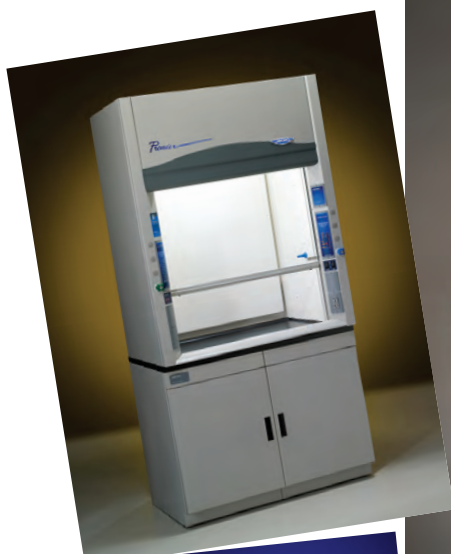# SELECTION GUIDE FOR FUME HOODS AND VENTILATION SYSTEMS FOR SCIENCE EDUCATION

Protecting your laboratory environment

LABCONCO®

The Purpose of a Fume Hood:

To capture, contain and remove fumes and contaminants generated by scientific experiments.

VENTILATION REFERENCES AND STANDARDS

Hood Location:

According to the current ANSI Z9.5 recommendations, fume hoods shall not be placed in a location that will adversely affect their performance. Placement with respect to open windows, doorways, personal traffic flow areas and supply air diffusers can influence containment. A good rule of thumb is at least 10 feet from a door or window and at least 5 feet from a supply air diffuser.

ASHRAE 110-1995

American Society of Heating, Refrigerating and Air-Conditioning Engineers

- Three part test: Smoke generation, face velocity profile, tracer gas release @ 4 liters/minute.
- Rated As Manufactured (AM), As Installed (AI) and As Used (AU).

Industrial Ventilation-ACGIH

American Conference of Governmental Industrial Hygienists

- Stack discharge height 1.3-2.0 times the building height

NFPA 45

National Fire Protection Association

- Materials of construction should have flame spread of 25 or less
- Fume hood exhaust air should not be recirculated

ASTM E84-01

American Society for Testing and Materials

- Test method to determine flame spread
  - Mineral fiber cement board flame spread 0
  - Red oak flooring flame spread 100

ANSI Z9.5-2003

- All hoods shall be equipped with a flow indicator, flow alarm or face velocity monitor
- Ductless hoods should only be used with non-hazardous material

OSHA 29 CFR Part 1910

Occupational Health and Safety

- 2.5 linear feet of hood space per person

DEMONSTRATION HOODS

Advanced

Protector® ClassMate® Hood

Requires Ductwork and Blower

Protector ClassMate Laboratory Hood 6970401 shown with SpillStopper Work Surface 6986401 and Protector Acid Storage Cabinet 9901000

- For general chemistry applications in an instructional setting
- Clear tempered safety glass back and sides and taller front viewing window provide enhanced visibility
- Ducts to the outside

All Protector ClassMate models listed will be equipped with 4 service fixtures (gas, air, vacuum and water) and 2 electrical duplex receptacles.

Size (w x d x h)
____ 48" x 32.25" x 59" Labconco #6970401
____ 60" x 32.25" x 59" Labconco #6970501
____ 72" x 32.25" x 59" Labconco #6970601

ACCESSORIES:
SpillStopper™ Work Surface (6" x 3" cupsink cutout left rear)
____ 4' Labconco #6986401
____ 5' Labconco #6986501
____ 6' Labconco #6986601

6" x 3" Cup Sink
____ Labconco #4005200

Airflow Monitor, 115VAC
____ Guardian Jr. (Analog), Labconco #9743204
____ Guardian 335 Digital, Labconco #9743203

Blower
____ Fiberglass
____ Coated Steel

See Blower Selection Guide on page 8. Consult Labconco for help with blower sizing. Ductwork length and configuration are needed to size the blower correctly.

For base cabinet or stand selection, see page 6.

Additional models are available. Contact Labconco for details and ordering information.

