

BioChemGARD®

ENERGY EFFICIENT ENGINEERED

Class II, Type B2 Biosafety Cabinet
(Meets UL 1805 Classification, Fume Hoods)



The quietest, most energy-efficient, total exhaust biological safety cabinet with the industry's simplest and safest filter exchange system.

THE BAKER COMPANY



Meets NSF Standards



Underwriter Laboratories Listed



UniPressure™ Preflow Plenum

Introducing The Baker Company BioChemGARD e3 Biological Safety Cabinet



**BioChemGARD e3
BCG401**



**BioChemGARD e3
BCG601**

Make the World a Better Place

- Industry's most durable and reliable cabinet means lower life-cycle costs and years of trouble-free operation
- Most energy-efficient operation available. A **70%** reduction in electrical power compared to traditional B2 cabinets
- Increased motor blower reserve (**at least 420%**) extends filter life for less downtime
- Continuously safe work environment with self-adjusting motor technology enhances productivity
- Easy exhaust filter exchange system minimizes exposure to contaminants and allows faster, simpler maintenance
- Quieter operation and ergonomic design with slanted viewscreen, cool-white lights for easier viewing and reduced heat generation
- Optional fume hood package for versatile laboratory design

BioChemGARD

 ENERGY EFFICIENT ENGINEERED

The BioChemGARD e3 from the Baker Company offers superior performance, versatility, energy savings, and simpler maintenance



Based on six decades of research and innovation, the BioChemGARD e3 is the most advanced biological safety cabinet engineered specifically for laboratories that need containment and removal of vapors, mists, and particulates.

With the optimum balance of performance and energy efficiency, the BioChemGARD e3 protects personnel, product, and the environment, all while increasing lab productivity and user comfort. Each cabinet is precisely engineered to deliver a lower life cycle cost, the latest ergonomic design, and a revolutionary airflow management system.

Exclusive Filter Exchange System Decreases Downtime and Increases Safety

Our new Sealed Access Exhaust Filter Exchange System* permits filter bagging and exchanges within the work surface, providing improved access, a simpler process, and an overall reduction in maintenance time while still minimizing exposure to contaminants by running the exhaust during the filter change.

