

THE UVC SERIES · EDITION ONE

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VITA PRO  
CLEANING  
DUBAI

# Clean Air, *Proven.*

*A plain-English guide to UVC  
sanitisation – what it is, what it isn't,  
and what to expect.*

## A NOTE FROM THE FOUNDER

# Why we wrote *this booklet.*

**M**ost of our customers come to us having never heard of UVC. That is entirely fair — it's a technology borrowed from hospitals, laboratories, and pharmaceutical cleanrooms, and it has only recently started making its way into ordinary homes and offices in Dubai.

So here is the sixty-second version. There's an old saying — *sunlight is the best disinfectant*. That isn't just a metaphor. The reason sunlight kills microbes is the ultraviolet band within it. UVC is a specific slice of that same ultraviolet light, normally filtered out by the atmosphere before it ever reaches the ground. Because living things never evolved defences against it, a correctly designed UVC lamp — installed inside your air-conditioning unit or ductwork — damages the DNA of airborne and surface microbes so they cannot reproduce. It does not clean. It keeps clean. Quietly, continuously, and entirely out of sight.

We are the only company in Dubai with engineers qualified to survey and install it properly. Our team has personally installed UVC in hospitals, pathology labs, and research facilities across the UK and Europe — environments where the standard is commissioning-grade and the tolerance for poor workmanship is zero. That is the discipline we brought to the Dubai market, and it is what sits behind every line of the following pages.

*Annual cleaning is an event. UVC is a service. It is what keeps a clean AC system clean for the other eleven months of the year.*

We wrote this guide in plain English so you can decide for yourself whether UVC belongs in your space. Read it, ask harder questions of us and of anyone else you're considering, and make your own call.

*Mark Mitchell*

Founder & Director, Vita Pro Cleaning  
Dubai, UAE

# 01

## What is UVC, *in sixty seconds.*

The light you can't see, doing work your eyes would struggle to believe.

Sunlight contains a spectrum of ultraviolet radiation — UVA, UVB, and UVC. We're all familiar with UVA and UVB: they're what tan you and, in excess, burn you. UVC is the third and shortest-wavelength band, between roughly 200 and 280 nanometres.

On the surface of the Earth, UVC is something of a novelty. The atmosphere's ozone layer filters almost all of the sun's UVC out before it reaches us. The practical consequence is that the microorganisms we share our buildings with — bacteria, viruses, mould spores, yeasts — never evolved defences against it.

When you shine UVC light (particularly at the 254-nanometre germicidal peak) on a microorganism, it punches through the cell wall and damages the DNA or RNA inside. The microbe is no longer able to reproduce. In practical terms, it is inactivated — the next page shows exactly how, drawn to scale.

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### THE GERMICIDAL PEAK

## 254 nm

The wavelength used in most in-duct UVC fixtures. It's absorbed efficiently by microbial nucleic acids, and it's the best-studied band in germicidal science.