DEMONSTRATION HOODS

Intermediate

Protector® XVS Ventilation Station

Requires Ductwork and Blower or FilterMate Portable Exhauster

Protector XVS Ventilation Station 4863010 shown with Work Surface 3908401 and Base Stand 3746711

- For light general chemistry in educational applications
- Clear tempered safety glass sides and top, steel back
- Ducts to the outside. Can recirculate into the room with FilterMate™ Portable Exhauster

Size (w x d x h)
____ 24" x 22.81" x 22.75" Labconco #4862010
____ 36" x 22.81" x 22.75" Labconco #4863010
____ 48" x 22.81" x 22.75" Labconco #4864010

ACCESSORIES:
Solid Epoxy Dished Work Surface
____ 2' Labconco #3908400
____ 3' Labconco #3908401
____ 4' Labconco #3908402

Airflow Monitor, 115VAC
____ Guardian 500 (Analog), Labconco #3944700
____ Guardian 1000 (Digital), Labconco #3908800

Fluorescent Light Kit 115VAC
____ Labconco #3909200

Blower or Filtered Exhauster
____ Remote Coated Steel Blower, Labconco #4863500
____ FilterMate Portable Exhauster, Labconco #3970001

Organic Filter for FilterMate Portable Exhauster
____ Labconco #3923400
See *www.labconco.com/services/request-chemical-assessment* to complete a Chemical Assessment form for your application. Other filter types are also available.

Duct Transition Adapters
____ Upper to 6" diameter duct, Labconco #3912401
____ Lower to 6" diameter duct, Labconco #3912403

For stand or base cabinet selection, see page 6.

Additional models are available. Contact Labconco for details and ordering information.

DEMONSTRATION HOODS

Simple

Protector® Demonstration Hood

Requires Ductwork and Blower or FilterMate Portable Exhauster

Protector Demonstration Hood System 3945000

- For very light chemistry, chemical reactions, classroom observation
- Tempered safety glass sides, top and back
- Ducts to the outside. Can recirculate into room with FilterMate™ Portable Exhauster

Size (w x h x d)
____ 36" x 22.75" x 29.1" Labconco #3944300
____ 36" x 32" x 29.1" Labconco #3944301
____ Protector Demonstration Hood System (22.75"h) Labconco #3945000
____ Protector Demonstration Hood System (32"h) Labconco #3945001
Protector Demonstration Hood System includes Enclosure, Epoxy Work Surface, Cart and FilterMate Portable Exhauster.

ACCESSORIES:
Solid Epoxy Dished Work Surface
____ 3' Labconco #3908401

Airflow Monitor, 115VAC
____ Guardian 500 (Analog), Labconco #3944700
____ Guardian 1000 (Digital), Labconco #3908800

Fluorescent Light Kit 115VAC
____ Labconco #3909200

Blower or Filtered Exhauster
____ Remote Coated Steel Blower, Labconco #4863500
____ FilterMate Portable Exhauster, Labconco #3970001

Organic Filter for FilterMate Portable Exhauster
____ Labconco #3923400
See *www.labconco.com/services/request-chemical-assessment* to complete a Chemical Assessment form for your application. Other filter types are also available.

Duct Transition Adapters
____ Upper to 6" diameter duct, Labconco #3912401
____ Lower to 6" diameter duct, Labconco #3912403

For stand or base cabinet selection, see page 6.

Advanced

Protector® Premier® Hood

Requires Ductwork and Blower

4' Protector Premier Laboratory Hood 100400002 is shown with SpillStopper Work Surface 9500410 and Protector Standard Storage Cabinet 9900000.

- For general chemistry applications
- One-piece molded fiberglass liner is corrosion resistant, durable, fire resistant and light reflective

All Protector Premier models listed will be equipped with 2 service fixtures and 1 electrical duplex receptacle

Size (w x d x h)
____ 48.0" x 31.7" x 59.0" Labconco #100400002
____ 60.0" x 31.7" x 59.0" Labconco #100500002
____ 72.0" x 31.7" x 59.0" Labconco #100600002
____ 96.0" x 31.7" x 59.0" Labconco #100800002

ACCESSORIES:
SpillStopper™ Work Surface (6" x 3" sink cut out left rear)
____ 4' Labconco #9500410
____ 5' Labconco #9500510
____ 6' Labconco #9500610
____ 8' Labconco #9500810

6" x 3" Cup Sink
____ Labconco #4005200

Cold Water Gooseneck
____ Labconco #9827900

Airflow Monitor, 115VAC
____ Guardian, Labconco #9413300
____ Guardian Digital, Labconco #9413400

Blower
____ Fiberglass
____ Coated Steel

See Blower Selection Guide on page 8. Consult Labconco for help with blower sizing. Ductwork length and configuration are needed to size the blower correctly.

For base cabinet or stand selection, see page 6.

