



Vita

Operating Room Solutions

Enabling wellbeing

Halton

Operating Room Solutions

Hygienic and comfortable environments for patients, doctors and nurses.

Halton's Vita solutions offer a full range of airflow systems for operating room air cleanliness and thermal environment management, all meeting the highest standards.

The safe and energy efficient system consists of all necessary elements for guaranteed performance: HEPA filtrated supply air terminals, exhaust air units, recirculation air handling units, an operating room control system and supporting services for performance validation.

Halton – at the forefront of innovation.

Operating rooms are the most demanding spaces in the hospital environment. Our world-leading laboratories and co-creation with our customers help us design solutions that meet your requirements today and in the future.

- Ultraclean operational conditions lower infection risk
- Operational efficiency allows quick changes in the operating room setup, type of operation or medical team of personnel
- Flexible use of the space in operating room allows full use of floor area
- Comfortable conditions in the operating room increase wellbeing and comfort of the patient and the medical team
- Energy efficiency brings savings in operational costs
- The offering is compliant with various national and international standards

The Halton Vita OR solution family offers a full range of high-quality airflow solutions.

Halton Vita OR Space

Halton Vita OR Space is an airflow solution which provides the highest required air cleanliness for the ultraclean operations in the entire operating space. This unique controlled-dilution innovation provides hygienic conditions and safety without compromising on comfort and freedom to use the whole room.



Halton Vita OR Zone

Halton Vita OR Zone is a high-class low-turbulent-flow solution for ultraclean operating environments. It provides a constant stream of ultraclean air to a defined zone with a traditional laminar flow principle.



