VAULT 160

COMMERCIAL UV-C LIGHT DISINFECTION CHAMBER

MADE IN CANADA

The **APERON UV VAULT 160** is a large profile commercial chamber designed for quick object disinfection. High intensity ultraviolet (UV-C) bulbs produce germicidal light that is capable of eliminating viruses, bacteria, fungi and other harmful microorganisms.

100+ mJ/cm² in one minute

- ☑ **ENHANCE** disinfection protocols
- ☑ **CONTROL** points-of-entry
- ☑ **RESPOND** quickly to outbreaks
- ☑ **PREPARE** for unknown future events
- ☑ **REDUCE RISK** for staff, clients and visitors

INDUSTRY APPLICATIONS

MEDICAL FACILITIES
PERSONAL CARE HOMES
SCHOOLS
EMERGENCY SERVICES
PRISONS
LABORATORIES
REMOTE COMMUNITIES
CONSTRUCTION SITES
SPORTS & ARENAS
COMMUNITY CENTRES
COMMUNAL LIVING FACILITIES

ULTRAVIOLET GERMICIDAL LIGHT

- 5 high-output UV-C bulbs (275 watts)
- Germicidal UV-C bulbs (254nm)
- 85 watt total UV-C output
- Consistent exposure of 2 mW/cm²/sec
- Strategic bulb placement

CUSTOM DOSAGE CONTROL

- Adjustable timer
- Quick disinfection cycles
- 100+ mJ/cm² exposure per minute

LARGE CAPACITY

- 160 litre capacity
- Horizonal orientation
- Large chrome rack

USER FRIENDLY

- Simple push-button operation
- Magnetic doors
- Slide-out interchangeable rack
- Mobile (with cart)
- Standard 120v electrical
- No special installation required

SAFETY FEATURES

- Keyed power switch
- Magnetic interlocks on doors
- Emergency shut-off
- UV-C blocking window (tested)
- CSA compliant (UV & Ozone)
- Electrically inspected (SPE-1000)
- Protective cages on the bulbs

ENVIRONMENTAL IMPACT

- No chemicals used
- No ozone produced
- No residue or harmful by-products
- No costly consumables
- No venting or exhaust
- Made with recyclable material

"...APERON UV is going to be able to assist healthcare and other industries with their design which utilizes the tried and proven science of UV surface disinfection."
-Craig Doerksen (Divisional Director, Shared Health Manitoba)

APERON UV
UV-C DISINFECTION SYSTEMS

www.aperonuv.ca

VAULT 160 FEATURES

GERMICIDAL EFFECTIVENESS

The **VAULT 160** uses five high-output ultraviolet germicidal bulbs (254nm) producing 85 watts of UV-C energy. Shadowing is minimized through strategic bulb placement and highly reflective all-aluminum construction. All known pathogens respond to UV-C irradiation and are able to be inactivated with sufficient exposure.

CAPACITY

The **VAULT 160** has a large 160-litre capacity and is capable of accommodating larger objects that do not fit in smaller chambers. The spacious interior combined with the horizontal orientation and large rack allow a wide array of objects of varying sizes and shapes to be disinfected quickly and effectively.

SIMPLE OPERATION

The **VAULT 160** was designed with the user in mind and requires no special installation. The simple push-button operation allows users to be trained quickly. The magnetic doors eliminate the need for complicated latching mechanisms and the sliding interchangeable rack system allows for easy loading and unloading.

DOSAGE CONTROL

The **VAULT 160** has custom dosage control. The adjustable timer allows the user to customize the length of exposure to control the desired dosage. The VAULT 160 produces 2 mW/cm² of germicidal energy which translates into a dosage of 100+ mJ/cm² every 60 seconds and is capable of eliminating pathogens with the appropriate application of timed dosage. (see "Pathogen Dosage Chart")

NO CHEMICALS, HEAT OR STEAM

The **VAULT 160** does NOT use chemicals, liquids, heat or steam in the disinfection process. It is an effective tool to disinfect objects that cannot be disinfected with traditional methods. This preserves and protects electronic equipment, paper products, organic material and other items that could be destroyed or not properly disinfected.

