applicant's attorney or an associate thereof; and to the best of his/her knowledge, if prior to his/her appointment another U.S. attorney or a Canadian attorney/agent not currently associated with his/her company/firm previously represented the applicant in this matter: (1) the applicant has filed or is concurrently filing a signed revocation of or substitute power of attorney with the USPTO; (2) the USPTO has granted the request of the prior representative to withdraw; (3) the applicant has filed a power of attorney appointing him/her in this matter; or (4) the applicant's appointed U.S. attorney or Canadian attorney/agent has filed a power of attorney appointing him/her as an associate attorney in this matter.

The applicant is not filing a Notice of Appeal in conjunction with this Request for Reconsideration.

Serial Number: 85069744

Internet Transmission Date: Wed Apr 27 15:42:58 EDT 2011

TEAS Stamp: USPTO/RFR-12.157.59.83-20110427154258015

360-85069744-480922257ee743d8c68bfd9491

b48d58-N/A-N/A-20110427152514179776

Making Time for Science



SP SCIENTIFIC

Freeze dryers Thermal management
Sample concentrators Glassware washers



Making Time for Science

SP SCIENTIFIC
VIRTUO
DETERMINATION
PACKAGING
ETC. SOLUTIONS

Lyophilization Product Line Overview



Virtis x FTS Systems

SP SCIENTIFIC

WEIGHING 0.1g - 200g 3.0077.00

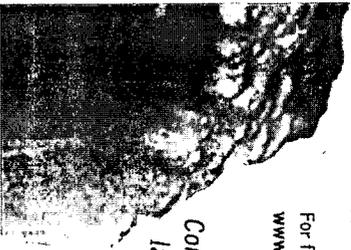
Introduction

SP Scientific, through their brands Vir-Tis and FT-S, offer the finest lyophilization range available. You will notice that in designing each model, we recognize that all freeze dryer users have their own unique needs and requirements. "One freeze dryer fits all" does not work well in today's competitive research, development and production environments, which is why we offer a wide selection of options including refrigeration packages, condenser capacity, shelf configuration, control software, endpoint detection, clean room configurations and many others. Our technical sales team is always ready to help you configure a system that will best meet your technical and budgetary needs.

Our relationship starts before the sale and lasts a lifetime. The LyoLearn Webinar and Technical Briefs on our website are designed to provide continuing education on topics of interest for the lyophilization scientist, engineer and user. When you choose a Vir-Tis or FT-S freeze dryer, you are entering a long-term relationship with our technical support team. We are here to answer your equipment and application questions as well as provide troubleshooting support.

For further information about any of the products shown here, please visit www.spscientific.com, or contact your nearest SP Scientific office.

Configure a system that is just right for your scientific laboratory and production needs.



Contents

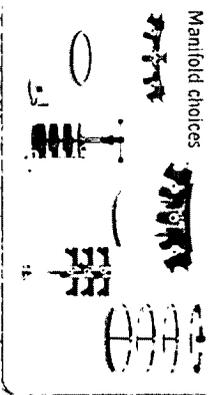
BenchTop K Manifold Freeze Dryers	3
Freezemoobile Manifold Freeze Dryers	4
Advantage Plus and Advantage Bench Top Tray Freeze Dryers	5
Genesis Pilot Lyophilizers	6
LyoStar	7
SMART™ /MTM Freeze-Dryer Technology	8
Ultra and VirTual Small Production Capacity Freeze Dryers	9
Benchmark Pilot to Production Lyophilizers	10
General Purpose Freeze Dryers	11
Control Systems At-a-Glance	12
Additional Services	13
LyoTech Center	14

BenchTop K Manifold Freeze Dryers

Performance and versatility in a compact unit

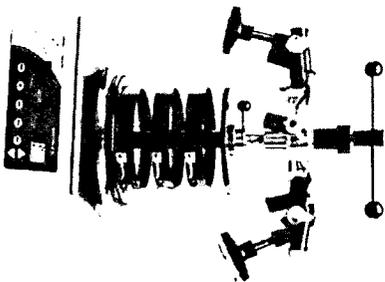
- Configure to meet your application/solvent needs
- Condenser capacity of 3, 8 and 9 liters
- Drum or tray manifolds with optional see-through acrylic or rugged stainless steel
- Easy view digital front panel for continuous parameter monitoring
- Condenser temperatures of -55°C, -75°C, -85°C and -105°C
- User selectable pressure control maximizes energy transfer into samples
- Power saving control features
- Optional stand alone shell bath decreases freeze drying time
- Superior trapping with -105°C condenser temperature option
- Optional heated shelves for tray drying
- Full range of glassware and other accessories
- Vacuum display in user selectable mT, uB or Pa
- Convenient quick turn around with hot gas defrost

Control: Sentry



Manifold choices

12 1/2" W 31.7cm
 19" D 48.3cm
 15 1/2" H 39.4cm
 (BASED ON B12K)



TYPICAL APPLICATIONS

- Laboratory research
- Protein purification
- Products for analysis – plant material, organic tissue, waste products

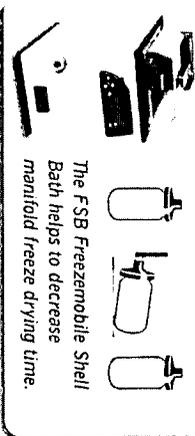


Freezemobile Large Capacity Manifold Freeze Dryers

Got a big freeze drying problem? The answer just rolled up

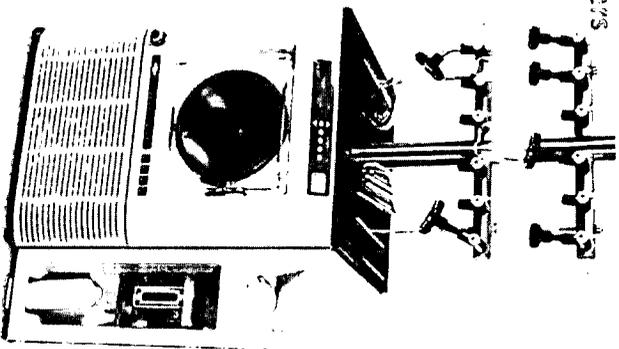
- Match condenser configuration to solvent types and loads
- Floor standing and fully mobile
- Available in 25L or 35L configuration
- Condenser temperatures to -85°C
- Wide choice of drum, tee, or tree manifolds – see-through acrylic or rugged stainless steel models
- Easy view digital front panel for continuous parameter monitoring
- User selectable pressure control maximizes energy transfer into samples
- Power saving control features
- Optional stand alone shell bath decreases freeze drying time
- Fast turn-around time defrosts from smooth wall condenser
- Full range of glassware and other accessories
- Easy access vacuum pump drain and fill for simplified and convenient maintenance
- Vacuum readout user selectable in mT, uB or Pa
- Shell bath available as stand-alone or system integrated

Control: Sentry



The FSB Freezemobile Shell Bath helps to decrease manifold freeze drying time.

35" W 89.0cm
29" D 74.0cm
37" H 94.0cm
(BASED ON FM25)



OPTIONAL ACCESSORIES

- Condenser assembly
- Vacuum pump/tee
- Bagged for cryolysis (not condenser)

also for manual freeze & storage

AdVantage Plus and AdVantage Bench Top Tray Freeze Dryers

Tray and manifold freeze drying in one exceptional package

- Capabilities similar to larger pilot R&D freeze dryers in a small bench top system
- Process flexibility provided by on-board control package
- Ability to anneal/thermally treat product to enhance freeze drying results
- Up to 12 programmable segments in the freezing stage
- Flexibility to customize cycles with up to 16 programmable freeze drying segments
- Easy access to frequently utilized programs with storage of up to 16 cycles
- Adjustable pressure control throughout cycle available in user selectable mT, uB and Pa
- Monitor freeze drying progress more effectively with four product thermocouples
- Condenser capacity of 6L; Condenser temperatures to -85°C
- Accommodates up to three stainless steel shelves
- Flooded shelf design with temperatures as low as -65°C; +/- 1°C shelf temperature uniformity
- Temperature control from -55°C to +60°C
- Available in bulk or stoppering
- Shelf capacity quick comparison: Up to 1197--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using all 3 shelves

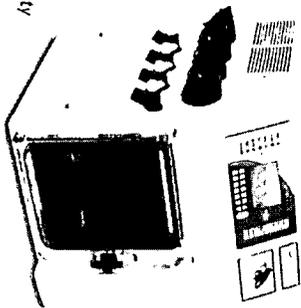
AdVantage Plus features

Control: Wizard

AdVantage features

- A great step up from a manifold freeze dryer when more product is being processed at one time, or when shelf temperature control is needed
- Teflon coated solid shelves
- Single shelf system
- Controller capability similar to the AdVantage Plus
- Condenser capacity of 3.5L with maximum low temperature of -85°C
- Shelf temperature as low as -70°C with control from -55°C to +60°C
- Shelf capacity quick comparison: Up to 399--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper)

Control: Wizard



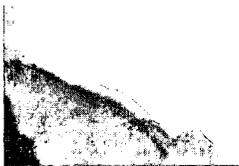
253/4" W 65.4cm
28" D 71.1cm
283/4" H 73.0cm

TYPICAL APPLICATIONS

- Laboratory/research and development freeze drying
- 96 well plates
- Serum bottles or vials
- Bulk products for analysis – plant material, organic tissue, waste products

AdVantage Plus (In addition to AdVantage)

- Small R&D freeze drying



Genesis Pilot Lyophilizers for Product Development and Small Batch Production

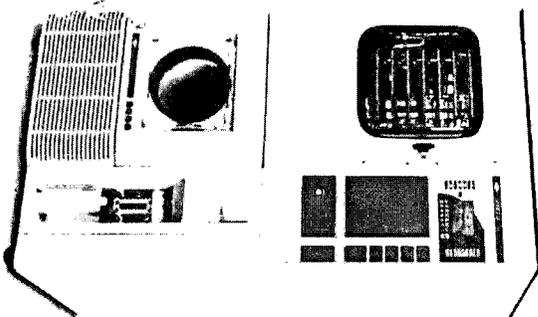
Expertly designed with your needs in mind