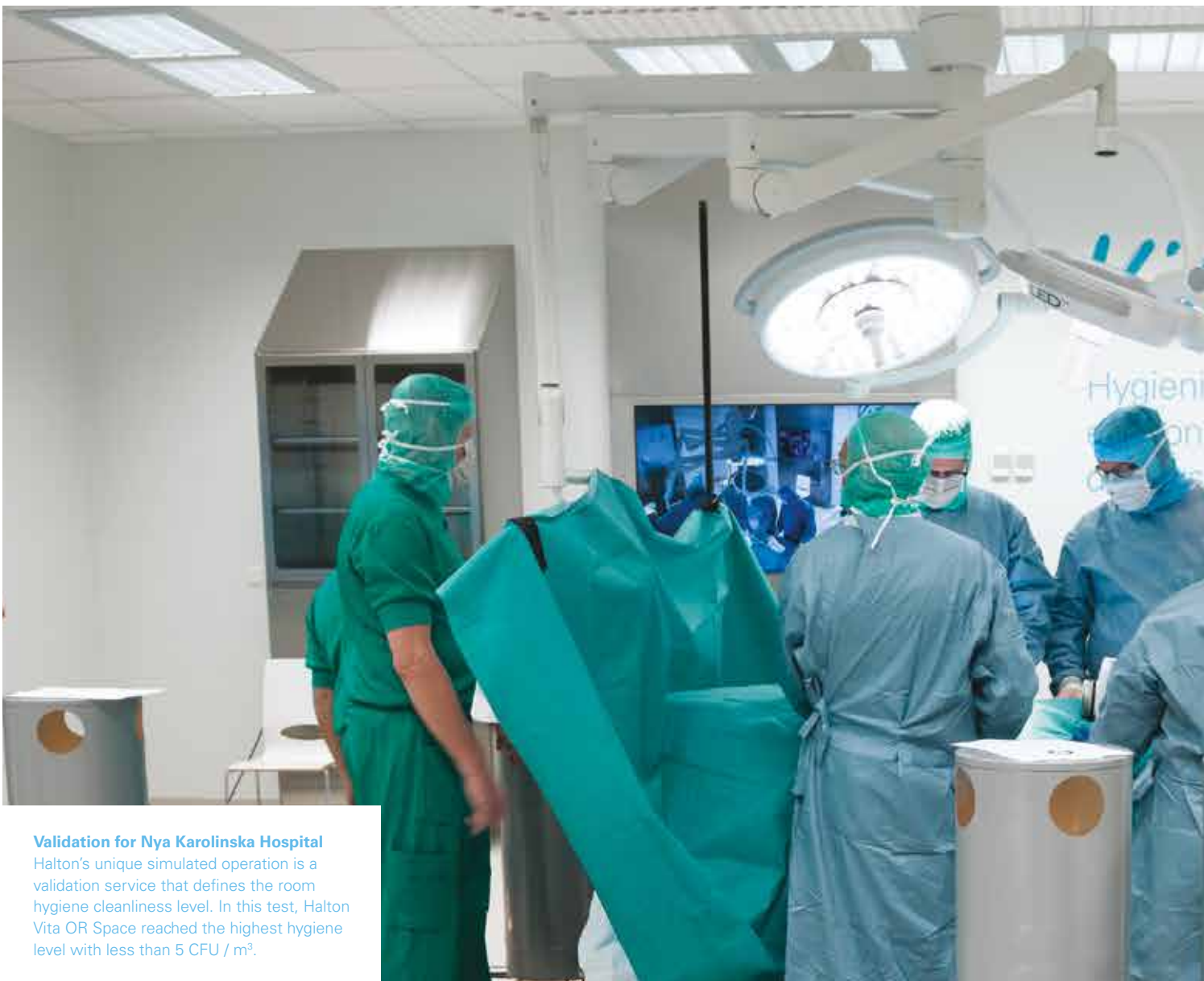
Halton Vita OR Cell

Halton Vita OR Cell is a mobile airflow solution providing clean air where needed. Mobile HEPA filtering units deliver ultraclean air to the patient's wound area or the instrument table.



Halton Vita OR Space

New, unique ventilation
solution for modern hospital
operating rooms.



Validation for Nya Karolinska Hospital

Halton's unique simulated operation is a validation service that defines the room hygiene cleanliness level. In this test, Halton Vita OR Space reached the highest hygiene level with less than 5 CFU / m³.



As the requirements for operating rooms increase, Halton Vita OR Space brings together ultraclean* environments with comfortable conditions and high energy efficiency for the entire operating room.

Highest level of air cleanliness

The Halton Vita Space 5 system is designed to provide ultraclean operating environment for high risk operations. The air flow for each operating room is designed based on maximal microbial load eg. maximum number of personnel and the quality of clothing system to be used in the room.

Comfortable conditions

The system enables an ideal and adjustable work environment for the medical team. It allows modifications in air flow patterns and adjustment of thermal conditions according to individual needs.

Flexible use of space

The unique controlled-dilution innovation provides desired cleanliness level for the entire operating space. For the operational efficiency point of view this allows to place the personnel as well as the medical equipment optimally for each operation using the entire space.

Energy efficiency

The highly automated ventilation control system makes Halton Vita OR Space exceptionally energy efficient. The control system reduces the air flow automatically during the off-duty hours still maintaining the desired overpressure in the room. In addition to savings in energy costs the reduced air flow will extend the life-time of HEPA-filters, which will decrease the life cycle costs of the system. As an optional feature of the control system room air cleanliness can be controlled based on demand. The control system will then automatically adjust the air flow in the room according to microbial load eg. amount of the people in the room and the desired microbial air cleanliness for each operation.

Silent operational environment

Professionally designed system enables low noise levels in the operating area.

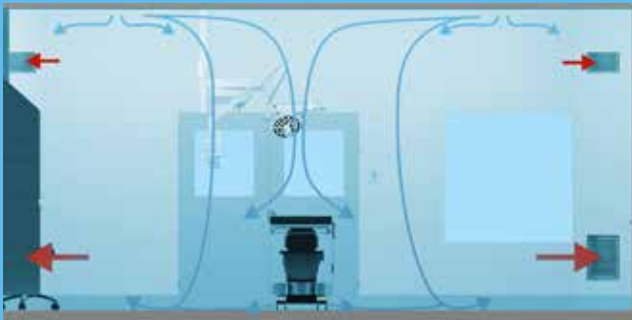
*) The prEN 16244-2 (by CEN TC156 WG18) for operating room ventilation defines two quality levels for operating room air cleanliness: ultraclean and clean. Microbial cleanliness of ultraclean air should be <10 CFU/m³ and <100 CFU/m³ for clean air measured with active sampling method and in operation conditions. Swedish guideline for microbial cleanliness in the operating rooms, SIS-TS 39:2015, recommends to use mean value <5 CFU/m³ as limit value for infection-prone surgery.