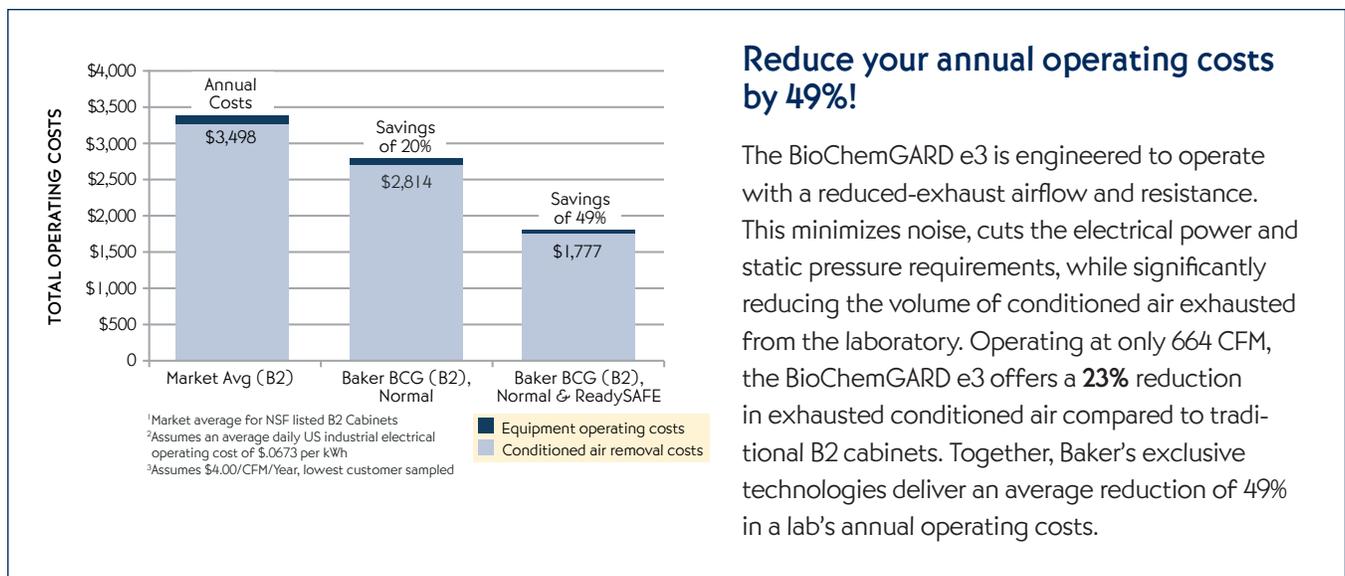
*patent-pending

Innovative Fume Hood Option Offers Greater Versatility in the Lab

With our optional Fume Hood Package, the BioChemGARD e3 meets the UL requirements for Electrical/Mechanical Safety (UL 61010-1) and the UL requirements for Material Flammability and Effectiveness of Airflow Characteristics (UL 1805). The cabinet has been tested in accordance with ANSI/ASHRAE 110-1995. Usage should be determined by a professional industrial hygienist or safety officer.

Precision engineering and our exclusive technologies work in concert to achieve an optimum balance of energy efficiency with high performance.

The BioChemGARD e3 is the only total exhaust biosafety cabinet that offers your lab this level of high performance, user convenience and comfort, with such significant operational savings. Our exclusive technologies—StediFlow, ReadySAFE, UniPressure Preflow Plenum, and innovative motor/blower system—work seamlessly together to deliver unparalleled safety performance, less cabinet downtime for cleaning and maintenance, and increased productivity, all while reducing your equipment operating and conditioned air removal costs.

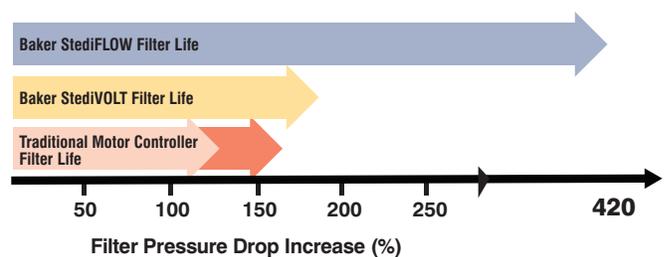


StediFLOW™ VFD Motor Controller Automatically Achieves Optimum Performance

Baker's new StediFLOW VFD (variable frequency drive) motor controller uses less energy, reduces heat output, and operates more quietly. VFD is state-of-the-art technology in HVAC systems for performance and energy savings. The BioChemGARD e3 cabinet can automatically handle an increase in pressure drop of more than 420% across the filter without reducing total air delivery more than 10%. There is no need for manual speed control.

- Maintains precise airflow and motor draws only 0.6 Amps—a **90%** reduction in the draw of traditional B2 cabinets.
- Automatically compensates for normal power line variations, air disruptions, and filter loading.
- Constant air volume reduces risk of performance degradation, which can compromise personnel and product protection.
- Controls the ReadySAFE operating mode.

StediFLOW extends filter life





ReadySAFE mode – Unique bypass armrest allows cabinet to continue operation with closed viewscreen

ReadySAFE™ mode – A Versatile Low Flow Mode to Make Your Job Easier

This versatile mode can be used during meetings, work breaks, and overnights to maintain safe conditions, create a quieter work environment, and significantly reduce energy usage, compared to leaving the cabinet in operating mode 24 hours per day.

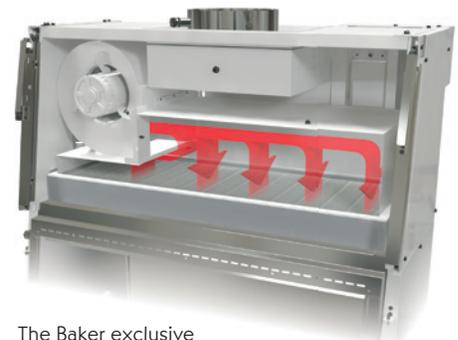
- The BioChemGARD e3 meets and exceeds NSF/ANSI Standard 49 Class II and ISO class 4 criteria in ReadySAFE mode. When the viewscreen is closed, which results in a 50% reduction in the electricity draw and a 55% reduction in exhaust airflow.