- Space saving, self-contained mobile tray freeze dryer
- Available as a stand-alone or clean room configuration
- One to six shelf (bulk) or 5 shelf (stoppering) capacity offering 1.5 ft²/1.4m² to 9.18 ft²/85m²
- Bulk or stoppering
- Large capacity pilot scale with condenser choice of 25L or 35L
- Choice of condenser temperatures
- Hollow flooded shelves provide uniform temperature on shelf surfaces
- Process a wide variety of products (Shelf temperatures as low as -70°C)
- Shelf temperature control range of -55°C to +65°C
- Fast turn-around time defrost from smooth wall condenser
- Optional manifold drying module
- Add options and accessories to get just the unit you require
- Available with 21CFR Part 11 electronic signature
- Shelf capacity quick comparison: Up to 3135 --2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 5 shelf stoppering unit
- Available with Pirani, capacitance manometer and/or barometric end point determination

Control: Wizard, Encore or Maestro

TYPICAL APPLICATIONS

- Laboratory research and development
- Small production freeze drying
- Diagnostic kits
- 96 well plates
- Serum bottles and vials
- Bulk products for analysis — plant material, organic tissue, waste products



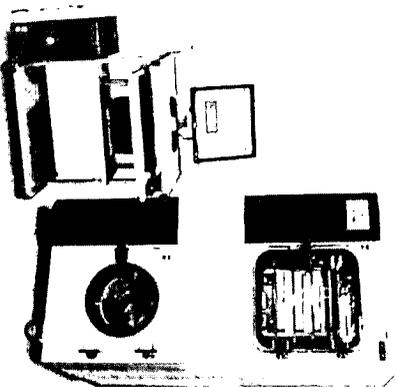
40" W 102cm
30" D 76cm
73 1/2" H 187cm
(STANDARD CONFIG.
FOR BULK 25L CONDENSER)

LyoStar for Cycle Development and Optimization

Matchless process accuracy and reliability for R&D professionals

- Space saving, self-contained freeze dryer
 - Available as a stand-alone or clean room configuration
 - Design facilitates scale-up with characteristics similar to larger systems
 - Available with one to five shelves (bulk) or four (stopping) (1.5 ft², 14m² to 7.6 ft², 71m²)
 - Bulk or stopping
 - Hollow flooded shelves provide uniform temperature on shelf surfaces
 - Process a wide variety of products (shelf temperature control range between -70°C and +60°C)
 - Large capacity pilot scale with 30L condenser capacity
 - Process non aqueous solvents with maximum low temperature of -85°C
 - Add options and accessories to build units specific to your needs
 - Shelf capacity quick comparison: Up to 2816 --2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 4 shelf stopping unit
- LyoStar with patented SMART™ MTM technology**
- Optimizes most product primary drying cycles in one run
 - Can significantly reduce freeze drying cycle development time
 - Allows researchers to concentrate on formulation development
 - Offers an important Process Analytical Technology (PAT) tool

- CONVENIENT OPERATION**
- Remote control operation via computer
 - Easy operation and service
 - Up to 1000 cycles of freeze-drying with 100% uptime
 - 100% humidity control with 100% uptime
 - 100% uptime
 - 100% uptime
 - 100% uptime



Now available with Praxair's ControlLyte™
Nucleation On-Demand Technology

33" W 84.0cm
43" D 109.0cm
78" H 190.0cm
(Computer cart not included)

SMART™ Freeze-Dryer Technology

Putting the experience of top lyophilization scientists at your fingertips

SMART™ freeze-dryer technology eliminates the trial-and-error approach normally associated with developing new lyophilization cycles. It enables experts and novices alike to develop new cycles quickly, while also ensuring that those cycles are elegant and efficient.

The SMART™ tools provide instant feedback on important product data – such as product resistance, heat flow, and product thickness – that was previously unavailable.

SMART™ determines and verifies your optimized primary drying cycle in three runs or less. This decrease in cycle development time allows researchers to spend more time on value added activities such as formulation optimization and helps return on investment for busy companies.

This patented technology has resulted from extensive partnering with freeze drying industry experts, having been developed exclusively with leading academics at The University of Connecticut and Purdue University. It has been recognized as one of the most important control breakthroughs in freeze drying control and processing in recent years.

SMART™ is available on the LyoStar freeze-dryer, including a retrofit option for existing LyoStar systems.



Case #1 Detail		Traditional Approach	SMART Approach	Savings
Number of Experimental Runs Performed	10	2	8	76
Estimated Development Time (Days)	95	9	10	\$33,648
Analytical (OSD) Costs	\$1,000	\$2,412	\$18,750	\$18,750
Labor Costs	\$36,080	\$75,000	\$57,398	..
Material Costs	\$93,750	\$78,412
Total Costs per Development Program	\$130,810	\$157,206	\$419,184	..
Development Programs per Year	8	8
Total Annual Cycle Development Costs	\$1,046,480	\$1,257,768	\$419,184	..

Case #2 Detail		Traditional Approach	SMART Approach	Savings
Number of Experimental Runs Performed	8	2	6	47
Estimated Development Time (Days)	63	16	10	\$0
Analytical (OSD) Costs	\$1,000	\$1,000	\$2,820	\$27,660
Labor Costs	\$30,480	\$2,820	\$25,000	\$0
Material Costs	\$25,000	\$28,820	\$28,820	\$27,660
Total Costs per Development Program	\$56,480	\$32,640	\$76,640	..
Development Programs per Year	8	8
Total Annual Cycle Development Costs	\$451,840	\$261,120	\$613,120	\$221,280

Ultra & Virtual Small Production Capacity Freeze Dryers

Scale up has never been so easy

- Space saving, self-contained freeze dryer
- Available as a stand-alone or clean room configuration
- Ideal for high mass/surface area product with smaller solvent load
- Bulk or stoppering
- Hollow flooded shelves provide uniform temperature on shelf surfaces
- Process a variety of products with shelf temperatures as low as -70°C
- Maximum control range of -55°C to +65°C
- Choice of condenser temperatures
- Vacuum readout user selectable in mT, uB and Pa
- Sophisticated process development controls
- Add options and accessories to build units specific to your needs

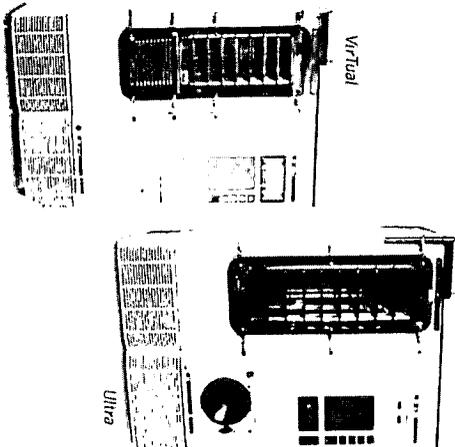
Ultra:

- Four to 15 shelf capacity offering 6.12 ft²/57m² to 22.96 ft²/2.13m²
- External condenser
- Capacity up to 9270 - 2 ml vials with partially inserted stoppers
- Condenser capacity of 25L, 35L, or 50L

Virtual

- Four to 10 shelf capacity offering 6.12 ft²/57m² to 15.30 ft²/1.42m²
- Internal condenser
- 50L condenser only
- Shelf capacity quick comparison: Up to 6270--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 10 shelf stoppering unit

Control: Wizard, Encore or Maestro



TYPICAL APPLICATIONS

- Laboratory, research and development and/or small production freeze drying
- Diagnostic kits
- 96 well plates
- Serum bottles and vials
- Bulk products for analysis, plant material, organic tissue, waste products
- Tissue banking

50" W 127.0cm
38 3/4" D 98.0cm
75 3/4" H 193.0cm
(25L & 35L
ULTRA & VIRTUAL)



Benchmark Lyophilizers for Pilot to Production Freeze Drying

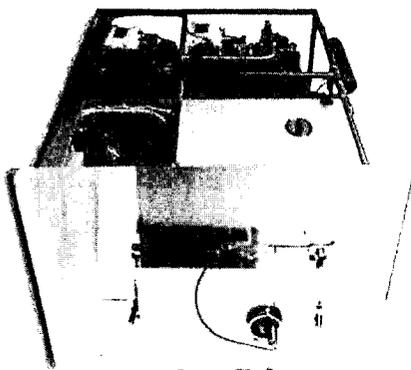
Custom built for today – with an eye to the future

- Meets the most demanding requirements from pilot to production
- Entirely configurable
- Shelf area up to 240 ft²/22.30m² stoppering and 416 ft²/38.65m² bulk
- Bulk or stoppering (top down or bottom up stoppering available)
- Hollow flooded shelves provide uniform temperature (+/- 1 °C) on shelf surfaces
- Bio-seal flange for clean room installation
- Optional Clean-in-Place and Steam-in-Place
- Critical systems redundancy available to safeguard valuable products
- Extensive validation and support if required
- Add options and accessories to build units specific to your needs

Control: Encore or Maestro

TYPICAL APPLICATIONS

- Pharmaceuticals/Biotech Parenterals
- Diagnostic Kits
- Tissues
- Nutraceuticals
- Medical devices



General Purpose Freeze Dryers

Perfect for whole specimen, artifact and plant drying

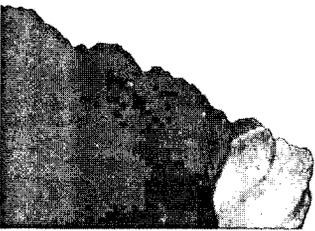
- Ideally suited for:
 - Plant matter including leaf disks, seeds, grain or cereals
 - Taxidermy
 - Water-damaged document restoration
 - Whole biological specimens
 - Irregular shaped objects
 - Flowers
- 25L or 35L condenser configuration with temperatures to -85°C
- Tray configuration with or without programmable heat
- Lyotroll control with manual & automatic programming capabilities
- Shelf areas from 1.2.3ft²/1.4m² to 3.70ft²/3.4.37m²

Control: Lyotroll

TYPICAL APPLICATIONS

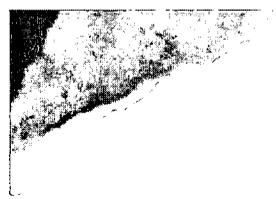
- Specimens for taxidermy
- Field equipment and accessories
- Restoration/drying of artifacts/documents

Did you know that SP Scientific has a Certified Pre-Owned Lyophilizer program?