Design and operation based on microbial cleanliness and system recovery time

- Microbial load from operating personnel is the principal source of contamination
- System recovery time emphasises the system's ability to maintain cleanliness in various operating situations and between individual operations
- The unique control system saves energy while maintaining the cleanliness levels

A complete operating room ventilation solution

- The Vita OR Space total solution includes a fully functional system consisting of supply and exhaust air units, an intelligent ventilation control system, recirculation units and verification services.
- Continuously updated to meet the pan-European CEN TC 156 WG18 -standard development



Innovative controlled-dilution principle

HEPA-filtered air is introduced into the room in a carefully controlled manner, effectively displacing and diluting air impurities, and preventing them from re-entering into the operating area. With this method, the highest required air cleanliness level is achieved for the entire operating space, without compromising the safety and comfort of the patient and medical team.

Halton Vita OR Space 5

Performance criteria for ultraclean air ventilation

- Microbial cleanliness in *operational* occupancy state < 5 CFU/m³ (SIS-TS 39:2015) / < 10 CFU/m³ (CENTC 156 WG 18)
- Particle counts in *at rest* occupancy state should be within ISO 5 (CENTC156 WG18)
- Recovery time (100:1) < 10 min (CENTC156 WG18)

Dimensioning of required minimum airflow rate and suggested unit size

Based on:

- Maximum number of operation personnel
- Quality of clothing system - Microbial source strength 1.5 CFU/person**
- Microbial cleanliness requirement 5 CFU/m³, Ultraclean air*
- Recovery time (100:1) < 10 minutes

Maximum number of personnel in OR	Minimum supply airflow rate (l/s / m ³ /h)	Supply unit dimensions (mm x mm)
4	1200 / 4320	3000 x 3000
6	1800 / 6480	3600 x 3600
8	2400 / 8640	4200 x 4200

* CFU = Colony forming unit, bacteria carrying particle which gives rise to a colony on a culture plate

** Source strength < 1.5 CFU - requires the use of operating suits of clean room quality

The unit dimensions may be adjusted according to airflow rate and room dimensions.



System description of Halton Vita Space

Halton Vita OR Space 7

Performance criteria for clean air ventilation

- Microbial cleanliness in *operational* occupancy state < 50 CFU/m³ (SIS-TS 39:2015) / < 100 CFU/m³ (CEN TC156 WG18)
- Particle counts in *at rest* occupancy state should be within ISO 7 (CEN TC156 WG18)
- Recovery time (100:1) < 20 min (CEN TC156 WG18)

Dimensioning of required minimum airflow rate and suggested unit size

Based on:

- Operation personnel, up to 8 persons
- Quality of clothing system - Microbial source strength 3 CFU/person**
- Microbial cleanliness requirement 50 CFU/m³, Clean air*
- Recovery time (100:1) < 20 minutes

Room size [m ²]	Minimum supply airflow rate (l/s / m ³ /h)	Supply unit dimensions, 2x Units (mm x mm)
40	525 / 1890	2400 x 600
50	650 / 2340	2400 x 600
60	775 / 2790	3000 x 600