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### WHY IT WORKS

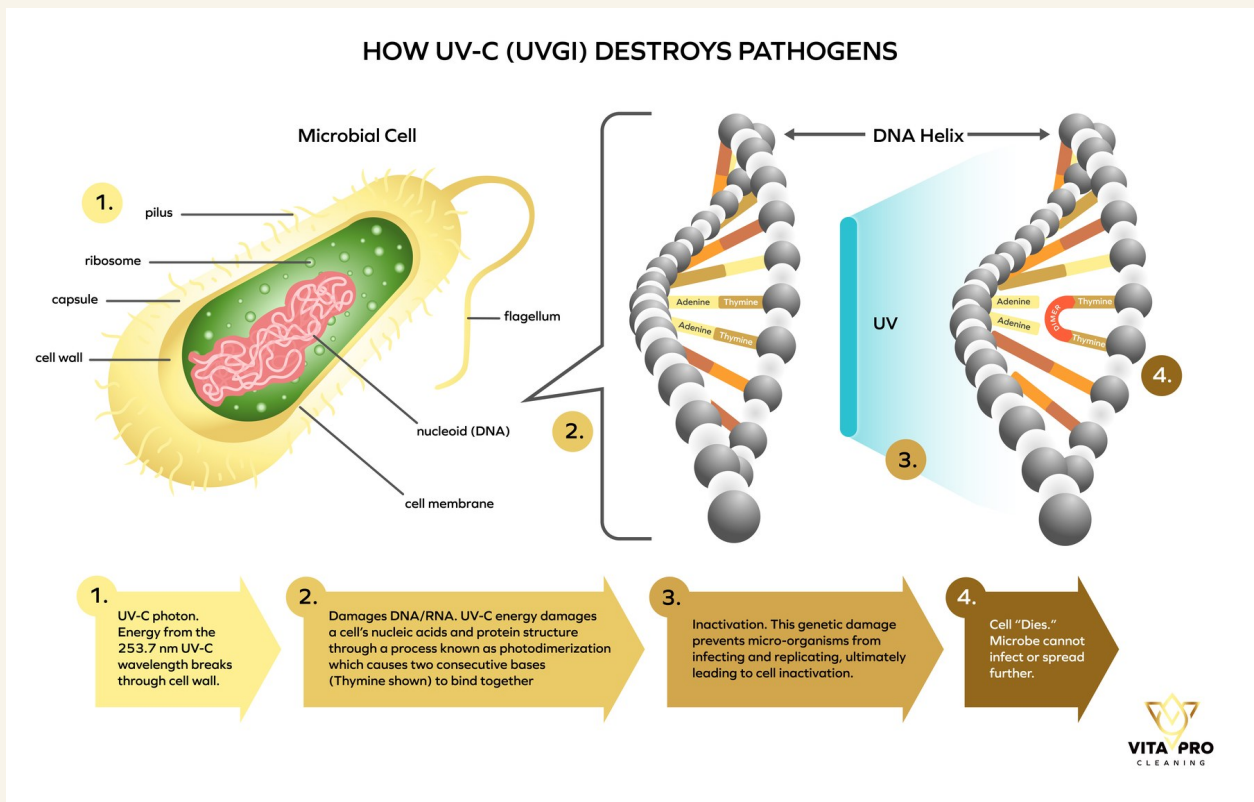
## No Defence

Because terrestrial organisms evolved with UVC filtered out by ozone, microbes don't have repair mechanisms for the damage it causes. That's the whole principle.

# 02

## How UVC *destroys pathogens.*

A four-step, microscopic sequence that takes a fraction of a second.



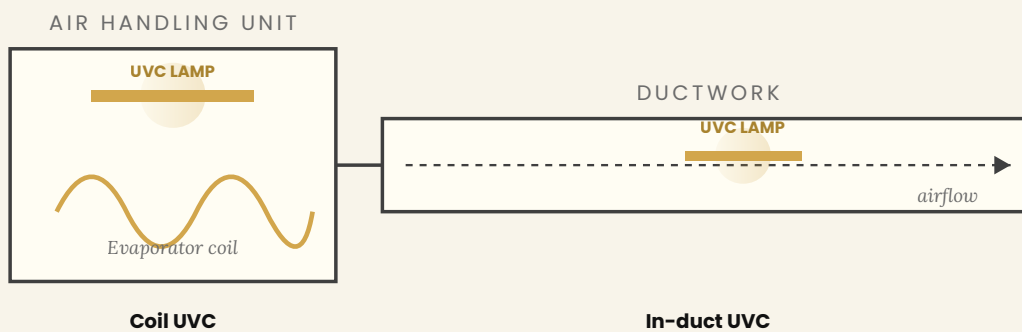
A UVC photon at 253.7 nm breaks through the microbial cell wall (1), damages the cell's DNA or RNA through a process called photodimerization (2), preventing the microbe from replicating (3), which inactivates the cell (4). The microbe cannot infect or spread further.

## 03

# How UVC fits into *your AC system.*

There are two practical placements, and they do slightly different jobs.

When we install UVC in a residential or commercial air-handling system in the UAE, we're almost always doing one of two things. Both are valid; the right answer depends on what your system looks like and what you're trying to achieve.



## OPTION A

## Coil UVC

A UVC lamp is mounted inside the air-handling unit, aimed at the evaporator coil. It runs continuously, keeping the coil surface and drip tray clear of the biofilm that would otherwise build up.

**Best for:** long-term prevention. The lamp isn't primarily disinfecting air — it's stopping the coil from turning into a microbial breeding surface.