Control Systems At-a-Glance

Capabilities:	Wizard 2.0	Wizard Workstation	Encore	Maestro
Up to 16 Primary and 1 Secondary Drying Segments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Thermal Treatment (Annealing) Segments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4-8 Product Probes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9-16 Product Probes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17+ Product Probes			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Integrated Performance and Vacuum Integrity Testing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Historical Data Trending		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Eutectic Point Monitoring with Data Trending			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Batch Reporting			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manual Pressure Rise (Barometric Endpoint) Testing	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automatic Pressure Rise (Barometric Endpoint) Testing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automated Pirani/CM Differential Feedback			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clean-In-Place (CIP) Cycle			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CIP Skid Integration			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Steam Sterilization (SIP) Cycle			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Multi-Level Security Capability			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Security Integration with Microsoft Windows XP			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
21 CFR Part 11 Compliance Capability with SQL Database	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RS-232 Communications			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ethernet Communications			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cycle Customization			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Additional Services

Additional value-add services from SP Scientific

The following products and services are available for Advantage 2.0, Advantage Plus, FreezeMobile, Genesis, Ultra, Vir-Tual, LyoStar and Benchmark freeze dryers.

Validation Support Services

- Factory Acceptance Testing (Includes document and testing)
- Control System Testing
- System Integration Testing

Freeze Dryer Validation Guide and Workbook (1Q/0Q)

Site Acceptance Testing

- Equipment Qualification (1Q/0Q)
- Control System Software Qualification (1Q/0Q)

Service, Equipment Management, Maintenance and Repair

Together we can do it better.

- On-site & Return-to-Service-Center capabilities
- Extensively trained staff
- Local service relationships with global presence
- Wide range of post-sales services that can be tailored to your specific needs



LyoTech Center

SP Scientific offers in-depth resources for lyophilization scientists

We are committed to helping our customers achieve the best possible results from their investment and so we offer the following resources online.

LyoLearn Webinar*: this free online monthly seminar series has topics of interest to lyophilization scientists and is presented by industry experts.

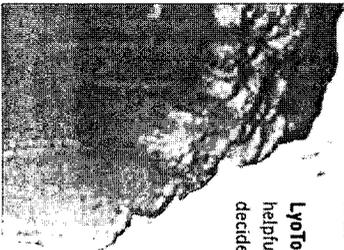
LyoLearn Webinar Archive*: each online LyoLearn Webinar is archived for future reference, as both the actual webinar, including PowerPoint and audio, or just the PowerPoint presentation.

LyoLearn Tech-Brief*: LyoLearn Tech Briefs are articles, case studies and technical notes provided by our associates or consultants to present fundamental freeze drying information.

LyoTools: LyoTools contains a variety of tools and programs that may be helpful in either day-to-day lyophilization research, or in helping customers to decide their lyophilization requirements.



* Available in multiple languages.



The LyoLearn Webinar series is a free online monthly seminar series that provides lyophilization scientists with the latest information on the latest lyophilization technology and processes. The series is presented by industry experts and covers a wide range of topics, including:
- Lyophilization process optimization
- Lyophilization equipment selection
- Lyophilization product development
- Lyophilization quality control
- Lyophilization safety
- Lyophilization regulatory requirements
- Lyophilization troubleshooting
- Lyophilization case studies
- Lyophilization research and development
- Lyophilization industry trends
- Lyophilization future outlook
The LyoLearn Webinar series is a valuable resource for lyophilization scientists and is presented by industry experts. For more information, please contact us at info@lyolearn.com.



The Role of Vacuum in Freeze Drying
The LyoLearn Webinar series is a free online monthly seminar series that provides lyophilization scientists with the latest information on the latest lyophilization technology and processes. The series is presented by industry experts and covers a wide range of topics, including:
- Lyophilization process optimization
- Lyophilization equipment selection
- Lyophilization product development
- Lyophilization quality control
- Lyophilization safety
- Lyophilization regulatory requirements
- Lyophilization troubleshooting
- Lyophilization case studies
- Lyophilization research and development
- Lyophilization industry trends
- Lyophilization future outlook
The LyoLearn Webinar series is a valuable resource for lyophilization scientists and is presented by industry experts. For more information, please contact us at info@lyolearn.com.

Lyo Consultants: a listing of consultants not commercially affiliated with SP Scientific.

Allied Technology: includes links to companies that offer products commonly utilized in freeze drying, but not offered by SP Scientific.

Courses and meetings: a listing of educational opportunities for lyophilization scientists offered by organizations other than our own.

Publications: links to publications and journals of interest to lyophilization scientists and users of lyophilization equipment.

Organizations: details of organizations and groups of interest to the lyophilization community.

Educational facilities: a listing of universities and colleges that provide educational opportunities in freeze drying.

Shows and conferences: a directory of trade shows and venues of relevance to lyophilization scientists.



Situaciones Encontradas en Escala de Crecimiento de un Producto Liofilizado – de Pequeñas Moléculas a Proteínas

Resumen:
Dr. Boris Wurst, IMSC
Professor Dr. Peter Schubert, Universität
Kiel, Alemania

Freeze-drying of eco-solvent systems: rationale, opportunities, and applications

Hans-Joachim
Department of Pharmaceutical Technology and
Biopharmaceutics, University of Cologne
A-Collabor: h.joachim@uni-koeln.de

Optimization of Freeze-Drying Cycles Using Modulated Differential Scanning Calorimetry (MDSC[®])

Steven R. Audsion, Ph.D.
Product Manager, Thermal Analysis
sraudsion@qimacstruments.com



VITIS X FTS Systems



Making Science For Everyone

SP Scientific

815 Route 208 Gardiner NY 12525 USA
3538 Main Street Stone Ridge NY 12484 USA

T: (845) 255-5000

F: (845) 255-5338

The Sovereign Centre Farthing Road
Ipswich Suffolk UK IP1 5AP

T: +44 (0)1473 240000

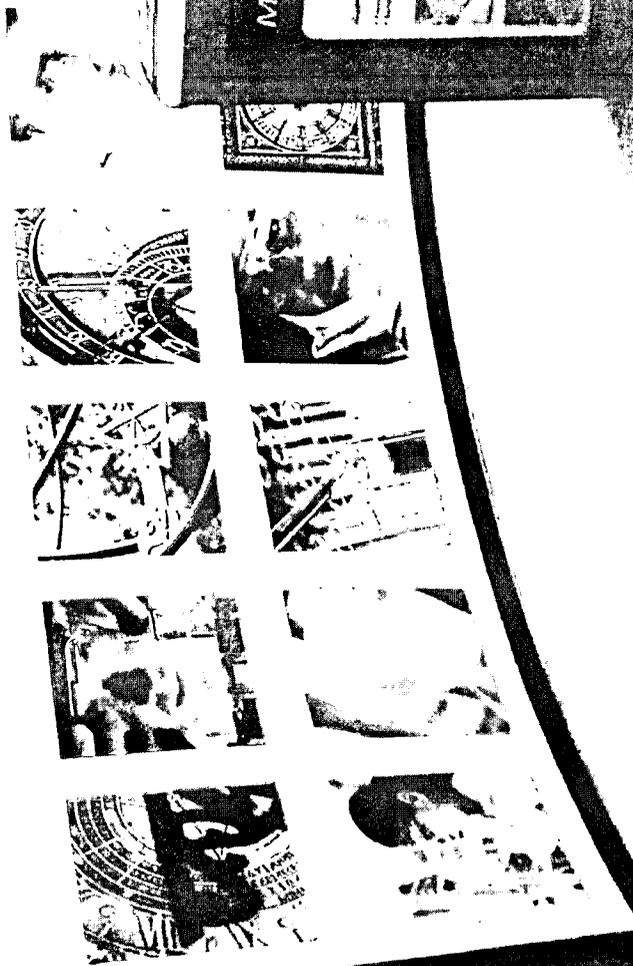
F: +44 (0)1473 461176

www.spscientific.com

Making Time for Science



Freeze dryers Thermal management
Sample concentrators Glassware washers



Making Time for Science



Lyophilization Product Line Overview



Virtis X FTS Systems



Advancing the World's Standards

Introduction

SP Scientific, through their brands VirTis and FTS, offer the finest lyophilization range available. You will notice that in designing each model, we recognize that all freeze dryer users have their own unique needs and requirements: "One freeze dryer fits all" does not work well in today's competitive research, development and production environments, which is why we offer a wide selection of options including refrigeration packages, condenser capacity, shelf configuration, control software, endpoint detection, clean room configurations and many others. Our technical sales team is always ready to help you configure a system that will best meet your technical and budgetary needs.

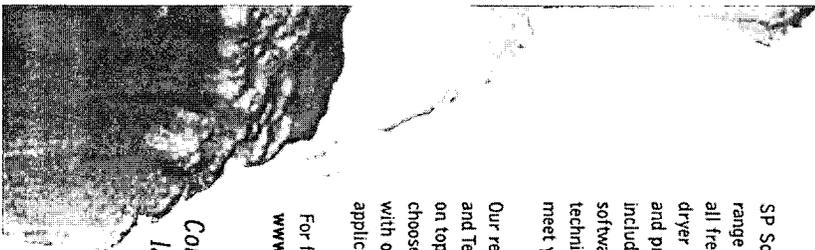
Our relationship starts before the sale and lasts a lifetime. The LyoLearn Webinar and Technical Briefs on our website are designed to provide continuing education on topics of interest for the lyophilization scientist, engineer and user. When you choose a VirTis or FTS freeze dryer, you are entering a long-term relationship with our technical support team. We are here to answer your equipment and application questions as well as provide troubleshooting support.

For further information about any of the products shown here, please visit www.spscientific.com, or contact your nearest SP Scientific office.

Configure a system that is just right for your scientific laboratory and production needs.