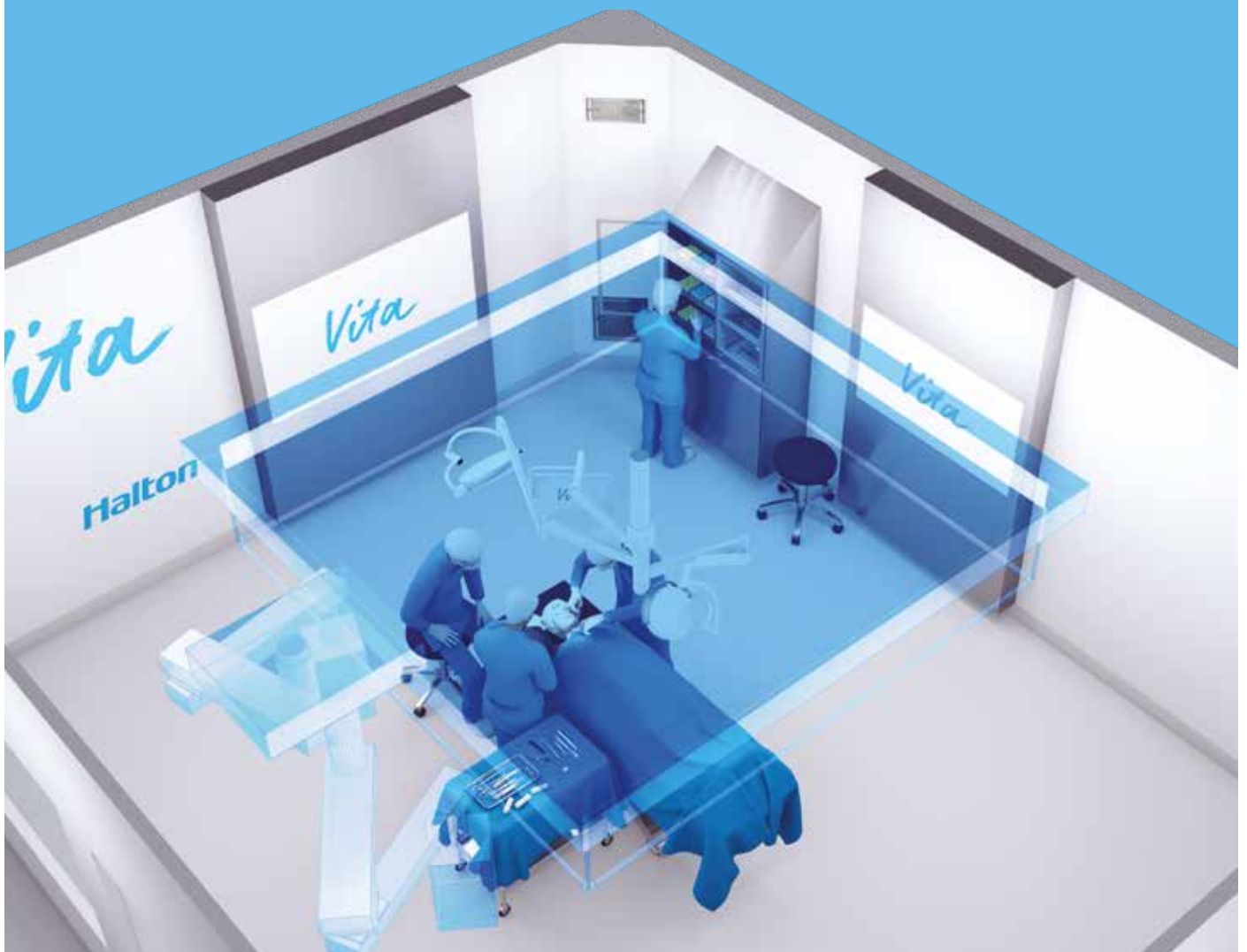
* CFU = Colony forming unit, bacteria carrying particle which gives rise to a colony on a culture plate

** Source strength < 3.0 CFU - corresponds to the use of good quality operating suits

The unit dimensions may be adjusted according to airflow rate and room dimensions.

Halton Vita OR Zone

Low-turbulent-flow ventilation
solution for operating rooms.



A complete operating room ventilation solution for ultraclean operating environments

- Complies with the ISO class 5 cleanliness requirements
- Compliant with many national hospital ventilation standards
- The total solution includes a fully functional system consisting of supply and exhaust air units, an intelligent ventilation control system, recirculation units and verification services. Halton Vita OR Zone is available with a recirculation unit or with ceiling-integrated circulation. Integrated general lighting is available as an option.