Additional models are available. Contact Labconco for details and ordering information.

Intermediate

Fiberglass 30 Hood

Requires Ductwork

Fiberglass 30 Laboratory Hood 3030000 shown with Work Surface 4882806 and Protector Standard Storage Cabinet 9900200

- For light to moderate chemistry applications
- One-piece molded fiberglass liner is corrosion resistant, durable, fire resistant and light reflective

The Fiberglass 30 Hood model listed is equipped with a built-in exhaust blower. Electrical receptacles and service fixtures are sold as accessories.

Size (w x d x h)
____ 30" x 30.2" x 48" Labconco #3030000

ACCESSORIES:
Solid Epoxy Flat Work Surface (no sink cut out)
____ 30" Labconco #4882806

Electrical Duplex Kit, 115VAC, 20amp
____ Labconco #2834800

Service Fixture Kit, Gas
____ Labconco #2832605

Airflow Monitor, 115VAC
____ Guardian 500 (Analog), Labconco #9743213
____ Guardian (Digital), Labconco #9743201

See Blower Selection Guide on page 8. Consult Labconco for help with blower sizing. Ductwork length and configuration are needed to size the blower correctly.

For base cabinet or stand selection, see page 6.

Additional models are available. Contact Labconco for details and ordering information.

EXPERIMENTAL HOODS

Simple

Basic 47 and 70 Hoods

Requires Ductwork

Basic 47 Laboratory Hood 2247300 shown with Work Surface 4882803 and Protector Standard Storage Cabinet 9900000

- For non-corrosive chemistry applications
- Epoxy-coated steel interior and exterior
- Basic Hoods are less deep and high than Premier and ClassMate models. Designed to fit existing counter tops and cramped areas.

All Basic Hood models listed are equipped with a built-in exhaust blower. Blower can be relocated to the roof. Electrical receptacles and service fixtures are sold as accessories.

Size (w x d x h)
____ 47" x 25" x 53" Labconco #2247300
____ 70" x 25" x 53" Labconco #2246300

ACCESSORIES:
Solid Epoxy Flat Work Surface (no sink cut out)
____ 4' Labconco #4882803
____ 6' Labconco #4882804

6" x 3" Cup Sink & Turret Kit (mounts on right side wall of hood)
____ Labconco #4852500

Electrical Duplex Kit, 115VAC, 20amp
____ Labconco #4844400

Service Fixture Kit, Gas
____ Labconco #2832605

Airflow Monitor, 115VAC
____ Guardian Jr. (Analog), Labconco #9743208
____ Guardian (Digital), Labconco #9743207

For base cabinet or stand selection, see page 6.

Additional models are available. Contact Labconco for details and ordering information.

DUAL ACCESS HOODS

Protector® Pass-Through Hood

Requires Ductwork and Blower

Protector Pass-Through Laboratory Hood 9942502 shown with Work Surface 9972500 and Protector Standard Storage Cabinets 9900200

- Vertical rising sashes front and back permit dual access
- Audible alarm prevents simultaneous opening of both sashes
- Chemical resistant composite panel liner
- Available with right side viewing window for classrooms or without viewing window for through-wall installations

All models include one electrical duplex receptacle.

Size (w x d x h)
With right side viewing window:
____ 48" x 33.2" x 59" Labconco #9942402
____ 60" x 33.2" x 59" Labconco #9942502
____ 72" x 33.2" x 59" Labconco #9942602
Without viewing window:
____ 48" x 33.2" x 59" Labconco #9942403
____ 60" x 33.2" x 59" Labconco #9942503
____ 72" x 33.2" x 59" Labconco #9942603

ACCESSORIES:
SpillStopper™ Work Surface (no sink cut out)
____ 4' Labconco #9972400
____ 5' Labconco #9972500
____ 6' Labconco #9972600

Airflow Monitor, 115VAC
____ Guardian 500 (Analog), Labconco #9743213
____ Guardian 1000 (Digital), Labconco #9743211

Blower
____ Fiberglass
____ Coated Steel

See Blower Selection Guide on page 8. Consult Labconco for help with blower sizing. Ductwork length and configuration are needed to size the blower correctly.

For base cabinet or stand selection, see page 6.