Contents

BenchTop K Manifold Freeze Dryers	3
Freezable Manifold Freeze Dryers	4
Advantage Plus and Advantage Bench Top Tray Freeze Dryers	5
Genesis Pilot Lyophilizers	6
LyoStar	7
SMART™/MTM Freeze-Dryer Technology	8
Ultra and VirTual Small Production Capacity Freeze Dryers	9
Benchmark Pilot to Production Lyophilizers	10
General Purpose Freeze Dryers	11
Control Systems At-a-Glance	12
Additional Services	13
LyoTech Center	14

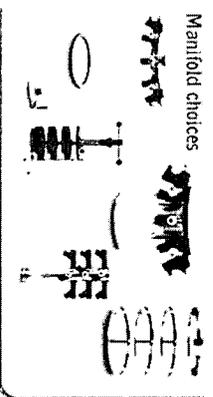


BenchTop K Manifold Freeze Dryers

Performance and versatility in a compact unit

- Configure to meet your application/solvent needs
- Condenser capacity of 3, 8 and 9 liters
- Drum or tray manifolds with optional see-through acrylic or rugged stainless steel
- Easy view digital front panel for continuous parameter monitoring
- Condenser temperatures of -55°C, -75°C, -85°C and -105°C
- User selectable pressure control maximizes energy transfer into samples
- Power saving control features
- Superior stand alone shell bath decreases freeze drying time
- Optional heated shelves for tray drying
- Full range of glassware and other accessories
- Vacuum display in user selectable mT, uB or Pa
- Convenient quick turn around with hot gas defrost

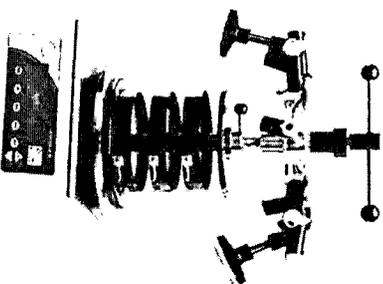
Control: Sentry



Manifold choices

12 1/2"	W	31.7cm
19"	D	48.3cm
15 1/2"	H	39.4cm

(BASED ON B12N)



TYPICAL APPLICATIONS

- Laboratory research
- Protein purification
- Products for analysis – plant material, organic tissue, waste products

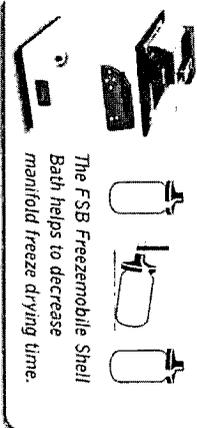


Freezmobile Large Capacity Manifold Freeze Dryers

Got a big freeze drying problem? The answer just rolled up

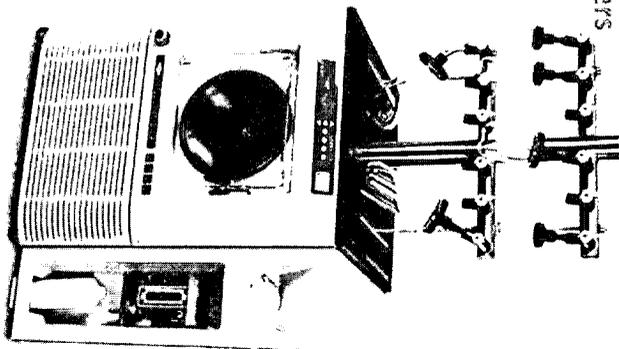
- Match condenser configuration to solvent types and loads
- Floor standing and fully mobile
- Available in 25L or 35L configuration
- Condenser temperatures to -85°C
- Wide choice of drum, tee, or tree manifolds — see-through acrylic or rugged stainless steel models
- Easy view digital front panel for continuous parameter monitoring
- User selectable pressure control maximizes energy transfer into samples
- Power saving control features
- Optional stand alone shell bath decreases freeze drying time
- Fast turn-around time defrosts from smooth wall condenser
- Full range of glassware and other accessories
- Easy access vacuum pump drain and fill for simplified and convenient maintenance
- Vacuum readout user selectable in mT, uB or Pa
- Shell bath available as stand-alone or system integrated

Control: Sentry



The FSB Freezmobile Shell Bath helps to decrease manifold freeze drying time.

35" W 89.0cm
29" D 74.0cm
37" H 94.0cm
(BASED ON FM25)



- OPTIONAL CONFIGURATIONS**
- Accelerator/venter
 - Ionization/venter
 - Front-to-back manifold
- or see the inside cover for details

Advantage Plus and Advantage Bench Top Tray Freeze Dryers

Tray and manifold freeze drying in one exceptional package

- Capabilities similar to larger pilot R&D freeze dryers in a small bench top system
- Process flexibility provided by on-board control package
- Ability to anneal/thermally treat product to enhance freeze drying results
- Up to 12 programmable segments in the freezing stage
- Flexibility to customize cycles with up to 16 programmable freeze drying segments
- Easy access to frequently utilized programs with storage of up to 16 cycles
- Adjustable pressure control throughout cycle available in user selectable mT, uB and Pa
- Monitor freeze drying progress more effectively with four product thermocouples
- Condenser capacity of 6L; Condenser temperatures to -85°C
- Accommodates up to three stainless steel shelves
- Flooded shelf design with temperatures as low as -65°C; +/- 1°C shelf temperature uniformity
- Temperature control from -55°C to +60°C
- Available in bulk or stoppering
- Shelf capacity quick comparison: Up to 1197--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using all 3 shelves

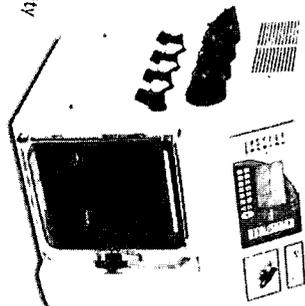
Advantage Plus features

Control: Wizard

Advantage features

- A great step up from a manifold freeze dryer when more product is being processed at one time, or when shelf temperature control is needed
- Teflon coated solid shelves
- Single shelf system
- Controller capability similar to the Advantage Plus
- Condenser capacity of 3.5L with maximum low temperature of -85°C
- Shelf temperature as low as -70°C with control from -55°C to +60°C
- Shelf capacity quick comparison: Up to 399--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper)

Control: Wizard



253/4" W 65.4cm
28" D 71.1cm
283/4" H 73.0cm

TYPICAL APPLICATIONS

- Laboratory research and development
- Freeze drying
- 96 well plates
- Serum bottles or vials
- Bulk products for analysis - plant material, organic tissue, waste products

Advantage Plus (In addition to Advantage)

- Small R&D freeze drying



Genesis Pilot Lyophilizers for Product Development and Small Batch Production

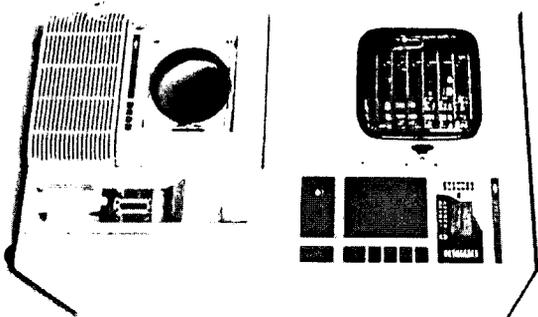
Expertly designed with your needs in mind

- Space saving, self-contained mobile tray freeze dryer
- Available as a stand-alone or clean room configuration
- One to six shelf (bulk) or 5 shelf (stoppering) capacity offering 1.5 ft²/1.4m² to 9.18 ft²/85m²
- Bulk or stoppering
- Large capacity pilot scale with condenser choice of 25L or 35L
- Choice of condenser temperatures
- Hollow flooded shelves provide uniform temperature on shelf surfaces
- Process a wide variety of products (Shelf temperatures as low as -70°C)
- Shelf temperature control range of -55°C to +6.5°C
- Fast turn-around time defrost from smooth wall condenser
- Optional manifold drying module
- Add options and accessories to get just the unit you require
- Available with 21CFR Part 11 electronic signature
- Shelf capacity quick comparison: Up to 3135 --2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 5 shelf stoppering unit
- Available with Pirani, capacitance manometer and/or barometric end point determination

Control: Wizard, Encore or Maestro

TYPICAL APPLICATIONS

- Laboratory research and development
- Small production freeze drying
- Diagnostic kits
- 96 well plates
- Serum bottles and vials
- Bulk products for analysis—plant material, organic tissue, waste products



40" W 102cm
30" D 76cm
73 1/2" H 187cm
(STANDARD CONFIG.
FOR BULK 25L CONSOLE)

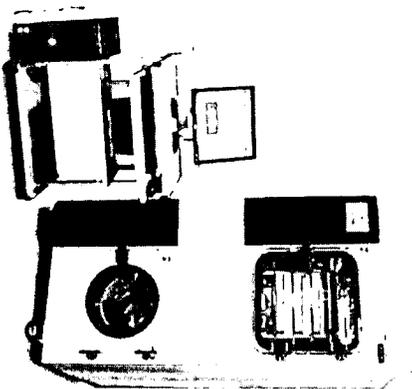
LyoStar for Biotech Development and Optimization

Matchless process accuracy and reliability for R&D professionals

- Space saving, self-contained freeze dryer
 - Available as a stand-alone or clean room configuration
 - Design facilitates scale-up with characteristics similar to larger systems
 - Available with one to five shelves (bulk) or four (stopping) (1.5 ft²/1.4m² to 7.6 ft²/7.1m²)
 - Bulk or stopping
 - Hollow flooded shelves provide uniform temperature on shelf surfaces
 - Process a wide variety of products (shelf temperature control range between -70°C and +60°C)
 - Large capacity pilot scale with 30L condenser capacity
 - Process non aqueous solvents with maximum low temperature of -85°C
 - Add options and accessories to build units specific to your needs
 - Shelf capacity quick comparison: Up to 2816 --2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 4 shelf stopping unit
- LyoStar with patented SMART™ MTM technology**
- Optimizes most product primary drying cycles in one run
 - Can significantly reduce freeze drying cycle development time
 - Allows researchers to concentrate on formulation development
 - Offers an important Process Analytical Technology (PAT) tool

STANDARD ACCESSORIES

- Refrigerated condenser and freeze tray
- Lyophilizer control and software
- Temperature monitoring system to integrate with existing facilities
- High resolution Research and Development higher shelf production freeze drying
- Biologics trays
- Control shelves
- Special trays for vials



Now available with Praxair's ControlLyo™
Nucleation On-Demand Technology

33" W 84.0cm
43" D 109.0cm
78" H 190.0cm
(Computer cart not included)

SMART™ Freeze-Dryer Technology

Putting the experience of top lyophilization scientists at your fingertips

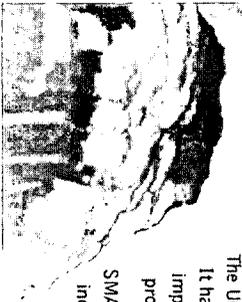
SMART™ freeze-dryer technology eliminates the trial-and-error approach normally associated with developing new lyophilization cycles. It enables experts and novices alike to develop new cycles quickly while also ensuring that those cycles are elegant and efficient.