Smart design and high-quality materials

- Filter sizes are optimised so that the filtered surface area is maximised
- Easy-to-clean single-layer membrane guarantees an even airflow throughout the unit
- An air-guiding skirt ensures a maximum amount of ultraclean air to the targeted area
- An advanced filter-leakage detection system prevents contamination of the ultraclean air zone

Ultraclean air created with the low-turbulent-flow principle

An ultraclean air zone is created around the surgical field. The risk of surgical site infections is decreased as the ultraclean airflow prevents air impurities from entering the operating area from the periphery.



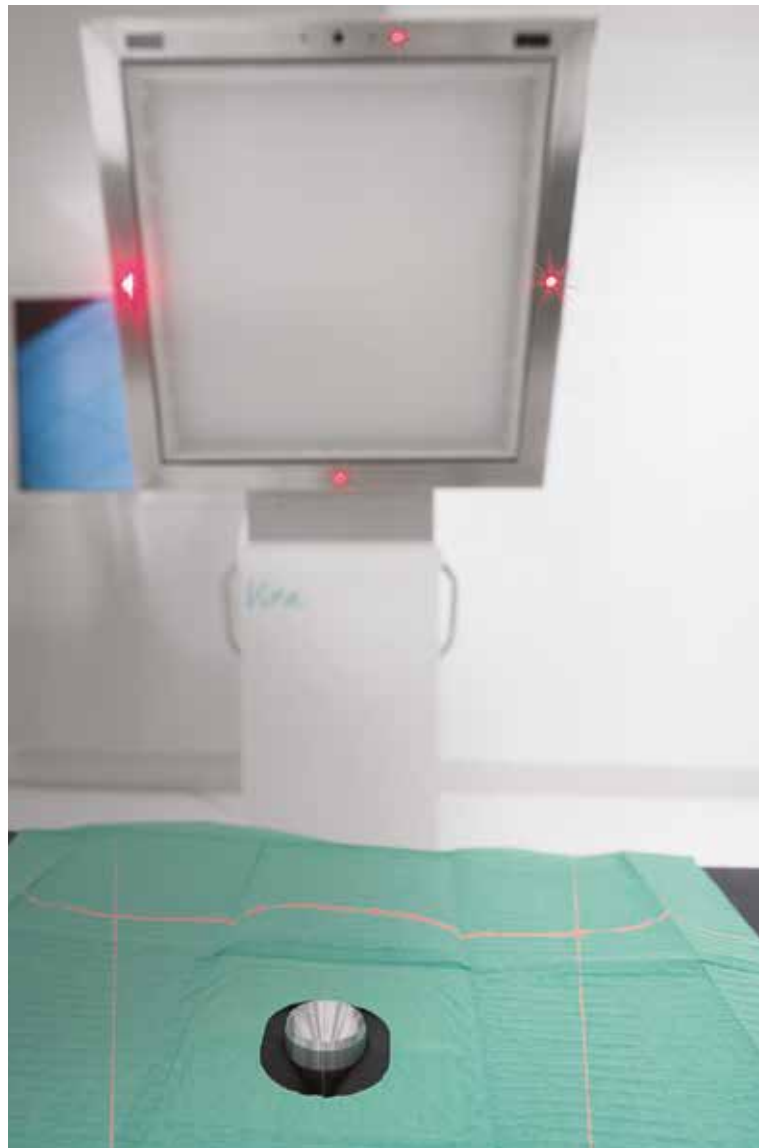
Halton Vita OR Zone

Size of supply air outlet (mm x mm)	Size of protected zone (m x m)	ACCORDING TO DIN 1946-4: 2008			ACCORDING TO HTM-03-01: 2008			Minimum OR size (m x m)
		Supply air velocity (m/s)	Airflow rate (l/s)	Airflow rate (m ³ /h)	Supply air velocity (m/s)	Airflow rate (l/s)	Airflow rate (m ³ /h)	
2400 x 1800 *	2.0 x 1.4	0.24	950	3420	0.38	-	-	5.4 x 4.8
2400 x 2400	2.0 x 2.0	0.24	1300	4680	0.38	-	-	5.4 x 5.4
2800 x 2800	2.4 x 2.4	0.24	1900	6840	0.38	3000	10800	5.8 x 5.8
3200 x 3200	2.8 x 2.8	0.24	2350	8460	0.38	3700	13320	6.4 x 6.4
3500 x 3500	3.1 x 3.1	0.24	2800	10080	0.38	4450	16020	7.0 x 7.0

* Unit size not available with ceiling integrated circulation

Halton Vita OR Cell Solution

An easy and cost-effective way to upgrade the safety of the operating environment.