- Reduces laboratory air-conditioning requirements with less heat generation.
- Increases productivity by allowing user to have instantly safe working conditions upon opening the viewscreen and ongoing work can be left in the cabinet without fear of contamination.
- Reduces cabinet noise levels in laboratory environment—measured at 43 decibels (excluding exhaust system).

Innovative UniPressure™ Preflow Plenum

The BioChemGARD e3 biological safety cabinet incorporates Baker's exclusive UniPressure Preflow Plenum high-performance airflow system that saves energy and extends filter.

- Apportions and distributes air across, then through, the HEPA supply filter, improving downflow uniformity, reducing noise, and increasing reserve blower/motor capacity.
- Filter mount provides direct seal of HEPA filters to plenum, and simplifies filter replacement.



The Baker exclusive UniPressure Preflow Plenum provides quieter, more efficient operation.

Motor/Blower System Extends Filter Life

Baker's optimum blower/motor design ensures performance and extends filter life at least additional **50%** over our previous cabinets—the longest life in the industry—with a range of over 10 years. (High levels of background particulates may shorten HEPA filter life.)

- Provides consistent volume of air despite increases in resistance due to filter loading, resulting in extremely long filter life.
- Extended filter life minimizes filter replacement and decontamination costs, reduces use of toxic fumigants, and produces less waste in the environment.
- Requires no manual adjustment over filter's life. All filter reserve is automatic.

Craftsmanship and Innovative, Versatile Design Ensures Quality Performance

Baker cabinet designs represent many years of experience in stainless steel fabrication and craftsmanship. The BioChemGARD e3, like all Baker cabinets, includes design features to improve safety, productivity, user-comfort, and performance throughout a range of repetitive tasks performed on a daily basis.

Exclusive Filter Exchange System Decreases Downtime and Increases Safety

Many traditional bag-in/bag-out (BIBO) filter systems, which are typically located overhead the cabinet's work surface, have complex and time-consuming procedures that can result in a higher risk of exposure to contaminants. Our new Sealed Access Exhaust Filter Exchange System* permits filter bagging and exchanges within the work surface, providing improved access, a simpler process, and an overall reduction in maintenance time while still minimizing exposure to contaminants by running the exhaust during the filter change.

*patent-pending



Innovative Fume Hood Option Offers Greater Versatility in the Lab

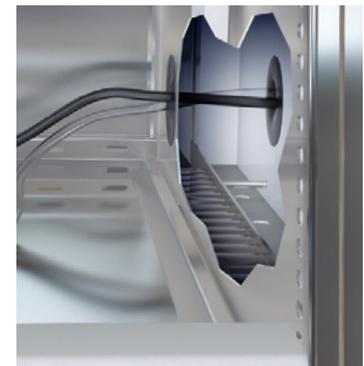
With our optional Fume Hood Package, the BioChemGARD e3 meets the UL requirements for Electrical/Mechanical Safety (UL 61010-1) and the UL requirements for Material Flammability and Effectiveness of Airflow Characteristics (UL 1805). The cabinet has been tested in accordance with ANSI/ASHRAE 110-1995. Usage should be determined by a professional industrial hygienist or safety officer.

Negative-Pressure Double-Wall Plenums with Cable Ports Enhance Safety

Baker's unique all metal, double-wall design of the BioChemGARD e3 cabinet creates base, side, and back wall plenums that capture and contain contaminated air under negative pressure. This prevents contaminated air from escaping into the laboratory environment in the event of damage to the cabinet walls.

Our optional cable ports are an industry exclusive* and can be located in both the left and right side walls of the cabinet. They provide a safe and ergonomic way of introducing cables or siphoning tubes into the work area without interfering with the viewscreen opening.

*patent pending and NSF-approved



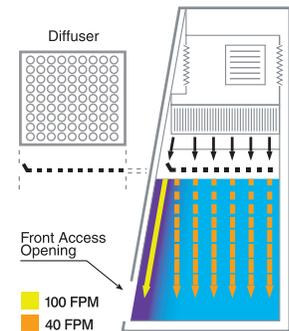
Cable ports allow cables/tubing to exit side walls rather than the front work area.

Momentum Air Curtain and High-Velocity Return Air Slots Increase Protection

The BioChemGARD e3 cabinet employs a unique momentum air curtain that offers an added measure of containment and protection exclusive to the Baker design.