MOBILITY

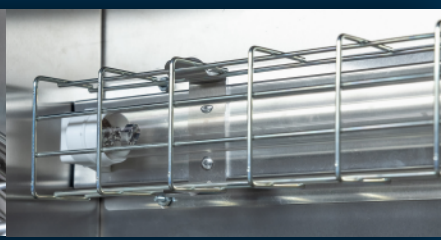
The **VAULT 160** can be moved quickly and safely throughout a facility and can be plugged into any standard (110 volt) grounded outlet. The optional custom stainless steel cart has durable non-marking lockable wheels and a large drawer for supplies.

ENVIRONMENTAL IMPACT

The **VAULT 160** has no exhaust or venting, uses no chemicals or other costly consumables and leaves no residue or harmful by-products behind. The use of recyclable material in the manufacturing minimizes its environmental impact.

SAFETY FEATURES

The **VAULT 160** meets CSA safety and electrical standards and has been tested to ensure the user is not exposed to harmful UV-C radiation. A keyed power switch limits access to the overall function of the chamber. If at any time the doors are opened during a disinfection cycle, the magnetic interlock system will trigger an automatic shut-off. In the unlikely event of a malfunction, the emergency shut-off button is easily accessible. The observation window allows for the user to verify the machine is operating properly. The safety glass has been tested to ensure the user is protected from exposure to the UV-C light.



"The use of the UV chamber now allows families to bring in items for their family members which we may not have been able to accommodate in the past, because we can disinfect what is coming into the building."

-**Sherry Janzen** (CEO, Salem Care Home in Winkler, MB)

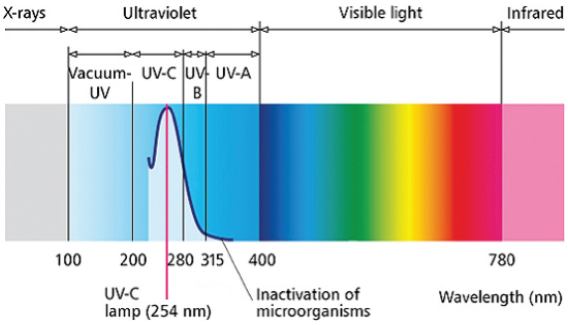
"...the [Vault 160] provides peace of mind that items are being sanitized at a high level and I believe this has directly affected our staff's confidence that they are safe at work."

-Laurie Cerqueti

CEO, Saul & Claribel Simkin Centre, Winnipeg, MB

HOW DOES UV-C WORK?

Ultraviolet (UV) light is radiation produced by the sun and exists within the non-visible spectrum of light between 10 nanometre (nm) and 400nm wavelength range.



UV-V (10-100nm) or extreme UV exists only in a vacuum in space and is blocked by oxygen.

UV-C (100-280nm) or far UV is filtered out by the ozone layer and water vapour in Earth's atmosphere.

UV-B (280-315nm) or middle UV comprises 95% of all UV light on earth and is what causes sunburns; it is also the wavelength used in tanning-bed lights.

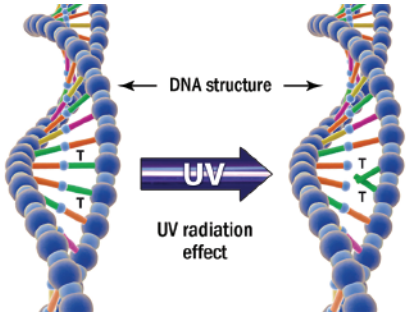
UV-A (315-400nm) or near UV provides glow effects in blacklights, as well as has curing applications in industry.

The optimal germicidal (germ killing) effect is found in the narrow window of 240-270nm or UV-C range. Since UV-C does not exist naturally on earth it has to be created artificially through specialty light bulbs. Most UV-C bulbs emit energy at 254nm which is within the optimal wavelength range for killing germs and are commonly known as germicidal bulbs.