Halton Vita OR Cell Patient and Halton Vita OR Cell Instrument – clean air where needed

- Complements existing ventilation system in spaces where improved clean air conditions for surgical procedures are required
- Primary provider of clean air conditions in smaller outpatient and ambulatory treatment facilities



Halton Vita OR Cell Patient

Easy-to-use, innovative flexibility

- Simple user interface
- Easy to set up and re-adjust
- Wheels for easy repositioning
- Startup and qualification services

All materials and the construction design of the products enable easy cleaning of both unit and space.



Halton Vita OR Cell Instrument



Ultraclean air with mobile HEPA air filtering units

Halton Vita OR Cell products extract air from the space and treat it with a pre-filter followed by a H14 HEPA-filter. The air is delivered as a constant and stable laminar airflow directly to the wound area or the instrument table. This lowers the risk of airborne contamination of the wound area and the instruments.

Halton Vita OR Services

Halton Vita OR solutions are delivered as turnkey solutions. Halton's expertise ensures the best outcome - all the way from early design to validation and support throughout the building lifecycle.



Halton helps you find the optimal solution for operating environments at the design phase and verifies excellent system performance at the handover. During building use, our services offer a proactive and user-centric tool for managing the safety and comfort of your indoor environment.



Halton Design Studio services

- Co-designing with the customer, defining the requirements and performance targets, matching targets to optimal OR solutions
- Halton CFD simulations for thermal comfort, air quality and system performance analysis
- Halton Mock-up for system performance and full-scale indoor environment testing conducted in Halton Innovation Hubs
- Simulated operations carried out in Halton's full-scale operating room



Halton Tune services

- Securing the safety and functionality of spaces with smooth commissioning and optimal system performance validation services
- Ensuring safe and comfortable working conditions with space cleanliness and indoor climate validation services
- End-user training for all solutions



Halton Life Cycle services

- Continuous validation and fine-tuning services for guaranteeing the safety, hygiene and comfort of spaces
- Regular maintenance services for all Halton Solutions
- System performance evaluation and optimization



Vita

Wherever air quality we take care of everything

Your partner in indoor air quality

Halton is your lifetime partner from the design of the systems, through construction process to annual maintenance. Our services cover your project from end to end, ensuring the best solution for all your needs.

- Project design and support
- Pre-validation with mock-up or CFD modelling
- Commissioning and performance validation
- Annual maintenance
- Halton HIT Design tool and solution documentation

Halton is a key supplier for all indoor air solutions in the ultra-modern Nya Karolinska Solna University Hospital in Sweden – the world's largest PPP hospital with LEED Gold certification. Illustration: White Tengbom Team.

Quality is critical, every breath you take.

Halton Vita Solutions

Demanding spaces

- Operating rooms
- Laboratories
- Patient environments
- Isolation rooms
- Hospital pharmacies

Specialised needs

- Outdoor air intake hygiene
- Fire and smoke safety
- Air diffusion and thermal comfort
- Solutions for hospital kitchens

Halton Vita solutions are designed for

- Maximum safety, reliability and comfort for professionals and patients
- Easy and intuitive system use and monitoring with smart controls and interfaces
- Optimised energy efficiency with demand-based system operation



Vita

Halton Vita Values

Putting people first

Halton Vita solutions are made for people who depend on them. From laboratory and pharmaceutical professionals to doctors, nurses and their patients, our first responsibility is the safety, comfort and wellbeing of these people and their environment.

Passion for better solutions

We are driven by our customers' needs, and demanding spaces demand better solutions. Halton Vita solutions are designed, produced and delivered to the highest standards of safety, quality and efficiency.

Solving each challenge together

Delivering the best solutions for demanding spaces requires great flexibility, a commitment to continuous development, and close cooperation with our customers. Together, we can ensure that every Halton Vita solution meets the unique demands of your project and the people it serves.