- Creates a strong air barrier, or momentum air curtain, at front of cabinet, increasing protective capabilities for both products and personnel.
- Resulting air curtain combines with high-velocity return air slots, aerodynamically contoured front-opening surfaces, and optimum air intake velocity to minimize turbulence and prevent migration of airborne contaminants into or out of the work area.

Momentum Air Curtain



Supply and Exhaust Filters Perform Optimally

Because filters remove microorganisms and airborne particulates (e.g., aerosols) from the air, the quality, performance, and useful life of downflow and exhaust HEPA/ULPA filters are critical biosafety considerations.

- Leak-free performance is verified through scan tests conducted at the factory prior to shipping and is confirmed at the cabinet's initial certification.
- Closed-cell neoprene gasket provides an airtight seal between the filter assembly and the metal plenum.
- VFD motor system and large-sized filters yield the longest filter life in the industry.
- An audible/visual airflow alarm and automatic shut-off system called the Airflow Monitor (AFM) warns when the exhaust airflow decreases.



High-velocity return air slots maximize protection.

Superior technologies and an industry-leading approach to ergonomics ensure a new level of productivity, and user comfort.

The BioChemGARD e3, like all Baker cabinets, includes design features to improve safety, productivity, user-comfort, and performance throughout a range of tasks performed on a daily basis. Our cabinets are designed with the user in mind so that routine tasks can be done more comfortably, efficiently, and with less fatigue.

Reduced noise levels: The unique airflow design inside the cabinet, combined with the lower exhaust requirements, result in quieter operating noise levels. In standard operating mode, the BioChemGARD e3 emits an average of 50dB*, a 30% decrease in noise on our previous B2 cabinet. This drops to 43dB when the cabinet is in ReadySAFE mode.

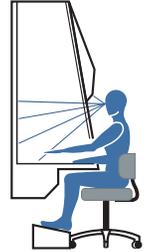
		Rustle of Leaves	Library	Average Office	BioChemGARD e3	Normal Conversation	Traditional B2 Cabinet	Power Mower
Decibels	10	20	30	40	50	60	70	80
Relative loudness	1/32	1/16	1/8	1/4	1/2	1	2	4

*Average tested noise level. Noise level of cabinet is influenced by the building exhaust system.

Efficient lighting: The work area is illuminated by one external fluorescent lamp with an electronic ballast. The cool-white lights use less energy, produce less heat, and provide better color fidelity.

Slanted viewscreen: The slanted sliding viewscreen minimizes glare and makes the cabinet easier and more comfortable to use. A counterbalancing feature allows the user to open and close the laminated safety glass viewscreen effortlessly, which can also be fully closed for ReadySAFE mode, system shutdown, or UV light operation.

- Maximum opening of up to 20" simplifies equipment and instrument loading and unloading and allows for placement of large items more easily.
- Allows operator more comfortable head and elbow position, reducing fatigue.
- Provides safe, highly visible, and easily accessible work area for a wide range of procedures.
- Laminated safety glass with a stainless steel edge protector increases durability and safety.



Highly productive work environment

Design considerations such as wide radius corners, aerodynamically shaped surfaces, and non-glare satin finish interiors combine to improve comfort, simplify cleaning, and maintain proper containment.

- Large unobstructed, usable work area can accommodate more lab equipment because of the rear grille being parallel to the straight back wall.
- A reduced front grille depth moves the work surface area closer to front of the cabinet for better arm position and less back strain.
- Consolidated electrical controls on panel behind hinged light canopy offer unique access outside containment area.
- The fluorescent lights, UV light, and the electrical outlets can all be programmed in 15-minute or hour-long intervals to delay the time they power down.
- Petcocks, valves, and plumbing connections are strategically placed for convenience and proper air management.
- Work surface and walls are one-piece, corrosion-resistant, stainless steel with smooth radius corners for easy cleaning. White powder-coated finish protects cold-rolled steel cabinet exterior.

Options and accessories: Most options, accessories, and modifications are factory-installed and should be specified when ordering. Common options are listed below.