## OPTION B

## In-duct UVC

One or more lamps are mounted inside the ductwork, irradiating air as it passes. Lamp count and placement are sized to your system's airflow so each air parcel receives an adequate dose.

**Best for:** active air treatment — reducing airborne microbial load in circulated air. Common in healthcare, hospitality, and high-occupancy corporate spaces.

# 04

## What UVC *is not*.

The list of things we won't claim for you — and wouldn't trust anyone else claiming either.

Here is the more uncomfortable chapter. A lot of UVC marketing is written by people who have quietly dropped a few important words. These are the boundaries we'll draw on your behalf.

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— **Not a replacement for cleaning.**

UVC does not remove existing dust, debris, or biofilm from coils and ducts. If your system is already dirty, UVC installed on top of that dirt will be working at a fraction of its effectiveness. A thorough clean comes first. Always.

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— **Not a medical device.**

UVC does not cure, treat, or prevent any medical condition. It reduces the microbial load in the air and on the surfaces within your AC system. Any claim stronger than that — ours or someone else's — should be treated as marketing rather than science.

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— **Not a room steriliser for occupied spaces.**

Handheld UVC wands and upright UVC lamps aimed into living rooms are a different category of product with different safety considerations. Our installations are shielded inside ductwork or air-handling units. We do not supply or install open UVC fixtures for occupied rooms.

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— **Not a one-size-fits-all solution.**

Lamps need to be sized correctly to the airflow of your system, placed where they'll reach the microbes they're meant to inactivate, and paired with clean ductwork to work as advertised. Any UVC that's been sold on a per-metre basis without an assessment is a guess.

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# 05

## Is it *safe*?

The short answer is yes — provided three conditions are met.

Direct UVC exposure to skin and eyes is not harmless. That is precisely why a properly installed UVC system never exposes anyone to direct UVC. The lamps live inside sealed equipment, doing their work out of sight.

### The three conditions.

- **1. Containment.** The lamp is installed inside the air-handling unit or inside the ductwork. It is physically impossible for the UVC to reach an occupant in the room. Service access panels are interlocked where appropriate, so the lamp shuts off if the panel is opened.
- **2. Ozone-free specification.** Standard low-pressure mercury UVC lamps emit at 254 nm. A different wavelength, 185 nm, produces ozone. We specify ozone-free lamps as standard — they have a filter that blocks the 185 nm emission while letting 254 nm through.
- **3. Competent installation and service.** The lamps are installed and serviced by British-qualified engineers. Mercury-containing lamps are handled and disposed of per UK and UAE waste regulations. Your system doesn't become your problem at end of life.

*In 40+ years of UK mechanical and electrical practice, the pattern holds: UVC is safe when the install discipline is right, and risky when it isn't. That's the whole story.*

*UVC technology has been shown to reduce airborne pathogens when installed and operated correctly. Results may vary by system configuration, air volume, and maintenance schedule.*

## 06

# What *the evidence says*.

UVC is one of the most studied air-treatment technologies of the last fifty years. Three sources worth knowing.

## § I.

The  
Engineering  
Body

### ASHRAE — AC guidance for UVGI

The American Society of Heating, Refrigerating and Air-Conditioning Engineers publishes the international reference on how ultraviolet germicidal irradiation (UVGI) should be designed into air-conditioning systems. Their position is that correctly designed and installed UVGI reduces airborne and surface microbial contamination.

*Reference: ASHRAE Position Document on Airborne Infectious Diseases; ASHRAE Handbook, Chapter on UV Air and Surface Treatment.*

## § II.

The Public  
Health Body

### CDC / NIOSH — UVGI guidance

The US Centers for Disease Control and Prevention, together with the National Institute for Occupational Safety and Health, has published guidelines for the use of UVGI in healthcare settings — originally for tuberculosis control — that underpin most modern UVC practice in air-conditioning systems globally.

*Reference: CDC/NIOSH "Environmental Control for Tuberculosis: Basic Upper-Room UVGI Guidelines for Healthcare Settings."*

## § III.

Peer-  
reviewed  
science

### Independent laboratory research

Multiple peer-reviewed studies report log-reduction rates on common airborne and surface pathogens when UVC lamps are correctly sized to system airflow. The literature is extensive; the headline finding is that effect depends on dose, and dose depends on a correct engineering design.