UV-C light destroys nucleic acids and disrupts the DNA of microorganisms causing structural changes and rendering them incapable of replicating and other vital functions, or in effect, killing the organism. This process of killing pathogens with UV-C light is often referred to as Ultraviolet Germicidal Irradiation (UVGI).

UV-C disinfection is an established and reliable technology. Since the mid-20th century UVGI has been used in disinfecting water, air, pharmaceutical products, food packaging and surfaces against all manner of human pathogens. All bacteria and viruses tested to date (including coronaviruses) respond to UV-C disinfection. Some organisms are more susceptible to UV-C light than others, but all respond when the appropriate dosage is applied.

Studies have shown that the dosage required for inactivating bacteria typically varies between 2 and 25 mJ/cm² (with a few resilient strains requiring doses up to a 100 mJ/cm²). Slightly higher values are required in general for viruses, typically between 10 and 100 mJ/cm² (and adenoviruses can be in the 100-200 mJ/cm² range). Studies are ongoing regarding COVID-19 (SARS-COV-2), but coronaviruses typically require doses between 6 and 30 mJ/cm² for inactivation.



PATHOGEN DOSAGE CHART

dosages required to inactivate pathogens to a $\log_4$ (99.99%) reduction

Pathogen	Type	Dose (mJ/cm²)	Source/Study
Listeria monocytogenes	Bacteria	4.1	Collins, 1971
Mycobacterium tuberculosis (TB)	Bacteria	4.3 (Log_2)	Collins, 1971
Coronavirus (SARS)	Virus	6.1	Walker, 2007
Clostridium pasteurianum	Spore	6.7	Claußß, 2006
Mycoplasma Pneumoniae	Bacteria	8.2	Furness, 1977
Salmonella typhimurium	Bacteria	8.3 (50 in sludge)	Maya et al, 2003
Staphylococcus aureus (MRSA)	Bacteria	10	McKinney & Pruden, 2012
Enterococcus (VRE)	Bacteria	13	McKinney & Pruden, 2012
Escherichia Coli (E. Coli)	Bacteria	13	Quek & Hu, 2008
Streptomyces griseus	Spore	15	Claußß, 2006
C. Difficile	Spore	16	Sifuentes, 2015
Influenza A	Virus	19.3	Jensen, 1964
Murine Norovirus	Virus	27	Park et al, 2011
Faecal streptococci	Bacteria	30	Maya et al, 2003
Hepatitis A	Virus	35	Wilson et al, 1992
Rotavirus	Virus	43	Wilson et al, 1992
Penicillium expansum	Spore	49	Claußß, 2006
Adenovirus (various)	Virus	22-206	Various

Source: Malayeri, Adel & Mohseni, Madjid & Cairns, Bill & Bolton, James. (2016). Fluence (UV Dose) Required to Achieve Incremental Log Inactivation of Bacteria, Protozoa, Viruses and Algae. International UV Association

DOSAGE & DOSIMETERS

Dosage is the accumulated UV-C exposure. All pathogens respond to UV-C if the appropriate dosage is applied. With its adjustable timer the VAULT 160 is capable of applying any dosage.

VAULT 160 EXPOSURE TIME CHART

TIME	DOSAGE (CENTRE OF RACK)	DOSAGE (OUTER EDGES OF RACK)
1 MINUTE	120 mJ/cm²	50 mJ/cm²
2 MINUTES	240 mJ/cm²	100 mJ/cm²
3 MINUTES	360 mJ/cm²	150 mJ/cm²
5 MINUTES	600 mJ/cm²	250 mJ/cm²
10 MINUTES	1200 mJ/cm²	500 mJ/cm²
30 MINUTES	3600 mJ/cm²	1500 mJ/cm²

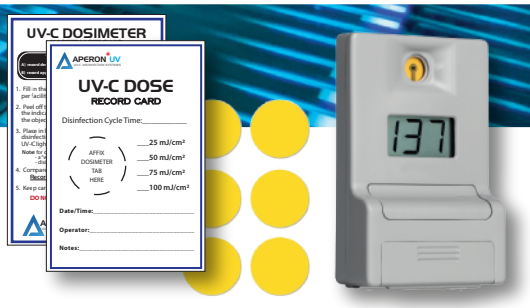
NOTE: Exposure data verified through third party testing in collaboration with Manitoba Shared Health and Health Sciences Centre (Winnipeg).

