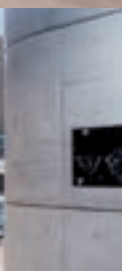
Halton – Chilled Beams

Care for Indoor Air

Halton
CARE FOR INDOOR AIR



A life cycle with sustainable comfort

Sustainable buildings are a global trend. With focus on people and their work, the quality of indoor air is today an essential issue. Furthermore, economic considerations of energy efficiency and total life cycle performance are key arguments for selecting the HVAC system. The chilled beam system offers a perfect solution to all these issues.

Good indoor air fosters wellbeing and productivity. The chilled beam system provides excellent thermal comfort and draught-free conditions. Unlike other typical systems, the chilled beams operate silently, fulfilling even the highest acoustic demands of working, relaxing and healing environments. They also promote enhanced hygiene, as their operation is filter and drainage-free.

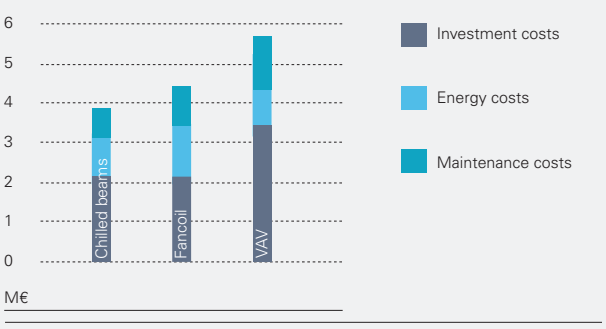
Better indoor climate with less energy. In the chilled beam system, most of the heating and cooling capacity is transferred through water. The system optimizes the opportunity for free cooling and heating. For free cooling, outdoor air, ground and sea water can be exploited. In heating, condensing boilers and heat pumps run more efficiently at lower temperatures.

In the chilled beam system, the outdoor airflow is optimized to cover hygienic and air quality requirements. More efficient ventilation uses less fan energy and smaller air-handling units and ductwork than traditional all-air systems. This leads to a highly efficient building structure with lower construction costs. Also, the total pressure loss can be optimized for a competitive specific fan power level.

Good indoor air is sustainable. The chilled beam system features a number of enduring life cycle elements for a low environment impact compared to all-air systems. It is highly energy-efficient, easy to maintain, and simple to adapt as required.
The very operation principle of the chilled beam system is trouble-free and uncomplicated: no fans, filters or condensation systems. Consequently, the system's maintenance need is low.

2.

LIFE CYCLE COSTS



Best solution for economic life cycle. *A life cycle cost analysis comparing typical indoor air systems shows that the chilled beams system with constant airflow rate in offices and variable airflow rate in other areas is the most efficient and economic over a period of 20 years. The net present value analysis was based on the study conducted by Consulting Engineering Olof Granlund Oy in a reference office building of 10 000 m².*

Facts about Halton Adaptable^{Climate}

Benefits for facility owners and users:

- flexible positioning of office and meeting rooms
- fast layout changes with minimal interruption and churn cost
- good indoor environment, high user satisfaction
- minimal energy and maintenance costs

Benefits for design and construction teams:

- large beam operation range for fast design and only one specification
- consistent appearance enables attractive architecture
- adaptability reduces need of redesigns in layout changes
- easy order-delivery and site logistics process

Halton Adaptable^{Climate} – the concept for easy interior changes

Flexibility is one of the most important demands for high performance premises. Recently, the need of office meeting and team rooms has increased spectacularly. On the other hand, there is also a need for more freedom in positioning office and meeting areas.

With the traditional systems, churn costs and project duration to meet these needs are considerable. Halton Adaptable^{Climate} is a concept that changes all this. While ensuring good working conditions and reducing churn costs to a fraction, it allows easy and cost efficient layout changes without interruption to the space usage.

The system adaptability also gives an unprecedented freedom in design and installation stages. The system can be built of just one type of product as chilled beams cover different usages and requirements. This gives the system a consistent appearance. Using just one type of product also makes the logistics chain easy.

Change from offices to meeting rooms. Chilled beams designed according to the Halton Adaptable^{Climate} concept allow users to determine the position of meeting and office rooms in a zone without limitations. With a broad operation range, the air velocity, cooling and outdoor airflow rate provided by the chilled beams are simply adjusted to meet the requirements of the new layout.

Change from office rooms to open-plan office. In office layout changes, thermal comfort conditions need to be adjusted to maintain user satisfaction. In case of a partition wall is relocated close to a chilled beam and a working place, the air velocity conditions must be controlled to prevent local draught. Outdoor air flow is 25% of the re-circulated room air. The most effective way to control conditions in a space is to adjust the amount of air induced through the coil of the beam and afterwards released in the space.

With the Halton Adaptable^{Climate} concept, user satisfaction can be just as high in an open-plan office as in separate office rooms: the indoor climate can still be adjusted according to each person's wishes.

Optimized for working, relaxing and healing

Halton chilled beam system offers unique comfort and flexibility, efficient use of space and economical life cycle. The system combines ventilation, cooling, heating and other building services especially for spaces where high-quality conditions and individual space control are important.

Office spaces and meeting rooms. In modern offices, re-positioning is continuous. With Halton Adaptable^{Climate}, layout and local climate changes are possible by simply adjusting the chilled beam operation. Indoor climate conditions are always optimal, together with user satisfaction and productivity.