- Low exhaust static pressure kit
- Fume Hood UL 1805
- VHP decon ports
- Stainless steel IV bar
- UV germicidal lamp
- Floor/wall seismic restraints
- Black iron pipe
- Additional cable port
- Plastic storage bins
- Casters with brakes
- Enhanced electrical system with touch pad control panel (GTO I, UL approved)
- 220V, 50 Hz Electrical NSF/ANSI 49 & UL listed
- Ergonomic adjustable footrest
- Reinforced work surface
- Remote-controlled petcocks
- Electric hydraulic lift
- Auxiliary wiring package (for monitoring blower switch status)
- ULPA filters

Ordering

For ordering information, terms, and conditions of sale, contact The Baker Company or visit the Baker website at bakerc.com for the name of your authorized Baker Company representative.

BioChemGARD e3, Class II, Type B2 Biological Safety Cabinet, Vertical Flow

APPROVALS

The cabinet shall have the following approvals, listings, and/or certifications:

1. UL 61010-1, Second Edition: Electrical Equipment for Measurement, Control, and Laboratory Use For Electrical, Fire, and Personal Safety
2. CAN/CSA-C22.2 No. 61010-1, Second Edition: Electrical Equipment for Measurement, Control, and Laboratory Use For Electrical, Fire, and Personal Safety
3. NSF/ANSI 49, Biosafety Cabinetry: Design, Construction, Performance, and Field Certification
4. UL 1805, First Edition: Standard for Laboratory Hoods and Cabinets For Material Flammability and Effectiveness of Airflow Characteristics
5. ANSI/ASHRAE 110-1995: Method of Testing Performance of Laboratory Fumehoods

PERFORMANCE

1. The cabinet shall provide intake velocity through the front access opening of the cabinet at a minimum of 100 FPM.
 2. The cabinet shall incorporate higher-velocity airflow behind the viewscreen (momentum air curtain) for added personnel and product protection.
 3. The cabinet shall contain high-velocity return air slots in the sidewalls and top adjacent to the front access opening for enhanced containment and reduction of air turbulence at the sash opening.
 4. The cabinet shall incorporate a high-performance airflow system (UniPressure Prewlow Plenum™). This system apportioned and distributes air across and then through the HEPA supply filter.
 5. The bottom of the cabinet access opening shall be aerodynamically designed to direct airflow into the front grille to optimize containment.
 6. The cabinet exhaust requirements (Concurrent Balance Value per NSF/ANSI 49) for 12"-diameter exhaust collar, measured directly above the exhaust filter before any restrictions, elbows, or reductions, are:
 - a. BCG401 – 664 CFM at 1.5" water column suction
 - b. BCB601 – 993 CFM at 1.5" water column suction
 7. The cabinet sound level as measured per NSF/ANSI 49 shall be no more than:
 - a. 50 dBA – (BCG401 and BCG601) cabinet without background noise
 - b. 60 dBA – (BCG401 and BCG601) cabinet and exhaust system
 8. The cabinet shall have a reduced airflow energy-saving mode (ReadySAFE™), which is active when the viewscreen is closed. This mode of operation shall reduce energy consumption by at least 50% and still meet the product and personnel protection testing requirements of NSF/ANSI 49. Particle testing while the cabinet is in this mode shall exceed the requirements for ISO Class 5 conditions for 0.3 micron particles. A connection shall be provided for indicating the ReadySAFE status to the facility building management system.
 9. The cabinet shall use a variable frequency drive (VFD) and three-phase motor/blower system (StediFLOW™) that is capable of maintaining a constant air volume as filter resistance increases.
- The system shall:
- a. Be capable of automatically handling an increase in pressure drop across the filter of at least 420% (BCG401) without reducing total air volume by more than 10%.
 - b. Operate under normal conditions at a typical current of
 - BCG401 – 1.0 amp
 - BCG601 – 1.4 amps
 - c. Automatically compensate for normal power-line variations, air disruptions, and supply filter loading
 10. The manufacturer can provide a representative copy of the personnel, product, and cross-contamination biological tests upon request. These tests are equivalent to, or more demanding than, the tests specified in NSF/ANSI 49. Detailed biological test reports can be provided at additional cost.