The SMART™ tools provide instant feedback on important product data – such as product resistance, heat flow, and product thickness – that was previously unavailable.

SMART™ determines and verifies your optimized primary drying cycle in three runs or less. This decrease in cycle development time allows researchers to spend more time on value added activities such as formulation optimization and helps return on investment for busy companies.

This patented technology has resulted from extensive partnering with freeze drying industry experts, having been developed exclusively with leading academics at The University of Connecticut and Purdue University. It has been recognized as one of the most important control breakthroughs in freeze drying control and processing in recent years.

SMART™ is available on the LyoStar freeze-dryer, including a retrofit option for existing LyoStar systems.



Case #1 Detail		Traditional Approach	SMART Approach	Savings
Number of Experimental Runs Performed	10	10	2	8
Estimated Development Time (Days)	95	95	9	76
Analytical (DSC) Costs	\$1,000	\$1,000	\$1,000	\$0
Labor Costs	\$36,000	\$36,000	\$2,412	\$13,648
Material Costs	\$93,750	\$93,750	\$75,000	\$18,750
Total Costs per Development Program	\$130,810	\$130,810	\$78,412	\$52,398
Development Programs per Year	8	8	8	..
Total Annual Cycle Development Costs	\$1,046,480	\$1,046,480	\$627,296	\$419,184

Case #2 Detail		Traditional Approach	SMART Approach	Savings
Number of Experimental Runs Performed	8	8	2	6
Estimated Development Time (Days)	63	63	16	47
Analytical (DSC) Costs	\$1,000	\$1,000	\$1,000	\$0
Labor Costs	\$30,480	\$30,480	\$2,820	\$17,660
Material Costs	\$25,000	\$25,000	\$25,000	\$0
Total Costs per Development Program	\$56,480	\$56,480	\$28,820	\$17,660
Development Programs per Year	8	8	8	..
Total Annual Cycle Development Costs	\$451,840	\$451,840	\$230,560	\$221,280



Ultra & Virtual Small Production Capacity Freeze Dryers

Scale up has never been so easy

- Space saving, self-contained freeze dryer
- Available as a stand-alone or clean room configuration
- Ideal for high mass/surface area product with smaller solvent load
- Bulk or stoppering
- Hollow flooded shelves provide uniform temperature on shelf surfaces
- Process a variety of products with shelf temperatures as low as -70°C
- Maximum control range of -55°C to +65°C
- Choice of condenser temperatures
- Vacuum readout user selectable in mT, uB and Pa
- Sophisticated process development controls
- Add options and accessories to build units specific to your needs

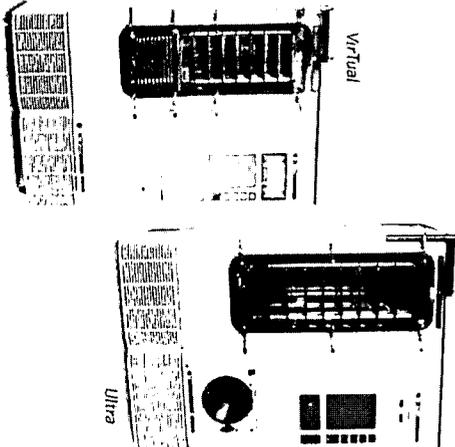
Ultra:

- Four to 15 shelf capacity offering 6.12 ft²/57m² to 22.96 ft²/2.13m²
- External condenser
- Capacity up to 9270 - 2 ml vials with partially inserted stoppers
- Condenser capacity of 25L, 35L, or 50L

Vir-Tual

- Four to 10 shelf capacity offering 6.12 ft²/57m² to 15.30 ft²/1.42m²
- Internal condenser
- 50L condenser only
- Shelf capacity quick comparison: Up to 6270--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 10 shelf stoppering unit

Control: Wizard, Encore or Maestro



TYPICAL APPLICATIONS

- Laboratory, research and development and/or small production freeze-drying
- Diagnostic kits
- 96 well plates
- Serum bottles and vials
- Bulk products for analysis - pharmaceutical, organic, tissue, waste products
- Tissue banking

50" W 127.0cm
38 3/4" D 98.0cm
75 3/4" H 193.0cm
(25L & 35L
ULTRA & VIRTUAL)



Benchmark Lyophilizers for Pilot to Production Freeze Drying

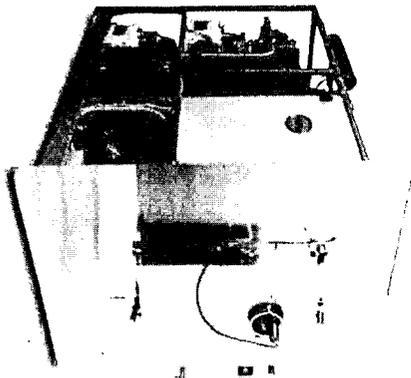
Custom built for today – with an eye to the future

- Meets the most demanding requirements from pilot to production
- Entirely configurable
- Shelf area up to 240 ft²/22.30m² stoppering and 416 ft²/38.65m² bulk
- Bulk or stoppering (top down or bottom up stoppering available)
- Hollow flooded shelves provide uniform temperature (+/- 1 °C) on shelf surfaces
- Bio-seal flange for clean room installation
- Optional Clean-in-Place and Steam-in-Place
- Critical systems redundancy available to safeguard valuable products
- Extensive validation and support if required
- Add options and accessories to build units specific to your needs

Control: Encore or Maestro

TYPICAL APPLICATIONS

- Pharmaceuticals/Biotech Parenterals
- Diagnostic Kits
- Tissues
- Nutraceuticals
- Medical devices



General Purpose Freeze Dryers

Perfect for whole specimen, artifact and plant drying

- Ideally suited for:
 - Plant matter including leaf disks, seeds, grain or cereals
 - Taxidermy
 - Water damaged document restoration
 - Whole biological specimens
 - Irregular shaped objects
 - Flowers
- 25L or 35L condenser configuration with temperatures to -85°C
- Tray configuration with or without programmable heat
- Lyotroll control with manual & automatic programming capabilities
- Shelf areas from 12.3ft²/1.14m² to 370ft²/34.37m²

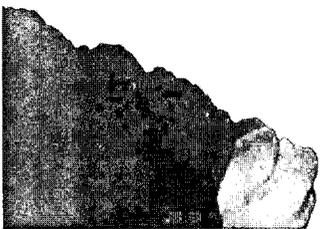
34" W 86.0cm
55" D 140.0cm
79" H 200.0cm
(BASED ON GFD
2-DBX48)

Control: Lyotroll

TYPICAL APPLICATIONS

- Specimens for taxidermy
- Floral/leaves: floral arrangements
- Restoration/drying of artifacts & documents

Did you know that SP Scientific has a Certified Pre-Owned Lyophilizer program?



Control Systems At-a-Glance

Capabilities:	Wizard 2.0	Wizard Workstation	Encore	Maestro
Up to 16 Primary and 1 Secondary Drying Segments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thermal Treatment (Annealing) Segments	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4-8 Product Probes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9-16 Product Probes			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17+ Product Probes				<input checked="" type="checkbox"/>
Integrated Performance and Vacuum Integrity Testing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Historical Data Trending		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Eutectic Point Monitoring with Data Trending			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Batch Reporting			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manual Pressure Rise (Barometric Endpoint) Testing	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automatic Pressure Rise (Barometric Endpoint) Testing			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automated Pirani/CM Differential Feedback			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clean-In-Place (CIP) Cycle			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CIP Skid Integration			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Steam Sterilization (STP) Cycle			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Multi-Level Security Capability			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Security Integration with Microsoft Windows XP			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
21 CFR Part 11 Compliance Capability with SQL Database	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RS-232 Communications			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ethernet Communications			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cycle Customization			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Additional Services

Additional value-add services from SP Scientific

The following products and services are available for Advantage 2.0, Advantage Plus, FreezeMobile, Genesis, Ultra, VirTual, LyoStar and Benchmark freeze dryers.

Validation Support Services

- Factory Acceptance Testing (Includes document and testing)
- Control System Testing
- System Integration Testing

Freeze Dryer Validation Guide and Workbook (1Q/0Q)

Site Acceptance Testing

- Equipment Qualification (1Q/0Q)
- Control System Software Qualification (1Q/0Q)

Service, Equipment Management, Maintenance and Repair

Together we can do it better.

- On-site & Return-to-Service-Center capabilities
- Extensively trained staff
- Local service relationships with global presence
- Wide range of post-sales services that can be tailored to your specific needs



LyoTech Center

SP Scientific offers in-depth resources for lyophilization scientists

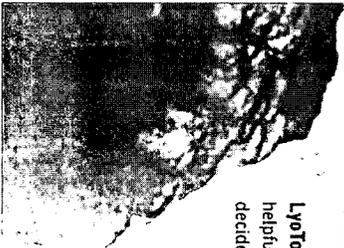
We are committed to helping our customers achieve the best possible results from their investment and so we offer the following resources online.

LyoLearn Webinar*: this free online monthly seminar series has topics of interest to lyophilization scientists and is presented by industry experts.

LyoLearn Webinar Archive*: each online LyoLearn Webinar is archived for future reference, as both the actual webinar, including PowerPoint and audio, or just the PowerPoint presentation.

LyoLearn Tech-Brief*: LyoLearn Tech Briefs are articles, case studies and technical notes provided by our associates or consultants to present fundamental freeze drying information.