Dosimeters* visually register the accumulated exposure (dosage). This allows a user to confirm that the appropriate dosage has been applied to the object(s) being disinfected. Dosimeters can also be used to test and verify that UV-C equipment and systems are working properly.

Analog tabs use special colour-changing ink that reacts to UV-C light. The adhesive backing allows the user to attach the tab directly to any surface; verifying dosage for that object.

A digital dosimeter can be used to quickly and simply verify the dosage in every cycle.

Dosage verification is an essential step in the disinfection process. By confirming dosage you bring confidence to your clients and staff.



*Dosimeter products available from Aperon UV

VAULT 160 ADVANTAGE

"Super easy to use and quite convenient."
"It saves a lot of time and sanitizing wipes."
"I use it multiple times per shift for belongings or when cleaning the station for hard to wipe items."
"I am using it all the time for every delivery package..."

-Facility Management and Maintenance Team
(Health Sciences Centre in Winnipeg, MB)

Complement and enhance established disinfection practices and protocols for objects that can't be disinfected effectively through other methods.

Control pathogen transmission at points-of-entry by disinfecting deliveries quickly and effectively.

Adjust to changing needs by counteracting present and future pathogens with custom dosage control.

Disinfect shared items within congregate living facilities and other shared group situations with the large capacity chamber.

Respond to outbreaks throughout a facility and prepare rooms quickly for new occupants with a mobile unit on a custom cart.

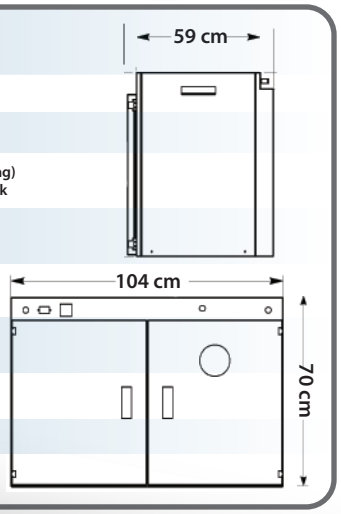
Use less chemicals and costly consumables and extend the life of electronics and other items by disinfecting without the use of liquids, steam or heat.

Save time and train staff and volunteers quickly with the simple controls and operation of the VAULT 160.

Instill confidence in staff, clients, and visitors with regular disinfection of personal items.

SPECIFICATIONS

Dimensions	External 104cm x 70cm x 59cm (41" x 27.75" x 23.25")	Internal (usable) 92cm x 38cm x 46cm (36" x 15" x 18")	Weight 45kg (100lbs)
Electrical	120v 60Hz, 4.4 amps (standard grounded outlet)		
Construction	UV-C reflective Aluminum, durable industrial construction		
UV-C Bulbs	five (5) x 55-watt germicidal (254nm) bulbs (non-ozone producing) Total UV-C output: 85 watts or 2 mW/cm²/second at centre of rack		
Controls	Keyed power switch, Adjustable timer, Usage meter, lighted start button, emergency stop		
Doors	Magnetic catch with safety interlock system UV-C blocking polycarbonate observation window		
Rack	Interchangeable sliding chrome rack Wire for hanging objects across top of chamber		
Standards	Electrical SPE-1000	UV & Ozone CSA 22.2 No. 61010-1 & 187-20	
Warranty	1 Year Limited Warranty		
Cart (Optional)	Stainless steel, large drawer, non-marking lockable wheels Custom mounting system for VAULT 160		



**The Vault 160 is a commercial disinfection system and is not intended to be used as a certified medical device.*

APERON UV
UV-C DISINFECTION SYSTEMS

MADE IN CANADA

MADE IN MANITOBA

Aperon UV Inc. is a Manitoba based manufacturing company committed to the production and advancement of ultraviolet light disinfection technologies in Canada.

info@aperonuv.ca
www.aperonuv.ca
1-833-960-3512