Ductless Hoods

Paramount® Ductless Enclosure

Paramount Ductless Enclosure 6963302 shown with Work Surface 3909901 and Telescoping Base Stand with casters 3746711

- Requires no ducting and can be moved from lab to lab
- For light to moderate chemistry applications
- Clear tempered safety glass sides, back and baffle
- Uses carbon filters to trap or treat chemical fumes
- Uses HEPA filters to trap particulates
- Equipped with a built-in blower

Size (w x d x h)
____ 36" x 29" x 53" Labconco #6963302
____ 48" x 29" x 53" Labconco #6963402

ACCESSORIES:
Paramount Filters
____ Ammonia-Amine Filter Labconco #6938202
____ Acid-Sulfur Filter Labconco #6938201
____ Organic Vapor Filter Labconco #6938200
____ Formaldehyde Filter Labconco #6938203
____ Mixed Bed Filter (four chemicals listed above) Labconco#6938204
____ HEPA Filter Labconco #6938100
See ***www.labconco.com/services/request-chemical-assessment*** to complete a Chemical Assessment form for your application.

Solid Epoxy Dished Work Surface
____ 3' Labconco #3909901
____ 4' Labconco #3909902

Hydraulic Lift Base Stands
Adjust from 25.5" to 33.5" for easy access to filters and mobility through 80" doorways. Stands include leveling feet which can be replaced with 5" diameter toe-locking casters.
____ 3' Electric Labconco #3780300
____ 3' Manual Labconco #3780400
____ 4' Electric Labconco #3780301
____ 4' Manual Labconco #3780401
____ Casters for field replacement of leveling feet Labconco #3784000

For additional stand or base cabinet selection, see column to right. Additional models are available. Contact Labconco for details and ordering information.

Base Cabinets

Standard Storage Cabinet 9900000

Standard Storage Cabinet
____ 24" single right hinge Labconco #9900300
____ 24" single left hinge Labconco #9900600
____ 30" dual doors Labconco #9900200
____ 36" dual doors Labconco #9900100
____ 48" dual doors Labconco #9900000

Acid Storage Cabinet
____ 24" single right hinge Labconco #9901300
____ 24" single left hinge Labconco #9901500
____ 30" dual doors Labconco #9901200
____ 36" dual doors Labconco #9901100
____ 48" dual doors Labconco #9901000
____ Vent Kit for Acid Storage Cabinet Labconco #3591100

Solvent Storage Cabinet
____ 24" single right hinge Labconco #9902300
____ 24" single left hinge Labconco #9902400
____ 30" dual doors Labconco #9902200
____ 36" dual doors Labconco #9902100
____ 48" dual doors Labconco #9902000
____ Vent Kit for Solvent Storage Cabinet Labconco #9910000
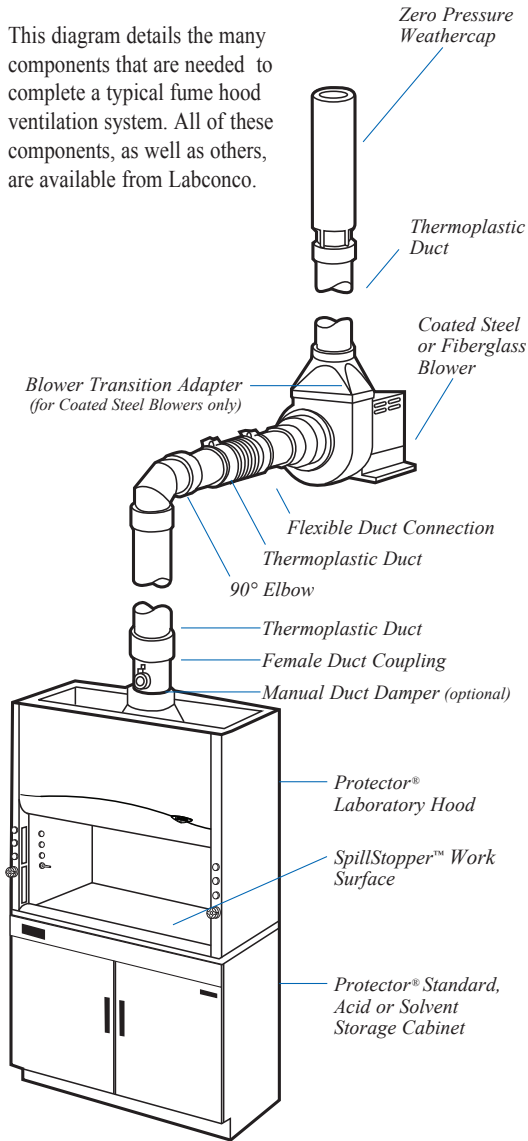
Base Stands