LyoTools: LyoTools contains a variety of tools and programs that may be helpful in either day-to-day lyophilization research, or in helping customers to decide their lyophilization requirements.



* Available in multiple languages.



The Role of Vacuum in Freeze Drying

By Dr. Robert J. ...

...

Lyo Consultants: a listing of consultants not commercially affiliated with SP Scientific.

Allied Technology: includes links to companies that offer products commonly utilized in freeze drying, but not offered by SP Scientific.

Courses and meetings: a listing of educational opportunities for lyophilization scientists offered by organizations other than our own.

Publications: links to publications and journals of interest to lyophilization scientists and users of lyophilization equipment.

Organizations: details of organizations and groups of interest to the lyophilization community.

Educational facilities: a listing of universities and colleges that provide educational opportunities in freeze drying.

Shows and conferences: a directory of trade shows and venues of relevance to lyophilization scientists.



Situaciones Encontradas en Escala de Crecimiento de un Producto Liofilizado – de Pequeñas Moleculas a Proteinas

Expositor invitado:
Dr. Felix Lopez, M.D.Sc.
Director de Investigación Científica
Laboratorio de Estudios de

Freeze-drying of co-solvent systems: rationale, opportunities, and applications

Hans-Joachim
Department of Pharmaceutical Technology and
Biopharmaceutics, University of Cologne
Vollhard Institute, 50931 Cologne, Germany

**Optimization of Freeze-Drying Cycles Using
Modulated Differential Scanning
Calorimetry (MDSC[®])**

Steven R. Anderson, Ph.D.
Product Manager, Thermal Analysis
sranderson@tamresearch.com



Virtis x FTS Systems



SP SCIENTIFIC

www.spscientific.com

SP Scientific

815 Route 208 Gardiner NY 12525 USA
3538 Main Street Stone Ridge NY 12484 USA

T: (845) 255-5000

F: (845) 255-5338

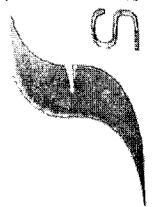
The Sovereign Centre Farthing Road
Ipswich Suffolk UK IP1 5AP

T: +44 (0)1473 240000

F: +44 (0)1473 461176

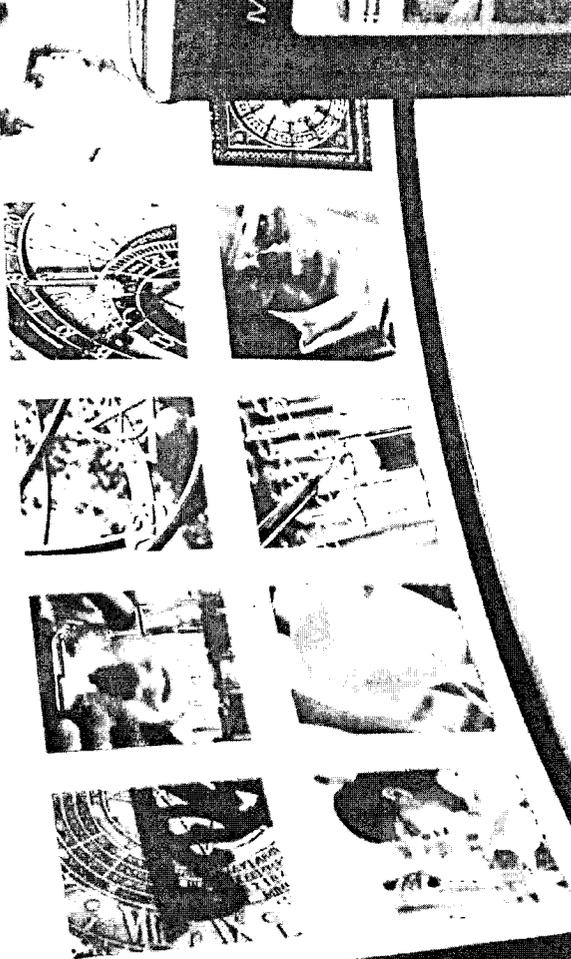
www.spscientific.com

Making Time for Science



SP SCIENTIFIC

Freeze dryers Thermal management
Sample concentrators Glassware washers



Making Time for Science

SP SCIENTIFIC
Making Time for Science
Freeze Dryers
Thermal Management
Sample Concentrators
Glassware Washers

Lyophilization Product Line Overview



Virtis X FTS Systems

SP SCIENTIFIC

ADVANCING THE ART OF SCIENCE

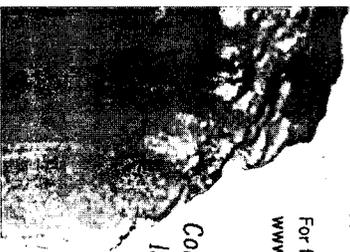
Introduction

SP Scientific, through their brands VirTis and FTS, offer the finest lyophilization range available. You will notice that in designing each model, we recognize that all freeze dryer users have their own unique needs and requirements: "One freeze dryer fits all" does not work well in today's competitive research, development and production environments, which is why we offer a wide selection of options including refrigeration packages, condenser capacity, shelf configuration, control software, endpoint detection, clean room configurations and many others. Our technical sales team is always ready to help you configure a system that will best meet your technical and budgetary needs.

Our relationship starts before the sale and lasts a lifetime. The LyoLearn Webinar and Technical Briefs on our website are designed to provide continuing education on topics of interest for the lyophilization scientist, engineer and user. When you choose a VirTis or FTS freeze dryer, you are entering a long-term relationship with our technical support team. We are here to answer your equipment and application questions as well as provide troubleshooting support.

For further information about any of the products shown here, please visit www.spscientific.com, or contact your nearest SP Scientific office.

Configure a system that is just right for your scientific laboratory and production needs.



Contents

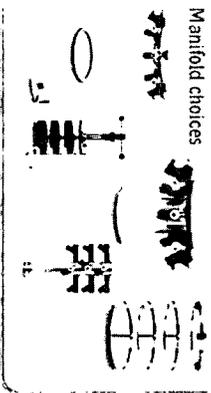
BenchTop K Manifold Freeze Dryers	3
FreezeMobile Manifold Freeze Dryers	4
Advantage Plus and Advantage Bench Top Tray Freeze Dryers	5
Genesis Pilot Lyophilizers	6
LyoStar	7
SMART™/MTM Freeze-Dryer Technology	8
Ultra and VirTual Small Production Capacity Freeze Dryers	9
Benchmark Pilot to Production Lyophilizers	10
General Purpose Freeze Dryers	11
Control Systems At-a-Glance	12
Additional Services	13
LyoTech Center	14

BenchTop K Manifold Freeze Dryers

Performance and versatility in a compact unit

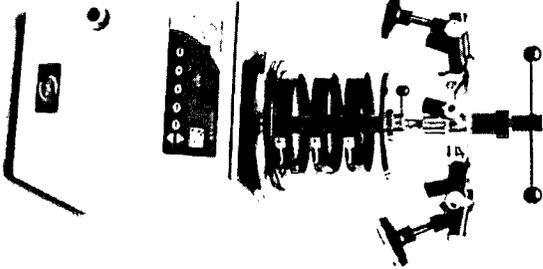
- Configure to meet your application/solvent needs
- Condenser capacity of 3, 8 and 9 liters
- Drum or tray manifolds with optional see-through acrylic or rugged stainless steel
- Easy view digital front panel for continuous parameter monitoring
- Condenser temperatures of -55°C, -75°C, -85°C and -105°C
- User selectable pressure control maximizes energy transfer into samples
- Power saving control features
- Optional stand alone shell bath decreases freeze drying time
- Superior trapping with -105°C condenser temperature option
- Optional heated shelves for tray drying
- Full range of glassware and other accessories
- Vacuum display in user selectable mT, uB or Pa
- Convenient quick turn around with hot gas defrost

Control: Sentry



Manifold choices

12 1/2" W 31.7cm
 19" D 48.3cm
 15 1/2" H 39.4cm
 (BASED ON B12X)



TYPICAL APPLICATIONS

- Laboratory research
- Protein purification
- Products for analysis - plant material, organic tissue, waste products

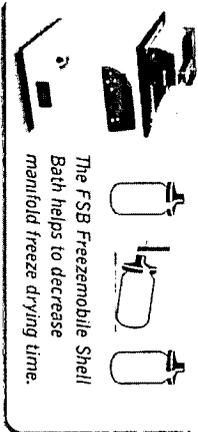


Freezemobile Large Capacity Manifold Freeze Dryers

Got a big freeze drying problem? The answer just rolled up

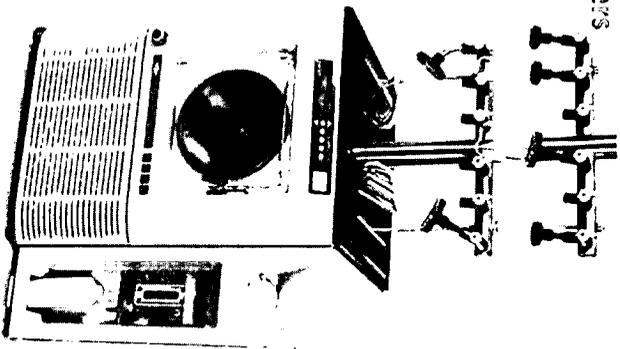
- Match condenser configuration to solvent types and loads
- Floor standing and fully mobile
- Available in 25L or 35L configuration
- Condenser temperatures to -85°C
- Wide choice of drum, tee, or tree manifolds – see-through acrylic or rugged stainless steel models
- Easy view digital front panel for continuous parameter monitoring
- User selectable pressure control maximizes energy transfer into samples
- Power saving control features
- Optional stand alone shell bath decreases freeze drying time
- Fast turn-around time defrosts from smooth wall condenser
- Full range of glassware and other accessories
- Easy access vacuum pump drain and fill for simplified and convenient maintenance
- Vacuum readout user selectable in mT, uB or Pa
- Shell bath available as stand-alone or system integrated

Control: Sentry



The FSB Freezemobile Shell Bath helps to decrease manifold freeze drying time.