CONSTRUCTION

1. The cabinet's exterior construction is of seal panels and dress panels of 16-gauge cold-rolled steel, powder-coated finish, Sherwin-Williams, PermaWhite™.
2. Exterior dimensions (W x D x H) of the cabinets are:
 - a. BCG401 – 53⁷/₈" x 33³/₈" x (86" to 94¹/₂")
 - b. BCG601 – 77⁷/₈" x 33³/₈" x (86" to 94¹/₂")
3. Cabinet shall have permanent metal double-wall construction with negative-pressure airflow between the walls, from drain pan to top of the work area, surrounding all biologically contaminated areas.
4. The cabinet shall contain a vertical sliding viewscreen slanted at an angle of 10° for user comfort.
5. The cabinet shall have an adjustable stand. The available work surface elevations are:
 - a. 29⁵/₈" to 32¹/₈"
 - b. 35⁵/₈" to 38¹/₈"
6. The cabinet interior work area will be constructed as one piece. The material shall be 16-gauge, Type-304 stainless steel. The interior shall have smooth coved-corners to facilitate cleaning.
7. The interior dimensions (W x D x H):
 - a. BCG401 – 46" x 22⁷/₈" x 27⁵/₈"
 - b. BCG601 – 70" x 22⁷/₈" x 27⁵/₈"

Usable workspace (W x D x H):

 - a. BCG401 – 46" x 18" x 27⁵/₈"
 - b. BCG601 – 70" x 17⁵/₈" x 27⁵/₈"
8. The cabinet shall feature a straight back wall to maximize work area and more easily accommodate laboratory equipment.
9. The cabinet shall have a cable port to allow passage of tubes and/or cables through the negative-pressure double-wall plenum sidewalls of the cabinet. Design shall meet Class 100 (ISO Class 5) air cleanliness immediately inside the opening in the work area. The cabinet feature must be approved per NSF/ANSI 49.
10. The unit shall have standard HEPA filters for a protection effectiveness of 99.99% on 0.3 micron size particles. The cabinet supply filter, exhaust filter, and test ports shall be accessible from the front of the cabinet.
11. The viewscreen shall be constructed of 1/4" laminated safety plate glass, with a maximum opening of 20" to optimize access to the interior of the cabinet.
12. The cabinet shall feature a counterweighted pulley system to reduce the effort of opening and closing the viewscreen.
13. The cabinet shall be equipped with a stainless steel supply-air diffuser and exhaust-filter protector .
14. The cabinet contains primary exhaust filters located under the work surface to capture particles

at the immediate site of generation. Exhaust filters shall be designed for bagging and safe removal in the work area and sized to fit in a standard Department of Transportation (DOT) container for removal as hazardous waste.

15. A plenum assembly shall be provided to allow the supply filters to be directly clamped to the plenum against a closed-cell neoprene gasket. The plenum applies even force, rather than point force, to the full perimeter of the supply filters.
16. The cabinet shall have a unitized drain pan with smooth coved-corners and a fully removable work surface and work-surface supports to facilitate cleaning and prevent microbial growth.
17. The cabinet shall have a bypass armrest for user comfort and to allow intake airflow when the cabinet is in ReadySAFE mode.
18. The standard cabinet shall contain one petcock and one plugged penetration on the right side wall. The left sidewall shall be pre-punched for optional/additional plumbing connections.
19. The cabinet shall be equipped with a stainless steel ball drain valve to allow for safe and effective removal of spills.
20. The supply motor blower shall be located in a clean zone of the cabinet that does not require any decontamination should maintenance or replacement be required.

ELECTRICAL

1. The cabinet shall have a microprocessor-based control system with an easy-to-clean membrane control panel mounted on the front of the cabinet.
2. The cabinet shall have adjustable timers for fluorescent lights, outlets, and optional UV lights. Timers shall be able to be set in 15-minute and one-hour increments.
3. The work area of the cabinet shall be provided with two GFCI-protected duplex outlets with drip-proof covers and shall be protected by a self-resetting circuit breaker.
4. A single 14' power cord with NEMA 5-20 plug shall be provided for electrical power connection.
5. The unit shall have an optional UV light. Operation of the UV light is only permitted when the viewscreen is in a closed/safe position.
6. The cabinet shall have electronic ballasts to provide more efficient operation for fluorescent lighting and optional UV lighting.
7. The cabinet shall have an externally mounted fluorescent light fixture capable of providing an average of more than 100 foot-candles of illumination at work surface.
8. The cabinet shall be provided with a low-exhaust-flow alarm. This alarm shall have audible and visual indicators of the alarm condition and be interlocked to shut down the cabinet supply blower, which minimizes pressurization of the work zone in the event of a low-exhaust-flow condition. An audible alarm mute function shall be provided. The alarm shall automatically reactivate after five minutes if the alarm condition persists.
9. The cabinet shall have an audible and visual alarm indicating that the sliding viewscreen is in an unsafe position. An alarm mute function shall be provided to allow the operator full access to the work area. The alarm shall automatically reactivate after five minutes if the viewscreen remains in an unsafe position.