Telescoping Base Stand 3746702

Telescoping Base Stands
Adjust to seven height positions from 27.5" to 33.5" in 1" increments

____ 2' Labconco #3767000 (Use with Protector XVS)
____ 2' with casters Labconco #3767010 (Use with Protector XVS)
____ 3' Labconco #3746701 (Use with Paramount Ductless Enclosure, Protector XVS, Demonstration Hood and Fiberglass 30)
____ 3' with casters Labconco #3746711 (Use with Paramount Ductless Enclosure, Protector XVS and Demonstration Hood)
____ 4' Labconco #3746702 (Use with Paramount Ductless Enclosure, Protector XVS, Protector Hoods and Basic 47)
____ 4' with casters Labconco #3746712 (Use with Paramount Ductless Enclosure and Protector XVS)
____ 5' Labconco #3746703 (Use with Protector Hoods)
____ 6' Labconco #3746704 (Use with Protector Hoods and Basic 70)

TYPICAL VENTILATION SYSTEM

This diagram details the many components that are needed to complete a typical fume hood ventilation system. All of these components, as well as others, are available from Labconco.

Zero Pressure Weathercap

Thermoplastic Duct

Coated Steel or Fiberglass Blower

Blower Transition Adapter (for Coated Steel Blowers only)

Flexible Duct Connection

Thermoplastic Duct

90° Elbow

Thermoplastic Duct

Female Duct Coupling

Manual Duct Damper (optional)

Protector® Laboratory Hood

SpillStopper™ Work Surface

Protector® Standard, Acid or Solvent Storage Cabinet

DUCTWORK AND ACCESSORIES

Thermoplastic Duct, 10 feet lengths
____ 6" Labconco #4708600
____ 8" Labconco #4718900
____ 10" Labconco #7027200
____ 12" Labconco #5602000

Duct Couplings, Female
____ 6" Labconco #4708900
____ 8" Labconco #4719200
____ 10" Labconco #7027500
____ 12" Labconco #5602300

Duct Couplings, Male
____ 6" Labconco #2144700
____ 8" Labconco #4719900
____ 10" Labconco #7027800
____ 12" Labconco #7067300

Elbows, 90 degree
____ 6" Labconco #4708700
____ 8" Labconco #4719000
____ 10" Labconco #7027300
____ 12" Labconco #5602100

Elbows, 45 degree
____ 6" Labconco #4708800
____ 8" Labconco #4719100
____ 10" Labconco #7027400
____ 12" Labconco #5602200

Duct Reducers
____ 6" x 8" Labconco #5605900
____ 8" x 10" Labconco #5606000
____ 10" x 12" Labconco #5606100

Zero Pressure Weather Caps
____ 6" Labconco #4722200
____ 8" Labconco #4722300
____ 10" Labconco #7095100
____ 12" Labconco #5622100

Blower Transitions, for Blowers 7068000–7068700
____ 8" Labconco #4722400
____ 10" Labconco #4722401

Flexible Duct Connections
____ for 6" Duct, Labconco #4861800
____ for 8" Duct, Labconco #4726500
____ for 10" Duct, Labconco #7034200
____ for 12" Duct, Labconco #5621400

Manual Duct Dampers
____ 6" Labconco #4724200
____ 8" Labconco #4741300
____ 10" Labconco #5983400
____ 12" Labconco #5981200

BLOWERS

Labconco Blowers have been specifically designed to meet the demanding day-to-day ventilation requirements for a wide range of hood choices. Coated Steel Blowers are recommended for low to moderately corrosive applications. They are offered in a broad spectrum of capacities from 300 to 2150 CFM at static pressures to 1.50" H$_2$0.
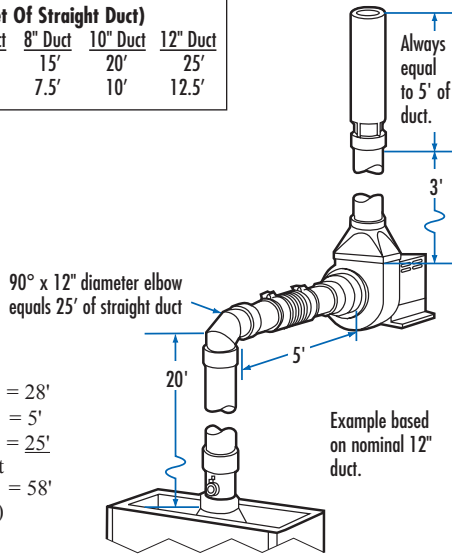
Labconco Fiberglass Blowers are ideal for fume hood exhaust systems in moderate to highly corrosive conditions. They are offered in a broad range of capacities from 250 to 3500 CFM at static pressures to 4.0".