*Reference: Kowalski, W. Ultraviolet Germicidal Irradiation Handbook (Springer). See also peer-reviewed journals indexed in PubMed under "UVGI" and "ultraviolet germicidal irradiation."*

## 07

# Why Vita Pro Cleaning.

We are the only company in Dubai with engineers qualified to both survey and install UVC to the same standard a hospital would expect. Three reasons that matters.

## § I.

The  
Engineering  
Gap

### **Survey and install by qualified engineers — not resellers**

Most UVC in Dubai is sold per metre by suppliers who don't design the system, don't measure your airflow, and don't return after the install. We do all three. A British-qualified engineer walks the plant, reads the AC drawings, sizes the lamp to your airflow, installs it, and signs the commissioning report. Same engineer, start to finish.

## § II.

Hospital &  
Laboratory  
Heritage

### **We've personally installed UVC in UK and European hospitals and labs**

Clinical-grade environments don't tolerate guesswork. The UVC we've installed across UK and European hospitals, pathology labs, and research facilities is held to commissioning, validation, and service standards an order of magnitude stricter than retail air-conditioning. That discipline is what you get in a Dubai residential or corporate install — because the engineers doing it are the same people.

## § III.

Protection  
Between  
Cleans

### **Annual cleans are an event. UVC is a service.**

Competitors clean once a year and leave the system to accumulate biofilm for the other eleven months. With UVC correctly installed, microbial load on the coil and within the airflow is being reduced continuously — not just the week after a clean. That is the practical reason UVC sits *alongside* duct cleaning, not instead of it. It's what keeps a cleaned system clean.

## 08

# How we install *UVC* properly.

Forty-plus years of UK mechanical and electrical discipline, compressed into four steps.

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**i.****ASSESSMENT — FREE**

A British-qualified engineer inspects your air-handling unit, ductwork, and current air quality. We take a baseline IAQ reading, photograph the system, and return a written summary of what we found. No obligation, no pressure. If UVC isn't the right answer, we'll say so.

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**ii.****CLEAN FIRST**

UVC goes on a clean system, not on top of an existing problem. Duct cleaning, coil cleaning, and drip tray sanitisation come before any lamp is installed. This is where most installers cut corners. We don't.

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**iii.****INSTALL — TO BRITISH STANDARDS**

Lamps are sized to your system's airflow, positioned for effective dose, and wired per UK electrical standards (adapted for UAE regulations where required). Shielding, interlocks, and labels are all fitted. You get a photograph of every install point.

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**iv.****DOCUMENT & HAND OVER**

You receive a RAG-scored written report: before and after IAQ readings, photographs, lamp specifications, and the maintenance schedule. Evidence, not guesswork — it's one of our three operating principles, and this is where it shows up.

## 09

## What *results look like.*

What you should expect in the first month, the first year, and beyond.

A properly installed UVC system is boring. It sits inside your ductwork quietly doing its job, and almost the only time you think about it is when the lamp is due for replacement. That is the point.

### THE TYPICAL PICTURE

#### LAMP LIFE

**~9,000** hrs

Approximately 12 months of continuous operation.

#### POWER DRAW

**40–80** watts

Per lamp. Comparable to a small incandescent bulb.

#### SERVICE CYCLE

**12** months

Lamp replacement and re-test during annual AMC visit.

### The first thirty days.

You will not smell, hear, or see the UVC system in operation. What typically changes in the first month is a gradual reduction in the musty or damp notes that often build up in older ductwork, and — for coil UVC installs — a visibly cleaner coil at the first inspection. We take a post-install IAQ reading and compare it to your baseline. You get both.

### Year one and onwards.

Lamps lose output gradually over their operating life. By roughly the 9,000-hour mark, the 254 nm emission has dropped below effective dose, and the lamp is replaced — visibly unchanged to the eye, measurably depleted. This is normal, expected, and built into the annual maintenance schedule.

*IAQ readings provide a snapshot to verify cleaning effectiveness. They are not medical assessments.*

## 10

# Questions *people ask us.*

Eight of the most common. The answers are the same ones we'd give you over coffee.

**Q. Does UVC replace duct cleaning?**

No. Think of UVC as ongoing prevention and duct cleaning as restoration. UVC doesn't remove what is already there — it keeps things clean once they are. Both have a place. Neither replaces the other.