Hotel rooms. Hotel guests appreciate comfortable air conditioning and silence in rooms. Chilled beams run silently while providing excellent thermal comfort for sleeping. Furthermore, easy maintenance and low running costs make this system truly competitive in hotel use.

Hospital ward rooms. The importance of proper thermal and acoustic comfort can not be underestimated in the healing process. The chilled beam system is a fully cleanable, dry coil solution that also promotes safety of the indoor environment. In large hospital buildings, efficient life cycle performance creates considerable savings.

Retail stores. Retail outlets are often high spaces with demand-based mixing ventilation. In such environments, chilled beams are used to create additional cooling to keep conditions pleasant as load variations occur.

Active chilled beams

Solution to match your needs

Halton offers various chilled beam types that suit even the most challenging architectural, constructional, and functional requirements. Chilled beams offer various installation options from false ceiling to concealed and exposed.

Active chilled beams. These are connected to ventilation ductwork and water pipework. Most of the cooling and heating capacity is transferred through water. The primary air is supplied through the beam to the room. This induces the room air to circulate through the beam's heat exchanger, and the beam mixes the primary and circulated air before diffusion to the room.

Such units are used for ventilation, cooling and heating in offices, health care facilities and hotels both in new and renovation projects. Advanced adaptability, excellent indoor conditions and efficient life cycle cost performance make active chilled beams an attractive option.

Passive chilled beams. These contain a heat exchanger, and they are used to provide additional cooling. The operation is based on natural convection. Ventilation is realized by using a separate system e.g. under-floor supply, ceiling diffusers or displacement ventilation. Passive beams can also be positioned close to glazed facades or windows as perimeter beams to offset perimeter zone solar loads.

Passive chilled beams are used in same applications as the active beams. Special applications for the passive beams are cases where the ventilation rates are relatively high or the existing ventilation system is preserved.

Customized service beams. Functionally these can be either active or passive beams. The customized beams are tailor-made to the specific customer demands. This option further enhances the beams' suitability to special architectural and constructional environments.

Active chilled beams

Passive chilled beams

Customized service beams

Choose Halton chilled beams

Halton is the leading chilled beam manufacturer. To meet the highest standards, all Halton products are tested to the finest detail at Halton's R&D facilities. To ensure top quality and full environmental responsibility, Halton complies with the ISO 9001 and ISO 14001 quality systems.

Extensive range of applications. Halton's wide range of chilled beams offers the right solution for various applications with high cooling and low humidity loads.

Office and team rooms. Adaptable active chilled beams CCE and CCC are used both in offices and team rooms, and they enable free locating of team rooms. Active chilled beams CBE, CBC, CBD, CBM with constant air flow rate are optimised for office use. Passive chilled beams CPT and CPA are designed to provide additional cooling together with a separate ventilation system. Customised service beams are active or passive beams tailored to the space's interior design.

	Features	Adaptable active chilled beams		Active chilled beams			
		CCC	CCE	CBC	CBD	CBE	CBH
	Installation	Suspended ceiling	Exposed	Suspended ceiling	Suspended ceiling	Exposed	Exposed
Dimensions	Width, mm	595	328	595	300	328	295
	Height, mm	220	183/228	220	250	183/228	230
	Length, mm	1200…3600	1200…4800	1200…3600	1200…3000	1200…4800	1800…5000
Performance	Cooling capacity, W/m	…350 (400)	…350 (400)	…350 (400)	…250	…350 (400)	…350
	Heating capacity, W/m	150 (200)	150 (200)	150 (200)	150 (200)	150 (200)	150(200)
	Airflow rate, l/s/m	5…50	5…50	5…20	10…18	5…12	5…12
Accessories	Halton Velocity Control	•	•	•		•	
	Halton Air Quality Control (manual or motorized)	•	•				
	Valves	•	•	•		•	•
	Light fittings		•			•	

Hotel guest rooms. Halton CBH and CHH offer silent conditions for guest rooms. Units are installed either exposed, concealed or hidden into a bulkhead structure for freedom in room interior design. Chilled beam technology does not use fans or filters, and has considerably lower maintenance costs than e.g. fan coil systems.

Hospital ward rooms. Active chilled beams CBC, CBH and CHH are the hygienic choice. Based on dry coil operation without condensation collection or filters, they require only limited maintenance. Chilled beams are fully cleanable.

Retail stores. Active and passive beams are used either as a primary cooling system or as a cooling system for additional all-air system. System selection and sizing are based on total outdoor airflow rate and required cooling capacity.

Airports. Gate passages have high outdoor airflow rate and extremely high cooling capacity requirement. In compact passages, the passive chilled beams are a rational solution for generating additional cooling for an all-air system and for maintaining the specific outdoor airflow rate within reasonable limits.

		Passive chilled beams		Customised service beams
CBM	CHH	CPA	CPT	
Suspended ceiling	Bulkhead	Exposed	Ceiling void	
600	826/1000	305…605	305…605	
120	176/235	100/130	80/105	
1200…2400	925	1000…5000	1000…5000	
…250	…800W (1200W)	…200 (300)	…200 (300)	
150 (200)	…500W (800W)	Limited applications	Limited applications	
5…14	15…59			
•		•	•	
•				

The customized beams can feature a variety of ceiling mounted acessories in an all-in-one solution:

- Light fittings
- Occupancy sensor
- Smoke detector
- Space for sprinkler
- PA system
- Electrical connections and cabling

Offsite manufacturing speeds up installation, improves and ensures quality, and offers a low risk, one source responsibility option.

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