Coated Steel Blowers and Fiberglass Blowers feature forward curved impellers to ensure quiet operation and optimum air delivery. They are belt-driven with adjustable sheave and self-adjusting gravity belt tightener. The variable exhaust orientation adjusts to eight outlet positions for installation flexibility (vertical discharge is recommended).

How To Calculate Equivalent Length of Hood Duct

The equivalent length duct method is used to properly size blowers. To determine the correct blower, first determine the total equivalent length of duct in the installation.

Elbow Equivalent Resistance Chart (In Feet Of Straight Duct)

	6" Duct	8" Duct	10" Duct	12" Duct
90° Elbow	12'	15'	20'	25'
45° Elbow	6'	7.5'	10'	12.5'

Always equal to 5' of duct.

3'

90° x 12" diameter elbow equals 25' of straight duct

20'

5'

Example based on nominal 12" duct.

Calculation:
Straight Length,
20' + 5' + 3' = 28'
Weathercap = 5'
90º Elbow = 25'
Total Equivalent Feet = 58'
(in straight duct)

Protecting your laboratory environment

LABCONCO®

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ISO 9001:2008 CERTIFIED

Blower Type/Equivalent Duct Run

Hood	Sash Open	Face Velocity (fpm)	Airflow (CFM)	Duct Run Dia.(in)	Steel 25'	Fiberglass 25'	Steel 50'	Fiberglass 50'	Steel 75'	Fiberglass 75'	Steel 100'	Fiberglass 100'
4' Protector Premier Hood	100%	100	725	12	7068800	7181000	7068800	7181000	7068800	7181000	7068800	7181000
4' Protector Premier Hood	60%	100	435	12	7068000	7180000	7068000	7180000	7068000	7180000	7068000	7180000
5' Protector Premier Hood	100%	100	955	12	7069000	7181200	7069000	7181200	7069200	7181200	7069200	7181200
5' Protector Premier Hood	60%	100	575	12	7068800	7180800	7068800	7180800	7068800	7180800	7068800	7180800
6' Protector Premier Hood	100%	100	1180	12	7069000	7181400	7069000	7181400	7069200	7181400	7069200	7181400
6' Protector Premier Hood	60%	100	710	12	7068800	7181000	7068800	7181000	7068800	7181000	7068800	7181000
4' Protector ClassMate Hood	60%	100	570	8	7068200	7180200	7068200	7180200	7068200	7180400	7068400	7180400
5' Protector ClassMate Hood	60%	100	730	8	7068400	7180400	7068400	7180600	7068600	7180600	7068600	7180600
6' Protector ClassMate Hood	60%	100	890	10	7068600	7180600	7068600	7180600	7068600	7180600	7068600	7180600
4' Protector Pass-Through Hood	100%	100	830	10	7068400	7180400	7068400	7180400	7068600	7180600	7068600	7180600
4' Protector Pass-Through Hood	60%	100	530	8	7068000	7180200	7068200	7180200	7068200	7180400	7068400	7180400
5' Protector Pass-Through Hood	100%	100	1100	12	7069000	7181400	7069200	7181400	7069200	7181400	7069200	7181600
5' Protector Pass-Through Hood	60%	100	700	8	7068200	7180400	7068400	7180400	7068400	7180600	7068600	7180600
6' Protector Pass-Through Hood	100%	100	1350	12	7069200	7181400	7069400	7181400	7069400	7181600	7069400	7181600
6' Protector Pass-Through Hood	60%	100	866	10	7068600	7180600	7068600	7180600	7068600	7180600	7068600	7180600
2' Protector XVS Ventilation Station	100%	80	95	6	4863500	—	4863500	—	4863500	—	4863500	—
3' Protector XVS Ventilation Station	100%	80	145	6	4863500	—	4863500	—	4863500	—	4863500	—
4' Protector XVS Ventilation Station	100%	80	200	6	4863500	—	4863500	—	4863500	—	4863500	—
Protector Demonstration Hood, 22.75" tall	100%	80	145	6	4863500	—	4863500	—	4863500	—	4863500	—
Protector Demonstration Hood, 32" tall	100%	80	185	6	4863500	—	4863500	—	4863500	—	4863500	—