Performance Data

MODEL NUMBER	BCG40 I	BCG60 I
Size	4'	6'
Interior Dimensions (w x d x h)	46" x 22 ⁷ / ₈ " x 27 ⁵ / ₈ "	70" x 22 ⁷ / ₈ " x 27 ⁵ / ₈ "
Usable Workspace (w x d x h)	46" x 18" x 27 ⁵ / ₈ "	70" x 17 ⁵ / ₈ " x 27 ⁵ / ₈ "
Exterior Dimensions (w x d x h [min to max])	53 ⁷ / ₈ " x 33 ⁵ / ₈ " x (86" to 94 ¹ / ₂ ")	77 ⁷ / ₈ " x 33 ⁵ / ₈ " x (86" to 94 ¹ / ₂ ")
Cabinet Weight (lbs)	720	850
Shipping Weight (lbs)	850	1020
Sash Height	8"	8"
Opening Max.	20"	20"
Operating Amperage (Normal/ReadySAFE)* (Amps)	1.0 Amps/.3 Amps	1.4 Amps/.3 Amps
Power Consumption (Normal/ReadySAFE)* (W)	115 Watts/35 Watts	161 Watts/35 Watts
Heat Generation (Normal/ReadySAFE)* (BTU/hr)	392/119	549/119
Note: 100% exhausted		
Electrical (Requires 20 AMP Outlet)	115V, AC 20A, 60 Hz	115V, AC 20A, 60 Hz
Noise, exhaust & cabinet, NSF International (dBa)	59	60
Noise, cabinet (dBa)	< 50	< 50
CONCURRENT BALANCE VALUE		
Exhaust Flow Rate (Total CFM)	664	993
Exhaust Static Press Adjusted Value (Per NSF 49)		
12" Diameter Exhaust Collar	-1.5" W.G.	-1.5" W.G.
10" Diameter Exhaust Collar (Optional)	-1.6" W.G.	-1.6" W.G.
8" Diameter Exhaust Collar (Optional)	-1.7" W.G.	-1.7" W.G.
Exhaust Flow Rate (Total CFM) (Normal/ReadySAFE)	664/300	993/300

*Values provided under normal, 24-hour operation and under ReadySAFE mode

Caution

A Class II, Type B2, 100% total exhaust biological safety cabinet is suitable for work with low to moderate risk (Biosafety Levels 2 and 3) biological agents. It may also be used with biological agents treated with volatile toxic chemicals and radionuclides required as an adjunct to microbiological studies (as stated by NSF International Standard, NSF/ANSI Standard #49).

Note: The adequacy of this containment cabinet for the user's personal safety, as with any containment cabinet, should be determined by an industrial hygienist or safety officer. Site preparation information, architectural drawings, detailed dimensions, and purchase specifications are available.

Warranty 72 Months

The Baker Company, Inc., expressly represents and warrants all goods (a) to be as specified (and described) in The Baker Company catalogs and literature, and (b) to be free under normal use, service, and testing (all as described in The Baker Company catalogs and literature) from defects in material and workmanship for a period of seventy-two months from the invoice date.

The exclusive remedy for any breach or violation of this warranty is as follows: The Baker Company, Inc., will F.O.B. Sanford, Maine, furnish without charge repairs to or replacement of the parts or equipment that proved defective in material or workmanship. No claim may be made for any incidental or consequential damages.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE UNLESS OTHERWISE AGREED IN WRITING SIGNED BY THE BAKER COMPANY. (THE BAKER COMPANY SHALL NOT BE RESPONSIBLE FOR ANY IMPROPER USE, INSTALLATION, SERVICE, OR TESTING OF THE GOODS.)



PROUDLY MADE IN THE U.S.A.

THE BAKER COMPANY

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