35" W 89.0cm
29" D 74.0cm
37" H 94.0cm
(BASED ON FM25)



OPTIONAL ACCESSORIES

- Acetylene/Propane
- Argon/Nitrogen
- Radiometer

Typical system made to order

Advantage Plus and AdvantAge Bench Top Tray Freeze Dryers

Tray and manifold freeze drying in one exceptional package

- Capabilities similar to larger pilot R&D freeze dryers in a small bench top system
- Process flexibility provided by on-board control package
- Ability to anneal/thermally treat product to enhance freeze drying results
- Up to 12 programmable segments in the freezing stage
- Flexibility to customize cycles with up to 16 programmable freeze drying segments
- Easy access to frequently utilized programs with storage of up to 16 cycles
- Adjustable pressure control throughout cycle available in user selectable mT, uB and Pa
- Monitor freeze drying progress more effectively with four product thermocouples
- Condenser capacity of 6L; Condenser temperatures to -85°C
- Accommodates up to three stainless steel shelves
- Flooded shelf design with temperatures as low as -65°C; +/- 1°C shelf temperature uniformity
- Temperature control from -55°C to +60°C
- Available in bulk or stoppering
- Shelf capacity quick comparison: Up to 1197--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using all 3 shelves

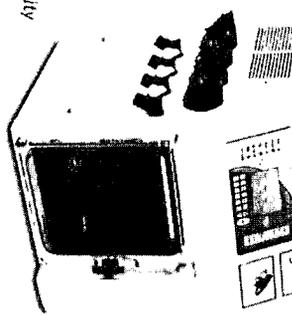
Advantage Plus features

Control: Wizard

Advantage features

Control: Wizard

- A great step up from a manifold freeze dryer when more product is being processed at one time, or when shelf temperature control is needed
- Teflon coated solid shelves
- Single shelf system
- Controller capability similar to the AdvantAge Plus
- Condenser capacity of 3.5L with maximum low temperature of -85°C
- Shelf temperature as low as -70°C with control from -55°C to +60°C
- Shelf capacity quick comparison: Up to 399--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper)



25 3/4" W 65.4cm
28" D 71.1cm
28 3/4" H 73.0cm

TYPICAL APPLICATIONS

- Laboratory, research and development
- freeze drying
- 96 well plates
- Serum bottles or vials
- Bulk products for analysis—plant material, organic tissue, waste products
- AdvantAge Plus (in addition to AdvantAge)
- Small R&D freeze drying



Genesis Pilot Lyophilizers for Product Development and Small Batch Production

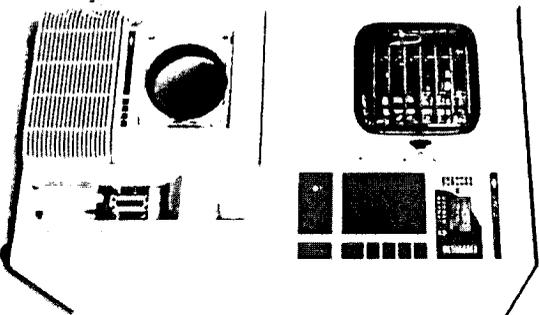
Expertly designed with your needs in mind

- Space saving, self-contained mobile tray freeze dryer
- Available as a stand-alone or clean room configuration
- One to six shelf (bulk) or 5 shelf (stopping) capacity offering 1.5 ft²/1.4m² to 9.18 ft²/85m²
- Bulk or stopping
- Large capacity pilot scale with condenser choice of 25L or 35L
- Choice of condenser temperatures
- Hollow flooded shelves provide uniform temperature on shelf surfaces
- Process a wide variety of products (Shelf temperatures as low as -70°C)
- Shelf temperature control range of -55°C to +65°C
- Fast turn-around time defrost from smooth wall condenser
- Optional manifold drying module
- Add options and accessories to get just the unit you require
- Available with 21CFR Part 11 electronic signature
- Shelf capacity quick comparison: Up to 3135 --2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 5 shelf stopping unit
- Available with Pirani, capacitance manometer and/or barometric end point determination

Control: Wizard, Encore or Maestro

TYPICAL APPLICATIONS

- Laboratory research and development
- Small production freeze drying
- Diagnostic kits
- 96 well plates
- Serum bottles and vials
- Bulk products for analysis — plant material, organic tissue, waste products



40" W 102cm
30" D 76cm
73 1/2" H 187cm
STANDARD CONFIG.
FOR BULK 25L CONSOLE

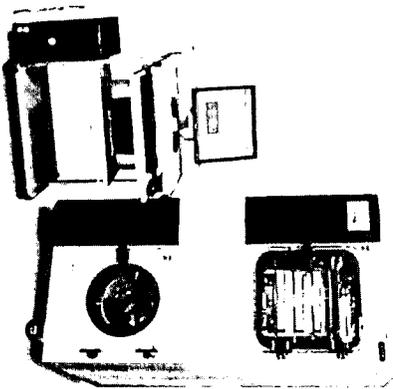
LyoStar for Lyo Development and Optimization

Matchless process accuracy and reliability for R&D professionals

- Space saving, self-contained freeze dryer
 - Available as a stand-alone or clean room configuration
 - Design facilitates scale-up with characteristics similar to larger systems
 - Available with one to five shelves (bulk) or four (stopping) (1.5 ft²/1.4m² to 7.6 ft²/7.1m²)
 - Bulk or stopping
 - Hollow flooded shelves provide uniform temperature on shelf surfaces
 - Process a wide variety of products (shelf temperature control range between -70°C and +60°C)
 - Large capacity pilot scale with 30L condenser capacity
 - Process non aqueous solvents with maximum low temperature of -85°C
 - Add options and accessories to build units specific to your needs
 - Shelf capacity quick comparison: Up to 2816 --2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 4 shelf stopping unit
- LyoStar with patented SMART™ MTM technology**
- Optimizes most product primary drying cycles in one run
 - Can significantly reduce freeze drying cycle development time
 - Allows researchers to concentrate on formulation development
 - Offers an important Process Analytical Technology (PAT) tool

TECHNICAL SPECIFICATIONS

- Capacity: 600g freeze-drying and 4000g storage
- Size: 640mm (H) x 600mm (W) x 600mm (D)
- Weight: 100kg (220lb)
- Power: 1500W (30A, 208V, 3-Phase)
- Refrigerant: R-404A
- Compressor: 2x 1000W
- Control: Touch screen



Now available with Praxair's ControlLyo™
Nucleation On-Demand Technology

33" H 84.0cm
43" H 109.0cm
78" H 190.0cm
(Computer cart not included)

SMART™ Freeze-Dryer Technology

Putting the experience of top lyophilization scientists at your fingertips

SMART™ freeze-dryer technology eliminates the trial-and-error approach normally associated with developing new lyophilization cycles. It enables experts and novices alike to develop new cycles quickly, while also ensuring that those cycles are elegant and efficient.

The SMART™ tools provide instant feedback on important product data – such as product resistance, heat flow, and product thickness – that was previously unavailable.

SMART™ determines and verifies your optimized primary drying cycle in three runs or less. This decrease in cycle development time allows researchers to spend more time on value added activities such as formulation optimization and helps return on investment for busy companies.

This patented technology has resulted from extensive partnering with freeze drying industry experts, having been developed exclusively with leading academics at The University of Connecticut and Purdue University. It has been recognized as one of the most important control breakthroughs in freeze drying control and processing in recent years.

SMART™ is available on the LyoStar freeze-dryer, including a retrofit option for existing LyoStar systems.



Case #1 Detail		Traditional Approach	SMART Approach	Savings
Number of Experimental Runs performed	10	95	2	8
Estimated Development Time (Days)	1,000	\$1,000	\$1,000	76
Analytical (DSC) Costs	\$36,060	\$36,060	\$2,412	\$33,648
Labor Costs	\$93,750	\$93,750	\$75,000	\$18,750
Material Costs	\$130,810	\$130,810	\$78,412	\$52,398
Total Costs per Development Program				
Development Programs per Year	8	\$1,046,480	\$677,296	\$419,184
Total Annual Cycle Development Costs				

Case #2 Detail		Traditional Approach	SMART Approach	Savings
Number of Experimental Runs performed	8	63	2	6
Estimated Development Time (Days)	1,000	\$1,000	\$1,000	47
Analytical (DSC) Costs	\$39,480	\$39,480	\$2,870	\$37,610
Labor Costs	\$25,000	\$25,000	\$25,000	\$0
Material Costs	\$55,480	\$55,480	\$28,870	\$27,610
Total Costs per Development Program				
Development Programs per Year	8	\$451,840	\$230,560	\$221,280
Total Annual Cycle Development Costs				



Ultra & Virtual Small Production Capacity Freeze Dryers

Scale up has never been so easy

- Space saving, self-contained freeze dryer
- Available as a stand-alone or clean room configuration
- Ideal for high mass/surface area product with smaller solvent load
- Bulk or stoppering
- Hollow flooded shelves provide uniform temperature on shelf surfaces
- Process a variety of products with shelf temperatures as low as -70°C
- Maximum control range of -55°C to +65°C
- Choice of condenser temperatures
- Vacuum readout user selectable in mT, uB and Pa
- Sophisticated process development controls
- Add options and accessories to build units specific to your needs

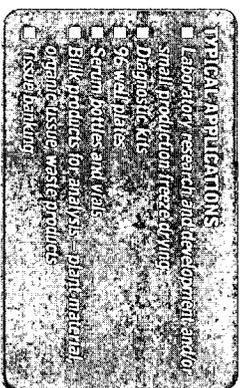
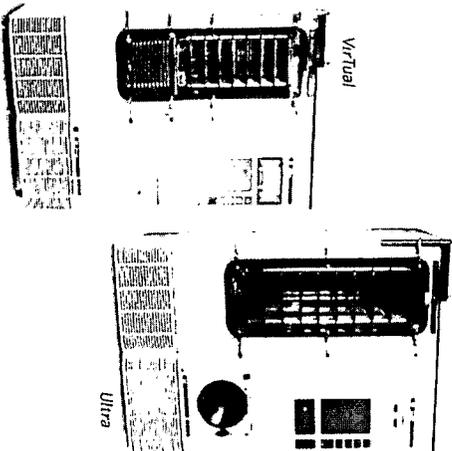
Ultra:

- Four to 15 shelf capacity offering 6.12 ft²/5.7m² to 22.96 ft²/2.13m²
- External condenser
- Capacity up to 9270 - 2 ml vials with partially inserted stoppers
- Condenser capacity of 25L, 35L, or 50L

Virtual

- Four to 10 shelf capacity offering 6.12 ft²/5.7m² to 15.30 ft²/1.42m²
- Internal condenser
- 50L condenser only
- Shelf capacity quick comparison: Up to 6270--2ml vials (14.75mm OD x 40 mm high with partially inserted stopper) using a 10 shelf stoppering unit

Control: Wizard, Encore or Maestro



50" W 127.0cm
38 3/4" D 98.0cm
75 3/4" H 193.0cm
(25L & 35L
Ultra & Virtual)



Benchmark Lyophilizers for Pilot to Production Freeze Drying

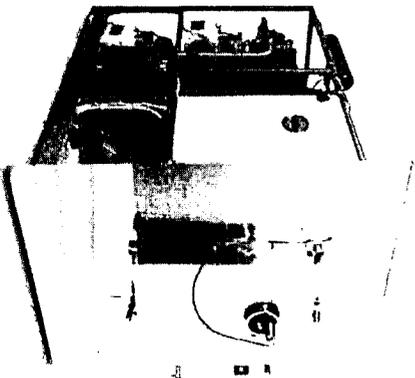
Custom built for today – with an eye to the future

- Meets the most demanding requirements from pilot to production
- Entirely configurable
- Shelf area up to 240 ft²/22.30m² stoppering and 416 ft²/38.65m² bulk
- Bulk or stoppering (top down or bottom up stoppering available)
- Hollow flooded shelves provide uniform temperature (+/- 1 °C) on shelf surfaces
- Bio-seal flange for clean room installation
- Optional Clean-in-Place and Steam-in-Place
- Critical systems redundancy available to safeguard valuable products
- Extensive validation and support if required
- Add options and accessories to build units specific to your needs

Control: Encore or Maestro

TYPICAL APPLICATIONS

- Pharmaceuticals/Biotech Parenterals
- Diagnostic Kits
- Tissues
- Nutraceuticals
- Medical devices



General Purpose Freeze Dryers

Perfect for whole specimen, artifact and plant drying

- Ideally suited for:
 - Plant matter including leaf disks, seeds, grain or cereals
 - Taxidermy
 - Water damaged document restoration
 - Whole biological specimens
 - Irregular shaped objects
 - Flowers
- 25L or 35L condenser configuration with temperatures to -85°C
- Tray configuration with or without programmable heat
- Lyotroll control with manual & automatic programming capabilities
- Shelf areas from 12.3ft²/1.4m² to 370ft²/34.37m²

34" W 86.0cm
55" D 140.0cm
79" H 200.0cm
(BASED ON GFD
24DX48)

Control: Lyotroll

TYPICAL APPLICATIONS

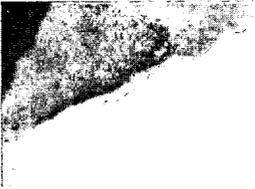
- Specimens for taxidermy
- Fluid biologicals and arrangements
- Restoration/drying of artifacts & documents

Did you know that SP Scientific has a Certified Pre-Owned Lyophilizer program?



- Control Systems At-a-Glance

Capabilities:	Wizard 2.0	Wizard Workstation	Encore	Maestro
Up to 16 Primary and 1 Secondary Drying Segments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thermal Treatment (Annealing) Segments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4-8 Product Probes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9-16 Product Probes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17+ Product Probes			<input type="checkbox"/>	<input type="checkbox"/>
Integrated Performance and Vacuum Integrity Testing			<input type="checkbox"/>	<input type="checkbox"/>
Historical Data Trending		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Erectic Point Monitoring with Data Trending			<input type="checkbox"/>	<input type="checkbox"/>
Batch Reporting	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Manual Pressure Rise (Barometric Endpoint) Testing	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Automatic Pressure Rise (Barometric Endpoint) Testing			<input type="checkbox"/>	<input type="checkbox"/>
Automated Pirani/CM Differential Feedback			<input type="checkbox"/>	<input type="checkbox"/>
Clean-in-Place (CIP) Cycle			<input type="checkbox"/>	<input type="checkbox"/>
CIP Skid Integration			<input type="checkbox"/>	<input type="checkbox"/>
Steam Sterilization (SIP) Cycle			<input type="checkbox"/>	<input type="checkbox"/>
Multi-Level Security Capability			<input type="checkbox"/>	<input type="checkbox"/>
Security Integration with Microsoft Windows XP			<input type="checkbox"/>	<input type="checkbox"/>
21 CFR Part 11 Compliance Capability with SQL Database	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
R-S-232 Communications			<input type="checkbox"/>	<input type="checkbox"/>
Ethernet Communications			<input type="checkbox"/>	<input type="checkbox"/>
Cycle Customization			<input type="checkbox"/>	<input type="checkbox"/>



Additional Services

Additional value-add services from SP Scientific

The following products and services are available for Advantage 2.0, Advantage Plus, FreezeMobile, Genesis, Ultra, Vir-Tual, LyoStar and Benchmark freeze dryers.

Validation Support Services

- Factory Acceptance Testing (Includes document and testing)
- Control System Testing
- System Integration Testing

Freeze Dryer Validation Guide and Workbook (10/00)

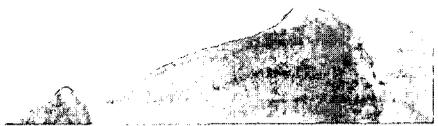
Site Acceptance Testing

- Equipment Qualification (10/00)
- Control System Software Qualification (10/00)

Service, Equipment Management, Maintenance and Repair

Together we can do it better:

- On-site 2, Return-to-Service-Center capabilities
- Extensively trained staff
- Local service relationships with global presence
- Wide range of post-sales services that can be tailored to your specific needs



LyoTech Center

SP Scientific offers in-depth resources for lyophilization scientists

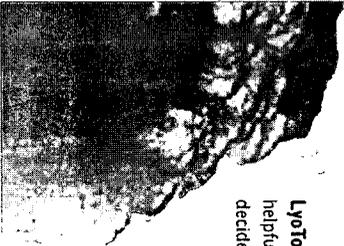
We are committed to helping our customers achieve the best possible results from their investment and so we offer the following resources online.

LyoLearn Webinar*: this free online monthly seminar series has topics of interest to lyophilization scientists and is presented by industry experts.

LyoLearn Webinar Archive*: each online LyoLearn Webinar is archived for future reference, as both the actual webinar, including PowerPoint and audio, or just the PowerPoint presentation.

LyoLearn Tech-Brief*: LyoLearn Tech Briefs are articles, case studies and technical notes provided by our associates or consultants to present fundamental freeze drying information.

LyoTools: LyoTools contains a variety of tools and programs that may be helpful in either day-to-day lyophilization research, or in helping customers to decide their lyophilization requirements.



* Available in multiple languages.



SP Scientific
Smart Freeze Drying Technology
Customer Research to Lead Us

SP Scientific is a leading provider of lyophilization solutions, offering a wide range of products and services to meet the needs of our customers. Our commitment to quality and customer service is reflected in our products and services, which are designed to help our customers achieve the best possible results from their investment.

Our products and services are designed to help our customers achieve the best possible results from their investment. We offer a wide range of products and services, including lyophilization systems, components, and services. Our products and services are designed to help our customers achieve the best possible results from their investment.



The Role of Viscosity in Freeze Drying

Viscosity is a critical factor in the freeze-drying process, affecting the rate of ice formation and the final product quality. Understanding the role of viscosity is essential for optimizing the freeze-drying process and ensuring the best possible results.

Viscosity is a critical factor in the freeze-drying process, affecting the rate of ice formation and the final product quality. Understanding the role of viscosity is essential for optimizing the freeze-drying process and ensuring the best possible results.

The role of viscosity in freeze-drying is a complex topic that involves understanding the relationship between viscosity and the rate of ice formation. This relationship is influenced by a variety of factors, including the concentration of the product, the temperature of the product, and the rate of cooling.

Understanding the role of viscosity is essential for optimizing the freeze-drying process and ensuring the best possible results. This involves understanding the relationship between viscosity and the rate of ice formation, and how this relationship is influenced by a variety of factors.

- **Lyo Consultants:** a listing of consultants not commercially affiliated with SP Scientific.

Allied Technology: includes links to companies that offer products commonly utilized in freeze drying, but not offered by SP Scientific.

Courses and meetings: a listing of educational opportunities for lyophilization scientists offered by organizations other than our own.

Publications: links to publications and journals of interest to lyophilization scientists and users of lyophilization equipment.

Organizations: details of organizations and groups of interest to the lyophilization community.

Educational facilities: a listing of universities and colleges that provide educational opportunities in freeze drying.

Shows and conferences: a directory of trade shows and venues of relevance to lyophilization scientists.



**Situaciones Encontradas en Escala
de Crecimiento de un Producto
Liofilizado – de Pequeñas
Moléculas a Proteínas**

Requerimientos:
Dr. Alicia Ward, M.D.C.
Sistemas de Análisis de Datos
Experiencia en Liofilización

**Freeze-drying of co-solvent systems:
rational, opportunities, and
applications**

Hans de Vries
Department of Pharmaceutical Technology and
Biopharmaceutics, University of Groningen
A contact: h.h.de.vries@azg.umg.nl

**Optimization of Freeze-Drying Cycles Using
Modulated Differential Scanning
Calorimetry (MDSC[®])**

Sven R. Aulander, Ph.D.
Product Manager, Thermal Analysis
saulander@tamstruments.com



VIRTIS x FTS Systems



Making sense for everyone

SP Scientific

815 Route 208 Gardiner NY 12525 USA
3538 Main Street Stone Ridge NY 12484 USA

T: (845) 255-5000
F: (845) 255-5338

The Sovereign Centre Farthing Road
Ipswich Suffolk UK IP1 5AP

T: +44 (0)1473 240000
F: +44 (0)1473 461176

www.spscientific.com