**Q. Does it add much to my electricity bill?**

A typical lamp draws between 40 and 80 watts — about the same as an older incandescent bulb running continuously. The running cost is almost always immaterial compared to the cost of the AC system itself.

**Q. Is it safe for pets and children?**

Yes. Because the lamp is physically enclosed inside the AC unit or ductwork, nothing in your home — human or animal — is ever directly exposed to UVC light. It is physically impossible during normal operation.

**Q. Can I retrofit it to any AC system?**

Most modern systems can accept a retrofit UVC installation. A small number — usually older or unusually configured units — may require adaptation. The free assessment tells us within about thirty minutes what's appropriate for your system.

**Q. Will I smell or hear anything?**

No. A correctly specified ozone-free UVC lamp produces no detectable smell. The lamp is silent, and because it sits inside your AC unit or ductwork, you'll never see it either.

**Q. How often do the lamps need replacing?**

Roughly every 12 months, or about 9,000 operating hours. Replacement is included in our annual maintenance contract. The lamp looks fine when it's replaced — its 254 nm output has simply dropped below effective dose.

**Q. Does it produce ozone?**

Our standard specification is ozone-free lamps, which use a filter that blocks the ozone-producing 185 nm wavelength while transmitting the germicidal 254 nm. If you see a supplier that doesn't mention this, it's worth asking.

**Q. Is there a warranty?**

Yes. Lamp and installation workmanship are covered under the terms of your AMC (annual maintenance contract) or stand-alone install agreement. Exact terms vary by installation type — we confirm them in writing at the point of quote.

## 11

A short *glossary*.

Plain-English definitions for the terms we use in assessments and reports.

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| <b>UVC</b><br><i>ultraviolet C</i>             | Short-wavelength ultraviolet light, between 200 and 280 nanometres, used to inactivate microbes.                      |
| <b>UVGI</b><br><i>germicidal irradiation</i>   | The engineering term for using UVC light to inactivate microorganisms, particularly in air-conditioning applications. |
| <b>254 nm</b><br><i>germicidal peak</i>        | The wavelength at which DNA absorbs UV most efficiently; the standard emission band of low-pressure mercury lamps.    |
| <b>AHU</b><br><i>air handling unit</i>         | The central box of an air conditioning or ventilation system, containing the coil, fan, and filters.                  |
| <b>Coil</b><br><i>evaporator coil</i>          | The heat-exchange surface inside an AHU where air cools. A frequent site for biofilm and mould growth.                |
| <b>Biofilm</b><br><i>microbial layer</i>       | A thin, often invisible layer of microorganisms that forms on moist surfaces such as coils and drip trays.            |
| <b>IAQ</b><br><i>indoor air quality</i>        | A combined measure of airborne pollutants (particulates, VOCs, humidity, CO <sub>2</sub> ) inside a building.         |
| <b>VOC</b><br><i>volatile organic compound</i> | Organic chemicals that evaporate at room temperature; measured as part of an IAQ reading.                             |
| <b>PM2.5</b><br><i>particulate matter</i>      | Airborne particles 2.5 micrometres or smaller — small enough to reach the lungs. A standard IAQ metric.               |
| <b>Ozone-free</b><br><i>lamp specification</i> | A UVC lamp with a filter that blocks the 185 nm band responsible for ozone formation.                                 |
| <b>RAG</b><br><i>red/amber/green</i>           | The colour-coded scoring format we use in post-assessment reports, so findings are readable at a glance.              |
| <b>AMC</b><br><i>annual maintenance</i>        | A scheduled twelve-month servicing arrangement — for UVC installs, this includes lamp replacement and a re-test.      |

# If you've read this far, you probably have a question.

We're happy to answer it. Book a free assessment, send us a photograph of the system you're thinking about, or just reply with the thing you're stuck on. There's no pressure, no sales script, and no obligation to proceed.

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**A note on claims.**

UVC technology has been shown to reduce airborne pathogens when installed and operated correctly. Results may vary by system configuration, airflow, and maintenance schedule. Vita Pro Cleaning does not make medical claims for UVC installation.

IAQ readings provide a snapshot to verify cleaning effectiveness and are not medical assessments.

This booklet is written for educational purposes. Any pricing, warranty, or performance guarantee is issued separately in writing at the point of quote. No part of this document forms a contractual commitment.